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Impact of Traditional Myth on Infant Health in Rural Area (Special reference of Various Villages of Durg, Raipur and Rajnadgaon District of Chhattisgarh) (AbstractView.aspx?PID=2017-8-4-6) (https://scholar.google.co.in/scholar?q=Impact of Traditional Myth on Infant Health in Rural Area (Special reference of Various Villages of Durg, Raipur and Rajnadgaon District of Chhattisgarh))

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ABSTRACT:

The difference between human and other much important difference is seen from the childhood which there are two very prominent differences are first only the human is a creature into the living world who needs a long-duration care in childhood and second is that it can be seen the effect of site and society in; he lives. These are many direct and indirect effects over the child of this culture, in which there is much traditional and local knowledge is used to take care of the children from disease. Sometime it affects to the children positively or negatively. It presented the research letter is based over care of new-born children of Durg, Rajnandgaan and Raipur district of Chhattisgarh state in which intellectually the negative effect is seen in the new-born children by tradition and costumes and many kinds of activities related with it. Presented survey study is based on triangular method in which the data is compiled by the both counting and quality method.

Keywords: Myth () Children Health () Magic () Religion. ()

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Birhor, Particularly Vulnerable Tribal Group of Chhattisgarh : An Ethnographic Introduction (In Hindi)

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REMARRIAGE AMONG THE BAIGA TRIBE OF CHHATTISGARH

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Remarriage, Polygamy, The Baiga, Tribe, Chhattisgarh

ABSTRACT

Attempts were taken up to explore the nature of remarriage/polygamous marriages and what could be those factors that led to remarriage/ polygamy among the Baiga of Chhattisgarh. Objectives of the study were to find out the incidences of remarriage among the Baiga tribe of Chhattisgarh, to explore notion and approaches regarding remarriage and to conceptualize the pattern of remarriage among the Baiga tribe of Chhattisgarh. 400 married Baiga males belonging to age 18-49 years were selected through multistage random sampling. These 400 Baiga males i.e. 235 males from Bodala and 165 males from Pandariya development blocks of Kabirdham district of Chhattisgarh, India were randomly selected. Structured interview schedule were used for collection of data. The finding was, in Baiga society, the polygamy form of marriage does have existence. But there is no tradition of polygamy, it is just a remarriage. Polygamy was the exigent result of the contemporary materialistic, social and demographic conditions of the society. As a conclusion, the remarriage found in the Baiga tribe of Chhattisgarh is purely a circumstantial polygamous marriage whose main reason is the death of their ex-wives, not a custom or tradition.

INTRODUCTION

According to the Library of Congress (1995), rules for the remarriage of widows differ from one group to another. Generally, lower-ranking groups allow widow remarriage, particularly if the woman is relatively young, but the highest-ranking castes discourage or forbid such remarriage. The strictest adherents to the nonremarriage of widows are Brahmans. Almost all groups allow widowers to remarry. Many groups encourage a widower to marry his deceased wife's younger sister (but never her older sister).

By forms of marriage or remarriage, it means here the number of marriages, which the Baiga men, subjected to present study, did undergo. If any Baiga married one time, the form of such a marriage is monogamous. If a Baiga married more than once, his marriages will be polygamous in form. Attempts were taken up to explore the nature of remarriage/polygamous marriages and what could be those bio-social factors that led to remarriage/ polygamy.

Objectives of the study

1. To find out the incidences of remarriage among the Baiga tribe of Chhattisgarh.
2. To explore notion and approaches regarding remarriage among the Baiga tribe of Chhattisgarh.
3. To conceptualize the pattern of remarriage among the Baiga tribe of Chhattisgarh

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METHODOLOGY

400 married Baiga males belonging to age 18-49 years were selected through multistage random sampling. These 400 Baiga males i.e. 235 males from Bodala and 165 males from Pandariya development blocks of Kabirdham district of Chhattisgarh, India were randomly selected. Structured interview schedule were used for collection of data. The results were analyzed using the 16.0 SPSS package.

RESULTS AND DISCUSSIONS

Incidences of remarriage

The results arrived at the study, are shown in table no. 01according to which majority (87.2%) of Baiga men are found to have married once in comparison to 12.8% incidence of those marrying more than once. It clearly shows that Baiga tribe allows only one marriage, traditionally. It is worth mentioning that in most cases among those married second time; invariably it is after the death of first wife. Those who married more than once-under serial polygamous- those who recourse to polygamy and represented it- more than half among them had married second time after the death of their first wife or had been divorced from her. Some married more than once due to prolonged illnesses of the wives. The finding was, in Baiga society, the polygamy form of marriage does have existence. But there is no tradition of polygamy, it is just a remarriage. Polygamy was the exigent result of the contemporary materialistic, social and demographic conditions of the society.

Since March 2002

Scarcity of the Food Stuff among the Baiga : A Particularly Vulnerable Tribal group of Chhattisgarh

The tragedy of starvation deaths among shifting cultivator/hunting gathering communities has been in the making for some decades. Based on the results and analysis of this research, it is clear that the Baiga tribe of Chhattisgarh is going through a severe crisis of food items. And they yearn for two times' meals. The economic condition of the Baiga families is comparatively slightly better, only their families get full-sour food for a few days of the year. The rest of the day is similar to the other Baiga families.
***Key Words** : Scarcity, Food stuff, The Baiga, Chhattisgarh.*

Dr. Jitendra Kumar Premi

Introduction :

A Planning Commission document look at that "A decline in their (PTG's) sustenance base and the resultant food insecurity, malnutrition and ill-health force them to live in the most fragile living conditions and some of them are even under the threat of getting extinct"[1]. The tragedy of starvation deaths among shifting cultivator/hunting gathering communities has been in the making for some decades, but has got intensified in the last few years with cumulative effect of malaise and malnutrition from which these communities have been suffering for years. Over a generation or two, chronic malnutrition begins to give way to large-scale deaths [2]. It is identified that the Rice and the Maize are the main food items among the Baiga of Chhattisgarh. In the present study, attempts were made to explore the food scarcity, especially in the terms of the Rice and the Maize among the Baiga of Chhattisgarh and to find out the factors affect the availability of those food materials among them.

Objectives of the Study :

To explore the food availability, especially in the terms of the rice and the Maize and to examine causal factors concerning the availability of f those among the Baiga of Chhattisgarh.

Methodology :

400 Baiga males i.e. 235 males from Bodala and 165 males from Pandariya development blocks of Kabirdham district of Chhattisgarh, India were randomly selected. Structured interview schedule were used for collection of data. Correlation analyses were used to understand linkages between variables.

Results and Discussions :

Availability of Rice by the Baiga families :

Table no. 01 shows the staple food of Baiga people is rice, though as a two square meal, they don't get rice to eat two times a day, As the table points out, only 37% respondents' families, as daily meal, eat rice only once in the evening. Similarly, the families of 35% respondents take rice on special occasion like festival or ceremonial rituals. This is followed, by 8.8% respondents whose families eat rice once a day in the form of 'Pej'. 3% and 2.2% families feasted on this cereal once a week, and once in a fortnight respectively. On the contrary, a meager percent of 10.2% respondents divulged the truth that whenever they ate their meal every day, every time they ended their eating with a dash of rice as the chief component. On the other hand, 3.8% respondents confided that there was no certainty as when their families would eat maize as proper meal, on which definite intervals of time.

Table No.01 : Frequency of rice eating by the Baiga families

S. No.	Interval of taking rice	No. of families	Percent n=400
1	Not Sure	15	3.8
2	Once in a fortnight	9	2.2
3	Once in a Week	12	3.0
4	Especial occasion	140	35.0
5	Only once in the evening	148	37.0
6	Once a day in the form of *'Pej'*	35	8.8
7	Every day every eating time	41	10.2
	Total	**400**	**100.0**

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RESEARCH ARTICLE

Attitude towards Impotence and Barren among the Baiga Males of Chhattisgarh, India

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ABSTRACT:

Several conceptions and misconceptions prevail in human society about sexual impotency. In different human societies in different human cultures, opinions and criteria regarding impotence vary. Such opinions and criteria become perceptions in that particular society. Such perceptions were also traced in the Baiga community, which are presented in this paper. Objectives of the study are to explore notions about impotence and barren among the Baiga males of Chhattisgarh, India. The universe of our sample is 400 married Baiga males belonging to age 18-49 years. The Baiga tribe is one of seven Particularly Vulnerable Tribal Group (PVTG) of Chhattisgarh state of India. In the present study multi-stage random sampling method were followed. Structured interview schedules, focused group discussions and non-participant observation were used for collection and cross validation of data. According to the findings 33.5% respondents regard those males impotent who in the course of his youthful age could not make his wife pregnant. 30% respondents have the conviction that witchcraft and sorcery are the main causes of suffering from impotency. Perception regarding impotence among the Baiga males is found to be very placid and positive influenced by their age with value of $\chi 2$ = 1.153 and value of p is 0.020 at 5% level of significance. More than of half of them (50.8%) agreed that if any woman was unable to conceive, she was castigated as "barren". Perception about barrenness among the Baiga males is found to be moderate and positively depended on their educational status, with associated value of $\chi 2$ = 30.32 and value of p is 0.016 at 5% level of significance. From the observation of multi-nomial logistic regression test, the finding was: in order to, all the above causes were found responsible for the barrenness of any women, which were relative to result as deities, breach of taboos and magic and witchcraft held responsible for barrenness at value of β for predictor's age at marriage of the respondents, i.e., < 18 years had been found to be -1.069 with associated value of p is 0.048 at 5% level of significance. From the extant study one thing that came to light was that those men who are younger in age hold such forces less responsible than their elderly counterparts who happen to be more credulous, even superstitions. The fact also emerged through the study that with the rise in educational status and income, the general attitude of the male Baiga towards barrenness of women have become realistic and scientific.

KEYWORDS: Attitude. Impotence. Barren. The Baiga. Tribe. Chhattisgarh. India, Reproductive Health.

INTRODUCTION:

Several conceptions and misconceptions prevail in human society about sexual impotency and barrenness. In different human societies in different human cultures, opinions and criteria regarding impotence vary. Such opinions and criteria become perceptions in that particular society. As numerous perceptions and conceptions are prevalent behind a male's and female's suffering or not suffering from impotence and barrenness, in the same way, behind the possibility of its probable causes, several perceptions and conceptions

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Beliefs regarding Causes of Diseases and Healers among the Baiga

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Abstract

Various conceptions and misconceptions prevail in human society about causes of diseases. In different human societies in different human cultures, opinions and criteria regarding causes of diseases vary. Such opinions and criteria become perceptions in that particular society. The universe of our sample is 400 married Baiga males belonging to age 18-49 years were selected through multistage random sampling. Structured interview schedule and non-participant observation were used for collection and cross validation of data. most of the respondents (i.e. 75.8%) believed that sorcery of the witchcraft is the main cause of illness followed by 58.5 %, 58.2 %, 46 % respondents simultaneously accepted that acts of devils, evil eye, evil touch and evil mouth and good goddess were responsible for spread of diseases among them. On the light of above findings more or less all respondents believe that supernatural beings are the main factors for causing diseases, apart from that they think some natural factors also play vital role. It was found that in the choice of their healer whom they appealed as 'Baiga', two prime reasons that worked- they had profound faith in him, and secondly, he was readily available.

Keywords: Belief. Causes. Disease. Healers. The Baiga

Introduction

Numerous conceptions and misconceptions prevail in human society about causes of diseases. In different human societies in different human cultures, opinions and criteria regarding causes of diseases vary. Such opinions and criteria become perceptions in that particular society. Jaiswal and Premi (2014) stated, it is quite difficult to define the concept about health and disease of any culture because these are commonly known as relative terms. The notions and concerns regarding health and disease vary from culture to culture; it could be possible that any physical, mental and social conditions which are called healthy state in our culture may be considered unhealthy by some other ones. It is very difficult to be familiar with the notions and attitude of the semiliterate or illiterate and indigenous society.

Tribal concept of health, disease, treatment, life and death is different in different culture and tribal societies follow traditionally laid down customs and every member of the society is expected to conform to it" (Premi et al., 2010). Chaudhuri (2004) has stated that every culture has its own beliefs and practices concerning diseases.

According to Parsons (1972) health is a state of optimum capacity of an individual for the effective performance of the roles and tasks for which he has been socialized. Before asking a group of people to assume new health habits, it is

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Personality dimensions as predictors of career maturity in adolescents of oraon tribe in Chhattisgarh state

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The aim of the present piece of research work is to examine the predicting effects of personality dimensions, viz., extraversion and neuroticism on career maturity. Employing the correlational design 100 male students of Oraon tribe studying in class 10th within the age range 14- 16 years were drawn randomly from different schools of Surguja District of the state of Chhattisgarh to serve as Ss. For assessing the criterion variable. i.e., career maturity, Career Maturity Inventory (CMI) by Gupta (1989) and for assessing the predicting variable viz., personality dimensions Junior Eysenck Personality Inventory by Helode (1985) were used. Multiple regression analysis was used to examine for predicting effects of personality dimensions. Extraversion and Neuroticism have emerged as significant predictors of career maturity. The theoretical implications have been discussed.

Keywords: career maturity, personality dimensions, extraversion, neuroticism

Career maturity has been defined as the maturity of attitudes and competencies pertaining to career decision making (Crites, 1973, 749, 74b). The attitudinal variables include (1) decisiveness in career decision marking (2) involvement in career decision making (3) independence in career decision making (4) orientation to career decision making (5) compromise in career decision making. The competencies include (1) self-appraisal (2) goal selection (3) planning and (4) problem solving.

This concept has its origin in the developmental theory of career behavior which invisages that the selection of an occupation is a process spanning a considerable number of years usually from the childhood to early adulthood. The process even continues after a person establishes in an occupation and makes efforts to maintain and advance in it and later in life prepares to retire from it.

The term vocational maturity has been defined normatively, in terms of congruence between an individual's vocational behavior at a point of time and his/her expected vocational behavior at that particular age. The closer the correspondence between the two, the greater the individual's vocational maturity.

It has been found to be predicted by a number of variables such as age (Edwords, Natziger, & Holand, 1974; Hen & Ederline, 1976; Kelso, 1973, 77) Locus of Control (Glabe, Thompson, & Glanstein, 1976; Helbing, 1984; Hoise & Hansen, 1978; Ono & Sakayanagi, 1986; Tylor, 1985) Locus of control, dependence proneness and gender (Hasan & Dewangan, 2004) Percired work relation barriers (Patten et al., 2003): Personality variables (Hirchi's et al., 2010; Lounsbury et al., 2005; Sarickas, 2002).

Although a number of studies have been conducted in which the relationship between personality variables and career maturity has been ascertained Hirches et al. (2016); Loursbury et al. (2005); and Sarickas (2002) no study involving a personality theory or model has yet been conducted to find out the relationship between personality dimensions and career maturity till now.

Lawrence and Brown (1976) and Pond (1978) have shown that career maturity has been found to the influenced differently in different culture, race and gender groups by certain psychological, demographic and educational factors. So this study was conceived to examine the prediction effects of personality dimension viz neuroticism and extraversion on career maturity under Indian cultural setup. It was expected that extraversion and introversion would emerge as predictors of career maturity.

Method

Participants

Following the random sampling technique 100 - male students of Oraon tribe studying in class 10th within the age range of 14- 16 years were drawn from different school of Surguja District of Chhattisgarh state to sever as subjects in the present study.

Research design

In the present study correlational research design was employed Career Maturity is criterion variable. Personality Dimensions, viz., extraversion and neuroticism are suspected predictors.

Instruments

Career Maturity Inventory: To measure the career maturity of Ss the Indian adaptation of Career Maturity Inventory (CMI) by Gupta (1989) was used. The inventory was originally constructed and standardized by Crites (1973-1978). It measures the maturity of attitudes and competencies that are critical in realistic career decision-making. The items of the inventory are suitable for the students of class 9th and 10th. The attitudinal variables assessed by attitude scale are (i) decisiveness, (ii) involvement, (iii) independence, (iv) orientation, and (v) compromise in career decision-making. It has five independent dimensions- (a) self-

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Abstract

THE ROLE OF DOPAMINE D2 RECEPTOR POLYMORPHISM TOWARDS SUSCEPTIBILITY TO ALCOHOL DEPENDENCE AMONG MALE CASES OF BILASPUR DISTRICT: A PRELIMINARY STUDY

Moumita Sinha*, Niketa Vishwakarma, Ashish Pradhan, I.Arjun Rao, Bharti Ahirwar and Mitashree Mitra

ABSTRACT

Dopamine is a key substrate for alcohol and other drug related behaviours and plays an important role in the central reward process. The psychoactive substances and high levels of alcohol elevate the dopamine release in the NAc zone of the CNS and it is thought that this release is important for the addictive behaviour as it is associated with positive moods, pleasure and euphoria. The DRD2 gene has three most commonly investigated polymorphisms i.e. -141C ins/Del, TaqI B and TaqI A. As a result, we studied association of three single nucleotide polymorphisms (SNP) in DRD2 gene with alcohol dependence in the central Indian subjects using a case-control approach. Cases satisfied DSM-IV criteria for Alcohol Dependence was determined and total of 50 AD cases and 50 healthy unrelated age-matched control samples were included. To determine risk conferred by a predisposing allele/genotype/ haplotype Odds ratio and confidence interval was calculated. The investigation revealed a significant association of -141C Ins allele and a tendency of association of TaqI A1 allele of DRD2 with alcohol dependence. Haplotype with the influencing -141C Ins and TaqI A1 alleles (-141C Ins-A-A1) appears to bestow 3.19 times risk to acquire alcohol dependence. Present study imparts initial understanding towards genetic susceptibility to alcohol dependence in central Indian males. Polymorphisms namely, -141C Ins/Del and TaqI A at DRD2 gene could have proven influences among central Indian alcoholic cases.

Keywords: Alcohol Dependence, DRD2, SNP, Genotype, Allele Frequency.

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Article

Role of Medicinal Plants and Local Health Tradition for Primary Healthcare: An Anthropological Study of Bilaspur District of Chhattisgarh (India)

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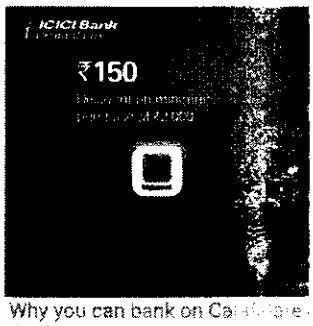

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Utilization of Mother and Child health care services among the Telis of Raipur District

Neerja Sen[1], Moyna Chakravarty[2] and Satyajeet Singh Kosariya*[2]

ABSTRACT

The study was aimed to assess the level of utilization of mother and child health care services among the Telis of Raipur district in order to develop effective health planning fulfilling specific local need. For the present investigation data, was collected from 11 blocks of Raipur district on the basis of preponderance of Teli population. Twenty two villages were selected on the basis of probability proportion to size of the population covering 303 households. Interview schedule was used for data collection. The study found out that home delivery cases were very high, while prolonged labour and excessive bleeding were the post delivery complications. Immunization status was also recorded to be low. Both the pregnant and the non pregnant woman are predominantly over burdened with heavy work load both in agriculture and in household. They continue to work until the time of birth and resume the work shortly after the delivery which puts deep impact on their health and general well being. Although Chhattisgarh government and health department have launched various good schemes for the betterment of maternal and child health care but substantial efforts and implementation is required as a priority for betterment of the reproductive health amongst the Telis.

INTRODUCTION

India has been adopting many programmes to strengthen and increase quality services to regulate fertility as effectively as possible. Researchers and social scientists have identified a number of factors responsible such as poor accessibility, lack of infrastructures, poor quality of care involved in the way a client is tackled by the providers, lack of faith in the services, delivery system etc. However, the extent of impact of these factors on utilization of services varies according to traits, beliefs and perception of beneficiaries (Varma, et al., 1993). 9th five year plan has integrated all the related programmes of the earlier plans like Child Survival and Safe Motherhood (CSSM) and Maternal and Child Health (MCH) programmes. Since the Reproductive and Child

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PREVALENCE OF OSTEOPOROSIS IN WOMEN OF RAIPUR CITY

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Abstract-There has been an increase in the number of both men and women with osteopenia and osteoporosis, i.e., reduced bone mass and architectural disruption in bones in India in the last few years. Low calcium intakes, Vitamin D deficiency, sex inequalities, longer life expectancies, lack of diagnostic facilities, early menopause, poor knowledge of bone health and genetic predispositions have contributed towards high incidence of osteoporosis in India.The present study focuses on the prevalence of osteoporosis among the women of Raipur city and the data have been compared with the studies done so far in India. Among the respondents under study 24.22% had osteopenia and 25.63% had osteoporosis.

Key words-Bone mineral density, Osteoporosis, Vitamin D

Introduction-Osteoporosis is a complex multifactorial disease characterized by compromised bone strength and micro architectural deterioration of the bone tissues, predisposing an individual to bone fragility and increased risk of fractures (NIH Consensus Development Panel on Osteoporosis, 2001). It is not a disease entity separate from ageing process but is rather a more extreme version of the normal porcess of bone loss.Osteoporosis is often refered as a silent killer as it is generally not recognized until its first manifestation in the form of low traumatic fracture. Osteoporosis is an important clinical and public health problem through its association with fragility fractures. Osteoporosis is ever been called a silent epidemic because postmenopausal bone loss itself causes hardly any symptom and becomes clinically apparent only when a fracture has occurred, by that time the disease has progressed considerably (Bathena, 2012). Further, increase in the life span has resulted into a large number ofelderly / geriatric people globally. At present the life expectancy in India is67 years which is expected to increase by 71 years by 2025 and increase further to 77 years by the year 2050(Kanis , Delmas, Burckhardt, Cooper, & Torgerson, 1997).

Several studies have reported habitual low intakes of calcium in infants, adolescents, pregnant and lactating mothers and among postmenopausal women in India(Mithal & Kaur, 2012)(Puri, et al., 2008)(Kadam N. , Chiplonkar, Khadilkar, Divate, & Khadilkar, 2010)(Tandon, et al., 2014). There is a need to build up peak bone mass during the growth years especially during puberty and increase the calcium intake during pregnancy, lactation and around pre and post- menopausal years as the situation is critical among the Indian women(Ohlsson, Bengtsson, Isaksson, Andressen, & Slootweg, 1998). Further there is sexual difference in serving milk and milk products as larger portions are served to males, especially inlower socio economic classwhich worsens the situation among the women folk(Gupta, 1987).Government programs for providing supplementation gives 500mg/d of calcium through a serving of 165gms of micronutrient fortified food per day to pregnant and lactating mothers. But there is no national program for supplementation for promotion of bone health. Despite of being a sun rich country deficiency of vitamin D is reported in all age groups amongst the Indians. Poor intake of dietary calcium , environmental pollution, avoidance of sunlight exposure, skin tanning and higher 25(OH)-D-24-hydroxlase enzyme among the Asian Indians are some of the reasons for lower levels of vitamin D(Khadilkar A. V., 2010).Food items and oily fish containing vitamin D form a very small portion of Indian diet. Edible oils have 5-15µg/100 g of oil of fortification of vitamin D,whereas fortification of other food products with vitamin D is not done commercially in India (Nutrient requirements and recommended dietary allowance for Indians: A report of expert group of the Indian council of medical research, 2009).

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REMOVAL OF FE(II) USING *Aspergillus flavus* FROM AQUEOUS SOLUTION

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ABSTRACT

Biosorption is receiving more attention for the removal of metal ions from waste water in comparison with the conventional technologies. In present investigation, *Aspergillus flavus* is tested for its abilities to absorb Fe(II) ions from aqueous solution. The biosorption capacity of Fe(II) was found to 5.17 mg/g of live biomass. The optimization of some important parameters, such as incubation time, pH, temperature and initial metal ion concentration on biosorption capacity were examined in batch experiments. Maximum biosorption rate was obtained at pH range from 7.0-8.0, after 5 days of incubation time and between 30-35°C of temperature range. It was also observed that increasing Fe(II) concentration decreased the biosorption capacity. Langmuir and Freundlich isotherm model were used for mathematical description of adsorption of Fe(II). The value of correlation coefficients (R^2) of Langmuir and Freundlich isotherm model were found to 0.974 and 0.872, respectively, therefore, the Langmuir model fitted the equilibrium data better than Freundlich isotherm model.

KEYWORDS: Biosorption; *Aspergillus flavus*; iron; Isotherms

The unceasing growth of industrialization and urbanization has increased the demand of natural resources. These demands of human development have also increased the level of pollution in the present environment. Water pollution by the heavy metals is one of the most significant problems, which is mainly due to the discarding industrial effluent, domestic wastewater or dumping solid waste nearby water resources. The heavy metals such as Fe, Zn, Cu, Pb, Mn, Hg, Cr and Cd etc. are widely distributed into earth's surface. Iron is commonly used in electroplating industries, steel and ferroalloy units etc. Almost all organisms and living cell require iron for the basic cellular process. However, excessive iron causes iron toxicity. In humans, vomiting, diarrhea and damage in the intestine are the symptoms of iron toxicity and it is also affecting the aquatic life through getting precipitated in the gills of fishes (Binupriya et al., 2006). The industrial effluents have containing heavy metals and other toxic substances and its disposal into natural water systems is, a cause of serious environmental concern.

Conventional methods such as chemical precipitation, electrowinning, membrane separations, evaporation and ion exchange are very expensive as an economic point of view to remove heavy metal from wastewaters (Dursun, 2006). Biosorption is one of the methods to solve water pollution in an inexpensive manner. Biosorption is a physicochemical process that can be simply defined as the removal of substances from solution by biological material (Fomina and Gadd, 2014). A variety of biological materials is available for metal removal processes. Bacteria, yeast, algae and fungi have received more attention for metal removal and their recovery due to their good performance, low cost and large availabilities (Wang and Chen, 2009).

The main objective of this investigation is to reduce the higher concentration of iron from the industrial effluents using biosorption method. For this purpose, an artificial aqueous solution of iron (II) was tested in the laboratory. In the present study, the biosorption of Fe(II) by live biomass of *Aspergillus flavus* was investigated and effect of parameters such as incubation time, pH, temperature and initial metal ion concentration were studied in a batch system. For characterization of uptake capacity of Fe(II) isotherm model were also studied.

MATERIALS AND METHODS

Microorganism

Fungal strain *Aspergillus flavus* was isolated from the steel industrial effluent of Urla industrial area, Raipur (Chhattisgarh), India by serial dilution technique on Potato Dextrose Agar (PDA) and identified based on morphological and microscopic characteristics (Nagamani et al., 2006). The fungal culture was routinely maintained in PDA medium.

Preparation of Biosorbent

The fungal culture was inoculated in a Potato Dextrose Broth (PDB), pH 5.5-5.6 and after 3-4 days of inoculation, 100 µL of 10^{-1} fold diluted fungal spores suspension was transferred into the experimental batch setup. The batch biosorption experiment was carried out in Erlenmeyer flask (150 mL) containing 50 mL of PDB with Fe(II) approximately 5 mg/L of concentration. In the medium, ferrous ammonium sulfate (FAS) compound was used as Fe(II) source. The

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BIOCONVERSION STUDY OF DEOILED RICE BRAN FOR BIOETHANOL PRODUCTION

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ABSTRACT

Bioethanol is the most promising alternative fuel for transportation. It is obtained from lignocellulosic biomass through microbial conversion leads towards the development of second generation biofuel technology. In the present work, Deoiled rice bran (DORB) a lignocellulosic by-product was used as a substrate for bioethanol production by *Pichia stipitis* NCIM 3497 and also optimizes its fermentation conditions; inoculum size, pH, temperature and fermentation period. The effect of nutrient supplementation on bioethanol production was also analyzed. The results of this study revealed that maximum bioethanol 9.31±0.08 g/L was produced at 30°C temperature, pH 6 after 48 h of fermentation period using *Pichia stipitis* NCIM 3497 of inoculum size 1.5% v/v whereas on addition of ammonium sulphate at 2mM concentration gave 12.56% more bioethanol compared to control.

KEYWORDS: Deoiled Rice Bran, Bioethanol, Bioconversion, *Pichia stipitis* NCIM 3497

Bioethanol is an eco-friendly fuel that replaces additive methyl tertiary butyl ether (MTBE) from gasoline (Sun and Cheng; 2002). The environmental advantage of an oxygenated compound ethanol over gasoline, as it provides more oxygen on combustion and has better combustion efficiency. Thus the utilization of ethanol helps in maintaining level of greenhouse gases as well as decreases dependency on fossil fuels. Biofuel can be categorized on the basis of feedstock used for its production. Second generation biofuel can be produced from non-food crops such as lignocellulosic biomass, industrial wastes and agricultural residue etc (Bhatia and Johri; 2015). In order to maintain food security, second generation biofuel grasp more attention by researcher's.

Many agro-industrial by-products can be used as a carbon source for bioconversion in alcohol distilleries. Deoiled rice bran (DORB), an agro-industrial lignocellulosic residue left after the extraction of oil from rice bran, rich in carbohydrate; cellulose 39%, hemicellulose 31%, lignin less than 4% with crude fibers and ashes (Chandel et al. 2009). Several microorganisms have a capability to ferment glucose and xylose after complete hydrolysis of cellulose and hemicelluloses respectively into ethanol (Behera et al. 2014). *Pichia stipitis* are naturally occurring yeasts which has a potential for fermenting glucose and xylose into ethanol with a high yield (Chandel et al. 2009; Bhatia and Johri; 2015). Each micro-organism has its own optimum conditions for fermentation therefore the present study firstly deals to optimize fermentation conditions and then the nutrient optimization for bioethanol production from DORB by *Pichia stipitis* NCIM 3497.

MATERIALS AND METHODS

Substrate and Microbial Culture

Deoiled rice bran (DORB), was collected from Shree Sita Agro Food Private Limited, Dhamdha Naka, Durg, Chhattisgarh, India. *Pichia stipitis* NCIM 3497 used as a fermentative microorganism, procured from School of Studies in Biotechnology, Pt. Ravishankar Shukla University, Raipur Chhattisgarh, India. It was cultured and maintained in MGYP broth (w/v) [0.5 % Malt extract, 0.3 % Yeast extract, 0.5% Peptone and 1% Glucose] at pH 6.5 and 30°C for 12 h.

Fermentation Process and Optimizes its Parameters

For fermentation, 15 g of DORB was added in 150 ml of distilled water (1:10, w/v) in 250 conical flasks then autoclaved to obtain DORB hydrolysate. This DORB hydrolysate was used as fermentation media and inoculated with 1% v/v inoculum size of *Pichia stipitis* NCIM 3497 aseptically then incubated at 30±2°C for fermentation to produce bioethanol. Different parameters of fermentation condition were optimized for bioethanol production like, inoculum size, pH, temperature and fermentation period. Initially inoculum sizes of *Pichia stipitis* NCIM 3497 were used to optimize in the range of 0.5-2% (v/v), then pH ranges (5-7), temperatures (20-40°C) after that different fermentation periods of 24, 48, 72, 96, 120 and 144 h (hours) were performed for higher amount of bioethanol.

Nutrient Supplementation

The presence of nutrients and its concentration both are played an essential role in metabolic pathway of micro-organisms. Therefore, inorganic nutrient salts

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ATMOSPHERIC STUDIES OF FUNGAL BIOAEROSOLS IN THE MARKET AREA OF NAWAPARA (RAJIM), DISTRICT- RAIPUR (CHATTISGARH)

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ABSTRACT

Bioaerosols are airborne particles, large molecule or volatile compounds that are ubiquitous in the environment. Fungi are heterogeneous group of organisms belonging to the group of eukaryotes, are the major part of the microbial diversity. Most of them cause disease in plants, animals and humans beings, and are also responsible for deterioration of fruits, vegetables and other food stuffs, when present in more than reasonable limits. Air is not a suitable medium for fungal growth due to lack of nutrients, but it is a suitable medium for dissemination of fungal spores from one place to another. Market area is always densely populated area where people of different area gather. Hence the present study is undertaken to analyze the atmospheric studies of fungal bioaerosols in the market area of Nawapara (Rajim). It was carried out from July 2008 to June 2009 with the help of Gravity petriplates method. During present investigation 728 colonies of 67 fungal sp. were identified maximum 51 fungal sp. were observed in the month of December, while minimum 09 fungal sp. were observed in May. Out of total fungal flora the percentage contributions of different classes were as follows, Zygomycotina (2.60), Ascomycotina (1.09), Anamorphic fungi (92.85) and Mycelia sterilia (3.43). Out of total fungal population *Cladosporium cladosporiodes* (15.10) was most dominated were as *Aspergillus niger* (12.08), *A. flavus* (10.43), *A. versicolar* (5.49), *Cladosporium oxysporum* (3.15) and *Curvularia clavata* (2.47) were dominant fungal bioaerosols.

KEYWORDS: Bioaerosols, Aerobiology, Nawapara (Rajim)

The American Conference of Governmental Industrial Hygienists (ACGIH) defines bioaerosols as air borne particles, large molecule or volatile compounds that are living contain living organism or were released from living organisms. Dust, Mites, Molds, Fungi, Spores, Pollen, Bacteria, Viruses, Algae, Protozoa's, gases, vapors, fragment of plant materials, and human and pet dander (skin which has been shed) are some example. Bioaerosols are everywhere in the environment and pose no problems in most cases when its quantity and the various types are kept within reasonable limits. However some bioaerosols, when breathed in, can cause diseases including pneumonia, asthma, rhinitis (cold hay fever) and respiratory infection. Bioaerosols may also cause allergic reaction on the skin. However, in agriculture many of the crops are affected by the airborne pathogenic bioaerosols. Airborne fungal spores contribute a major share of bioaerosols and investigations are essential to understand their distribution, ecology and biodeterioration, to forecast plant diseases and to detect allergies and skin diseases. The most significant environmental factors influencing the viability of microorganisms are temperature, relative humidity, and wind velocity. The study of air borne microorganisms their identity, behavior, movement, survival, dispersion, deposition and impact of human beings, animal and plant is referred to the branch of science called Aerobiology. Fungi are heterogeneous group of organisms belonging to the group of eukaryotes. They are ubiquitous in indoor and outdoor environments. Fungi are the major part of microbial diversity. Nawapara (Rajim) is a place of historical importance. Market area is always densely populated area where people of different area gather. Hence the present study is undertaken to analyze the atmospheric studies of fungal bioaerosols in the market area of Nawapara (Rajim).

MATERIALS AND METHODS

Bioaerosols are ubiquitous and present in various fields of environment. In the present study entitled "Atmospheric studies of fungal bioaerosols in the Market area of Nawapara (Rajim), District- Raipur" by using gravity petriplates method (containing PDA medium) during July 2008 to June 2009.

Raipur is capital of newly formed Chhattisgarh state. It is geographically located approximately in central part of India at 21- 14' North latitude and 81- 37' in East latitude, situated at a height of 298.60 meters above mean sea level.

Nawapara (Rajim), District-Raipur is located 45 kilometers southeast of Raipur on the bank of the Mahanadi river, this was ones an important urban center of Chhattisgarh state. It is geographically located at 20° 58' North latitude and 81° 50' in East latitude, situated at height of 297.80 meters above the sea level and situated in the middle east of Chhattisgarh. This area is known as the "Prayag" of Chhattisgarh because it is

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Optimization of key factors for enhanced fermentative biohydrogen production from water hyacinth by RSM

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This communication discusses the optimization of key factors for the enhanced bio-hydrogen production from water hyacinth. Three critical factors inoculums age (18–24 h), inoculums volume (20–80 ml/l) and concentration of sulphuric acid (0.5–2.0%) were optimized by response surface methodology (RSM) with central composite design (CCD) for better production. RSM analysis showed that all three factors significantly influenced hydrogen production. The optimum hydrogen production was 705 ml/l obtained with 21 h old bacterial culture, 50 ml/l inoculums with 1.25% sulphuric acid pre-treatment. The hydrogen concentration produced by *Clostridium acetobutylicum* NCIM 2877 was enhanced after using RSM. The results obtained indicate that RSM with CCD can be used as a technique to optimize culture conditions for enhancement of hydrogen production by pre-treatment of low-cost organic substrate; water hyacinth using dark fermentation methods may be one of the most promising approaches.

Keywords: Central composite design, *Clostridium acetobutylicum* NCIM 2877, hydrogen production, response surface methodology, water-hyacinth.

BIOHYDROGEN has high energy density (122 kJ/g) and also does not produce any harmful combustion products. These characteristics make it the most promising and advanced biofuel when compared to other biofuels. Processes such as steam reformation and water electrolysis are efficient methods for hydrogen production but require high energy input, whereas biological processes are operated at ambient temperature and mild operational conditions. Certain bacterial species like clostridium and enterobacter are used in the process of dark fermentation for biohydrogen production. However, there are two bottlenecks in the biological hydrogen production process. They are, low hydrogen yield and high-cost substrates. Conventional substrates like glucose, sucrose and starch used for biological hydrogen production are expensive which restricts the application and development of biohydrogen[1].

Water hyacinth (*Eichhornia crassipes*) is a free-floating aquatic plant. In India it was first observed in West Bengal, in the beginning of 1890, and is now found

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In Vitro Mid-Term Conservation of *Acorus calamus* L. *via* Cold Storage of Encapsulated Microrhizome

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ABSTRACT

In vitro *rhizome production, encapsulation and cold storage of* Acorus calamus *were attempted for its propagation and 'true-to-type' conservation. Shoot cultures were initiated using underground rhizome buds, on 6-benzyladenine (BA) containing Murashige and Skoog (MS) medium. Maximum microrhizome production was observed in presence of 33.3 µM BA, on modified MS medium containing 6% sucrose, 100 mg/L citric acid and 1 g/L polyvinyl pyrrolidone-40. Synthetic seeds were produced from regenerated microtubers by encapsulation in calcium alginate beads. These synthetic seeds were stored in complete darkness at 10°C temperature for different durations for mid-term conservation. After cold storage, synthetic seeds were re-cultured* in vitro, *100% survival was recorded after the storage of 1, 3 or 6 months; and 80% survival was observed after the storage of 12 months. The microrhizomes were produced roots in 4.9 µM indole-3-butyric acid containing half strength MS medium. All the regenerated plantlets were successfully transferred to field after acclimatization. It is the first report on successful one year* in vitro *cold storage of* A. calamus *synthetic seeds.*

Key words: Aromatic plant, Encapsulation, Sweet Flag, Synthetic seeds, Plant tissue culture

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Modulation in arsenic-induced lipid catabolism in *Glycine max* using proline, 24-epibrassinolide and diphenylene iodonium

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Abstract: Proline, 24-epibrassinolide and diphenylene iodonium are few of the novel antioxidant molecules, involved in growth regulation and abiotic stress tolerance of plants. However, these are scarcely explored in relation to their role in arsenic stress tolerance. Therefore, present study was designed to investigate the involvement of proline, 24-epibrassinolide and diphenylene iodonium in conferring tolerance to *Glycine max* L. against arsenic toxicity. The results showed that arsenic caused decrease in growth attributes like germination percentage, radicle length and dry mass, which were accompanied by the accumulation of arsenic. The application of arsenic steeply reduced total lipid content while increased the levels of oxidative stress markers such as superoxide anion, hydroxyl radical, hydrogen peroxide, free fatty acid, conjugated diene, lipid hydroperoxide, malondialdehyde and 4-hydroxy-2-nonenal, and the activities of lipase and lipoxygenase. Impressively, proline, 24-epibrassinolide and diphenylene iodonium played their roles as protective agents, and caused enhanced growth and reduced arsenic accumulation. These protective molecules enhanced the total lipid content while reduced the levels of oxidative stress markers and activities of lipase and lipoxygenase. The results indicated that proline, 24-epibrassinolide and diphenylene iodonium served as potential inhibitors of As-induced oxidative stress in *Glycine max* L.

Key words: arsenic toxicity; 24-epibrassinolide; diphenylene iodonium; lipid metabolism; oxidative stress; proline; reactive oxygen species.

Introduction

Arsenic (As) is a hazardous metalloid, ubiquitously present in several environment and has no known beneficial biological function. Its contamination in the environment, from both anthropogenic and natural sources, is of global concern (Tripathi et al. 2014). Availability of even low level of As hampers the normal growth and development of plants, resulting in toxicity symptoms. The symptoms of As-toxicity in plants include reduced growth and biomass accumulation, leaf gas exchange, chlorophyll synthesis and thereby photosynthesis, nutrient supply, cellular water potential, and activity of RUBISCO (Chandrakar et al. 2016a). Two dominant forms of As namely arsenite (As^{III}) and arsenate (As^{V}), are shown to exist naturally, depending upon the redox status of soil (Siddiqui et al. 2015). Out of these, As^{III} readily reacts with the sulphydryl (-SH) groups of both enzymes and proteins, thereby inhibiting cellular functions and leading to cell death (Rai et al. 2015). Alternatively, being an analogue of phosphate, As^{V} competes with it for uptake in the root epidermal cells, where it might disrupt normal metabolism by replacing phosphate of ATP, and forms unstable ADP-As complex (Rai et al. 2015). Moreover, contamination of both As^{III} and As^{V} are widely reported to induce unrestrained production of reactive oxygen species (ROS) like superoxide anion, hydroxyl radical and hydrogen peroxide (Siddiqui et al. 2015; Chandrakar et al. 2016b). However, these ROS are popularly shown to modify all sort of cellular macromolecules deleteriously, resulting in death of the cells (Parkhey et al. 2014; Chandra & Keshavkant 2016; Singh & Bhardwaj 2016).

Amongst cellular macromolecules, lipids, more particularly poly unsaturated fatty acid (PUFA) fractions of it, are chief and foremost sites of As-promoted ROS attack, inducing changes in structural and functional properties of the cells and its membranes (Chandrakar et al. 2016b). Accumulation of malondialdehyde (MDA), a chief product and reflection of lipid peroxidation reaction, is directly connected with the disturbed integrity or leakiness of the cellular membranes (Keshavkant & Naithani 2010; Chandra et al. 2015). In a number of As-stressed plants, MDA accumulation and membrane leakiness has been observed (Kaur et al. 2012; Singh et al. 2015). Additionally, lipoxygenase (LOX, EC 1.13.11.12) has also been shown to enhance PUFA oxidation by promoting conjugation and

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ARTICLE

Modulation of nickel toxicity by glycinebetaine and aspirin in *Pennisetum typhoideum*

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ABSTRACT Germinated *Pennisetum typhoideum* seeds were grown under phytotoxic amount of nickel (Ni) and its combinations with aspirin (Asp) and/or glycinebetaine (GB). The results revealed that exposure to Ni caused reduced growth and membrane stability index of *P. typhoideum*, which were correlated with the accumulated Ni and reactive oxygen species. Oxidative stress markers; malondialdehyde, 4-hydroxy-2-nonenal and lipoxygenase were also elevated by Ni, while were diminished significantly by exogenously applied Asp and/or GB. However, considerable loss in protein and DNA contents were discernible in Ni subjected tissues, but were stimulated largely in the Asp and/or GB applied radicles. Additionally, alteration in the activities and native-PAGE profiles of antioxidant enzymes (superoxide dismutase, catalase, guaiacol peroxidase and ascorbate peroxidase) were discernible in response to Ni, which are reputed to counterbalance the oxidative condition. However, exogenous addition of Asp and/or GB activated the defense system and uplifted proline accumulation in stressed *P. typhoideum*. The results approved that combined addition of Asp and GB performed far better in Ni-stress mitigation than their alone application. Conducted study indicated that combined application of Asp and GB served as complementary tool to confer tolerance by up-regulating the antioxidant enzymes and thus can be implicated in the mitigation of Ni-toxicity.
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KEY WORDS
antioxidant enzymes
aspirin
glycinebetaine
nickel toxicity
oxidative stress

Introduction

Nickel (Ni) is necessarily required by the plants for their normal growth/development and completion of life cycle, but is equally toxic in excess leading to altered growth and metabolism (Negi et al. 2014). It is essentially required by the enzyme urease that metabolizes the nitrogenous compounds like urea, inside the plant (Hussain et al. 2013). Therefore, its deficiency not only lowers down the nitrogen assimilation rate, but also results superoxide ($O_2^{\cdot-}$) accumulation (Negi et al. 2014). In normal course, Ni is required by the plants within 0.05 to 10 μg g^{-1} dry mass (DM) for their optimum growth and development, synthesis of anthocyanin, and to resist diseases (Stanisavljevic et al. 2012). However, over accumulation of it alters metabolic status and uptake of both water and nutrients (Gajewska et al. 2012). Nickel also causes hindrance in the activities of key enzymes like amylase, protease and ribonuclease, thereby inhibited seed germination and growth responses. The most obvious symptoms of Ni-toxicity includes decreased root and shoot growth, chlorosis, necrosis, wilting, altered mineral nutrition and water relations, photosynthesis, respiration, nitrogen and carbohydrate metabolism in plants (Kazemi et al. 2010; Hussain et al. 2013).

Although, Ni is not a redox-active metal, even though studies indicate that toxicity of it is associated with production of reactive oxygen species (ROS) like; $O_2^{\cdot-}$, hydrogen peroxide (H_2O_2) and hydroxyl radical (·OH) consequently oxidative stress in plants. Regardless of this fact, studies on antioxidant system in Ni-stressed plants confirmed that it interferes with the defense responses (Hussain et al. 2013). Therefore, over accumulation of ROS prompts degenerative modifications in nucleic acids, proteins and lipids (Chandrakar et al. 2016a, 2017). Poly unsaturated fatty acids (PUFAs) of membrane lipid are prone to ROS assault and lipoxygenase (LOX: EC 1.13.11.12), which releases aldehydic cytotoxic products after like malondialdehyde (MDA) and 4-hydroxy-2-nonenal (4-HNE) (Chandrakar et al. 2016a). To adjust with oxidative condition plants developed an integrated network of defense system comprising both enzymatic and non-enzymatic candidates, former includes superoxide dismutase (SOD: EC 1.15.1.1), catalase (CATEC: in between CAT and EC. 1.11.1.6), ascorbate peroxidase (APX: EC 1.11.1.11) and guaiacol peroxidase (POD: EC 1.11.1.7), while later consists of α-tocopherol, ascorbic acid, glycinebetaine (GB), and pro-

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REVIEW

Acid rain-induced oxidative stress regulated metabolic interventions and their amelioration mechanisms in plants

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Abstract: Increased anthropogenic environmental pollution, one of the serious threats associated with rapid industrial/ economic development leads to enhanced release of SO_X and NO_X in the troposphere which later combined with moisture and results in acid rain (AR). Recurrence of AR leads an array of alterations in plants that includes inhibited seed germination, growth and productivity, biomass accumulation, photosynthesis, enzyme activities, protein synthesis, gene expression patterns, and over production of active oxygen species (AOS). This over produced AOS damages/ oxidizes to lipids, proteins and nucleic acids, and releases a number of cytotoxic intermediate/ end products thereby alterations in metabolic pathways and inactivation of key enzymes. Additionally, AR upsets the balance between AOS generation and elimination by altering the antioxidant defense system, and consequently oxidative stress in plants. However, in the recent past, few attempts have been made, to ameliorate the adverse impacts of AR in plants. Modulation in the levels of antioxidants for prevention against AOS-induced injuries has been recognized as one of the effective approaches towards AR tolerance. Accumulation of ascorbic acid, carotenoids, phenols and proline, and exogenous addition of calcium, polyamines, growth tonic, salicylic acid and β-aminobutyric acid were shown to be the effective strategies to cope low-pH stress in plants. The present review summarizes information on mechanisms of AR formation, uptake of H^+, SO_4^- and NO_3^- by plants, AR-induced physiological, biochemical, and molecular changes and their amelioration using potential compounds. Gaps in the existing knowledge on AR-stress in plants, and future research directions are discussed.

Key words: acid rain; antioxidants; gene expression; mitigation mechanisms; oxidative stress.

Introduction

Since the beginning of the industrial revolution and modernization, a significant proportion of the human population has congregated in urban areas, resulting in increased demand as well as utilization of energy. Energy is generated chiefly by combustion of flammable waste and fossil fuels within thermal power plants, smelters, automobiles, etc. (Liu et al. 2014). These developments have resulted in enhanced atmospheric pollution by releasing hazardous gases and other contaminants. These emissions contain huge amounts of oxides of both sulphur (SO_x) and nitrogen (NO_x), smoke and other particulate matter, which later undergone oxidation reactions with tropospheric ozone, forming strong acids like H_2SO_4 and HNO_3 (Ramlall et al. 2014). The mixing of dissolved CO_2 in the atmosphere has resulted in natural rain becoming slightly acidic, but dissolution of existing acids (H_2SO_4 and HNO_3) makes the rain severely acidic (Fan & Wang 2000). Rain water that contains a concentration of H^+ ions greater than 2.5 μeq^{-1} and pH lower than 5.6 is considered as Acid rain (AR). The term AR was first time coined in the year 1872 to describe the acidic nature of rain, and in the year 1984, it was interpreted as an unseen plague of the industrial age (Singh & Agrawal 2008).

Acid rain can be deposited in either wet (rain, fog and snow) or dry (gases and particles) forms, but the former has generally been implicated as a potential causal factor for loss of crops and forest (Singh & Agrawal 2008). Acid rain has been shown to cause ill effects on almost all living and non-living entities. However, herbaceous plants are recognized to have more susceptibility to AR injury than the woody plants (Heck et al. 1986). It was shown to cause lethal effects on plants growth and development through direct deposition on leaves and indirectly *via* acidification of surface water and soil (Singh & Agrawal 2008). It presumably also affects microorganisms and changes symbiotic microbial community (Lv et al. 2014). Moreover, transformation of dry depositions of AR into salts cause damage to soil ecosystem severely (Singh & Agrawal 2008). The availability of soil nutrients to plants was adversely affected by increased concentration of H^+ in the soil. The H^+ competes with minerals like Ca, Mg, P, Fe, etc., for their uptake and transportation resulting in reduced plant growth (Ginocchio et al. 2009). Moreover, excessive H^+ directly interacts with soil cations and displaces

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Research Article

Efficient synthesis of plant-mediated silver nanoparticles and their screening for antimicrobial activity

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Abstract

Now days, the development of safe, cost effective, reliable and eco-friendly processes for the synthesis of nanoparticles is an important aspect of nanotechnology. Among the various agents, plants show immense potential for the synthesis of nanoparticles. The bio-molecules found in plants induce reduction of Ag^+ ions from silver nitrate to silver nanoparticles (AgNPs); therefore, in the present work, the aqueous leaves extract of the plant was used as reducing agent for the synthesis of silver nanoparticles. We synthesized extracellular silver nanoparticles using extract of the leaves of four different medicinal plants which act as a reducing agent at room temperature. The characteristic color change was observed on addition of plant extract to the silver nitrate solution due to their specific properties (Surface Plasmon Resonance). UV-Vis spectroscopy was used for the characterization of the silver nanoparticles. Green synthesized nanoparticles are evaluated for their antimicrobial activity against the Gram-positive and Gram-negative bacteria as well as two pathogenic fungi *Aspergillus fumigatus* and *Curvularia lunata*. The silver nanoparticles (SNPs) of selected plant parts have shown more toxicity towards bacterial species than that of the fungal species. Comparing with simple plant extracts, the SNPs exhibited greater antimicrobial efficacy and advantage over conventional antibiotics to which these microorganisms usually impart resistance.

Keywords

SNPs; Plant extract; Antimicrobial activity; Nanobiotechnology

Citation

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1 Introduction

Nanotechnology refers to an extensive area of research with a unifying theme of controlling matter size from micrometer to nanometer which is known as nanoparticles, which constitute the fundamental building blocks of nanotechnology. Owing to their extensive applications, several artificial methods have been developed

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NUTRACEUTICAL PROPERTIES EVALUATION OF *Schizophyllum commune*

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ABSTRACT

***Schizophyllum commune* belongs to the large and remarkable group of mushroom and it is known as split gill mushroom. It is an unexplored and non-consumed by the human. Recent research revealed that *S. commune* emerges as a richness for various antioxidants and other pharma active component. In the present studied, hot water, methanol, and ethanol crude extracts of *S. commune* were investigated for their antioxidant capacity by using various assay methods and also determined antidiabetic property. Ethanolic extract showed ample potential for antioxidant activity, in the DPPH scavenging method recorded higher inhibition (IC_{50} =18.56 µg/ml), other than in hot water and methanol extracts. For the reducing power assay, hot water extract showed great scavenging activity recorded (IC_{50} =20.00 µg/ml) comparison to another extract. Ethanolic extract showed most potent H_2O_2 scavenging activity in the assay; which was showed (IC_{50} =19.79 µg/ml) and similarly total phenolic content was given significantly values for ethanolic extract (IC_{50} =11.86 µg/ml), comparatively methanol and hot water extracts. Positive correlation was found between to all extracts medium and their antioxidant activities. The studied revealed that split gill mushroom may have potential sources of natural antioxidant and antidiabetic stuff, therefore may be utilized as promising sources of therapeutics.**

KEYWORDS: Split Gill Mushroom, Antioxidant Capacity, Antidiabetic Assay

Mushrooms are an essential product of forest ecosystem that grows on the most abundant nutrients like cellulose. Mushrooms are a macro-fungus that has a distinctive fruiting body. It is suggested that only 2000 are safe for edible to human and about 650 of these possess medicinal value out of approximately 15,000 known species in the world (Petrovi*et al.*, 2015). Mushrooms have been mostly used as a human food for centuries and have been famous for texture and flavour as well as having various medicinal properties. However, in recently emerged the mushrooms as being an important source of biologically active material that has medicinal value. Wild-growing mushrooms contain a number of different secondary metabolites, carbohydrates, minerals, proteins, fibres, vitamins and fats that having antitumor, antifungal, antimicrobial and antioxidant property (Mehadi*et al.*, 2015). It is suggested that Mushrooms are also important sources for compounds alike beta-glucans, ascorbic acid, tocopherols, carboxylic acids, lectins, terpenoids, and various dietary fibres (Babu et al., 2013). Mushrooms are not accumulated sufficient amount of proteins or fats but taking mushroom in our regular diet or taking of their isolated bioactive constituents present in mushrooms that is also beneficial to health (Petrovi*et al.*, 2015).

In the present studied, taken *Schizophyllum commune*, which belongs to basidiomycete, it completes life cycle in ~10 days. The ecotype nature is saprobic on dead wood, which is growing alone or more frequently, in clustered way. It's widely distributed in through the world. The fruiting body of *S. commune*, approx. 1-5 cm wide, fan-shaped when attached to the side of the log. The spore print depicts white colour (Kuo, M., 2003). According to Patel and Goyal (2012), Schizophyllan is a non-ionic, water-soluble homopolysaccharide consisting of a linear chain of β-d-(1-3)-gluco-pyranosyl groups and β-d-(1-6)-glucopyranosyl groups produced by *S. commune* ATCC 38548. The present scenario of pharmaceutical and drug development industry have focused for the preeminent option for immune-modulatory and anti-cancer agents. The antioxidant compounds, present in mushrooms that are capable of scavenging free radicals in the protection from oxidative damage in living organisms also play an important role in defensive and curing of unwanted physiological effects. The present study primarily focused on the selection of solvents for extraction and analysis of antioxidant potency. The results will be beneficial for pharma sector and drug developments. Consequently, it may be part of alternative antioxidant resources instead of synthetic antioxidant.

MATERIALS AND METHODS

Sample Collection

Fresh dried *Schizophyllum commune* spilt mushrooms collected from Charama forest, district Kanker, Chhattisgarh, at the session of October 2015. This collected sample was kept in polythene bags and packed loosely, also designated code (SC). Identification was made on the basis of critical observations of the specimens and examination of relevant literature (Kuo, M., 2005; Kuo, M., 2007). These identified mushrooms

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Enterobacter ludwigii strain IF2SW-B4 isolated for bio-hydrogen production from rice bran and de-oiled rice bran

Mona Tandon, Veena Thakur, Kishan Lal Tiwari, Shailesh Kumar Jadhav

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Highlights

- **Dark fermentation process was proposed for production of bio-hydrogen.**
- **Batch fermentation process done for efficient bio-hydrogen production.**
- **The maximum production was obtained by *Enterobacter ludwigii* strain IF2SW-B.**

Abstract

This research is aimed to study fermentative bio-hydrogen producing bacteria isolated from rice bran (RB) and de-oiled rice bran (DORB) wastes of oil extracting industry where RB used as renewable biomass. Therefore, the present research was carried out to isolate different bacterial species from RB and DORB wastes and their along with microscopic and biochemical characterization. Secondary screening was performed to analyse their efficiency of bio-hydrogen production (BHP) under optimum temperature of 37 ± 2 °C and at initial pH 6. Total 115 bacteria were isolated seasonally from RB and DORB wastes. Highest production of 545 ± 5 ml/l H_2 bio-hydrogen was obtained in second season by RB II-6 was confirmed as *Enterobacter ludwigii* strain IF2SW-B4 based on 16S rRNA gene sequencing. Its specific hydrogen production rate (SHPR) is 3.29 ml/g substrate/h in 3rd day and 1.89 ml/g substrate/h after 6th day of BHP whereas DORB II-4 gave 295 ± 5 ml/l H_2 production and SHPR of 1.82 ml/g substrate/h in 3rd day and 1.02 ml/g substrate/h in 6th day of production.

Previous article | Next article

Keywords

BHP; Rice bran; De-oiled rice bran and SHPR

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Diversity of fungal endophytes in *Typha latifolia* (L.) and their lead biosorption activity

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Received: 19 November 2016 / Accepted: 7 October 2017

Abstract The present study was done to determine the lead (Pb) adsorption capability of endophytic fungi isolated from *Typha latifolia* (L.), a member of Cattail family (Typhaceae). Wetland plant *Typha latifolia* (L.) is a well-known pollution indicator, having the ability to absorb and accumulate heavy metals. Twenty fungal endophytes were isolated from different parts of the plant; amongst all isolates, 100% adsorption of lead has been screened in the case of *Aspergillus niger* A40. Interaction between the fungal biosorbent and metal ion was optimized at contact time of 180 min. As an endophyte, fungi have the potential to remove soil contaminants by enhancing phytoremediation. It may be expected that they may prove good absorbance in case of heavy metal biosorption and waste water treatment.

Keywords Biosorption · Endophytic fungi · Heavy metal · Lead (Pb)

Introduction

Chhattisgarh is one of the mineral-rich states of India. The area of Chhattisgarh is 135,194 km^2 and is situated on a peninsular plateau at 17–22°N, 80–8°E at an altitude of $\geq$ 300 m above sea level and has a population of 20 million. It is highly rich in natural resources including a 44.21% forest cover and has rich deposits of remnant fuels such as coal and minerals like pyrite, alumina, and dolomite. Here, several thermal power plants for energy production, heavy industries such as steel, aluminum, and cement plants are present, which tend to increase the deposition of lead (Pb) and other metals in the environment (Patel et al. 2006). Some aquatic plants are used as pollution indicators due to their ability to absorb and tolerate heavy metals. *Typha latifolia* (L.) is a one such pollution indicator plant, which is a member of Cattail Family (Typhaceae). Cattails are herbaceous in nature, rhizomatous perennial plants with long, slender green stalks topped with brown, feathery, sausage—shaped flowering heads (Wilson et al. 2000). The plant has a high capacity for taking heavy metals into its body. *Typha* tolerates enhanced levels of metals in its tissue without severe physiological damage (Sasmaz et al. 2008). Macro hydrophytes, while oxygenating bottom sediments, cause the metals to become more easily available and enable them to be absorbed through the roots and transported to the aerial plant parts (Klink et al. 2013). Generally, lead enters the body through inhalation, ingestion, or transmission from mother to child via breast milk (Kumar et al. 2013). Symptoms of acute lead poisoning include irritation, headache, abdominal pain, and many others related to nervous system. In adults, lead poisoning affects the peripheral and central nervous systems, blood pressure, and kidneys (Tiwari et al. 2013). The alkyl form of lead, i.e., tetraethyl lead (TEL), is a powerful neurotoxin (Yao et al. 2016; Needleman 2004). According to the report of World Health Organization (2010), once lead enters the body, migration occurs from blood to the organs and soft tissues, and sooner or later reaches the bones and teeth. It can be stored up to 30 years in bones (Tiwari and Tripathi 2013). There are mainly two sources of lead contamination: natural ones, includes rock erosion and volcanic eruptions, and anthropogenic ones, such as industrial effluents, fertilizers, household chimneys

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Desiccation-induced ROS accumulation and lipid catabolism in recalcitrant *Madhuca latifolia* seeds

Jipsi Chandra[1] · **S. Keshavkant**[1]

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Abstract Loss of viability in desiccation-sensitive seeds of *Madhuca latifolia* (Roxb.) J. F. Macbr., an important multipurpose tropical tree, was correlated with seed water content (WC). WC declined from 0.59 to 0.19 g g^{-1} fresh mass, 35 days after harvest from mother plant, at ambient conditions (temperature 25 ± 2 °C, relative humidity 50 ± 2%). The desiccation-induced reduction in viability was related with an accumulation of reactive oxygen species (ROS) that promoted lipid peroxidation associated loss of membrane integrity. Conducted study revealed 1.6–19 folds rise in lipid peroxidized products in desiccated *M. latifolia* seeds, and was found to be linked inversely with WC and germination percentage. Additionally, increased activities (7 and 13 folds) of lipid hydrolyzing enzymes; lipase (EC 3.1.1.3) and lipoxygenase (EC 1.13.11.12) respectively, were discernible in desiccating *M. latifolia* seeds. In summary, increased ROS, lipid oxidation, lipase and lipoxygenase were strongly correlated with viability loss in desiccating *M. latifolia* seeds.

Keywords Desiccation · *Madhuca latifolia* · Lipase · Lipid peroxidation · Lipoxygenase · Reactive oxygen species · Water content

Introduction

Plants have been an indispensable part of human life for ages. Ever since ancient times, their fruits, seeds even roots and branches have been used to meet personal and social needs such as food, curing diseases and beautifying the planet (Canan et al. 2016; Sorkheh and Khaleghi 2016; Yazici and Sahin 2016). *Madhuca latifolia* (Roxb.) J. F. Macbr., a commercially important tropical tree, is mostly propagated through seeds (Orwa et al. 2009; Royal Botanic Gardens Kew 2016). Recalcitrant, desiccation-sensitive seeds are widespread in nature and their loss of viability has been ascribed to a variety of factors, including oxidative stress via reactive oxygen species (ROS) and resulting physical damage to cell membranes and other organelles (Berjak and Pammenter 2008). However, the desiccation sensitivity and associated mechanisms of seed death in *M. latifolia* have not been reported.

Recalcitrant seeds possess relatively high [0.4–4.4 g g^{-1} dry mass (DM)] water content (WC) at the time of shedding from their mother plant, hence are metabolically highly active, and quite sensitive towards desiccation and low temperature (Berjak and Pammenter 2004). Such seeds deliberately lose water even under ambient temperature and optimum relative humidity (Umarani et al. 2015). Desiccation leads to imbalanced metabolism, intracellular damage and death of embryos even at higher WCs within weeks or months time, depending on the species (Pammenter and Berjak 1999). This metabolism related seed deteriorations are intimately related with the over production of ROS due to inefficient functioning or failure of ROS scavenging system (Anjum et al. 2015). Accelerated production of ROS causes oxidation of membrane lipids, proteins and nucleic acids (Berjak and Pammenter 2008). These types of desiccation-

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ORIGINAL ARTICLE

Ageing-regulated changes in genetic integrity of two recalcitrant seeded species having contrasting longevity

Jipsi Chandra[1] · Suruchi Parkhey[2] · S. Keshavkant[1]

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Abstract

Key message **Storage longevity of two contrasting recalcitrant seeded species was studied relative to oxidative metabolism and DNA damage under ambient storage (25 ± 2 °C, 50 ± 2% relative humidity).**

Abstract The present study was aimed to investigate the ageing-induced amendments in two recalcitrant seeded species, *Madhuca latifolia* and *Shorea robusta*. These are economically important tropical trees and are exploited extensively in commercial sectors. Fresh seeds of *M. latifolia* and *S. robusta* lost their germinability within 35 and 8 days after harvest, respectively, under ambient storage (temperature 25 ± 2 °C, relative humidity 50 ± 2%). To untangle the possible mechanisms involved in deteriorative changes in respective seeds, levels of reactive oxygen species (ROS) and changes in DNA content, oxidation, fragmentation and polymorphism, and DNase activity were monitored. The results revealed significant (2.1–7.3 folds) upsurge in ROS levels in these seeds. In contrast, remarkable fall in DNA content of embryonic axes (3.8 fold and twofold) and cotyledons (6.7 fold and twofold) of *M. latifolia* and *S. robusta* seeds, respectively, were observed. Moreover, enhanced oxidation (8.9–18.8 fold) and fragmentation (2.1–2.8 fold) of DNA along with increased (9.9–25.3 fold) DNase activity were observed in axes and cotyledons of respective seeds, revealing active participation of ROS in oxidation ($r = 0.96$, $p < 0.05$), and of DNase in fragmentation ($r = 0.94$, $p < 0.05$) of DNA. Dendrogram of RAPD unveiled significant alterations in similarity coefficients of aged and non-aged seeds of both the species. Thus, overall results concluded that loss of viability of *M. latifolia* and *S. robusta* seeds was closely associated with ageing related changes such as over accumulation of ROS, fall in DNA content, increased oxidation, fragmentation and DNA polymorphism, and DNase activity.

Keywords DNA damage · Reactive oxygen species · Recalcitrant · *Madhuca latifolia* · RAPD · Seed viability · *Shorea robusta*

Introduction

Ageing is a major problem for maintenance of seed quality and viability during long term storage at ambient conditions; however, various plant species and populations from different environments lose germinability in varied pace (Dona et al. 2013). Ageing has been shown to be related closely with a number of deteriorative changes that are taking place at cellular, biochemical and metabolic levels, and in differing magnitudes (El-Maarouf-Bouteau et al. 2011). Therefore, in-depth and precise understanding regarding physiology and biochemistry of ageing phenomenon are crucial to design dedicated seed storage protocols for various species (Chen et al. 2013; Michalak et al. 2015). Being a short lived and metabolically active seeds, recalcitrants are popularly exploited to unravel the basic mechanism(s) underlying ageing phenomenon (Berjak and Pammenter 2013; Walters et al. 2013).

In recalcitrant as well as other categories of seeds, ageing is accompanied with the gradual fall in rate of germination and consequent loss of membrane integrity, reduced energy

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GROWTH AND METABOLIC RESPONSES OF *GLYCINE MAX* L. TO ARSENATE AND ARSENITE: A COMPARATIVE ASSESSMENT

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Keywords: Antioxidants, Arsenate, Arsenite, Proline, Reactive oxygen species

Abstract

Arsenic (As), a non-essential metalloid and severely toxic to all the living organisms exists mainly in two inorganic forms arsenate (As^V) and arsenite (As^{III}). Arsenic is known to cause deleterious impacts on growth and metabolism of plants chiefly *via* slowing down the cell division and elongation, increased formation of reactive oxygen species (ROS) and alteration in antioxidative system. Therefore, the present study was aimed to evaluate the adverse effects of both As^V and As^{III} on growth traits, contents of As, ROS and malondialdehyde, and antioxidant system in *Glycine max* L. Data revealed that As reduced germination percentage, radicle length and biomass accumulation, while enhanced the contents of As, malondialdehyde, and localization and accumulations of ROS. In addition, significant change in the activities of antioxidant enzymes and proline content were revealed. Overall results suggested that As^{III} is more injurious to *G. max* L. than As^V.

Introduction

Arsenic (As) has been considered as an element of environmental concern in the recent past, due to its toxicity and carcinogenic properties. A huge part of agricultural land is contaminated with As, where its concentration ranges from 3.34 to 105 mg/kg soil (Patel *et al.* 2005). Both bioavailability and toxicity of As are dependent closely on its chemical form. Two inorganic forms arsenite (As^{III}) and arsenate (As^V) are severely toxic than the organic ones, and in between these inorganic forms, former being more injurious than the later (Chandrakar *et al.* 2017a). In general, As^V is taken up by the root cells through phosphate transporters. It replaces phosphate during ATP synthesis thereby disturbs the energy flow (Siddiqui *et al.* 2015). While, As^{III} enters into the root cells *via* aquaporins and reacts with -sulphydryl (-SH) groups of both enzymes and proteins, thus altering their functions (Armendariz *et al.* 2016). Hence, As adversely affects normal metabolic processes of the plants such as growth, development, respiration, photosynthesis, reproduction, etc. (Chandrakar *et al.* 2016a). Therefore, in the recent past research on As toxicity has come to limelight to unravel the precise mechanisms of its toxicity on plants and human beings.

Both As^{III} and As^V are popularly shown to provoke formation of reactive oxygen species (ROS) like superoxide ($O_2^{\cdot-}$), hydrogen peroxide (H_2O_2) and hydroxyl radical ($^{\cdot}OH$) (Chandrakar *et al.* 2016b). These ROS can lead to peroxidation of membrane lipids, oxidation of proteins, damage to nucleic acids, inhibition of enzymes, activation of apoptotic pathway, finally terminating with death of the cells or tissues (Rughani *et al.* 2016, Yadu *et al.* 2016, 2017a). To fight against oxidative damages, plant cells are armed with protective mechanisms comprising both enzymatic and non-enzymatic members. Enzymatic system includes superoxide dismutase (SOD: EC 1.15.1.1), catalase (CAT: EC 1.11.1.6), ascorbate peroxidase (APX: EC 1.11.1.11), etc., while glutathione, phytochelatins, proline, etc., constitutes non-enzymatic defense system (Chandra and Keshavkant 2016, Yadu *et al.* 2017b).

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Modulation of arsenic-induced oxidative stress and protein metabolism by diphenyleneiodonium, 24-epibrassinolide and proline in *Glycine max* L.

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Abstract – Arsenic (As)-toxicity is a major constraint for crop production. The present study was intended to examine the comparative ameliorative effects of diphenyleneiodonium (DPI), 24-epibrassinolide (EBL) and proline (Pro) on As-stress in *Glycine max* L. Seeds of *Glycine max* L. were subjected to As (100 μM) singly, and together with DPI (10 μM), EBL (0.5 μM) or Pro (10 mM), for five days, and were then analyzed. Experimental results showed that As treatment caused a substantial fall in growth traits like germination percentage, radicle length and dry mass, which was accompanied by As accumulation. Additionally, As application also revealed reduced viability, total protein content and activities of antioxidative enzymes (superoxide dismutase, catalase and ascorbate peroxidase), while it increased the levels of total sugar, proline and oxidative stress markers such as electrolyte leakage, reactive oxygen species, lipid oxidized products, protein carbonyls and hydroperoxides, Amadori and Maillard reaction products, malondialdehyde-/4-hydroxy-2-nonenal-protein adducts, protease and proteasome. Isozymes of antioxidative enzymes were also observed to be altered considerably under As-stress. Impressively, DPI, EBL and Pro played their role as protective agents, hence caused enhanced growth and reduced As accumulation. These protective chemicals also improved the viability, accruals of total protein, total sugar and endogenous proline, and activities of antioxidants, while they reduced the levels of oxidative stress markers. Our findings demonstrated the involvement of DPI, EBL and Pro in As-stress tolerance in *Glycine max* L. Further, Pro appears to be superior to DPI and EBL, in alleviating As-induced responses in *Glycine max* L.

Keywords: arsenic, diphenylene iodonium, 24-epibrassinolide, oxidative stress, proline, protein metabolism, reactive oxygen species

Introduction

Arsenic (As) is a hazardous metalloid, which ranks 20th in the Earth's crust and is ubiquitously present in the natural environment. Its concentration above the permissible limit (10 μg L^{-1}, WHO) hampers the normal growth, development and overall metabolic functioning of plants, resulting in toxicity symptoms. The symptoms of As-stress in plants include reduced growth and biomass accumulation, leaf gas exchange, chlorophyll synthesis and thereby photosynthesis, nutrient supply, cellular water potential, protein turnover, and enzymic dysfunction (Chandrakar et al. 2016a). A plant's root serves as the foremost and most susceptible site for the perception of abiotic stress responses including As-toxicity. After entering into the plant's body, As readily binds with sulfhydryl groups of both proteins and enzymes, thereby perturbing the cellular metabolism and inhibiting enzymatic activities (Farooq et al. 2015). A well-known consequence of As-toxicity is over-production of reactive oxygen species (ROS) such as superoxide ($O_2^{\cdot -}$), hydroxyl radical ($^{\cdot}OH$) and hydrogen peroxide (H_2O_2), affecting the oxidative condition inside the plants (Siddiqui et al. 2015, Chandrakar et al. 2016b). This over-produced ROS are largely shown to attack cellular macromolecules such as lipids, proteins, nucleic acids, etc. (Chandrakar et al. 2017a).

The polyunsaturated fatty acid (PUFA) fractions of membrane lipids are the prime targets of ROS attack (Chandrakar et al. 2016b). Accruals of malondialdehyde (MDA) and 4-hydroxy-2-nonenal (HNE), chief products and biomarkers of lipid peroxidation reaction in stressed cells, are linked directly with the disturbed integrity or leakiness of the membranes (Yadu et al. 2016). Accumulation of ROS has also been shown to cause reduced fluidity of cellular membranes and

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Spermidine and Melatonin Attenuate Fluoride Toxicity by Regulating Gene Expression of Antioxidants in *Cajanus cajan* L.

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Abstract
Being regulators of growth, both spermidine (Spd) and melatonin (Mel) are involved actively in the modulation of abiotic stress responses of plants. Hence, the present study was aimed to scrutinize the possible involvements of Spd and Mel in alleviation of fluoride ion (F^-)-induced injuries in *Cajanus cajan* L. Seeds of *C. cajan* L. were exposed to 1) control, 2) F^-, 3) Spd, 4) Spd + F^-, 5) Mel and 6) Mel + F^- for five days. The results unveiled that F^- treatment caused inhibited growth (radicle length and dry mass accumulation), protein content, genomic template stability, membrane stability index, and free radical scavenging capacity, but enhanced the levels of cell death, active oxygen species (AOS), malondialdehyde, lipase, protein carbonylation, and DNA polymorphism. Moreover, F^- toxicity elevated the concentrations of endogenous proline, ascorbic acid, and glutathione, and altered the isoenzyme profiles and gene expressions of stress responsive enzymes (superoxide dismutase, catalase, ascorbate peroxidase, and glutathione-S-transferase). In contrast, exogenous supplementation of Spd and Mel alleviated the deleterious effects of F^-, consequently improved growth, free radical scavenging capacity, and accumulations of protein, proline, ascorbic acid, and glutathione in *C. cajan* L. Additionally, application of Spd or Mel also improved the isoenzyme profiles and gene expressions of stress responsive enzymes, and genomic template stability, thereby reduced cell death, AOS, lipid peroxidation, lipase activity, and DNA polymorphism in stressed tissues. The present study concludes that Spd and Mel, particularly Mel, alleviated the adverse impacts of F^- by improving antioxidant machinery and genomic template stability.

Keywords Active oxygen species · *Cajanus cajan* L. · Fluoride ion · Gene expression · Melatonin · Spermidine

Introduction

The contamination of potable water with fluoride ions (F^-) is a worldwide problem with severe implications in animals and human beings. Higher concentrations of F^- in the soil and irrigation water can disturb both physiological and biochemical processes of plants (Yadu and others 2016). Additionally, it interferes with phosphorylation of proteins, activities of key enzymes, rate of photosynthesis, genomic template stability (GTS), gene expression patterns, and other metabolic processes via overproduction of active oxygen species (AOS) (Gadi and others 2012; Yadu and others 2016). Fluoride ions intimately bind with sulfhydryl groups of proteins thereby altering the structure, functions, and secretion of proteins involved in cell signaling, proliferation, and apoptosis, and also inactivating the enzymes of the DNA repair system (Agarwal and Khan 2016). However, reduced level of DNA synthesis, weaker protection of DNA from damaged histone protein, and increased activity of DNase have recently been reported in abiotically stressed cells (Chandrakar and others 2017a).

To reduce oxidative stress, plant cells possess a complex network of defensive mechanisms involving both non-enzymic {proline (Pro), ascorbic acid (AsA), glutathione (GSH), and so on}, and enzymic {superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX), glutathione-S-transferase (GST), and so on} agents (Iannelli and others 2002; Ahmad and others 2016; Chandrakar and others 2016). However, under severe conditions, this

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Enhanced production of diosgenin through elicitation in micro-tubers of *Chlorophytum borivilianum* Sant et Fernand

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ABSTRACT

Diosgenin, one of the steroidal sapogenin, is a chief bioactive compound, commercially known for its pharmaceutical application to treat sexual dysfunction. The biosynthesis of plant secondary metabolites *in vitro* cultures is usually manipulated by different elicitors that lead to higher production than non-elicited cultures. In the present investigation, *in vitro* tubers of *Chlorophytum borivilianum* were produced on semisolid and stationary liquid Murashige and Skoog (MS) medium supplemented with various concentrations of sucrose. To elicit diosgenin contents, these micro-tubers were exposed *in vitro* to different concentrations of jasmonic acid (JA) and salicylic acid (SA) for 1-month. An optimum number of micro-tuber was obtained on MS semisolid medium containing 60 g/L of sucrose. However, the stationary liquid medium consisting of same sucrose level was found more suitable for increased production of micro-tubers than semisolid medium. Exposure to the lower doses of JA and SA individually induced the improved production of diosgenin in the micro-tubers of *C. borivilianum*. A 2.1-fold higher production of diosgenin was obtained after the 1-month exposure of micro-tubers to 25 μM of JA; while after the 25 μM of SA elicitation, 1.5-fold higher diosgenin in micro-tubers was obtained in comparison to diosgenin present in tubers of the mother plant. The results suggest that JA and SA have the considerable ability to stimulate the production of valuable diosgenin in the micro-tubers of *C. borivilianum*.

1. Introduction

The *in vitro* productions of secondary metabolites *via* plant tissue cultures are limited due to high water content, lower yield and lower accumulation of bioactive in cultured cells (Yukimune et al., 1996). To deal with such problems often the application of elicitors such as JA and SA has been attempted in a number of studies (Raomai et al., 2015; Verma et al., 2014; Zaheer et al., 2016). Moreover, the biosynthetic pathways of secondary metabolites are complex and require tissue specific architecture (Awad et al., 2014). Consequently, an organized tissue shows better stability in culture and produce tissue specific bioactive, in comparison to unorganized callus or suspension culture of the same species (Awad et al., 2014; Banerjee et al., 2012).

Chlorophytum borivilianum Sant et Fernand, an important medicinal herb native to India is a highly valuable herb having aphrodisiac potential and very useful to treat sexual disorders. The tubers of *C. borivilianum* are used in the Ayurvedic medicinal system in curing many diseases such as male impotency, arthritis and diabetes (Acharya et al., 2009; Chauhan et al., 2016a; Kaushik, 2005). Because of its important bioactive constituent, it is exploited rigorously as a very good alternative to 'Sildenafil'; a well-known drug to overcome sexual dysfunction. Moreover, diosgenin also exhibits anticancer property (Yan et al., 2015). Looking to its massive commercial exploitation and declining population, recently International Union for Conservation of Nature and Natural Resources (I.U.C.N., 2015) referred this species as "critically endangered".

The tuberous roots possess saponin and sapogenin (diosgenin) which has pharmaceutical application (Acharya et al., 2008; McAnuff et al., 2002) and was documented to constitute 2–17% of saponin and 0.18% of sapogenin of its dry weight (DW), depending upon the genotypes (Bordia et al., 1995; Kaushik, 2005). In addition, diosgenin is a precursor for the production of steroidal drugs and hormones such as testosterone, progesterone and glucocorticoids (Jasim et al., 2017). Thus, its enhanced production is of significant applications. Till now, there is a single available report about the production of diosgenin in the micro-tubers of *C. borivilianum* (Ashraf et al., 2013a). Hence, the present study was aimed to establish an effective micro-tuber production system for *C. borivilianum* to investigate the effects of JA and SA on the production of diosgenin in the *in vitro* developed tubers.

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Viral Elimination Strategies for *Musa* spp.

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Abstract

Banana is one of the major crops in tropical parts of the world. The banana plant is susceptible to many diseases due to the less genetic diversity in its popular cultivars. Particularly viral diseases can severely destruct quantity and quality of the crop. Four major banana infecting viruses doing the damage- banana bunchy top virus, banana streak virus, banana bract mosaic virus, cucumber mosaic virus; two other viruses- banana mild mosaic virus and banana virus X causing mild infections. Treatments are not available to remove viral infections from field crop. Banana-infecting viruses readily transmit through insect vectors and via vegetative planting materials, causing diseases in germplasm storage, their exchanges and in cultivation fields. Present account gathers information on recent viral disease outbreak reports in Musa species, about their newer isolates, vector, alternate host, etc. It further reviews viral elimination approaches used to produce virus-free planting material in banana like- in vitro culture, thermotherapy, chemotherapy, and cryo-exposure, for their effectiveness, mode of action and survival rate. In vitro viral eradication approaches those found effective on the other crops also discussed; like new antiviral drugs, electrotherapy, and combinations of various therapies that may steer to formulate future strategies to protect Musa species from viral diseases.

Keywords: *Banana bunchy top virus, Banana streak virus, Banana bract mosaic virus, Cucumber mosaic virus*

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INTRODUCTION

Musa species is one of the essential crops, particularly in tropical zones based on production and utilization [1]. Banana is a major staple food crop for a huge number of people and provides income through local and international trades. Banana is the fourth most cultivated fruit in more than 130 countries belonging to Asia, America, Africa, Oceania and the Pacific [2]. Conventional *Musa* cultivation takes place by using suckers as planting material taken from the mother plant. The most vital sucker borne diseases of *Musa* planting materials are nematodes, weevils, and infections, including viruses and bacterial shrivels. Viral diseases are the main threats for the banana crop. Since plants lack the immune system, as a result, virus infection lasts generally for the complete lifespan of their hosts [3]. Popular banana cultivars are sterile and propagated vegetatively. Therefore, acquisition of viral resistance via sexual recombination is difficult. Hence, proficient techniques are required to recover selected genotypes from the infected stocks in the absence of virus resistance lines in *Musa* for safer germplasm conservation and exchange.

MUSA INFECTING VIRUSES

The banana plant is susceptible to different viral infections. Four major viruses can cause severe infections; two of them are DNA viruses- banana bunchy top virus (BBTV) and banana streak virus (BSV) while the two other contain RNA genome- banana bract mosaic virus (BBrMV) and cucumber mosaic virus (CMV). Two other RNA viruses- banana mild mosaic virus (BanMMV) and banana virus X (BVX) can cause mild infections.

BBTV is the causal agent of banana bunchy top disease (BBTD) that may destruct banana crop up to 100%, and it is the main reason for limiting cultivation areas in the Asia Pacific regions and some extent to the African continent [4]. BBTV belongs to genus *Babuvirus* of family *Nanoviridae*. BBTV is an isometric virus, 18–20 nm in width, with

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Keratinophilic fungi from warm, moist, cattle - house of Bilaspur Central - India

Research Article

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Abstract

Soil is a well known source that harbors a wide variety of microorganisms. The current study briefly explains the isolation and identification of keratinophilic fungi, which is responsible for the degradation of most abundant and highly stable animal protein keratin. Soil is the home of several such fungi which are not even noticed from various unexplored habitats. During the course of study approximately 18 different fungal species were isolated and identified. The Vanbreuseghem's hair bait techniques were used for the isolation of fungi. The present study includes important fungi like *Aspergillus, Chrysosporium, Microsporum, Trichopyhton*, etc isolated from cattle house located in and around the Bilaspur town of Chhattisgarh state in Central - India.

Keywords: *Aspergillus, Chrysosporium, Microsporum, Trichopyhton*

Introduction

The Soil supports a range of microorganisms and is one of the most complex microbial habitats, allowing the fungi to sustain their entire life cycle. Soil is a cosmopolitan habitat for majority of microbial population that can be explored to find out more specific fungal flora.[1] The soils rich in keratinous material were found to more conducive for keratinophilic fungi[2–11] where this group of fungi usually grow abundently and reproduce. The fungi's nourishment is provided by the keratin substances in skin, hair, nail, feather, horn, hooves, beak etc. The fungi use the keratinous material as carbon source either living or dead.[12,13] Within the potential keratinolytic specificity, some of fungi of this group are potential pathogens to human beings and animals.

Keratinophilic fungi are widely distributed and are responsible for causing dermal infection in man and animal groups.[14] This is one of the most special homogenous groups of fungi which are regarded as potent dermatophytes causing cutaneous infections.[15] In general, the qualitative and quantitative composition of these fungi can be multifunctional and serve as bio-indicators of environmental pollutants. It means that the composition not only include the presence of keratin remnants but also fecal contaminants in the environment and respond to the changes in environmental conditions.[13,14]

The distribution of keratiniphilic fungi is influenced by the amount of available keratin wastes which are usually found in dumping yards, animal house, poultry and veterinary farms. However, their number is restricted because these are mostly confined to habitats rich in keratin wastes.[15] Since the habitat of birds (bird's nest, poultry farm) and animal house with different keratin waste set of predominating species to the possibility of fungal growth and to obtain growth indices of keratin degrading species, therefore in present investigation the cattle forms / yards and houses with variable keratin waste seems worthwhile to find out fungal growth indices under any condition. Although a number of keratinophilic fungi from zoo and other cattle farms have been isolated by different workers,[16–18] but the amount of available literature to support the claim is less.

In cattle house plenty of keratin waste found as an important source promoting growth and contamination by keratinophilic fungi contamination of keratinophilc fungi. Therefore occurrence of keratinophilc fungi in animal house is quite obvious.

The hot and humid climate, with a temperature 22-30°C in wet season and the acidic pH of the soils in the state seems to be potentially interesting to study the distribution of these fungi.

The prevalence of dermatophytes may vary according to the geographical locations, for the susceptibility of dermatophytosis that also relies on the seasonal conditions and the fungal constituents, under which susceptible animals or human beings are exposed.

In general dermatophytes are mostly found in temperate conditions however the hot and humid climate, with a temperature 22 - 35°C, the acidic pH of the soils, seems to be more conducive in wet season rather than dry and hot summer season of low-land area in Chhattisgarh state. Furthermore the distribution of keratinophilic fungi found that *Trichphyon ajelloi* is commonly found in colder climates but found sporadic in hot climates,[19] where dry hot conditions hindering the fungal germination. Moreover they exclaimed that the fungus is to be more often found associated with acidic soils than with alkaline soils.

Several studies have demonstrated the ability of the fungi to invade keratinized living tissue of the body including skin, hair, nails etc.[11,13,19,20] The dermatophytic fungi are classified in to three ecologically groups,

i. Geophiles, which are primarily inhabit the soil

ii. Zoophiles are essentially animal pathogens and

iii. Anthrophiles restricted to man, which very rarely infect animals.

Evidently, the occurrence of keratinophilic fungi is mainly influenced by keratin waste, but the survival and occurrence of these fungi also affected and controlled by the ecological habitats.[10] Several studies on epidemiology of human dermatophytosis in India confirm the prevalence of fungi in rural areas. However, the prevalence and

Ipomoea triloba (Convolvulaceae) a new record for Chhattisgarh India

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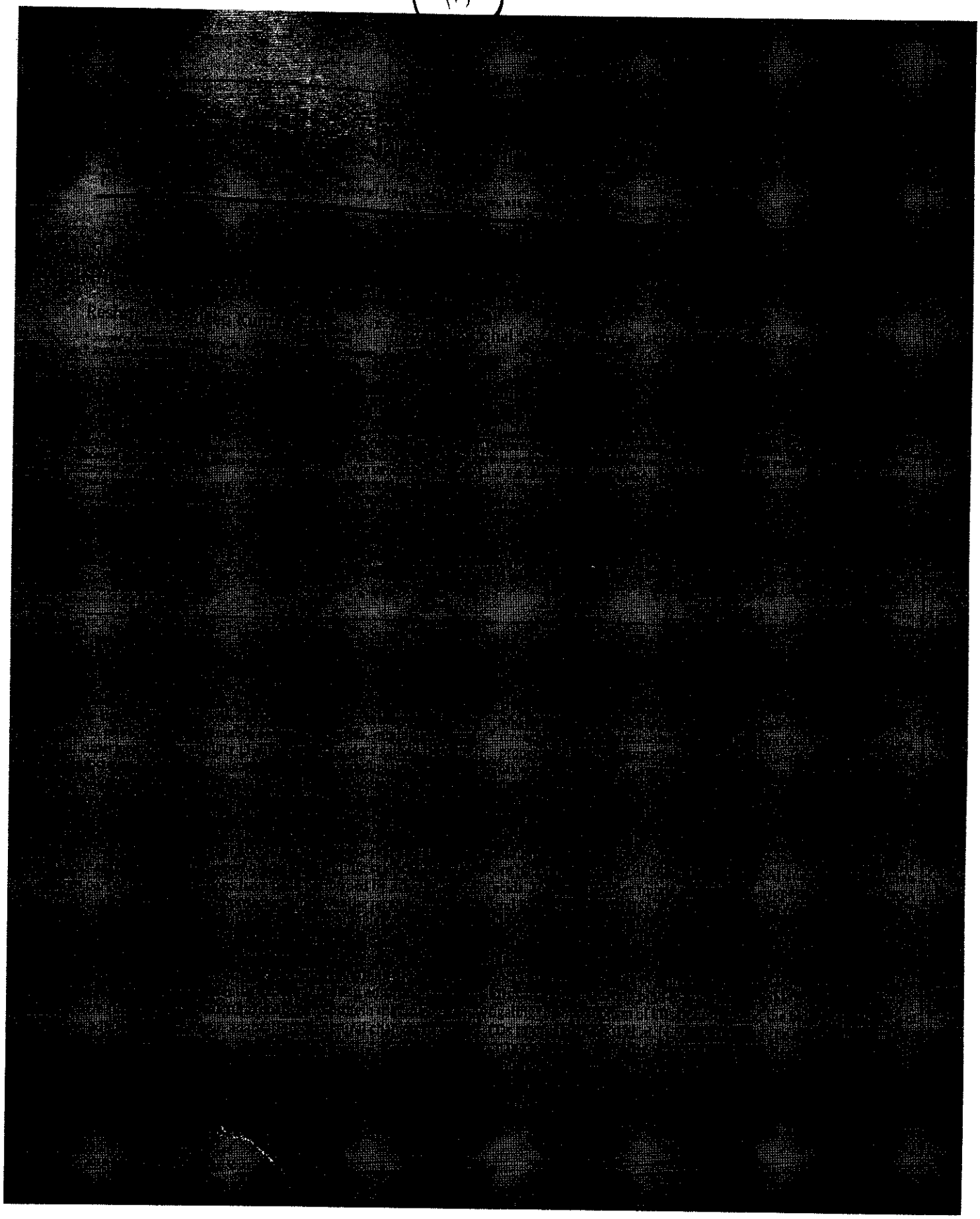

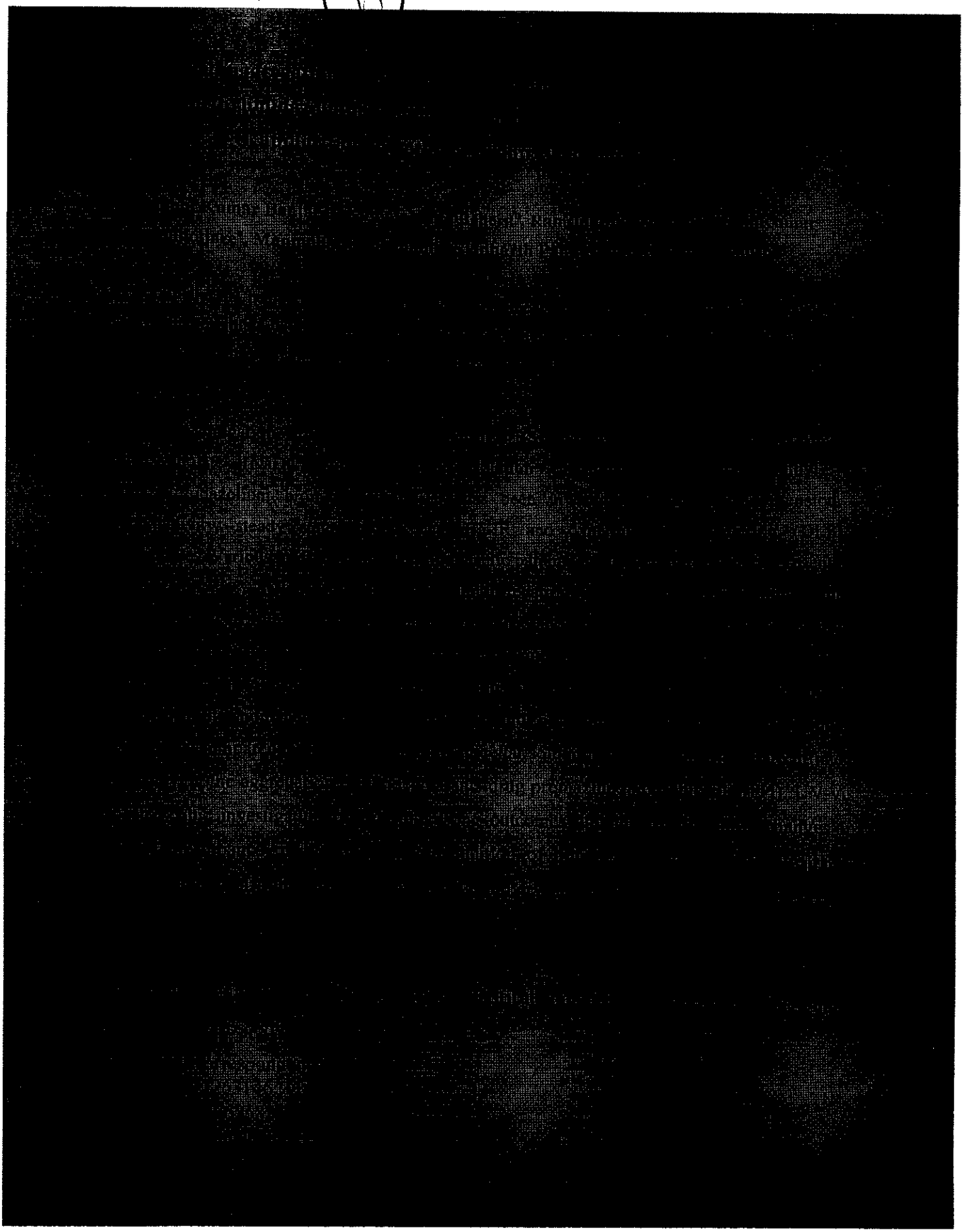

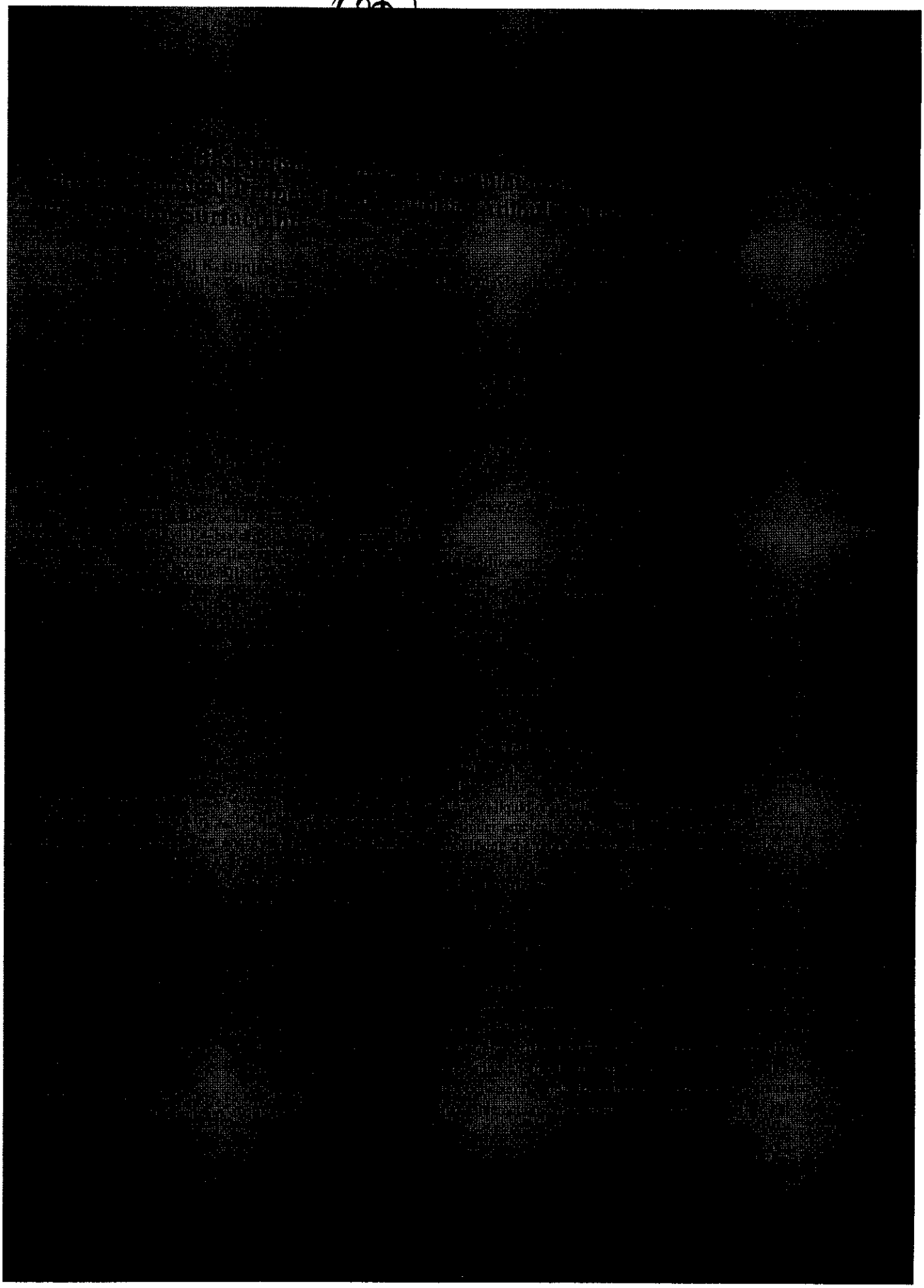

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Hydrolytic Dephosphorylation of *p*-Nitrophenyl Diphenyl Phosphate by Alkyl Hydroxamate Ions

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Abstract The kinetics of the hydrolysis of *p*-nitrophenyl diphenyl phosphate (PNPDPP) by hydroxamate ions ($R'(C{=}O)N(RO^-)$) such as octanohydroxamate (OHA^-) and decanohydroxamate (DHA^-) was investigated in dioctadecyldimethylammonium chloride (DODAC) and didodecyldimethylammonium bromide (DDAB) vesicles. The physicochemical properties of these surfactants were studied by conductivity and fluorescence measurements at 300 K. The hydrolysis of PNPDPP was studied in a vesicular system by using hydroxamate ions (OHA^- and DHA^-) at 300 K. The different catalytic effects of hydroxamate ions for the hydrolysis of PNPDPP in the vesicles were determined. All reactions followed pseudofirst-order kinetics. The reactivity of DHA^- was found to be higher than that of OHA^- in the vesicular system toward the cleavage of phosphate ester. Further, the binding constants (K) and free energy change (ΔG) for the associations of PNPDPP with DODAC and DDAB vesicles were determined spectrophotometrically as well as from the Benesi–Hildebrand (B–H) plots. The pseudophase model was applied for the quantitative treatment of the kinetic data in the vesicle systems.

Keywords Vesicular surfactant · octanohydroxamate (OHA^-) · decanohydroxamate (DHA^-) · PPM

Electronic supplementary material The online version of this article (doi:10.1002/jsde.12006) contains supplementary material, which is available to authorized users.

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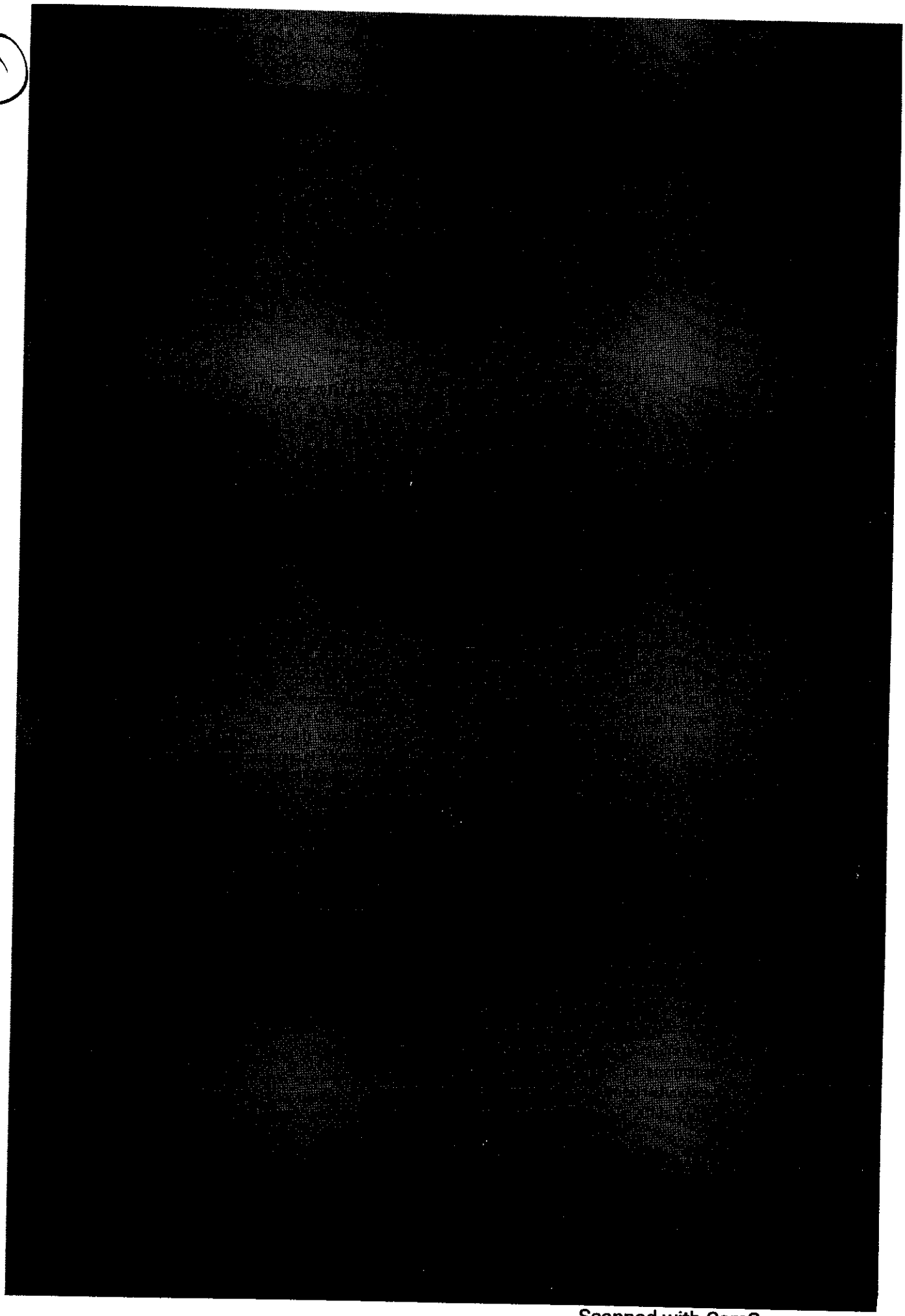
Introduction

Vesicles, or liposomes, first studied by Bangham in 1960, are important parts of the biological cell and control the flux of tiny molecules into and out of the cell and compartmentalize the cell contents. Vesicle self-assembly structures developed outside cells are key structures in developing biosensors and drug delivery vehicles (Alessandrini & Facci, 2014; Gunnarsson et al., 2015; Hardy, Nayak, & Zauscher, 2013; Kandpal et al., 2017; Mashaghi et al., 2014; Pross, 2004). Because of their arrangement, fluctuation, and basic properties, vesicles are also important in cosmetics and food and chemical industries (Keller, 2001; Laouini et al., 2012; Laouini, Jaafar-Maalej, Sfar, Charcosset, & Fessi1, 2011; Lian & Ho, 2001; Maurer, Fenske, & Cullis, 2001; Samad, Sultana, & Aqil, 2007). Vesicles have striking biological properties (anti-bacterial activity) as well as biocompatibility and biodegradability. They show promise in delivering encapsulated drugs to specific target sites and are especially applied in cancer treatment for sustained drug release (Uhumwangho & Okor, 2005). Vesicular properties can also be applied in the delivery of ingredients in the cosmetics industry (Betz, Aeppli, Menshutina, & Leuenberger, 2005). They offer great advantage because they are well hydrated and reduce the dryness of skin, which is a primary cause of aging. They are also being used in the treatment of hair loss; minoxidil, a vasodilator, is the active ingredient in products like Rogaine, which prevent or slow hair loss (Goymann, 2004; Lautenschläger, 2006). Vesicles or liposomes are also of importance in food products like dairy products preparation, in the stabilization of food components against degradation, and in enhancing the efficiency of



Analytical Methods

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A low-cost screen printed glass electrode with silver nano-ink for electrochemical detection of H_2O_2†

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Silver nanoparticles modified with poly(vinyl alcohol) (AgNP–PVA) were prepared by the reduction of silver ions with ascorbic acid. The concentrations of AgNPs, type of solvent and solvent ratio were optimized for the preparation of silver nano-ink to obtain a better conductive surface (low resistance). Different substrates such as glass, poly(vinyl chloride) (PVC) and poly(ethylene terephthalate) (PET) were tested and the sintering process was optimized for the preparation of an efficient electrode for electrochemical application. The screen-printed glass electrode fabricated with silver nano-ink showed low resistance and therefore was used as a working electrode in cyclic voltammetry (CV) determination of hydrogen peroxide (H_2O_2). A wide linear calibration range, 1.0 μM to 0.5 mM, was obtained for the determination of H_2O_2 with a limit of detection of 0.3 μM. The high recovery percentage (93.3–96.0%) has been obtained for the determination of H_2O_2 in a complex sample matrix (hospital and beauty parlor wastewater) and an interference study demonstrated the selectivity of the method. The screen-printed glass electrode is found to be simple, low cost and homemade compared to commercially available glass electrodes for monitoring H_2O_2 in environmental water samples.

Introduction

Hydrogen peroxide (H_2O_2) is an oxidizing agent having mild antiseptic properties. Many pharmaceuticals, cosmetic industries and beauty parlor shops also use H_2O_2 as a bleaching agent and disinfectant. Thus, the effluent from industries, hospitals and domestic drainage contains a high amount of H_2O_2 that enters ground water reservoirs. The consumption of H_2O_2 through drinking water may cause various health related problems such as headache, irritation, redness of eyes and syncope at very high concentrations. Therefore, monitoring of H_2O_2 from the effluent of hospitals and beauty parlors is necessary to know the entry of this toxic chemical into the environment and to take preventive actions against the excessive usage and discharge of this harmful chemical into natural water reservoirs.[1–3]

The most commonly used analytical techniques such as UV-Vis spectrophotometry,[2] spectrofluorimetry,[3] chemiluminescence,[4] infra-red spectrometry[5] and cyclic voltammetry (CV)[1,6] are reported for the determination of H_2O_2 in environmental, biological and cosmetic samples. Though the spectrophotometric, spectrofluorimetric and chemiluminescence methods seem simple,[2–4] easy and cost effective for the detection of H_2O_2, these methods require a selective chromophoric reagent/fluorophore to form a colored complex or luminescent substance with the target analyte for analysis. The CV technique is mostly used for the determination of H_2O_2 through the redox phenomenon occurring at the surface of the working electrode with better selectivity and sensitivity. Recently, the detection of H_2O_2 has been done by the immobilization of an enzyme on the surface of an electrode using nanocomposite materials.[7,8] Glassy carbon electrodes (GCE) and indium tin oxide (ITO) coated glass plates are demonstrated for the detection of H_2O_2 from a variety of samples.[9,10] The use of modified electrodes showed better selectivity and sensitivity though the reproducibility and stability are found to be poor.[11] ITO coated glass plates are generally found to be expensive. Therefore, in this work a glass substrate is directly modified with conductive silver nano-ink without the use of any intermediate layer (like ITO). The fabrication of a glass substrate with silver nanoparticles (AgNPs) for the preparation of an electrode is found to be simple and economic. Several techniques such as lithography,[12] screen printing,[13] chemical vapor deposition,[14] direct-writing,[15,16] spin coating and inkjet printing[17] are reported for the fabrication of conductive materials on different substrates such as paper,

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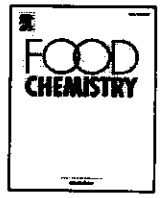

Sucrose capped gold nanoparticles as a plasmonic chemical sensor based on non-covalent interactions: Application for selective detection of vitamins B_1 and B_6 in brown and white rice food samples

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ABSTRACT

We report simple and selective method for detection of vitamins B_1 and B_6 in brown and white rice samples using localized surface plasmon resonance (LSPR) of sucrose capped gold nanoparticles (AuNPs) as a chemical sensor colorimetrically. Here, detection is based on the color change of AuNPs from pink to blue followed by a red shift of LSPR absorption band in UV–vis region with the addition of vitamins B_1 and B_6 into the NPs solution. A good linear range was observed in the range of 25–1000 ngmL^{-1} with detection limit of 8 ngmL^{-1} for B_1 and 50–1000 ngmL^{-1} with detection limit of 15 ngmL^{-1} for vitamins B_6. The employment of AuNPs for detection of B_1 and B_6 vitamins in rice food samples showed remarkable abilities in terms of the simplicity, low cost, stability, reproducibility and sensitivity.

1. Introduction

Vitamins are essential organic substance required in trace amount for the normal growth, self-maintenance and proper functioning of human body. All vitamins (except vitamin D and K) are obtained from various food products as they are not formed in adequate amount in our body. Thiamine (B_1) and pyridoxine (B_6) come under the water-soluble vitamins and are obtained externally through the food foodstuffs (Zafara-Goamez, Garballo, Morales, & Garcia-Ayuso, 2006; Ball, 1998; Moreno & Salvado, 2000). Vitamin B_1 is naturally present in sunflower seed, oat, brown rice, whole grain rye, cauliflower, potatoes, asparagus, flax, liver and egg. Vitamin B_6 exists in pea, banana, potatoes, pistachios, onions, salmon, beef liver and chicken breast. The recommended dietary allowances (RDAs) suggested by the Food and Nutrition Board of the U.S. Institute of Medicine for B_1 for women and men are 1.1 and 1.2 mg/day, respectively. Similarly, for B_6, RDAs for women and men are 1.2 and 1.5 mg/day, respectively. Vitamin B_1 facilitates the conversion of carbohydrate into glucose as a major source of energy in our body. The deficiency of B_1 causes Korsakoff's syndrome and beriberi disease and affects the peripheral nervous and cardiovascular systems. Vitamin B_6 helps in the synthesis of serotonin and its deficiency may cause depression, muscle weakness, irritability and short term memory loss (Combs, 2008; Institute of Medicine and Food and Nutrition Board, 1998; Lonsdale, 2006). Therefore, it is very important to develop a simple method to determine the vitamins B_1 and B_6 in food samples.

The common analytical techniques such as UV–vis spectrophotometry (Rahman, Elbashir, El-Mukhtar, & Ibrahim, 2016; Nayak, Kulkarni, Bhaskar, & Chavhan, 2016), fluorescence spectrometry (Garciua, Blazquez, San Andres, & Vera, 2001), enzyme-linked immunosorbent assay (ELISA) (Ball, 2005), resonance Rayleigh-scattering (RRS) (Liu, Zhang, Luo, & Kong, 2002), surface plasmon resonance (Wang et al., 2013), cyclic voltammetry (CV) (Brahman, Dar, & Pitre, 2013; Brunetti & Desimoni, 2014) and high performance liquid chromatography (HPLC) (Moreno & Salvado, 2000; Li & Chen, 2001) are used for the determination of vitamins B_1 and B_6 from variety of food and pharmaceuticals samples. The ELISA technique needed a specific antibody to react with target analyte that is found to be expensive and low temperature dependent. The use of RRS showed low precision and cost-effectiveness towards analyte detection. Voltammetric and HPLC methods showed accurate results with better sensitivity. However, for such detection, the major drawbacks of HPLC are the use of expensive

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REVIEW

Domestic Use of Cooking Fuel in India: A Review on Emission Characteristics and Associated Health concerns

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One out of every three Indians use biomass fuels such as wood, animal dung and coal cake, crop residues as their primary domestic energy source. About 23 and 61 % of urban and rural Indian households, respectively, rely on traditional stoves (Chullah) for cooking practices. Household air pollution, contains solid fuel burning emissions prominently, is reported to claim 4.3 million premature deaths yearly in developing countries. But most of the review studies to address air pollution scenario in India are focused on outdoor environments, which is the major reason to review the current knowledge on emission estimates from household biomass burning and associated impacts on indoor air and human health. This review intends to critically discuss the variability associated with emission estimates and impacts of household air quality in different parts of India, presented in several research works published during 2001-2015. About 27 and 11 % increase in $PM_{2.5}$ and PM_{10}, respectively, has been observed in Indian house-indoors during the assessment period. Emission factors, emission budgets of aerosol fractions, carbonaceous matter and other chemical components for household biofuel burning emissions were also summarized for the period of 2001-2015. Health effects studies due to household air pollution in India were also summarized and discussed. Improvement in ventilation system and modification in the pattern of fuels may contribute to reduce the effect of the pollution on national health. As there are no specific regulations or acts for controlling of household air pollution in India, urgent need is felt for implementing the strategies to create public awareness.

Keywords: Household air pollution, Biomass burning, Emission factor, Indoor air pollution, Health effect.

INTRODUCTION

The population explosion along with prevalent industrialization coupled with urbanization results dense urban and rural centers with deteriorating air quality in developing countries. In developing countries around half of the world's population and up to 90 % of rural household countries still rely on unprocessed biomass fuel (including fuel wood, dung cake and crop residues) burnt indoors in open fires using poorly implemented traditional stoves [1]. People, who spends on an average more than 14 h indoors, are reported to expose to high level of indoor air pollution not only due to proximity to the emissions resulting from burning of solid biomass fuels for cooking practices but also from infiltration of profuse outdoor pollution at places among other sources [2,3]. The major sources of indoor air pollution, globally, include infiltration of outdoor air, combustion of solid fuels, furnishings and constructions materials, ventilation systems [4]. These sources vary considerably between developing and developed country. Although 40 % of poor ventilated Indian houses with the use of solid fuels for cooking practices are major hotspots of producing adverse health effects among dwellers, most of the reported Indian air quality (IAQ) studies were focused to address ambient-outdoor air pollution [5-7]. The status of household air pollution can reproduce the high level of harmful pollutants [7] consequently, among various sources of household air pollution, the environmental significance of cooking activities has drawn a great deal of attention. Cooking-related to household air pollution is known to be affected by the combustion of various fuels, cooking styles and efficiency of cooking stoves [9]. Many types of pollutants *viz.*, particulate matter, carbonaceous matter (elemental carbon, polycyclic aromatic hydrocarbons and other organic compounds) are found to be released, mainly, from combustion of biomass [10].

Incomplete combustion of biomass can also serve as a route to transfer high levels of indoor pollutants to the exposed

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Simultaneous Determination of Cationic and Anionic Surfactants in Domestic, Sewage and River Effluent by Diffuse Reflectance-Fourier Transform Infrared Spectroscopic Analysis

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Abstract. A new, simple, rapid and precise novel hyphenated diffuse reflectance-Fourier transform infrared spectroscopy (DRS-FTIR) technique for the simultaneous determination of the most frequently used cationic surfactants (CS^+) i.e. cetyltrimethylammonium bromide (CTAB) and anionic surfactant (AS^-) i.e., sodium dodecyl sulphate (SDS) in domestic, sewage and river wastewater samples has been stabilised. CS^+ and AS^- were analyzed using DRS-FTIR, the most steady and strongest vibrational IR peak at 2917.13 cm^{-1} for CTAB and 1226.07 for SDS were selected for the simultaneous quantification of CS^+ and AS^- under the optimized condition such as effect of samples volume and effect of temperature. The limit of detection (LOD) and limit of quantification (LOQ) of the present method were 5 µg/mL and 15 µg/mL, respectively. The absorbance and peak area were determined by the DRS-FTIR method, which shows excellent linearity with a correlation coefficient value of 0.985 and 0.981 for the concentration range of 10-100 µg/mL. The standard deviation (SD) and relative standard deviation (RSD) for six replicate measurements were found to be 0.052 µg/L and 2.8 %, respectively.

Keywords: cationic surfactants, anionic surfactants, diffuse reflectance-Fourier transform infrared spectroscopy, wastewater samples.

Introduction

A surfactant is briefly defined as a material that can greatly reduced the surface tension of water when used in very low concentration (Olkowska *et al.*., 2012). On the basis of this characteristic behavior, these compounds are classified into different classes such as anionic, cationic, nonionic etc. The anionic surfactants (AS^-) are carboxylates (soap), sulphonates, sulfates, phosphates and the cationic surfactants (CS^+) represent a form of an amine product (Agrawal *et al.*., 2004). CS^+ and AS^- which are surface active compounds with at least one hydrophobic and hydrophilic group carrying a positive and negative charge for detail studies. Long persistence of surfactants are observed in environment due to their ionic nature maximum concentrations are found as pollutants in sewage water, ground water and river water (Olkowska *et al.*., 2011; Ramcharan and Bissessur, 2016; Ahmia *et al.*., 2016). In household products, CS^+ and AS^- are widely used as emulsifiers, wetting agents, fabric softeners, hair conditioner and other manufacture of commodity samples, such as detergents, soaps and shampoo etc. (Shyichuk and Ziolkowska, 2016; Yan *et al.*., 2017). The effluent from industry and households containing a large amount of CS^+ and AS^- are disposed into the natural surface water reservoirs. The excess intake of CS^+ and AS^- through drinking water may cause the human health problem such as nausea, diarrhea, vomiting, dermal necrosis, lung complication, hypotension, and corneal damage (Wyrwas and Zgola-Grzeskowiak, 2014; Sinha *et al.*., 2015). Therefore, the monitoring of CS^+ and AS^- present in environmental water samples will be helpful to find the entry-route of this pollutant in different surface and underground water reservoirs.

Different analytical techniques such as spectrofluorometric (Masadome, 1998), high-performance liquid chromatography-mass spectrometry (HPLC-MS) (Peng *et al.*., 2011), gas chromatography-mass spectrometry (GC-MS) (Li *et al.*., 2003), electrospray ionization-mass spectrometry (ESI-MS) (Radke *et al.*., 1999) and matrix-assisted laser desorption ionization mass spectrometry (MALDI-MS) (Shrivas and Wu, 2007) have been reported for determination of CS^+ and AS^- in variety of samples. The drawbacks of spectrophotometric and spectrofluorimetric methods are the employment of specific chromophoric reagents for formation of colored complexes with target analyte, and sometimes there is a chance of interference with other chemical species present in the samples. The use of HPLC-MS, GC-MS for analysis of CS^+ and AS^- may result the chromatographic separation due to the micelles formation in column. However, these techniques are restricted for high molecular group of compounds and thus only low molecules mass of non-ionic surface active agents such as ethoxylated groups can be determined. ESI-MS and MALDI-MS are found to be sensitive and more

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Regional and Transported Aerosols in Ambient Atmosphere of Raipur, India, during Winter

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Abstract: Size fractionated atmospheric aerosols were collected using cascade impactor sampler on quartz filter substrate during October 2015 to February 2016 in campus of Pt Ravishankar Shukla University of Raipur Chhattisgarh. The size of aerosol particles is of crucial importance to several processes in the atmosphere. The relative concentrations in both modes are responsible for the variability observed in the shape of the size distribution. Characteristic size distributions of measured aerosol over central India showed identification of three main behaviour types during entire study period: (i) month in which bimodal size distribution dominated in coarse mode (October 2015, 5 December 2015 and January, 2016), (ii) those months in which bimodal distribution equally intense in both one, and coarse modes (November, 2015) and (iii) those which were mainly dominated within fine (February, 2016, December, 2015). The two-subsequent month namely November 2015 and December 2015 shows bimodal size distribution with dominance in fine size range in comparison to coarse mode, possibly these high loading of one particles is due to long range transport. The peculiar observation of air trajectory shows that there is increase in fine particles concentration during December 2015, although there in increase in temperature and wind speed. The reason for this high concentration is long range transport of air masses. However, January has normal trend in particular matter concentration. The important finding of the present study based on characteristic size distribution and air trajectory plots accomplishes that fine particles are obtained through long range transport whereas coarse particles are mainly from local origin.

Keywords : Mass loading, ambient aerosol, Size fractions, biomass burning and inversion layer

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Aerosol emissions factors from traditional biomass cookstoves in India: insights from field measurements

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Abstract. Residential solid biomass cookstoves are important sources of aerosol emissions in India. Cookstove emissions rates are largely based on laboratory experiments conducted using the standard water-boiling test, but real-world emissions are often higher owing to different stove designs, fuels, and cooking methods. Constraining mass emissions factors (EFs) for prevalent cookstoves is important because they serve as inputs to bottom-up emissions inventories used to evaluate health and climate impacts. Real-world EFs were measured during winter 2015 for a traditional cookstove (*chulha*) burning fuel wood, agricultural residue, and dung from different regions of India. Average (±95 % confidence interval) EFs for fuel wood, agricultural residue, and dung were (1) $PM_{2.5}$ mass: 10.5 (7.7–13.4) g kg^{-1}, 11.1 (7.7–15.5) g kg^{-1}, and 22.6 (14.9–32.9) g kg^{-1}, respectively; (2) elemental carbon (EC): 0.9 (0.6–1.4) g kg^{-1}, 1.6 (0.6–3.0) g kg^{-1}, and 1.0 (0.4–2.0) g kg^{-1}, respectively; and (3) organic carbon (OC): 4.9 (3.2–7.1) g kg^{-1}, 7.0 (3.5–12.5) g kg^{-1}, and 12.9 (4.2–15.01) g kg^{-1}, respectively. The mean (±95 % confidence interval) OC / EC mass ratios were 6.5 (4.5–9.1), 7.6 (4.4–12.2), and 12.7 (6.5–23.3), respectively, with OC and EC quantified by the IMPROVE_A thermal-optical reflectance protocol. These real-world EFs are higher than those from previous laboratory-based measurements. Combustion conditions have larger effects on EFs than the fuel types. We also report the carbon mass fractions of our aerosol samples determined using the thermal-optical reflectance method. The mass fraction profiles are consistent between the three fuel categories but markedly different from those reported in past literature – including the source profiles for wood stove $PM_{2.5}$ emissions developed as inputs to receptor modeling studies conducted by the Central Pollution Control Board of India. Thermally stable OC (OC3 in the IMPROVE_A protocol) contributed nearly 50 % of the total carbon mass for emissions from all fuels.

1 Introduction

The Indian subcontinent is a regional hotspot for anthropogenic emissions (Ramanathan and Carmichael, 2008). Carbonaceous aerosol (black carbon, BC; and organic carbon, OC) in India is linked to surface dimming (Kambezidis et al., 2012), solar warming of the lower atmosphere (Ramanathan et al., 2001, 2007), changing regional monsoon patterns (Chung and Seinfeld, 2005; Menon et al., 2002; Ramanathan et al., 2005), and accelerated melting of Himalayan glaciers (Ramanathan et al., 2007). Particulate matter (PM) emissions – particularly particles with an aerodynamic diameters less than 2.5 µm ($PM_{2.5}$) – are also associated with nu-

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Source Profiles for $PM_{10-2.5}$ Resuspended Dust and Vehicle Exhaust Emissions in Central India

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ABSTRACT

Eight composite $PM_{10-2.5}$ source profiles were developed for resuspended dust and vehicle exhaust emissions with 32 chemical species, including 21 elements (Al, As, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Mo, Na, Ni, Pb, S, Sb, Se, V, and Zn), 9 water-soluble ions (Na^+, K^+, Mg^{2+}, Ca^{2+}, NH_4^+, Cl^-, F^-, NO_3^-, and SO_4^{2-}), and carbonaceous fractions (OC and EC). Dust samples were dominated by crustal elements (Al, Ca, Fe, and Mg) while exhaust emissions showed high abundances of carbonaceous aerosol (OC and EC). Crustal species (Al, Fe, Mg, and Na) were more enriched over native soils in $PM_{10-2.5}$ as compared to $PM_{2.5}$. The higher coefficients of divergence (COD) indicate that profiles differ from each other. Ca accounted for nearly 30% of $PM_{10-2.5}$ mass in construction dust while Fe accounted for nearly 20% of $PM_{10-2.5}$ mass in paved road dust. Three- and four-wheeler diesel exhaust profiles consisted of 5–7% EC, with 6–10 times higher Pb, Se, and S abundances than those in two-wheeler gasoline exhaust profile. The heavy-duty diesel exhaust profile consist of nearly 20% EC with abundant (> 0.5%) trace elements (e.g., Pb, Se, and Zn).

Keywords: $PM_{10-2.5}$; Source profile; Enrichment factor; Source markers; Resuspended dust; Vehicle exhaust.

INTRODUCTION

Air pollution is of great concern in India, especially the high levels of particulate matter (PM) emitted from uncontrolled industrial processes, solid waste and biomass burning, vehicular exhaust, and resuspended road dust (Pant and Harrison, 2013; Pant *et al.*, 2015). Real-world source characterizations are needed to obtain chemical source profiles for input to receptor models, such as the Chemical Mass Balance (CMB), to identify and quantify source contributions. The U.S. EPA SPECIATE (USEPA, 2013), European SPECIEUROPE (Pernigotti *et al.*, 2016), and China Source Profile Shared Service (CSPSS) (Liu *et al.*, 2017) databases have assembled many of these profiles.

Gargava and Rajagopalan (2016) found that road dust and vehicular exhaust emissions account for ~30–70% and ~15–20% of the measured PM_{10} mass, respectively, in India. Various studies have been conducted (Chow *et al.*, 2003; Ho *et al.*, 2003; Kong *et al.*, 2011, Patil *et al.*, 2013; Han *et al.*, 2014; Kong *et al.*, 2014; Matawle *et al.*, 2015; Pant *et al.*, 2015; Wang *et al.*, 2015; Liu *et al.*, 2016) to derive dust and motor vehicle exhaust profiles (Chow *et al.*, 2004; Han *et al.*, 2014; Matawle *et al.*, 2015; Liu *et al.*, 2017). This study reports additional $PM_{10-2.5}$ chemical source profiles for resuspended dust and vehicle exhaust emissions specific to India.

METHODOLOGY

Source Sampling and Chemical Analysis

Source sampling was conducted in Raipur, the capital of Chhattisgarh, India (21°14′22.7″N, 81°38.1′E), with a population of ~1.6 million (Census, 2011), as documented by Matawle *et al.* (2014, 2015) for $PM_{2.5}$. This paper describes the $PM_{10-2.5}$ chemical profiles for the eight resuspended dust and vehicle exhaust emissions tests. Source samples are summarized in Table 1. Geological samples typical of Central

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Spatiotemporal Variation in Groundwater Quality of India during last 15 Years: A Review

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Abstract. Groundwater resource in this few decades has been challenging in India due to intense agricultural, industrial and mining activities which make groundwater quality exposed to contaminants. This review article deals with results of groundwater quality monitoring and assessment works conducted in India during the year 2000 to 2015. Previously published research articles of study region with the theme of groundwater quality have been discussed for concentrations of heavy metals, ions, water-soluble organics and inorganics along with its associated health impacts. Several methodologies were used for various chemical contaminants quantification and a wide range of statistical approaches was also applied for their source identification and/or apportionment. The major groundwater pollutants were F^-, NO_3^-, As, V, Cd, Cr, Cu, Fe, Pb, Co, Mn, Ni, Zn, Polycyclic Aromatic Hydrocarbons (PAHs), Organochlorine Pesticides (OCPs) etc. monitored in India in higher concentration than standard permissible limits regulated by various international and national agencies like World Health Organization (WHO), United States Environmental Protection Agency (USEPA), American Public Health Association (APHA) and Bureau of Indian Standards (BIS). Studies reported that millions of people are suffering from chronic heavy metal poisoning causing cancer, cardiovascular diseases, affecting central nervous system, brain, liver, kidney etc., while 1.6 million children expire every year from ailment for which polluted drinking water is a primary cause.

Keywords: Groundwater quality, Heavy metals, Organic Pollutants, Health Risk, Source Apportionment

Introduction

India is one of the largest consumer of groundwater around the globe. It has been estimated that 230 cubic kilometers per year groundwater is used in India which is a quarter of total availability of groundwater in the whole world, 89% of the rural and 50% of the urban requirement of drinking water is fulfilled by groundwater sources (The World Bank, 2010). Overuse of groundwater due to growing population, exploring industrialization, urbanization and intensive agricultural activities has resulted in increasing the depth of groundwater table. When the depth of groundwater sources is considerably low such as in open wells and tube wells, anthropogenic activities play a significant role in degrading the quality of water. Anthropogenic sources such as agricultural wastes, leakages from septic tanks, industrial effluents, municipal solid wastes, waste deposition in dumping areas, household materials paints and inks, body care products, medicines and household pesticides are washed off by the rain and intensify impact on the hydrochemical characteristics of groundwater as well as surface water, constituents released by these sources are found to be toxic, even in trace amount. (Boetang *et al.*, 2016; Duong *et al.*, 2015; Zakhem *et al.*, 2004). Industrial and agricultural runoff are the major sources of pollution in surface and sub-surface water which contributes to change in chemical composition of water by elevating the concentration of organic and inorganic pollutants in water. Geogenic factor such as the dissolution of minerals from rocks while passing through the pores within rocks and soil during migration of water, climatic conditions, contamination in aquifers and residence time of water are another major source of groundwater contamination (Mahato *et al.*, 2016; Krishna *et al.*, 2009). Potable water quality comprises of biological, chemical and physical parameters. The major contaminants of potable water are F^-, I_R, As, V, Cd, Cr, Cu, Fe, Pb, Co, Mn, Ni and Zn. In the recent years, organic pollutants such as polycyclic aromatic hydrocarbons (PAHs), Organochlorine Pesticides (OCPs) and Volatile Organic Carbon (VOCs) has been detected in groundwater in trace amount. Few metals like Cu, Zn and Fe are essential micronutrients for living organism, but at higher concentration it causes health risk (Bhowmik *et al.*, 2015). To deal with the rising contaminant issues, many federal agencies like Environmental Protection Agency (EPA), and various research laboratories have done a number of research and screening to compute each type of emerging pollutants. The present review is focused on (a)Spatiotemporal study of groundwater contaminants during year 2000 to 2015 ; (b) Source apportionment study in groundwater; (c) Health Risks study of groundwater contaminants in India.

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Kinetic Study of Hydrolysis of Mono-3,5-dimethylaniline Phosphate in Buffer Medium

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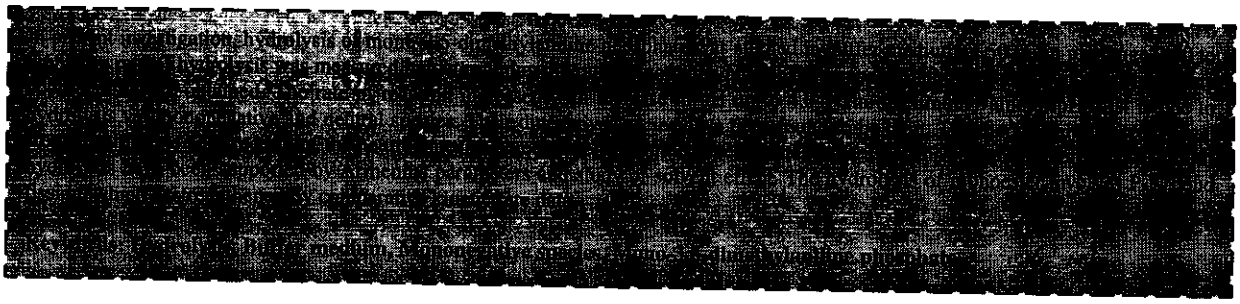

Phosphate esters are the derivatives of orthophosphoric acid, which can form a series of phosphate esters with alcohols, amines, phenols and their substituted compounds. Phosphate esters are important due to their versatile applications in various fields [1-6]. Many multi-ring phosphate ester heterocycles are used as pesticides [7], bactericides [8,9], antibiotics [10] and act as HIV protease inhibitors [11]. Phosphate esters have also achieved importance in industry as solvent and fuel additives for explosion control. These esters are also used as additives in the textile and clothing dyeing industry. Hydrolysis of phosphate ester is a subject of kinetic study due to their various uses in engineering, agricultural, medicinal and pharmaceutical chemistry. Therefore, phosphate esters have been the subject of extensive experimental [12] and theoretical [13] studies.

Mono-3,5-dimethylaniline phosphate has been synthesized by Cavilier method [14]. Kinetic study of hydrolysis of mono-3,5-dimethylaniline phosphate has been studied at 50 ± 0.5 °C employing 5×10^{-4} mol dm^{-3} solution of the monoester in aqueous medium. The buffer solutions were prepared using appropriate mixture of KCl, COOH, C_6H_4, COOK, NaOH and H_3BO_3. The inorganic phosphate produced during hydrolysis has been determined spectophotometrically using Allen's modified method [15]. All the solutions have been prepared in triply distilled water. All the chemicals used were of AR grade.

The kinetics of hydrolysis of mono-3,5-dimethylaniline phosphate has been studied in the range of pH 0.00 to 7.68 at 50 ± 0.5 °C. Pseudo-first-order rate constants obtained are shown in Table-1. From the result, it may be seen that the rate of reaction increases with the increase in pH up to 4.04. The maximum value at pH 4.04 is due to hydrolysis *via* mononegative species and dissociation of neutral species into mononegative species is almost complete at this pH. After pH 4.04 the fall in rates is due to the inertness of the dinegative species [16].

The rate of neutral and mononegative species at different pH are calculated from the eqns. 1 and 2:

$$k_N = k_{N_o} \frac{N}{N+M} \quad (1)$$

$$k_M = k_{M_o} \frac{M}{M+N} \quad (2)$$

where k_{N_o} is specific neutral rate, k_{M_o} (specific mononegative rate) is experimental rate at pH 4.04 and N/N + M and M/M + N are the fraction of neutral and mononegative species respectively. The value of specific neutral rate *i.e.* k_{N_o} was determined from the reaction:

$$k = k_{M_o} \frac{M}{M+N} + k_{N_o} \frac{N}{N+M} + k_{H^+} \cdot C_{H^+} \quad (3)$$

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Kinetics of Hydrolysis of Di-2,3-dichloroaniline Phosphate in Buffer Media

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Abstract : In present investigation, kinetic study of hydrolysis of di-2,3-dichloroaniline phosphate has been carried out in pH range from 0.00 to 7.49 in 30% dioxane-water medium at 80°C (±0.5). The pH log rate profile shows rate maximum at pH 4.11. Neutral and mononegative species have been found to be reactive in the range of pH 0.00 to 2.21 and only mononegative species in the range of pH 2.21 to 7.49. The theoretical rates determined from Debye Huckel equation have been found in close agreement with the experimental rates.Molecularity and Bond fission have been discussed in terms of isokinetic relationship. Probable reaction mechanism has been proposed for the hydrolysis of di-ester *via* its neutral and mononegative species.

Keywords: Hydrolysis, Di-2,3-dichloroaniline phosphate, Neutral and Mononegative species, P-N bond fission, Bimolecularity.

Introduction:

Phosphate esters are fundamental molecules in cellular chemistry and have a wide range of applications in the industrial, agricultural and academic field owing to their unique biological and physicochemical properties as well as their utility as synthetic intermediates[1].Other significant applications are as environmentallydegradable pesticides due to their toxicity to a wide range of insects and their relatively short residence time in the environment[2].The phosphate esters have also found application as surfactants and as brighteners in detergents[3].The cyclic and acyclic phosphate esters are normally considered as important pharmacological compounds[4-7]. Nucleoside derivatives of phosphate esters have found to be extremely important agents for anticancer and antiviral therapy[8].Prodrugs of phosphate esters have been successfully utilized to overcome a variety of drug delivery problems[9].Phosphate ester hydrolysis is a crucially important process for several biological systems, as it is involved in energy and signal transduction processes, the control of cellular metabolism, and the regulation of protein function[10, 11].Phosphate diesters play an essential role in biology, particularly as the backbone of DNA and RNA and therefore its hydrolysis represents a reaction of fundamental importance in living systems[12, 13].

Experimental:

Di-2,3-dichloroaniline phosphate was prepared from the reaction of 2,3-dichloroaniline with phosphorylating agent phosphorus oxychloride ($POCl_3$) by the procedure described earlier[14]. Characterization of the compound was done by melting point determination, elemental and IR spectral analysis techniques.Hydrolysis of di-2,3-dichloroaniline phosphate were carried out in the pH range 0.00-7.49 in 30%

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Micellar catalyzed hydrolysis of mono-2,3-dichloroaniline phosphate

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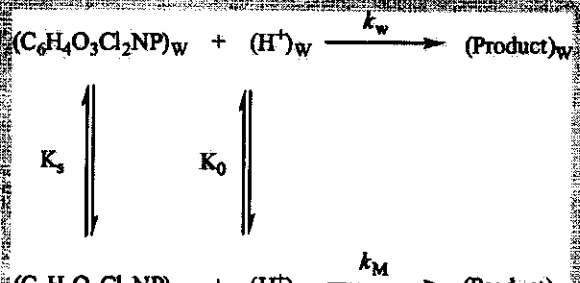
ABSTRACT

The kinetics of micellar catalyzed hydrolysis of mono-2,3-dichloroaniline phosphate in the presence of different surfactants has been studied at 303 K. The rate of reaction has been found to be first order with respect to both [substrate] and [HCl]. The cationic micelles of cetylpyridinium chloride (CPC), anionic micelles of di-octyl sodium sulphosuccinate (AOT), and non-ionic micelles of polyoxyethylene sorbitan monooleate (Tween 80) enhanced the rate of reaction to a maximum value and after that the increase in concentration of surfactant decreased the reaction rates. The applicability of different kinetic models has been tested to explain the observed micellar effects. The various thermodynamic activation parameters (E_a, $\Delta H^{\neq}$, $\Delta S^{\neq}$, $\Delta G^{\neq}$) have been evaluated. The added salts viz. KCl, KNO_3, K_2SO_4 enhanced the rate of reaction in the presence of CPC, AOT, and Tween 80 micelles. The kinetic parameters were determined from the rate (surfactant) profile and a suitable mechanism consistent with the experimental finding has been proposed.

GRAPHICAL ABSTRACT



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Hydrolysis; mono-2,3-dichloroaniline phosphate; Menger–Portnoy's; Piszkiewicz's and Berezin models

1. Introduction

Phosphate esters are the derivatives of orthophosphoric acid and they play a vital role in many biological processes. Phosphate esters are present in important biomolecules, such as DNA, RNA, vitamins, various metabolites and proteins.[1] Hydrolysis of phosphate esters occurs in biochemical processes including energy storage, biosynthesis, or replication of genetic material.[2] Phosphate esters having C–N–P linkages are used as insecticides, pesticides, cancer chemotherapeutic agents.[3,4] They are also used as additives for fire retardant, petroleum and corrosion inhibitors.[5,6]

Surfactants are specific functional materials that form various types of self-assemblies (micelles) and affect local water ordering alongside solution properties.[7] Surfactants of cationic nature are well known as antibacterial compounds. They are used as environmental cleaning products, cosmetic formulations, and pharmaceuticals.[8,9] Surfactant solutions are capable of both catalyzing and inhibiting the reaction rates depending on the type of surfactant as well as reactants. The utilization of surfactants as a reaction media affects reaction rates, position of the chemical equilibria, products, and in some cases stereochemistry of the reactions.[10] Surfactant properties have attracted growing attention for use in biological and chemical research applications.[11] Research on surfactants is a rapidly developing field due to their successful applications in many important applied and fundamental sciences like petroleum, oil recovery, water and water pollutions, understanding the mysterious role of biological membranes, biotechnology, and other systems.[12]

Micelle-catalyzed reactions had become an area of rapidly increasing interest, and a number of extremely important thermodynamic and kinetic studies of organic reactions have been performed in micellar solutions. There is extensive evidence on the ability of aqueous micelles and other associated colloids to influence reaction rates, equilibria, concentration, or depletion of reactants in the interfacial region.[13,14] Micellar

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Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/ldis.

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Self-aggregation of bio-surfactants within ionic liquid 1-ethyl-3-methylimidazolium bromide: A comparative study and potential application in antidepressants drug aggregation

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Highlights

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Facile synthesis and electrochemical evaluation of PANI/CNT/MoS_2 ternary composite as an electrode material for high performance supercapacitor

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ABSTRACT

Synthesis of a novel ternary composite consisting of polyaniline (PANI), functionalized multi-walled carbon nanotubes (CNTs) and molybdenum disulfide (MoS_2), *via* an in-situ polymerization method is reported. Detailed structural and electrochemical characterization shows that incorporation of a small amount of MoS_2 in PANI/CNT composite tends to eliminate agglomeration problem of CNT. The PANI/CNT/MoS_2 ternary composite reaches a specific capacitance of 350 F/g at the current density 1 A/g corresponding to a 5% MoS_2 content. This ternary composite shows good cycling stability even at a higher energy density of 10 A/g. Further, PANI/CNT/MoS_2 composite electrode shows higher energy density (7.77 Wh/kg) and power density (2140 W/kg) as compared to PANI/CNT composite without MoS_2.

1. Introduction

Electronic technology has witnessed rapid progress during the past few decades, and more importance is being given to make better, faster and smaller electronic devices for different applications. Supercapacitors (SCs) are proved to be important type of energy storage devices because of their rapid charge-discharge processes, high power densities, and long cycle life. Supercapacitors are essentially maintenance-free, possess excellent charge/discharge characteristics as well as high specific power, require a very simple charging circuit and are safe for operation [1–4]. Energy storage in supercapacitors can be explained using two mechanisms, electric double-layer capacitors (EDLCs) that store charges electrostatically *via* reversible ion adsorption on high surface area carbon electrodes. Whereas, the other mechanism leading to the phenomenon of pseudocapacitance stores energy through fast redox reactions involving metal oxides, conducting polymers, etc. as electrode materials [2–6].

Pseudocapacitive materials like electrochemical conducting polymers (ECPs) possess good electrical conductivity, large surface area, a short path for the ion transport and superior electrochemical activity [7–9]. These properties make them specifically suitable for energy storage applications. Various ECPs such as polyaniline (PANI), polypyrrole (PPY), polythiophene (PTP), polyethylene dioxythiophene (PEDOT), polyacetylene (PAC), etc. are explored for SCs application. In particular, PANI has received increased attention due to its rich chemistry, semi-flexible nature, light weight property, various oxidation states, corrosion-resistivity, high chemical inertness, ease of synthesis and low cost [10–14]. However, low cyclability, high self-discharge rate and slow kinetics of ion transport during charging-discharging process often restrict the application of PANI as pseudocapacitor electrode material [12,15]. Integrating PANI, with suitable materials possessing high electrical conductivity, thermal, and mechanical stability can overcome the limitations of PANI and provide excellent capacitive performance.

For example, CNTs; properties like high electrical conductivity, high surface area and interconnectivity of CNTs are known to increase mechanical as well as the electrochemical stability of the pseudocapacitive polymeric materials. PANI has a good

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PARAMETER ANALYSIS OF WIRELESS SENSOR NETWORKS ON VARIOUS NON REALISTIC MOBILITY MODELS

By

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ABSTRACT

In present days, Wireless Sensor Networks (WSN) play an important role in wireless communication. Wireless Sensor Networks are self-configurable, self-healing networks consisting of a larger number of small size sensor nodes. Senor Node is composed by processor, memory, battery, sensor devices and transceiver. WSN focuses mainly on sensing environment data and transferring it to the computational centre via the sink. Mobility Models play an important role in the performance of WSN. In this paper, various performance parameters of WSN on different mobility models are analyzed with the help of NS-3.22 simulation tool. Network performance depends on the nodes' population and displacement.

Keywords: WSN, Mobility Models, Performance Metrics, Simulation Tools.

INTRODUCTION

In wireless sensor network, the sensor nodes are distributed in various geographic areas for sensing the data and the sink nodes are used to collect data from different sensor nodes. In the in-building scenario, the base station acts as an access point to a wired network and nodes form a wireless backbone to provide wireless connectivity. Mobility models are defined as nodes which have displacement capability, change in their position, velocity and acceleration, in particular time interval. For an investigation of communication or navigation techniques, such models are simulated. In mobile communication, mobility management technique is used to predict the actual position node (Alaybeyoglu et al., 2009).

For Wireless Sensor Networks (WSN), various mobility models have been proposed. WSN is a group of N sensor nodes in dynamic topologies consisting of 1 master node and N-1 slave nodes. WSN works on data gathering mechanism where data from environment are collected and routed to the processing node (Stevanovic and Vlajic, 2008). WSN supports wide variety of applications such as military application, industrial area, machine health monitoring, environmental, home automation, traffic control etc (Ali, 2012). There are a number of mobility models such as Random Direction Mobility Model (RDMM), Random Waypoint Mobility Model (RWMM), Random Walk 2D Mobility Model (RW2DMM), Gauss-Markov Mobility Model (GMMM) etc. for wireless sensor network. Network Simulators (NS2, NS3), OPNET (Optimized Network Engineering Tools) modeler Wireless Suite, QualNet, OMNet++ (Objective Modular Network Testbed in C++), J-Sim, MATLAB SIMULINK, ATEMU tools etc are used in the implementation of wireless sensor networks (Ali, 2012; Dharani et al., 2014).

1. Mobility Models

A mobility model attempts to mimic the movement of real mobile nodes that change the velocity and direction with time. Mobility model represents the nodes' displacement and position. It also signifies the movement of nodes and their location, velocity and acceleration change over time. Such models are frequently used for simulation purposes, when new communication or navigation techniques are investigated. Mobility management schemes for mobile communication systems make use of mobility models for predicting future node positions (Jain et al., 2015). Israni

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RESEARCH ARTICLE

Synchronous Q Learning Based Technique for Performance Improvement in Multi core Processors

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ABSTRACT:
Conventional processors are widely used in many practical applications such as weather forecasting, AI, Ocean modeling, Big data analysis, etc. In this research work we have investigated various parallel computing approaches to improve the performance in terms of execution time. It is shown by simulation that multi processor systems takes less time. We have literature two algorithms namely Classical Q–learning and Modified Q-learning i.e. Synchronous Q- learning are available for load balancing from this point of view we have developed a new approach of dynamic load balancing technique. In the present work we have combine two algorithms and developed a new algorithms under the name Synchronous Q-learning Algorithms. It is shown by simulation that proposed Synchronous Q-learning algorithms takes less time. In this paper, we exhibit new Synchronous Q learning algorithm that consolidate components of policy iteration and classical Q learning/esteem iteration to effectively learn and control arrangements for a dynamic load adjusting situations utilizing reinforcement learning techniques.

KEYWORDS: Multi-core Processing Reinforced Learning, Machine Learning, and Computational Load Balancing.

INTRODUCTION:

With the coming of multi-core processors, the complexity of load balancing through scheduling threads has gone up impressively. Most schedulers take a gander at the need of threads that are prepared to rushed to settle on a scheduling decision. Since multi-core processors have shared resources e.g. the L2 cache, the conduct of a string running on one core can influence the performance of string running on different cores e.g. two threads which hoard the L2 cache if planned together on distinctive cores can have more awful performance than if they were co-booked with some different threads which did not hoard the cache [1-3]. The circumstance is more confused in light of the fact that the same string can change its conduct after some time e.g. it could be memory destined for quite a while and after that turn out to be computationally bound later on. It typically additionally is the situation that the threads correspond with one another to perform an assignment (this example likewise changes after some time) and it bodes well to co-plan these threads on diverse cores so they can share information through the L2 cache.

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A Study of New Horizon on Emerging IoT Technology

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Abstract **- Nowadays, IoT (internet of thing) has a great impact on emerging technology with the internet. There are number of IoT applications which used to make human's life easier. IoT can be defined as an electrical or electronic device. IoT devices have the capability to exchange the information between IoT devices as well as communicate with the global world. Generally, IoT devices are considered as a wireless device. Therefore the reliability, security and accuracy are the new areas of research on IoT Technology. In this paper, we have studied the various IoT communication technologies and compare their features.**

Index Terms: IoT applications, Wireless technology.

I. INTRODUCTION

Internet of Things (IoT) is latest technology. It interacts with physical equipment. Physical equipment has computing power and communication functionalities that can allow communication everywhere. IoT has wide range of applications in home appliances, Smart home, smart city, engineering, financial, and ecological systems etc. Internet of Things represents a common thing for the capability of network devices to intuition and assembled data from the world. For implementation of IoT wireless communication play very important role. Wireless network is network where devices are connecting with each other via radio frequency. In wireless network have various connecting devices such as Bluetooth, ZigBee, Z-wave, Wi-Fi etc. there are various network like Wireless Sensor Network, MANET, VNET etc. employed in IoT. In Smart city have good traffic management system, Garbage management system, Health system, ecological system, e-governance system. The existing systems are transforms into a smart though infrastructure based IoT devices. In this paper we present the communication device and compare their advantages.

II. IOT COMMUNICATION DEVICES

In communication technology there are many devices used for IoT like

Bluetooth: Bluetooth is small range, low power wireless communication device. In this device a trans receiver is used. The trans receiver transmits and receives the signal in 2.4 GHz bandwidth. It supports the data as well as voice channel and classified in IEEE 802.15.1 standard. Bluetooth uses a pairing process to establish encryption and authentication between devices. Bluetooth is used for point to point and multipoint communication. Data rate of Bluetooth device is approximately 24000Kbps. [6]

ZigBee: Zig-bee is low data rate and very less power wireless communication device. It supports number of channels as compared with Bluetooth for data. ZigBee device is classified in IEEE 802.15.4 standard and supports 884MHz to 2.4GHz bandwidth. Data rate of ZigBee is approximately 250 kbps. Zig Bee follow 16- bit CRC data protection and nominal range 10m.[7][8]

Ultra- Wide Band: Ultra-Wide Band is advance technology as compared to Bluetooth and ZigBee. It provides radio system having very high bandwidth 3.1GHz to 10.6 GHz in low power. It is classified in IEEE 802.15.3a standard. Two ways of generating useful signal with Ultra – Wide Band namely TM-UWB and DSC-WUB which include low duty cycle and high duty cycle wavelets. Ultra – Wide Band is up to 100 Mbps bandwidth. [9]

Z Wave: Z Wave is low power 2-way wireless technology designed and optimized specially for smart home applications and the internet of things. Z Wave lead the home control market, providing system that deliver comfort, convenient, safety and security. Normally used for wireless sensor network and home automation. Sigma Design is the organization who mainly work on Z Wave technology. Z Wave supports mesh network topology.It operates on radio frequency band in which device control battery power by the use of sleep mode on and off simultaneously. [10] [11]

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RESEARCH ARTICLE

छत्तीसगढ़ में ग्रामीण विकास एवं पंचायती राज
(नगरी विकासखण्ड के ग्राम पंचायत केरेगाँव के संदर्भ में)

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सारांश–
प्राचीन काल से ही पंचायतें हमारे सामाजिक, राजनैतिक व्यवस्था का अंग रही है। संविधान के 73वें संशोधन द्वारा पंचायती राज व्यवस्था को सभी राज्य में अनिवार्य रूप से लागू करने का प्रावधान किया गया है। वर्तमान परिप्रेक्ष्य से ग्रामीण विकास की नीतियों का मूल्यांकन करना और उन पर पुनर्विचार करना आवश्यक हो गया है, क्योंकि सरकार द्वारा ग्रामीण विकास हेतु अनेक योजनाएँ संचालित किया जा रहा है। इसी आधार पर वर्तमान अध्ययन नगरी विकासखण्ड के ग्राम पंचायत केरेगांव का किया गया है, जिसमें उद्देश्यों को पूरा करने के लिए कुल 114 परिवारों का चयन किया गया है तथा साक्षात्कार अनुसूची के माध्यम से आंकड़ों का संकलन किया गया है एवं आंकड़ों के विश्लेशण के लिए प्रतिशत विधि का प्रयोग किया गया है जिसमें चयनित परिवारों के सामाजिक, आर्थिक स्थिति के अन्तर्गत आयु, जाति, शिक्षा एवं वैवाहिक स्थिति शामिल है तथा पंचायती राज द्वारा संचालित योजनाओं के माध्यम से रोजगार योजना के अन्तर्गत अधिकाधिक लोग मनरेगा से लाभान्वित हुए एवं अधिकांश लोगों के घरों में सरकारी शौचालय की व्यवस्था है तथा खाद्यान्न योजना से भी 100 प्रतिशत लोग लाभान्वित हुए हैं तथा आवास योजना का लाभ ज्यादातर परिवारों को नहीं मिल पाया है इस प्रकार सरकार द्वारा संचालित पंचायती राज व्यवस्था द्वारा क्रियान्वित कार्यक्रमों का ग्रामीण विकास पर अधिकाधिक सकारात्मक प्रभाव पड़ रहा है।

शब्दकुंजी – ग्रामीण विकास, पंचायती राज

भूमिका
भारत गांवों का देश है। जिस देश की आत्मा गांवों में निवास करती है वहाँ पंचायती राज के नाम से प्रसिद्ध ग्रामीण स्थानीय शासन का महत्व सर्वविदित है। इसके द्वारा ही शक्ति का विकेन्द्रीकरण करके निम्न स्तर पर लोकतांत्रिक संस्थाओं की स्थापना की जाती है। देश के नागरिकों में राजनीतिक चेतना के

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RESEARCH ARTICLE

छत्तीसगढ़ राज्य में मानव विकास सूचकांक – एक विश्लेषणात्मक अध्ययन

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ABSTRACT:

किसी भी देश के आर्थिक विकास में भौतिक पूँजी के साथ–साथ मानवीय पूँजी का भी महत्व होता है। व्यवहार में पूँजी स्टॉक की वृद्धि पर्याप्त सीमा तक मानव पूँजी निर्माण पर निर्भर रहती है जो कि देश के सभी व्यक्तियों के ज्ञान, कुशलता एवं क्षमताएँ बढ़ाने की प्रक्रिया है। "मानवीय साधन का विकास ज्ञान, योग्यता व समाज के व्यक्तियों की कार्यक्षमता में वृद्धि करने वाली एक प्रक्रिया हैं आर्थिक अर्थो में यह कहा जा सकता है कि यह मानवीय पूँजी एक संचय है, जिसका अर्थव्यवस्था के विकास में प्रभावशाली विनियोग किया जाता है। मानवीय संसाधनों का महत्तव विकासशीलन देशों अथवा अर्द्धविकसित देशों में बहुत अधिक है, क्योंकि मानवीय पूँजी के द्वारा ही प्राकृतिक संसाधनों एवं भौतिक पूँजी का उपयोग तीव्र गति से विकास कार्यो में करना संभव होता है।

KEYWORDS: मानव विकास सूचकांक

प्रस्तावना

किसी भी देश के आर्थिक विकास में भौतिक पूँजी के साथ–साथ मानवीय पूँजी का भी महत्व होता है। व्यवहार में पूँजी स्टॉक की वृद्धि पर्याप्त सीमा तक मानव पूँजी निर्माण पर निर्भर रहती है जो कि देश के सभी व्यक्तियों के ज्ञान, कुशलता एवं क्षमताएँ बढ़ाने की प्रक्रिया है। "मानवीय साधन का विकास ज्ञान, योग्यता व समाज के व्यक्तियों की कार्यक्षमता में वृद्धि करने वाली एक प्रक्रिया हैं आर्थिक अर्थो में यह कहा जा सकता है कि यह मानवीय पूँजी एक संचय है, जिसका अर्थव्यवस्था के विकास में प्रभावशाली विनियोग किया जाता है। मानवीय संसाधनों का महत्तव विकासशीलन देशों अथवा

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अर्द्धविकसित देशों में बहुत अधिक है, क्योंकि मानवीय पूँजी के द्वारा ही प्राकृतिक संसाधनों एवं भौतिक पूँजी का उपयोग तीव्र गति से विकास कार्यो में करना संभव होता है।

मानवीय विकास की अवधारणा की व्याख्या करते हुए यू.एन.डी.पी. की मानवीय विकास रिपोर्ट (1997) में उल्लेख किया कि "यह वह प्रक्रिया है जिसके द्वारा जनसामान्य के विकल्पों का विस्तार किया जाता है और इसके द्वारा उनके कल्याण के उन्नत स्तर को प्राप्त किया जाता है। यही मानवीय विकास की धारणा का मूल है। ऐसे सिद्धांत न तो सीमाबल होते हैं और न ही स्थैतिक होते हैं। परंतु विकास के स्तर को दृश्टि में रखते हुए जनसामान्य के पास तीन विकल्प है – एक लम्बा और स्वस्थ जीवन व्यतीत करना, ज्ञान प्राप्त करना और अच्छा जीवन स्तर प्राप्त करने के लिए आवश्यक संसाधनों तक अपनी पहुँच बढ़ाना।

मानव विकास रिपोर्ट (1997) में संबंध में उल्लेख किया : "आय केवल एक विकल्प है, जो लोग प्राप्त करना चाहेंगे, चाहे यह बहुत महत्वपूर्ण है, परंतु यह उनके समग्र जीवन का सार नहीं है। आय एक साधन है, जबकि मानवीय विकास एक ध्येय है।"

महबूब–उल–हक के मार्गदर्शन में 1990 में मानवीय विकास रिपोर्ट के प्रथम प्रकाशन पश्चात् कल्याण के मापों का निर्माण करने और उन्हें और परिश्कृत करने के लिए प्रयास किए गए। तीन माप विकसित किए गए :– वे हैं मानवीय विकास सूचक, लिंग संबंधित विकास सूचक और मानवीय निर्धनता सूचक।

1.2 मानवीय विकास सूचक :

यह 1990 से जारी किया जा रहा है इसके निर्माण में तीन संहार का प्रयोग होता है।

1 जीवन प्रत्याशा :

एक लम्बे और स्वास्थ्य जीवन के माप के लिए जन्म पर जीवन प्रत्याशा।

2 ज्ञान :

इसके माप के लिए बालिग साक्षरता दर (दो तिहाई भारांश) और समग्र प्राथमिक, माध्यमिक और उच्च दर्जा में कुल नामांकन अनुपात (एक–तिहाई भारांश) के आधार पर आंका जाता है।

3 एक अच्छा जीवन स्तर :

जिसका मापन प्रति व्यक्ति आय यू.एस.डॉलर क्रय शक्ति समता के आधार पर किया जाता है।

मानव विकास सूचकांक का परिकलन करने से पूर्व इन तीनों आयामों के अलग–अलग सूचकांक तैयार किए जाते है। इस उद्देश्य के लिए अधिकतम एवं न्यूनतम मूल्यों का प्रत्येक सूचक के लिए चुनाव किया जाता है।

तालिका क्रमांक–1 मानवीय विकास सूचकांक का परिकलन

सूचक	अधिकतम मूल्य	न्यूनतम मूल्य
जन्म पर जीवन प्रत्याशा	85	25
बालिग साक्षरता दर	100	0
कुल नामांकन अनुपात	100	0
प्रति व्यक्ति सकल देशीय उत्पाद (यू.एस. डॉलर क्रय शक्ति समता)	40,000	100

प्रत्येक आयाम के निश्पादन को 0 और 1 के बीच मूल्य रूप में इस फार्मूले के प्रयोग से प्राप्त किया जाता है।

$$\text{आयाम सूचक} = \frac{\text{वास्तविक मूल्य} - \text{न्यूनतम मूल्य}}{\text{अधिकतम मूल्य} - \text{न्यूनतम मूल्य}}$$

मानवीय विकास सूचक इन तीनों आयाम सूचकों का साधारण औसत है।

राज्य के आर्थिक विकास के दृष्टि से मानव विकास एक प्रमुख उद्देश्य है जबकि आर्थिक संवृद्धि इस उद्देश्य का साधन मात्र है। आर्थिक विकास की संपूर्ण प्रक्रिया का अंतिम उद्देश्य स्त्रियों, पुरूषों और बच्चों की वर्तमान और भावी पीढ़ियों के लक्ष्य के रूप में देखना मानव की स्थितियों में सुधार करना और लोगों के विकल्पों में विस्तार करना है।

मानव विकास ऊँची उत्पादकता का साधन है भली प्रकार से पोषित, स्वस्थ, शिक्षित, कुशल, और सर्तक श्रम शक्ति सर्वाधिक महत्वपूर्ण उत्पादक परिसंपत्ति है। अतः पोषण, स्वास्थ्य सेवा, शिक्षा में निवेश उत्पादकता के आधार पर उचित है।

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RESEARCH ARTICLE

पं. रविशंकर शुक्ल विश्वविद्यालय की वित्तीय स्थिति का तुलनात्मक अध्ययन

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ABSTRACT:
मानव संसाधन की गुणवत्ता के विकास में शिक्षा की महत्वपूर्ण भूमिका होती है। राज्यों को उच्च शिक्षा में मानवीय पूंजी के संग्रहण को प्रोत्साहित करना चाहिये। जिससे शिक्षण स्तर को बिना प्रभावित किये हुए शिक्षा को अधिक प्रभावकारी बनाया जा सके। भारत में उच्च शिक्षा में निधिकरण की समस्या है। उच्च शिक्षा में लगने वाली लागत का एक बहुत बड़ा भाग सरकार द्वारा वहन किया जाता है। प्रस्तुत अध्ययन में पं. रविशंकर शुक्ल विश्वविद्यालय की बजटीय स्थिति का अध्ययन किया गया है एवं इसके साथ विश्वविद्यालय की वित्तीय स्थिति का छत्तीसगढ़ राज्य निर्माण के पूर्व एवं पश्चात् की स्थितियों में तुलनात्मक अध्ययन किया गया है तथा विश्वविद्यालय की प्राप्तियों एवं व्यय के विभिन्न स्रोतों का अध्ययन अवधि में प्रवृत्ति एवं परिवर्तनशीलता का अध्ययन किया गया है। इन उद्देश्यों की प्राप्ति के लिये द्वितीयक आंकड़ों का संकलन पं. रविशंकर शुक्ल विश्वविद्यालय द्वारा विभिन्न वर्षों में प्रकाशित बजट एवं वार्षिक प्रतिवेदन से किया गया है। अंत में अध्ययन के विश्लेशण से प्राप्त निष्कर्शों के आधार पर उपयुक्त सुझाव प्रस्तुत किया गया है।

KEYWORDS: उच्च शिक्षा, पं. रविशंकर शुक्ल विश्वविद्यालय, प्राप्तियॉ एवं व्यय।

प्रस्तावना

ब्रिटिश अर्थशास्त्री "जॉन रॉबिन्सन" का यह कथन – "भारत के लिये आप जो भी कहें उसका विपरीत भी हमेशा सही होता है।" भारत में उच्च शिक्षा के संदर्भ में अत्यंत सटीक है। हमारे देश में उच्च शिक्षा के क्षेत्र में तेजी से वृद्धि हुई है परन्तु यह वृद्धि देश के सभी राज्यों में समान नहीं है। कुछ राज्यों में उच्च शिक्षा संस्थान अत्यंत कम है और कुछ राज्यों में उच्च शिक्षा वृद्धि देश की औसत वृद्धि से बहुत अधिक है। भारत में संघीय शासन व्यवस्था है

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जिसके कारण शिक्षा व्यवस्था में सरकार द्वारा विभिन्न स्तरों पर कार्य किया जाता है। शिक्षा योजनाओं को बनाने व कार्यरूप में परिणत करने के लिये शासन में बहु–स्तरीय व्यवस्था कार्यरत है। इस समय देश में शिक्षा पर तीन स्तरों – केन्द्रीय सरकार स्तर, राज्य सरकार स्तर एवं जिला स्तर पर कार्य हो रहा है। प्रारंभिक शिक्षा (कक्षा I-VIII) जिले की प्रशासनिक जिम्मेदारी के अंतर्गत आते है, राज्य सरकार समस्त स्कूली शिक्षा के साथ विश्वविद्यालय अनुदान संस्थान की भी जिम्मेदारी साझा करता है। संविधान के अनुसार केन्द्र शासन केन्द्रीय विश्वविद्यालयों की योजना एवं व्यवस्था, शोध, रख–रखाव एवं गुणवत्ता के लिये पूरी तरह जिम्मेदार है।

पं. रविशंकर शुक्ल विश्वविद्यालय की स्थापना सन् 1964 में मध्यप्रदेश अधिनियम (13) के अंतर्गत हुई एवं जून 1964 से विश्वविद्यालय ने कार्य करना आरंभ किया। रविशंकर विश्वविद्यालय का नाम छत्तीसगढ़ के महान स्वतंत्रता सेनानी पं. रविशंकर शुक्ल के नाम पर रखा गया, जो स्वतंत्र भारत में मध्यप्रदेश के प्रथम मुख्यमंत्री थे। विश्वविद्यालय के पहले कुलाधिपति श्री के.सी. रेड्डी तथा कुलपति डॉ0 बाबू राम सक्सेना थे।

विश्वविद्यालय की स्थापना के समय इससे संबंद्ध महाविद्यालयों की संख्या 46 थी एवं 5 विश्वविद्यालय शैक्षणिक संस्थान थे एवं विद्यार्थियों की संख्या 3400 थी। पं. रविशंकर शुक्ल विश्वविद्यालय छत्तीसगढ़ राज्य का सबसे पुराना विश्वविद्यालय है, जो 52 वर्षों से राज्य को अपनी सेवायें प्रदान कर रहा है। विश्वविद्यालय मूलतः अर्ध्दशासकीय संस्था है जो सामाजिक कल्याण हेतु संचालित है। विश्वविद्यालय का उद्देश्य आय अर्जित करना न होकर समाज के विकास में भागीदार बनना है। मुख्य रूप से छत्तीसगढ़ के युवाओं को उच्च शिक्षा के सुअवसर प्रदान कर उन्हें आगे बढ़ने में सहायता देना है। पं. रविशंकर शुक्ल विश्वविद्यालय की स्थापना तब हुई थी जब छत्तीसगढ़ राज्य मध्यप्रदेश का एक भाग हुआ करता था। अध्ययन में छत्तीसगढ़ के मध्यप्रदेश से अलग होने के बाद विश्वविद्यालय की आर्थिक स्थिति का पहले की स्थिति के साथ तुलनात्मक अध्ययन किया गया है।

प्रस्तुत अध्ययन का उद्दे य पं. रविशंकर शुक्ल विश्वविद्यालय की बजटीय स्थिति का अध्ययन करना एवं इसके साथ विश्वविद्यालय की वित्तीय स्थिति का छत्तीसगढ़ राज्य निर्माण के पूर्व एवं पश्चात् की स्थितियों में तुलनात्मक अध्ययन करना है तथा विश्वविद्यालय की प्राप्तियों एवं व्यय के विभिन्न स्रोतों की अध्ययन अवधि में प्रवृत्ति एवं परिवर्तनशीलता का अध्ययन करना। इन उद्देश्यों की प्राप्ति के लिये द्वितीयक आंकड़ों का संकलन पं. रविशंकर शुक्ल विश्वविद्यालय द्वारा विभिन्न वर्षों में प्रकाशित बजट एवं वार्षिक प्रतिवेदन से किया गया है। अंत में अध्ययन के विश्लेषण से प्राप्त निश्कर्षों के आधार पर उपयुक्त सुझाव प्रस्तुत किया गया है।

अध्ययन को सार्थक बनाने के लिए अध्ययन अवधि को दो भागों में विभाजित किया गया है, छत्तीसगढ़ राज्य के मध्यप्रदेश से पृथक होने के पूर्व 10 वर्ष (प्रथम अवधि 1990–91 से 1999–2000) एवं पृथक होने के पश्चात् 12 वर्ष अर्थात् द्वितीय अवधि वर्ष 2000–01 से 2011–12 तक कुल 22 वर्षों में विश्वविद्यालय की आर्थिक स्थिति का अध्ययन किया गया है, इसके साथ– साथ संपूर्ण अवधि (1990–91 से 2011–12) के लिये भी संकलित ऑकड़ों का विश्लेशण किया गया है। अध्ययन में चयनित उद्देश्यों की पूर्ति के लिये जिन प्रमुख शोध प्राविधि का प्रयोग किया गया है वे इस प्रकार है :–विचरण गुणांक, संयुक्त वृद्धि दर, सहसंबंध गुणांक, सरल प्रतीपगमन विश्लेशण ।

शोधपत्र चार भागों में विभाजित है प्रथम भाग में रविशंकर विश्वविद्यालय का परिचय है। द्वितीय भाग में छत्तीसगढ राज्य निर्माण के पूर्व विश्वविद्यालय की प्राप्तियों एवं ब्यय का विश्लेशण किया गया है। तृतीय भाग में पश्चात पूर्व विश्वविद्यालय की प्राप्तियों एवं ब्यय का विश्लेशण किया गया है। चतुर्थ भाग में निश्कर्ष एव सुझाव प्रस्तुत किया गया है।

पं. रविशंकर शुक्ल विश्वविद्यालय की प्राप्तियों एवं व्यय : प्रथम अवधि में

पं. रविशंकर शुक्ल विश्वविद्यालय छत्तीसगढ़ राज्य का सबसे पुराना विश्वविद्यालय है, जो 52 वर्षों से राज्य को अपनी सेवायें प्रदान कर रहा है। पं. रविशंकर शुक्ल विश्वविद्यालय द्वारा शिक्षित छात्र/छात्राएं आज देश एवं विदेशों में भी

26

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Poverty and Indebtedness Among Birhor
in Chhattisgarh

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ABSTRACT : Birhore is one of the special backward caste declared by t
Mainly Birhore tribe were lived in Bilaspur regionof undivided Madhya Pradesh.
people were found in Raigadh and Jaspur district of Chhattisgarh. After 67 years
,India has progressed in the field of economy ,culture as well as socially under
globlisation.When we look at the scheduled tribes of India ,we find that they ar
these developments .So,development of these people is a must,for the socio-econor
of the Country. This is a very difficult task but not an impossibleone, These ac
hardwork hard,patience and desireness It is clear from the income and expenditur
Birhore people that 100%people are living below the poverty line .Major portion o
used for food. With the help of this study I will try to find what is the position of Ind
poverty of Birhore tribes and what they actually need for consumption and their develo
If some people get benefits fromdevelopment programme and majority people n
,then these programme is failed to satisfy the welfare.

Key words: poverty ,Indebteness, consumption, backward ,desireness

...special backward caste declared by the Government. Birhore is derived ...undari language that is 'Bir' and 'Hore'. Bir means forest and hore means ...present the developed sector of Birhore tribe is found in centralized of western ...d State and East part of the Chhattisgarh State which is also called as ...t Bengal.Most of these people live in santhal pargana of Chhota Nagpur. ...mla etc.sector. These people are living in Raigarh, Sarguja,.and Durg district ...e . The Birhore tribes are famous in India for their traditional occupation ...l age the cottage industries includes those goods which are prepared by the ...to increase in poverty.Now continuous decrease in availability of forest goods ...olicy is possible for.rhe increase in poverty of Birhore people.The goods which ...ores do not face competition in the market.[1]Demographic Speciality: ...first class people of Birhore society who acts to collect foodgrain. Since 1956, ...ent is Continuesly working to develop the lifestyle of Birhore tribes. ...e tribe was developed in various district of ChhoteNagpur and santhal pargana ...where the Birhore population was 5117 in the year in 1993. Most of these tribes ...f undivided madhya Pradesh. Majority of these people were found out from ...ur district. According to 1961 census of Inseparate Madhya Pradesh the total ...n was 513,which includes 56 population from sargujja,440 from raigadh,13 from ...m balaghat , where as according to1971 census the total Birhore population was ...es 266 number of man and 295 number of woman.The information and knowledge ... population is available from survey and research by Jaspur hill area ...ential.[4]

...of the study:

...years of independence ,India has progressed in the field of economy ,culture as well ...er the umbrella of globlisation.When we look at the scheduled tribes of India ,we find ...r away from these developments .So,development of these people is a must,for the ...ic development of the country.With the help of this study the researcher will try to ... is the position of Indebtedness and poverty among of Birhore tribes and what they ...ired for consumption and development.[6]

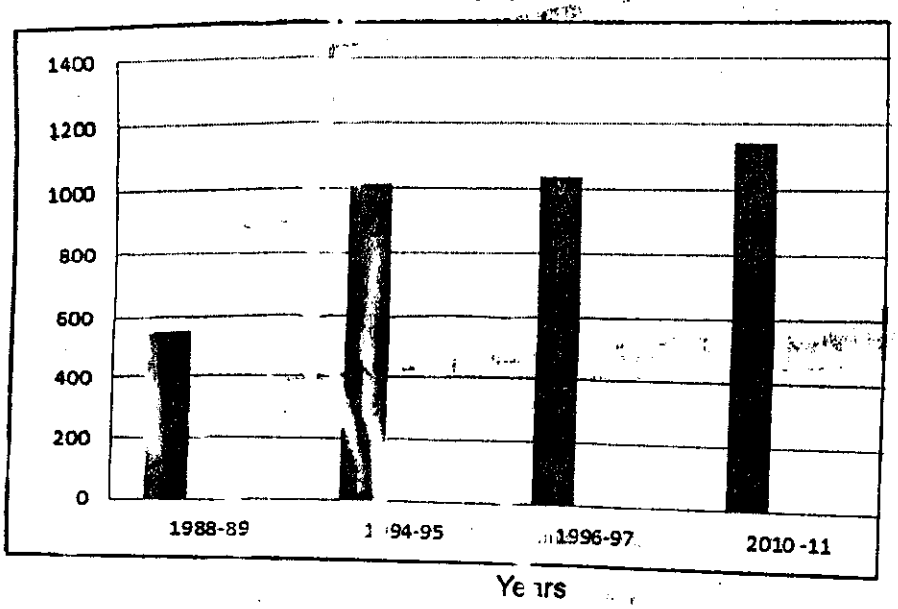
... literature

...(1864)[1]-The idea regarding Birhore tribe was found out the first time in the writing of ...ch was published in 1864.He wrotes in this book that after very difficulties some of the ...ople were present near him who were very poor and low caste people in Hindu society ...solation by me the Birhore people accept that their fore fathers were eaten death body. ...e also told that they were not done these activities. According to Dalton 'This behavior ...a little part of their tradition ,which aims at the soul will be ...born on their family and the soul will be not disturb the family. *Fobar's Report(1872)*[2]- ...munda tribe is the born of Nasla. Their language is the combination of 'mundari'and 'santhali' ...ge. Birhore is the most ancient tribe of the small Nagpur .The Birhore people are not harmful ...ybody. Generally most of these people established in up of the hill. They are not doing any ...of cultivation .The occupational factor of these people are to catch fish,monkey,Rabbit,birds ...o collect forest goods etc. They pet monkey and sell them.With this income they attain their ...hood.

Hindu society .After consolation l[illegible]me the Birhore people accept that their fore fathers were aten death body. They were also told that they were not done these activities. According to Dalton his behavior may be a little part of their tradition ,which aims at the soul will

Diagram-1

Birhore population

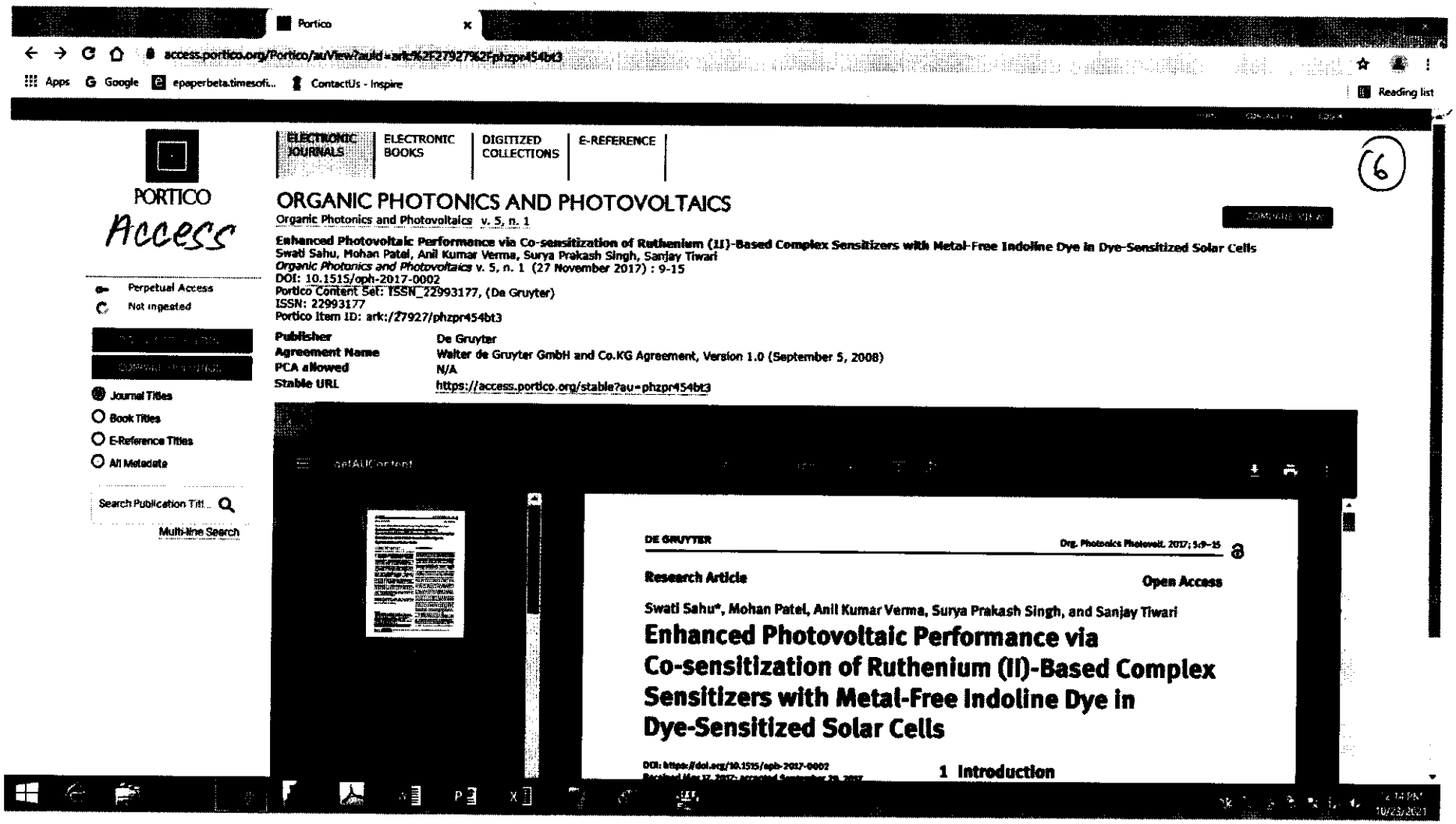


shows like a very lower level with a small shoulder, lack sceen,both man and women have long hair.*Rasal and Hiralal(1916)*[3]Accoding to him abou. Birhore tribe 'These people are the small group of the Ko'ereyen caste where approximately 150 individual of small Nagpur were established in the year 191[illegible] .*Mahadevan(1962)*[4]Including the present one observed no considerable seasonal variations in the diet of the tribal. *Rai Bahadur Sharad Chandra Ray(1925)*[5] He wrotes that the people whose behavior, traction, culture ,belief is described in the book 'The Birhore a little known jungle tribe of Chhota Nagpur (1925).By nature they are angry people. There is less availability of knowledge about them Before so many years where the British Government was interested to know about the Birhore people ,at that time their neighbour were called him 'Narvakshi' because the Birhore people were eaten the death body of their mother and father. At present these people are not eating death body. But they are famous because of their magical power.Pingle,(1972)[6]reported that food consuption of kolas and maria gond of central Province depends largely upon their socio- economic condition.Rao *k Mohan (1999)*[7]-According to him ,any development process in India should begin with the schemes/programmes meant for scheduled tribes and scheduled castes,as there are the most disadvantaged and neglected people in the society. Mishra&*Chakravarty(2002)*[8]-exmained that the Bhil women do not consume any special diet during pregnancy.On the contrary, most of the foods are banned to eat either being hot or cold or strongly favoured or consume space in abdomen.They prefer to eat gur,coconut,and deshi ghee after delivery and consume lots of buttermilk if available to enhance flow of breast milk.

Objectives of the study:

The objectives of the study are as follows:

1. To study the demographic features of Birhore tribe.
2. To study the socio -economic position of Birhoretribe.
3. To study about the administrative practices of Birhoretribe.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Enhanced Photovoltaic Performance via Co-sensitization of Ruthenium (II)-Based Complex Sensitizers with Metal-Free Indoline Dye in Dye-Sensitized Solar Cells
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Enhanced Photovoltaic Performance via Co-sensitization of Ruthenium (II)-Based Complex Sensitizers with Metal-Free Indoline Dye in Dye-Sensitized Solar Cells
1 Introduction

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A Low Cost Efficient Model for Automatic Barricading of Unmanned Railroad Level Crossings

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ABSTRACT
Safety on the Indian Railways network is the end product of the cohesive fusion of its myriad parts . Railroad related accidents are more serious or deadly than other transportation accidents in terms of severity and death rate etc. The problem of railway accidents is not of safety standards but the execution of standards. Unmanned Level Crossings continue to be a matter of concern for Indian Railways as most of the train mishaps take place in these unmanned level crossings, . There are about 10,000 unmanned railway crossings in the country which account for around 40 per cent of accidents involving the railways. Therefore, Safety at unmanned level crossings is a cause of serious concern for railways and the public transporter is exploring various ways to address the issue.

This paper presents a novel concept of an application to improve safety at unmanned level crossings without the burden of a huge infrastructure cost to the railways governing body. A low cost innovative reliable model has been proposed for automatic blockading of unmanned railway level crossings. . It explores too the quest for improved performance, and the need to focus not just on safety, but to contribute to the delivery of a cost-effective, efficient railway as well.

Keywords
Technology, Level crossing, traffic management, logic gates, innovation

1. INTRODUCTION
Railway system is undoubtly the preferred mode for mass transport on high demand corridors in India and lead to making cities more liveable and sustainable. This whole sector is run by government of India and one of the most popular because it's fast, traffic less , cheapest and most convenient mode of passenger transport both for long distance and suburban traffic. Today, Indian Railways carry 15 times more people than their capacity but still the 'Operating Ratio' of Indian Railways is at a decadal low of 96.9 per cent. In addition, Railways have played a significant role in development and growth of industries. Growth of textile industry in Mumbai, jute industry in areas surrounding Kolkata, coal industry in Jharkhand, etc is largely due to the development of railway network in these areas. Railways help in supplying raw materials and other facilities to the factory sites and finished goods to the market. Agriculture also owes its growth to railways to a great extent. Indian Railways plays a dual role of revenue earning as well as meeting the social obligations which are diametrically opposite and difficult to reconcile.

Trains could not run safely without reliable signaling devices. Signaling is required because Trains are guided by the track and hence have to be routed in such a way as to avoid collisions with one another and secondly Trains cannot stop within the distance that the driver can see – they need to have prior warning of the need to slow down and stop ahead. Signaling systems in railway allow the control, supervision and protection of the railway traffic. These systems play an important part in the railway's capacity and availability [1-4]

Since 2012, six of every 10 rail accidents in India have happened because of mistakes by or the negligence of railway staff, according to a study by NITI Aayog. n the year to 31 March 2017, 66 of 104 consequential rail accidents were attributed to failure of railway staff according to Indian Railways data There are also several other factors which are responsible for increasing number of railway accidents; some outstanding being overaged tracks, wagons, coaches, bridges and signaling system or a rash act by one of the millions of road users, an irresponsible act by a passenger who carries inflammable goods. Added to these are the acts of sabotage .Fig.1 portray the number of railway accidents due to various factors and train accident statistics [6-7].

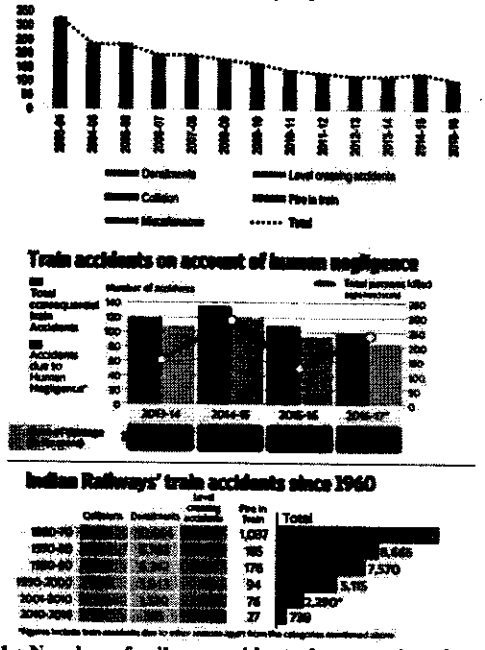

Fig.1 : Number of railway accidents due to various factors and train accident data

Safety is one of the crucial aspects when it's come to railway operation everywhere. With the ever increasing population, the railway industry always encounters many problems due to technical and human errors, especially at level crossings. The railway level crossing is the one where a railway line and a road intersect with each other at the same level.

Despite the technological advancement and the budgetary expenses made by government on safety of Indian railways, it still struggles in reducing the number of deaths at railway crossings. Train accidents at level crossings have always been a cause of concern for the railways. Quoting The Times of India "40 per cent of consequential accidents and 60 per cent of data of loss of life in train accidents.

The problem is further deeply rooted owing to the presence of unmanned railway crossings. About 10,000 railway crossings are either unmanned or without barriers out of 30,350 accounting about 40%. The scenario of unmanned level crossing is shown in Fig.3.There is always a longing for elimination of accidents by railways. Closure of the railway gates should be made compulsory during passage of train through any railway crossings to avoid causalities. As people casually cross railway crossings within towns and cities at unmanned railway crossings, such incidents do happen on a unmanned railway crossings daily.

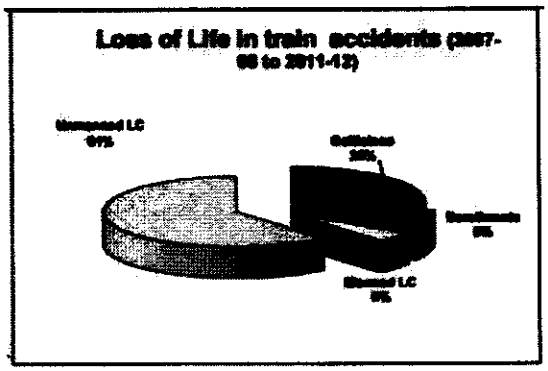

Fig.2 : Death statistics in train accident

Fig.3 : Unmanned railway crossing

Safety has been one of the biggest concerns in the Indian Railways system. The number of rail accidents has declined from 325 in 2003-04 to 106 in 2015-16. The number of railway accidents divided by cause is shown in the graph below. In 2015-16, majority of the accidents were caused due to derailments (60%), followed by accidents at level crossings (33%). In the last decade, accidents caused due to both these causes have reduced by about half. it's really difficult in India for implementation of unmanned auto gates with safety due to dense traffic and large population .most of the crossings are being converted to under bridge ways . The unfortunate part is that none will obey automated gates and try to break the rules rather than following it . Better to remain as manual or under bridge .

Divisional railway manager's liaison with the district authorities and the members of parliaments in the selection of unmanned railway crossing for manning. On identification of such railway crossing, Member of Parliament sends his recommendations to the district magistrate/ Dy. Commissioner for releasing funds for capital cost of construction covering the cost of lifting barrier, arrangement of water and electricity, quarters for the gatemen, duty hut etc. Recurring maintenance and operational cost is born by the railways. Based on traffic density, visibility and regular plying of buses/ motor vehicles, unmanned railway crossings have been categorized into following five categories:

S.No.	Number of train vehicle units	Category
1	Railway crossing where the train vehicle units (TUVs) exceed 10000	Category- I
2	Railway crossing where the train vehicle units (TUVs) exceed 6000 and where visibility is restricted	Category- II
3	Railway crossing where the train vehicle units (TUVs) is less than 6000 and visibility is restricted but buses / motor vehicles ply regularly	Category- III
4	Railway crossing where the train vehicle units (TUVs) is less than 6000 and visibility is restricted but buses / motor vehicles do not ply	Category- IV
5	Railway crossing where visibility is adequate but traffic density exceed 6000 train vehicle units (TUVs)	Category- V

Railway is a capital intensive industry. For manned railway crossings and construction of new lines enormous resources are required. Since passenger services are heavily subsidized, surplus resources generated are not adequate to cater to big investments. In such situations an alternative cost effective method should be applied for renewals and replacements.

The railways has set an ambitious target of eliminating all unmanned level crossings on busy routes by 2020. Unmanned level crossings pose a severe threat to rail safety and are major reasons of train accidents. Currently, the railways has about 4,000 unmanned level crossings on the busy rail corridors across the country. An action plan has been firmed up for eliminating 3,900 unmanned level crossing by 2020.

Recently Anil Kakodkar Committee has made following recommendations on Railway Safety

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Open Science

Wi-Fi Security System Based on Innovative Technology

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Abstract

Wi-Fi is the name of a popular wireless networking technology that uses radio waves to provide wireless high speed Internet and network connections. Every device has a unique MAC Address used for identifying devices connected over Wi-Fi. Since virtually every device now in the market is Wi-Fi capable, MAC address can be considered as a universal identifier. This paper proposes innovative approach to use the MAC Address as an authentication method.

Keywords

MAC Address, Wi-Fi, Bluetooth

1. Introduction

Wireless communication has the advantage of mobility and obviates the need for cabling, but is inherently less secure and is subject to the heavy regulation of the radio frequency spectrum. Wi-Fi has become the preferred means for connecting to the internet - at home, in the office, in hotels and at airports. Increasingly, Wi-Fi also provides internet access for remote communities where it is deployed by volunteers in community-based networks, by operators in 'hotspots' and by municipalities in 'hotzones' [1-4].

WLAN technology is progressing at a rapid pace, but the most widely accepted WLAN standard is the IEEE 802.11. Wireless sensor networks (WSN) is implemented significantly for many applications due to its proficiency to monitor observations and report them to a central unit. Therefore, WSNs have been adopted by several applications, such as health monitoring and military surveillance [5-7]. Wireless local area networks WLANs gained popularity because of their ease of deployment and the availability of portable devices. Consequently, malicious attacks have increased enormously because of the shared medium that wireless networks use to serve wireless devices [8-11]. The media access control (MAC) address identifies wireless devices in wireless networks and MAC based application has been discussed [12-15].

Reuse, Reduce and Recycle are the three R's of waste management. But these concepts are seldom applied in case of the technologies which are produced. The best way to fully optimize technologies is their re use. The most popular re use of technology will be of phone lines. The phone lines were re used to provide Internet connectivity. In recent years new technologies are being produced every day, but usually they are only used for achieving one or two ends. This creates a huge amount of technological waste. A single technology if properly analyzed, can present itself as usable in different fields. This paper describes a novel use of a preexisting popular technology of login using unique MAC address.

This paper discusses development in various security implementations such as guest access (open/no Wired Equivalent Privacy [that P]), static WEP, MAC-address authentication, 802.1x authentication protocol with dynamic WEP, 802.1x authentication protocol with Wi-Fi Protected Access (WPA), WPA Preshared Key (WPA-PSK), multiple Service Set Identifiers (SSIDs) along with wired VLANs, and IP security? Based virtual private network (IPSec VPN).

It provides secure management configuration examples to secure management traffic to the WLAN infrastructure devices and discusses secure wired policies (for example, Layer 3/Layer 4 ACLs) to match wireless policies.

2. Authentication Methods

In the following various authentication methods has been described

2.1. Open System Authentication

Open mode allows any device to connect to the wireless network. The major advantage of open mode is its simplicity: Any client can connect easily and without complex configuration. Open mode is recommended when there are guests who need to get onto the network, or more generally, when ease of connectivity is paramount and access control is not required.

In most environments, the administrator should ensure that wireless clients associated on an open network cannot access LAN resources, such as file shares. Administrators can control access using VLAN tagging, or Firewall Rules.

2.2. 802.1X Authentication

802.1X is an IEEE standard that provides an authentication framework for WLANs. 802.1x uses the Extensible Authentication Protocol (EAP) to exchange messages during the authentication process. The authentication protocols that operate inside the 802.1X framework include EAP-Transport Layer Security (EAP-TLS), Protected EAP (PEAP), and EAP-Tunneled TLS (EAP-TTLS). These protocols allow the network to authenticate the client while also allowing the client to authenticate the network. For more information on EAP authentication framework supported by the IAP, see Supported EAP Authentication Frameworks. 802.1x is a very secure method of protecting wireless network.

Each time the device connects the user configured on the device is authenticated against a RADIUS server and is given a unique encryption key that changes every 90 seconds. Removing a user from the Active Directory will block device access based on that account. Unique and changing encryption keys make it almost impossible to sniff customer traffic in the air.

802.1X authentication method allows an IAP to authenticate the identity of a user before providing network access to the user. The Remote Authentication Dial In User Service (RADIUS) protocol provides centralized authentication, authorization, and accounting management. For authentication purpose, the wireless client can associate to a network access server (NAS) or RADIUS client such as a wireless IAP. The wireless client can pass data traffic only after successful 802.1X authentication

2.3. Wi-Fi Based Login System

MAC, Media Access Control, address is a globally unique identifier assigned to network devices, and therefore it is often referred to as hardware or physical address. The address consists of 12 characters, or hexadecimal digits. Unlike the decimal numerical system you use in everyday life, the hexadecimal system consists of 16 digits: the numerals 0 through 9 and the letters A through F. For example, "00:11:22:AA:BB:CC" (without quotes) is an example of what a MAC address might look like. The first three groups of digits identify the manufacturer; the last three groups of digits represent a serial number. One can find MAC address, by pressing "Windows-W" and search for "connections." Then click "View Network Connections" and double-click "Wi-Fi." From there, you can click the "Details" button and find the information listed in the Physical Address field. Each manufacturer is assigned a block of MAC addresses by IEEE and within that block, it's up to the manufacturer to make sure there are no collisions. Packets that are sent on the ethernet are always coming from a MAC address and sent to a MAC address. If a network adapter is receiving a packet, it is comparing the packet's destination MAC address to the adapter's own MAC address. If the addresses match, the packet is processed, otherwise it is discarded.

The MAC authentication method grants access to a secure network by authenticating devices for access to the network. When a device connects to the switch, either by direct link or through the network, the switch forwards the device's MAC address to the RADIUS server for authentication. The RADIUS server uses the device MAC address as the username and password, and grants or denies network access in the same way that it does for clients capable of interactive logons. The process does not use either a client device configuration or a logon session. MAC authentication is well-suited for clients not capable of providing interactive logons, such as telephones, printers, and wireless access points. Also, because most RADIUS servers allow for authentication to depend on the source switch and port through which the client connects to the network, one can use MAC authentication to "lock" a particular device to a specific switch and port.

Every device has a unique MAC Address used for identifying devices connected over Wi-Fi. Since virtually every device now in the market is Wi-Fi capable, MAC address can be considered as a universal identifier. Now this presents a huge plethora of opportunities. This MAC Address can be used as an authentication method.

The MAC-based authentication is actually an internal policy processing by the AP. The AP has an internal table of MAC addresses from which it allows access to the network. Because MAC-based authentication is not part of the 802.11 standard, different implementations can vary. For example, some block association, whereas others simply block the traffic.

In many APs, MAC-based authentication can be achieved when using either open authentication or shared-key authentication, with the enhancement that the AP enforces the policy of matching the authenticating MAC address to the AP's table of valid MAC addresses.

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Academic Science

Optimum JPEG Quantization Table Generation for High-Quality Image Compression Using Multiobjective Evolutionary Optimization Based on Decomposition

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Abstract*—Joint Photographic Experts Group (JPEG) standard is a popular compression tool to facilitate decent quality communication of images over the band-limited channel. The compression performance of JPEG coder highly influenced by the nature of quantization technique used to quantize transform coefficients. Indeed, the compression amount and the reconst-ruction quality are strongly controlled by the characteristics of the quantization table. Over the years, several optimization techniques are used to generate optimum quantization table for the JPEG coder. Most of them are relying on to optimize this problem as single objective, but practically this problem is a multi-objective in nature. Hence, this paper aims at optimizing the JPEG quantization table generation problem by utilizing an efficient Multi-objective Evolutionary Algorithm based on Decomposition (MOEA/D) technique. The MOEA/D optimization is proposed because it is less complex and usually offers better petro front as compared to the existing multi-objective optimiz-ation algorithms. Several experiments have been performed to test and compare the compression performance of the quantiz-ation tables generated from the proposed technique. The results validate that the generated optimal quantization tables outperform the default JPEG quantization table and recently proposed TLBO optimization technique.*

Keywords*—*image compression; JPEG; quantization table; MOEA/D optimization algorithm; compression ratio; PSNR; MSE.

I. INTRODUCTION

Image compression is an important step in the image communication and storage applications. With the emergence of High-definition imaging technology, it now becomes a crucial element to satisfy channel bandwidth limitation and storage space constraints [1]. JPEG is one of the important lossy image compression technique, which is very popular for the image compression applications [2]. The JPEG standard is basically a transform coder which consists of a series of steps in the mapping of the input image to the compressed bit stream [2-5]. The basic functional steps of a baseline JPEG encoder are as follows [1]:

Step 1. Divide the input image into non-overlapping blocks of size 8×8.

Step 2. Apply Forward Discrete Cosine Transform (DCT) to each block independently.

Step 3. Independently quantize each DCT transformed blocks using default quantization table.

Step 4. Apply Run-length and Huffman coding to generate a compressed bitstream.

The baseline JPEG decoder exactly reverts the above steps to decompress the original input image. Functionally, in the JPEG encoding, the quantization is the only step which introduces the loss of information by approximating the DCT coefficients. Indeed, the quantization step entirely controls the compression quality and the compression ratio of JPEG coder. The JPEG suggested a perceptually optimized default quantization table (given in Annex K [2]), for quantizing the DCT coefficient of grayscale images. the default quantization table for luma component suggested by JPEG is shown in Fig. 1.

16	11	10	16	24	40	51	61
12	12	14	19	26	58	60	55
14	13	16	24	40	57	69	56
14	17	22	29	51	87	80	62
18	22	37	56	68	109	103	77
24	35	55	64	81	104	113	92
49	64	78	87	103	121	120	101
72	92	95	98	112	100	103	99

Fig. 1. Perceptually optimized default JPEG quantization table given in Annex K for luma component [2].

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However, it is a very tough task to generate a quantization table which is suitable for all types of images, due to the variation of DCT coefficient statistics for the natural images. As a result, the generation of the suitable quantization table for the JPEG coder is strictly an optimization problem, which requires the optimization of two different objectives compression ratio and reconstruction error. Over the years many efforts have been made to obtain quantization table which satisfies both the objectives using conventional optimization and Meta-Heuristic approaches.

Particularly, the Meta-Heuristic techniques used for this problem are centered around the GA [6-9], Firefly [10] and Differential Evolution (DE) [11-12] based optimization. Most recently, in 2017, Vikrant et al. [13] proposed a Teaching-Learning Optimization (TLBO) based approach to find optimal quantization table for the Satellite images on various compression ratios.

All the above works are developed around single objective optimization. That is the two objectives, compression ratio and reconstruction error are mostly fused together with different weights to generate single objective. Practically, this is not the best way to handle the multi-objective problem, hence some multi-objective optimization techniques such as Non-domin-ated Sorting Genetic Algorithm II (NSGA-II) [14], cultural based multi-objective particle swarm optimization [15] are also used to generate the optimized quantization table for the JPEG.

In [16], Zhang and Li established a new Multi-objective Evolutionary Algorithm based on Decomposition (MOEA/D) for the optimization problems of multi-objective cases. In this technique, the whole problem is first decomposed in a sequ-ence of sub-problems which are then optimized simultan-eously. Optimization of each sub-problem is then performed by the use of the relative information from the adjacent sub-problems. Hence MOEA/D offers less complexity and better petro front as compared to NSGA-II and other existing multi-objective optimization approaches.

Therefore, this paper presents an MOEA/D optimization based technique to generate optimal quantization table for the high-quality compression of grayscale images. The basic initiative is to exploit the less complex nature and better petro front solution generation ability of MOEA/D for the generation of optimal quantization tables.

The rest of the paper is structured as; Section 2, presents brief details of the MOEA/D optimization technique. The realization of the MOEA/D technique to generate optimum quantization tables for grayscale image compression is given Section 3. Next, Section 4 provides a comparative performance evaluation of the proposed technique which is followed by the conclusions of this work.

II. Multiobjective Optimization Using MOEA/D Technique

A Multi-Objective Optimization Problem (MOP) can be simply defined as,

$$\text{Minimize } F(x) = \left(f_1(x), f_2(x), \mathrm{K}, f_n(x)\right)^{\mathrm{T}} \quad \text{Subjected to } x \in \Psi \tag{1}$$

where Ψ is the decision variable space, $F : \Psi \rightarrow ¡^{n}$ contains n real-valued objective functions and $¡^{n}$ is the objective space. if $x \in ¡^{n}$ then (1) becomes a continuous MOP. Usually, in MOPs the objectives challenge each other, hence no particular point is available which minimizes all the objectives simulta-neously. the only solution is to find the suitable way to balance them. The finest tradeoffs among the framed objectives can be defined in terms of Pareto optimality. The set of all the Pareto optimal objective vectors is known as the Pareto front (PF) [17].

Let $\beta^1, \beta^2, \mathrm{K}, \beta^N$ is a set of evenly spread weight vectors and α^* is a reference point. Then, the problem of finding PF of (1) can be decomposed into N real-valued scalar sub-problems by using the Tchebycheff approach [17] and the objective function of the i^{th} sub-problem is given by,

$$g^{te}\left(x \mid \beta^j, \alpha^*\right) = \max_{1 \le i \le n} \left\{ \beta_i^j \left| f_i(x) - \alpha_i^* \right| \right\} \tag{2}$$

In MOEA/D technique, a neighborhood of weight vector β^i is defined as a set of its several closest weight vectors in $\beta_1, \beta_2, \mathrm{K}, \beta_N$. The neighborhood of the i^{th} sub-problem consists of all the sub-problems with the weight vectors from the neighborhood of β^i. The population is composed of the best solution found so far for each sub-problem. Only the current solutions to its neighboring sub-problems are exploited for optimizing a sub-problem in MOEA/D.

At each generation t, the MOEA/D with the Tchebycheff approach maintains:

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Research Impact of Astronomical Image Processing

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Abstract— *There are numerous applications of digital image processing in different emerging areas of research activities such as satellite imaging, medical imaging, biometrics, underwater imaging etc. Astronomical image processing is another challenging area of research where digital image processing concepts are hugely used in the analysis and processing tasks. There are research contributions in the field of astronomy, particularly those dealing with noise signals in the images captured by charge coupled devices (CCD) cameras. Image Enhancement and restoration techniques play very important role in modern astronomical science and study thereof. This paper presents an assessment of research work and its impact of the related research activities in astronomical image processing.*

Keywords— *Astronomical image, CCD (charged coupled device), image processing.*

1. INTRODUCTION

With basic contributions in the field of Medical Image Processing [1] and Applications (Sinha et al., 2014); Biometrics [2] and its applications (Sinha et al., 2013), it has been extensively studied that digital image processing has wide range of applications starting from biometrics to remote sensing applications. The research works that were applications of image enhancement methods [3] in reduction of speckle noise from ultrasound images (Sinha et al., 2008); Contrast enhancement [4] of underwater images (Sinha et al., 2008); and Assessment of image restoration methods [5] for remotely sensed images (Sinha et al., 2010) substantiate the usage of image processing tools and techniques in applications related to remote sensing, satellite imaging and astronomy.

Actually, all image processing tasks generally involve few important stages namely pre-processing; enhancement & restoration; segmentation and classification; and features for machine learning. The features which are extracted from the images are very useful in determining distinguished characteristics and classification of images [1, 2].

Now, astronomy related research includes huge data for processing; and one of the important data is image signal that requires proper interpretation using a set of tools [6]. The descriptions of image information does not only confine to beautiful appearance of the images but the intricate details of the images. The contrast, intensity, colour, resolution, presence of noise in the signals etc are very important in the process of analysis of astronomical images [7]. An image processing tool, *AstroFracTool*, was developed that provides a set of enhancement methods applied over the digital images, generally the recording time of astronomical images is very large requiring very long exposure to capture the images. The exposure for long time creates difficulties in terms of noise signals that could be addressed using an appropriate image de-noising method [8]. There is paradigm shift in the approaches used by astronomical researchers and scientists and they have been switching to non-traditional approaches, using computer-aided analysis of the images. Virtual observatory projects are implemented and International Virtual Observatory Alliance (IVOA) is constituted that takes care of developing the required standardization at international level [9].

Extragalactic field is used to get deep optical image that collects information of population of galaxies in the universe. CCD (charged coupled device) mosaic camera was used and *Spitzer space telescope* has been implemented in previous research work. The noise due to instrument disturbance or interference is also a concern that requires attention [10]. The images are formed by principle of reflection and incidence; whatever amount of light is incident its some part is reflected and accordingly the image formed. Therefore, in this process of image acquisition, noise or artefacts are added in the images that should be removed so as to get correct information about astronomical images [10]. Optical images are captured mostly by CCD cameras [11]. There are thousands of methods available for noise removal which can remove Gaussian noise, speckle noise, salt and pepper noise, dark noise and the improvement of noise removal, that is enhancement factor can easily be computed using a set of statistical parameters, such as mean, variance, entropy, CNR (contrast to noise ratio), PSNR(picture signal to noise ratio) etc [12]. Wavelet transform based methods, Fourier transform based methods and many others are there in the literature. One common challenge remains

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unaddressed is the robustness which means that a method should be developed so that it could be used to solve all types of noise signals from the images [1, 2]. Image enhancement still remains a subjective matter [12]. Celestial objects are transient in nature and the brightness is found to be changing, such as supernova, and hence dealing with brightness change is very important research task in such types of digital objects. Image subtraction or contrast enhancement or similar of such method can be used in this type of situation where the analysis and interpretation of images becomes bleak due to noise present in it [13, 14].

Tutorials on image processing methods, filtering techniques and few research contributions are reported in literature utilizing the information theory concept [15, 16]. Sometimes, if Nyquist rate is improper then problem arises in resolution and signal to noise ratio (SNR) is also disturbed. This is another challenging task that could be solved with the help of suitable image processing techniques. Colour images and other high quality images are produced using CCD detectors that increase the physical size of image and this dimensionality problem can be addressed by appropriate image processing step [17-19].

2. RELATED RESEARCH

Although, researchers and scientists have attempted applying image processing tools and techniques for better understanding and interpretation of astronomical images but the impact of research and development activities specially utilizing image processing is bleak due to limited research on these areas. This section highlights few important contributions on astronomical image processing and applications [6-19].

Wiley et al. [6] studied image processing for moving sources and computational computations hugely required. Massive data are reported that could be dealt using cloud computing. This presents scalable image processing pipeline architecture for the image database using Hadoop. The multiple overlapping images are registered, integrated and stitched into a single overarching image. Pre-filtering is used to remove irrelevant images from the database. Massive, parallel paradigm based computing was suggested in image co-addition system. This work is not more on image processing techniques but on parallelism used to deal with computational complexity. Christensen et al. (2014) attempted in determining parameters that could influence how well the image can be viewed and the images become quality images from observatory perspective. Theses parameters include good definition, colour, high SNR, removal of artefacts, and good photogenic resolution. Photogenic resolution depends on exposure and hence the exposure related noise can be removed and the resolution is enhanced. Good definition means more time is spent in dynamic range compression in the images. Proper colour combinations result in good appearance, which is important factor; along with this, artefacts were also addressed [7].

Marazzato et al. [8] suggested the implementation of fractional differential calculations for image processing tools which can be used in analysis of astronomical images. *AstroFracTool*, was proposed as enhancement tool for enhancing edges, applying basic operations such as image addition and image subtraction. This tool can be very useful in detection of faint objects and galaxy structures. Although, the tool was trial version and it needs improvement in implemented algorithms but it shows a roadmap to develop a framework of image processing analytics and methods to better analysis of astronomical and celestial images. Katz et al. [9] presents a survey on astronomical imaging data and describes the need for image processing task that could take large scale images and it was discussed using Montage tool. Clements (2016) studied that the experiments are to be performed over the extragalactic sky and capture the optical images using CCD cameras. The pixel counts and brightness play important role and a control is required in both of these factors [10].

Cadmus [11] proposed morphological operations and analysis for galaxies, comets and Jupiter. Remapping and brightness improvement were attempted using Polar and Frequency domain approaches. Image restoration of wide field comet was also achieved by removing sky background gradient values. The focus of work was on spiral galaxy NGC 7741. However, several additions and changes are there in the contribution that needs future work attention [12]. Long exposure, dark current is sources of noise in photographs of astronomy and the method suggested addressing the challenges due to this type of noise. CCD cameras produced black and white or gray scale images over which the image de-noising was tested. While removing the noise, sometimes graininess is also removed this is required in faint stars and nebula preservance. So, an offset or threshold is used to determine the level of graininess that has to be suppressed over which the details to be preserved [12].

Kirov [13] studied a new area of astroinformatics using ICT (information and communication technology) in institutes of the Bulgarian Academy of Sciences and a joint project, "Astroinformatics" was launched. It aims at preserving cultural and historical heritage of astronomical observations. The system employs various instruments for sampling and digitization; processing and representation; and finally for storage of astronomical images in the databases so that the information could be retrieved for future use. Zhao (2013) opined about image subtraction as an effective method used in astronomy for finding and exploring transient objects, which are actually time varying brightness based objects or images. Parallelization of HOTPANTS, astronomical image

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Image Processing Techniques for Remote Sensing Applications

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Abstract— *The government of India has been launching many satellites for last few years intended for different purposes. The data sent by satellites are captured, processed and analyzed by National remote sensing centre (NRSC) located at various places. The satellite data is huge and carry enormous information. This information is related to land description, crop assessment, cultivation monitoring, weather forecasting, regional description, underwater analysis, sea water interpretation and so on. The images, particularly sent by satellites suffer with noise signals contributed by several factors such as atmospheric disturbance, addition of unwanted rays, radiometric noise, speckle etc. If the signal quality is not good then the analysis and subsequent applications would not have appropriate impact to the concerned areas of implementation. Therefore, image de-noising becomes essential technique for improving the image quality that could greatly help in further processing of the remotely sensed data. There are many other image processing techniques, which are required for better interpretation for getting useful information. This paper presents a set of image processing tools that could be used in remote sensing applications with basic principles.*

Keywords— *Image processing, remote sensing, de-noising, segmentation, analysis etc.*

1. INTRODUCTION

One of the most emerging areas of digital image processing is in the field of remote sensing applications [1, 2]. Recently, Indian Space Research Organization (ISRO) launched 104 satellites together wherein, 04 satellites were indigenously designed. The point to be noted is that the number of satellites launched for different purposes are increasing with advancement of time and therefore huge amount of data is being captured and analysed by remote sensing centres. So, the application of digital image processing and appropriate set of tools becomes pertinent with regard to better visualization and information retrieval from the remotely sensed data or images. There are research contributions in the field of digital image de-noising and segmentation techniques for acoustical, ultrasound, medical images; and few research papers have also attempted for remote sensing applications [3-12].

The main aim of using image processing tools for analysis of remotely sensed images is to better extraction of information and noise removal. When CHANDRAYAAN sent the image of moon then researchers started their research works on the data. Now, number of satellites has been increased that have been moving around for different purposes. There are many examples where remotely sensed images play very important role such as: Impact study of soil moisture content and guiding the farmers; Predicting retail earnings and market share by counting cars in parking lot; Searching for aircrafts and saving lives after fatal crashes; Doing the detective work for fraudulent crop insurance claims; Detecting oil spills for marine life and environmental preservation; and Identifying forest stands and tallying their area to estimate forest supplies etc.

With basic research contribution in the field of image processing and image de-noising in particular inspired to take up task of improved analysis of agriculture, forest and other lands using remotely sensed data. Research contributions have been made in this direction but robust and efficient analysis and description of the images remain major challenges [1, 2].

2. RELATED RESEARCH

Remotely sensed images carry huge amount of information. If the quality of the images are not good or the analysis of images does not use optimum set of features then the impact of study based the images would be adversely affected. So, the image processing tools especially image enhancement has been extensively studied and few important contributions at international level have been highlighted here with their findings and limitations.

Ho et al. (2013) presented an alternative effective sonar image enhancement algorithm which was composed of two steps, including noise reduction and image sharpening. The sonar image is de-noised using Wiener, median filters and enhanced using un-sharp masking and histogram equalization. The method was tested on many sonar images of different underwater structures. The results were better in terms of noise reduction, and sharpening sonar images in comparison with existing

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Image Processing Techniques for Remote Sensing Applications

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EFFICIENT SEM IMAGE COMPRESSION USING HYBRID DWT-DCT TRANSFORM WITH EMBEDDED ZERO-TREE CODING

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ABSTRACT

Scanning Electron Microscopy (SEM) imaging is an important process for the proper analysis and characterization of the materials after fabrication. In a raw form, the high resolution SEM images occupy large storage space and also require higher bandwidth for the good quality transmission over the band-limited channel. Usually, all the raw SEM images are compressed in a lossy mode to reduce the higher transmission bandwidth and storage space requirements. The higher compression of SEM images significantly reduces the quality and hence highly affects the proper analysis of the materials. Hence, in this paper the authors contribute a new SEM image compression technique, which can provide high-quality compression of SEM images on higher compression rates. The proposed coder utilizes a hybrid version of two individual transforms, Discrete Wavelet Transform (DWT) and Discrete Cosine Transform (DCT) to achieve higher energy compaction of the input image followed by Embedded Zero-Tree Wavelet (EZW) coding to efficiently generate the final bit-stream. Several experiments have been performed to analyze the compression performance of the proposed SEM image coder against the popular JPEG codec and the latest JPEGXT codec. The result shows that the proposed SEM image coder provides a significant improvement in the quality of the reconstructed images in terms of the Peak Signal to Noise Ratio (PSNR) and Mean Structural Similarity Index (MSSIM) as compared to the JPEG and JPEGXT compression standard

Keywords: SEM Imagining , Material analysis and characterization, Image Compression, JPEG Standard, JPEGXT Standard, Hybrid DWT-DCT transfom, Embedded Zero-Tree Coding, PSNR, MSSIM

1. Introduction

The analysis and characterization of the fabricated material is a very important and crucial part in the material development technology. Usually this task has been performed with the help of image processing. The Scanning Image Microscopy (SEM) imaging is one of the prominent tool, which is commonly utilized for the material analysis process (Chen, Tao, & Li, 2003). The main issue related to the SEM images is their large sizes, which constrained the higher analysis time. The main issue related to SEM images is their large size, due to which analysis of material takes longer time. Further, due to large size, these images require more storage to store and require more bandwidth to transmit. To overcome this issue, all the raw SEM images are compressed in lossy mode using the existing image compression techniques. The most popular lossy compression technique for the compression of SEM images is JPEG standard (Wallace, 1991) which is based on Discrete Cosine Transform (DCT). However, there are several other image compression standards available for the compression of images, like Discrete Wavelet Transform based JPEG 2000 standard (David Taubman, Michael Marcellin, 2002), Back JPEG compatible JPEGXT standard (Mantel, Ferchiu, & Forchhammer, 2014), but JPEG standard is still popular due to its low computational complexity. The JPEG standard has the ability to offer good quality SEM Image compression over lower compression rates, but for the higher compression rates its performance decrease drastically due to the compression artifacts. As

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सरगुजा जिले में आर्थिक कारक एवं ग्रामीण शिशु मर्त्यता : एक भौगोलिक विश्लेषण

(ECONOMIC FACTOR AND RURAL INFANT MORTALITY IN SURGUJA DISTRICT: A GEOGRAPHICAL ANALYSIS)

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शोध सारांश

प्रस्तुत अध्ययन सरगुजा जिले में ग्रामीण शिशु मर्त्यता से संबंधित है। प्रस्तुत अध्ययन का उद्देश्य सरगुजा जिले में ग्रामीण जनसंख्या में शिशु मर्त्यता की स्थिति का आकलन एवं उसको प्रभावित करने वाले आर्थिक कारकों का विश्लेशण करना है। प्रस्तुत अध्ययन प्राथमिक आँकड़ों पर आधारित है। इस हेतु दो प्रकार की अनुसूची का उपयोग किया गया है। प्रथम पारिवारिक और द्वितीय व्यक्तिगत अनुसूची। अध्ययन हेतु जिले से प्रतिचयन यादृच्छिक विधि के द्वारा 38 ग्रामों की 2691 विवाहित महिलाओं से सूचना एकत्र किया गया, जिन्होंने सर्वेक्षण वर्ष के अन्दर शिशु को जन्म दिया हो अथवा जिनकी एक वर्ष से कम उम्र के शिशु की मृत्यु अथवा मृत जन्म हुआ। इन महिलाओं से शिशु मृत्यु तथा प्रभावित करने वाले आर्थिक कारकों से संबंधी सूचना एकत्र किया गया है। जिले में शिशु मर्त्यता दर 71.3 प्रति हजार है। जिले में शिशु मर्त्यता दर बालकों में 72.0 प्रति हजार तथा बालिकाओं में 65.4 प्रति हजार है। परिजन्म मर्त्यता दर 22.3 प्रति हजार, नवजात मर्त्यता दर 33.9 प्रति हजार तथा नवजातोत्तर मर्त्यता दर 37.4 प्रति हजार है। प्रस्तुत शोध पत्र में आर्थिक कारक के अंतर्गत माता–पिता का व्यवसाय, जोत का आकार एवं पारिवारिक आय शामिल है। भूमिहीन परिवारों में शिशु मर्त्यता दर सबसे अधिक 83.3 प्रति हजार है। लघु एवं सीमांत कृषक परिवारों में शिशु मर्त्यता दर 72.8 प्रति हजार, अर्द्ध मध्यम कृषक परिवार में 64.1 प्रति हजार, मध्यम कृषक परिवारों में 53.4 प्रति हजार और वृहद् कृषक परिवार में सबसे कम 47. 6 प्रति हजार है। शिशु मर्त्यता दर अन्य श्रमिक (92.2 प्रति हजार), कृषि श्रमिक (81.9 प्रति हजार) और कृषकों (57.0 प्रति हजार) से अधिक है। शिशु मर्त्यता दर व्यापार और गृह उद्योग में संलग्न पति में क्रमशः 25.3 प्रति हजार और 19.2 प्रति हजार है। शासकीय सेवा में संलग्न पति में शिशु मर्त्यता दर (11.5 प्रति हजार) सबसे कम है। आय में वृद्धि के साथ शिशु मर्त्यता दर में क्रमशः कमी हुई है। अतः आर्थिक कारक शिशु मर्त्यता दर को प्रभावित करने वाला प्रमुख कारक है।

शब्द संक्षेपिका : मर्त्यता, परिजन्म, नवजात, नवजात्तोतर ;

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6 Geology

WILEY

RESEARCH ARTICLE

6 An island-arc tectonic setting for the Neoarchean Sonakhan Greenstone Belt, Bastar Craton, Central India: Insights from the chromite mineral chemistry and geochemistry of the siliceous high-Mg basalts (SHMB)

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The Neoarchean Sonakhan Greenstone Belt, located in the northeastern fringes of Bastar Craton, Central India, is dominated by basalts, andesites, dacites, and rhyolites and also contains some basic rocks with very high MgO (up to 33.4 wt%). Chromite mineralization is present in these rocks along with the cumulates of olivine and clinopyroxenes. The rocks are classified as siliceous high-magnesium basalts (SHMB) exhibiting enriched large ion lithophile elements (LILE) and light rare earth elements (LREE) relative to the high field strength elements. Elevated Th/Yb ratios and negative Nb-Ta-Ti anomalies in the primitive mantle normalized multielement diagram indicates a significant role of subduction-related melts/fluids in their genesis. The chromites in SHMB have high Cr# (0.67–0.75) and moderate Mg# (0.11–0.5) values. Parental melt calculations in the chromites indicate that they are crystallized from an SHMB magma in an island-arc setting. A plausible model for the genesis of the rocks of Sonakhan Greenstone Belt includes initial subduction of an intraoceanic lithosphere followed by eruption of lava in an oceanic environment. Continued subduction of the slab followed by slab rollback followed by the generation of SHMB parental magma, which was introduced into the basal portions of the lithosphere in which cumulates of olivine and clinopyroxene have been developed and the chromite mineralization occurred in the inter cumulus space. Final emplacement of the magma took place in a forearc suprasubduction-zone environment with SHMB signature carrying the cumulates, which were located in the lower part of the lithosphere.

KEYWORDS

Bastar Craton, chromite, SHMB, Sonakhan Greenstone Belt, suprasubduction zone

1 | INTRODUCTION

The Archean crust is considered to have dominantly evolved through terrain accretion processes, which include an amalgamation of island arcs and oceanic plateaus at the convergent margins (Kerrich & Polat, 2006; Manikyamba & Kerrich, 2012; Polat, Kerrich & Wyman, 1998; Smithies, Champion, Van Kranendonk, Howard, & Hickman, 2005). Recent models for the Archean crustal evolution based on the histograms of U–Pb zircon ages indicate a peak of crustal growth during the Neoarchean (Condie, Belousova, Griffin, & Sircombe, 2009; Hawkesworth & Kemp, 2006; Yang & Santosh, 2017). Most of the Neoarchean greenstone terrains contain a great compositional diversity of subduction-related volcanic rock associations, which include basalt-andesite-rhyolite, adakites, low- and high-TiO_2 basalts, Nb-rich basalts, Mg-andesites and boninites (Naqvi, Khan, Manikyamba, Mohan, & Khanna, 2006; Polat & Kerrich, 2002; Samsonov, Bogina, Bibikova, Petrova, & Shchipansky, 2005; Wang, Wilde, Wang, & Yu, 2004).

Chromite is considered as one of the most important accessory minerals in the mafic volcanic rock associations (Arai & Miura, 2016; Zhou et al., 2014). The chemical composition of chromites can be influenced by several geological factors such as magma compositions, pressure–temperature conditions, oxygen fugacity, and crystallization sequence. Further, the mineral chemistry of chromite may also reflect the tectonic environment of its genesis (Arai, 1980; Arai & Yurimoto, 1994; Arai et al., 2011; Ballhaus, 1998; Graham, Franklin, & Marshall,

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Interaction of coeval felsic and mafic magmas from the Kanker granite, Pithora region, Bastar Craton, Central India

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Field and petrographic studies are carried out to characterize the interactions of mafic and felsic magmas from Pithora region of the northeastern part of the Bastar Craton. The MMEs, syn-plutonic mafic dykes, cuspate contacts, magmatic flow textures, mingling and hybridization suggest the coeval emplacement of end member magmas. Petrographic evidences such as disequilibrium assemblages, resorption textures, quartz ocelli, rapakivi and poikilitic textures suggest magma mingling and mixing phenomena. Such features of mingling and mixing of the felsic and mafic magma manifest the magma chamber processes. Introduction of mafic magmas into the felsic magmas before initiation of crystallization of the latter, results in hybrid magmas under the influence of thermal and chemical exchange. The mechanical exchange occurs between the coexisting magmas due to viscosity contrast, if the mafic magma enters slightly later into the magma chamber, then the felsic magma starts to crystallize. Blobs of mafic magma form as MMEs in the felsic magma and they scatter throughout the pluton due to convection. At a later stage, if mafic magma enters the system after partial crystallization of felsic phase, mechanical interaction between the magmas leads to the formation of fragmented dyke or syn-plutonic mafic dyke. All these features are well-documented in the study area. Field and petrographic evidences suggest that the textural variations from Pithora region of Bastar Craton are the outcome of magma mingling, mixing and hybridization processes.

Keywords. Kanker granite; mafic microgranular enclaves (MMEs); syn-plutonic mafic dyke; magma mixing and mingling; Bastar Craton.

1. Introduction

Numerous examples of magma mixing and mingling are documented in exhumed magma chambers through field, petrographic and geochemical studies on the mafic microgranular enclaves, syn-plutonic mafic dykes, hybrid enclaves and host granitoids (Hibbard 1981; Frost and Mahood 1987; Barbarin 2005; Kumar 2010; Perugini and Poli 2012; Jayananda *et al.* 2014). Such studies are confined mostly to calc-alkaline plutons of the Phanerozoic (Arvin *et al.* 2004; Kumar

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Geochemical constraints on the tectonic setting of the Sonakhan Greenstone Belt, Bastar Craton, Central India

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Abstract The Neo-Archean Sonakhan Greenstone Belt (SGB) located in the north-eastern fringes of Bastar craton, Central India, is dominated by Basalts, Andesites, Dacites and Rhyolites association. Partial melting modeling on the SGB metabasalts indicates that these rocks were derived by 20% melting of spinel peridotite. Fractional crystallisation modeling with REE reveal that the most evolved samples represent the product of fractional crystallization of least evolved magma with 35% plagioclase, 35% clinopyroxene, 20% olivine, 5% magnetite and 5% ilmenite as fractionating minerals with 40% remaining magma. Depletion of HFSE with reference to the LILE and LREE/HFSE ratios and Nb, Zr anomalies in the multi-element diagram of the mafic rocks of SGB indicate Island arc magmatic setting. The enriched Th/Yb values further substantiate that the mantle arrays were modified by subduction-related fluids or melts. The general conclusions drawn indicate that the metabasalts from the SGB were formed as a result of subduction of an intraoceanic lithosphere in a fore-arc suprasubduction zone environment.

Keywords Supra-subduction · Neo-Archean · Sonakhan Greenstone terrain · Bastar craton

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1 Introduction

The nature of petrogenetic and geodynamic process behind the generation of Archean continental crust still remains one of the most challenging problems in Earth Science (Hawkesworth et al. 2010; Foley et al. 2002; Rapp et al. 2003; Xiao and Santosh 2014; Zhai 2014). Occurrence of Greenstone-Gneiss association is a common feature of Archean cratons (Naqvi 2005). The term Greenstone Belt is generally used to describe elongated to variably-shaped terrain of variable length and width, consisting of spatially and temporally related materials from (1) Archean to Proterozoic intrusive and extrusive ultramafic, (2) mafic to felsic rocks commonly associated with variable amounts and types of metasedimentary rocks, and (3) intruded by granitoid plutons. 85% of the ophiolite occurrences in the greenstone sequences can be classified as the subduction-related tectonic environment. Subduction unrelated greenstone occurrences are mainly developed during ocean basin evolution, and are related to continental rifting, seafloor spreading drift-rift tectonics and plume magmatism (Furnes et al. 2014, 2015).

The Peninsular Indian Shield, which is made up of low to high-grade metamorphic terrain, has an age range of 3.6–2.6 Ga. These terrain attained tectonic stability for prolonged periods, and they constitute continental crust designated as cratons (Naqvi and Rogers 1987; Balasubramanyan 2006; Ramakrishnan and Vaidyanadhan 2008). Stabilization of a craton occurs when intruded by plutons, and as a result, the whole-rock isotopic systems become closed so platform sedimentation takes place on the newly formed basement (Rogers and Santosh 2003). The Bastar Craton, which is located in the eastern part of Peninsular India, is bordered by the Satpura mobile belt in the north, the Pranhita–Godavari rift in the south, the Deccan Traps

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Oldest lamproites from Peninsular India track the onset of Paleoproterozoic plume-induced rifting and the birth of Large Igneous Province

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ABSTRACT

Potassic and ultrapotassic magmatism from deep lithospheric sources in intra-cratonic settings can be the signal of subsequent voluminous mafic magmatism and the formation of Large Igneous Provinces (LIPs) triggered by mantle plumes. Here we report for the first time, precise zircon U–Pb age data from a suite of lamproites in the Bastar Craton of central India that mark the onset of Paleoproterozoic rifting and culminating in the formation of extensive mafic dyke swarms as the bar codes of one of the major LIP events during the Precambrian evolution of the Indian shield. The lamproites from the Nuapada field occur as dismembered dykes and are composed of phenocrysts and microphenocrysts of altered olivine together with microphenocrysts of phlogopite and magnetite within a groundmass of chlorite and calcite with accessory rutile, apatite and zircon. The rocks compositionally correspond to olivine phlogopite lamproite and phlogopite lamproite. Geochemical features of the lamproites correlate with their counterparts in Peninsular India and other similar suites elsewhere in the world related to rift settings, and also indicate OIB-like magma source. The associated syenite shows subduction-related features, possibly generated in a post-collisional setting. Magmatic zircon grains with high Th/U ratios in the syenite from the Nuapada lamproite form a coherent group with an upper intercept age of 2473 ± 8 Ma representing the timing of emplacement of the magma. Zircon grains in three lamproite samples yield four distinct age groups at ca. 2.4 Ga, 2.2 Ga, 2.0 Ga and 0.8 Ga. The 2.4 Ga group corresponds to xenocrysts entrained from the syenite whereas the 2.2 Ga group is considered to represent the timing of emplacement of the lamproites. The ca. 2.0 Ga zircon grains correlate with the major thermal imprint associated with mafic magmatism and dyke emplacement in southern Bastar and the adjacent Dharwar Cratons. A few young zircon grains in the syenite and lamproites show a range of early to middle Neoproterozoic ages from 879 to 651 Ma corresponding to younger thermal event(s) as also represented by granitic veins cutting across these rocks and extensive silicification. Zircon Lu–Hf isotope data suggest magma derivation from a refertilized Paleo-Mesoarchean sub-continental lithospheric mantle, or OIB-type sources. The differences in Hf-isotope composition among the zircon grains from different age groups indicate that the mantle sources of the lamproite are heterogeneous at the regional scale. A combination of the features from geochemical and zircon Hf isotope data is consistent with asthenosphere-lithosphere interaction during the lamproite magma evolution.
The timing of lamproite emplacement in central India correlates with the global 2.2 Ga record of LIPs. We link the origin of the related mantle plume to the recycling of subducted slabs associated with the prolonged subduction-accretion history prior to the Neoarchean cratonization, as well as the thermal blanket effect of the Earth's oldest supercontinent. Pulsating plumes and continued rifting generated voluminous dyke swarms across the Bastar and Dharwar Cratons, forming part of a major global rifting and LIP event.

1. Introduction

The late Archean–early Paleoproterozoic period in Earth history marks one of the vigorous phases of rift-related mafic magmatism following the cratonization of many ancient crustal blocks including the

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15

REVIEW ARTICLE

Evidence for the Contrasting Magmatic Conditions in the Petrogenesis of A-type Granites of Phenai Mata Igneous Complex: Implications for Felsic Magmatism in the Deccan Large Igneous Province

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Abstract | We report contrasting magmatic conditions in the generation of anorogenic (A-type) felsic rocks from the Phenai Mata hill of Deccan Large Igneous Province. The felsic units in the present study area can be classified as granite, monzonite, quartz monzonite and granodiorite. The field as well as the geochemical evidences collectively indicate the mixing and mingling of contrasting magma compositions which were widely involved in the genesis of these anorogenic intrusions. Based on the anorogenic granite classification diagrams, it has been observed that the granite shows A1 type character whereas the monzonite, quartz monzonite and granodiorite exhibit A2 type characters. Both A1 and A2 type intrusions were compared with the associated basaltic andesites in the variation diagrams and found that the A1 type rocks exhibit a well-defined trend pointing towards a fractional crystallization process. The A2 type rocks do not exhibit any particular geochemical relation with the mafic rocks. Moreover, the A2 type rocks are characterized by negative Nb and Ta anomalies in the normalized diagrams indicating the involvement of crustal components. From the field and geochemical evidence, it can be presumed that the A1 type rocks represent the fractional crystallization sequence from a basaltic magma, whereas the A2 rocks might have been produced by the melting of the pre-existing crust or by the assimilation of crustal components into the mafic magma during ascent. These contrasting magmas along with the mafic magma variably interacted in the shallow crustal levels to form present-day field features in the Phenai Mata Igneous complex.

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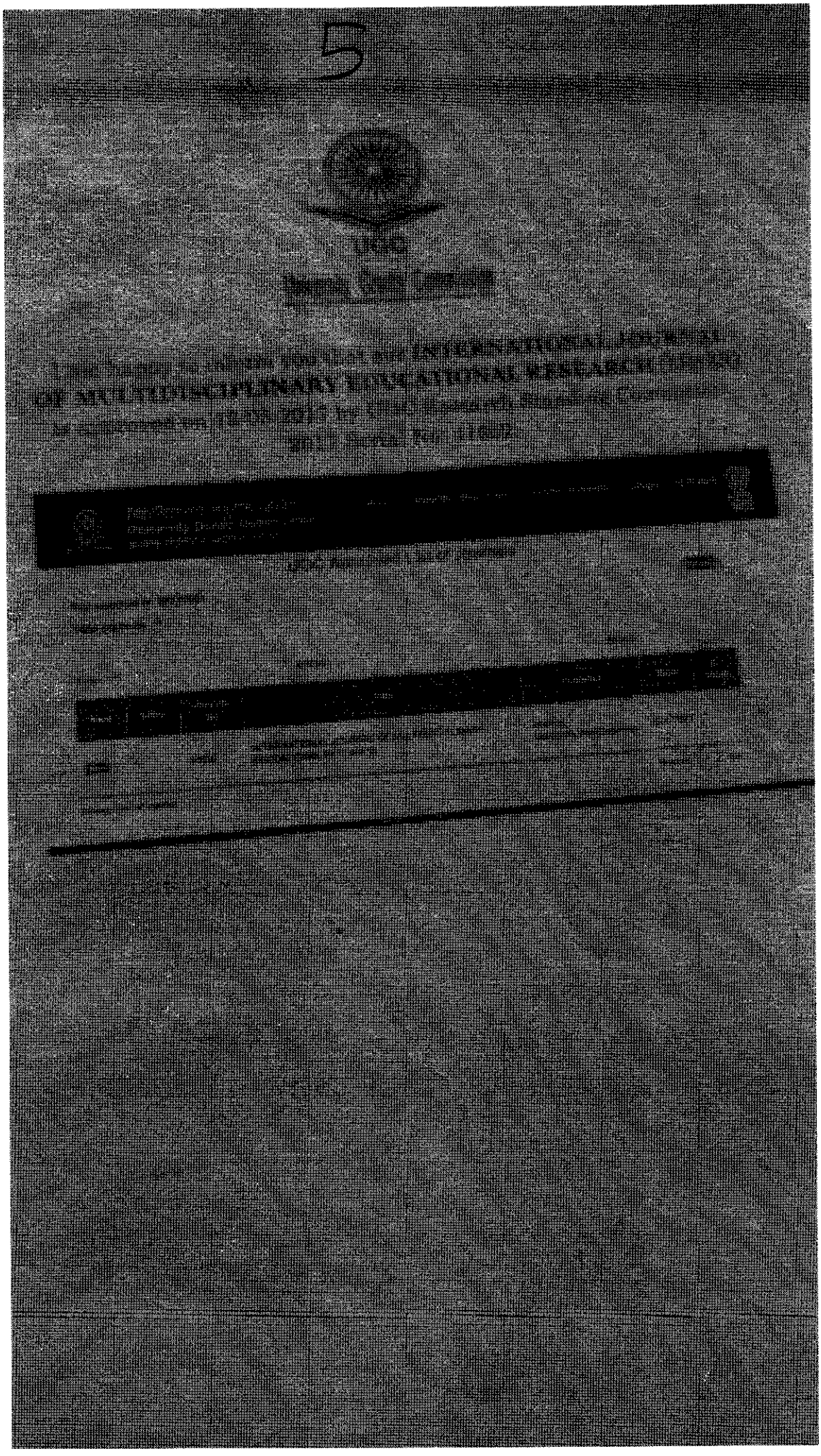

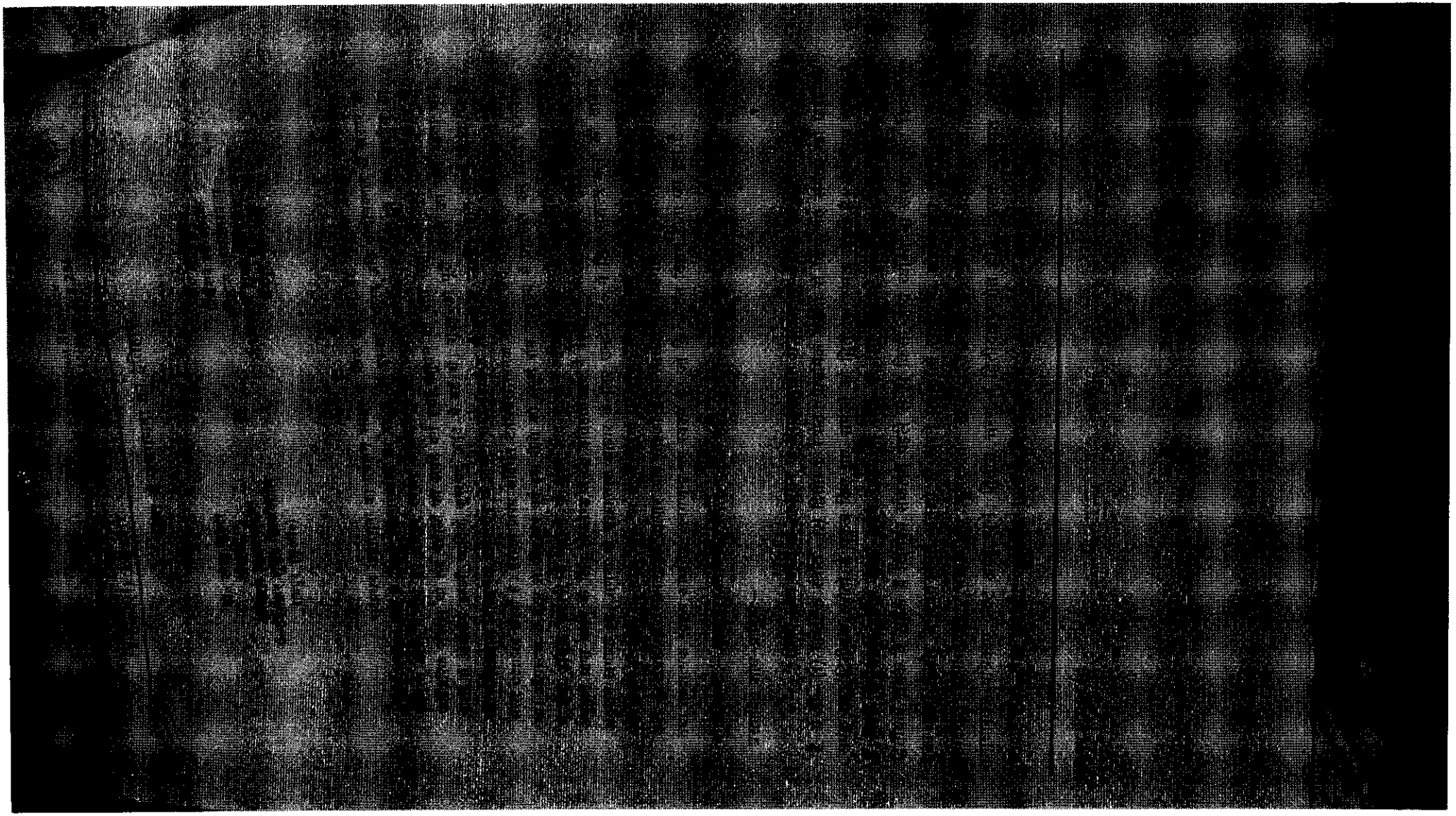

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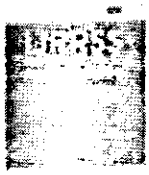

RESEARCH ARTICLE

ऐतिहासिक परिप्रेक्ष्य में समानांतर सिनेमा में पारंपारिकता तथा आधुनिकता का निर्वहन करती स्त्री

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शोध सारांश:

नारी जो समाज की धुरी है वह समानांतर सिनेमा की भी केन्द्र बिन्दु रही है। नारी भारतीय समाज में आज भी दो राहों पर खड़ी है–परम्परावादी बनाम आधुनिक–आधुनिक की परिभाषा हर बार दशक या दशक बदल जाती है–समयानुसार कभी उसके पहनावे से, कभी उसके दिखने, रूप–रंग से–पर वास्तव में आधुनिकता का अर्थ "सोच" से है। इस दृष्टिकोण से समान्तर सिनेमा में नारी के इन दोनो रूपों को बखूबी दो विभिन्न कथानक में पिरोकर निर्देशकों द्वारा उभारा गया। सिनेमा का प्रारंभिक इतिहास समानांतर सिनेमा के बहुत पहले प्रारंभ हो चुका था। एक आंदोलन के रूप में समानांतर सिनेमा का आरंभ छठे दशक में होता है। साठ के दशक के मध्य में बौद्धिक समाज में एक वैचारिक आंदोलन का उदय हुआ। बौद्धिक प्रतिभाओं का सिनेमा के प्रति रूझान बढ़ा और फिल्म अपने आदर्शवाद को छोड़कर यथार्थवाद की ओर आगे बढ़ी। यथार्थ को कहने का साहस समाज की वास्तविक तस्वीर तथा उद्देश्यपूर्ण समानांतर फिल्में विकसित हुई जिसके महत्वपूर्ण फिल्मकार मुजफ्फर अली, राजिंदर सिंह बेदी, श्याम बेनेगल, बासु भट्टाचार्य, उत्पलेंदु चक्रवर्ती, नंदिता दास आदि है। 70 का दशक भारतीय सिनेमा में समांतर सिनेमा का दौर था। समांतर सिनेमा की स्त्रियाँ विद्रोहिणी तथा अपने लिए नये राह को तलाशती स्त्रियाँ हैं जिन्होने समाज की वास्तविकता को यथार्थ के साथ समान्तर सिनेमा में प्रस्तुति दी है। व्यावसायिक सिनेमा (मुख्यधारा कमर्शियल) में स्त्री को कोमलांगी तथा शेग की वस्तु मात्र बनाया गया था किन्तु समांतर सिनेमा में बदलते सामाजिक–राजनीतिक परिदृश्य में स्त्रियाँ स्वयं को एक मनष्य के रूप में प्रतिष्ठित की यही समांतर सिनेमा की ताकत है।

कुँजी शब्द: यथार्थवाद, बौद्धिकता, कोमलांगी, विद्रोहिणी, चमक–दमक, समानांतर, व्यावसायिकता।

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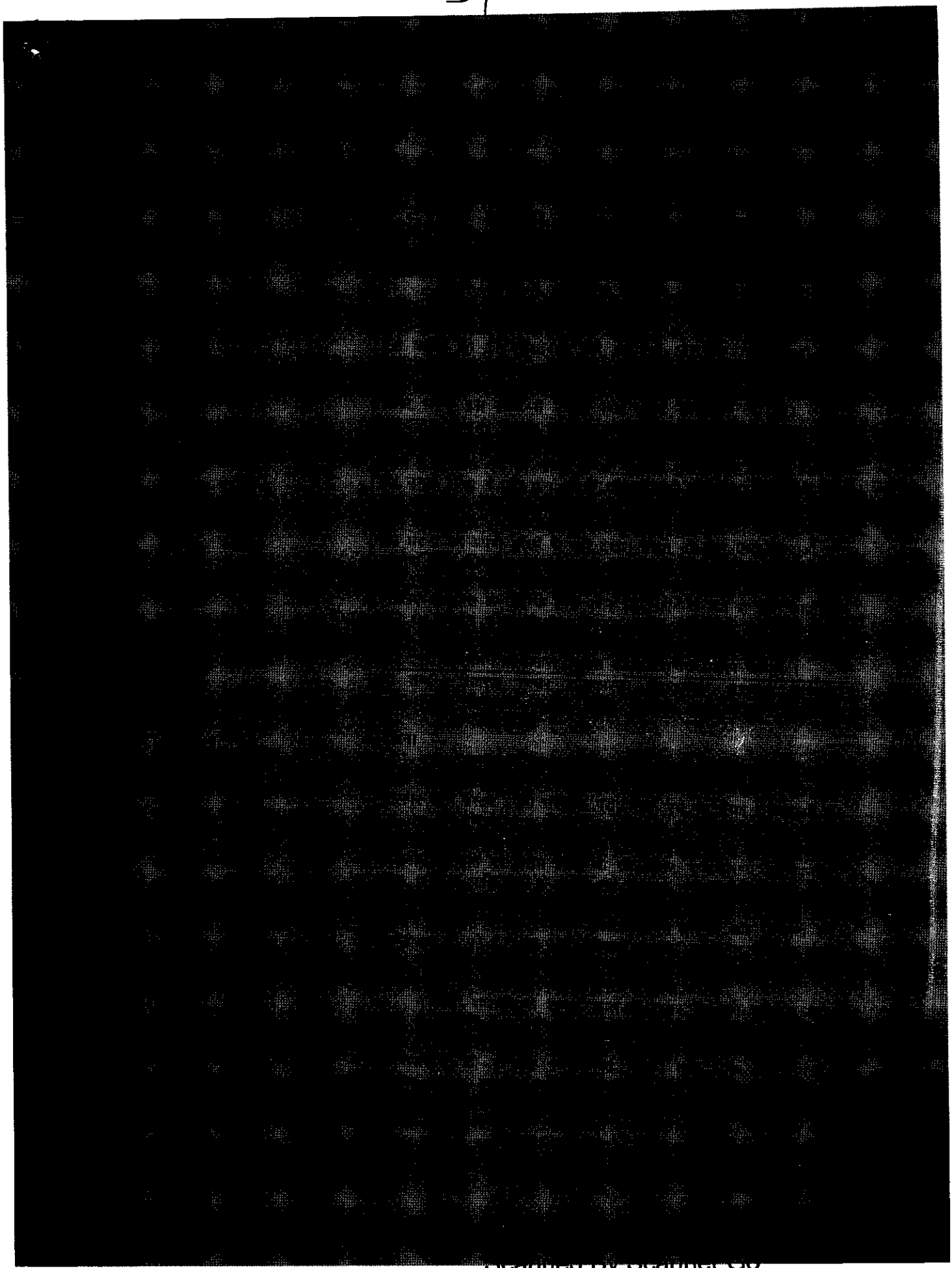

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JUDICIAL STANDARDS AND JUDICIAL ACCOUNTABILITY

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In a democratic country like India, the judiciary plays a vital role. The judicial system has a duty to deliver justice. History has taught us that Judges are considered as "God". Their decisions are final and cannot be questioned. A Judges has a moral as well as legal duty. Sometimes in some circumstances, a judge has to decide a case with the help of moral principles or ethics. Judges have the duty to interpret the laws and Acts correctly and use it wisely.

One of the indispensable features of our constitution is Separation of powers. It is a theory on functional division of governmental power between legislative, judicial, and executive. These three branches are kept separate to prevent the abuse of power. Also known as the system of checks and balances, each branch is given certain powers so as to check and balance the other branches. This doctrine of separation of powers provides for a responsibility to the judiciary to act as a watch and to check whether the executive and the legislature are working within their limits under the constitution and interfering in each other's functioning.

Rule of law that is responsible for good governance of the country can be attained through unbiased judiciary. The task given to judiciary to act as a watchdog and supervise the doctrine of separation of powers cannot be carried on in true sense if the judiciary is not independent in itself. An independent judiciary supports the base of doctrine of separation of powers to a large extent.

"Power corrupts, and absolute power corrupts absolutely." – John Emerich Edward Dalberg Acton.

"Corruption is like a hidden tiger in the bushes, waiting to pounce on the deer (rule of law), catch it by the neck and finally strangulate it to death. Unless the tiger is caged it will continue to

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INTRODUCTION

Independence of the Judiciary ensures the rule of law. The Judges have the duty to deliver justice. Any interference with their work can disturb the justice delivery system. Independence of the judiciary is a basic feature of Indian Constitution. In Democratic country like India, the system is managed by the representatives elected by the people. To ensure these representatives work effectively and to control misuse of powers by them, the government has three separate organs. The three main organs of the Government are Executive, Legislative and Judiciary. The Executive executes the law, the legislative makes the law and the Judiciary interprets the law. The main task of the Judiciary is to deliver justice. Administration of justice is the primary function of the Judiciary. However the Judiciary has other functions also which are non-judicial in nature. Judges have the responsibility to make decisions regarding fundamental rights of the people, their freedoms etc. The Judiciary has the responsibility to uphold the Constitution and assure that the rule of law envisaged in our Constitution will always prevail.

Thus the concept of independence of judiciary was implanted in the Constitution so that it can be discharges its duty effectively. The doctrine of separation of powers recognizes that

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A BIBLIOMETRIC STUDY OF INTERNATIONAL RESEARCH JOURNAL OF LIBRARY AND INFORMATION SCIENCE PERIOD 2011 – 2014

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ABSTRACT

The present study attempts to make bibliometric analysis of the "International research journal of Library and information science" published during 2011 – 2014. It journal help teachers, Students & researchers and also focus on Understanding the modern development of LIS. it Studies Analyses *various aspects such as* authorship pattern, *Issue wise distribution of Article, State and Country wise distribution of Article* and degree of collabration *etc have been made. It is found that most of the Issue that is 9 out of 12 contributed 15 Articles each Issue in the 2012, 2013 & 2014. Maximum numbers of State wise contributions are from Tamilnadu 24 (22.64%) and country wise contributions are from India 106 (65.03%) and Minimum numbers of contributions from Pondicherry, Ashan, Telangana 1(0.94%) and Zambia USA & Bahrain Iran1 (0.61%).*

Key words: Bibliometrics Study, International Research Journal of Library and Information Science, Articles.

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1. INTRODUCTION

International research journal of Library and information science is a well known peer reviewed open-access journal / Publication in the field of Library and information science. It is cognitive publishing as a Quarterly since 2011. it journal published original research papers, survey report, reviews & opinions pertaining to the subject. The main purpose of this journal is to together academicians, researchers, information scientists to focus on understanding the modern development of LIS and stablishing new collabration in this area.The chief editor of this journals is Prof. Mary K.

International Journal of Library & Information Science (IJLIS)
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A STUDY OF AUTHORSHIP PATTERN AND COLLABORATIVE RESEARCH IN IASLIC BULLETIN DURING 2010 – 2014

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ABSTRACT

The purpose of the study is to identify the Authorship pattern and collaborative research of IASLIC Bulletin during 2010 – 2014. Authorship pattern and collaborative research is one of the important aspects of the bibliometric analysis. This study highlights the authorship pattern in the area of Library and information science. The study Analyze and discusses on the Distribution of article, authorship pattern, productivity and degree of collaboration. In this study found that the highest number of article i.e. 38 (24.34%) were published in the year 2010 & lowest 18(15.65%) in the year 2013. The highest numbers of author productivity i.e. 42 (32.59%) were in the year 2012 & lowest 29 (16.29%) in the year 2013. out of 178 contribution 62 (34.83%) contributors contributed as a single author. out of 115 articles 62 (53.91%) single and 53 (46.09%) Multi authored articles. The degree of the author collaboration is 0.6516.

Key words: Authorship Pattern, Productivity, IASLIC Bulletin & Degree of Collaboration.

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1. INTRODUCTION

The IASLIC Bulletin is a peer reviewed journal started from 1956.it published from Indian Association of special Libraries and information centers Kolkata (IASLIC) with four issues (March, June September & December) each year. The aim of this Bulletin is to bring out original and valuable research paper field in the Library and Information science. The honorary editor of this Bulletin is Prof Pijuskanti Panigrahi .Currently it Bulletin indexed in LISA, ILSA & INSPEC etc the Study of the Authorship Pattern and collaborative research is one of the most popular study fields in the Library & Information Science. It Analyze the different pattern of Authors such as Author Productivity, single and joint authors contributions, Year wise single and multi Authored Articles and Degree of collaboration with Statistics.

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African Journal of Microbiology Research

Full Length Research Paper

Effect of nutritional parameters and NaCl concentration on phosphate solubilization potential of *Penicillium purpurogenum* Stoll isolated from paddy field

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Phosphorus (P) is the major essential macronutrient of plants. But its availability in Indian soil is relatively low due to high rate of P fixation. The use of phosphate solubilizing microorganism (PSM) to solubilize the fixed form of P is economically reasonable and ecologically safe as compared to chemical phosphatic fertilizers. Fungi have been reported to possess greater ability to solubilize insoluble phosphate than bacteria. However, phosphate solubilizing efficiency of PSM is found to be affected by different environmental factors. The main objective of this work was to optimize different process parameters for the solubilization of rock phosphate (RP) by the phosphate solubilizing fungus, *Penicillium purpurogenum* Stoll (NFCCI 3788) isolated from paddy field. The concentration of soluble P release by the isolate was tested in Pikovskaya's broth supplemented with RP. Glucose (169 µg/ml) and sucrose (153 µg/ml) significantly promoted P solubilization as compared to other carbon sources. Ammonium sulphate was found to be optimum for maximum RP solubilization. Change in medium pH and mycelial dry weight were also recorded in all the tested groups. The fungus showed different levels of phosphate solubilization under different NaCl concentration tolerating maximum upto 6% sodium chloride concentration.

Key words: *Penicillium purpurogenum* Stoll, carbon source, nitrogen source, optimization, rock phosphate, Chhattisgarh.

INTRODUCTION

Phosphorus (P), the second most essential element after nitrogen, is required by the plants for their growth and development. Apart from its abundance in soil in both organic and inorganic forms, the availability of soluble P in the soil is limited, explaining the need for the application of chemical phosphatic fertilizers for adequate plant growth. But, use of chemical fertilizers on a regular basis has become costly affair and environmentally

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Effects of Socio-Demographic Factors on Performance of Adolescents on Intelligence Task and Short-interval Time Estimation

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Abstract. We aimed to examine the effects of socio-demographic factors on performance of adolescents on intelligence (intelligence quotient, IQ) task and short interval time estimation. 207 healthy randomly selected adolescent including males and females voluntarily participated in this study. Performance on IQ task was tested using Pass Along Test. Adolescent also produced 10 s interval prospectively. A significant gender difference was obtained in IQ score. The IQ score of high school students was higher than higher secondary. Adolescent belonging to joint family estimated 10-s interval near to accuracy than nuclear family. IQ score exhibited a significant negative correlation with age and chronotype, and a positive association with sunlight exposure duration. The 10-s estimation was positively correlated with body mass index (BMI). The socio-demographic factors, chronotype, and sunlight exposure seem to be the confounding modulators of the cognitive attribute IQ. The family structure and BMI might manipulate the time perception.

Keywords: Intelligence quotient, short-interval time estimation, pass along test, socio-demographic, body mass index, chronotype

Introduction

In humans, one of the subtle characteristics known as cognitive ability exists that helps them to live in harmony with the ambient natural and social environment. Intelligence is one of the cognitive skills, which is confirmed to be an output of genetic repertoire, and physical and/ or social environment (Chiang *et al.*, 2011). Resing and Drenth (2007) have described the intelligence as "the whole of cognitive or intellectual abilities required to obtain knowledge and to use that knowledge in a good way to solve problems that have a well described goal and structure." It helps the subjects to solve problems tactfully (Alder, 2000). Intelligence is measured using various cognitive tests and the total score achieved through these tests is called the intelligence quotient (IQ) as it is a quotient/ ratio. Various performance tests, such as Corsi's block-tapping test (Orsini, 1994), Pass Along test (Alexander, 1932, 1937), Kaufman Assessment Battery (Kaufman and Kaufman, 1983), and Raven's Progressive Matrices (Raven, 1936, 2000) are available to determine the intelligence of an individual.

Various socio-economic status (Nisbett *et al.*, 2012), circadian typology (Killgore and Killgore, 2007; Maierova *et al.*, 2016; Piffer *et al.*, 2014; Preckel *et al.*, 2011; Goldstein *et al.*, 2007; Kanazawa and Perina, 2009), and life stress levels (Nisbett *et al.*, 2012) are known to alter a person's cognitive abilities including intelligence level. Age and gender-linked variability in performance score on IQ task has been reported in earlier studies (Colom *et al.*, 2000; Kar *et al.*, 2014; Lynn and Kanazawa, 2011). Lynn and Kanazawa (2011) revealed that at the age group of 7 to 11 years, the IQ score of girls was higher approximately one point than the boys. However, they further emphasized that the IQ scores changed at adolescent age, i.e., about 16 years of age. At this age the boys have IQ advantage of 1.8 points higher than their girl counterparts. Some studies also reported sex difference in general intelligence in adults and in young adolescents (Aluja-Fabregat *et al.*, 2000; Colom *et al.*, 2000).

Further, short-interval time estimation (SITE) is also one of the cognitive characteristics in human, which is used to acknowledge the passage of short durations. It is also known as interval timing as it deals with the measurement of short intervals in the range of seconds (Aschoff, 1998; Buhusi and Meck, 2005; Verginia, 1996). It has been established that the time spent on day-to-day activities is acknowledged by two means or paradigms (Zakay, 1990), namely *prospective paradigm* - when the subjects have the prior knowledge of performing time estimation (attention demanding) and *retrospective paradigm* - when an individual is unaware of time estimation task and suddenly asked for the duration of the elapsed event. Short-interval time estimation helps in coherence implementation of any activity or in decision making process. It has been said that the time estimation could be used as an index to identify attention related problems (Carrasco *et al.*, 2000) or psychological discomfort (Wittmann *et al.*, 2006). Chronotype is reported to modulate the time perception capability in extreme chronotypes (Esposito *et al.*, 2007).

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Evaluation of Decolorization and Lignin Degrading Potentiality of Ligninolytic *Bacillus aryabhattai* Isolated from Pulp and Paper Mill Waste Water

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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 Total five bacterial strains PMB1-PMB5 were isolated from pulp and paper mill waste water. 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 analyzed for pH and reduction of color and lignin content . Biochemical and 16S rDNA gene sequence analysis suggested that strain PMB3 belonged to the Bacillus aryabhattai. It was observed that this bacterial strain reduced color by 47% and lignin content 17%.

Key words- Bacillus aryabhattai Decolorization, Kraft lignin, , pulp and paper mill waste water.

I. INTRODUCTION

As food wood is almost as important to humanity and have enormous environmental value as natural forests from which most of it is harvested [1]. However, continually growing demand for paper is putting pressure on the world's forests, and resulting in the loss and degradation of forest. The alternative raw materials are Agricultural remains which could meet global paper making demand five times over [2]. One kind of such remains is wheat straw and because of wheat straw can make high quality paper than other agricultural residues it is often used to make paper pulp [2, 3]. Wood digestion and bleaching are two main processes during pulping in pulp paper industries. In the process of wood digestion, wood chips are cooked in the solution of sodium hydroxide and sodium sulphate at elevated temperature and pressure to break chips into fiber mass., all the depository materials which are hard to degrade are dissolve by The chemical reaction with wood fibers and these derivatives are washed away from the fiber during washing and dewatering process. The extracted products such as lignins, cellulose, phenolics, resins, fatty acids and tannins during washing processes mixed together and make dark black viscous alkaline waste known as black liquor. The color of the effluent is mainly due to the presence of lignin and its derivatives. Alkaline effluent is of high pH, BOD, COD and color which make it significantly toxic to the environment [4]. Lignin is a heterogeneous, three dimensional polymer, composed of oxyphenylpropanoid units [5]. Processes based on physical (adsorption, microfiltration and photoionization etc.) and chemical (sedimentation, coagulation, oxidation and ozonation etc.) methods for

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In vitro and *In vivo* Anti-Filarial Effect of Tetracycline/ Doxycycline

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Tetracycline is an established antibiotic and is targets to *Wolbachia* endosymbiont present within the filarial worms. Antibiotic treatment of filarial nematodes results in sterility and inhibits larval development and adult worm viability; this is due to effect on the *Wolbachia*. In the present study *in vitro* and *in vivo* anti-filarial effect of different concentration of tetracycline/ doxycycline was determined. *In vitro* results indicated that 50 µg/ml and 100 µg/ml tetracycline concentrations affects the motility in both microfilariae and adult worms of *B. malayi*. The loss of motility was efficiently higher in female adult worms than male adult worms, could be attributed to the differences in *Wolbachia* load of the filarial worms. 14 (10 Male and 4 female) microfilaraemic subjects were treated with doxycycline @ 200mg/day for 30 days to study the *in vivo* filaricidal effect. In which the mean mf counts were gradually decreased after doxycycline treatment in both male and female subjects upto 6 months. The findings suggest that tetracycline/ doxycycline treatment can eliminate or reduce the mf load due to targeting *Wolbachia* endosymbiont therefore provide good tool for treatment and to hamper the transmission of filariasis from one host to another.

Keywords: *Wolbachia, Tetracycline, Doxycycline, in vitro,* Filariasis, *Brugia malayi.*

Lymphatic filariasis (LF) is a disease of considerable socio-economic burden in the tropics and sub-tropics and is caused by *Wuchereria bancrofti, Brugia malayi* and *B. temori*. *Wolbachia* endosymbiontic bacteria are found in mutualistic relationship in many filarial nematodes infecting animals and humans including *W. bancrofti*. Currently, the estimated 68 million people infected, among them, 36 million are microfilaria carriers and 40 million are symptomatic[1]. Additionally, 946 million people live in areas of southeast Asia and sub-Saharan Africa are at risk of infection[1].

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Anti-filarial chemotherapy is associated with systemic adverse reaction, due to release of microfilariae and *Wolbachia* bacteria into the blood. The available standard chemotherapy kills only the microfilariae and their macrofilaricidal function is not established either *in vitro* or *in vivo*. In recent past anti-*Wolbachia* antibiotics treatment has become a novel approach to treat lymphatic filariasis; these antibiotics inhibit worm development, embryogenesis, fertility and viability. The studies have demonstrated sub-lethal effect of antibiotics on filarial worms and this is due to effect on the *Wolbachia*[2-4]. Anti-*Wolbachia* treatment studies of tetracycline on animal models revealed the reduction in worm burden and blocking molting of infective stage larvae (L3 to L4 and L4 to L5)

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Research Article

Production and Characterization of Actinomycin D from *Streptomyces parvulus* Av-R5 Isolated from *Aloe vera*

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ABSTRACT

Plants serve as a reservoir of large number of organisms. However, [illegible] of endophytic actinomycetes. The aim of this study was to screen [illegible] for inhibitory activity against human pathogens. *Streptomyces* sp. Av-R5 was [illegible] which. Structure of the antimicrobial compound was purified by HPLC and [illegible] *Streptomyces* sp. Av-R5produced extracellular [illegible] human pathogens. Morphological, cultural, physiological and 16S rRNA sequencing [illegible] showed 100% similarity with *Streptomyces parvulus* NBRC 13189^T (AB184830). Two [illegible] fermented broth by spectroscopic analysis were as actinomycin D and actinomycin X_{2b}. The [illegible] ethyl acetate extracted compound exhibited antimicrobial activity against Gram-positive, Gram-negative [illegible] albicans MTCC 183 with the MIC ranging between 0.25 to 1 mg /ml. The endophytic *Streptomyces* sp. Av-R5 produced [illegible] higher quantities 420 mg/l of antimicrobial compound in glucose soybean meal broth [illegible] previously reported actinomycete-producing strains. Endophytic *Streptomyces* sp. Av-R5 may be explored as a potential source for the commercial production of actinomycin D.

Keywords: Actinomycin D, actinomycin X_{2b}, central composite design, glucose soybean meal broth, *Streptomyces parvulus*.

INTRODUCTION

Medicinal plants are known to be rich source of bioactive compounds with therapeutic potential. Several bioactive molecules from plants have been commercially exploited. Since the endophytic actinomycetes symbiotically associate with their plant host and have genetically evolved together over a long period of time, they benefit each other by producing metabolites of biological and physiological significance complementary to each other[1]. Endophytic actinomycetes benefit host plants by means of growth promotion, stress tolerance and reduction in disease symptoms[2]. Herbaceous plants are the major host for endophytic actinomycetes followed by shrubs[3, 4]. *Streptomyces* is the dominant species followed by *Microbispora*, *Micromonospora*, *Nocardioides*, *Nocardia* and *Streptosporangium*. There are many reports in which both plant and its endophyticactinomycetes produce same metabolites such as, 6 prenylindole, kaempferol, isoscutellarin, umbelliferon and cichorin[5], fisetin, naringenin, 3' hydroxydaidzein and xenognosin B[6]. However, reports of different antimicrobial substances produced by the endophytic actinomycetes and the host plant also exist[7, 8, 9]. *Streptomyces parvulus* are known for the production of actinomycin D. Actinomycins are a family of chromo peptide lactone antibiotics, among which actinomycin D has been widely studied. Actinomycin D can be synthesized by different species of *Streptomyces* as part of a mixture of several actinomycins[10]. It has been clinically used for the treatment against viruses, cancer and blocking cell cycle. Due to its toxicity, actinomycin D has limited clinical use as an antimicrobial agent, but is used as an important tool in molecular and cellular biology.

Endophytic actinomycetescan be a promising biological control agent of human and plant diseases and can thus be considered as a potential alternative to industrial production of antibiotics for pharmaceutical industries. Keeping this in view, *Streptomyces* sp. Av-R5 was isolated from root of *Aloe vera* and screened for their antimicrobial activity against human pathogens. The optimal conditions for production of antimicrobial compound, its thermal stability, and its proteolysis resistance to enzymes were also examined.

MATERIALSAND METHODS

Endophytic actinomycetes Av-R5

The endophytic *Streptomyces* sp. Av-R5 was isolated from root of *Aloe vera* growing in the garden of School of Studies in Life Science, Pt. Ravishankar Shukla University, Raipur, Chhattisgarh by five step surface sterilization process on starch casein agar medium (soluble starch 10 g, K_2HPO_4 2 g, KNO_3 2g, NaCl 2 g, Casein 0.1 g, $MgSO_4$ 0.05 g, $CaCO_3$ 0.02 g, $FeSO_4$ 0.01 g, Distilled water 1000 ml) supplemented with nalidixic acid (50 mg / l) and nystatin (50 mg / l) to suppress the growth of bacteria and fungi respectively. The plates were incubated at 28 ± 2°C for 21 days. After attaining visible powdery growth, colonies were transferred on starch casein agar slants for storage and preservation. *Streptomyces* sp. Av-R5 was screened

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Reactive oxygen species, lipid peroxidation, protein oxidation and antioxidative enzymes in dehydrating Karanj (*Pongamia pinnata*) seeds during storage

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ABSTRACT

We investigated the storage behaviour of karanj (*Pongamia pinnata* L. Pierre), a very popular tree valued for medicinal and biodiesel use, seeds at ambient conditions (27–30 °C and RH 45%). Fresh karanj seeds, showing 100% germination were shed with water content of 0.22 $gH_2O\ g^{-1}$ DM. The karanj seeds exhibited intermediate storage behaviour as the percent germination dropped from 100 to 80% when the seeds desiccated below critical water content i.e. 0.11 $gH_2O\ g^{-1}$ DM. The loss of germination index (GI) and viability, and increase in solute leakage preceded the loss of germinability. Dehydration mediated decline in seed viability and vigour was negatively associated with accumulation of reactive oxygen species (ROS, like superoxide radical and H_2O_2). In dehydrating seeds, excess amounts of ROS mediated cellular damage by oxidizing biomolecules like lipids and proteins. The activities of antioxidant enzymes like superoxide dismutase (SOD), catalase (CAT) and ascorbate peroxidase (APX) were higher in the 100% viable seeds, and reduced with dehydration induced viability and vigour loss. The expression of specific isoenzymes of SOD (band 1) and CAT (band 2) detected only in seeds exhibiting higher germination, may be considered as markers for seed quality.

1. Introduction

Seed longevity, an important trait from ecological and agricultural perspectives, has been studied in considerable detail (Rajjou et al., 2008; Nonogaki et al., 2010). Seeds after harvest, undoubtedly deteriorate gradually and lose quality during extended storage (Rajjou et al., 2008). The seed storage behaviour has been categorized as orthodox and recalcitrant on the basis of desiccation tolerance and sensitivity, respectively. Orthodox seeds can be stored for longer periods if their moisture contents are reduced to 1–5% (Ellis et al., 1991a), whereas the recalcitrant seeds are killed when dehydrated below relatively high moisture content (30–50%) (Varghese and Naithani, 2008). Several seeds like *Carica papaya*, *Coffea arabica*, *Elaeis guineensis* (Ellis et al., 1991a,b) once categorized as recalcitrant have now been reclassified as intermediate in storage behaviour.

During ageing, loss of seed vigour and viability precedes the loss in germinability (Eksi and Demir, 2011). Membrane deterioration associated enhanced solute leakage, a measure of seed vigour (Eksi and Demir, 2011), has been reported in several recalcitrant seeds during ageing (Pukacka and Ratajczak, 2007; Varghese and Naithani, 2008). Similarly, the ageing related loss of viability was reported in seeds using TTC (triphenyl tetrazolium chloride), a quick and precise test (ISTA, 2003). In dry and viable seeds, leakage of reactive oxygen species (ROS) from electron transport chain of mitochondria during seed desiccation is inevitably enhanced that in turn promotes oxidative damage of nucleic acids, proteins and lipids. Active metabolism in the hydrated pockets, reported in restricted cellular areas of dry seeds, is one of the potential sources of ROS formation (Leubner-Metzger, 2005). Additionally, non-enzymatic ROS production in anhydrate sites of dry seeds also contributes to ageing associated cellular damage (Job et al., 2005). Excessive accumulation of ROS (superoxide radical and H_2O_2) in orthodox, recalcitrant and intermediate seeds (Bailly, 2004; Pukacka and Ratajczak, 2007; Varghese and Naithani, 2008; Sahu et al., 2017) has been discussed as a potential cause of viability loss. ROS induced oxidative damage of proteins and lipids (Balesevic-Tubic et al., 2007; Oracz et al., 2007; Varghese and Naithani, 2008; Parkhey et al., 2012) leads to severe cellular damage that eventually results in loss of viability (Halliwell and Gutteridge, 2007). Membrane damage and generation of toxic by-products are common features of lipid peroxidation (Parkhey et al., 2012). Many proteins are specific as they are regulatory and associated with particular stages of seed development (Tunnacliffe et al., 2010; Sahu et al., 2017), dormancy (Oracz et al., 2007), germination (Nonogaki et al., 2010; Tunnacliffe et al., 2010) and longevity/

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Active oxygen species metabolism in neem (*Azadirachta indica*) seeds exposed to natural ageing and controlled deterioration

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Abstract Success of ex situ storage of germplasm for trade and conservation essentially depends upon the precision of the protocol employed for the assessment of germination potential. Active oxygen species and antioxidative enzymes during natural ageing (NA) and controlled deterioration (CD) was monitored during the loss of seed vigour and germination potential in neem seeds showing intermediate seed storage behaviour. Higher levels of SOD, CAT and APX were strongly and positively associated with germination and vigour. The loss of CAT and APX activity estimated quantitatively and number of isoenzymes were closely accompanied with the simultaneous increase in the amounts of H_2O_2 and OH-radical. The decline in germination and vigour was negatively related with the levels of H_2O_2 and OH-radical and enhanced electrolyte leakage. The amounts of OH-radical were positively correlated with the decline in DNA content and DNA damage. The levels of SOD isoenzymes initially increased as the germination index of seeds declined from 5250 to 762 and 882 under NA and CD conditions, respectively. Increasing activity of SOD in the ageing seeds were associated with the accumulation of H_2O_2. The role of antioxidative enzymes in maintaining signalling and damaging amounts of AOS as well as revelations of different pathways of ageing during NA and CD in the ageing neem seeds were discussed.

Keywords Antioxidative enzymes · Active oxygen species · *Azadirachta indica* · Ageing · Controlled deterioration

Introduction

Seed germination is compromised inevitably in spite of the best storage conditions (Rajjou et al. 2008). Therefore, from the research and commerce point of view, understanding the seed deterioration during prolonged storage is of foremost concern in most of the seed banks engaged in germplasm conservation. The expression of seed longevity depends upon its genetic and physiological quality and their interaction with the storage conditions (Arc et al. 2011).

Prolonged seed storage that accounts for seed ageing has long been associated with non-reversible metabolic and cellular alterations including oxidation of lipid, protein and nucleic acids, enzyme inactivation, membrane perturbations and impairment of RNA and protein biosynthesis (Kibinza et al. 2006; El-Maarouf-Bouteau et al. 2011; Hu et al. 2012). Although the precise mechanism of seed deterioration is still unclear, the excess accumulation of AOS (active oxygen species) including superoxide, hydroxyl radical (OH-radical) and hydrogen peroxide (H_2O_2) are closely related with the reduced seed vigour and viability (Kibinza et al. 2006; El-Maarouf-Bouteau et al. 2011; Richards et al. 2015). In ageing seeds, oxidative stress induced unregulated metabolism disturbs the balance between AOS production and AOS scavenging enzymes that eventually permits accumulation of AOS (Rajjou et al.

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Research Note

Evaluation of Indira Soya-9 [Glycine Max (L.) Merrill] for protein profile variation and desiccation tolerance during germination

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Indra soya-9 *Glycine max*. (L.) Merr. a variety of soybean seed rich in protein, harvested in Chhattisgarh region of India is one of the main cash crops. Physiochemical changes in developing seeds of Indra soya-9 establish relationship between the germination and desiccation tolerance. The quantitative and qualitative profiling of total, soluble and heat-stable proteins was assessed through Ocular comparison and protein extraction from axes and cotyledons at various stages of seed development. The study of variety Indra soya-9 reveals gradual changes of pod colour synchronized to proteins availability. Total protein declined slighty but soluble protein content rose between first two stages compared with heat stable protein which increased gradually from Stage -I to Stage-IV both in the axes and cotyledons. Desiccation tolerance appears to be linked with change in drying induced proteins. Further, these change the water content of the seed which marks the transition from development to germinability.

Keywords: Protein, quantitative, germination, ocular marker, desiccation tolerance

Soybean (*Glycine max*), a member of the family Fabaceae, is well known as "Golden bean". Soyabean is regarded as being native to the North-eastern part of the China. The seeds are considered a good source of a complete protein diet as it contains all the essential amino acids for human consumption. Seeds that are valued as a rich source of protein, oils and carbohydrates are a product of fertilization. Following fertilization, seed development in higher plants can be broadly divided into three confluent stages *viz*., 1-Histodifferentiation; 2-Cell expansion; and 3-Maturation and drying (Kermode 1990). Each phase of seed development is controlled by several internal factors, namely cell water content, hormonal balance and differential gene expression and external factors (environmental). During histo-differentiation (also called embryogenesis) the single-celled zygote forms a multicellular embryo which distinctly consists of the embryonic axis and cotyledons. Further, development involves first the cell expansion of the newly divided cells followed by deposition of reserves *viz*., protein, lipid and carbohydrates in the storage tissues i.e. cotyledons (dicot plants) or endosperm (monocot plants) (Kermode 1990). The distinct three overlapping phases are characterized by different patterns of fresh and dry weight (Grilli et al. 1989). The deposition of food reserves during cell expansion and maturation stages are the most prominent morphological and biochemical events during seed development (Thomas 1993). During seed development the maturation drying of seed permits acquisition of desiccation tolerance (in orthodox seeds) and germinability, two important traits that contribute to seed quality and are responsible for successful survival of seedling (Vertucci and Farrant 1995; Borek et al. 2009). Imbibition of mature seeds leads to reactivation of metabolism and the reorganization of the organelles finally leading to germination of viable seeds. Absolute germinability is accomplished only in seeds that have completed the total time period

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PAPER TITLE: ISOLATION AND IDENTIFICATION OF PHOSPHATE SOLUBILIZING FUNGI FROM RHIZOSPHEREC SOIL OF CHICKPEA PLANT

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ABSTRACT

The present investigation was carried out for understanding and exploring the indigenous phosphate solubilizing fungi and their efficient utilization as a potential biofertilizer for the improvement of soil fertility. In this study total of 23 fungi were isolated from rhizospheric soil of chickpea plants. Out of 23, thirteen fungi were showed as phosphate solubilizers on the Pikovskaya's Agar medium. Fungi that showed halo zones around the colonies are good phosphate solubilizers and belong mainly to the genera of Aspergillus, Penicillium. The present study would help in utilizing the indigenous phosphate solubilizing fungal strains as an effective biofertilizers by the farmers.

Keywords: Aspergillus, Biofertilizer, Penicillium ,Phosphate solubilizing fungi & Solubilization

I.INTRODUCTION

Phosphorus is one the most essential elements for plant growth after nitrogen. However, the availability of this nutrient for plants is limited by different chemical reactions especially in arid and semi-arid soils. Phosphorus plays a significant role in several physiological and biochemical plant activities like photosynthesis, transformation of sugar to starch, and transporting of the genetic traits.

Phosphate solubilizing microorganisms refer to a group of soil microorganisms that as components of phosphorus cycle, can release it from insoluble sources by different mechanisms [1]. Phosphate solubilizing fungi and bacteria are known as effective organisms in this process [2]. Fungi are the important components of soil microbes typically constituting more of the soil biomass than bacteria, depending on soil depth and nutrient conditions. Fungi have been reported to have greater ability to solubilize insoluble phosphate than bacteria [3]. A wide range of soil fungi are reported to solubilize insoluble phosphorous such as *Aspergillus niger* and *Penicillium sp.* which are the most common fungi capable of phosphate solubilization [4]. Exploration of phosphate solubilizing microorganisms has been conducted by many researchers from soils, mangrove and rhizosphere (5). Since large population of Chhattisgarh state is dependent on agriculture the present investigation is aimed to isolate some fungal strains that may have high efficiency for phosphate solubilization.

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Isolation of Phosphate Solubilizing Fungi from The Rhizospheric Soil of Wheat plant in Raipur

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ABSTRACT

Phosphate solubilizing fungi were isolated from the rhizosphere soil of wheat plant of Raipur region, Chhattisgarh state of India.. In this study total of 19 fungi were isolated from rhizospheric soil of wheat plants. Out of 19, twelve fungi were showed as phosphate solubilizers on the Pikovskaya's Agar medium. Aspergillus species, a soil isolate had excellent potential to solubilize phosphate in vitro. In present study fungal strains isolated from soil having potential to solubilize phosphate were characterized and fungal strain used as bioinoculent.

Keywords: Aspergillus, Penicillium , Phosphate solubilizing fungi & Solubilization

I.INTRODUCTION

Improving soil fertility is one of the most common practices in agricultural production. Phosphorus (P) is one of the most essential plant nutrients for maximizing crop productivity. This nutrient is limited in soils, which remain as a major challenge to agriculturists and land managers. (1). Phosphorus is one of the major nutrients, second only to nitrogen in requirement for plants. A greater part of soil phosphorus, approximately 95–99% is present in the form of insoluble phosphates and cannot be utilized by the plants (2). Compared with the other major nutrients, phosphorus is by far the least mobile and available to plants in most soil conditions. Although phosphorus is abundant in soils in both organic and inorganic forms, it is frequently a major or even the prime limiting factor for plant growth (3).

Phosphate solubilizing fungi and bacteria are known as effective organisms in this process (4,5). Fungi are the important components of soil microbes typically constituting more of the soil biomass than bacteria, depending on soil depth and nutrient conditions. Fungi have been reported to have greater ability to solubilize insoluble phosphate than bacteria (6). A wide range of soil fungi are reported to solubilize insoluble phosphorous such as *Aspergillus niger* and *Penicillium sp.* which are the most common fungi capable of phosphate solubilization (7).

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BRIEF COMMUNICATION

Multi-frequency rhythms in activity of mixed human population in social networking sites – a preliminary study

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ABSTRACT

There has been a global surge in the use of social networking sites (SNSs), like Facebook (FB) and WhatsApp (WA). Many studies have been conducted thus far highlighting the effects of use of SNSs on psychosocial behavior, but none on biological rhythms. The main aim of this study was to ascertain rhythms in intensity of FB use and WA chats as a group/population phenomenon. Of the two authors, RA has a FB account consisting of 291 friends, whereas AKP has 1031 friends at the time of this study. RA used Raipur Rockers (RR) group and AKP used BHU-MSc'77 (BHU) group from their respective WA accounts. The findings indicate the presence of multi-frequency rhythms in the intensity of online activity among the FB friends and in the frequency of chat postings among the members of the RR and BHU groups. A difference in the peak timings of activity between RR and BHU groups could be attributed to the factor, 'age.' While more intensive research is warranted in this area, for the time being, the difference in the pattern of activity between young and old SNSs users might have a bearing on the success of e-business possibly through appropriate scheduling of e-advertisements.

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KEYWORDS
Circadian rhythm; 12-h rhythm; Facebook usage; WhatsApp usage; spectral density; mixed human population

1. Introduction

The social networking sites (SNSs), such as Facebook (FB) and WhatsApp (WA) have become increasingly popular worldwide. According to the Zephoria Inc. – a digital marketing consulting firm, there are about 1.86 billion FB users that includes 1.15 billion mobile daily active users (mobile DAU) (https://zephoria.com/top-15-valuable-facebook-statistics/). It has been predicted that the number of FB users will touch a staggering 2.0 billion mark very soon. The WA – mobile messaging app also has about 1.2 billion monthly active users globally (https://www.statista.com/statistics/260819/number-of-monthly-active-whatsapp-users/). The magnitude of FB and WA use on daily basis has compelled researchers especially in the domain of social science to ask several pertinent questions. Does this habit of using FB or similar such SNSs produce negative effects on psycho-social behavior of human subjects? Are the subjects addicted to FB are more

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ORIGINAL ARTICLE

Shortening of sleep length and delayed mid-sleep on free days are the characteristic features of predominantly morning active population of Indian teenagers

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Abstract

We studied patterns in the distribution of chronotype and sleep–wake behavior in a randomly chosen sample population of Indian teenagers consisting 965 school-going children. All of them voluntarily responded on two structured inventories, namely truncated version of the morningness–eveningness questionnaire (MEQ) to assess chronotype and the Munich Chronotype Questionnaire (MCTQ) to determine sleep–wake variables on both work and free days. The results revealed that a majority of teens were predominantly morning active (59%), about 33% were intermediate, whereas only 8% were evening type. The mid-sleep on free days (MSF) in most of the subjects was 1 h delayed compared to those on work days. The MSF in adolescent was identified as the primary predictor of social jetlag. The average sleep duration was recorded to be less than 7 h on both school and free days. The evening chronotype teenagers were significantly sleeping less with more social jetlag and delayed mid-sleep than morning or neither type. This study gave an insight on the prevalence of lark chronotype and shorter sleep among Indian teenagers.

Keywords Chronotype · Mid-sleep on free days · Social jetlag · Sleep duration · Teenager · India

Introduction

Teenage (= adolescent age) is considered as the transitional period from childhood towards young age. A number of physiological and intellectual changes occur during this period. In addition, alteration in behavior, social engagements, lifestyle, and the sleep–wake habits takes place in an adolescent. The sleep–wake habits are determined by individual circadian preference that is known as 'Chronotype'. The continuum between two extreme preferences morningness and eveningness encompasses three types of circadian typology, viz., morning, intermediate and evening chronotypes. The morning or lark types schedule their sleep–wake early and prefer physical or mental activity early, whereas the evening or owl types schedule their sleep–wake timings late and like to do physical or mental activity in the evening or night hours. The intermediate chronotypes figure in between these two ends. The chronotype depends upon the culture, geographical location or climate [1, 2]. The morningness–eveningness inclination has been proposed to have a genetic basis [3] and represents the endogenous phase of the circadian rhythm [4]. Therefore, the inhabitants of temperate countries are mostly evening or intermediate type, whereas the inhabitants of subtropical countries, like India, are generally morning-oriented or early risers [5–8]. The morning or eveningness inclination varied according to age and gender [9]. Females are more morning-oriented than males [10, 11]. The morning to evening orientation in adolescent has been associated with the changing environmental factors or pubertal development [12, 13].

The individual circadian preference or chronotype is determined using questionnaires. The widely used inventory is the Horne and Östberg [14] morningness–eveningness questionnaire (MEQ) that qualitatively estimates the preference as well as defines the cut-off for the three types of chronotypes. The second popular inventory is

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Spermidine and Melatonin Attenuate Fluoride Toxicity by Regulating Gene Expression of Antioxidants in *Cajanus cajan* L.

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Abstract
Being regulators of growth, both spermidine (Spd) and melatonin (Mel) are involved actively in the modulation of abiotic stress responses of plants. Hence, the present study was aimed to scrutinize the possible involvements of Spd and Mel in alleviation of fluoride ion (F^-)-induced injuries in *Cajanus cajan* L. Seeds of *C. cajan* L. were exposed to 1) control, 2) F^-, 3) Spd, 4) Spd + F^-, 5) Mel and 6) Mel + F^- for five days. The results unveiled that F^- treatment caused inhibited growth (radicle length and dry mass accumulation), protein content, genomic template stability, membrane stability index, and free radical scavenging capacity, but enhanced the levels of cell death, active oxygen species (AOS), malondialdehyde, lipase, protein carbonylation, and DNA polymorphism. Moreover, F^- toxicity elevated the concentrations of endogenous proline, ascorbic acid, and glutathione, and altered the isoenzyme profiles and gene expressions of stress responsive enzymes (superoxide dismutase, catalase, ascorbate peroxidase, and glutathione-S-transferase). In contrast, exogenous supplementation of Spd and Mel alleviated the deleterious effects of F^-, consequently improved growth, free radical scavenging capacity, and accumulations of protein, proline, ascorbic acid, and glutathione in *C. cajan* L. Additionally, application of Spd or Mel also improved the isoenzyme profiles and gene expressions of stress responsive enzymes, and genomic template stability, thereby reduced cell death, AOS, lipid peroxidation, lipase activity, and DNA polymorphism in stressed tissues. The present study concludes that Spd and Mel, particularly Mel, alleviated the adverse impacts of F^- by improving antioxidant machinery and genomic template stability.

Keywords Active oxygen species · *Cajanus cajan* L. · Fluoride ion · Gene expression · Melatonin · Spermidine

Introduction

The contamination of potable water with fluoride ions (F^-) is a worldwide problem with severe implications in animals and human beings. Higher concentrations of F^- in the soil and irrigation water can disturb both physiological and biochemical processes of plants (Yadu and others 2016). Additionally, it interferes with phosphorylation of proteins, activities of key enzymes, rate of photosynthesis, genomic template stability (GTS), gene expression patterns, and other metabolic processes via overproduction of active oxygen species (AOS) (Gadi and others 2012; Yadu and others 2016). Fluoride ions intimately bind with sulfhydryl groups of proteins thereby altering the structure, functions, and secretion of proteins involved in cell signaling, proliferation, and apoptosis, and also inactivating the enzymes of the DNA repair system (Agarwal and Khan 2016). However, reduced level of DNA synthesis, weaker protection of DNA from damaged histone protein, and increased activity of DNase have recently been reported in abiotically stressed cells (Chandrakar and others 2017a).

To reduce oxidative stress, plant cells possess a complex network of defensive mechanisms involving both non-enzymic {proline (Pro), ascorbic acid (AsA), glutathione (GSH), and so on}, and enzymic {superoxide dismutase (SOD), catalase (CAT), ascorbate peroxidase (APX), glutathione-S-transferase (GST), and so on} agents (Iannelli and others 2002; Ahmad and others 2016; Chandrakar and others 2016). However, under severe conditions, this

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General Article

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The Psychological Science Accelerator: Advancing Psychology Through a Distributed Collaborative Network

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Sleep and Biological Rhythms
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ORIGINAL ARTICLE

Level of alpha amylase activity in human saliva as a non-invasive biochemical marker of sleep deprivation

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Received: 19 September 2017 / Accepted: 13 May 2018

Abstract
To investigate the usefulness of the enzyme salivary alpha amylase as a biochemical marker of sleep deprivation in human subjects. Total 168 healthy school-going adolescents studying in 9th grade were selected randomly from morning shift ($n=84$) and dayshift ($n=84$) schools. The study was undertaken longitudinally for a period of 2 years. Study encompassed administration of questionnaire and collection of saliva samples from the participants. Activity of salivary alpha amylase (sAA) activity was estimated spectrophotometrically and statistical analysis was performed to determine the association between sAA activity and sleep duration. Excessive daytime sleepiness among students was also studied in association with sAA activity. sAA activity of students was found to have a negative correlation with the duration of sleep and a positive correlation with their level of sleepiness. Morning shift students were found to have significantly less sleep and correspondingly higher sAA activity as compared to dayshift students. A significant increase in the sAA activity was noticed in the second year as the students progressed from 9th to 10th grade. Higher amylase activity was also observed in sleep deprived students suffering from excessive daytime sleepiness irrespective of school timings. Salivary alpha amylase activity increases in saliva in response to sleep deprivation. School timings may modulate sleep duration of students. Present finding reveals that sAA could be an appropriate non-invasive biochemical marker for the objective assessment of sleep deprivation among individuals as well as at population level.

Keywords Salivary alpha amylase · Sleep deprivation · Adolescents · Excessive daytime sleepiness

Introduction

Sleep-related problems and susceptibility towards stress, the two most common feature of the modern society, are interrelated. The scientific community has made a considerable effort to establish a valid biomarker for the assessment of the sleepiness and stress level in human beings. To explore useful biomarkers, saliva is considered the most suitable medium due to ease of its collection and causing least discomfort to the subjects. One such biomarker, salivary alpha amylase (sAA) has been studied widely and recommended as a marker of activity of sympathetic nervous system [1–3]. It has been suggested that the level of the enzyme alpha amylase increases in saliva in response to stressful conditions with an increase in the sympathetic nervous system activity. The sympathetic activity is also known to increase due to reduced duration of sleep [4]. Increase in salivary alpha amylase activity has also been reported among individuals suffering from obstructive sleep apnea syndrome (OSAS) [5]. OSAS is a major cause of excessive daytime sleepiness. Though the genetic studies using drosophila as model organism has revealed a strong association between amylase mRNA and sleep deprivation [6, 7], studies on the association between salivary amylase enzyme activity and sleep deprivation in human has not yet been studied extensively on a larger sample size.

Sleep need varies considerably across different age groups and the need for sleep is higher among adolescents as compared to pre-pubertal children, younger children and adults [8, 9]. Adolescence is a stage between childhood and adulthood and the stage is associated with behavioral and psychosocial changes. The sleep requirement of adolescents is more than the adults or child because of their physiological requirement. However, the higher need for sleep in adolescents largely remains unmet due to a number of factors

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Market Orientation for Agribusiness in Chhattisgarh (AbstractView.aspx?PID=2017-8-3-33) (https://scholar.google.co.in/scholar?q=Market Orientation for Agribusiness in Chhattisgarh)

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ABSTRACT:

Famous as 'The Rice Bowl of India', Chhattisgarh is the 26th state of the country. It came into existence on 1st of November in the year 2000. The quality of soil, adequate climatic conditions, vast rural population and availability

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(24)

Evidencing Adoption and Diffusion amongst Textile Marketers: A Study

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Abstract

Purpose: The purpose is to study adoption and diffusion of innovation amongst textile marketers in the city of Raipur, Chhattisgarh, India towards services provided by Wholesale box.

Design/methodology/approach: Authors have done empirical research while analyzing the data gathered through primary sources and discussed their viewpoints.

Findings: Respondents were categorized in to three categories namely "first adopters", "late adopters" and "non adopters." Merchant and website factors affect the process of adoption and diffusion of innovation amongst textile marketers.

Originality/value: This is a fairly original paper which studies and discusses adoption of innovation.

Keywords: Innovation, Adoption, Diffusion, Merchant Factor, Website Factor, Purchase Intention.

Paper type: Research Paper

Introduction

Competition is the driving force of monopolistic economy which is characterized by large number of sellers who offer heterogeneous offerings to large number of buyers. In monopolistic competition non price competition has dominated its economy more in comparison to price competition. Heterogeneous product offerings with different features, application of all aspects of promotion mix and establishment of new sources of product procurement and delivery are dominating the markets for establishing the point of differentiation between two sellers. The sellers are approaching diverse markets and selling more commodities to distribute their fixed cost on large number of products manufactured or distributed by them. In recent times monopolistic competition is more fueled by advent of information technology. Information technology is helping the marketers to cover the untapped markets for product sourcing as well as product delivery from new, distant as well as remote markets from geographically dispersed suppliers. Further the symbiotic relationship of marketing and information technology is also helping the marketers to reach the untapped markets. The culmination of information technology with market research has led to development of a scientific approach for marketers to reach different sellers and procure goods and services according to needs, preferences, and purchasing power of their target

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Evidencing the Role of Demographic Variables on Functioning of Consumer Forums- A Case Study

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Abstract: *Purpose: The purpose is to study complainants' perception about consumer dispute redressal agencies in the selected districts of Chhattisgarh*

Design/methodology/approach: Authors have done empirical research and applied logistic regression to analyze the data gathered through primary sources and discussed their viewpoints.

Findings: It was found from empirically in this study that demographic variables do not have their impact on complainants' perception about consumer dispute redressal agencies, whereas working of these agencies significantly impact complainants' perception.

Originality/value: This is a fairly original paper which studies and discusses adoption of innovation.

Keywords: *Complainant, Consumer Protection Act, Consumer Dispute Redressal Agencies, Complainant Perception, Logistic Regression*

I. INTRODUCTION

Consumers are the king of the market. It is a fact that has been tested by researchers, academicians, policy makers and practitioners from time to time for clarity and evidence. However evidences at various levels prove that the king of the market faces the challenge of being aware of his/ her rights for empowerment. An empowered customer is the need of the hour where policies like 'Caveat Emptor' are legally supported. The sellers of in the markets are required to match their offerings with the need and want of the customers according to the specifications described by them. Many a times the information and specifications is complex for customers to decipher therefore, they take uninformed purchase decision with limited or no help of the seller.

The policy makers in India and abroad have taken conscious and small steps to ensure consumer safety in the markets. The enactment of Consumer Protection Act 1986 was undertaken by Indian Parliament to provide customers with (i) Right of safety (ii) Right of Information (iii) right to Choose and (iv) Right to be heard. Further the solutions of grievances of consumers were provided by forming consumer protection councils and consumer dispute redressal agencies. However research indicates that the functioning and awareness of these remedies are limited due to impact of various internal and external factors.

In this regard Singh (1996) indicated that the functioning of consumer forums across India needs to be revisited on the grounds of legal issues like judicial decisions on issues like service rendered free of charge and services rendered under the contract of personal services and non legal fundamental like consumer education, consumer representation and lobbying etc. In addition to the functioning of consumer redressal forums the study Morganstern and Stanley (1978) highlighted that the purview of Consumer Protection Act has increased over the years as there are varied number of innovative services and products which are available in the markets through virtual and real distribution channels. Hence, it is essential to study awareness, functioning, speed and cost related with working of Consumer forums. Further it has become increasingly essential to understand the perception of widely dispersed consumers on India regarding the provisions of consumer protection and redressal mechanism. Raj Rani (1978) undertook a detailed analysis of opinion of middle class consumers on variable like exploitation of consumers and the available recourse under Indian Judiciary. The study indicated that the consumer awareness regarding Consumer Protection Act was limited and consumers had little knowledge regarding working of consumer forums. Nayak(1991) indicated that proper awareness of consumer rights can be the only means of empowering consumers in markets. Consumer Redressal agencies can safeguard consumer rights only when the consumers are aware about their mistreatment and the market and are ready to invest time, energy and money to gain legal solutions. Thus, it has become increasingly essential on part of consumers to be aware in the market while being part of a selling process and take necessary actions in cases of defaults on part of seller. A large number of researchers have conducted empirical analysis to identify the problems related with low consumer awareness regarding the consumer protection act.

Further many researchers have tried to identify the role of media in generating consumer awareness. Kumar and Batra (1990) discussed the role of media with relation to increasing consumer awareness. Their

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VISCOSITY APPROXIMATION METHOD FOR COMMON FIXED POINT PROBLEMS OF A FINITE FAMILY OF NONEXPANSIVE MAPPINGS

YEN-CHERNG LIN, B. K. SHARMA*, AJEET KUMAR†, AND NIYATI GURUDWAN

ABSTRACT. The purpose of this paper is to introduce a new iterative algorithm for computing a common element of the set of common fixed points of a finite family of nonexpansive mappings and the set of solutions of a variational inequality problem in Hilbert space setting. Our iterative algorithm generates a strongly convergent sequence. We establish a strong convergence of our algorithm which extends and generalizes many results of this nature existing in the literature. We also give a numerical example to support our main result.

1. INTRODUCTION

Let C be a nonempty closed convex subset of a real Hilbert space H with inner product $\langle .,. \rangle$ and norm $\|.\|$, respectively. For a given nonlinear mapping $A : C \to H$, consider the following classical variational inequality problem:

$$\text{find } x^* \in C \text{ such that } \langle Ax^*, x - x^* \rangle \geq 0 \text{ for all } x \in C. \tag{1.1}$$

The set of solutions of problem (1.1) is denoted by $VI(C, A)$, that is,

$$VI(C, A) = \{x^* \in C : \langle Ax^*, x - x^* \rangle \geq 0 \text{ for all } x \in C\}.$$

The variational inequality problem (1.1) was first studied by Stampacchia [16] in 1964. Many important applications of the classical variational inequality have been intensively studied (see [7,9,13,20]). There are several iterative methods for solving variational inequality problems as, a variational inequality problem is equivalent to the fixed point problem.

In 2000, Moudafi [14] proposed the viscosity approximation method for approximating the fixed points of nonexpansive mappings in Hilbert space setting as follows: Let C be a nonempty closed convex subset of a real Hilbert space H and f a contraction mapping of H into C. Let T be a nonexpansive mapping from C into itself. For an arbitrary $x_1 \in C$, let $\{x_n\}$ be a sequence in C defined by

$$x_{n+1} = \alpha_n f(x_n) + (1 - \alpha_n) T x_n \text{ for all } n \in \mathbb{N}. \tag{1.2}$$

where $\{\alpha_n\}$ is a sequence in $(0, 1)$. He also proved the strong convergence theorem of (1.2) (see [22] for further developments in both Hilbert spaces and Banach spaces). In 2004, Xu [22] proved the strong convergence of a sequence generated by the

2010 *Mathematics Subject Classification.* 47H09, 47H10.

Key words and phrases. Metric projection mapping, nonexpansive mapping, variational inequality, viscosity method.

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Cancer Control Algorithm

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Abstract

Curing cancer by controlling the growth of the cancer cell is the objective of this paper. The growth of the cancer cell is analysed by the optimization programming. The algorithm is proposed for minimizing the rate of growth of the cancer cell. Hence the chaotic cancer became structured for the further research. This is an extended work of Warburg [1], where he defined the centre of the cancer cell, known by Warburg effect, but here we control the increasing radius of the cancer circle by the proposed Cancer Control Algorithm.

Keywords: Cancer; Cell; Centre; Circle; Optimization.

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Cancer medicine: a direction

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Abstract

The medicine of cancer is directed in this paper. The pie theory is applied for the proposed medicine. The improbability and un-constancy are the major theories, which are used to design this anti-cancer medicine.

Keywords: Pie Theory; anti-cancer; cancer; improbability; medicine; un-constancy.

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A Splitting Iterative Method for a System of Accretive Inclusions in Banach Spaces

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Abstract

In this paper, a system of accretive inclusions is proposed and a splitting iterative method is investigated for solutions of proposed system of operator inclusion problems. Under suitable conditions on the parameters, strong convergence of our splitting iterative method is established in a reflexive Banach space.

2010 Mathematics Subject Classification: 47H06, 47H09

Key words and phrases: Accretive operator, reflexive Banach space, splitting iteration, resolvent

1 Introduction

In the area of nonlinear analysis, the theory of accretive operators is an important and developing field [3, 4]. The class of accretive operators is firmly connected with equations of evolutions found in the heat, wave, Schrödinger and similar other equations [5]. Many problems in operations research and mathematical physics can be written as variational inequalities, equilibrium problems or operator inclusions with accretive operators [2, 10, 17].

Let H be a real Hilbert space whose inner product and norm are denoted by $\langle \cdot, \cdot \rangle$ and $\| \cdot \|$, respectively. One popular method for solving the following inclusion problem:

$$\text{find } z \in H \text{ such that } 0 \in Az. \tag{1.1}$$

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Cancer-meter: measure and cure

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Abstract

This paper presents a theory and system on "Cancer-Meter'. This idea came through the statement that "cancer is curable if it is measurable". The Cancer-Meter proves that it is possible. This paper proposes the cancer-meter in two ways, theoretical and electronically, as per the measurement and treatment. By the mathematics, first part is defined but the second part is based on computer programming, electrical and electronics. Thus, the cancer-meter is a programmed-electrical-electronic device which measures and cures the cancer both.

Keywords: Cancer-Meter.

LinkOut - more resources

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Chapter 15

AN APPLICATION OF FIXED POINT THEOREM TO LOCAL ATTRACTIVITY OF SOLUTIONS OF A GENERALISED FUNCTIONAL NONLINEAR INTEGRAL EQUATION*

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Abstract

In this paper, an application of fixed point theorem of Aghajani, Banas and Sabzali is given to prove the existence of solution of a generalized functional nonlinear integral equation. Under certain additional condition, the local attractivity of the solutions is also shown.

Keywords: Measure of noncompactness; modulus of continuity; measure theoretic fixed point theorem; functional integral equation; local attractivity of solutions.

AMS Subject Classification: 45G10; 45G99.

1. Introduction

The concept of measure of noncompactness has played an important role in nonlinear functional analysis, especially in the study of metric and topological fixed point theory. It may be observed that several papers have been published on the existence and behavior of solutions of a wide class of nonlinear differential and integral equations via the measure of noncompactness.

The aim of this paper is three folds. Firstly, to obtain a generalization of Darbo fixed point theorem which compliments to fixed point result of Aghajani, Banas and Sabzali via

*Dedicated to the Diamond Jubilee Birth Anniversary of Shyam Lal Singh.

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IMPLICIT ITERATION SCHEME WITH NUMERICAL ANALYSIS FOR A FINITE FAMILY OF STRICTLY PSEUDOCONTRACTIVE MAPPINGS

Balwant Singh Thakur, Rajshree Dewangan, Alia Kurdi[1]

In this paper, we propose an implicit iteration scheme with perturbed mapping for a finite family of strictly pseudocontractive mappings and establish weak and strong convergence theorems. We report some preliminary computational results related to the influence of parameters of the algorithm. Results in this paper extend and improve recent results in the literature.

Keywords: Strictly pseudocontractive mapping, iteration scheme with perturbed mapping, common fixed point, strong convergence.

1. Introduction

In the past five decades, iteration processes for numerical reckoning fixed points of nonlinear mappings and their applications have been studied extensively by many authors. In 2001, Xu and Ori [24] introduced an implicit iteration process to approximate a common fixed point of a finite family of nonexpansive self mappings in a Hilbert space. In 2004, Osilike [12] further extended the iteration process of Xu and Ori to a finite family of strictly pseudocontractive self mappings in Banach spaces. In 2007, Acedo and Xu [1] proposed a parallel iterative algorithm for strictly pseudocontractive mappings in the framework of Hilbert spaces. Zeng and Yao [30] introduced in 2006 an implicit iteration process with perturbed mapping, to approximate common fixed points of a finite family of nonexpansive mappings. Ceng *et al.* [3] introduced in 2007 an implicit iteration process with perturbed mapping G, for approximating common fixed points of a finite family of continuous pseudocontractive self-mappings. Our contribution in this paper is motivated and inspired by the above described research, and proposes a new implicit iteration scheme, with perturbed mapping, to approximate fixed point of a finite family of strictly pseudocontractive self-mappings.

2. Mathematical preliminaries

Let E be a real Banach space and let $J: E \to 2^{E^*}$ is the normalized duality mapping defined by

$$J(x) = \{f \in E^* : \langle x, f\rangle = \|x\|\,\|f\|; \|x\| = \|f\|\} \quad \forall\, x \in E,$$

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CONVERGENCE THEOREMS FOR TOTAL ASYMPTOTICALLY NONEXPANSIVE MAPPINGS IN $CAT(0)$ SPACES

BALWANT SINGH THAKUR*, DIPTI THAKUR†, AND RAVI P. AGARWAL

Dedicated to Professor Brailey Sims on the occasion of his 70th birthday

ABSTRACT. In this paper, we propose a new hybrid iteration for total asypmptotically nonexpansive mappings. We establish Δ-convergence and strong convergence theorems on a $CAT(0)$ space which extend and improve many results in this literature. We also provide numerical examples to illustrate the performance of proposed iteration.

1. INTRODUCTION

Iterative procedures for nonlinear operators is a topic of extensive study in last decades. First major result of this nature was obtained by Browder [6] in Hilbert spaces for nonexpansive self mappings. Since then, iterative approximation of fixed points of these mappings have been studied by a number of researchers, see e.g. [17, 18, 24, 25, 27, 33, 34].

Let C be a nonempty subset of a real normed space E. A self-mapping T of C is said to nonexpansive if $\|Tx - Ty\| \leq \|x - y\|$, for all x, y in C. In 1972, Goebel and Kirk [16] introduced the notion of asymptotically nonexpansive mappings as a generalization of nonexpansive mapping. A mapping T is said to be *asymptotically nonexpansive* mapping if there exists a sequence $\{\mu_n\}_{n\geq 1} \subset [0, \infty]$ with $\lim_{n\to\infty} \mu_n = 0$ such that for all $x, y \in C$

$$\|T^n x - T^n y\| \leq (1 + \mu_n) \|x - y\| .$$

holds for all $n \geq 1$.

In 1993, Bruck et al. [7] introduced asymptotically nonexpansive mappings in the intermediate sense. A mapping T is said to be *asymptotically nonexpansive in the intermediate sense*, if it is continuous and the following inequality holds:

$$\limsup_{n\to\infty} \sup_{x,y\in C} (\|T^n x - T^n y\| - \|x - y\|) \leq 0 .$$

The above inequality can be equivalently written as

$$\|T^n x - T^n y\| \leq \|x - y\| + \mu_n , \qquad \text{for all } x, y \in C ,$$

where $\mu_n = \sup_{x,y\in C} (\|T^n x - T^n y\| - \|x - y\|)$.

2010 *Mathematics Subject Classification.* 47H09, 47H10.

Key words and phrases. Total asymptotically nonexpansive mappings, Δ-convergence and strong convergence theorem, $CAT(0)$ space.

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A deniable authenticated 2 party key agreement protocol from bilinear pairing

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Abstract

The deniability property are useful in applications scenario like email, electronic voting, electronic biding and internet negotiations. The deniable authenticated key agreement(DAKA) protocol enables a participant to deny his/her involvement after the execution of the protocol and enables receiver to identify the source of a message without revealing the identity of the sender to a third party. Still DAKA protocol cannot prevent forgery, chameleon hash will be used to prevent forgery. Thus, we propose an unforgeable efficient (DAKA) protocol using bilinear pairing and chameleon hash. We will also discuss the efficiency of the proposed protocol and show the advantages of the proposed protocol.

Keywords and phrases : Deniable, Authenticated, Key agreement protocol, Bilinear Pairing.
AMS Subject Classification : Primary: 94A60; Secondary: 94A62.

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A Chameleon hash-and-sign paradigm based dynamic group key agreement protocol

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Abstract

We proposed an efficient and provable secure dynamic authenticated group key agreement protocol with two communication round. The security is proven in random oracle model under decision bilinear Deffie-Hellman (DBDH) assumption. The protocol also provides desirable security attributes like forward security and resistant to key control attack. Additionally, Chameleon hash-and-sign paradigm is employed for authentication process which considerably decreases the computation cost.

AMS subject classification: Primary: 94A60; Secondary: 94A62.
Keywords: Chameleon hash-and-sign, dynamic, group key agreement protocol.

1. Introduction

Dynamic group key agreement (DGKA) protocols are required in the situations in which group members are not known in advance and the members may join and leave the group as often possible. In dynamic group, session key must be securely and efficiently updated. So that the leaving/joining members do-not get any information of subsequent/previous session keys. In 1976, Diffie and Hellman [1] gave the first one round two-party key agreement protocol. Joux [4] proposed a one round tripartite key agreement protocol using pairing. Then number of protocol has been proposed by generalizing protocols

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A Provable Secure and Escrow-able Authenticated Group Key Agreement Protocol without NAXOS Trick

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ABSTRACT

We present an ID-based escrow-able authenticated group key agreement (AGKA) protocol which is provably secure in random oracle model. Additionally, the proposed protocol neither involve NAXOS trick nor uses gap assumption. And the security is proven in stronger eCK model. To our best knowledge, the proposed protocol will be first provable Secure and escrow-able ID based authenticated group key agreement protocol without NAXOS trick in eCK model.

Keywords

Group key agreement, identity based, escrow-able, NAXOS trick

1. INTRODUCTION

Authenticated group key agreement(AGKA) protocol provides the participant with a shared group key which is used in different collaborative and group oriented application, to achieve confidentiality as well as authentication. Mostly, group application communication take place over a public(open) network which are usually insecure network. So,a strongly secure AGKA protocol is essential requirement for a group oriented applications. The first group key agreement was proposed by Ingemarsson [15] in the year 1982. After, that a number of group key agreement has been proposed and their security has been extensively studied.Bellary and Rogaway in the year 1993 were first to give the formal security model for key agreement protocols popularly known as BR model. Then there has been several modification and extension to the BR model [2], [3], [8] etc. The most note-able one is the CK model given by CanettiKrawczyk [8], later it was extended as eCK model by LaMacchia et al [16].

But, there exist two big problem in the security proof of the models:(1) Most of these models use Gap assumption [20](artificial oracle) in their security analysis. But,the gap assumption is not practical at all, as it is not possible to construct such a decisional oracle in the real world. Cash et al [10] gave solution to this problem they define the twin Deffie-Hellman problem whose core is the trapdoor test. The trapdoor technique enabled us to implement decisional oracle without use of artificial oracle (2) LaMacchia et al [16] used NAXOS trick to hide the exponent of ephemeral public key, but it is leaked by side-channel attack. Many of the secure AGKA protocol uses NAXOS trick. Hence, should be avoided as recommend by [19] and [22].

So, we propose an AGKA protocol without using gap assumption and NAXOS trick. Further, the proposed protocol is an ID-based escrow-able AGKA protocol. As discussed in [18], the key escrow is desirable property in some close group application where audit trial is legal requirement. An ID-based encryption was first given by Boneh and Franklin [4], since then it is widely used for its simplicity. Hence, to our best knowledge we present a strongly secure ID based AGKA protocol without gap assumption and NAXOS trick in stronger eCK model.

2. OUR CONTRIBUTION

We present an ID-based escrow-able authenticated group key agreement (AGKA) protocol which is provably secure in random oracle model. Additionally, the proposed protocol do not involve NAXOS trick. The proposed protocol has the following features:

—we use the trapdoor test [10] and [13] for security analysis which avoids the Gap Bilinear Diffie Hellman (GBDH) assumption which weakens the security assumption.

—The protocol is based on Computational Bilinear Diffie Hellman (CBDH) assumption in the considerably strong eCK model.

—Most of the key agreement protocols [12], [21] and [23] use signatures for mutual authentication, which considerably degrades the performance of the protocol.The Proposed protocol do not use signature for mutual authentication.

—The proposed protocol is escrow-able and has a better performance especially when we consider certain pre-computations which can be performed off line.

—To our best knowledge this protocol is the first provably secure id based AGKA protocol in eCK model without using gap assumption and NAXOS trick.

3. PRELIMINARIES

The present section briefly defines some of the properties of the bilinear pairing related mathematical problems and the trapdoor test.

Bilinear Pairing: Let $\langle G_1, + \rangle$ be a cyclic additive group generated by P, whose order is a prime p and $\langle G_2, . \rangle$ be a cyclic multiplicative group of the same order p. A bilinear pairing e is a map defined by $e : G_1 \times G_1 \rightarrow G_2$ and have the following properties:

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Provable Secure Identity Based Key Agrement Protocol With Perfect Forward Secrecy

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Abstract

In this paper we propose an efficient identity based authenticated key agreement (AKA) protocol based on bilinear pairing. The proposed protocol is evaluated as well as analyzed in term of efficiency, security and compared with the existing protocol. Further, the security is proved by modular proof technique given by Kudla and Paterson in the random oracle model under the Gap Bilinear Diffie Hellman (GBDH) assumption.

AMS subject classification: Primary: 94A60; Secondary: 94A62.
Keywords: identity based, key agrement, bilinear pairing, modular security technique,perfect forward secrecy.

1. Introduction

Key agreement is one of the fundamental cryptographic primitives for establishing a secure communication in hostile environment. It is a process in which two or more parties establishes a common session key in such a way that not a single party can predetermine the resulting value. Authenticated key agreement (AKA) protocol allows sharing of the session key as well as provides authenticity of the users [6]. An AKA protocol can be

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A Variant of Nadler's Theorem on Weak Partial Metric Spaces with Application to a Homotopy Result

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Abstract The notion of almost partial Hausdorff metric is introduced and a generalization of well-known Nadler's fixed point theorem for multi-valued mappings on weak partial metric spaces using almost partial Hausdorff metric is obtained. A homotopy result is derived as an application.

Keywords Fixed point · Partial metric space · Multi-valued map · Weak partial metric space · Homotopy

Mathematics Subject Classification (2010) 47H10 · 47H04 · 54H25

1 Introduction

Let $CB(X)$ be the family of all nonempty closed and bounded subsets of a metric space (X, d). For $E, F \in CB(X)$, define

$$\mathcal{H}(E, F) := \max\left\{\sup_{a\in E} d(a, F),\ \sup_{b\in F} d(b, E)\right\},$$

where $d(x, E) := \inf\{d(x, a) : a \in E\}$ is the distance between a point x and a set E. It is known that $\mathcal{H}$ is a metric on $CB(X)$, called the Hausdorff metric induced by the metric d.

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Preparation and optimization of chitosan-gelatin films for sustained delivery of lupeol for wound healing

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ABSTRACT

Lupeol entrapped chitosan-gelatin hydrogel (LCGH) films were prepared by solution cast method by blending chitosan and gelatin solution using glycerol as plasticizer, followed by crosslinking with glutaraldehyde. LCGH films were characterized by scanning electron microscopy (SEM), Fourier transform infrared spectroscopy (FTIR), differential scanning calorimetry (DSC), equilibrium water content (EWC), Water vapor transmission rate (WVTR) and *in vitro* release studies. SEM confirmed presence of the uniform porous network of both blank and LCGH films. The incorporation of lupeol in hydrogel was confirmed FTIR and DSC. The LCGH film was smooth, flexible, non-brittle and showed excellent swelling ability. EWC (85.40%) and WVTR (2228 ± 31.8) met the condition of ideal wound dressing. The biological activity of lupeol was assessed by antioxidant and antibacterial assay. Antioxidant assay confirmed that lupeol and LCGH film have excellent antioxidant properties by scavenging both radicals at steady increasing rate which increases with time due to steady release of lupeol. Antibacterial activity of lupeol in LCGH film was found to be retained as assessed by disc diffusion method. Cell viability was evaluated by MTT assay with NIH/3T3 fibroblast cells. The MTT assay showed that the CGH film evidently offered acceptable cell viability and non-toxicity. These observations depicted that chitosan/gelatin hydrogel film can be an ideal delivery system for sustained released of lupeol and LCGH film for enhanced wound healing.

1. Introduction

Varieties of dressings have been developed as drug delivery systems for management of wounds in the past. Over the last two decades, progressions in the understanding of pathophysiology of wounds has led to substantial biomedical innovations in the treatment of wounds including plant derived bioactives, drugs, growth factor, skin substitutes, and scaffolds. It has been suggested that wound healing is a complex series of cellular events that rebuild and restore the integrity and function of damaged skin [1]. Inflammatory phase is key phase in wound healing process. Various pro-inflammatory cytokines, growth factor and cells initiate proliferation and migration of new cells. Free radicals and reactive oxygen species released in this phase in presence of microbes at the wound site causes severe complications including infection, delayed healing process and severe wound dehydration. Dehydration interrupts ideal moist healing environment and further delay wound healing [2].

Major limitation with traditional wound dressing and formulation as cream, gauze, cotton wool, gels etc are short residence time, leakage, poor patient compliance, least preservation of moist environment [3]. Modern wound dressing like hydrogels, hydrogel film provides moist environment, prevent tissue dehydration and cell death, enhanced migration of inflammatory cells and growth factor. It also allow gaseous exchange, enhanced angiogenesis, act as a barrier to microorganisms, remove excess exudates, have excellent biocompatibility and promote a rapid healing of wound [4]. These characteristics made hydrogel film close to ideal wound dressing.

Hydrogels are three-dimensional polymer complexes prepared by natural or synthetic polymer (hydrophilic) chains by physical or chemical crosslinking. It smartly responds to the various changes of temperature, ionic strength, pH of medium and presence of any enzyme. In the swollen form, they are soft and elastic, mimicking the tissue [5,6]. Hence these are widely used in different field of pharmaceutical and biomedical engineering, drug delivery devices, artificial skin, and wound dressing production [7].

Chitosan and gelatin are the primary components used in preparation of wound dressing with the film forming nature [8]. Chitosan

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Anti-inflammatory and associated analgesic activities of HPLC standardized alcoholic extract of known ayurvedic plant Schleichera oleosa

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Development and optimization of apigenin-loaded transfersomal system for skin cancer delivery: in vitro evaluation

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Abstract

The aim of this work is to apply Box-Behnken design to optimize the transfersomes were

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Recent advancements in liposomes targeting strategies to cross blood-brain barrier (BBB) for the treatment of Alzheimer's disease

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Targeting of herbal bioactives through folate receptors: a novel concept to enhance intracellular drug delivery in cancer therapy

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Abstract

Author keywords

Abstract

Targeted drug delivery through folate receptor (FR) has emerged as a most biocompatible, target oriented, and non-immunogenic cargoes for the delivery of

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Medical management of glaucoma: focus on ophthalmologic drug delivery systems of timolol maleate

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ABSTRACT

Eye is a vital organ of our body and any complication not only poses the risk of serious medical condition but also economic burden on the individual. Timolol maleate is one of the preferable therapeutic agents for the management of glaucoma. Globally, eye drops are among the most common and popular conventional formulations, but they are also associated with some limitations in terms of therapeutic response, bioavailability, dosing frequency and poor patient compliance. Present paper gives an overview of the drug delivery systems developed for management of glaucoma, advances and novel approaches with special emphasis on timolol drug delivery.

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Eye; glaucoma; ocular; ocular drug delivery; ophthalmic; timolol; topical

Introduction

Glaucoma is the leading cause of blindness worldwide. It has been anticipated that approximately 80 million people will be affected by glaucoma and near to 11 million population will move towards loss of vision by the year 2020 (National Eye Institute 2012, Quigley and Broman 2006). It is also projected that in the next 15 years, approximately 50% population will be affected with glaucoma (Gooch et al. 2012, Quigley and Broman 2006).

Glaucoma is characterized by the increase in intraocular pressure (IOP) above the normal level. Glaucoma can be of various types, namely open angle, closed angle or congenital. Each type of glaucoma can be further subdivided into primary and secondary type of glaucoma which is indicated when no cause for glaucoma can be identified or underlying ocular or systemic conditions cause glaucoma (Shields et al. 1996). Additionally, glaucoma is characterized not only by the ganglion cell apoptosis but also by apoptosis of trabecular meshwork (TM) cells. In fact, the IOP increases just because of the malfunctioning of these cells (Saccà et al. 2007, 2015). Almost 60–70% of the people are affected by primary open angle glaucoma (POAG) that leads to degeneration of optic nerves and ultimately loss of vision (Leske 2007). POAG affects three target ocular tissues, where the liquid filled area inside the eye cavity connects with iris and cornea. The primary layer is the TM in the anterior portion of the eye (Saccà and Izzotti 2008). Thereafter the secondary tissue of targeting is optic nerve head, which is present in the retinal ganglion cells and consist of head into the peripheral segment of iris (Howell et al. 2007). Moreover, the tertiary is visual cortex which brings the central nervous system of primate and affects the lateral geniculate nucleus (Gupta et al. 2006). Although glaucoma is the disorder of mounting IOP and extend towards the posterior part along with neuronal sequence prior to visual cortex and these mechanisms lead to cell death. This increment in IOP leads to neurodegenerative disorder followed by degeneration of retinal ganglion, which is responsible for generation of retinal nerves (Gooch et al. 2012, Lavik et al. 2011). Maintenance of optimum level of IOP is highly critical along with administration of potential neuro protective agent (Chang and Goldberg 2012, Krupin et al. 2011, Lambiase et al. 2009). Majority of the cases are associated with high IOP and decreasing IOP eliminates or greatly reduces degeneration in most cases, including cases in which the IOP is in the normal range but optic neuropathy occurs.

Ocular diseases like glaucoma, conjunctivitis, and dry eye syndrome require frequent drug administration. But, poor ocular bioavailability of drugs (<1%) from conventional eye drops is a grave concern This is mainly attributed to the precorneal loss factors that include rapid tear turnover, nonproductive absorption, transient residence time in the cul-de-sac, and the relative impermeability of the drugs to corneal epithelial membrane (Figure 1).

Eye-drops constitute approximately 90% of all the topically applied ophthalmic drug formulations. Although, eye-drops are convenient and well accepted by patients, nearly 95% of the drug contained in the drops is lost due to absorption through the conjunctiva or through the tear drainage. The traditional ophthalmic solution, suspension, and ointment are no longer adequate to combat various ocular ailments (Mysore et al. 1996). Various conventional marketed products of timolol maleate are listed in Table 1. A major fraction of the drug eventually enters the blood stream and is instrumental in triggering side effects (Bourlais et al. 1998, Lang 1995, Segal 1991).

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ORIGINAL PAPER

PLGA nanoparticles for ocular delivery of loteprednol etabonate: a corneal penetration study

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ABSTRACT

The purpose of the present study was to develop loteprednol etabonate (LE) loaded poly(D,L-lactide co-glycolide) (PLGA) nanoparticles (NPs) and study their penetration profile into the excised goat cornea. In the present study, LE loaded PLGA NPs were prepared by solvent evaporation with high speed homogenization method and the penetration profile was studied using confocal laser scanning microscopy (CLSM). Rhodamine (Rd) was used as a fluorescent marker to prepare Rd-LE-PLGA-NPs. The NPs were characterized for particle size, X-ray diffraction (XRD), differential scanning calorimetry (DSC), transmission electron microscopy (TEM), drug entrapment, and permeation profile. Intense fluorescence observed across the depths of goat corneal tissue suggested an improved penetration profile of NPs. The entrapment efficiency and mean diameter of the optimized formulation (F5) were found to be 96.31 ± 1.68% and 167.6 ± 0.37 nm, respectively. These findings indicate that LE loaded PLGA NPs may serve as a potential drug carrier for ocular administration in eye disease.

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CLSM; corneal penetration; loteprednol etabonate; nanoparticle; ocular delivery; PLGA

Introduction

The treatment of ophthalmic medical complications has been achieved with various steroidal anti-inflammatory agents. Betamethasone sodium phosphate has been the drug of choice for the management of ocular inflammation, but this conventional steroidal anti-inflammatory agent, has the propensity to increase intra-ocular pressure (IOP) (Yasueda et al. 2004). Loteprednol etabonate (LE) is a topical steroidal anti-inflammatory agent used for the effective management of ocular inflammation. For topical ophthalmic applications, liquid eye drops like suspension, emulsion and solution are favored due to ease in application with minimal alteration in vision. But these formulations are associated with some limitations like rapid drainage via nasolacrimal route, quick dilution by tearing and systemic absorption which pilot the systemic side effects (Rafie et al. 2010). The constraints posed by the pharmacokinetic profile of the drug clearly warrant the need for novel carriers to overcome these barriers. Polymeric nanoparticles (NPs) offer promising benefits in terms of biodegradability, biocompatibility, non-toxic, and sustained drug release profile (Soppimath et al. 2001). Biodegradable polymers are widely studied for the development of various nanoparticulate carrier systems for ophthalmic application, primarily due to their potential to improve the residence time of formulation on precorneal surface (Kaur et al. 2012). Poly(D,L-lactide-co-glycolide) (PLGA) is a biodegradable polymer which is approved by FDA for ophthalmic use and have large potential for ocular drug delivery applications (Soppimath et al. 2001).

Confocal laser scanning microscopy (CLSM) is a distinctive technique for direct visualization of penetration pathway and depth of penetration of the carriers in excised tissue (Sarwa et al. 2014). This technique is devoid of mechanical section and a laser beam is used as the energy source which acts as an optical knife to section tissue at multiple depths. It also allows non-invasive visual evaluation of dynamic changes in real time and the images of optical sections can be captured with reasonable time-resolution. A fluorescent marker is used to label the sample which on interaction with the laser beam moves to an excited state and emits light of a specific wavelength (Sarwa et al. 2014). Goat cornea is a well-established model for the permeation as well as depth of penetration studies and is widely reported (Ahuja et al. 2006, Pescina et al. 2015, Yadav and Ahuja 2010). Goat cornea has been used for permeation studies of various nanocarriers like NPs (Gupta et al. 2010, Jain et al. 2011, Katara and Majumdar 2013, Kaur et al. 2012, Zhang et al. 2009) and aqueous drops (Mohanty et al. 2013, Rathore and Majumdar 2006). Based on the above facts and considerations, the present study focused on the development of PLGA loaded LE NPs and their ability to transform drug permeation and penetration profile was assessed in excised goat cornea using confocal laser scanning and optical digital microscope.

Materials and methods

Materials

Loteprednol etabonate and PLGA were kindly supplied as a gift sample by M/s Sun Pharma Advance Research Center

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BENTHAM SCIENCE

Biofilm-mediated Antibiotic-resistant Oral Bacterial Infections: Mechanism and Combat Strategies

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Abstract: Oral diseases like dental caries and periodontal disease are directly associated with the capability of bacteria to form biofilm. Periodontal diseases have been associated to anaerobic Gram-negative bacteria forming a subgingival plaque (*Porphyromonas gingivalis, Actinobacillus, Prevotella and Fusobacterium*). Biofilm is a complex bacterial community that is highly resistant to antibiotics and human immunity. Biofilm communities are the causative agents of biological developments such as dental caries, periodontitis, peri-implantitis and causing periodontal tissue breakdown. The review recapitulates the latest advancements in treatment of clinical biofilm infections and scientific investigations, while these novel anti-biofilm strategies are still in nascent phases of development, efforts dedicated to these technologies could ultimately lead to anti-biofilm therapies that are superior to the current antibiotic treatment. This paper provides a review of the literature focusing on the studies on biofilm in the oral cavity, formation of dental plaque biofilm, drug resistance of bacterial biofilm and the anti-biofilm approaches as biofilm preventive agents in dentistry, and their mechanism of biofilm inhibition.

Keywords: Dental caries, periodontal disease, anti-biofilm approaches, antibiotic.

1. INTRODUCTION

Bacteria biofilms are formed when unicellular organisms assemble to form a community that is attached to a solid surface and is broadly defined as adherent microorganisms within a polymeric matrix, typically encompassing exopolysaccharide matrix that develops into a complex community [1]. Biofilms form on medical implants such as catheters, artificial hips and contact lenses [2]. Oral bacterial infection such as gingivitis, dental caries, periodontitis, and peri-implantitis, rather than any single organism skidding past the host defence causes periodontal tissue breakdown [3, 4]. The biofilms colonizing the tissues of the mouth are continuously subjected to fluctuations in the environmental conditions [5]. Dental plaque is a tooth-borne biofilm that initiates periodontal disease and dental caries [6]. Dental plaque accumulates preferentially at stagnant sites that afford protection from the vigorous removal forces that apply in the mouth [7]. Biofilms bring about profound changes in microorganisms, which may therefore exhibit important differences from their planktonic counterparts, susceptibility to antimicrobial agents, including physiological properties, interaction with host tissues and immunological response [3]. Biofilm constitutes a protected mode of microbial growth that allows survival in a hostile environment. A typical development of biofilm- includes several stages, *i.e.*, attachment to a surface, establishment of microcolonies, expansion of young biofilm, differentiation of structured mature biofilm, and dispersal of mature biofilm (Fig. 1). Bacterial biofilms are highly resistant to antibiotic treatment and immune responses. Therefore, once a bacterial biofilm infection is established, it becomes difficult to eradicate them [8].

2. BIOFILM IN ORAL CAVITY

The human oral cavity is a highly dynamic environment inhabited by more than 750 microbial species [9]. One cubic millimetre of dental plaque contains about 100 million bacteria and serves as a persistent reservoir for potential pathogens [9, 10]. The biofilm associated to oral cavity is complex and is formed by several cell layers (100-300) [3]. A group of gram negative anaerobic bacteria are associated with periodontitis viz., *Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia, Bacteroides forsythus, Fusobacterium nucleatum, Streptococcus intermedius, Treponema denticola, Eikenella corrodens* whose presence are correlated with increased probing depth and greater risk of progressive attachment loss [10, 11].

Dental biofilms are three-dimensional structured microbial communities that colonize the surfaces of the teeth, exist in a dynamic equilibrium with host defences and are generally compatible with the integrity of the tissues they colonize [11-13]. Biofilm in the form of supragingival and subgingival plaque is the etiologic agent in the dental caries and periodontitis [13, 14]. The development and advancement of such pathologies are linked with the increased resistance to bacterial biofilm [4]. Antibiotic resistance of bacteria in biofilms is easily reproduced *in vitro*, illustrating that host factors are not pertinent for this phenomenon of biofilm defence [14, 15].

2.1. Formation of Dental Plaque Biofilms

Dental plaque formation occurs through an ordered sequence of events, resulting in structurally and functionally organised species rich microbial biofilm. The major challenges in the control of biofilm-associated infection are to restrain microbial adhesion and/or biofilm formation [15, 16]. The mechanism of attaching to surfaces follows an organised sequence starting from deposition of specific adhesive protein that binds to the surface reversibly followed by successive deposition of cells that creates a strong binding by cell to cell cohesion and cell-binding proteins [16, 17].

There are certain distinct phases in plaque formation:

- Adsorption of host and bacterial molecules to tooth surface: When molecules are originated mainly from saliva and absorbed onto the tooth surface developed pellicle.
- Passive transfer of oral bacteria to the tooth surface: Reversible adhesion, which involves interaction between specific

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BENTHAM SCIENCE

Loteprednol Etabonate Nanoparticles: Optimization via Box-Behnken Design Response Surface Methodology and Physico-chemical Characterization

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Abstract: ***Background***: Abstract: The objective of the present work was to prepare and optimize the loteprednoletabonate (LE) loaded poly (D,L-lactide co-glycolide) (PLGA) polymer based nanoparticle carrier. The review on recent patents (US9006241, US20130224302A1, US2012/0028947A1) assisted in the selection of drug and polymer for designing nanoparticles for ocular delivery applications.

Methods: The nanoparticles were prepared by solvent evaporation followed by high speed homogenization. Biodegradable polymer PLGA (50:50) grade was utilized to develop various formulations with different drug:polymer ratio. A Box-Behnken design with 33 factorial design was selected for the present study and 17 runs were carried out in totality. The influence of various process variables (viz., polymer concentration, homogenization speed and sonication time) on the characteristics of nanoparticles including the *in vitro* drug release profile were studied.

Results: The nanoparticulate formulations were evaluated for mean spherical diameter, polydispersity index (PDI), zeta potential, surface morphology, drug entrapment and in-vitro drug release profile. The entrapment efficiency, drug loading and mean particle size were found to be 96.31±1.68 %, 35.46±0.35 % and 167.6±2.1 nm respectively.

Conclusion: The investigated process and formulation variables were found to have significant effect on the particle size, drug loading (DL), entrapment efficiency (EE), and *in vitro* drug release profile. A biphasic *in vitro* drug release profile was apparent from the optimized nanoparticles (NPs) for 24 hours.

Keywords: Box-behnken design, corticosteroid, loteprednol etabonate, nanoparticle, optimization, ocular delivery, PLGA, surface response methodology.

1. INTRODUCTION

Loteprednol etabonate (LE) is a new generation corticosteroid having ester functional group at C-20 position as compared with the traditional corticosteroid which has a ketone group. It is used in the treatment of ocular inflammation, and exhibits less toxicity as compared to conventional corticosteroids [1]. Chemically it is chloromethyl 17-ethoxycarbonyloxy- 11-hydroxy- 10,13-dimethyl-3-oxo- 7,8, 9,11,12,14,15, 16-octahydro- 6H-cyclopenta[a] phenanthrene-17-carboxylate (Fig. 1). It is a steroidal anti-inflammatory agent and acts by the mechanism of generation of phospholipase A2 inhibitory proteins (Lipocortins), which restrict the biosynthesis of inflammatory agents, including prostaglandins and leukotrienes by inhibition of their precursor arachidonic acid [2].

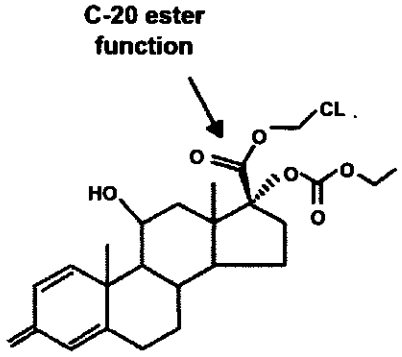

Fig. (1). Molecular structure of Loteprednol etabonate (LE).

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Application of nanocarrier-based drug delivery system in treatment of oral cancer

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ABSTRACT

Oral cancer includes cancer of lips, oral cavity and oropharynx. Oral cancer is the sixth most life-threatening disease affecting 65% of population. The delivery of cytotoxic chemotherapeutic anticancer drugs is a challenging task due to unfavorable properties. Both synthetic chemotherapeutic agents and herbal constituents are used in treatment of oral cancer. The purpose of present article is to overcome the limitations through concept of nanotechnology and conjugation approach. Also, it will provide better therapeutic effect and sustain long life of healthy and recovered cells. Moreover, development in this area will raise opportunities for the oncologist, researchers and pharmaceutical scientists. This review summarizes the clinical findings and patents on various oral anticancer drugs for effective pharmacotherapeutics.

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KEYWORDS
Oral cancer; nanotechnology; oropharyngeal cancer; conjugation; targeted delivery

Introduction

In most of the developing countries, oral cancer is one of the major causes of increasing mortality. Not only men but women's also suffers from oral cancer with a higher risk. This is due to the increasing addictive habits and several cultural and geographical factors. Oral cancer includes cancer of lips, oral cavity and oropharynx. From 2005, every year, an article is published about the facts of oral cancer, its prevalence, mortality rate and prevention aspects. This shows that there is an alarming need to think and act on oral cancer and its scenario [1].

Oral and pharyngeal cancer is the sixth or seventh most prevalent cancer throughout the world. The global epidemiology of oral malignancies/cancers/tumors is discussed in brief by Warnakulasuriya et al. (2009) [1]. Most of the oral cancers (≥90%) originating in the tissues that line the mouth and lips and thus are oral squamous cell carcinoma (OSCC). They look very similar under the microscope and are malignant type which tends to spread rapidly. These oral malignancies are heterogeneous in nature and arise in various parts of the oral cavity due to predisposing factors, prevalence and treatment outcomes. Of all the oral cancers, cancer of lips and oral cavity are preventable [2].

Primary oral cancer is finally turned into second primary cancer of aerodigestive tract (oral cavity, pharynx and esophagus). The countries which are at higher risk of oral cancer include India, Pakistan, Bangladesh, South Africa, Asia, Thailand, Canada and Australia. In India, Chennai, Gorakhpur and Uttar Pradesh are more prone to risk of oral carcinomas, malignancies and tumors.

There are several agencies working for the prevention, care and treatment of oral cancer throughout the world [3]. Some of these are:

- National Institute for Clinical Excellence (NICE), UK,
- International Agency for Research on Cancer,
- National Institute of Health and the American Dental Association, and
- WHO Global Oral Health Programme.

Causes of oral cancer

The causes of oral cancer are well-known. It occurs mainly due to lack of hygienic conditions, consumption of tobacco and related products, alcohol consumption, certain hormonal factor and infectious agents. Awareness about drawbacks of addictive substances, educating the illiterate persons is a mandatory requirement at broader level to combat and decrease the prevalence of oral cancer in society [4].

Human papilloma virus (HPV) mainly type 16 and type 18 are known risk factors and independent causative factor for oral cancer. This is causing not only huge impact on the health of the community but also the economy of the countries. The distribution of oral cancer in the oral cavity is shown in Figure 1.

Percentage statistics and prevalence of oral cancer

Globally, India is at the highest to report prevalence of oral cancers. Every year 75,000–80,000 new cases of oral cancer

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Newer Substituted Indolyl-Pyrazoline Derivatives as Anti-Inflammatory Agents

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Abstract

A novel series of nine indolyl pyrazoline pharmacophore were synthesized by the reaction of hydrazine hydrate derivatives with the synthesized chalcones (C4,C5,C6). The chalcones were synthesized by the Claisen Schimdt condensation method. These pyrazoline derivatives were evaluated for anti-inflammatory activity using Carrageenan induced paw oedema method. The activity profile reveals that the unsubstituted N1 of these indolyl pyrazoline was found to give better activity than other N1- sustituted indolyl pyrazolines. The reference drug for the inflammatory activity was Indomethacine.

Keywords:

Antiinflammatory; Claisen schimdt reaction; Chalcones; Pyrazoli ne; Indolyl pyrazoline

Introduction

The pyrazolines are the five membered heterocyclic compounds which has attracted the attentions of organic chemists in the past decades due to their immense biological applications. These compounds are generally prepared from the reactions of chalcones with hydrazine derivatives under the ordinary conditions. The present derivatives contains indole moiety. Literature survey revealed that incorporation of indole moiety in pyrazoline ring enhanced anti-inflammatory activity. Indole alkaloids have been proved to be medicinally important natural compounds. Indole ring was an important template for drug design such as the classical NSAIDS indomethacin and indoxole. Further indole derivatives had been reported to possess number of potent biological activities including analgesics, antipyretics antifungal, anti-inflammatory, anthelmintic, cardiovascular, anticonvulsant, antimicrobial, and selective COX-2 inhibitory activities. Hence the efficient synthesis of novel substituted indolyl derivatives compounds still represents highly pursued target. The substitution of heterocyclic moiety at the 3-position of indole ring markedly influences the anti-inflammatory activity [1].

Promoted by the number of research studies, the present article aimed at gathering the two bioactive entities (i.e. indole and pyrazole) into one compact structure and evaluating its anti-inflammatory activity.

Result and Discussion

Chemistry

The 3-indolaldehyde is 3H-indene-1-carbaldehyde, prepared using Vielsmeier Haack method was utilized for synthesis of chalcones by reacting with selected aryl ketone. Chalcone [1] is a generic term given to compounds bearing the 1, 3-diphenyl-2-propen-1-one framework and belong to the flavonoid family [2-4]. Chemically they are open-chain flavonoids in which the two aromatic rings are joined by a three carbon α, β-unsaturated carbonyl system. We had three synthesized chalcones (E)-2-((1H-indol-3-yl) methylene) cyclohexanone (C3); (E)-3-(1H-indol-3-yl)-1-(4-nitrophenyl)prop-2-en-1-one (C 4) and (E)-3-(1H-indol-3-yl)-1-phenylprop-2-en-1-one (C5) which were synthesized [5] by using 3-indolaldehyde with cyclohexanone, p-nitro phenylacetone and phenylacetone respectively. The reaction which produces chalcones is base catalysed claisen schimdt condensation reaction [6-10]. Formed chalcones than made to react with hydrazine hydrate, phenyl hydrazine and isonicotinyl hydrazine respectively to produce different derivatives with different N1 substitution. The scheme 1 represents the scheme of reaction for the synthesis of indolyl pyrazoline. The substituted hydrazine hydrate had synthesized the substituted pyrazoline derivatives (P1, P2, P3) (Table 1). The table enlisted these substituted derivatives as compounds 7a-7g. The completion of reaction was monitored by TLC using acetic acid: ethyl acetate as solvent system in 1:1 and the spots were visualized by exposure to iodine vapour or spraying dilute sulphuric acid. The structures of synthesized pyrazoline derivatives (7a-7i) were confirmed on the basis of IR, 1H NMR, Mass Spectroscopy and elemental analysis. The pharmacological activity taken over was anti-inflammatory by the Carrageenan induced paw oedema method (Figure 1).

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Development and validation of multivariate calibration methods for simultaneous estimation of Paracetamol, Enalapril maleate and hydrochlorothiazide in pharmaceutical dosage form

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ABSTRACT

Three multivariate calibration spectrophotometric methods were developed for simultaneous estimation of Paracetamol (PARA), Enalapril maleate (ENM) and Hydrochlorothiazide (HCTZ) in tablet dosage form; namely multilinear regression calibration (MLRC), trilinear regression calibration method (TLRC) and classical least square (CLS) method. The selectivity of the proposed methods were studied by analyzing the laboratory prepared ternary mixture and successfully applied in their combined dosage form. The proposed methods were validated as per ICH guidelines and good accuracy; precision and specificity were confirmed within the concentration range of 5–35 μg mL^{-1}, 5–40 μg mL^{-1} and 5–40 μg mL^{-1} of PARA, HCTZ and ENM, respectively. The results were statistically compared with reported HPLC method. Thus, the proposed methods can be effectively useful for the routine quality control analysis of these drugs in commercial tablet dosage form.

1. Introduction

Paracetamol (PARA) is chemically N-(4-hydroxy) acetanilide and it is commonly used for analgesic, antipyretic and anti-inflammatory activity [1,2]. Hydrochlorothiazide (HCTZ) is chemically 6-chloro-3, 4 dihydro-2H-1, 2, 4-benzothiadiazine-7-sulfonamide 1, 1-dioxide and it is a potent diuretic by inhibiting reabsorption of chloride and other ions [3,4]. Enalapril maleate (ENM) is chemically (S)-1-(N-(1-(Ethoxycarbonyl)-3-phenylpropyl)-L-alanyl)-Lproline (Z)-2-butene dioate an angiotensin-converting enzyme (ACE) inhibitor, use in management of hypertension [5]. Structures of PARA, HCTZ and ENM respectively were shown in Fig. 1.

The combinations of these drugs are frequently prescribed for treatment of blood pressure, fluid retention and heart failure. Furthermore, it is used to increase the pain threshold [6,7]. Several studies suggested that use of NSAIDS is associated with cardiovascular risk i.e. increase in blood pressure [8,9]. However, most of the hypertensive patients who are suffering from osteoarthritis requiring chronic pain relief, particularly in case of increased risk of hypertensive and atherosclerotic complications [10,11]. Though, Paracetamol belongs to NSAIDS hence, it can also be associated with risk of increase in blood pressure but there is no agreement on this issue [12]. Therefore, Paracetamol appears to be one of the best options for hypertensive patients requiring analgesia.

Present study involves with simultaneous estimation of marketed formulation and laboratory prepared mixture of Paracetamol, Hydrochlorothiazide and Enalpril maleate. The tablet contains variable amount of ingredients due to their recommended therapeutic dose; 325 mg Paracetamol, 25 mg Hydrochlorothiazide and 10 mg Enalpril maleate. The variable amount and different chemical properties of drugs in same formulation make the process tedious for the routine analysis [13]. Furthermore, the resolution of the mixtures containing two or more different analytes without prior chemical separation is major problems of the conventional analytical techniques. Hence, there is need for development of new methods for simultaneous estimation of multicomponent systems which have overlapping spectra.

The multivariate techniques such as classical least-squares, Tri-linear regression equation and Multi linear regression equation have been extensively used due to some advantages, i.e. rapid data processing related to the concentrations and absorbance values of compounds which have spectral interference [14]. Furthermore, minimize the errors of calibration model by measuring the absorbance of the zero order spectra at various points within the selected wavelength range. It gives satisfactory resolution for multicomponent systems and eliminates the interference problems. Multivariate calibration spectrophotometric methods were found to increase the selectivity and sensitivity by applying the mathematical algorithms methodology [15]. Hence, these methods are a power full technique for the quantitative analysis of these tablet formulations and laboratory prepared mixture.

Various methods have been adopted for estimation of Paracetamol and its combinations in pharmaceuticals dosage form and biological fluids, which includes fluorimetry [16], colorimetry [17], UV-

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Optimization of RP-HPLC Method for Simultaneous Estimation of Lamivudine and Raltegravir in Binary Mixture by Using Design of Experiment

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ABSTRACT
A simple, sensitive, cost effective and robust RP-HPLC method for the simultaneous estimation of the Lamivudine (LAM) and Raltegravir (RAL) in laboratory prepared binary mixture was developed, optimized and validated. Separation was achieved on phenomenex C18 column (150 X 4.6 mm id, 5µ particle size) and mobile phase was composed of 75% methanol: 15% Acetonitril: 10 % (0.05mM) phosphate buffer (at pH 3.0), with flow rate 1.2 ml/min at 254nm. Developed method was optimized by using Box Behnken Design (BBD) in response surface methodology (RSM). The independent variables such as the concentration of methanol, pH in mobile phase and flow rate were selected for the optimization and Retention time (Rt) were used as responses for both drugs. Derringer's desirability function was used to concurrently optimize the selected responses. The LOD and LOQ were found to be 1.04 and 3.18 µg/ mL for LAM and 0.36 and 1.08µg/mL of RAL. The percentage recoveries were found to be less than 2% for LAM and RAL. Retention time of LAM and RAL was 3.13±0.07 and 7.27±0.01 minutes respectively.
Conclusion: The developed and optimized method was fully validated. The validated method further can be potentially used for estimation of these drugs in combined dosage form.
Keywords: response surface methodology, box behnken design, RP-HPLC, lamivudine, raltegravir

INTRODUCTION

Lamivudine (LAM) is chemically (2R, cis)-4-amino-1-(2-hydroxymethyl-1, 3-oxathiolan-5-yl)-(1H)-pyrimidin-2-one. It is an HIV-1 nucleoside analogue reverse transcriptase inhibitor [1, 2]. Similarly, Raltegravir (RAL) is chemically N-[(4-Fluorophenyl) methyl]-1,6-dihydro-5-hydroxy-1-methyl-2[1-methyl-1-[[(5-methyl-1,3,4-oxadiazol-2-yl) carbonyl] amino] ethyl]-6-oxo-4 pyrimidine carboxamide mono potassium salt. It is a human immunodeficiency virus (HIV) integrase strand transfer inhibitor [1, 2]. The chemical structure of LAM and RAL were shown in **Figure 1.**

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RJPT

RESEARCH ARTICLE

Synthesis and Characterization of Indolyl-pyrazoline and their Evaluation of anti-inflammatory Activity

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ABSTRACT:
In the present work, ten novel 3-(4,5-dihydro-3-(naphthalen-1-yl)- N_1-substituted -pyrazol-5-yl)-1H-indole [1,1a,1b.1e,2] and 3-(4,5-dihydro-3-(pyridin-3-yl)-N_1-substituted-pyrazol-5-yl)-1H-indole [5,5a,5b,5e.6] were synthesized by condensation between substituted pyrazoline and substituted hydrazine in the presence of glacial acetic acid. The synthesized compounds were evaluated for their anti-inflammatory activity using carrageenan-induced paw oedema method and compared to the well known NSAID indomethacin as a standard drug. The entire synthesized compounds were characterized by elemental analysis, IR, 1H NMR and mass spectroscopy.

KEYWORDS: Anti-inflammatory activity, Carageenan induced paw oedema method, indole, pyrazoline, indolyl pyrazoline.

1. INTRODUCTION:

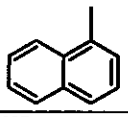
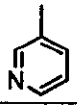
Encouraged by the diverse biological activities of pyrazoline compounds, we had decided to prepare a new series of 2- pyrazoline derivatives, having different kinds of heterocyclic moieties fused on it. 2-pyrazoline is proved to be a 'Multiactivity Ring'. This will provide us good series of pharmacologically active indole and pyridine fused to pyrazoline. NSAIDs is continue to be a group of choice for researchers due to its wide pharmacological use and greater life expectancy ,it is not surprising that the development of newer NSAIDs continue to be in rapid pace.

In the view of the various activities reported for the compound possessing pyrazoline moiety. In the present study we attempted to synthesize pyrazoline along with other heterocyclic rings such as indole, naphthyl and pyridinyl, fused to form pharmacologically active derivatives, to improve the activities.

Chalcones were synthesized by reacting aryl aldehyde with aryl ketone by applying claisen schimdt method[1]. The derivatives were confirmed by determining melting point, TLC, Elemental analysis and by performing spectral studies.

The aforementioned numerous pharmacological activities of 2-pyrazoline prompted us to study the in vivo anti inflammatory activities of some important indolyl pyrazoline with different aromatic groups.

Graphical abstract:

Groups	Intermediates	Series of synthesized derivatives
If R= 	C1	Series 1 1,1a,1b,1e,2
If R= 	C2	Series 5 5,5a,5b,5e,6

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REVIEW ARTICLE

Glimpses of Ethnopharmacological Approaches to Treat Acne

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ABSTRACT:

Skin ailments are the commonest problem in the world. Mainly, all cultures in the world have believed that to use medicinal plants for skin diseases. Acne vulgaris is developed by abnormalities in sebum. it is one of the considerable problem among skin diseases. Its clinical manifestations involve both inflammatory (papules, pustules, and nodules) and non-inflammatory (comedones, open and closed) lesions. Some of the enviromental microbes such *as Propionibacterium acne and Staphylococcus epidermdis,* triggers the signs of the acne vulgaris. This type of skin disorder is mostly found in adolescents but also occur in all age group. Almost 95% of worldwide population affected from acne vulgaris in their life time. The main objective of this review is to compile exhaustive literature and pharmacological aspects of plants used for the treatment of acne that has been found to be very safe and effective. Plants have been selected possess active phytochemical constituents and have therapeutically significant value.

KEYWORDS: Acne vulgaris, Herbal treatment, *Propionibacterium acnes, Staphylococcus epidermidis.*

1. INTRODUCTION:

The largest organ of the human body is skin. The skin protects us from the external environment and helps us to regulate the body temperature. It allows the sensation of touch, warmth, and cool. Most of the skin diseases arise from the layers of the skin. Skin contains number of cells and tissues and it is divided into three main layers such as epidermis, dermis, and hypodermis. The epidermis is the outer most layer of the skin and it provides a water proof barrier and makes our skin tone. The dermis is underneath the epidermis, and it contains connective tissues, hair follicles, and sweat glands. And the hypodermis is made up of connective tissue and fat. The size and colour of the skin differs from individual to individual. The skin plays an important role in overall function of the body [1]. Figure 1 represented the normally occurring skin diseases.

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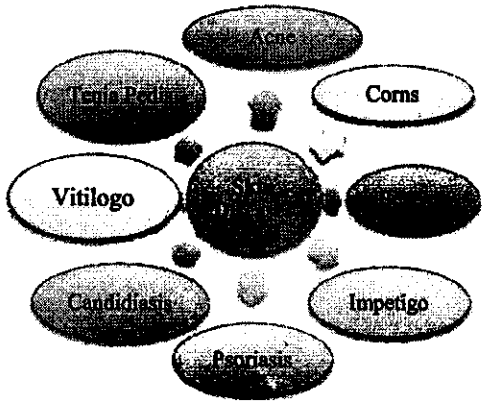

Figure 1: Commonly occurring skin diseases

Numbers of infectious agents are responsible for skin diseases[2]. Acne is the most common chronic inflammatory skin diseases of the pilosebaceous units [3]. It is believed that it is the most common diseases of the skin [4]. Approximately 95% people in the world suffer from acne vulgaris in their lifetime [5]. Papules, pustules,

17-19

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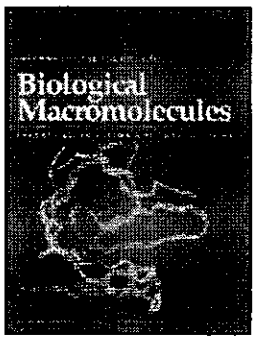

In vitro and In vivo characterization of quercetin loaded multiphase hydrogel for wound healing application

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Research Article

Folate-conjugated Superoxide Dismutase Adsorbed Over Antioxidant Mimicking Nanomatrix Frameworks for Treatment of Rheumatoid Arthritis

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ABSTRACT

Rheumatoid arthritis (RA) is an autoimmune disease occurring in larger population, characterized by synovial inflammation followed by destruction of joint. Major concerned factor for cause of RA has been related to oxidative stress due to environmental toxicity and immune imbalance. Reactive oxygen species (ROS) generated from macrophages communes series of oxidation at cellular and genetic level and leads to generation of inflammatory cytokines for provoking inflammation in RA. Superoxide dismutase (SOD) and catalase (CAT) are supposed to be potential antioxidant enzymes to scavange free radicals. However, many clinical studies report reduced potency of enzyme due to lack of its targeting efficacy. Therefore, the aim of the work involves development of nanomatrix mimicking as catalase over which folate-linked superoxide dismutase (SOD) was adsorbed for a macrophage targeting. The developed formulation was optimized, characterized for morphological studies, enzyme loading efficiency, protein activity, and *in vitro* drug release. Quantification of interleukin 6 (IL-6) was performed by indirect enzyme linked immunosborent assay (ELISA) over macrophage cell lines to determine *in vitro* treatment efficacy. It is concluded that the prepared system can act as enzyme reservoir to deliver acid labile enzymes in controlled form to efficiently treat RA.

Introduction

Worldwide, rheumatoid arthritis (RA) is the foremost medical, social, and economic problem and is the leading cause of hospitalization. Currently, no clinical interventions are present that could cure RA completely, and its treatment is based only on palliative measures. In RA, oxidative stress plays central role by generating free radicals causing lipid peroxidation and protein metabolism, which alters whole conformation of joint matrix.[1-3] Pathophysiology of RA is slightly complex with unknown genesis. Numerous studies revealed the decreased expression of antioxidant enzymes as compared with accumulation of free radicals at inflammatory sites as a major cause of this autoimmune disorder. A highly reactive radical ion causes oxidative destruction at cellular and molecular level and leads to immune reaction causing RA. Reactive oxygen species (ROS) too stimulates release of inflammatory interleukin (IL) TNF-α from macrophages. The regulated TNF-α causes phosphorylation of kinase-κ inhibitor and promotes binding of NF-κB to proinflammatory promoting sites. Although it promotes generation of ILs, proteases, and nicotinamide adenine dinucleotide phosphotase oxidase, which further aggravates oxidative burst, it attracts lymphocyte cells and releases matrix metalloproteinase, causing degradation of cartilage and maintains arthritic condition.[4,5]

In general, superoxide anion generated is converted into hydrogen peroxide in the presence of antioxidant enzyme superoxide dismutase (SOD), these peroxide molecules break down into nontoxic molecules of water and oxygen in the presence of catalase enzyme.[6,7] The lack of these enzymatic activities leads to imbalance and results into various disorders. Therefore, proposed work involves development and characterization of folate-conjugated SOD, adsorbed over cellobiose-coated polypropylene sulphide–tailored nanomatrix system for mitigating oxidative stress in RA.[8] The present study will be directed at the root cause of the disease rather than symptomatic relief for RA. Nanomatrix designed by the use of polymer propylene sulphide possesses catalase mimicking property to convert peroxide molecules into nontoxic molecules. Thus,

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Fabrication, optimization and characterization of Triamcinolone acetonide loaded nanostructured lipid carriers for topical treatment of psoriasis: Application of Box Behnken design, *in vitro* and *ex vivo* studies

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ABSTRACT

Psoriasis is a highly inflamed, chronic, autoimmune skin disorder affecting 2–5% of the world population. Complete cure for psoriasis is still lacking and there remains a substantial challenge for world health systems to explore a new drug moiety or delivery system which could safely and effectively manage psoriasis without compromising patient compliance. Present work was aimed to develop, optimize and investigate the potential of nanostructured lipid carriers (NLC) for secure and efficient delivery of Triamcinolone acetonide (TA). TA loaded NLCs were effectively fabricated by modified microemulsion method and examined for particle size, zeta potential, polydispersity index, drug entrapment efficiency, drug loading, transmission electron microscopy, X ray diffraction and Differential scanning calorimetry study. Release study demonstrated prolonged TA release from NLCs following Higuchi release kinetics with $r^2 = 0.995$, while pure TA suspension showed quicker drug release obeying Zero order kinetics with R^2 value of 0.993. *In vitro* skin distribution studies demonstrated the presence of significant quantity of TA on the epidermis when treated with TA loaded NLCs suspension. Adverse side effects linked with systemic exposure might be removed by selective drug accumulation in the epidermis. Conclusively TA loaded NLCs might be a efficient carrier for effective management of psoriasis.

1. Introduction

Psoriasis is a T cell mediated autoimmune disorder characterized by inflammatory, red, scaly patches that constantly shack its scale due to over growth of epithelial cells [1]. Unpredictable remissions and reversions take place in psoriasis for lifetime which makes the condition of psoriasis patient very pity. The condition gets pathetic day by day thereby influencing the manner a patient view himself and the manner he is observed by others. Furthermore pain, distress, physical discomfort and psychological distress are also key hurdles faced by patients suffering from psoriasis [2].

The treatment option for psoriasis varies depending on the extent and sternness of diseases. However, topical medications remain the bastion of psoriasis treatment. Among topical medications, corticosteroids are recurrently used worldwide for effectual management of psoriasis. Conventional formulations including sprays, powders, lotions, solutions, emollient creams, ointments, gels, creams, medicated tapes etc are accessible for psoriasis treatment. But serious cutaneous and systemic side effects associated with corticosteroids have limited their use though they still stay the most effective drug [3].

Lack of safe and efficient management of psoriasis using conventional approach has directed to develop and implement novel approach for psoriasis treatment resulting into more convenient, acceptable and suitable treatment. Nano structured lipid carriers (NLCs) are the new invention of lipid nanoparticle gaining gigantic attention as novel colloidal carriers for topical drug delivery. NLCs are comprised of solid matrix surrounding liquid lipid inside which the drug is diffused [4,5]. Negative aspect linked with solid lipid nanoparticles such as modification of drug release, inadequate drug loading capacity and drug liberation while storage condition might be avoided by using this new generation lipid carrier [6,7].

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Treatment of rheumatoid arthritis by targeting macrophages through folic acid tailored superoxide dismutase and serratiopeptidase

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ABSTRACT

Reactive oxygen species (ROS) released by activated macrophages causes oxidative stress, pain and inflammation and play a central role in causing inflammatory disorders like rheumatoid arthritis (RA). Thus therapeutics that can inhibit the production of ROS by macrophages has great clinical potential. Both Superoxide Dismutase (SOD) and Serratiopeptidase (STP) are dynamically involved in treating inflammatory diseases specifically RA by scavenging ROS and mitigating inflammation respectively. But, being protein these exhibit certain stability issues clinically. In the present study, both STP and SOD were individually conjugated with folic acid to target activated macrophages equipped with upregulated folate receptor during inflammatory stage. The experiments proved efficient conjugation of folic acid with both the enzymes and enhanced uptake of conjugated enzymes by macrophages with improved activity. Promising results obtained demonstrate enhanced potency and efficiency of both folate conjugated enzymes in future to treat RA and numerous related autoimmune disorders.

1. Introduction

Rheumatoid disorders are distinct with over production and accumulation of free radicals. Oxidative stress leads to various forms of inflammatory disorders among which arthritis is most common. Reactive oxygen species (ROS) produced from macrophages play a central role in causing this autoimmune disorder known as rheumatoid arthritis [1]. Reactive oxygen species generally provoke the series of oxidation at cellular level. The accretion of free radicals trigger release of various inflammatory interleukins, cytokines, chemokines, tumor necrosis factors and mediates signal transduction and transcription pathways as NF-κB, STAT3, HIF-1α, Nrf2 and alterations in the expression of specific mRNAs causing autoimmune disorders [2,3]. The supplements of natural defense mechanism such as antioxidant enzymes and anti-inflammatory enzymes like SOD and STP reduce oxidative stress by scavenging reactive oxidant molecules and naturally treat pain respectively. The SOD has the potency to suppress ROS production from macrophages and is being considered for treatment of arthritis and other autoimmune disorders. On the other hand, STP, possesses antiinflammatoy, proteolytic and pain relieving property which collectively benefits patient from various disorders such as arthritis, wound healing etc [4,5]. But, major challenges associated with the delivery of SOD and STP are their rapid renal clearance due to low molecular weight, stability and pharmacokinetic issues leading to short half life and inefficient delivery of drug [6].

Thus to overcome these disadvantages, approach has been made to target these fragile molecules at site of action. Biologically it has been demonstrated that there is up regulation of folate β receptors [7,8] in condition of oxidative stress induced disorders like arthritis, scleroderma, colitis, crohn's and pulmonary fibrosis [8]. Thus, based on this substantiation, conjugation of SOD and STP with folic acid was designed potentially to target these enzymes to activated macrophages and enhance their efficacy in treating inflammatory diseases. Folate can be readily conjugated with SOD and STP with high efficiency with no effect on the activity of these enzymes [9]. It was also demonstrated by Lee et al. that conjugation of folate enhances the ability of antioxidant enzymes SOD and Catalase to scavenge ROS produced by activated macrophages. Based on this hypothesis, we individually tested one antioxidant enzyme and one anti-inflammatory enzyme for their efficacy in terms of their activity and localization during inflamed situation so that proper check can be made on inflammation and oxidative stress. Conclusively numerous applications can be anticipated in future by taking both the antioxidant and anti-inflammatory enzymes together depending on situation of oxidative stress and inflammatory conditions.

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Review

Role of enzymatic free radical scavengers in management of oxidative stress in autoimmune disorders

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ABSTRACT

Autoimmune disorders are distinct with over production and accumulation of free radicals due to its undisclosed genesis. The cause of numerous disorders as cancer, arthritis, psoriasis, diabetes, alzheimer's, cardiovascular disease, Parkinson's, respiratory distress syndrome, colitis, crohn's, pulmonary fibrosis, obesity and ageing have been associated with immune dysfunction and oxidative stress. In an oxidative stress, reactive oxygen species generally provoke the series of oxidation at cellular level. The buildup of free radicals in turn triggers various inflammatory cells causing release of various inflammatory interleukins, cytokines, chemokines, and tumor necrosis factors which mediate signal transduction and transcription pathways as nuclear factor- kappa B (NF-κB), signal transducer and activator of transcription 3 (STAT3), hypoxia-inducible factor-1 (HIF-1α) and nuclear factor-erythroid 2-related factor (Nrf2). The imbalance could only be combat by supplementing natural defensive antioxidant enzymes such as superoxide dismutase and catalase. The efficiency of these enzymes is enhanced by use of colloidal carriers which include cellular carriers, vesicular and particulate systems like erythrocytes, leukocytes, platelets, liposomes, transferosomes, solid lipid nanoparticles, microspheres, emulsions. Thus this review provides a platform for understanding importance of antioxidant enzymes and its therapeutic applications in treatment of various autoimmune disorders.

Contents

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Rationalized Insights on Causes of Rheumatoid Arthritis in the Elderly and Women: Special Emphasis on Treatment Strategies

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ABSTRACT: Rheumatoid arthritis (RA) is an autoimmune disorder distinguished by synovial inflammation followed by destruction of joint. The pathogenesis of arthritis involves immune imbalance of the endogenous system. Causative factors include immune imbalance, oxidative stress, genetics, and environment. Continued effort has been made to treat RA via chemical, enzymatic, genetic, and hormonal approaches. RA has been reported more in the aged and in women. Arthritis necessitates lifelong administration of drugs to maintain quality of life. The major challenges of treatment are the side effects associated with these drugs. Novel approaches and targets have been explored as alternative measures to relieve pain in RA sufferers. Customary treatment strategies have limited therapeutic capability with episodes of associated side effects. Thus, revolutionary advances in novel RA-targeted drug delivery strategies are needed for efficient therapies and to meet the demand for treatment. The current review summarizes the pathogenesis of RA, its causative factors, and therapeutic approaches. These approaches are discussed with regard to mode of action, pharmacokinetics, marketed products, side effects of individual RA drugs, recent developments, modifications in the delivery of various drugs through targeted ligands, novel drug carriers as vesicular, particulate, self assembled, cellular, ceramic systems, and future prospects.

KEY WORDS: autoimmune disease, rheumatoid arthritis, pathogenesis, enzymatic therapy, novel targeted system

I. INTRODUCTION

The term rheumatoid arthritis (RA) was first coined in 1859 by Sir Alfred Baring Garrod.[1] Rheumatoid arthritis is characterized as a chronic inflammatory disorder involving multiple joints. Joints collectively comprise different types of connective tissue, articular cartilage, ligaments, and joint capsule.[2] The onset of RA involves multifaceted interactions between immune disarray, oxidative stress, genetic, and environmental factors. Oxidative stress disorder and altered immune responses are considered important causative elements of RA. Oxidative stress causes damage aT cellular and molecular levels and triggers inflammation and promotes the infiltration of cells. Antigen-presenting cells are activated (dendrite cells) with major histocompatibility complexes of type I and II. Mature B cells express vascular cell adhesion molecule-I/cluster designation (CD)-106 and differentiate

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Novel carters and targeted approaches: Way out for rheumatoid arthritis quandrum

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ABSTRACT

Rheumatoid arthritis (RA) is an autoimmune disorder distinct with series of complex change with unknown genesis. Constant effort has been made to treat RA through varied form of bioactives involving drugs, biologics, enzymes, genetic and hormones. Thus advancement in therapy involved introduction of targeted approaches and formulation of novel carters for efficient therapy. Current review is an attempt to contemplate RA in terms of pathogenesis, causative factors, targeted approaches, delivery of drugs through targeted ligands, novel carters as vesicular, particulate, self assembled, cellular and ceramic systems. Various polymeric components, drugs, biological molecules could be tailored directly or indirectly to target cells, bone site (hydoxyappatite), and macrophage cells to treat RA. The additional benefit of cellular carriers like erythrocytes and lymphocytes cells warrant likelihoods for delivery of peptides and recombinant proteins effectively.

Contents

1. Introduction

Rheumatoid arthritis (RA) has been grouped into systemic autoimmune disorder of multiple joints which symmetrically

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INFLUENCE OF SELECTED VARIABLES ON FABRICATION OF MUPIROCIN LOADED PLGA NANOCARRIERS

ABSTRACT

Aim of the study was to develop PLGA nanoparticles (PLGA-NP) of mupirocin (MP) and to study the effect of independent variables in order to optimize the formulation for effective delivery. Drug loaded PLGA-NPs were successfully prepared by nanoprecipitation method and characterized by mean particle size, zeta potential, entrapment efficiency, drug loading, drug release, TEM, and DSC study. Independent variables like drug-polymer ratio, surfactant concentration, and stirring speed showed significant effect on the dependent variables like particle size, entrapment efficiency and drug loading. The ANOVA results showed that selected independent variables had a significant effect on the preparation of mupirocin loaded PLGA-NP.

Keywords: Mupirocin, PLGA nanoparticles, Response surface methodology

INTRODUCTION

Nanoparticulate carrier systems (e.g. Polymeric nanoparticle, lipid nanoparticles and liposomes) have recently been under consideration for topical drug delivery on wound space, because they offer the possibility of modulating drug release in sustained manner, by facilitating its transport, localization and controlled delivery of drugs on wound space to prevent infections by intracellular pathogens of MRSA (methicillin resistant staphylococcus aureus), thus becoming attractive vehicles for the treatment of infected burn wound[1]

Biodegradable polymers like PLGA are widely studied for the development of various nanoparticulate carrier systems for topical and wound healing applications. PLGA based nanoparticles may present extensive opportunities for exploration of new ways for sustained and controlled local release of loaded drugs due to their potential to promote wound healing activity like angiogenesis, reepithelization and granulation tissue formation[2].

Mupirocin is a hydrophobic topical antibiotic chemically derived from pseudomonic acid with short half-life of 15-25 minutes. It acts as bacterial protein synthesis inhibitor mainly against Gram-positive and some Gram-negative bacteria and specially used for the treatment of MRSA infected burn wound. It is slowly metabolized by the skin to antimicrobially inactive metabolite monic acid controlling the release of drug with improved efficacy of formulation and decreased frequency of application[3,4].

In the present study, we aimed to develop PLGA based nanoparticulate system for controlled delivery of mupirocin in the alkaline environment (pH 6.5-8.5) of infected burn wound[5,6]. This investigation consisted of preparation, optimization, and evaluation of mupirocin loaded PLGA nanoparticles. In this study, a 17-run, 3-factor, 3-level Box-Behnken design was employed to construct polynomial models for the optimization process. This design was suitable for investigating the quadratic response surface and for constructing a second order polynomial model using Design-Expert software (Trial Version 10.0.1, Stat-Ease). Factors evaluated in this study were the drug-polymer ratio ($X1$), concentration of surfactant ($X2$) and the stirring speed ($X3$) as the independent variables which were represented by −1, 0 and +1, analogous to the low, middle, and high values respectively as described in Table 1. The studied dependent responses were particle size ($Y1$), entrapment efficiency ($Y2$), and drug loading (DL %) (Y3) as described in Table I.

MATERIALS AND METHOD

Materials

Mupirocin calcium, polyvinyl alcohol (PVA) and acetone were purchased from HiMedia Pvt. Ltd., Mumbai, India. PLGA (ratio 50:50) was kindly supplied by Evonik, degassa, Mumbai, India. *Bacillus subtilis* (MTCC 441), Methicillin-resistant *S. aureus* (MRSA, ATCC 25923), *Escherichia coli* (ATCC 25922) and *Pseudomonas aeruginosa* (ATCC 27853) were obtained from Center for Microbiology and Biotechnology Research and Training Institute, Bhopal (M.P.). The dialysis membrane (Molecular weight cut off 10,000 Da) was purchased from HiMedia Laboratories (India). Purified water from ultra-pure water system (Synergy UV water purifier system, India) was used throughout the study. Other chemicals used were of analytical grade.

Method of preparation

Mupirocin loaded PLGA nanoparticles were prepared by modified nanoprecipitation method. Briefly, mupirocin

month with no remarkable changes in % EE of drug and the particle size of optimized formulation (NP6). The drug release behavior from the PLGA nanoparticles exhibited a biphasic pattern with the burst release at the initial stage and sustained release subsequently (Fig 1C).

CONCLUSION

The optimized formulation selected was 1:2 (drug: polymer) concentration, 1% surfactant concentration and 3000 RPM stirring speed and observed responses were closed to the predicted value for the optimized formulation. The size of nanoparticle and the loading of drug in carrier were highly dependent on the ratio of drug-polymer, surfactant concentration and stirring speed

The encouraging results obtained in this study could propose this system for future *in vivo* studies, especially for delivery of other antibiotic, useful in treatment of various wounds.

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Intellectual Property Rights-An Overview

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Abstract

This review article the global intellectual property fortification regimes are hindering admittance to pharmaceutical sciences by countries. It is understood that harmonization of worldwide legislation and regulations on intellectual property rights will continu overview of understanding the concept, rules, laws, regulations, present status, controlling authorities with emphasis on its sta inference to understand the future challenges of Intellectual Property Rights and how to restore our scientific knowledge to pro ideas and make them acceptable without financial constraints. As such, emphasis is placed on the ways in which budding cou or should be trade with these issues. Opportunities arising from an increased availability of information and from little hindranc patents in the budding world most often do not recompense for the require of capacity and infrastructure to absorb the technol

Keywords

Intellectual property rights, IPR, Patent medicine.

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Colorimetric and paper-based detection of lead using PVA capped silver nanoparticles: Experimental and theoretical approach

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Show more

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Highlights

- Plasmonic colorimetric sensing using silver nanoparticles and paper-based analytical devices for selective detection of Pb
- Method is based on the measurement of red shift of LSPR band of AgNPs/PVA in visible region after the addition of Pb
- Paper is based on color developement paper after addition of analyte followed by processing in ImageJ software
- Density functional theory assisted by experimental data is used to elucidate the plausible mechanism for detection of Pb

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REVIEW ARTICLE OPEN ACCESS

A Bird Eye view on Recent Covid-19 Data Reports Over Less Abundant Superficial Information

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ABSTRACT

Recent episode of Coronavirus (SARS-CoV-2) was first announced from Wuhan, China in late 2019. Its contamination proliferates around the world swiftly with a reformist pattern towards mortality of residents. Representing a potential danger to living beings, SARS-CoV-2 spread from animal to-human and then to general populace with manifestations ranging from mild to severe sick conditions and consequently numerous deaths, affirming two measures for proclaiming COVID-19 a pandemic. The disease shows a reformist pattern in symptomology, going from mild to serious pneumoniae to respiratory and multi-visceral failure that frequently shows pattern to death of patients with comorbidity within a short period of time. Escalated research endeavors on various parts of this human microbe are in progress across the globe towards clarifying viral transmission courses and the mechanisms employed to overcome host defense responses. With colossal infective potential, clinical examinations are being done enthusiastically to create compelling diagnostics and remedial mediations including re-purposing antiviral medicines and vaccine development. In this context, we depict the structural configuration of SARSCoV-2 genome; its pathogenicity, transmission; and we sum up risk appraisal and approaches applied in preventing infection. Lastly, we talk about significant parts of the improvement of diagnostic probes and restorative countermeasures that can possibly help in controlling the COVID-19 pandemic.

Key words: Pandemic, viral transmission, pathogenicity, vaccine, preventive measures, diagnostic probe.

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INTRODUCTION

Pandemics of various infectious diseases with millions dying have been recorded in the history for the past several centuries. The most well known in the history have been pandemic due to plague in Asia and several pandemics of influenza that killed millions of people. [1-2] The pandemics continued in the current millennium too, and COVID-19 is the latestand certainly not the last pandemic. COVID-19 pandemic erupted in the Wuhan City of People's Republic of China in December 2019. The virus is being identified as a new coronavirus by Chinese officials [3]; which was later denoted as severe acute respiratory syndrome (SARS)-CoV-2 by the International Committee on Taxonomy of Viruses. [4] The WHO also named the disease due to this virus as COVID-19. [5]

DESCRIPTION OF COVID- 19 VIRUS

COVID-19is a β-coronavirus belonging to the family of *Coronaviridae*. [6] It is a zoonotic disease and was firstly identified in1965 (HCoV-229E). Thereafter two outbreaks of same potencies were occurred - in 2003 and 2012, respectively (SARS-CoV and MERSCoV). [7-8]

COVID-19 is a RNA type virus. According to the Phylogenetic studies, it is possible that the actual suspect of SARS-CoV-2 is another unidentified host instead of bats, which was possibly being sold at Wuhan seafood market before the outbreak. [9] However bat-SL-CoVZC45 and bat-SL-CoVZXC21 genomic sequences are 89% similar, there is a doubt regarding its direct ancestors. [10]

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Research Article

Evaluation of Anthelmintic and Antioxidant Potential of *Solanum melongena* Leaf Extract Using *In-vitro* Models and Estimation of Total Flavonoid Content

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ABSTRACT

The objective of this study is to study the anthelmintic and antioxidant activity of the leaf extracts of *Solanum melongena Linn.* (Family: Solanaceae) and to estimate the total flavonoid content. The aqueous (AE) and ethanolic (EE) leaf extracts of *Solanum melongena Linn.* were prepared and these were evaluated for total flavonoid content by aluminium chloride colorimetric method and for determination of anthelmintic activity using Indian earth worm *Pheretima posthuma*. Various extract concentrations i.e. 10, 20, 40, 80 and 100 mg/mL will be made for this study. The extracts were also evaluated for antioxidant activity by superoxide scavenging activity. Anthelmintic activity was showed by all the extracts at concentration of 40 mg/mL. The ethanolic extract of *Solanum melongena Linn* leaf of 100 mg/mL has exhibited a significant effect ($P<0.001$) when compared to standard drug albendazole. The antioxidant activity of the extracts was quite prominent but it was comparatively lower when compared to standard drug ascorbic acid ($P<0.05$). Total 5.38 mg QE/100 g flavonoid traces observed in the extract. The above analytical study clearly that the *Solanum melongena Linn* leaf extract has shown a good anthelmintic and antioxidant activity.

Keywords: Helminthiasis, *Solanum melongena Linn.*, Aluminium chloride colorimetric method, *Pheretima posthuma*.

INTRODUCTION

Helminthic diseases now a day is the major health related concern in all over the world. They affect a large human population in endemic areas and hence can cause life threatening issues. WHO reported that a big number of people around the world suffer from parasitic worm infections[1]. Worms like pinworms, round worms and tapeworms are common parasites which infected the human body parts and responsible for Helminthiasis disease. These worms often reside in gastro intestinal tract as well as target the liver and other organs of human body. Helminth eggs are excreted by infected humans through their faeces and these eggs can contaminate the soil[2]. Drugs that completely kill or remove the infesting worms are termed as anthelmintic drugs. Unfortunately some common side effects like nausea, vomiting, abdominal pain, hair loss, fall in blood pressure decreased, sedation, fever, and body ache are associated with the popular drugs which are available to target these worms[3]. Considering the above problems, it is required do identify new alternative therapies for this helminthes. Plant based herbal treatment will be surely beneficial in this area. Therefore, herbal plant extract based anthelmintic drug development was focused in this research work.

Plants are used by mankind as herbal remedies for several diseases from ancient times. In India Ayurveda, Unani and Sidha systems of medicines are broadly used to treat and curing of many diseases. *Solanum melongena* was significantly used as an effective therapy against various human diseases conditions from the centuries. "Melongene" is the common name of this plant. In most of the regions of Asia, it is called brinjal. In America, Australia and Canada it is known as "eggplant". In Britain and sometimes in Canada it is called "aubergine"[4]. The fruit of this plant is very popular in India for used as vegetable. *Solanum melongena* exhibits many traditional uses and also reported for showing various potent pharmacological actions[5]. Recently the insecticidal activity of *Solanum melongena* is reported, which is of great importance. Ethanolic extract of *Solanum melongena* leaf showed very prominent insecticidal activity against *Sitophylus oryzae*, Carpenter ant Pantry weevil larvae[6].

MATERIALS AND METHODS

Plant material

The fresh leaves of *Solanum melongena* were procured from the rural agricultural land area of Chhattisgarh, India and were authenticated.

Preparation of extract

Leaves of *Solanum melongena* were dried in shade and coarsely powdered. Then this powder was subjected to Soxhlet extraction by water and ethanol using as a solvent for 72 hrs. The extracts were then subjected to distillation for removing the solvent and then the concentrated mass was dried on water bath for further evaporation.

Drugs and chemicals

The XOD (xanthine oxidase), NBT (nitro blue tetrazolium), SOD (superoxide dismutase) were purchased from Sigma Chemical Company, Albendazole (Alkem Laboratories Ltd.) and rest of all chemicals used in the study are of analytical grade.

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Mechanistic Insight into Caffeine–Oxalic Cocrystal Dissociation in Formulations: Role of Excipients

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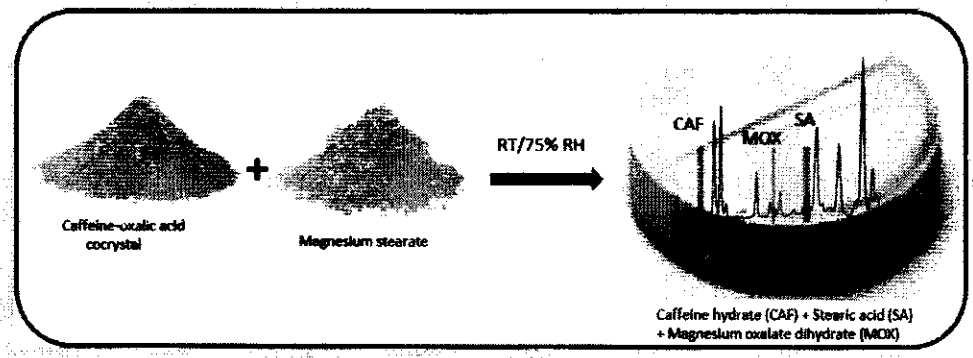
Supporting Information



ABSTRACT: Caffeine–oxalic acid cocrystal, widely reported to be stable under high humidity, dissociated in the presence of numerous pharmaceutical excipients. In cocrystal–excipient binary systems, the water mediated dissociation reaction occurred under pharmaceutically relevant storage conditions. Powder X-ray diffractometry was used to identify the dissociated products obtained as a consequence of coformer–excipient interaction. The proposed cocrystal dissociation mechanism involved water sorption, dissolution of cocrystal and excipient in the sorbed water, proton transfer from oxalic acid to the excipient, and formation of metal salts and caffeine hydrate. In compressed tablets with magnesium stearate, the cocrystal dissociation was readily discerned from the appearance of peaks attributable to caffeine hydrate and stearic acid. Neutral excipients provide an avenue to circumvent the risk of water mediated cocrystal dissociation.

KEYWORDS: *pharmaceutical cocrystals, dissociation, excipients, formulations, powder X-ray diffractometry*

INTRODUCTION

Pharmaceutical cocrystals have been prepared with the goal of improving the physicochemical, mechanical, and/or biopharmaceutical properties of active pharmaceutical ingredients (API).[1−3] This approach is of particular interest for class II and class IV drugs in the Biopharmaceutical Classification System.[4] For example, the bioavailability of a danazol–vanillin cocrystal was about an order of magnitude higher than that of danazol.[5] The cocrystal strategy has advanced from an early development option (support preclinical studies) to marketed drug products, for example, Entresto (valsartan–sacubitril) by Novartis[6] and Suglat (iproglifozin–L-proline) by Astellas Pharma.[7] In addition, an ertugliflozin–L-pyroglutamic acid cocrystal formulation by Pfizer is under late stage development.[8] There have been enormous advancements in the design, synthesis, and characterization of pharmaceutical cocrystals. However, two important areas remain largely unaddressed: large-scale synthesis of cocrystals[9,10] and their formulation into dosage forms. Since cocrystals are typically sustained by hydrogen bonds, in the presence of competing excipients, there is potential for hydrogen bond disruption leading to dissociation.

In order to develop a cocrystal into a pharmaceutical dosage form (for example, tablets), it is necessary to assess cocrystal stability under three conditions: (i) "as is", (ii) in the presence of excipients or additives, and (iii) during various processing steps (milling, granulation, compression) in the manufacture of solid dosage form. The stability of as is cocrystals has been the subject of numerous investigations. For example, heating caffeine–theophylline cocrystal to ~150 °C resulted in dissociation followed by the crystallization of caffeine and theophylline.[11] The combined effects of temperature and water vapor pressure were comprehensively investigated in pyrazine–phthalic acid cocrystal.[12] An elevation in temperature or water vapor pressure accelerated cocrystal dissociation. The dissociation mechanism was postulated to be dissolution of the

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PRELIMINARY SCREENING OF *WALTHERIA INDICA* (L.) PLANT FOR ITS ANTI-INFLAMMATORY ACTIVITY

Amol Chandekar, Amber Vyas, Neeraj Upamanyu, Atul Tripathi, Surendra Agrawal

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Abstract

The investigation on anti-inflammatory activity of the various extract of Waltheria indica L. was reported to find out the pharmacological basis for its ethnomedical use. **The anti-inflammatory activity of the pet ether (PEW) and methanol (MEW) extracts of the leaves of Waltheria indica L.** (Malvaceae)were evaluated by using in vivo (Carrageenan & histamine induced rat paw edema, cotton pellet granuloma test) models. **It was observed that, all the extracts showed significant activity in the in-vivo model at the dose of 500 mg/kg b.w. orally, when compared with control and standard drugs.** Of the two extracts tested, methanol extract MEW showed most significant activity well in comparison to the standard drug. Therefore, present study suggests, potential of leaves of Waltheria indica L. in both models of acute and chronic inflammation.

Keywords

Anti-inflammatory, Waltheria indica L., Delayed type hypersensitivity

Full Text:

PDF

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Pharmacokinetic study of solid-lipid-nanoparticles of altretamine complexed epichlorohydrin-β-cyclodextrin for enhanced solubility and oral bioavailability

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Affiliations

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Abstract

Altretamine is a synthetic drug approved for treatment of ovarian cancer. The only drawback with its formulation is poor aqueous solubility and low oral bioavailability. In the present work an attempt has been made to prepare inclusion complex of altretamine with epichlorohydrin beta cyclodextrin. The complexes were prepared by kneading, co-evaporation and freeze-drying method and were confirmed by FTIR, XRD, DSC, drug content and dissolution study. Kneaded complex possess maximum solubilizing efficiency of 82.63 in 25mM Epi-β-CD solution. SLNs of pure altretamine and ALT complexed with Epi-β-CD were prepared by modified emulsification-ultrasonication method. The particle size and zeta potential was found to be 151.5nm and -21.3mV. The drug release pattern of SLNs was bi-phasic in nature; with an initial burst release followed by sustained drug release. Pharmacokinetic study showed that the average C_{max} was found to be 0.94μg/ml, which was 2.47 times higher as compared to the pure drug. The AUCt for SLNs was 150minμgh/ml and 54minμgh/ml for pure ALT suspension which proved that the SLNs exhibited greater absorption compared to the pure drug. Thus, smaller particle size, higher entrapment efficiency and enhanced aqueous solubility led to improvement in oral bioavailability of ALT.

Keywords: Altretamine; Epichlorohydrin beta cyclodextrin; Pharmacokinetics.

Related information

MedGen
PubChem Compound (MeSH Keyword)

LinkOut - more resources

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Original Research Article

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Evaluation of hepatoprotective effect of *Waltheria indica* against various NSAIDs-induced hepatic damage in rats

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Abstract

The objective of the present study was to evaluate methanolic extract of leaves of *Waltheria indica linn.* for hepatoprotective potency of the potent solvent extract. The hepatotoxicity was induced bydiclofenac, carbon tetrachloride (CCl_4)and acetaminophen. In CCl_4 induced hepatotoxicity study, animals were divided into five groups (n=6). Methanolic extract of *Waltheria indica* (WIM) groups were injected in doses of 400 mg/kg and 600mg/kg body weight along with CCl_4 and Silymarin 100mg/kg was taken as standard drug. Similarly procedure was followed in diclofenac and acetaminophen induced hepatotoxicity. Blood samples and liver were collected and liver hisopathological studies were carried out.These histopathological analysis suggested that WIM extract have the ability to reduce the degree of hepatic fibrosis induced by various factors. And concluded that WIM extract has significant hepatoprotective activity thus this study scientifically support the theory to use of this plant in traditional medicine for the treatment of liver disorders.

Keywords: Diclofenac, Carbon tetrachloride (CCl 4) and Acetaminophen, Waltheria indica methanolic extract (WIM), hepatoprotective activity.

Introduction

The liver is a versatile organ which is responsible for the metabolism of chemicals and for the regulation of internal chemical environment. It is involved in several vital functions, such as metabolism, secretion and storage. It has great capacity to detoxicate toxic substances and synthesize useful principles. Liver functions as a centre of metabolism of nutrients such as carbohydrates, proteins and lipids and excretion of waste metabolites. Additionally, it also handles the metabolism and excretion of drugs and other xenobiotics from the body thereby providing protection against foreign substances by detoxifying and eliminating them [1].The liver is a major target organ for toxicity of xenobiotics and drugs, because most of the orally ingested chemicals and drugs first go to liver where they are metabolized into toxic intermediates. A large number of xenobiotics are reported to be potentially hepatotoxic [2].

Nearly all of the NSAIDs have been implicated in causing liver injury. Diclofenac, and particularly sulindac, are reported to be more commonly associated with hepatotoxicity, Several NSAIDs have been withdrawn from clinical use because of associated hepatotoxicity [3]. The new more selective COX-2 inhibitors (e.g. celecoxib, rofecoxib, nimesulide) are also associated with hepatotoxicity [4]. Hepatotoxicity from NSAIDs can occur at any time after drug administration, but like most adverse drug reactions, most commonly occurs within 6–12 weeks of initiation of therapy. There are two main clinical patterns of hepatotoxicity due to NSAIDs. The first is an acute hepatitis with jaundice, fever, nausea, greatly elevated transaminases and sometimes eosinophilia.

Material and methods

Hepatoprotective studies

Diclofenac induced hepatotoxicity

Five groups were made with six rats in each. Control Group (Group 1) served as normal and received the vehicle alone (Sterile distilled water, 10 ml/kg, p.o.) for 5 days. Toxin control group (Group 2) animals received diclofenac (50 mg/kg i.p.) on the 3rd and 4th day. WIM-400 (Group 3) and WIM-600 (Group 4) were treated with WIM at a dose level of 400 mg/kg and 600 mg/kg body weight p.o. per day respectively for 5 days and on the 3rd and 4th day diclofenac (50 mg/kg i.p.) was given 1 h after the treatment of the extract[5]. Standard group (Group 5)was treated for 5 days with standard drug Silymarin (100 mg/kg p.o.) and diclofenac (50 mg/kg i.p.) on the 3rd and 4th day was given 1 h after the treatment of the drug. After 48 hrs animals were sacrificed the last injection of diclofenac under mild ether anesthesia. The blood was collected and allowed to stand for 30 min at 37 C and then centrifuged to separate the serum to estimate various biochemical parameters.

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Original Research Article

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Antioxidant and Antiulcer Potential on leaves of *Brassica nigra L.* against Gastric Ulcer

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Abstract

In the present study, anti-ulcerative effects of extract of *Brassica nigra* L. leaves were investigated in pylorus ligation and aspirin-induced gastric ulcer models in rats. In present study antiulcer effect of ethanolic extract of *Brassica nigra* leaves is well understood by total acidity, free acidity, and ulcer index of different groups of animals in both the model viz. Pylorus ligation model & Aspirin induced gastric ulcer in experimental rats when compared the test group with control and standard group. The percentage of ulcer inhibition was observed in pylorus ligated model was as follows: standard, BNLE 100mg/kg, BNLE 200mg/kg and BNLE 300mg/kg 55.76%, 30.96%, 49.54% and 51.35% respectively. The mechanism of gastric ulcer healing is not well understood and further study is needed to evaluate the specific phytoconstituents responsible for the gastric ulcer healing but on the basis of present study it can be concluded that this gastric healing potential may be due to the pharmacological effect played by the different phytoconstituents present in the ethanolic extract of *Brassica nigra* leaves for prevention of gastric mucosa or by the antioxidant potential of the leaves which is evaluated during the DPPH free radical scavenging activity.

Keywords: *Brassica nigra L.* (Brassicaceae), Gastric ulcer,Pylorus ligation, Antioxidant, *Brassica nigra* leaf extract (BNLE)

Introduction

Peptic ulcer is one of the major gastro-intestinal disorders, which occur due to an imbalance between the offensive (gastric acid secretion) and defensive (gastric mucosal integrity) factors [1]. Consequently, reduction of gastric acid production as well as re-inforcement of gastricmucosal production has been the major approaches for therapy of peptic ulcer disease. As a result, more and more drugs, both herbal and synthetic are coming up offering newer and better options for treatment of peptic ulcer. The type of drugs varies from being proton-pump inhibitor to H_2 antagonist or a cytoprotective agent. At the same time, each of these drugs confers simpler to several side effects like arrhythmias, impotence, gynaecomastia, enterochromaffin-like cell (ECL), hyperplasia and haemopoeitic changes [2]. There are evidences for the participation of reactive oxygen species in the etiology and pathophysiology of human disease, such as neurodegenerative disorders, inflammation, viral infections, autoimmune gastrointestinal inflammation and gastric ulcer [3]. Drugs with multiple mechanism of protective action, including antioxidant activity, may be highly effective in minimizing tissue injury in human diseases.It has been demonstrated that many drugs and formulations possess potent antioxidant action and are effective in healing experimentally induced gastric ulcers [4-6]

Materials and methods

Plant material

The leaves of *Brassica nigra* L. was collected in the month of January from the local market, Bhopal (M.P.). Herbarium file of plant part was prepared and authenticated by Dr. Zia UlHasan (Professor, Department of Botany), Safia College Bhopal and the specimen voucher no. assigned was 454/Bot/Safia/14.

Preparation of the extract

Fresh leaves were collected, shade-dried and powdered mechanically. For defatting about 500 g of the coarsely powdered leaves soxhlatation with Pet. Ether for 72 hours at 50-60°C. Powder was dried in hot air oven at 40-50°C soxhlatation with Pure Ethanol for 36 hours at 60-70°C, Extract was dried at room temperature for 5 days and extract was collected.

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17-18

(10)

Article | Publisher preview available

Formulation and evaluation of gel containing nanostructured lipid carriers of tretinoin–Epi-β-CD binary complex for topical delivery

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The objective of present research work was to formulate and evaluate topical gel containing tretinoin–cyclodextrin (CD) binary complex loaded into nanostructured lipid carriers (NLCs). Use of cyclodextrin and nanolipid carrier together in a system produced a synergistic effect by increasing the drug release and skin permeation, thus improving the overall therapeutic effect. Two different cyclodextrins i.e. β-CD and its water soluble polymeric derivative epichlorohydrin-β-cyclodextrin (EPI-β-CD) were used to obtain binary inclusion complex of drug-cyclodextrin (D-CD) systems by two different techniques (kneading and co-evaporation). The prepared solid complexes were characterized by FTIR, DSC, XRD etc. and the best system was selected for loading into nanolipid carriers. NLC comprising glyceryl mono stearate (GMS) and oleic acid were obtained by slightly modified emulsification evaporation method. Four different formulations of NLCs were suitability characterized for particle size, zeta potential, entrapment efficiency, drug loading and drug release. EPI-β-CD was found to be more effective than β-CD in enhancing solubility and dissolution properties of tretinoin. The most effective NLC formulation was incorporated into carbopol hydrogel which showed better permeation properties than that of the reference gel (0.1%).

Chemical structure of... | Phase solubility diagram of... | a X ray diffractogram of... | a TEM image of TRET NLCs; b... | Release profile of tretinoin from...

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Application of nanocarrier-based drug delivery system in treatment of oral cancer

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ABSTRACT

Oral cancer includes cancer of lips, oral cavity and oropharynx. Oral cancer is the sixth most life-threatening disease affecting 65% of population. The delivery of cytotoxic chemotherapeutic anticancer drugs is a challenging task due to unfavorable properties. Both synthetic chemotherapeutic agents and herbal constituents are used in treatment of oral cancer. The purpose of present article is to overcome the limitations through concept of nanotechnology and conjugation approach. Also, it will provide better therapeutic effect and sustain long life of healthy and recovered cells. Moreover, development in this area will raise opportunities for the oncologist, researchers and pharmaceutical scientists. This review summarizes the clinical findings and patents on various oral anticancer drugs for effective pharmacotherapeutics.

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KEYWORDS
Oral cancer; nanotechnology; oropharyngeal cancer; conjugation; targeted delivery

Introduction

In most of the developing countries, oral cancer is one of the major causes of increasing mortality. Not only men but women's also suffers from oral cancer with a higher risk. This is due to the increasing addictive habits and several cultural and geographical factors. Oral cancer includes cancer of lips, oral cavity and oropharynx. From 2005, every year, an article is published about the facts of oral cancer, its prevalence, mortality rate and prevention aspects. This shows that there is an alarming need to think and act on oral cancer and its scenario [1].

Oral and pharyngeal cancer is the sixth or seventh most prevalent cancer throughout the world. The global epidemiology of oral malignancies/cancers/tumors is discussed in brief by Warnakulasuriya et al. (2009) [1]. Most of the oral cancers (≥90%) originating in the tissues that line the mouth and lips and thus are oral squamous cell carcinoma (OSCC). They look very similar under the microscope and are malignant type which tends to spread rapidly. These oral malignancies are heterogeneous in nature and arise in various parts of the oral cavity due to predisposing factors, prevalence and treatment outcomes. Of all the oral cancers, cancer of lips and oral cavity are preventable [2].

Primary oral cancer is finally turned into second primary cancer of aerodigestive tract (oral cavity, pharynx and esophagus). The countries which are at higher risk of oral cancer include India, Pakistan, Bangladesh, South Africa, Asia, Thailand, Canada and Australia. In India, Chennai, Gorakhpur and Uttar Pradesh are more prone to risk of oral carcinomas, malignancies and tumors.

There are several agencies working for the prevention, care and treatment of oral cancer throughout the world [3]. Some of these are:

- National Institute for Clinical Excellence (NICE), UK,
- International Agency for Research on Cancer,
- National Institute of Health and the American Dental Association, and
- WHO Global Oral Health Programme.

Causes of oral cancer

The causes of oral cancer are well-known. It occurs mainly due to lack of hygienic conditions, consumption of tobacco and related products, alcohol consumption, certain hormonal factor and infectious agents. Awareness about drawbacks of addictive substances, educating the illiterate persons is a mandatory requirement at broader level to combat and decrease the prevalence of oral cancer in society [4].

Human papilloma virus (HPV) mainly type 16 and type 18 are known risk factors and independent causative factor for oral cancer. This is causing not only huge impact on the health of the community but also the economy of the countries. The distribution of oral cancer in the oral cavity is shown in Figure 1.

Percentage statistics and prevalence of oral cancer

Globally, India is at the highest to report prevalence of oral cancers. Every year 75,000–80,000 new cases of oral cancer

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Prediction of Goal Keeper Performance on the Basis of Coordinative Abilities

Rakesh Kumar Patel[1] and Dr. Rajeev Choudhary[2]

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Abstract

The objective of the present study was to estimate goal keeper performance on the basis of selected coordinative abilities. A total ten handball male players were selected who played goal keeper position of handball game. All the selected handball players were from different Universities of the country who participated in all India Intervarsity handball championship. All the player's age was ranging from 16 to 24 years. The study was conducted by taking five coordinative abilities (Orientation ability, Differentiation ability, Reaction ability, Balance ability and Rhythmic ability) were selected independent variables and only one goal keeper performance was selected for dependent variable. To estimation goal keeper performance on the basis of selected coordinative abilities, multiple regression analysis was used.Two regression models were established. Established regression models are: Model-IGoalkeepers Performance = 71.839 – 6.979 X Orientation AbilityModel-IIGoalkeepers Performance = 46.058 – 4.679 X Orientation Ability + 6.816 X differentiation ability.

Keywords

Coordinative Abilities and Goalkeeper Performance

1. INTRODUCTION

Coordination is considered as important factors which are closely related to performance, especially with high complex movements. It is the ability of integrating different types of movements in specific patterns. Different activities have different demands of coordination. Coordination can not to be measured isolately because it is interrelated with other factors. (Bhat, A. H., 2010).In the field of exercise science, coordination is recognized as the ability of the body to organize two or more patterns to achieve a specific movement goal. Coordination involves an intricate and complex sequence of activities. In Simple words these activities encompass reacting to sensory input (stimulus), choosing and processing the proper motor program from learned skills (motor learning), and finally, executing the action. Information is sent to the brain for prediction, evaluation, and adjustment. The entire process occurs in fractions of milliseconds. (Foran, B., 2001)

2. OBJECTIVE OF THE STUDY

The objective of the present study was to estimate goal keeper performance on the basis of selected coordinative abilities.

3. METHODOLOGY

3.1. Subjects

A total ten handball male players were selected who played goal keeper position of handball game. All the selected handball players were from different Universities of the country who participated in all India Intervarsity handball championship. All theplayer's age were ranging from 16 to 24 years.

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Comparative Study of Football Players With Reference to Arm Length and Leg Length of Different Playing Positions and Regions

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Abstract

Objectives: First objective of the study was to find out the significant difference between different regions in relation to Arm Length and Leg Length. Second objective of the study was to find out the significant difference between different Playing Positions in relation to Arm Length and Leg Length. Third objective of the study was to find out the interaction effect between different Playing positions and different regions in relation to Arm Length and Leg Length.

Methodology: Selection of Subjects:A total of 72 Intervarsity Football Players were selected, 12 from each playing position (Defenders, Mid-fielders, and Attackers), from East and South zones.

Variables:In this study, selected zones (East and South) and Different Playing Positions (Defenders, Mid-fielders, and Attackers) were considered as independent variables and Arm Length and Leg Length was considered as dependent variable.

Measures: Arm Length was measured with the flexible steel tape from the point just above the shoulder joint to the tip of the middle finger and was recorded to the nearest half centimetre. Leg Length was taken with the flexible steel tape from the greater trochanter to the floor and recorded to the nearest half centimeter.

Design of the Study:3 x 2 factorial design was used for the study. Total of 3 Playing Positions were selected at two levels (Zones) i.e. East and South Zone.

Statistical Analysis: To find out the significant difference between South and East Zone in relation to Arm Length and Leg Length (1), to find out the significant difference between different Playing positions in relation to Arm Length and Leg Length (2) and to find out the interaction effect between different Playing Position and Zones in relation to Arm Length and Leg Length (3), Two Way Analysis of Variance was Used at .05 level of Significance.

Findings and Conclusions: Insignificant difference was found among different playing positions in Arm Length and Leg Length.Insignificant difference was found between South and East zone footballersin Arm Length and Leg Length. Insignificant interaction was found between columns (different playing positions) and rows (South and east Zone Footballers)in Arm Length and Leg Length.

1. INTRODUCTION

There is nothing more exhilarating than a player who explodes through a defensive gap, checks, turns and side steps to avoid desperate, defensive lunges, and fires the ball home. Or when a centre-half defies gravity by jumping into the air, hanging there long enough to intercept a crossed ball with his head before directing it to a supporting midfielder's feet for a swift, decisive counter attack. Soccer is the greatest game in the world. These wonderful acts of speed, agility and quickness are what make the difference between winning and losing. Often thought to be 'God

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Effect of Prandharana and Tratak on Orientation Ability of Physical Education Students

Rajeev Choudhary *
Pradnya Karandikar **
Om Prakash Mishra ***

Objective: *The objective of the study was to determine the effect of Prandharana and Tratak on Orientation Ability. [The objective of the study was to find out the significant difference between adjusted post test means of experimental groups (Prandharana and Tratak) and control group in relation to Orientation Ability]*

Methods/Methodology:

Sample: *Ninety male physical education students from Madhya Pradesh were selected as subjects for this study. The age of the subjects ranged between 18-25 years. The subjects were divided into three groups i.e. Two experimental groups (Prandharana and Tratak) and one control group.*

Variable/Content: *The purpose of the study, Orientation Ability Variable was selected.*

Statistical Analysis: *In order to find out the effect of Prandharana and Tratak on Orientation Ability, Analysis of Co-Variance (ANCOVA) was used. The level of significance was set at 0.05 level.*

Results & Conclusions:

Significant difference was found among the adjusted post test means of experimental groups and control group in Orientation Ability, since the F-value (15.058) was found significant at .05 level with 2, 86 df. Tratak Group proved to be superior than Prandharna Group in Orientation Ability.

Keywords: *Orientation Ability, Prandharna, Tratak, Physical Education*

Introduction

Any person who actively practises Yoga becomes a Siddha, be he young, old or even very old, sickly or weak.

—Hatha Yoga Pradipika[1]

Yogic techniques are known to improve one's overall performance. *Pranayama* (breathing exercise) is known to be a part of yogic techniques. Patanjali in his Yoga Sutra describes- *Yama, Niyama, Asana, Pranayama, Pratyahara, Dharana, Dhyana and Samadhi* as eight *angas* (parts) of yoga[2]. Amongst them, in the present materialistic world, the third and fourth part, *Pranayama* and *Asana* (Postures) are considered as very important parts and prescribed by modern medicine too. Many physicians now recommend yoga to patients at risk for heart diseases, as well as those with back pain, arthritis, depression and other chronic diseases[3]. The beneficial effects of different *Pranayamas* are well reported and has sound

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Different Types of Bhastrika Pranayama: Repeated Measures Trials with Different Treatments to Study the Trend of the Effects on Static Balance Ability

Rajeev Choudhary *
Vineeta Singh **
Krzysztof Stec ***
Les³aw Kulmatycki ****
Tilak Raj Meena *****

Purpose: *The objective of the study was to find out the trend of the effects of four varieties of Bhastrika pranayama on Static Balance Ability.*
Methods: *75 students were selected as subjects. Age of the Subjects was ranged from 17 to 25 years. All the subjects were divided randomly in to five groups i.e. 15 in each group. They practiced four varieties of Bhastrika pranayama.*
Results: *Quadratic components for overall trends were found significant in Static Balance Ability, since the F value (21.876) was found significant at .05 level with 1, 70 df. Significant difference was found between linear components of the trends for treatment groups and control group in Static Balance Ability, since the F value (30.646) was found significant at .05 level with 4, 70 df. Significant difference was found between quadratic components of the trends for treatment groups and control group on Static Balance Ability, since the F value (16.335) was found significant at .05 level with 4, 70 df.*
Conclusions: *Significant difference was found among the adjusted posttest means of four experimental groups and a control group in Static Balance Ability.*
Keywords: Static Balance Ability, Bhastrika Pranayama, Randomized Block Design, Trend Analysis, Linear Trend, Quadratic Trend, Cubic Trend.

Introduction : Yoga is an ancient system based on philosophical and practical knowledge concept and a holistic vision of individual, refined over the ages for the all round development of both i.e. the body & the mind. *Pranayama* as a part of classical yoga controls the energy and vital forces (*prana*) within the organism in order to rejuvenate & to maintain good health as well as to promote evolution. Yoga practitioner follows the proper patterns of deep breathing that strengthen and rejuvenate respiratory system, also soothe our nervous system as well as reduce distress. Yoga also helps the mind to set calm and become a useful vehicle for concentration and meditation. *Bhastrika pranayama* is one of the eight main forms of pranayama. Bhastrika is mentioned in the classical yoga texts *Hathapradipika* and the *Gheranda Samhita.* In Sanskrit it means the 'bellows' and is related to a metaphor - "the blacksmith blows to create heat and purify iron and bellows is an instrument/device for

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Estimation of weight lifters performance on the basis of Anaerobic Power and Balance Abilities: Belonging to 69 Kg. Weight Category

Dr. Rajeev Choudhary[1], Diwakar Singh[2], Dr. Tilak Raj Meena[3]

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Abstract

The objective of the study was to estimate of 69 kg. Weight category of Weight lifters performance on the basis of Anaerobic Power and Balance Abilities. In this study, fifteen male University level Weight lifters who performed 69 kg. weight category were selected. All the Weight lifters age were ranging from 18 to 26 years. In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables. For the estimating dependent variable (69 kg. weight category of Weight lifters performance) on the basis of independent variables (Anaerobic Power and Balance Abilities), Multiple regression analysis was used. Weight Lifters performance (69 kg.) = -24.717 + .418 × Anaerobic Power.

Key Words: Time of Day, balance ability, Rhythm ability.

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).

2. Methodology

2.1 Objective of the Study

The objective of the study was to estimate of 69 kg. weight category of Weight lifters performance on the basis of Anaerobic Power and Balance Abilities.

2.2 Selection of Subjects

In this study, fifteen male University level Weight lifters who performed 69 kg. weight category were selected. All the Weight lifters age were ranging from 18 to 26 years.

2.3 Selection of Variables

In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables.

2.4 Criterion Measures

Variable	Test used	Unit of measurement
Anaerobic power	Lewis Nomogram	Kg-m/sec
Static balance	Stork Stand Test	Seconds
Dynamic balance	Modified Bass Test	Points

2.5 Statistical Analysis

For the estimating dependent variable (69 kg. Weight Category of Weight lifters performance) on the basis of independent variables (Anaerobic Power and Balance Abilities), Multiple regression analysis was used.

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Estimation of Weight Lifters Performance on the basis of Anaerobic Power and Balance Abilities: Belonging to 77 Kg. Weight Category

Dr. Rajeev Choudhary[1], Diwakar Singh[2], Dr. Jitender Kumar[3], Dr. Om Prakash Mishra[4]

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Abstract

The objective of the study was to estimate of 77 kilogram weight category of Weight lifters performance on the basis of Anaerobic Power and Balance Abilities. In this study, fifteen male University level Weight lifters who performed 77 kilogram weight category were selected. All the Weight lifters age were ranging from 18 to 26 years. In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables. For the estimating dependent variable (77 kilogram Weight Category of Weight lifters performance) on the basis of independent variables (Anaerobic Power and Balance Abilities), Multiple regression analysis was used. Weight Lifters performance (77 kilogram) = -72.730 + .752 × Anaerobic Power.

Key words: Weight Lifter Performance Anaerobic power and Balance abilities.

1. Introduction

The ability to balance easily in static position or in motion is a function of the mechanism in the semicircular canals, the kinaesthetic sensations in the joints and muscles, visual perception of motion, and the degree of coordination in response to these three sources of stimuli. Individuals, doubtless, vary in the quality of this total neuromuscular organization. Further variations appear because some have been trained to use kinaesthetic awareness as a basis for balance and weight control: others have never had such training, nor have they developed awareness through their own efforts. From the skill standpoint and from the safety standpoint, good balance seems important. Studies and experience shows that excessive fatigue, particularly long-term chronic fatigue, reduces balance control. Balance test appear to be useful in somewhat of a diagnostic or interpretive way. For example, poor balance may explain erratic performance on certain skills, tension in trying to perform static activities such as skating, skiing, diving, dancing, tranpolining, or others where dynamic balance is important. Also, a marked drop in ability to balance may be associated with fatigue (Scott, M. G., & French, E., 1972).

2. Methodology

2.1 Objective of the Study

The objective of the study was to estimate of 77 kilogram weight category of Weight lifters performance on the basis of Anaerobic Power and Balance Abilities.

2.2 Selection of Ssubjects

In this study, fifteen male University level Weight lifters who performed 77 kilogram weight category were selected. All the Weight lifters age were ranging from 18 to 26 years.

2.3 Selection of Variables

In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables.

2.4 Criterion Measure

Variable	Test used	Unit of measurement
Anaerobic power	Lewis Nomogram	Kg-m/sec
Static balance	Stork Stand Test	Seconds
Dynamic balance	Modified Bass Test	Points

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Estimation of Weight Lifters Performance on the basis of Balance Abilities and Anaerobic Power: Delimited to 105 Kilogram Weight Category

Dr. Rajeev Choudhary[1], Diwakar Singh[2], Dr. Bharat Chandra Thakur[3], Dr. Tilak Raj Meena[4]

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Abstract

To establish regression equation for predicting Dependent Variable (weight lifter performance belonging to 105 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 105 kilogram weight category from Indian Universities were selected. In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables. For predicting Dependent Variable (weight lifter performance belonging to 105 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power), Multiple Regression Analysis was used. Weight Lifters performance (105 kilogram) = -14.424 + .224 × Anaerobic Power.

Key words: Weight Lifters Performance, Anaerobic power and Balance abilities.

1. Introduction

Balance and posture have been discussed throughout this text because they are inseparable and are an integral part of all the areas of the field of physical education. Sense of position and the awareness of body alignment are essential to efficient movement and physical fitness. Posture may be defined as the relative arrangement of the various segments of the body. In a good posture each body segment is well balanced in relation to other body segments. In other words, the head, trunk, pelvis, and lower limbs should be in such a relationship to one another that the least amount of strain and energy expenditure is created. With faulty posture, the mechanical performance of the body becomes inefficient because there is imbalances in those muscles that properly align the various body segments. As the child matures, stationary and moving postural positions become automatic. Body alignment becomes a matter of unconscious self- regulation. Postural awareness becomes a coordination of visual cues, responses from the inner ear, and information given by tendon, joint, and muscles receptors. Wrong information or malfunction of any of these sense organs can cause faulty body alignment and result in a generally inefficient use of the body. Therefore, one most consider all aspects of physical fitness as affecting postural fitness (Arnheim, D. D., & Robert, A. P., 1978).

1.1 Objective of the Study

To establish regression equation for predicting Dependent Variable (weight lifter performance belonging to 105 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power).

2. Methodology

2.1 Subjects of the Study

The subjects for this study were selected from Different Universities. A total of 15 male weight lifters belonging to 105 kilogram weight category from Indian Universities were selected.

2.2 Variables of the Study

In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables.

2.3 Criterion Measure

Variable	Test used	Unit of measurement
Anaerobic power	Lewis Nomogram	Kg-m/sec
Static balance	Stork Stand Test	Seconds
Dynamic balance	Modified Bass Test	Points

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Estimation of Weight Lifters Performance on the basis of Balance Abilities and Anaerobic Power: Delimited to above 105 Kilogram Weight Category

Dr. Rajeev Choudhary[1], Diwakar Singh[2], Dr. Tilak Raj Meena[3]

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Abstract

To establish regression equation for predicting Dependent Variable (weight lifter performance belonging to above 105 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 above 105 kilogram weight category from Indian Universities were selected. In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables. For predicting Dependent Variable (weight lifter performance belonging to above 105 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power), Multiple Regression Analysis was used. Weight Lifters performance (above 105 kilogram) = -24.015 + .268 × Anaerobic Power.

Key words: Weight Lifters Performance, Anaerobic power and Balance abilities.

1. Introduction

Weight lifting got its start in the year 1860 in "strong man" contests, with George Barker Windship, a physician, health reformer, and strong man, at the fore. Windship is credited with inventing the plate-loading barbell, which he patented in the year 1865, named it the "Practical Graduating Dunb-bell". In Germany, Vladislav Krayevsky, a native of Poland, founded the St. Petersburg Amateur Weight lifting society in 1885, and a national federation was established in Germany in 1891. The first national championship was held in London in 1891, with lifters from Austria, Belgium, Germany, and the United States competing their strength. Weight lifting became an Olympic event in 1896 but was intermittently dropped from the games until 1920. In 1928, the three "classic" lifts-press, snatch, and jerk were established. The press was dropped from Olympic lifting in 1976 because of controversy over what constituted a proper lift. In the sport Weight lifting, Weightlifters execute two lifts: (1) First is the snatch (2) Second is the clean and jerk. Each Weightlifter gets three attempts or chance at both lifts. Competitors are placed in different weight categories, starting from 48 kilograms for women and on the other hand 56 kilograms for men. In any international competition, Weightlifting teams are divided into two classes. Men's teams consist of eight members, and women's teams consist of seven; both classes can have no more than two members per weight class. The Olympic games have their own unique qualifying procedures, based on a country's placing at the world championships; a men's team may have as may have maximum six members and a women's team four (Hanlon, T., 2009).

1.1Objectives of the Study

To establish regression equation for predicting Dependent Variable (weight lifter performance belonging to above 105 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power).

2. Methodology

2.1 Subjects of the Study

The subjects for this study were selected from Different Universities. A total of 15 male weight lifters belonging to above 105 kilogram weight category from Indian Universities were selected.

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Estimation of Weight Lifters Performance on the basis of Balance Abilities and Anaerobic Power: Delimited to 85 Kilogram Weight Category

Dr. Rajeev Choudhary[1], Diwakar Singh[2], Dr. Om Prakash Mishra [3], Dr. Jitender Kumar[4]

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Abstract

To establish regression equation for predicting Dependent Variable (weight lifter performance belonging to 85 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 85 kilogram weight category from Indian Universities were selected. In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables. For predicting Dependent Variable (weight lifter performance belonging to 85 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power), Multiple Regression Analysis was used. Weight Lifters performance (85 kilogram) = -23.134 + .322 × Anaerobic Power. Weight Lifters performance (85 kilogram) = -21.134 + .274 × Anaerobic Power + .076 × Dynamic Balance.

Key words: Weight Lifters Performance, Anaerobic power and Balance abilities.

1. Introduction

Balance is the most important ability that is essential for weightlifters. Both the type of balance abilities are required i.e. static balance and dynamic balance. Dynamic balance is essential for performing skills and static balance is required to maintain the final position. Balance and posture have been discussed throughout this text because they are inseparable and are an integral part of all the areas of the field of physical education. Sense of position and the awareness of body alignment are essential to efficient movement and physical fitness. Posture may be defined as the relative arrangement of the various segments of the body. In a good posture each body segment is well balanced in relation to other body segments. In other words, the head, trunk, pelvis, and lower limbs should be in such a relationship to one another that the least amount of strain and energy expenditure is created. With faulty posture, the mechanical performance of the body becomes inefficient because there is imbalances in those muscles that properly align the various body segments. As the child matures, stationary and moving postural positions become automatic. Body alignment becomes a matter of unconscious self- regulation. Postural awareness becomes a coordination of visual cues, responses from the inner ear, and information given by tendon, joint, and muscles receptors. Wrong information or malfunction of any of these sense organs can cause faulty body alignment and result in a generally inefficient use of the body. Therefore, one most consider all aspects of physical fitness as affecting postural fitness (Arnheim, D. D., & Robert. A. P., 1978).

1.1 Objective of the Study

To establish regression equation for predicting Dependent Variable (weight lifter performance belonging to 85 kilogram weight category) on the basis of Independent Variables (static balance, dynamic balance and anaerobic power).

2. Methodology

2.1 Subjects of the Study: The subjects for this study were selected from Different Universities. A total of 15 male weight lifters belonging to 85 kilogram weight category from Indian Universities were selected.

2.2 Variables of the Study: In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables.

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Estimation of Weight Lifters Performance on the basis of Anaerobic Power and Balance Abilities: Belonging to 94 Kg. Weight Category

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Abstract

The objective of the study was to estimate of 94 kilogram weight category of Weight lifters performance on the basis of Anaerobic Power and Balance Abilities. In this study, fifteen male University level Weight lifters who performed 94 kilogram weight category were selected. All the Weight lifters age were ranging from 18 to 26 years. In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables. For the estimating dependent variable (94 kilogram Weight Category of Weight lifters performance) on the basis of independent variables (Anaerobic Power and Balance Abilities), Multiple regression analysis was used. Weight Lifters performance (94 kilogram) = -26.385 + .325 × Anaerobic Power.

Key words: Weight Lifters Performance, Anaerobic power and Balance abilities.

1. Introduction

In simple terms, balance can be described as the foundation from which all movements originate. It is perhaps the most important component of athleticism. At all times, your body is subjected to a force that cannot be seen by the naked eye. This force is, of course, called gravity, and your ability to control your centre of gravity determines your sense of balance. Dynamic balance is the ability to control your centre of gravity during angular and unstable body movements. It determines whether you perform with power and grace or become drained and risk getting thrown to the ground. Without balance, even your strongest muscles become useless and unable to exert force on another body. Thus poor balance often results in weak skill development in terms of speed, power and strength: it increases one's risk of injury. As a training activity, rope jumping draws effect on nearly every muscle in your body. In addition to the major muscle groups already discussed, rope jumping also draws effect upon stabilizing muscles and muscles fibers. These are the muscle systems that contribute to your overall sense of balance. As you increase in proficiency and become able to sustain rope jumping for as long as 5 minutes at a time, you will get a feel for the stabilizer muscles, located near the joint, that complement the support of ligaments and tendon. During sports play, athletes constantly lose their centre of gravity and regain it in order to maintain balance. Rope jumping forces you to lose and regain your balance several times per second. It forces you to alternate balancing on one leg and then on the other while your upper body coordinates the rope swing with each jump. It also requires proper timing and coordination (Lee, B., 2010).

1.1 Objective of the study:

The objective of the study was to estimate of 94 kilogram weight category of Weight lifters performance on the basis of Anaerobic Power and Balance Abilities.

2. Methodology

2.1 Selection of subjects:

In this study, fifteen male University level Weight lifters who performed 94 kilogram weight category were selected. All the Weight lifters age were ranging from 18 to 26 years.

2.2 Selection of Variables:

In this study, Weight lifters performance was selected as dependent variable and Anaerobic Power & Balance Abilities as independent variables.

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Estimation of Left Shooter's Performance in Handball on the Basis of Coordinative Abilities

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Abstract

The objective of the study was to estimate left shooter performance on the basis of selected coordinative abilities. A total ten handball male players were selected who played left shooter position of handball game. All the selected handball players were from different Universities of the country who participated in all India Intervarsity handball championship. All the player's age were ranging from 16 to 24 years. In this study, taking five coordinative abilities (Orientation ability, Differentiation ability, Reaction ability, Balance ability and Rhythmic ability) were selected independent variables and only one goal keeper performance was selected for dependent variable. To estimation goal keeper performance on the basis of selected coordinative abilities, multiple regression analysis was used. One regression model was established. Established regression model is: Left Shooters performance = 189.033 - 1.772 × Reaction Ability.

INTRODUCTION

Co-coordinative abilities are understood as moderately stabilized and generalized patterns of motor control and regulations process. These enable the sports player to do a group of actions with better quality and effect (Singh, H. 1995).

Using different parts of the body in an ordered sequence of movement to achieve a desired goal requires a high degree of neuromuscular coordination. Some skilled acts required predominantly eye-foot-hand coordination, such as in punting a football; other skills require mainly eye-hand coordination, such as in the precision task of hitting the ball in a centre jump in basketball, and still others require eye-foot coordination, such as in kicking a soccer ball. (Daniel, D. A., & Robert, A. P., 1978)

Handball is a game where players are assigned different names, keeping the goalkeeper a reference point so that a defender on the right is against the attacker on the left. The positions of the player in handball are assigned under two categories namely offensive positions & defensive positions. (Jain, d., 2012)

OBJECTIVE OF THE STUDY

The objective of the study was to estimate left shooter performance on the basis of selected coordinative abilities.

METHODOLOGY

Subjects

A total of ten handball male players were selected who played left shooter position of handball game. All the selected handball players were from different Universities of the country who participated in all India Intervarsity handball championship. All the player's age were ranging from 16 to 24 years.

Variables

In this study, taking five coordinative abilities (Orientation ability, Differentiation ability, Reaction ability, Balance ability and Rhythmic ability) were selected independent variables and only one left shooter performance was selected for dependent variable.

DIFFERENT TYPES OF BHASTRIKA PRANAYAMA: REPEATED MEASURES TRIALS WITH DIFFERENT TREATMENTS TO STUDY THE TREND OF THE EFFECTS ON STATIC BALANCE ABILITY

original paper
doi: 10.1515/humo-2017-0038

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ABSTRACT

Purpose. The objective of the study was to find out the trend of the effects of 4 varieties of bhastrika pranayama on static balance ability.

Methods. The total of 75 male students were selected as subjects. The age of the subjects ranged 17–25 years. The participants were divided randomly into 5 groups, 15 students each. They practiced 4 varieties of bhastrika pranayama.

Results. Quadratic components for overall trends were found significant in static balance ability. A significant difference was observed between linear components of the trends for the treatment groups and the control group in static balance ability. Also, a significant difference was noted between quadratic components of the trends for the treatment groups and the control group as for static balance ability.

Conclusions. There was a significant difference among the adjusted post-test means of 4 experimental groups and the control group in static balance ability.

Key words: balance ability, bhastrika pranayama, trend analysis

Introduction

Yoga is an ancient system based on philosophical and practical knowledge/concept and a holistic vision of an individual, refined over the ages for the overall development of the body and mind. *Pranayama*, as a part of classical yoga, controls the energy and vital forces (*prana*) within the organism in order to rejuvenate and maintain good health as well as to promote evolution. A yoga practitioner follows the proper patterns' of deep breathing that strengthen and revitalize the respiratory system, soothe the nervous system, and reduce distress. Yoga also helps the mind to set calm and become a useful vehicle for concentration and meditation. *Bhastrika pranayama* is one of the 8 main forms of pranayama. Bhastrika is mentioned in the classical yoga texts, *Hathapradipika* and *Gheranda Samhita*. In Sanskrit, it means 'bellows' and is related to the following metaphor: 'A blacksmith blows to create heat and purify iron and bellows is a device for generating a strong current of air, used to give flow to fire in old times.' Swami Sivananda describes the bhastrika pranayama practice as a process of rapid inhalation and exhalation with a hissing sound. Except the different practices of simple breathing exercises, the old yogis also explained that different types of deep breathing techniques can have varied effects on both mind and body [1–5]. There are different principles and theories which support the concept that by reducing and controlling their breath, yoga practitioners may improve the physical and mental stability [6–8]. Some studies have reported that yogic practices related to breathing employ voluntarily strong abdominal contractions, which brings stimulation related to somatic and splanchnic receptors, and induces parietal areas of the cerebral cortex, with a suggested effective arousal.

The main goal of the study was to select an appropriate bhastrika version to improve the static balance ability of individuals.

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Comparative Effects of Mental and Ideo-Motor Training on "Tai O Toshi" Performance in Judo

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Abstract

The objective of the present study was to get the influence of mental training and ideo-motor training on "Tai O toshi" performance in Judo. Thirty male inter-collegiate level Judoka from Madhya Pradesh were selected as subjects for this study. The subjects were divided into three group's i.e. two experimental groups and one control group. Mental training & Ideo-Motor training were selected as independent variables & "Tai O toshi" performance in Judo was selected as dependent variable. Performance of "Tai Otoshi" in Judo was measured by panel of three experts and score was given out of 30 points. The data were collected before the start of the experiment (pre-test) and at the end of the training period (post-test). For the study, pre-test-post-test randomized group design, which consists of one control group (n=30) and two experimental groups (n=30 in each) was used. Equal numbers of subjects were assigned randomly to the groups. Two groups (Mental training group and Ideo-motor training group) served as experimental groups on which treatment was assigned and the third group served as the control group. In order to find out the effect of mental training and ideo-motor training on learning "Tai Otoshi" performance in Judo,analysis of Co-Variance (ANCOVA) was used. The level of significance was set at 0.05 level. Both the experimental treatments (Mental Training group & Ideo-Motor Training Group) proved to be equally effective in learning "Tai O toshi". In case of treatments, 84.6 % (Partial Eta Squared = .846) in the total variance can be explained by treatment effect and remaining 15.4 % is unexplained.

Keywords

Mental Training, Ideo-Motor Training & "Tai O toshi".

1. INTRODUCTION

The beginning of sports training should have in sight the development make-up of the learner. It is the prime need of all the physical activities that the learner should perform the movements quite accurately. It will also get judoka to be involved more if would come to know why particular activity should be executed by the way it is being performed. Sport should not be only physical aspect of his personality; it should be an integrated part of his personality, as the sports attitude. Using of mental training is useful facility to achieve psycho relation and also help the learner in learning his successful performance, which will lead to a useful change in psychomotor behaviour. Mental training and ideo-motor training are supposed to reduce the high activation level and psycho physiological disequilibrium and also contribute to steadiness, psychomotor coordination and emotional stability.

2. OBJECTIVE OF THE STUDY

The objective of the present study was to get the influence of mental training and ideo-motor training on "Tai O toshi"performance in judo.

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Estimating feeder's performance of basketball players on the basis of selected coordinative abilities

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Abstract

The objective of the study was to estimate feeder's performance on the basis of selected coordinative abilities. A total of fifty basketball male players were selected who played feeders position of basketball game. All the selected basketball players were from different universities of the country who participated in all India inter university basketball championship. The study was conducted by taking selected coordinative abilities (Reaction ability, Orientation ability, Differentiation ability, Balance ability, Rhythmic ability) which were independent variable and only one feeders performance was selected for dependent variable. To estimate feeder's performance on the basis of selected coordinative abilities, multiple regression analysis was used. Only one regression modal was established and that was: **Feeders performance = 34.678 + 0.415 × Reaction ability.**

Key Words: Reaction Ability, Feeders Performance, Coordinative Abilities.

1. Introduction:

In modern times, it has been found that sports performance up to maximum extent is dependent on coordinative abilities. Coordinative abilities have been considered as an important tool for learning sports techniques. It is also essential to refine and modify these techniques during long term training process. The already developed coordinative abilities, especially in childhood, individual's asset for learning complex techniques in advance stages. According to the nature of basketball game which requires speed, agility, coordinative ability etc. as fitness components to perform well; it is the reaction time that plays a vital role depending upon the reflexes of a player against a stimulus. Coordination is considered to be an important factor which is closely related to performance; especially with high complex movements. It is the ability of integrating different types of movements in specific patterns.

1.1 Objective of the Study:

- To find out relationship between dependent variable (feeder's performance in basketball) and independent variables (selected coordinative abilities).
- To estimate regression equation model for estimating dependent variables (feeder's performance in basketball) and independent variables (selected coordinative abilities).

2. Methodology:

To achieve the purpose of present study fifty male Volleyball players was selected purposely from different sports hostels and colleges of UP .

2.1 Subjects: A total of fifty basketball male players were selected who played feeders position of basketball game. All the selected basketball players were from different universities of the country who participated in all India inter university basketball.

2.2 Variables: The study was conducted by taking selected coordinative abilities (Reaction ability, Orientation ability, Differentiation ability, Balance ability, Rhythmic ability) which were selected independent variable and only one feeder's performance was selected for dependent variable.

To estimate feeder's performance on the basis of selected coordinative abilities, multiple regression analysis was used.

Finding and results of the study related to feeders performance.

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Online Advertisement and Purchase Intentions of Sports Equipments

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Abstract

The objective of this paper is to identify the relationship between online advertisement and purchase intentions of consumers of sports equipment in Raipur City. Online advertisement has been considered as independent variable whereas, purchase intentions was considered as dependent variable. Six antecedents of online advertisement have been considered in this study viz. informativeness, inter activity, entertainment, credibility, irritation, and accessibility. A survey-based exploratory and correlational research design was used. The data was collected from 101 customers using sports equipments of various telecom brands through structured questionnaires. Multiple regression analysis was used to determine the causal relationship between both the independent & dependent variables. Results depicted that the credibility, inter activity and irritation have significant and positive impact on purchase intention.

Keywords

Online Advertisement, Purchase Intentions, Sports Equipments, Informativeness, Inter activity, Entertainment, Credibility, Irritation, Accessibility

1. INTRODUCTION

In India advertising sector has magnificently changed in last few decades. Advertising spends in India are expected to grow around 10% year on year to Rs 61,204 crores, according to media buying agency Group M. This is effectively a slowdown in growth from the 15.5% which it had predicted last year, and later ended up being a growth of 11.9%. (Pahwa, 2017).

Today customers became more techno savvy; almost everything is now a click/touch away. There are various electronic devices and gadgets are available to the customers from desktop to smart phones. The electronic stores or e-commerce is the best example that has revolutionized the way humans used to shop. It has changed the entire system of buying and selling a product and also affected the buying pattern of the customers. In today's hectic and fast moving world, people don't have time to go for shopping. A today online store provides customer various alternatives at discounted rates that they cannot get from their traditional store. All this has led to tremendous growth of the online retail industry throughout the world (Hairong Li, 1999).

Electronic commerce is changing in a rapid way; consumers shop and buy goods and services. Consumers started to learn how to behave in an ever-changing electronic market environment in today's scenario, shopping and buying online have become part of their daily lives for many consumers, whereas others may consider it risky.

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Comparative Effects of Mental and Ideo-Motor Training on "O Goshi" Performance in Judo

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Abstract

The objective of the present study was to get the influence of mental training and ideo-motor training on "O Goshi"performance in Judo. There are ninety male national level judokas from Madhya Pradesh were selected as subjects for this study. The subjects were divided into three group's i.e. two experimental groups and one control group. Mental training & Ideo-Motor training were selected as independent variables & "O Goshi" performance in Judo was selected as dependent variable. Performance of "O Goshi" in Judo was measured by panel of three experts and score was given out of 30 points. The data were collected before the start of the experiment (pre-test) and at the end of the training period (post-test). For the study, pre-test post-test randomized group design, which consists of one control group (n=30) and two experimental groups (n=30 in each) was used. Equal numbers of subjects were assigned randomly to the groups. Two groups (Mental training group and Ideo-motor training group) served as experimental groups on which treatment was assigned and the third group served as the control group. In order to find out the effect of mental training and Ideo-motor training on learning "O Goshi" performance in Judo, analysis of Co-Variance (ANCOVA) was used. The level of significance was set at 0.05 level. Both the experimental treatments (Mental Training group & Ideo Motor Training Group) proved to be equally effective in learning "O Goshi". In case of treatments, 88.6% (Partial Eta Squared =0.886) in the total variance can be explained by treatment effect and remaining 11.4 % is unexplained.

Key Words: Mental Training, Ideo-Motor Training & "O Goshi.

1. Introduction:

It is evident that today, worlds most sporting Nations are very much conscious of these facts and concentrate on the development of both of these aspects. Mental training and Ideo-motor training are supposed to reduce the hign activation level and psycho physiological disequilibrium and also contribute to steadiness, psychomotor coordination and emotional stability. Such condition of high activation level and psycho physiological imbalance along with emotional instability seem to increase the various disorganization of motor responses and tremors meditation and mental practices are intended to stabilize the psycho physiological mechanism so that there is less and less tendency towards an imbalance in the face of external and internal stimuli. Moreover, it is found that there was reduction in anxiety level and increase in emotional stability.

In fact Judo skills also need psycho physiological balance, which can be achieved perhaps by adopting both the disciplines of physical and psychological practice. The above literature it can be justifiably employed not only for promotion of skill improvement in Judo, but also be used in every sphere of life activities.

1.1 Objective of the Study:

The objective of the present study was to get the influence of mental training and ideo-motor training on "O Goshi" performance in judo.

2. Methodology:

2.1 Subjects:

Ninety male national level judokas from Madhya Pradesh were selected as subjects for this study. The subjects were divided into three group's i.e. two experimental groups and one control group.

Estimating Shooter's Performance Of Basketball Players On The Basis Of Selected Anthropometric Characteristics

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Abstract

The objective of the study was to estimate shooter's performance of basketball players on the basis of selected anthropometric characteristics. A total 50 basketball male players were selected who played shooters position of basketball game. All the selected basketball players were from different universities of the country who participated in all India inter university basketball championship. The study was conducted by taking selected anthropometric characteristics (Standing Height, Body weight, Arm length, Fore arm length, Upper arm length, Hand length, Leg length, Thigh length, Lower leg length, Thigh girth and Calf girth) which were independent variable and only one shooter's performance was selected for dependent variable. To estimate shooter's performance on the basis of selected anthropometric characteristics, multiple regression analysis was used. Only one regression modal was established and that was: Shooter's Performance = -1.622 + 0.389 × Standing height.

1. Introduction

Basketball is a sport where two teams of five players play. Each team tries to score points by throwing a ball through a hoop (the basket) under organized rules. Shooter is one of five traditional positions on basketball team. They are often shorter, leaner and quicker than forwards and are frequently called upon to create a high volume of shots on offense and guard the opponent's best perimeter player on defense. Shooter is also known as "2-guard" or point guard and "off guard", since they play off the ball on offense. Some teams ask their shooting guards to bring up the ball as well; these players are known as "combo guard". Shooter is sometime the best jump-shooters on the floor, most can also drive the basket well. A shooter should be a good ball handler and be able to pass reasonably well, though passing should not be high on his or her priorities. Most shooters focus on primarily on scoring, allowing the feeder to worry about distributing the ball.

2. Objective of the Study

2.1 To find out relationship between dependent variable (shooter's performance in basketball) and independent variables (selected anthropometric characteristics).

2.2 To estimate regression equation modal for estimating dependent variables (shooter's performance in basketball) and independent variables (selected anthropometric characteristics).

3. Methodology

3.1. Subjects

A total of fifty basketball male players were selected who played shooter's position of

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A Comparative Study of Anthropometric Variables and Physical Fitness Variables of Residential and non- residential Tribal Players of Bastar, Chhattisgarh, India .

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Abstract: A cross sectional study of the anthropometric variables and physical fitness variables was carried out on 782 boys and girls, aged 12+ to 17+ years from Tribal residential and non-residential school of Bastar dist of Chhattisgarh. The study was aimed to compare stature, body weight, 50 m run, 10*4 m shuttle run and vertical jump to measure motor fitness components. Height and weight measurements showed increasing trend with age in both groups of boys and girls, but it is not uniform in all the ages. However, comparison revealed that, there was no difference in height and weight measurements in residential and non-residential boys and girl of all the age group but the motor fitness variables exhibited better scores for boys and girls of residential school.

Keywords- *Anthropometric & Physical Fitness Variables, Weight, Height, Tribal.*

Date of Submission: 12-07-2018 Date of acceptance: 28-07-2018

I. INTRODUCTION

Bastar, the land of tribes where about 70% of the total population comprises of tribals, which is 26.76% of the total tribal population of Chhattisgarh. The major tribes of the Bastar region are the Gond, Abhuj Maria, Bhatra etc. The tribes of Bastar region are known for their unique and distinctive tribal culture and heritage in all over the world. Each tribal group in Bastar has their own distinct culture and enjoys their own unique traditional living styles. Each tribe has developed its own dialects and differs from each other in their costume, eating habits, customs, traditions and even worships different form of god and goddess.

II. MATERIAL AND METHODS

Chhattisgarh is a state in Central India. 782 boys and girls of Tribal school aged 12+ to 17+ years were the sample of the present study. Present paper aims at assessing and comparing the Anthropometric Variables and Physical Fitness Variables of Residential group that is school children, who were sports person residing in school hostels and pursuing their school along with sports training and sports participation and non- residential was the second group consisted of tribal students who were day scholars and also taking part in sports training or sports competition. Anthropometric measurements weight, height and physical fitness variables speed, vertical jump, shuttle run were taken following standard techniques. Descriptive and comparative analysis of the data was done using SPSS package version.

Body weight:

Weighing machine was used for recording body weight. Weighing machine was placed on plain surface and the subject was made to stand on the center of platform bare foot without support. Extra clothing and shoes were removed. Body weight recorded in Kilogram. (Tanner 1962)[1]

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RESEARCH ARTICLE

A Study of Anthropometric and Psychological Discriminating Factors of Hypertension

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ABSTRACT:

The purpose of the study was to find out the discriminating predictors of high blood pressure and normal blood pressure group of teacher. A total sample of 520 (254 males and 266 female) university teachers of Chhattisgarh was selected for the study. The dependent variable for the study was high blood pressure and healthy group of teachers. The independent variables were body mass index, physical activity, age, weight, height, waist hip ratio (anthropometric), hypo-kinetic problems awareness, personal and environmental barrier to physical activity (psychological) and physical activity level. The high blood pressure and normal blood pressure groups were identified by checklist and the other variables were assessed with help of questionnaires, standard equipments. Discriminant analysis was used to analyze the data. The result indicated that the independent variables, age, waist hip ratio and personal barrier to physical activity, emerged out to be discriminating predictors, contributing significantly in discriminating the two groups. These variables contributed 62%, 47.8% and 36.5%, of their variance respectively. Significant positive association between predicting factors with the high blood pressure group was found, indicating their role in HBP problem.

KEYWORDS: Hypertension, Age, Sedentary life style, Barrier of Physical activity, Hypo-kinetic Problems Awareness.

INTRODUCTION:

Hypertension is serious hypo-kinetic problem of modern times; it is a long term medical problem. Hypertension is measured as high blood pressure (HBP), in which the blood pressure in the arteries is constantly elevated. HBP is a major risk factor for coronary artery disease, stroke, heart failure atrial fibrillation, peripheral vascular disease, vision loss, chronic kidney disease and dementia[1,2,3,4]. Blood pressure is measured by two numbers; one represents systolic pressure and other represents diastolic pressure. The systolic measure is the amount of arterial pressure when the ventricles contract and the diastolic measure is when the ventricles relax. The degree of arterial pressure in a young adult would be 120 (systolic) over 80 (diastolic). A blood pressure level that is over 140 (systolic pressure) and does not fall below 90 (diastolic pressure) is usually considered high

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Anthropometric and Psychological Factor Discriminating Diabetic and Non Diabetic Healthy Population

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Abstract

The purpose of the study was to find out the discriminating predictors (body mass index, personal and environmental barrier, physical activity, age, weight, height, waist hip ratio and Hypo-Kinetic Problems awareness) of diabetic and non diabetic group of teacher. A total sample of 520 (254 males and 266 female) university teachers of Chhattisgarh was consider for the study. The diabetic and non diabetic groups were identified by checklist and the other variables were assessed with help of questionnaires. Discriminant analysis was used to analyze the data. The result indicated that the independent variables, Environmental Barrier, Hypo-kinetic ActivityAwareness, Waist Hip Ratio emerged out to be significant discriminating predictors contribute significantly in discriminating the group, contributing 56.6%, 47.9% and 42.5%, of their variance respectively. Significant positive association between predicting factors and diabetic group indicates their role in progression of diabetes problems.

Keywords: Diabetes type 2, , Barrier of Physical activity, Hypo-kinetic Problems Awareness, Weight Height Ratio.

Introduction

Diabetes mellitus commonly referred as diabetes, is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period (WHO, 2014). Symptoms of high blood sugar include frequent urination, increased thirst, and increased hunger. Acute complications of diabetes can include diabetic ketoacidosis, nonketotic, hyperosmolar coma or death (Kitabchi et al.2009, Razavi, et al. 2003, Adrogue, et al. 1982, Rumbak et al. 1991, Kaminskaet al.1993, Fisher et al.1977 and Yadav et al. 2000). Serious long-term complications of diabetes include heart disease, stroke, chronic kidney failure, foot ulcers, and damage to the eyes (WHO, 2013). Significant evidence exists that supports a range of interventions to improve diabetes outcomes (American Diabetes Association, 2014; Kumar, Pandey & Shrivastva 2016). Diabetes mellitus is associated with significant rates of morbidity and

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Effect of eight weeks proprioceptors training on agility of male Kho-Kho players

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Abstract

Objective: The purpose of the study was to find out the effect of eight weeks proprioceptive training on agility of male kho-kho players.

Methodology: Fifty (25= experimental & 25= Control group) male national level kho-kho players were selected purposively as subject for the present study. The age of the subjects ranged between 14 to 18 years. Eight weeks proprioceptive training was considered as independent variable and Agility acts as dependent variable. The design of the study was repeated measure group design since the data were collected at different intervals. The test was conducted before the intervention program i.e. at baseline level, then after 4 weeks & finally after 8 weeks of intervention program. Agility of both the groups was measured by using Illinois agility test. In order to find out the effect of proprioceptive training on agility, Descriptive Statistic and Analysis of Covariance (ANCOVA) was used. Trend analysis was used to find out the trend of improvement. The level of significance was set at 0.05. The data was analyzed by statistical package of social science (SPSS).

Results & Conclusion of the study: The finding of the study showed that the Proprioceptive training improve performance of Illinois agility test of male kho-kho players. Statistically significant difference was found between experimental and control groups in pre, mid and post mean scores, experimental group showed higher scores at ($p < .05$) level.

Keywords: proprioceptive training, agility etc.

Introduction

Proprioception is a sensitivity mechanism present in mammals which coordinates with central nervous system through Mechanoreceptors present in the joint, muscles, & tendons as a result it signals the body how to react & with what amount of tension against a particular message. Proprioception is unconscious initially, but it can be enhanced via training. Proprioception is defined as the awareness of posture, movements & changes in equilibrium as well as the knowledge of position, weight & resistance to objects in relation to the body.

Ya-Wen-Liu, *et al.* (1997) defined proprioception as the conscious awareness of limb position & movement, and is a specialized variation of the sensory modality that encompasses the sensation of joint movement (kinesthesia) and joint position (joint position sense).

Sports training have been an integral part of sportsperson success, trends in this domain is continuously changing as per demand of excellence in sports competitions. Traditional sports training have been incorporated with various emerging advance scientific techniques that lead to enhance performance, in order to achieve peak & consistent performance, modern & innovative concept of sports training should be included in training programs.

Among all the new approaches in sports training one of the rapidly emerging approaches is Proprioceptors training; it has been widely used to increase performance level of sportsperson by elevating sportspersons fitness level.

India is renowned worldwide for its uniformity, culture, traditions and versatility. Physical exercise constituted an important part of Indian culture from ancient time,, there are various indigenous games which were integral part of the Indian culture like Kabbadi and Kho-Kho of which Kabaddi has been recognized at international level where as Kho-Kho is an indigenous sport which is originated from the villages of India not popularized internationally is appealing for its existence and exposure. The game requires well developed physical fitness components, energy, concentration, determination, hard work & skills to achieve top performance. Speed, agility, quickness, reaction time, strength, explosive strength, flexibility etc. are the physical fitness components that lead to top performance in Kho-Kho. Agility as the term indicates is the ability of the individual to respond towards a stimulus quickly & effectively. This game requires vigorous training, therefore the researcher thought of investigating the effectiveness of proprioceptors training on agility for kho-kho players.

Objective of the present Study

The purpose of the present study was to find out the effect of eight weeks Proprioceptive training on agility of male kho-kho players.

Methodology of the study

Selection of Subjects

For the purpose of present study national level male kho-kho players aged 14 to 18 years were selected as subjects. These subjects were divided in experimental group (N=25) and

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Effect of eight weeks proprioceptive training program on dynamic postural stability of male kho-kho players using star excursion balance test (SEBT)

Ashutosh Pandey and Dr. Reeta Venugopal

Abstract
Objective: The purpose of the present study was to find out the effect of 8 weeks Proprioceptive training program on dynamic postural stability of male Kho-Kho players using Star excursion balance test (SEBT).
Methodology: Fifty (50) male national level Kho-Kho players from Bhilai (C.G) India, were selected purposively as subjects for the present study. These subjects were categorized into experimental group (N=25) & Control group (N=25). Age of the subjects ranged from 14-18 years. Star excursion balance test (SEBT) performance on Non-dominant leg (Right leg stance) was used as a tool to assess dynamic postural stability among experimental & control groups before, during & after 8-weeks Proprioceptive training program.
Statistical technique used: Descriptive statistics was used to characterize dynamic postural stability among experimental & control group. Analysis of covariance (ANCOVA) was used to find out the effect of 8-weeks Proprioceptive training program on dynamic postural stability through the mean of SEBT performance. Trend analysis was used to assess the trend of improvement in experimental group during Proprioceptive training program. The level of significance was set at 0.05.
Results & Conclusion: The result of the present study showed significant difference ($p< 0.05$) in SEBT (Normalized excursion distance) performance on non-dominant leg (Right leg stance) that leads to improvement in dynamic postural stability. Proprioceptive training program showed 44 % improvement in SEBT performance & a positive trend of improvement in SEBT performance after 8-weeks Proprioceptive training program.

Keywords: Proprioceptive training program, Star excursion balance test, dynamic postural stability, Kho-Kho etc.

Introduction

Proprioception" is a sensitivity mechanism present in mammals which has direct connection with central nervous system through Mechanoreceptors present in the joint, muscles, & tendons as a result it signals the body how to react & with what amount of tension against a particular message. Proprioception is unconscious initially, but it can be enhanced via training. Proprioception is defined as the awareness of posture, movements & changes in equilibrium as well as the knowledge of position, weight & resistance to objects in relation to the body.

Proprioceptors are special sense organs which helps in execution of smooth & coordinated movements in effective patterns. Proprioceptors are also significant as they maintain normal body posture and muscle tonus. They provide information to the antigravity muscle to counterbalance the effect of gravity, so that the movement occurs effectively while maintaining the stability of the body. (Edward l. fox, 1989, Pg-143) [20].

Correct execution & learning of skill is a complex phenomenon which cannot be completed without the assistance of proprioceptors. Skill learning is originated and operated in cerebral cortex & cerebellum, when a movement is originated in the motor cortex; it is transmitted to the muscles which send the information through proprioceptors back to cerebellum. As a result a corrected signal regarding the skill, generated in the cerebellum is received by the muscles to execute skill (Edward l. fox, 1989, Pg-155) [20].

Postural control may be defined as ability to maintain a posture for a given time without taking the assistance of base of support.

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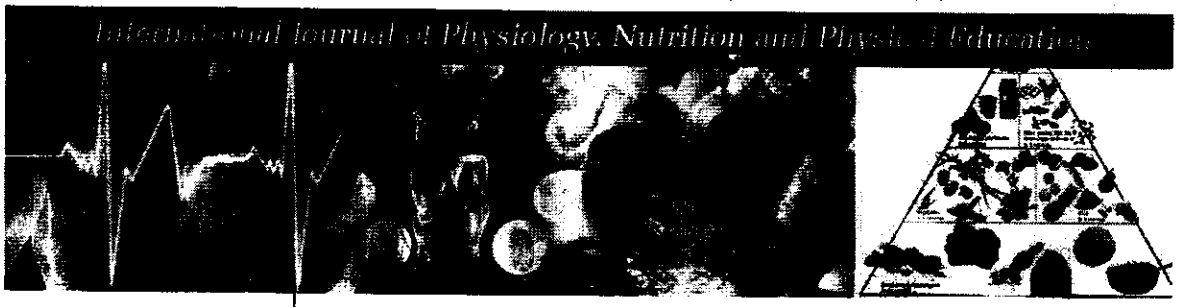

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Effect of ocular muscle imbalance on fundamental skills of junior male hockey players

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Abstract
It is believed that athletes need certain visual abilities to perform at the highest level. However, despite the need for understanding ocular muscle balance and visual fatigue in hockey not only for talent identification but also in sports performance, very few studies have been conducted in the past in this regard still very little information is available on effect of ocular muscle imbalance on skill ability of hockey players, hence the present study was planned. The present study was conducted to find out the effect of ocular muscle imbalance on skill ability of hockey players. 100 state level junior male hockey players (Ave. age 16.23 yrs) were selected as sample. The criteria for selection of subjects were participation in state level hockey competitions in the state of Chhattisgarh. Random sampling method was preferred choice in the present investigation. Ocular muscle imbalance was tested at Department of Ophthalmology, All India Institute of Medical Science, Raipur. To assess basic fundamental skills of hockey, three dimensional SAI Hockey Skill Testing for Talent Spotting at Young Age was used. The results clearly indicate that hockey skill ability of junior hockey players is significantly affected by ocular muscle imbalance. It was concluded that ocular muscle balance is the key factor as far as execution of basic skill in field hockey is concerned.

Keywords: Ocular muscle imbalance, skill ability, hockey

Introduction
Vision is an essential part of most human activities including sports and games because it is the process of reacting to what we see (Martin, 1993) [6]. The discipline of sports vision is a relatively young and growing area of optometry that explores the importance and repercussion of the visual system during one's athletic performance. On average, the competitive athlete's vision is no better than the rest of the population. There is always a high percentage of visual deficiency amenable to correction, even in elite groups. Athletes with visual deficiency partaking in sports with a high visual demand may well be lost to that event. Optimal visual correction allows these players to compete on level terms. Skilled movement is not a spontaneous muscular response but represents a sequence of complicated processes within the central nervous system. An athlete absorbs information from the surrounding sporting environment and processes this information. The final output produces a movement response. This model of humans as information processing systems is commonly used to explain the role of vision in producing and controlling skilled movement.

In sporting context, sports such as field hockey and tennis requires high visual demand while football and rugby, may not require high acuity demand, but need other qualities such as peripheral awareness. The high visual demand is often associated with ocular muscle balance. Balance is the ability to maintain the body's center of mass over its base of support. A properly functioning balance system allows humans to see clearly while moving, identify orientation with respect to gravity, determine direction and speed of movement, and make automatic postural adjustments to maintain posture and stability in various conditions and activities. Balance is achieved and maintained by a complex set of sensorimotor control systems that include sensory input from vision (sight), proprioception (touch), and the vestibular system (motion, equilibrium, spatial orientation); integration of that sensory input; and motor output to the eye and body muscles [Davidson; M. Nussbaum, 2004] [3]. Hence to execute skill movement in a sport like field hockey ocular muscle balance is the key apart from

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Effect of menstrual cycle on soccer playing ability of national players

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Abstract
The present study with a prime focus on female soccer players was conducted to find out the effect of menstrual cycle on soccer playing ability. To conduct the study, 50 female soccer players (Ave. age 24.22 yrs) who took part in inter-university/national level soccer tournaments were selected as sample. Warner's soccer skill test (1950) was used to assess soccer playing ability of selected subjects. To assess soccer playing ability of female soccer players on the basis of their menstrual cycle, the data was collected before, during and after the menstruation period. Results indicate that soccer playing ability was at its best in post menstruation period as compared to pre menstruation and menstruation period. It was concluded that menstrual cycle is an important marker as far as soccer playing ability is concerned.

Keywords: Menstruation cycle, soccer playing ability

Introduction
Effect of menstrual cycle on athletic performance is an issue which has generated quite a lot of debate. The studies in this regard have shown that menstrual cycle affect physical, physiological, psychological and biological functioning of women taking part in competitive sports but the results in this regard are not consistent. Sports scientist also opined that the sports performance during menstruation depends on other factors also.
Women's hormone levels do fluctuate during menstruation, and because of these fluctuations their autonomic nervous system and metabolic functions also gets affected. Therefore it is possible that due to physiological changes athletic performance may also be compromised.
Greeves *et al.* (1999) [3] reported that lowest strength in women was during late follicular stage because of higher estrogen levels. Female with normal menstrual cycle are at stronger during mid luteal period because of higher progesterone level during this phase as compared to menstrual phase. Contradictory theories have been proposed by various researchers in explaining the role of fluctuating sexual hormones in relation to muscle strength or fatigue (Janse de Jonge *et al.* (2001) [4]. Effect of menstruation on sports performance has been studied by many researchers, viz., Brooks-Gunn, Gargiulo and Warren (1986) [1], Quadagno, Faquin, Lim, Kuminka, & Moffet (1991) [5], Wojtys *et al.* (1998) [9], Tasmektepligil *et al.* (2010) [7], Tasgin (2011) [6].
Just like any other sport, participation of women in soccer has age old history. To perform at highest level female soccer players needs to possess basis soccer skills. The execution of these soccer skills are dependent upon many physical, physiological and psychological factors. But as far as women soccer is concerned, menstrual cycle may be the most challenging factor for execution of soccer skills. Surprisingly soccer playing ability of female soccer players has not been studied in the light of menstrual cycle, hence present study was planned.

Objectives
The objective of the present study is to assess the effect of menstrual cycle on soccer playing ability of interuniversity national players.

Hypothesis
It was hypothesized that soccer playing ability of selected female soccer players will show significant variation during different phases of menstrual cycle.

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A comparative study of depression between elite sportspersons and non-sportspersons

CD Agashe and Vijay Kumar Chaurasiya

Abstract
The present study has been conducted with a specific aim of assessing depression in elite athletes as compared to non-sporting population. To conduct the study, 50 elite sportspersons were selected as sample. The criteria for selection of elite sportspersons was participation in national level sports tournament with achievement of finishing in first three position of that event. To fulfill the objectives of the present study, 50 non-sportsperson students from colleges and Universities operational in Chhattisgarh were also selected. The age range of selected subjects from both the group were within 18 to 28 years. Depressive symptoms in selected subjects were assessed by Jodhpur Multiphasic Personality Inventory prepared by Joshi and Malik (1981). It was found that non-sportspersons showed significantly more magnitude of low stress tolerance, rigid conscience development and more magnitude of proneness to guilty as compared elite sportspersons. It was concluded that elite sportspersons possess enhanced mental set of skills to cope more effectively with depression as compared to non-sportspersons.

Keywords: elite sportspersons, non-sportspersons, depressive symptoms

Introduction
As per the definition given in DSM-IV, personality disorders means class of personality types and enduring behaviors associated with significant distress or disability, which appear to deviate from social expectations. These patterns develop early, are inflexible, and are associated with significant distress or disability (American Psychiatric Association, 2013) [1]. Grohol (2014) [4] described depressive symptoms as pessimistic, brooding, fatalistic, over aggressive, low stress tolerance, guilt etc. In modern world where depressive symptoms are alarmingly getting high, the role of competitive sports has been advocated to control it. The basis of sports therapy in controlling depressive symptoms is based on previous studies in which participation in sports was found to be beneficial for betterment of psychological characteristics [Zamanian *et al.* (2011) [8], Gholap (2013) [3], Sidhu *et al.* (2013) [7], Mittal (2014) [6]. But things are different in sports when a player performs at elite level. Elite sportspersons have to face various stressors be it psychological, training or competition which are unique in sports. Hence in order to comparatively analyse the depression reported by elite sportspersons and non-sportspersons, the present study was planned.

Hypothesis
It was hypothesized that elite sportspersons will show more magnitude of depression as compared to non-sportspersons.

Methodology
The following methodological steps were taken in order to conduct the present study.

Sample
To conduct the study, 50 elite sportspersons were selected as sample. The criteria for selection of elite sportspersons was participation in national level sports tournament with achievement of finishing in first three position of that event. To fulfill the objectives of the present study, 50 non-sportsperson students from colleges and Universities operational in Chhattisgarh were also selected. The age range of selected subjects from both the group were within 18 to 28

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Assessment of Locus of Control in Talented Female Hockey Players

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Abstract
The aim of the present study is to comparatively assess locus of control in talented female hockey players. For present study, 40 national level female hockey players (Ave. age 24.12 yrs.), 40 state level female hockey players (Ave. age 23.34 yrs.), 40 district level female hockey players (Ave. age 21.02 yrs.) were selected as sample. Purposive sampling was used in the present study for selection of sample. Rotters Locus of Control Scale (1966) was used to collect psychological data in the present study. One way ANOVA and Post-hoc test indicate a significant difference in locus of control of national, state and district level female hockey players. National level female hockey players showed superior internals as compared to state and district level female hockey players. It was concluded that despite the fact that field hockey performance is affected by so many variables, national female hockey players believe that their performance is solely dependent upon their efforts and not the external factors as compared to state and district level female hockey players.
Keywords: Field Hockey, Female Players, Locus of Control, Sports Achievement etc

Introduction

A person's belief in his/her abilities to control over certain events in life is termed as locus of control. Internal locus of control means controlling and influencing the outcome of an event while external locus of control means blaming own failures on some external factors. The concept of locus of control was coined by Rotter (1954). Locus of control was formulated within the framework of Rotter's (1954) social learning theory of personality.A person's "locus" (Latin for "place" or "location") is conceptualized as either internal (the person believes they can control their life) or external (meaning they believe their decisions and life are controlled by environmental factors which they cannot influence, or by chance or fate).

The theory of locus of control may also be useful in sports because of its nature. The magnitude of locus of control can bifurcate athletes into two zones i.e. those who believe that success/failure depends on their own abilities and those athletes who blame outcome on external factors like environmental conditions, crowd disturbance etc.

One such sport where theory of locus of control may prove useful is field hockey. The outcome of a hockey match is dependent upon so many external factors like environmental conditions, teammate's performance on that particular day apart of a player's own abilities. In this context it would be worthwhile to analyses locus of control in talented female hockey players of India so that behaviour pattern of female hockey players may be judged. It is even more important because so far researchers like Sarah M. Lambert et al. (1999), Sousa et al. (2008), Chugh et al. (2012), Singh (2015), Dhormare (2016) studied locus of control under sports psychology but surprisingly no study has been conducted as yet in which locus of control in talented female hockey players has been assessed. Hence the researcher decided to compare locus of control between national, state and district level female hockey players.

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Family type and its Impact on Sportspersons Disordered Personality

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Abstract
Present study was carried out to study personality disorder among sportspersons in the background of type of family. To conduct the study 130 sportspersons (Average age 24.82 years) of both the sexes who took part in national level competitions were selected as sample. Out of these selected subjects, 65 sportspersons belonged to nuclear family while 65 sportspersons came from joint families. Personality disordersof selected subjects was assessed by Jodhpur Multiphasic Personality Inventory prepared by Joshi and Malik (1981). It was found that personality disorders namely anxiety, conversion-reaction, hysteria-dissociate, and phobia respectively was found to be in higher magnitude in sportspersons belonging to nuclear families as compared to their counterparts i.e. sportspersons belonging to joint families while other forms of personality disorders viz. obsessive-compulsive reaction, depression, neurasthenia and social Introversion respectively was not significantly affected by sportspersons family structure. It was concluded that type of family influencing factor as far as disordered personality in sportspersons is concerned.

Introduction
Participation in sports is known to develope positive personality characteristic in a person. On the other hand studies have shown that athletes performing at sometimes suffer from personality disorders namely neurosis, anxiety, phobia, depression etc.,Due to excessive pressure and intricacies to succeed in modern competitive sports environment. Personality disorder refers to a class of personality types and enduring behaviors associated with significant distress or disability, which appear to deviate from social expectations (DSM-IV, 2000). A class of mental disorders characterized by enduring maladaptive patterns of behavior, Cognition, and inner experience, exhibited across many contexts and deviating markedly from those accepted by the individual's culture is known as disordered personality. These patterns develop early, are inflexible, and are associated with significant distress or disability (American Psychiatric Association, 2013).
The pressure to succeed at all cost generates from coaches, fans, financial matters and self pride. In this context it is worthwhile to know the role of family be it joint or nuclear on sportspersons personality disorders. This is even greater significance because so far researchers like Eric et al. (2005), Kamm(2008), Sohrabi (2011), Schaal et al. (2011), Quadri and Vidhate (2012), Masmoudi (2015) have investigated major personality disorders in athletic population but so far it has not been investigated in the light of family type. Since sportspersons in India comes from joint or nuclear families it would be interesting to assess personality disorders between sportspersons coming from nuclear and joint families.

Hypothesis
It was hypothesized that there will be a significant difference on personality disorder among sportsperson belong to nuclear family and joint family.

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Effect of Neuroticism on Basic Human Virtues: With Reference to Elite and Sub-Elite Sports persons

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Abstract

The aim of the present study is to analyse the impact of neuroticism on basic human virtues of elite and sub-elite male sportspersons. To conduct the study, 100 elite male sportspersons(Ave. age 20.47yrs) were selected. The criterion for selection of elite male players was participation in national level sports event and those who finished in first four positions of that particular event. Another set of 100 male sportspersons (Ave. age 20.02 years) from intercollegiate sports tournament were also selected as sub-elite sportspersons. To assess basic human virtues of the selected subjects, four dimensional basic human virtues inventory prepared by Agashe and Helode (2012) was adopted. For the purpose of tapping neuroticism, Hindi version of Eysenck's PEN inventory prepared by Menon et al. (1978) was used. For the purpose of the study only neuroticism dimension of personality was taken into consideration. Q1 and Q3 cutting points were adopted to bifurcate cases into High-Low Neurotic group. Result indicate that elite male sportspersons possesses superior basic human virtues as compared to sub-elite male sportspersons. It was also found that a basic human virtue in sportspersons with low neuroticism was significantly better as compared to high neurotic male sportspersons. The two factor interaction of level of participation (elite and sub-elite) and neuroticism (low-high) on basic human virtues of male sportspersons was not found to be statistically significant. It was concluded that level of participation and neuroticism alone but not in interaction with each other, affect basic human virtues of male sportspersons.

KEYWORDS: Basic Human virtues, elite, Sub-elite, male sportspersons

INTRODUCTION

It has been widely accepted fact that sportspersons at elite level possesses some specific psychological qualities which differentiate them from sub-elite sportspersons. Results from so studies such as Bois et al. (2009), Bhardwaj and Sharma (2011), Agashe, Bajpai and Kashyap (2011), Mohammadzadeh and Sami (2014), Boora (2016)to name a few clearly mentioning that the mental, skills of elite sportspersons are far superior as compared to sub-elite sportspersons. The list of psychological variables that affect sports performance is exhaustive but the results are contradictory. Hence it seems more appropriate to compare basic human virtue which encompasses four cardinal virtues i.e. prudence, justice, fortitude and temperance. These four cardinal virtues form almost all the character traits such as decision making, self-confidence, practical wisdom, openness, emotional stability etc. and they are closely related with personality. It has been opined that emotions play major part in shaping our virtues. So one of the personality dimension i.e. neuroticism may be an influencing factor as far as formation of basic human virtues are concerned. Eysenck and Rachman (1965) included moody, touchy, anxious and restlessness as

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A Comparative Assessment of Basic Human Virtues in Elite Players

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Abstract

The aim of the present study is to compare basic human virtues between elite male players and non-players. To conduct the study, 100 elite male players (Ave. age 20.47 yrs) were selected. The criterion for selection of elite male players was participation in national level sports event and those who finished in first four positions of that particular event. To fulfill the objectives of the present study, another set of 100 non player males studying in various colleges (Ave. age 21.73 yrs) were also selected. To assess basic human virtues of the selected player and non-player males, four dimensional basic human virtues inventory prepared by Agashe and Helode (2012) was adopted. The results indicate that basic human virtues did not differ significantly between elite male players and non-players. It was concluded that elite male players also exhibit same magnitude of human virtues as that of non-player males.

Key words: Human virtues, elite male players, non-player males etc.

1. Introduction

Virtue is moral excellence. A virtue is a positive trait or quality deemed to be morally good and thus is valued as a foundation of principle and good moral being. Personal virtues are characteristics valued as promoting collective and individual greatness. Justice, good judgment, personal toughness and self-control are four core human qualities for formation of strong character. The four virtues i.e. prudence, justice, fortitude and temperance are cardinal virtues and all the other virtues like acceptance, idealism, openness, patience, reliability, respect, responsibility, self-discipline, temperance, tolerance, truthfulness, understanding, Wisdom, zeal etc find their roots in four cardinal virtues.

According to World Health Organisation (2003) sports provide wide range of physical, mental and social benefits. Studies conducted by various researchers like Salokum and Toricola (1985), Singh, et al. (1987) Rathe (2009), Bostania and Saiirib (2011), Mehrparvar and Mazaheri (2012), Mittal (2014), Zaffer and Rajpal (2017) reported the psychological benefits such conscientious, more trustworthy, self-perception, happiness, Stress tolerance and self assertiveness, ability to solve psychological problems, frustration tolerance, self-assurance, higher potential to survive with the environment of participation in sports. It has been advocated that participation in sports is a good medium for ideal personality but the second school of thought provides negative side of participation in sports that too at highest level. In modern sport so much emphasis is put on winning or improving level of performance. This leads to incidences like doping, betting etc. Sometimes sportspersons also indulge in practices which are against the nature of sportsman spirit. Reports of doping case of Maria Sharapova or betting scam in cricket, fixing of a soccer match makes the researcher to ponder that whether elite male players still possess same magnitude of basic human virtues despite modern day competitive sports in which so much emphasis is given to winning. Hence in order to assess basic human virtues in elite male players, the present study was planned.

1.1 Hypothesis

It was hypothesized that elite male players will possess the same magnitude of basic human virtues as compared to non-player males.

2. Methodology

The following methodological steps were taken in order to conduct the present study.

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A STUDY ON PERSONALITY DISORDER WITH REFRENCE TO SPORTSPERSONS BELONG TO NEUCLEAR FAMILY

ABSTRACT

The aim of the present study is to compare personality disorder in joint and neucleare family sportsperson. For present study, 298 sportsperson who took part in national and interuniversity level sports meet for different game i.e. athletics, volleyball, kho-kho, basketball, boxing, judo, handball, cricket and kabbadi were selected as sample. Out of the 298 selected subject, 175 were neuclear family sportspersons (Av. age 21 yrs.) and 123 were Joint family sportspersons (Av. age 22 yrs.). To assess personality disorder, Jodhpur Multiphasic Personality Inventory prepared by Joshi and Sodhi (1981) was preferred. The result revealed significantly difference in mean score on personality disorder between Joint and Neucleare family sportsperson. It was concluded that significantly greate magnitude of personality disorder in compare to sportsperson belong to joint family.

KEYWORD:-Personality Disorder, Joint Family, Neuclear Family.

INTRODUCTION-

Participation in sports is known to infuse positive personality characteristic in a person. On the other hand studies have shown that athletes performing at sometimes suffer from personality disorders namely neurosis, anxiety, phobia, depression etc. due to excessive pressure and intricacies to succeed in modern competitive sports environment. Personality disorder refers to a class of personality types and enduring behaviors associated with significant distress or disability, which appear to deviate from social expectations (DSM-IV, 2000). A class of mental disorders characterized by enduring maladaptive patterns of behavior, cognition, and inner experience, exhibited across many contexts and deviating markedly from those accepted by the individual's culture is known as disordered personality. These patterns develop early, are inflexible, and are associated with significant distress or disability (American Psychiatric Association, 2013). The pressure to succeed at all cost generates from coaches, fans, financial matters and self pride. In this context it is worthwhile to know the role of family be it joint or nuclear on sportspersons personality disorders. This is even greater significance because so far researchers like Eric et al. (2005), Kamm (2008), Sohrabi (2011), Schaal et al. (2011), Quadri and Vidhate (2012), Masmoudi (2015) have investigated major personality disorders in athletic population but so far it has not been investigated in the light of type of family. Since sportspersons in India comes from joint or nuclear families. it would be interesting to assess personality disorders between sportspersons coming from nuclear and joint families.

HYPOTHESIS:

It was hypothesized that personality disorder will be significantly more prevalent in neuclear family sportspersons as compare to joint family sportspersons.

METHODOLOGY: The following methodology steps were taken in order to conduct the present study.

SAMPLE:For present study, 298 sportsperson who took part in national and interuniversity level sports meet for different game i.e. athletics, volleyball, kho-kho, basketball, boxing, judo, handball, cricket and kabbadi were selected as sample. Out of the 298 selected subject, 175 were neuclear family sportspersons (Av. age 21 yrs.) and 123 were Joint family sportspersons (Av. age 22 yrs.).The selection was based on convenience sampling technique.

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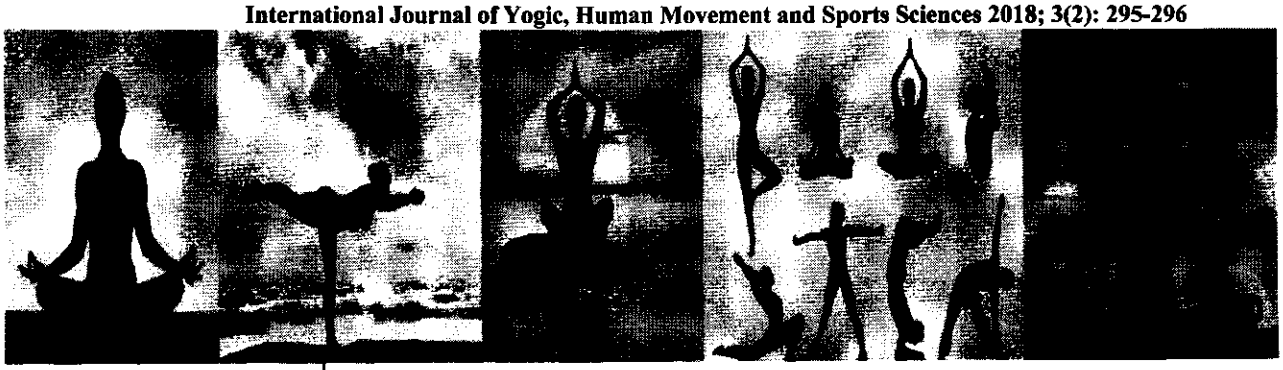

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Effect of time pressure on shooting skills of male archers

Naresh Kumar Sahu, CD Agashe and Vivek Mishra

Abstract
The aim of the present study is to assess the impact of time pressure on shooting skills of male archers. To conduct the study 50 male archers (average age 23.39 years) were selected as sample. Purposive sampling was used to select male archers who took part in national level archery championship. To assess shooting skills of selected male archers, a target set at 70 meters distance according to recurve archery rules was used. The archers shot 06 arrows in specified time of 04 minutes as well as 02 minutes. After two rounds the scores of each archer for two specified time limits were recorded. Paired sample 't' test reveal that shooting skills of male archers was far superior in 04 minutes time limit as compared to their shooting skills in 02 minutes time limit. It was concluded that time pressure significantly affect shooting skills of male archers. The results are discussed in the light of well established theories of time pressure in relation to cognitive and motor performance.

Keywords: Time pressure, male archers, skills

Introduction
In archery, an archer needs to shoot a definite number of arrows within a stipulated time limit. Recurve archey is conducted outdoors and barring extreme weather conditions play goes on. At Barcelona Olympics single elimination was introduced and since then it is being used in every subsequent Olympics. The time limit for shooting 06 arrows was 40 seconds for each arrow. Under revised rules the time limit for shooting one arrow is 30 seconds. The reduced time limit for shooting require an archer to change his/her style of shooting because due to lack of time an archer shoot instantly without getting much of preparation time.
There are four main phases of archery shooting. They are preparatory movements, period for production of forces, critical instant and the final phase is continuity. These phases include stance, nock the arrow, arrow grip, bow arm, body pre-positioning, bow raise and pre-draw in phase I. Phase II include pre-draw, full draw, anchoring and expanding. Critical instant includes anchoring, expanding, sighting and release with follow through and relaxation being last phase.
It has been advocated that work can be completed in shorter time but it reduces it quality. This fact has been scientifically documented by many researchers like Palmer, Huk and Shadlen (2005) [8], Carrasco and McElree (2001) [3], Dosher (1976) [4] and Fitts (1954) [5]. They advocate that time pressure has its effect on perceptual decision making, visual search, memory retrieval and motor planning. All these are important in archery because it requires above factors for sports performance.
Although researcher like Lee KooH (2009) [6], Takai *et al.* (2012) [6], Musa *et al.* (2016) [7], Anjali and Dabas (2017) [2] studied archery performance in the light of psycho-genetic factors, anthropometric based assessments, physical fitness, video feedback, biomechanical aspects and certain psychological factors no study yet has been conducted in which performance of male archers has been analysed in the light of time pressure. Hence the present study was planned to assess the impact of time pressure on shooting skills of male archers.

Objective
The objective of the present study is to assess the impact of time pressure on shooting skills of male archers.

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A study of shooting performance of female archers in relation to time pressure

Naresh Kumar Sahu, CD Agashe and Vivek Mishra

Abstract
Effect of time pressure was analysed on shooting performance of female archers. This study was conducted on 50 female archers (average age 24.07 years) performing at national level tournaments. The shooting skills of these archers were assessed with the help of standard target for recurve archery. A target was set at 70 meters and selected archer shot 06 arrows in specified time limit of 04 minutes and 02 minutes respectively. In all each subjects shot twice on both the specified time limit. The paired comparison of shooting scores reveal that shooting accuracy of female archers was markedly superior while shooting in 04 minute time duration as compared to their shooting accuracy while shooting in 02 minute time duration. The results are discussion in the light of cognitive and motor skill aspect of time pressure.

Keywords: Time pressure, female archers, skills

Introduction

Most popular form of archery practiced worldwide is target archery. Target archery is most recognizable form as far as modern archery is concerned. Target archery is indoor as well as outdoor sport. Indoor distance are 18 meters while outdoor distance may range from 25 meter to 90 meters. Competition is based on ends of 3 or 6 arrows. The distance can be upto 90 meters with target face being traditional five coloured 10-rings. Two bow styles namely recurve and compound are included in international target archery. Recurve target archery is practiced in Olympics while compound target archery is associated with world games. Archers must shoot their arrows in a stipulated time limit. 03 arrows are shot in two minutes while 06 arrows are shot in 04 minutes. The ranking round is conducted for seeding purpose. Single elimination pairing is used on the basis of placing in the qualification round. After elimination, remaining eight archer shoot 4 ends of 03 arrows alternately. In quarterfinal an archer gets 30 seconds to shoot one arrow. Hence archer gets pre-defined time to shoot all the arrows.

Due to its immense popularity so many researchers namely Landers *et al.* (1986) [8], Podrzaj (1998) [11], Hemaur *et al.* (2005) [6], French and Kirka (2007) [5], Lee KooH (2009) [9], Agashe *et al.* (2012) [1], Basumatary and Pramanik (2014) [3], Bebetsos (2015) [4], Kaur and Sinha (2017) [7] have assessed shooting performance of archers in the light of various psychological, physiological, biomechanical, perceptual and visual factors. Surprisingly one aspect that has very little literature is time pressure on shooting performance. According to Murayama *et al.* (2007) [10] time pressure as psychological stressors impairs skill performance. Bar-Eli and Tractinsky (2000) [2] also opined that time pressure influence cognitive performance which eventually decreases quality of motor performance.

It is a known fact that time plays a significant part as far as execution of certain task is concerned. It has been opined by researchers like Takai (2007) that medalist copes much better in time management as far as preparatory phase is concerned. Despite the relevance of time pressure on shooting skills in archery, the studies on it are far and few. Hence the researcher decided to assess the effect of time pressure on shooting skills of female archers.

Objective

The objective of the present study is to find out the effect of time pressure on shooting skills of female archers.

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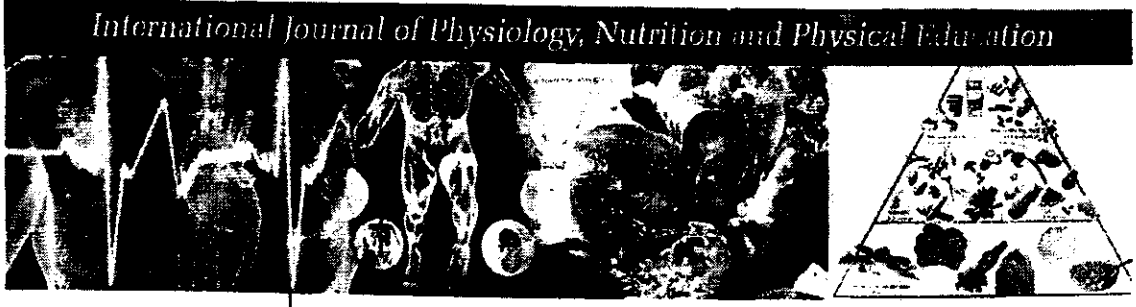

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A comparative study of depression in elderly males and females residing in old age home in Chhattisgarh

Pramod Kumar Yadav and CD Agashe

Abstract
During last one hundred years, longevity has increased manifold. This has also led to rise of elderly population. The sizeable chunk of these elderly resides in old age homes. The basic idea of establishing old age homes was to cater the need of elderly who do not have spouse or caretaker to look after them. The present study aims to compare geriatric depression in male and female elderly residing in old age homes in the state of Chhattisgarh. To conduct the study 40 male and 40 female elderly (>60 years) residing in old age homes were selected as sample. The established old age homes from where the sample is taken are located in Durg district of Chhattisgarh. The average age of elderly males was 65.33 years while that of female elderly was 63.14 years. Geriatric Depression Scale prepared by Ganguli *et al.* (1999) was used as psychological tool in the present study. The results reveal that elderly women living in old age homes were significantly more depressed as compared to elderly males living in old age home. It was concluded that elderly females than males living in old age homes are more prone towards developing depressive symptoms.

Keywords: Depression, geriatric, old age homes, gender

Introduction
Due to advancement in medical science and awareness towards health, last [illegible] years saw an increase in longevity. This also saw a rise of population of elderly people. This applies to India also. In India, increased life expectancy contributed to rise in older population also. The percentage of people of 60 years and above has risen from 6.8% in 1991 to 8% percent in 2011. According to trends population of older people in India will be 9.3% by 2016. 10.7% by 2021 and 12.40% by 2026. It will further increase to 19% of the total population of India by 2050 (UNFPA, 2012). The people of geriatric age in India will be around 323 million in 2050. Normally old age homes are established for those elderly who did not have the support of their family or children. The things have changed and in modern times the number in these old age homes are increasing. Social alienation and loneliness are often associated with elderly living in old age homes. Snapped social interaction along with loneliness and sacrificed physical functioning give rise to depression in elderly adults living in old age homes. According to Salmans (1997), state of low mood is considered as depression and it eventually affect person's well-being. People suffering from depression often lack interest in day-to-day activities. Depression although is not confined to any age group but it is seen in more magnitude among elderly. Barua *et al.* (2011) [1] in their study reported 10 to 25% prevalence rate of depression in elderly population. This has significant bearing in Indian context because there are 90 million and more elderly in India and quite a few live in old age homes. Researchers like Steffens *et al.* (2000) [8], Singh and Mishra (2009) [7], Sethi *et al.* (2013) [6] have studied depression in elderly but depression in elderly males and females living in of old age homes has not been studied so far. Hence, it would be worthwhile to compare geriatric depression in male and female inmates of old age homes. This will enable to psychologicai intervention to manage geriatric depression separately in male and female elderly living in old age homes.

Objective of the Study
The main objective of the present study is to compare geriatric depression between male and female elderly residing in old age homes.

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Analysis of temperature and frequency dependent dielectric properties, dynamic hysteresis loop and thermal energy conversion in $BaZr_{0.05}Ti_{0.95}O_3$ ceramic

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Abstract
The barium zirconium titanate ceramic with formula $BaZr_{0.05}Ti_{0.95}O_3$ has been synthesized by the conventional solid state reaction technique. The synthesized ceramic sample is characterized by X-ray diffraction, scanning electron microscopy, Raman spectroscopy, temperature dependent dielectric spectroscopy and ferroelectric behaviour. The Raman spectrum confirms the orthorhombic structure at room temperature and local distortions due to distorted octahedral structures. The temperature dependent dielectric study reveals the occurrence of three transition temperatures representing rhombohedra to orthorhombic, orthorhombic to tetragonal and tetragonal to cubic transition in the material. The area of the hysteresis loop decreases with temperature up to the transition temperature, followed by an increase at higher temperatures. Scaling relations for coercive field (E_c) and remnant polarization (P_r) are studied as a function of temperature. This exhibits back-switching polarization behaviour as a function of temperature. The thermal energy conversion potential of the studied sample is obtained by using Olsen cycle.

1 Introduction

Ferroelectric materials are widely used due to their excellent properties, such as hysteresis (non-volatile memory), high piezoelectric effect (actuators), strong electro-optic effect (electro-optic materials for data storage applications), high dielectric constant (capacitors), high pyro-electric coefficient (infrared detectors), high dielectric constant and anomalous temperature coefficient of resistivity [1–9]. Most of the work on the ferroelectric materials has been based on lead based materials, but due to environmental concern, they are not found suitable for direct industrial applications [10–13]. Recently, certain lead free perovskites are extensively studied due to their extraordinary dielectric, ferroelectric, piezoelectric, strain and electrostrictive properties. Among others, $BaTiO_3$ (BT) has attracted most of the attention due to its high dielectric constant, and ferroelectric behaviour for practical applications [14–19]. But, BT ceramic offers three main disadvantages. First, it has tetragonal to orthorhombic phase transition below room temperature (~ 5 °C); secondly, in the tetragonal phase the resonant frequency rises rapidly with temperature, and third is high dielectric loss shown by it. In order to overcome the drawbacks along with improvement in various properties, BT system needs to be modified. It has been reported that incorporation of Zr^{4+} ions in $BaTiO_3$ [$BaZr_xTi_{(1-x)}O_3$] improves its properties, and shifts the Curie temperature towards lower side as Zr^{4+} is chemically more stable than Ti^{4+}. Also, the feasibility of substitution of Ti^{4+} ions by Zr^{4+} ions lies in the fact that Zr^{4+} having larger ionic radius expands the lattice structure that reduces the possibility of conduction by electron hopping between Ti^{4+} and Ti^{3+} ions [20–29]. An interesting observation on the BZT system (with $x = 0.05$) was reported earlier, which exhibited high piezoelectric coefficient ($d_{33} = 236$ pC/N) and electromechanical coupling factor ($K_{33} = 56.5\%$) [30]. Recently, a high value of d_{33} i.e., 300 pC/N (420 pC/N, $k_p = 49\%$ at 100 h sintering time) was reported for composition with $x = 0.06$ [31]. Kalyani et al. have reported that

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Luminescence Properties of $BaAl_2O_4:Eu^{2+}$ Phosphors

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Abstract - *$BaAl_2O_4$ phosphors activated by Eu^{2+} have been synthesized by a combustion method using urea as a fuel at a temperature of 600°C. Photoluminescence (PL) and thermoluminescence (TL) properties of UV-irradiated Eu^{2+}-activated barium aluminate were investigated. The PL spectrum shows one strong peak at 493 nm under 363 nm excitation. The observed emission peak at 493 nm attributed to transition $4f^65d^1 \rightarrow 4f^7$ of Eu^{2+}. Thermoluminescence (TL) studies were performed for different concentrations of Eu. Optimum intensity of photoluminescence was found for 0.05 mol% concentration of Eu. It was found that initially the peak TL intensity increases with increasing concentration of Eu^{2+} in the $BaAl_2O_4$ host, attains a maximum value for 0.02 mol% concentration and decreases with further increase in the doping concentration due to concentration quenching.*

Key Words: Luminescence Properties, Photoluminescence (PL), Thermoluminescence (TL), Combustion technique.

1. INTRODUCTION

The alkaline earth aluminates MAl_2O_4 are an important class of phosphorescence materials because of their high quantum efficiency in visible region [1], long persistence of phosphorescence, good stability, color purity and good chemical, thermal and radiation resistance [2-3]. Rare earth and non-rare earth inorganic phosphors are widely used in a variety of applications, such as light industry, radiation measurement, X-ray imaging technique and colour display [4]. Several aluminates are used as host for doping rare earth ions in luminescent applications. The luminescence in the visible region of Eu^{2+} doped alkaline earth aluminates $MAl_2O_4:Eu^{2+}$ (M = Ca, Ba, Sr) phosphor has found interest in recent years owing to their safe, chemically stable and very bright photoluminescence properties and several researchers have made extensive investigations concerning the next generation of displays and lighting devices [5–7]. The rare earth metal ion-doped calcium aluminate phosphors, because of their high quantum efficiency, anomalous long phosphorescence and good stability, have been studied in depth and used widely. In particular $BaAl_2O_4:Eu^{2+},Nd^{3+}$ has been considered as a useful violet phosphor in the application of luminous clocks and watches as well as potential outdoor night time displays [8]. Aluminates of Ca, Ba and Sr doped with Eu^{2+} activator ion possess safer, chemically stable and intense photoluminescence in visible light [9, 10] compared with the conventional sulfide-based phosphors. These properties make them useful in many applications, such as luminous paints in highway, airport, buildings and ceramic products, in textile, dial plate of glow watch, warning signs and the escape routes [11].

Recently many studies on phosphors with barium aluminate as a host based on their persistent luminescence and photoconductivity spectrum have been reported [12]. Many phosphors such as $CaAl_2O_4:Eu^{2+}$, Dy^{3+} [13] and $CaAl_2O_4$: Ce^{3+} [14] were developed for their photoluminescence and high chemical stability. Thermoluminescent materials are used as passive dosimeters in a wide range of radiological applications. Alkaline earth aluminate ceramics are important host materials that have been prepared and studied by several researchers for luminescence applications. Several reports dealing with the luminescence studies of $SrAl_2O_4$, $BaAl_2O_4$ and $MgAl_2O_4$ are available in the literature [15, 16]. However, there are very few researchers who reported $CaAl_2O_4$ as a TL material. In the present work, we report the thermoluminescence (TL) and photoluminescence (PL) properties of UV irradiated ($BaAl_2O_4:Eu^{2+}$) phosphor to find out its suitability in dosimetry applications. In this paper, a facile combustion process was chosen to prepare Eu^{2+}-doped $BaAl_2O_4$ phosphor. Thermoluminescence (TL) and photoluminescence (PL) properties of Eu^{2+}-doped $BaAl_2O_4$ phosphor have been investigated.

2. EXPERIMENTAL

In figure (1) the flow chart for a quick material screening and material elaboration illustrated. Analytical grade barium nitrate Ba $(NO_3)_2$, aluminum nitrate Al $(NO_3)_3.9H_2O$, Europium oxide Eu_2O_3 and urea CO $(NH_2)_2$ were used as the staring materials. According to the stoichiometry the starting materials were weighted. First of all Eu_2O_3 was converted into Eu $(NO_3)_3$ by mixing Eu_2O_3 into 2 ml of dil. HNO_3. Then weighed quantities of each nitrate and urea were mixed together and crushed into mortar for 1 hour to form a thick paste. The resulting paste was transferred to crucible and introduced into a vertical cylindrical muffle furnace maintained at 600°C initiating temperature. Initially the mixture boils and undergoes dehydration followed by decomposition with the evolution of large amount of gases (oxides of carbon, nitrogen and ammonia). The process being highly exothermic continues and the spontaneous ignition occurs. The solution underwent smoldering combustion with enormous swelling, producing white foamy and voluminous ash. The foamy product can easily be milled to obtain the precursor powder.

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Studies on thermoluminescence properties of alkaline earth silicate phosphors

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ABSTRACT

In this paper we report the Thermoluminescence behaviour of $Sr_3MgSi_2O_8$ phosphor doped with Dy^{3+} synthesized by solid state reaction process. The prepared phosphors were characterized by the X-ray powder diffraction (XRD) method. The Thermoluminescence (TL) behaviour is studied for the 254 nm ultra violet (UV) exposure. The TL glow curve has dual peaks at 70 °C and 213 °C. All the TL parameters such as UV exposure time, dopant concentration, heating rate etc were optimized. The maximum TL intensity was found for 30 min UV exposure, 2.0 mol% Dy^{3+} Concentration and at 4 °C s^{-1} heating rate. The Kinetic parameters namely, activation energy (E), order of kinetics (b) and frequency factor (s) of $Sr_3MgSi_2O_8:Dy^{3+}$ sample have been determined using Chen's method for the deconvoluted glow curve.

1. Introduction

Silicate based materials exhibits unusual luminescence properties due to their outstanding thermal. Chemical and mechanical stability and structural diversity [1]. These materials can behave as photoluminescent or thermoluminescent materials. These luminescent behaviours of these host materials are due to their tendency of energy storage which can be converting in to luminescence due to either optical stimulation or thermal stimulation [2,3]. From all the silicate based host materials alkaline earth magnesium silicates are excellent luminescent materials. From this group $Sr_2MgSi_2O_7$ [4] and $Sr_2MgSi_2O_8$ [5] shows efficient thermoluminescence and persistent luminescence behaviours respectively. Various attempts have been made for preparation and luminescence study of strontium magnesium silicate based compound. Different methods such as solid state reaction method [6–9], combustion synthesis method [10], sol-gel [11] etc are accomplished by different author for synthesis. As far as we know, the thermoluminescence property and energy transfer of $Sr_3MgSi_2O_8:Dy^{3+}$ phosphors have not yet been investigated.

In this work we have synthesized Dy^{3+} doped phosphor by solid state synthesis method. The thermoluminescence property of the prepared phosphor was studied under UV excitation and all the conditions were optimized for the better results. Computerized glow curve deconvolution (CGCD) was applied for the TL glow curve recorded for optimized condition.

2. Experimental

The Dy^{3+}doped $Sr_3MgSi_2O_8$ phosphor with varying concentrations was prepared by solid state method. The raw materials are strontium carbonate [$SrCO_3$ (99.90%)], magnesium oxide [MgO (99.90%)], silicon di-oxide [SiO_2 (99.99%)] and dysprosium oxide [Dy_2O_3 (99.99%)], all of analytical grade (A.R.), were employed as reactants. Reactant samples were blended and milled thoroughly in an agate mortar for 2 h, then transferred in to a corundum crucible, and subsequently calcined at 1250 °C for 5 h [1].

The crystal structures of the prepared phosphors were characterized by powder XRD. Powder XRD pattern has been obtained from Bruker D8 advanced X-ray powder diffractometer and the data were collected over the 2θ range 10°–80°. The X-rays were produced using a sealed tube (CuKα) radiation source and the wavelength of X-ray was 1.54060 Å. The X-rays were detected using a fast counting detector based on Silicon strip technology (Bruker LynxEye detector). TL glow curves were recorded with the help of

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Influence of Eu doping on the structural, electrical and optical behavior of Barium Zirconium Titanate ceramic

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ABSTRACT

The influence of Eu^{3+} doping on the structural, dielectric and optical behavior of Barium Zirconium Titanate (BZT) with general formula $Ba_{1-x}Eu_{2x/3}Zr_{0.05}Ti_{0.95}O_3$ ($x = 0.00, 0.01, 0.02, 0.03, 0.04, 0.05$) has been investigated in the present study. The X-ray diffraction (XRD) data show a phase transition from orthorhombic to tetragonal symmetry due to the incorporation of Eu^{3+} ions in $BaZr_{0.05}Ti_{0.95}O_3$ matrix. A secondary phase of $Eu_2Ti_2O_7$ is observed for the composition with $x \geq 0.03$. The Raman spectroscopic study confirms the structural change as observed in XRD, while the Fourier transformation infra red (FT-IR) spectra reveal that Eu^{3+} doping in BZT creates vacancies in the system. The temperature dependent dielectric study shows that the transition temperature and maximum dielectric constant decrease with increase in Eu^{3+} content. It is observed that the dielectric diffuseness increases up to $x \leq 0.02$ followed by a decrease at higher concentrations of Eu^{3+}. The optical behavior of prepared samples is studied through UV–visible spectroscopy, and it is found that the optical band-gap value increases with Eu^{3+} concentration up to 2% and then decreases for higher concentrations ($x > 2\%$).

1. Introduction

Oxide perovskites having general formula ABO_3 are some of the most fascinating and technologically important class of materials in condensed matter research. These materials have found importance in the fabrication of various microelectronic and optoelectronic devices (near ultraviolet and visible range of spectrum) like capacitors, ferroelectric random access memories, sensors, actuators, optoelectronic modulators, etc. [1–10]. Barium Zirconium Titanate ($BaZr_xTi_{1-x}O_3$) is one such system that has attracted research groups all over the world because of its novel electrical properties [11]. The $BaZr_xTi_{1-x}O_3$ system exhibits high strain, high dielectric constant, low dielectric loss, high voltage resistance, composition dependent Curie temperature and better thermal stability as compared to $Ba_{1-x}Sr_xTiO_3$ [12–16].

Doping of rare earth (Re^{3+}) elements (which act as donor) in perovskites is one of the most suitable ways of enhancing the properties of the system [17–23]. Perovskite compounds are the best known inorganic materials for rare earth doping because of their stable crystal structure. Selection of proper dopant plays an important role in improving the dielectric properties of $BaZr_xTi_{1-x}O_3$ system. It is well reported that up to 4% of molar concentration of rare earth dopant, the $BaZr_xTi_{1-x}O_3$ system exhibits moderate dielectric constant and low dielectric loss [24]. The donors are also used to suppress the growth of grains during sintering, and to obtain low dielectric constant at Curie temperature [25]. The solubility of Re^{3+} ion in $BaZr_xTi_{1-x}O_3$ system depends on (a) ionic radius of the cation, (b) charge compensation mechanism in case of hetrovalent dopant ion and (c) Ba/Ti concentration ratio. The ions with small ionic radii are substituted into A-site of perovskite, whereas the ions with bigger ionic radii enter the ABO_3 structure at B site. The ions having amphoteric behavior can occupy both cation lattice sites in the ABO_3 structure [26,26]. The charge imbalance created by doping must be compensated by either cation/ionic or electronic vacancies. Ionic vacancies have a negligible effect on conductivity, and the materiai remains insulating at room temperature (RT), while the electronic vacancies increase the conductivity of the material. The effect of Re^{3+} substitution on Ba-ion can be expressed by Kroger – Vink notation as:

$$BaO + Ln_2O_3 \rightarrow Ba_{Ba} + Ln_{Ba} + V''_{Ba} + 4O_o \quad (1)$$

Above equation impiies that for every two Ln^{+3} ions positioned in the A-sites, one cationic vacancy V''_{Ba} is necessary for charge neutrality in the perovskite structure. Obviously, the number of vacancies

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Study on photoluminescence and thermoluminescence properties of UV-irradiated $CaSrAl_2SiO_7:Ce^{3+}$ phosphors

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Abstract This paper reports synthesis of $CaSrAl_2SiO_7:Ce^{3+}$ phosphors via traditional high temperature solid state reaction method. The phase analysis of the phosphors was carried out using powder X-ray diffraction (XRD) technique which indicates that all these compounds are of single phase of $CaSrAl_2SiO_7$ with tetragonal crystal structure. Average grain size of the phosphor was determined by using Scherrer formula. The photoluminescence (PL) study was carried out using spectrofluorophotometer. PL Excitation (PLE) spectra consist of two peaks at around 253 and 290 nm. $CaSrAl_2SiO_7:Ce^{3+}$ emits strong violet emission located at 418 nm when excited with 290 nm. Emission is associated with 5D→4F transition of Ce^{3+} ions. Thermoluminescence (TL) properties of UV-irradiated phosphor were measured. Effect of different heating rates on TL glow curve was recorded and 5 °C/s is found to be optimum heating rate. There is no shift in glow peak position with increase in UV-irradiation time. TL intensity increases with increase in UV exposure time up to 35 min and then saturates. To analyse kinetic study, glow curve was deconvoluted into four different traps and their activation energies were determined by using peak shape method. Concentration dependence on PL and TL was investigated; concentration quenching in PL occurs at 1 mol% of Ce^{3+} and quenching in TL arises at 0.5 mol% of Ce^{3+}. TL spectra and decay characteristic were also carried out. This paper deals with possible mechanism of PL and TL.

1 Introduction

Phosphors are the luminescent materials that exhibit emission of light (usually in ultraviolet, visible and infrared region of electromagnetic spectrum) by the conversion of any kind of stimulus [1]. Unlike other luminescent materials, persistent phosphors can continuously emit light for minutes or hours. Such types of materials are applicable in safety signage, dials, decoration and display [2]. ZnS-based materials are first commercially persistent phosphors. These materials absorb moisture from surrounding environment, exhibit formation of sulfate and destruction of sulfide structure. Hence they do not have better afterglow property. To supersede demerits of the sulfides invention is made towards the aluminate based phosphors. In the past few decades rare earth doped aluminates like $SrAl_2O_4:Eu^{2+}$, Dy^{3+} [3], $BaAl_2O_4:Eu^{2+}$, Dy^{3+} [4], $CaAl_2O_4:Eu^{2+}$, Nd^{3+} [5] were invented as efficient long persistent phosphors. Aluminates show afterglow for long duration as compared to sulfides however their properties are very much decreased under the influence of water, besides they have weak chemical stability, which limits their future applications [6]. Consequently silicate based phosphors have attracted much attention. Silicate and alumino-silicate based phosphors show excellent water resistance property, high quantum efficiency, long persistence, colour purity, rigid crystal structure, high chemical and thermal stability, multicolour emission [7, 8].

Rare earth ions are commonly used as the dopant ions in different host lattice due to their high fluorescence

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Electrical characterizations of $BaZr_{0.05}Ti_{0.95}O_3$ perovskite ceramic by impedance spectroscopy, electric modulus and conductivity

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Abstract We, here in report on the impedance, modulus and conductivity analyses of polycrystalline perovskite structured $BaZr_{0.05}Ti_{0.95}O_3$ ceramic prepared by the conventional solid state reaction technique (SSRT). The X-ray diffraction (XRD) pattern of the specimen confirms the formation of phase pure perovskite structure. The surface morphology of the sample investigated by scanning electron microscopy (SEM) reveals closed packing of grains having good density and very less porosity. Impedance spectroscopy, electric modulus and conductivity have been used as a tool to investigate the electrical conduction mechanism occurring within the material. These studies are performed as a function of both temperature and frequency. The sample has been observed to exhibit negative temperature coefficient of resistance (NTCR) behavior indicating its semiconducting character. The Cole–Cole plots indicate the presence of both grains and grain boundaries. The various relaxation times in the electric modulus studies indicate that the material does not follow Debye law. The conductivity variation of $BaZr_{0.05}Ti_{0.95}O_3$ ceramic has also been reported as a function of temperature.

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1 Introduction

The lead free perovskite structured (ABO_3) ceramics have been studied extensively due to their excellent electrical properties, thermal stability and eco friendliness [1–7]. Barium titanate ($BaTiO_3$) is one such perovskite that has been investigated for its remarkable dielectric, ferroelectric, piezoelectric and pyroelectric properties in last few decades [8–11]. This electro-ceramic offers incredible applications in multi layer ceramic capacitor (MLCC), thermistors, piezoelectric sensors, transducers and electro-optic devices [12–16]. Apart from excellent electrical properties, $BaTiO_3$ suffers from certain limitations like high dielectric loss and low figure of merit. Simple substitution of Ti^{4+} ions (ionic radius 0.068 nm) by Zr^{4+} ions (ionic radius 0.087 nm) results in a new system namely barium zirconium titanate ($BaZr_xTi_{1-x}O_3$). BZT is a system, which is chemically and thermally more stable as compared to other perovskites, and possesses a good figure of merit also in the light of electrical properties. It is important to mention that the larger ionic radius of Zr^{4+} expands the lattice structure reducing conduction due to electron hopping between Ti^{4+} and Ti^{3+} ions. The BZT system with high dielectric, ferroelectric and piezoelectric properties has been an interesting material for capacitor industry applications [17–20]. The investigations on BZT solid solutions are vast due to the possibility to tailor the ferroelectric properties by controlling the composition. Small amount of Zr^{4+} ions change the temperature dependent dielectric properties from normal ferroelectric to relaxor ferroelectric [21].

$BaTiO_3$ is well known for three structural phase transitions (i) cubic to tetragonal (paraelectric to ferroelectric) at 120 °C, (ii) tetragonal to orthorhombic (ferroelectric to ferroelectric) at 5 °C and (iii) orthorhombic to rhombohedral (ferroelectric to ferroelectric) at −90 °C

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Electrical characterizations of $BaZr_{0.05}Ti_{0.95}O_3$ perovskite ceramic by impedance spectroscopy, electric modulus and conductivity

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Abstract We, here in report on the impedance, modulus and conductivity analyses of polycrystalline perovskite structured $BaZr_{0.05}Ti_{0.95}O_3$ ceramic prepared by the conventional solid state reaction technique (SSRT). The X-ray diffraction (XRD) pattern of the specimen confirms the formation of phase pure perovskite structure. The surface morphology of the sample investigated by scanning electron microscopy (SEM) reveals closed packing of grains having good density and very less porosity. Impedance spectroscopy, electric modulus and conductivity have been used as a tool to investigate the electrical conduction mechanism occurring within the material. These studies are performed as a function of both temperature and frequency. The sample has been observed to exhibit negative temperature coefficient of resistance (NTCR) behavior indicating its semiconducting character. The Cole–Cole plots indicate the presence of both grains and grain boundaries. The various relaxation times in the electric modulus studies indicate that the material does not follow Debye law. The conductivity variation of $BaZr_{0.05}Ti_{0.95}O_3$ ceramic has also been reported as a function of temperature.

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1 Introduction

The lead free perovskite structured (ABO_3) ceramics have been studied extensively due to their excellent electrical properties, thermal stability and eco friendliness [1–7]. Barium titanate ($BaTiO_3$) is one such perovskite that has been investigated for its remarkable dielectric, ferroelectric, piezoelectric and pyroelectric properties in last few decades [8–11]. This electro-ceramic offers incredible applications in multi layer ceramic capacitor (MLCC), thermistors, piezoelectric sensors, transducers and electro-optic devices [12–16]. Apart from excellent electrical properties, $BaTiO_3$ suffers from certain limitations like high dielectric loss and low figure of merit. Simple substitution of Ti^{4+} ions (ionic radius 0.068 nm) by Zr^{4+} ions (ionic radius 0.087 nm) results in a new system namely barium zirconium titanate ($BaZr_xTi_{1-x}O_3$). BZT is a system, which is chemically and thermally more stable as compared to other perovskites, and possesses a good figure of merit also in the light of electrical properties. It is important to mention that the larger ionic radius of Zr^{4+} expands the lattice structure reducing conduction due to electron hopping between Ti^{4+} and Ti^{3+} ions. The BZT system with high dielectric, ferroelectric and piezoelectric properties has been an interesting material for capacitor industry applications [17–20]. The investigations on BZT solid solutions are vast due to the possibility to tailor the ferroelectric properties by controlling the composition. Small amount of Zr^{4+} ions change the temperature dependent dielectric properties from normal ferroelectric to relaxor ferroelectric [21].

$BaTiO_3$ is well known for three structural phase transitions (i) cubic to tetragonal (paraelectric to ferroelectric) at 120 °C, (ii) tetragonal to orthorhombic (ferroelectric to ferroelectric) at 5 °C and (iii) orthorhombic to rhombohedral (ferroelectric to ferroelectric) at −90 °C

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Original research article

Cost effective synthesis to promote effective photoluminescent properties of rare earth doped MgO nanophosphor

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ABSTRACT

A simple solution combustion method was adopted to form a series of MgO nanophosphors doped with different mol% of Dy^{3+} ions using urea as a fuel. The powder products were well characterized structurally, morphologically and optically by powder X-ray diffraction (PXRD), field emission scanning electron microscopy (FESEM), high resolution transmission electron microscopy (HRTEM) and diffuse reflectance spectra. The elemental confirmation was done through elemental analysis by energy dispersive X-ray spectroscopy (EDX). The XRD patterns show that the final product is cubic in shape with the crystallite size ranging from 25 to 44 nm along with strain and dislocation densities also supported by HRTEM analysis. Photoluminescence (PL) studies under identical experimental conditions for the UV excitations, the formation of three prominent emission spectra at 488, 590 and 630 nm has been observed. These spectra show the transitions of 4f → 6h energy levels, namely $^4F_{9/2} \rightarrow {}^6H_{15/2}$ (488 nm), $^4F_{9/2} \rightarrow {}^6H_{13/2}$ (590 nm) and $^4F_{9/2} \rightarrow {}^6H_{11/2}$ (630 nm). The afterglow decay curve shows the single exponential decay for different MgO:Dy^{3+} nanophosphors compositions have been studied in detail.

1. Introduction

Recent development of the illumination technology converges towards the white light emitting devices (WLED). These WLEDs found to be replacing the conventional and fluorescence lamps due to its higher luminous efficiency, highly stable energy saving, cost effective fabrication outstanding longevity, durability and easy maintenance [1,2]. Due to these outstanding properties of WLEDs are termed to be the fourth generation illumination source [3]. For the fabrication of these WLEDs the materials with the property of absorbing ultraviolet or blue region and emitting the complete visible region is required. These types of materials are called phosphors. Commonly some metal oxides such as In_2O_3, ZnO, SnO_2, CdO are found to be act as the good phosphors materials [4,5]. Among the different oxide materials MgO is one of the remarkable insulating materials since it has simple cubic crystal structure with perfect ionicity. But interest towards MgO is because of the properties like chemical inertness, electrical insulation, optical transparency, high temperature stability etc. MgO in the nano regime due to quantum confinement finds wide range of applications in microelectronic circuits, sensors, piezoelectric devices, fuel cells etc. [6–8]. In the nanoregime the surface reconstruction made this nanophosphor material suitable for

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Broad-line Type Ic supernova SN 2014ad

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ABSTRACT

We present optical and ultraviolet photometry and low-resolution optical spectroscopy of the broad-line Type Ic supernova SN 2014ad in the galaxy PGC 37625 (Mrk 1309), covering the evolution of the supernova during −5 to +87 d with respect to the date of maximum in the *B* band. A late-phase spectrum obtained at +340 d is also presented. With an absolute *V*-band magnitude at peak of $M_V = -18.86 \pm 0.23$ mag, SN 2014ad is fainter than supernovae associated with gamma ray bursts (GRBs), and brighter than most of the normal and broad-line Type Ic supernovae without an associated GRB. The spectral evolution indicates that the expansion velocity of the ejecta, as measured using the Si II line, is as high as ∼33 500 km s^{-1} around maximum, while during the post-maximum phase it settles at ∼15 000 km s^{-1}. The expansion velocity of SN 2014ad is higher than that of all other well-observed broad-line Type Ic supernovae except for the GRB-associated SN 2010bh. The explosion parameters, determined by applying Arnett's analytical light-curve model to the observed bolometric light-curve, indicate that it was an energetic explosion with a kinetic energy of $\sim(1 \pm 0.3) \times 10^{52}$ erg and a total ejected mass of $\sim(3.3 \pm 0.8)$ M$_\odot$, and that ∼0.24 M$_\odot$ of ^{56}Ni was synthesized in the explosion. The metallicity of the host galaxy near the supernova region is estimated to be ∼0.5 Z$_\odot$.

Key words: techniques: photometric – techniques: spectroscopic – supernovae: general – supernovae: individual: SN 2014ad – galaxies: individual: Mrk 1309.

1 INTRODUCTION

Core-collapse supernovae arising from progenitors that are stripped of hydrogen and/or helium are known as stripped-envelope supernovae. This includes Types IIb, Ib and Ic supernovae (SNe). For Type IIb SNe, the progenitor retains a thin layer of hydrogen at the time of explosion, whereas in Type Ib SNe, the hydrogen envelope is completely removed. Type Ic SNe show neither hydrogen nor helium in their spectra around maximum brightness, indicating that both the hydrogen and the helium envelope of the progenitor star are removed before the explosion (Filippenko 1997; Turatto 2003). The exact nature of the progenitors and the process operational in removing the outer envelopes are not fully understood. The progenitors of Type Ic SNe are thought to be either massive Wolf–Rayet (WR) stars, or less massive stars in a binary system. In the case of WR stars, the helium envelope is removed by powerful stellar winds, and in a binary system, mass transfer to the companion helps in the removal of the helium envelope (see Langer 2012 for a recent review).

A small fraction (∼4 per cent; Shivvers et al. 2017) of Type Ic SNe show very broad lines in their spectra obtained close to maximum light, indicating a very high expansion velocity (∼15 000–30 000 km s^{-1}) of the ejecta. These are known as broad-line Type Ic SNe. The association of the GRB 980425 (Galama et al. 1998) with SN 1998bw indicated that GRB-associated SNe are of broad-line Ic type. This was later confirmed by the subsequent discovery of many other broad-line SNe associated with GRBs/X-ray flashes (XRFs) (Hjorth et al. 2003; Stanek et al. 2003; Malesani et al. 2004; Pian et al. 2006; Bufano et al. 2012; Toy et al. 2016). Broad-line Type Ic SNe associated with GRBs/XRFs are also known as engine-driven SNe. They have a rapidly rotating central compact object powered by accretion, and are often associated with relativistic outflow. However, there are some broad-line SNe that are not associated with GRBs/XRFs (Sanders et al. 2012; Mazzali et al. 2013; Walker et al. 2014). A possible interpretation of the absence of an observed GRB for some broad-line Type Ic SNe is a relativistic jet that is initially

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Highly reddened Type Ia supernova SN 2004ab: another case of anomalous extinction

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ABSTRACT

We present optical photometric and spectroscopic data for supernova SN 2004ab, a highly reddened normal Type Ia supernova. The total reddening is estimated as $E(B-V) = 1.70 \pm 0.05$ mag. The intrinsic decline-rate parameter $\Delta m_{15}(B)_{\rm true}$ is 1.27 ± 0.05, and the B-band absolute magnitude at maximum $M_B^{\rm max}$ is -19.31 ± 0.25 mag. The host galaxy NGC 5054 is found to exhibit anomalous extinction with a very low value of $R_V = 1.41 \pm 0.06$ in the direction of SN 2004ab. The peak bolometric luminosity is derived as $\log L_{\rm bol}^{\rm max} = 43.10 \pm 0.07$ erg s^{-1}. The photospheric velocity measured from the absorption minimum of the Si II λ6355 line shows a velocity gradient of $\dot{v} = 90$ km s^{-1} d^{-1}, indicating that SN 2004ab is a member of the high velocity gradient (HVG) subgroup. The ratio of the strengths of the Si II λ5972 and λ6355 absorption lines, $\mathcal{R}$(Si II), is estimated as 0.37, while their pseudo-equivalent widths suggest that SN 2004ab belongs to the broad line (BL) type subgroup.

Key words: techniques: photometric – techniques: spectroscopic – supernovae: general – supernovae: individual: SN 2004ab – galaxies: individual: NGC 5054.

1 INTRODUCTION

The correlation of the absolute magnitude of Type Ia supernovae (SNe Ia) with their observed properties, such as the decline in the B-band magnitude from its peak to 15 d after peak (Phillips 1993; Phillips et al. 1999), the stretch parameter (Perlmutter et al. 1997), the shape of the light curve (Riess, Press & Kirshner 1996), the colour (Reindl et al. 2005; Wang et al. 2006) and the spectroscopic parameters (Nugent et al. 1995; Benetti et al. 2005), has made SNe Ia very important astronomical events, as they provide a means to calibrate the luminosity at maximum. Furthermore, the high luminosities of SNe Ia enable us to see them at great distances in the Universe and to use them as standard candles for distance estimation.

Their observed properties and theoretical investigations suggest that SNe Ia are a result of the explosion of a carbon–oxygen white dwarf (WD, Hoyle & Fowler 1960) that gains mass through accretion in a binary system or from merging with another WD. The binary companion may be a main sequence/red giant star (single-degenerate scenario; Whelan & Iben 1973) or another WD (double-degenerate scenario; Iben & Tutukov 1984; Webbink 1984). As the mass of the WD reaches the Chandrasekhar limit (Chandrasekhar 1931), an instability sets in, leading to a thermonuclear runaway fusion reaction that disrupts the WD. However, the exact nature of the progenitor and explosion scenario are still debated (Maoz, Mannucci & Nelemans 2014) and need to be addressed properly in order for SNe Ia to be used in precision cosmology (Howell 2011).

An estimate of the reddening suffered by SNe Ia and its correction are very important when these objects are being used as distance indicators. Although the majority of SN host galaxies show extinction properties similar to that of the Milky Way, consistent with a total to selective extinction ratio of $R_V = 3.1$, this value is found to be significantly lower in the direction of SNe Ia in many host galaxies (Krisciunas et al. 2006; Elias-Rosa et al. 2006; Krisciunas et al. 2007; Wang et al. 2008; Folatelli et al. 2010; Amanullah et al. 2014). The departure of R_V from the Galactic value is generally referred to as non-standard extinction. Several studies suggest that non-standard extinction with R_V lower than 3.1 is shown mostly by SNe Ia that are significantly reddened (Jha, Riess & Kirshner 2007; Folatelli et al. 2010; Chotard et al. 2011; Mandel, Narayan & Kirshner 2011; Scolnic et al. 2014).

The reddening of SNe Ia arises from at least two sources: the first one, causing a small amount of reddening and seen in most SNe Ia, is consistent with the properties of interstellar dust in the Milky Way, while the second, responsible for reddening in the high-extinction objects, is characterized by an unusually low value of R_V (Phillips 2012). Wang (2005) and Goobar (2008) suggest that the low value of R_V could result from multiple scatterings of light

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Exploring the optical behaviour of a Type Iax supernova SN 2014dt

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ABSTRACT

We present optical photometric (up to ~410 d since B_{max}) and spectroscopic (up to ~157 d since B_{max}) observations of a Type Iax supernova (SN) 2014dt located in M61. SN 2014dt is one of the brightest and closest ($D \sim 20$ Mpc) discovered Type Iax SN. It best matches the light-curve evolution of SN 2005hk and reaches a peak magnitude of $M_B \sim -18.13 \pm 0.04$ mag with $\Delta m_{15} \sim 1.35 \pm 0.06$ mag. The early spectra of SN 2014dt are similar to other Type Iax SNe, whereas the nebular spectrum at 157 d is dominated by narrow emission features with less blending as compared to SNe 2008ge and 2012Z. The ejecta velocities are between 5000 and 1000 km s^{-1}, which also confirms the low-energy budget of Type Iax SN 2014dt compared to normal Type Ia SNe. Using the peak bolometric luminosity of SN 2005hk, we estimate the ^{56}Ni mass of ~0.14 M$_\odot$. The striking similarity between SN 2014dt and SN 2005hk implies that a comparable amount of ^{56}Ni would have been synthesized in the explosion of SN 2014dt.

Key words: techniques: photometric – techniques: spectroscopic – supernovae: general – supernovae: individual: SN 2014dt – galaxies: individual: M61.

1 INTRODUCTION

The last two decades have witnessed the advent of a new subclass of Type Ia supernovae (SNe) that are grouped together and these are commonly known as Type Iax SNe (Foley et al. 2013). The rate of occurrence of Type Iax SNe is 31^{+19}_{-13} for every hundred normal Type Ia SNe (Foley et al. 2013). Type Iax SNe exhibit distinct properties both photometrically and spectroscopically when compared to the normal Type Ia SNe. The secondary peak in the near-infrared (NIR) light curves of Type Ia SNe is not seen in the NIR light curves of Type Iax SNe (Li et al. 2003). A wide range is seen in the peak absolute brightness ($M_V = -14$ to -18 mag). Their expansion velocities are (~4000 to ~9000 km s^{-1}) half of that of Type Ia SNe (~10,000 to ~15,000 km s^{-1}). For a small sample of objects similar to SN 2002cx, McClelland et al. (2010) suggested that there were correlations between the peak luminosity, light-curve shape and ejecta velocity. Narayan et al. (2011) also derived scaling relations between ejecta velocity and decline rate using the Arnett formulation. Narayan et al. (2011) found that the ejecta mass of Type Iax SNe was between 1 and 1.4 M$_\odot$ (with SN 2008ha being an exception). With a slightly larger sample, the ejecta mass of Type Iax SNe was estimated to be 0.5 ± 0.2 M$_\odot$ (Foley et al. 2013). With a greater number of Type Iax SNe discovered, correlations between the decline rate and ejecta velocity and between the peak luminosity and decline rate were found by Foley et al. (2013) and Magee et al. (2016). These are subluminous events but their early time spectra are similar to SN 1991T-like over-luminous events. Often their maximum light spectra show signs of unburned carbon, ~82 per cent of Type Iax SNe have clear absorption of carbon whereas only 30 per cent of Type Ia SNe have carbon in their pre-maximum spectra (Foley et al. 2013). The nebular spectra of Type Ia SNe are associated with the forbidden emission lines of iron group elements, whereas Type Iax SNe have permitted lines of these iron group elements along with intermediate-mass elements (S, Ca, etc.). It is also seen that the late-time spectra of Type Iax SNe have calcium interior to iron (Foley et al. 2013), which is the opposite of what we see in Type Ia SNe. The two-component model proposed by Foley et al. (2016) discusses the origin of broad emission lines from the ejecta and narrow forbidden lines originating from a wind that is thought to be associated with the remnant of the progenitor.

The progenitors are a very good source for a clear distinction between various subclasses of Type Ia SNe. Liu et al. (2015b) proposed

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A Peculiar Subclass of Type Ia Supernovae a.k.a. Type Iax

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Abstract: We present optical photometric (upto ~410 days since B_{max}) and spectroscopic (upto ~235 days since B_{max}) observations of a type Iax supernova SN 2014dt located in M61. The broad band light curves follow a linear decline upto ~100 days after which a significant flattening is seen in the late-time (beyond 150 days) light curves of SN 2014dt. SN 2014dt best matches the light curve evolution of SN 2005hk and reaches a peak magnitude of M_B ~-18.12±0.04 with Δm_{15} ~1.35±0.06 mag. The earliest spectrum at ~23 days is dominated by FeII and CoII lines with the absence of the Si II 6150 Å line. Using the peak bolometric luminosity we estimate a ^{56}Ni mass of 0.14 $M_\odot$ in the case of SN 2005hk and the striking similarity between SN 2014dt and SN 2005hk implies that a comparable amount of ^{56}Ni would have been synthesized in the explosion of SN 2014dt. There are several explosion scenarios proposed for these peculiar events. Being one of the brightest and closest SN, SN 2014dt is an ideal candidate for long term monitoring. Late phase observations are very essential to understand the progenitor system and the actual explosion scenario for these events.

1 Introduction

Type Ia SNe which are hydrogen deficient are the result of the complete disruption of a carbon oxygen white dwarf accreting matter from its companion and are commonly known as thermonuclear SNe. Type Ia SNe have secondary peaks in their I band light curves 30-35 days after maximum in B band. Type Ia SNe exhibit a wide range of similarities and can be parameterized with a few parameters. These parameters are the decline rate Δm_{15} which is the difference in magnitude during 15 days since maximum in B band and R(Si II) which is the ratio of the depth of two absorption features usually attributed to the Si II 5972 and Si II 6355 lines (Nugent et al. 1995).

Generally it is believed that type Ia SNe originate from the complete eruption of a carbon oxygen white dwarf. But there is a subclass of type Ia SNe which supports a different mechanism of explosion because of

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The Nainital Cape Survey Project : A Search for Pulsation in Chemically Peculiar Stars

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Abstract: The Nainital-Cape Survey is a dedicated search programme initiated in 1999 in the coordination of astronomers from SAAO South Africa, ARIES Nainital and ISRO Bangalore. Over the last 17 years a total of 345 chemically peculiar stars were monitored for photometric variability, making it one of the longest ground-based survey to search for pulsation in chemically peculiar stars in terms of both time span and sample size. Under this survey, we discovered rapid pulsation in the Ap star HD12098 while δ Scuti-type pulsations were detected in seven Am stars. Those stars in which pulsations were not detected have also been tabulated along with their detailed astrophysical parameters for further investigation.

1 Introduction

Stars having anomalous line strengths (strong/weak) in their optical spectra are called chemically peculiar (CP) stars. They are mostly A-type stars, but some of them are also found in spectral class from late B to early F type (Wolf 1983). These stars are grouped as Am/Fm (CP1), Ap/Bp (CP2), Hg-Mn (CP3), and He weak/strong (CP4) stars (Preston 1974). Since both Am and Ap stars are of prime interest for the present study, we introduce them briefly here. The Am stars are relatively cool (6 500-10 000 K) stars exhibiting weak lines of Ca, Sc and strong lines of Sr, Eu, and other rare-earth elements. Some stars of this group show pulsations similar to those observed in δ Scuti (δ Sct) stars (Joshi et al. 2003, 2006, 2009; Smalley et al. 2011; Catanzaro & Ripepi 2014; Hou et al. 2015). Similarly, the Ap stars have a surface overabundance of Sr, Cr, Eu, and other rare earth elements, a high magnetic field (few kG) and effective temperatures ranging from 7 000 to 10 000 K. In the early 1980s, it was found that a subset of Ap stars exhibit short period pulsations in the range of 5 to 23 min and are termed as rapidly oscillating Ap (roAp) stars (Kurtz & Martinez 2000). The roAp stars are important tools for asteroseismology.

The δ Sct stars show radial and/or non-radial low-overtone p-mode pulsations while roAp stars exhibit low-amplitude, low-degree, high-overtone, non-radial p-mode pulsations. The photometric amplitude of oscillations in roAp star is modulated with rotation and can be explained by the oblique pulsator model (Kurtz 1982). The multi-periodic nature of these pulsating Ap/Am stars make them suitable for asteroseismic studies (Joshi & Joshi 2015). The Nainital-Cape Survey, initiated in 1999

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ORIGINAL PAPER

Study of electrical and electrochemical behavior on copper ion conducting nano-composite polymer electrolyte

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Abstract
Poly (ethylene oxide) (PEO)-based nano-composite polymer electrolyte (NCPE) membranes: [85PEO: 15Cu$(ClO_4)_2$.6H_2O] + x Al_2O_3, where x = 0, 1, 2, 3, 4, 5, 6, 7, 8 wt%, have been casted by hot-press technique. Solid polymer electrolyte (SPE) composition: [85PEO: 15Cu$(ClO_4)_2$.6H_2O] (wt%) is highest conducting film with room temperature conductivity (σ_{rt}) ~ 1.59×10^{-6} S/cm, has been used as the Ist-phase host matrix and Al_2O_3 filler particles of nano-dimension (~ 50 nm) as IInd-phase dispersoid. The fractional dispersal of Al_2O_3 filler (viz. x = 2 wt%) in Ist-phase SPE host resulted into nearly four orders increase in the room temperature conductivity than that of pure PEO. This NCPE film: [85PEO: 15Cu $(ClO_4)_2$.6H_2O] + 2 Al_2O_3 has been referred to as optimum conducting composition (OCC) NCPE film. X-Ray diffraction (XRD), Fourier transform infrared (FTIR), scanning electron microscopy (SEM), differential scanning calorimetry (DSC), and Thermogravimetric Analysis (TGA) techniques have been used to study the structural, spectroscopic, morphological, and thermal responses, respectively, of SPE/NCPE OCC film material. The ion transport behavior has been characterized in terms of basic ionic parameters viz. conductivity (σ), total ionic (t_{ion})/cation (t_+) transference numbers which have been evaluated using different ac/dc techniques. Temperature dependent conductivity measurement in SPE/NCPE OCC film was done in order to understand the mechanism of ion transport and to evaluate activation energy (E_a) from "log σ–1/T" plot.

Keywords Nano-composite polymer electrolyte (NCPE) · Hot-press technique · Ionic conductivity · Ionic transport number

Introduction

Polymer electrolyte is an ion conducting membrane with moderate-high ionic conductivity ($\sigma_n \leq 10^{-4}$ Scm^{-1}) at room temperature. The first ion conducting solid polymer electrolytes was reported in 1973 [1] and subsequently, the first solid polymer electrolyte (SPE)-based film battery was practically demonstrated in 1979 [2]. These novel discoveries inspired scientists/researchers both from academic institutions and industrial sectors to intensively pursue research in this area of Materials Science. Consequently, a large number of polymer electrolyte materials involving different kinds of transporting ions, namely H^+, Li^+, Na^+, K^+, Ag^+, and Mg^{2+} have been reported. As already mentioned, the polymer electrolytes show great technological promise of fabricating a variety of all-solid-state electrochemical power sources, namely mini/macro primary/secondary batteries, fuel cells, and supercapacitors; hence, the applications of these materials in electrochemical devices are being explored extensively at different research and development laboratories as well as at commercial scales [1–20].

In the synthesis of SPE films, reported in the past, high mol. wt. polar polymer, namely poly (ethylene oxide) PEO has been commonly used as polymeric host matrix. The fact is that PEO possesses relatively higher electrochemical stability as well as an exceptional ability to dissolve wide variety of salts as compared to other polymers [2, 20]. The polar and flexible main chain dissociates the salt and hence, carrier ions are generated. These ions can migrate through the amorphous region of the polymer via inter-chain segmental motion. The degree of amorphosity of the polymer predominantly controls the ion conduction phenomenon in the polymer salt complexes. Larger is the amorphous region in the polymeric host,

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Effect of mobile phone use on stress parameters (Randomized Single blinded control trial)

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References (27)

Abstract

Several types of Clinical studies have indicated that the various types of diseases such as insomnia, anxiety and stress all have close relationship with the physiological parameter of autonomic nervous system. The main objective of the paper is to see the effect of mobile phone use on Physiological parameters of autonomic nervous system. The Physiological parameters viz. GSR (Galvanic skin resistance) EMG (electromyography), RESP (Respiration monitors breath) and PULSE Rate were measured with the help of computerized biofeedback equipment. Biofeedback is the technique of using monitoring devices to measure and feedback of autonomic activity; (e.g., Respiration rate, Mussels tense, Pulse rate, Galvanic skin Response (Silverthorn, 2009). or temperature). Incidental sampling method was adopted to select the sample. The total sample size for this study was 20 healthy college going

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Processing speed and verbal fluency as predictors of functional disability among patients with schizophrenia

April 2018

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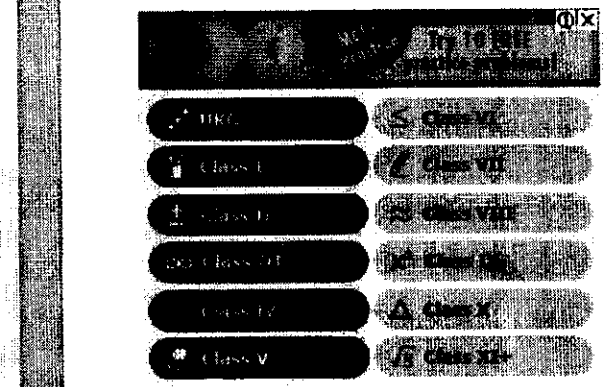
Abstract

Cognitive deficits are the common feature of schizophrenia and affect the whole functioning of patient. The main aim of the present study is to examine the predictive effect of verbal fluency and processing speed on functional disability in schizophrenia. 30 schizophrenia patients were selected as sample of the study. Processing speed was assessed by digit symbol substitution test, verbal fluency assessed by controlled oral word association test; functional disability assessed through WHO disability assessment schedule. Brief psychiatric rating scale was used to measure severity of illness. Hierarchical regression analysis used to find the relationship between functional disability and processing speed and verbal fluency. The result indicated that processing speed (-.683, p<0.01) and verbal fluency (-.559, p<0.01) age (.402, p<0.05) and education (-.502, p<0.01), duration of illness (.612, p<0.01) and severity of illness (.580, p<0.01) significantly predicted functional disability but gender showed no relationship with functional disability. Cognitive dysfunction affects the functioning of patients with schizophrenia. This paper may help to understand the role of processing speed and verbal fluency in functioning of the patients and also help to develop intervention programs.



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Processing speed and verbal fluency as predictors of functional disability among patients with schizophrenia

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Cognitive deficits are the common feature of schizophrenia and affect the whole functioning of patient. The main aim of the present study is to examine the predictive effect of verbal fluency and processing speed on functional disability in schizophrenia. 30 schizophrenia patients were selected as sample of the study. Processing speed was assessed by digit symbol substitution test, verbal fluency assessed by controlled oral word association test; functional disability assessed through WHO disability assessment schedule, Brief psychiatric rating scale was used to measure severity of illness. Hierarchical regression analysis used to find the relationship between functional disability and processing speed and verbal fluency. The result indicated that processing speed (-.683, p<0.01) and verbal fluency (-.559, p<0.01) age (.402, p<0.05) and education (-.502, p<0.01), duration of illness (.612, p<0.01) and severity of illness (.580, p<0.01) significantly predicted functional disability but gender showed no relationship with functional disability. Cognitive dysfunction affects the functioning of patients with schizophrenia. This paper may help to understand the role of processing speed and verbal fluency in functioning of the patients and also help to develop intervention programs.

Keywords: cognitive dysfunction, processing speed, verbal fluency, functional disability, schizophrenia

National Institute of Mental Health defined, schizophrenia is a chronic, severe and disabling mental disorder that has affected individual throughout life and involves emotion, cognition, perception and major aspects of behavior (Kaplan et al., 2005). It is characterized by positive symptoms, negative symptoms and disorganized behavior. Schizophrenia begins at any age, prevalent in both gender and having outcome which is multidimensional, includes severity of symptoms, employment, functional disability and management factors (Javed et al., 2000). Distorted cognition is the core feature of schizophrenia which is the central issue of the research from last decades and may present at the time of onset of disease (Saykin et al., 1994) and persist over time (Kurtz et al., 2006). Cognitive dysfunction is found to be a predictor of level of functioning in schizophrenia (Kaplan et al., 2005). The main cognitive dysfunction found in schizophrenia is information processing, verbal fluency, attention, working memory, problem solving, and memory. In many domains, average cognitive dysfunction in patients with schizophrenia can reach two standard deviation below as compared to healthy individuals (Kaplan et al., 2005). Recently 2009; Harvey, 2012; Keefe, 2013); interpersonal activity (Makhal, 2013); communication (Makhal, 2013); understanding (Makhal, 2013); and psychosocial functioning (Ismail, 2011); in schizophrenia. Information processing speed is a measure of the efficiency of cognitive function (Lawrance et al., 2011); and requires coordination of other parts of the brain. Verbal fluency also explained in a measure of processing speed but not in a traditional manner (Keefe et al., 2012). Fluency is a part of mental flexibility and exhibits a spontaneous flexibility that requires a ready flow of ideas and answers, often in response to a single question (Eslinger & Grattan, 1993) so it is a capacity to generate alternatives in a regulated manner (Spreen & Strauss, 1998). Processing speed mediates the relationship between verbal fluency and functional disability (Ojeda et al., 2007). Some studies showed the relationship between the different dimensions of functional disability and processing speed. Processing speed was found as a predictor of global psychosocial function and recreation impairment, the degree of dysfunction was found to be 4.4% (Miller et al., 2005) and had significant relationship with self care, vocational

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Personality dimensions as predictors of career maturity in adolescents of oraon tribe in Chhattisgarh state

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The aim of the present piece of research work is to examine the predicting effects of personality dimensions, viz., extraversion and neuroticism on career maturity. Employing the correlational design 100 male students of Oraon tribe studying in class 10th within the age range 14- 16 years were drawn randomly from different schools of Surguja District of the state of Chhattisgarh to serve as Ss. For assessing the criterion variable. i.e., career maturity, Career Maturity Inventory (CMI) by Gupta (1989) and for assessing the predicting variable viz., personality dimensions Junior Eysenck Personality Inventory by Helode (1985) were used. Multiple regression analysis was used to examine for predicting effects of personality dimensions. Extraversion and Neuroticism have emerged as significant predictors of career maturity. The theoretical implications have been discussed.

Keywords: career maturity, personality dimensions, extraversion, neuroticism

Career maturity has been defined as the maturity of attitudes and competencies pertaining to career decision making (Crites, 1973, 749, 74b). The attitudinal variables include (1) decisiveness in career decision marking (2) involvement in career decision making (3) independence in career decision making (4) orientation to career decision making (5) compromise in career decision making. The competencies include (1) self-appraisal (2) goal selection (3) planning and (4) problem solving.

This concept has its origin in the developmental theory of career behavior which invisages that the selection of an occupation is a process spanning a considerable number of years usually from the childhood to early adulthood. The process even continues after a person establishes in an occupation and makes efforts to maintain and advance in it and later in life prepares to retire from it.

The term vocational maturity has been defined normatively, in terms of congruence between an individual's vocational behavior at a point of time and his/her expected vocational behavior at that particular age. The closer the correspondence between the two, the greater the individual's vocational maturity.

It has been found to be predicted by a number of variables such as age (Edwords, Natziger, & Holand, 1974; Hen & Ederline, 1976; Kelso, 1973, 77) Locus of Control (Glabe, Thompson, & Glanstein, 1976; Helbing, 1984; Hoise & Hansen, 1978; Ono & Sakayanagi, 1986; Tylor, 1985) Locus of control, dependence proneness and gender (Hasan & Dewangan, 2004) Percired work relation barriers (Patten et al., 2003); Personality variables (Hirchi's et al., 2010; Lounsbury et al., 2005; Sarickas, 2002).

Although a number of studies have been conducted in which the relationship between personality variables and career maturity has been ascertained Hirches et al. (2016); Loursbury et al. (2005); and Sarickas (2002) no study involving a personality theory or model has yet been conducted to find out the relationship between personality dimensions and career maturity till now.

Lawrence and Brown (1976) and Pond (1978) have shown that career maturity has been found to the influenced differently in different culture, race and gender groups by certain psychological, demographic and educational factors. So this study was conceived to examine the prediction effects of personality dimension viz neuroticism and extraversion on career maturity under Indian cultural setup. It was expected that extraversion and introversion would emerge as predictors of career maturity.

Method

Participants

Following the random sampling technique 100 - male students of Oraon tribe studying in class 10th within the age range of 14- 16 years were drawn from different school of Surguja District of Chhattisgarh state to sever as subjects in the present study.

Research design

In the present study correlational research design was employed Career Maturity is criterion variable. Personality Dimensions, viz., extraversion and neuroticism are suspected predictors.

Instruments

Career Maturity Inventory: To measure the career maturity of Ss the Indian adaptation of Career Maturity Inventory (CMI) by Gupta (1989) was used. The inventory was originally constructed and standardized by Crites (1973-1978). It measures the maturity of attitudes and competencies that are critical in realistic career decision-making. The items of the inventory are suitable for the students of class 9th and 10th . The attitudinal variables assessed by attitude scale are (i) decisiveness, (ii) involvement, (iii) independence, (iv) orientation, and (v) compromise in career decision-making. It has five independent dimensions- (a) self-

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Personality Variables and Marital Satisfaction : A Systematic Review.

January 2018

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Citations (3)

Abstract

The aim of the present paper is to examine and explore the research status, from the relevant research literature, on the relationship between personality variables and marital satisfaction. It further contributes our knowledge of understanding by reviewing scientific research literature published over the last thirteen years. Review papers, articles and empirical studies were searched from eleven scientific database. The methodological assessments of each paper were examined using six parameters viz., research design, validity coefficient of criterion measure on own data, reliability coefficients of criterion measure on own data, validity or reliability coefficients of different predictor measure, statistical analyses and reported effect size. The most frequently predictors included neuroticism, agreeableness, conscientious, extraversion, openness to experience, impulsivity, immature defense mechanism, communication, attachment, emotional stability and spousal support. There have been many problems with the theory and empirical work in this area. The critical review includes both

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Predicting effects of acculturation strategies on acculturative stress

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The objective of the present empirical piece of research work is to examine the predicting effects of acculturation strategies on acculturative stress. Following the incidental cum random sampling technique, 200 North Indian migrated students were drawn from the different college in Bangalore city of Karnataka, to serve as participants in the present research work. The correlational research design was employed. Hierarchical multiple regression models were used to examine the predicting effects of acculturation strategies on acculturative stress. The result of the study indicated that, separation and marginalization acculturation strategies were significant predictors of acculturative stress. It is concluded that there is sufficient empirical and statistical evidence of the prediction effects of acculturation strategies viz. separation and marginalization on acculturative stress.

Keywords: acculturative stress and acculturation strategies

"Acculturation refers to the change in a cultural group or individual as a result of contact with another cultural group. It is the process that individual undergo in response to changing cultural context" (Berry, Poorting, Segall, & Dasen, 2002). Acculturation process response is equal to any stress as a cause of the main life transition (Sam & Berry, 1995-2010). Feeling of stress elicit by the procedure of learning a new culture, hopelessness, unimportant, defenselessness and overall anxiety, e.g., how to perform in the leading culture in a methodological way, individual ought to learn frequently new language and new code of conduct, strategies regarding effective job seeking reconstruct a social network and be trained to navigate through the sea of systematic barriers (Arthur & Collins, 2005).

An individual react to new circumstances may be necessary or supportive for definite amount of stress on the other aspect too much of stress can be difficult and can threaten healthy adaptation manifesting as insecurity, anxiety, depression (Revollo, Collazos, Valero, & Cases, 2011); Various form of physical and mental maladaptation (Roysircar, Sodowsky, & Maestas, 2000; Sam & Berry, 2010; Schwartzet et al., 2010); and decrease quality of life (Salgado et al., 2010). Correlating acculturative experience and cultural maintenance discover the relationship between acculturation attitude and psychosocial adjustment factor (Berry, 1997; Neto, 1986). Searle and Ward (1990) bifurcate between the two elements of adaptation viz. psychological adaptation and socio-cultural adaptation. Psychological adaptation imposes to psychological well-being or good mental health and satisfaction in a new cultural context. Socio-cultural adaptation correlates to learning the new social skill to interact with new culture dealing with the daily problem of living and effective execution of the task (Seale & Ward, 1990). Psychological adaptation and socio-culture adaptation these two forms of adaptation are interrelated with each other. Purposefully handling with the problem and involving positive interaction with the member of host culture are likely to accomplish one's feeling of well-being and satisfaction.

According to Berry (2003), "to what degree do desire to have contact with (or avoid) another exterior from their group and to what extent do people wish to maintain (or give up) their cultural attributes with these two major issue person face during acculturation (Berry, 2001)". The strategy that, they use through acculturation to individual response to these two issue interaction between attitude and behaviours. Orientation toward acculturation concerning these two dimensions exhibits four strategies assimilation, separation, integration and marginalization (Berry, 2001; Berry et al., 1989). Four strategies demonstrate the allocation of acculturation strategy, 'either- or' choice entail first two strategies e.g., when an individual do not value contact with their culture of origin assimilation is applied, maintain the culture of origin and avoid interaction with other group individual seek to separation. "Both or none" choice involve in the later two strategies e.g. the maintenance of one's non-dominant culture and simultaneous interaction with other group is applied. Avoiding interaction with the dominant culture represents distancing oneself from one heritage culture marginalization strategy is applied. Studies based on Berry's bi-dimensional model (Berry et al., 1989). The occurrence of mental health difficulties illustrates the relationship between each acculturation strategy integration is the most adaptive one (Banet Martinez, & Haritatos, 2005). Frequently the most efficient strategy for good psychological adaptation researchers has suggested integration strategy (Coatsworth, Maldonado, Molina, Pantin, & Szpocznik, 2005; David, Okazaki, & Saw, 2009). When resettlement is internal the benefit of integration have been found (e.g., moving from rural to the urban area within the same country) (Berry & Zhenz, 2012). Literature have established both positive and negative outcome related acculturation, context depending on how the route unfold within a scrupulous e.g., mainstream to assimilation, negative mental health associated with dominant culture including depression, anxiety, alcoholism, drug use and psychological outcome including linked to acculturation with a number of positive behavior self-esteem, educational attainment, career orientation, help-seeking behavior, life satisfaction and positive effects (Sood Mendez & Kendall, 2012). Further, prediction effect of acculturation strategies on acculturative stress in with country migration has not yet been ascertained. Thus, the understanding of the role of acculturation strategies on acculturative stress under with country migration remains unclear. To bridge the gap in the literature, the present study purports to examine the

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Is Internet Usage Improving the Academic Achievement of Adolescent Students in Chhattisgarh? A Study Across Locale and Gender

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ABSTRACT:

Use of Internet has become very widespread among students of all ages and regions for various purposes in everyday life. In the present paper the effect of use of Internet by the adolescent students on their Academic Achievement is discussed systematically. Data from the students belonging to urban, rural and tribal regions of Chhattisgarh state is collected and is analysed on the basis of locale and gender. 't' test and ANOVA are used to find out the effect of Internet usage on the academic achievement of the students. The result obtained shows that more use of Internet by the students improves their Academic Achievement in all locales and for both the genders.

Keywords: Internet adolescent Academic Achievement Academic Performance

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Prevalence of Subclinical Depression among College Students: A Review

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ABSTRACT:

INTRODUCTION - Early adult stage is the transition from adolescence to young adulthood, presents significant challenges like the chance to manage one's life and affect more independent roles. A number of them adjust with these challenges and a few couldn't manage these stressors which can cause the mental health problems. Among these problems depression is very common, and it is very difficult to detect in early stage, which often identified as a minor or subclinical depression. SD patients were in a mean position between non-depressive and depressive patients with regard to social isolation and physical destruction; women were overrepresented in the depressive and sub-depressive groups" (Schnieder et al. 2000). Study suggests the prevalence rate of subclinical depression was very high, which need urgent attention for identification and treatment. If it is ignored or left untreated long term effect may be appear in the form of major or severe depression. METHOD - A comprehensive systematic search of published literature and journal articles from Google Scholar, Pub Med, MEDLINE and EBSCO was taken. Search strategy specific to each data repository was used. During initial search 642 titles were retrieved and finally 38 empirical researches were selected based on the inclusion criteria. RESULT - Total 38 articles were selected, out of 38 approx 36 studies shows the rate of prevalence of Subclinical depression among college students and some studies based on impact and factors associated with subclinical depression. CONCLUSION - It is very important that health care providers, counselors, teachers and parents should pay special attention for early detection and treatment of subclinical depressive symptoms in early adults.

researchgate.net/publication/321699610_A_Study_of_Psychological_factor_discriminating_diabetic_and_non-diabetic_patients

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A Study of Psychological factor discriminating diabetic and non-diabetic patients

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Authors:

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Abstract

Several type of earlier empirical evidence indicated, positive relationship between psychosocial risk factor (i.e. stress, anxiety, depression, etc.) and life style diseases. The main objective of the research undertaken is, whether personality type and anxiety contribute in discriminating for diabetic and non diabetic population group. Present empirical piece of research is to examine the role of state, trait anxiety and personality type (extraversion & neuroticism) in discriminating diabetic and non diabetic population group of respondents. Following the incidental cum random sampling technique 50 participants (50 % diabetic suffering from diabetes type-2 clinically diagnosed and 50 % non diabetic) within the age range of 50 to 60 years were drawn from Raipur, to serve as participants in the present research work. Anxiety was measured by State- Trait Anxiety Inventory and Personality traits were measured by Maudsly Personality Inventory. Discriminant analysis was used with the help of SPSS 16.0 version software, for the data analysis. The results indicated that, state anxiety, trait anxiety, and neuroticism personality type are important significant discriminating

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Cultural identity and acculturative stress: A systematic review

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To find out the research status, from the relevant research literature, on the relationship between acculturative stress and cultural identity, a literature search using J gate, Google Scholar database covering the period from 2000 to 2016, was conducted. The authors acknowledged 15 studies with certain inclusion criteria. Search terms were cultural identity, acculturative stress and acculturation. After examining different aspect of 15 empirical papers, it was found that there is significant association between acculturative stress and cultural identity. Every dimension of different cultural identity play an important role in determining acculturative stress. So far as number of dimensions is concerned, the researchers are unequivocal. Some of them have identified three dimensions whereas in some other studies five dimensions have also been reported. Almost all researchers are agree that there is a positive relationship between cultural identity and acculturative stress.

Keywords: acculturation, acculturative stress, cultural identity

According to Keats (1997), "culture consists of the literature, media, values, belief systems, norms for social and family relations, products available for consumption, natural environments, hierarchical system of access to professional occupations, defined gender roles, etc. Culture can also be thought of as the accumulated knowledge of a particular society passed down form one generation to next and changed by evolution in the sciences, technology and the arts, as well as by contact with other cultures". Cultural identity is defined as "that component of the concept of the self which is concerned one's sense of embeddedness in one's family past, present and future and one's place in the wider cultural milieu" (Keats, 1997). "acculturation refers to the change in a cultural group or individual undergo in response to changing cultural context" (Berry & Grilo, 2002). The process of maladaptation to a new social and cultural setting is acculturative stress (Myers Wall, Frias, Know, Ko, & Lu, 2008). Acculturation deals with two important dimensions viz psychological and sociocultural adaptations. Psychological adjustment refers to "psychological well-being or satisfaction" whereas socio-cultural adjustment refers to "the ability to fit in to host culture" (Ward & Kennedy, 1999). The present paper is intended to review the studies related to the effect of cultural identity on acculturative stress. The review article deals with the technical and academic aspects of the major studies conducted in these two areas, viz., cultural identity and acculturative stress. The findings of such empirical studies have been summarized.

Method for review

Literature Search Procedure: Studies were identified through J-Gate, Google Scholar. It covers the period from 2000 to 2016. The review is conducted using search term acculturation, acculturative stress, cultural identity, acculturative strategies.

Inclusion Criteria: Followings are the inclusion criteria:(1) Empirical studies from peer reviewed journal.(2) Empirical studies in English language.(3) quantitative research 15 quantitative empirical studies were included for review within the period of 2000-2016.

Method

In present research six parameters are decided to assess internal validity of reviewed empirical studies as recommended by Zang and Goodson (2011). 1. Research Design; 2. Validity of criterion variable; 3. Reliability coefficient of predictor variable; 4. Validity and reliability coefficients of different predictor measures on own data; 5. Statistical analysis; 6. Effect Size.

Table 1: Shows the Mean, SD and t Value Work Dimension

Studies	Parameters					
	Research Design	Validity of Criterion Variable	Reliability Coefficient of Predictor Variable	Validity and Reliability Coefficient of Different Predi-ctor Measure on Own Data	Statistical Analysis	Effect Size
Helen Fobes-Mewett (2016)	0	1	1	1	1	1
Jianzhong Hong (2015)	0	1	1	1	1	1
NorizaMohd Ishak, Salehuddin, MohdZulhan Othman (2013)	0	0	0	0	1	1

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Demographic and Clinical Correlates of Social Cognition in Schizophrenia: Observation from India

Roshen Lal Dewangan, Promila Singh, Tanmay Mahapatra,[1] and Sanchita Mahapatra[1]

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Abstract

Go to:

Purpose:

Although deficits in social cognition (SC) had been recognized as a hallmark of schizophrenia, quality data in Indian context were limited. The purpose of the current research was to determine the demographic and clinical correlates of SC in schizophrenia.

Methods:

Between February 2014 and January 2015, a case–control study was conducted in Chhattisgarh, India, among 100 paranoid schizophrenia patients (ICD-10) from two psychiatric hospitals and 100 neighborhood-based healthy (28-item General Health Questionnaire) controls. After obtaining signed consent, SC was assessed among 20–35-year-old, high school or more educated subjects ensuring eligibility for appropriate scales.

Results:

Patients had poorer social knowledge (adjusted-beta-coefficient [AC] = −4.89 [−6.32, −3.45]) and lower predicted mean score for internal attribution of negative event (AC: −0.72 [−1.17, −0.27]). Nonrecognition of facial expressions especially for anger (adjusted-odds-ratio [AOR] = 3.50 [1.17, 10.51]), surprise (AOR = 2.91 [1.36, 6.25]) and fear (AOR = 2.35 [1.11, 5.01]) was more common among cases. Wrong recognition of expressions was less likely among females (for surprise: AOR = 0.35 [0.13, 0.93]) and educated (for sadness: AOR = 0.11 [0.02, 0.58]) but more common among wealthy (for surprise: AOR =

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Naxal Movement and Health Status of Tribes in Base Camp (A Case Study of Dantewada District of Chhattisgarh State of India)

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Abstract

Present study is based on Naxal movement in Chhattisgarh state and its impact on Tribal life. Study is focus on comparative study of social life of tribal people before coming to base camps and changes after boarding to base camps. Researcher has been try to find out that what are the change in tribal culture due to naxal incidents and what is impact of health program in the region after naxal activity. Findings of the study shows that in some context the naxal incidents are benificial of tribal people because in the base camp they having sufficient heath facility, especially in the context of women and children health facility which is provided by the govt.

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Full Length Research Article

FAMILY ADJUSTMENT AMONG WORKING WOMEN OF RAIPUR CITY OF CHHATTISGARH STATE (WITH SPECIAL REFERENCE TO COLLEGE PROFESSOR AND NURSES

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ABSTRACT

Present paper is based on a study of family adjustment among working women of Raipur city of Chhattisgarh state (INDIA).Study is based on purposively selected 136 Nurses of Dr. Bhimrao Ambedkar hospital of Raipur city and 66 College professors of Raipur city. Data were collected through Interview-schedule and observation technique. It is tried to clarify through the study, what is the volume of family adjustment in nurses and College professors. Findings of the study show that Nurses are facing more problem as compare to women professor in family adjustment.

INTRODUCTION

Family is a primary unit in Indian social system, if we try to know the role of family in respect of women, then it is very common that family responsibility value is more important in case of women in comparison to man. Culturally as the working place of women is limited to family and family works, they have to face less towards the state of role adjustment. But after 18th century especially in 1991, after implementation of new economic policy, women came in employment sector in large number; as a result their role also came to their work place along with the family. The role conflict also starts here, because so many scholars like Neera Desai, (1957) Pramila Kapoor, (1957) have written that, we not only talk about doing service of educated women but also expect from them to complete family works with integrity, but in behaviour it is not possible to find it. In any society the status of women is related to the cultural system of that society. The thoughts and studies on the status of women have become rapid in last few years. Before that the studies related to the scientific analysis of women are very less. The status of women in India gradually becomes very low after the advent of Moguls.

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After independence, when women start participating in works outside the home and got success, the pre-conceptions on women start changing. Since then the activities of doing something for women and thinking on status of women started.

Objectives of the study

- To study the socio-cultural background of the respondents.
- To understand the status and nature of family adjustment among professors and nurses of Raipur city.

Hypothesis

1. There is a significant co-relation between nature of job and family adjustment among professors and nurses.

Research Methodology

Study area: For present study the Raipur city which is the capital of Chhattisgarh state has been selected as study area.

The Sample: For this study 136 Nurses of Dr. Bhim Rao Ambedkar Hospital of Raipur City and 66 College professors of Raipur city were purposively selected as respondent.

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Migration of Adult Children' and its Impact on the Parents Left Behind - A Case Study of Chhattisgarh State

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Abstract:

Old age is a natural biological stage, but if the problem is natural then it is imperative to have little anxiety, becaause today we have a good health facility to solve the health problems that grow with age, where treatment is possible but if treatment is not done So it has many connotations as if there is no one to take care of elderly people in the hospital, or the financial condition is so weak that it is cured. Just is not possible. On the other hand, if an elderly is struggling with social and economic problems, the reason is not natural, but the result of the change in current social and family structure can be said. In the present study, the separation tax has been done in the category of problems of elderly, under which-i) Effect of the migration on the health status of the elderly. ii) Impact of migrations on the economic status of the elderly. Findings of the study shows that in the Chhattisgarh state most of the old age people have got food in time after the migration of their adult children but in the health concern their status is not too good because in the absence of adult member they are not able to take care themselves properly. Most of the elderly people faced health problem and also problem related to treatment after the migration of their young children.

Key Words : migration, Old age, adult children, economic problem, health problem,

Introduction :

With the growing number of senior citizens, we are living in the old age. Currently, more than 60 crores of population in the world has more than 60 years of age. It is estimated that this number of elderly people will double by 2025. [1] Indian scenario is not too different. The population of the elderly was 10.2 million in 2011, which reached 15 crore. in 2021. According to World Bank, between 2010 and 2025, the number of senior citizens in South Asia will increase dramatically by 9 times and the average age of men will be 75 and 82 years of women will become. [2] The increase in average age is due to medical occupations, health awareness and good life style. Due to increasing age, age-based diseases have increased and due to the disruption of the joint family system problems have arisen in front of this class, which include health, malnutrition, housing problems, fear depression, isolation, unification, unproductive, economic weakness is key.

The first attempt at resolving the problems of this class was at the international level in 1948, with the initiative of Argentina, which was re-raised by Malta in 1969. The first international conference was held in Vienna on this subject in 1982. UNO took the initiative to give new direction to the work by dividing this area into 5 groups by accepting 18 principles, on December 16, 1991. The same organization decided in 1992 to decide on the year 1999 as International Old Age Day. [3]

It is true that the status of elderly people has changed in the global phase, which has resulted in increase in their problems. The rise in industrial development in the country, the establishment of new industrial centers, and the rapid urbanization process has attracted the rural working population. Today's unemployed youth invites employment in the city rather than the village, as a result, leaving his parents and working in the city. At the time and at the same time, the original residence can be reached and in this case, the attention given to her family members cannot be given, and if the parents are elderly then their situation is even more worrisome..If the son sends money on time to the village If the elderly does not have problems in passing, but if money is not received at the time and if the country sent is less than the need, then the situation is even more serious.

Objectives of the Study :

1. To know the impact on economic status of ageing.
2. To study the impact of migration on physical and health status of ageing.

आधी आबादी

डॉ. संदीप श्रीराम पाईकराव
डॉ. संतोष विजय येरावर

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अनुक्रम

'धूल पौधों पर' उपन्यास में नारी-संघर्ष और अंतर्द्वन्द्व

डॉ. गिरजाशंकर गौतम

मनुष्य जन्म से लेकर मृत्युपर्यंत नाना प्रकार की समस्याओं से जूझता है, जीवन में कभी भी वह समस्याओं से परे नहीं रह सकता। परिवार, समाज, राजनीति, अर्थनीति के जोड़-घटाव से वह अपना भला-बुरा समझता है। बिखरते परिवार तथा बेरोजगारी, वर्तमान परिवेश में मुख्य समस्या हैं। आज शिक्षा जैसे महत्वपूर्ण कल्याणकारी कार्यों में दीमक की तरह भ्रष्टाचार व्याप्त है। अब समाज में व्यक्ति का मूल्यांकन अर्थ के आधार पर होने लगा है। जल्दी और ज़्यादा पैसा कमाने की होड़ है। धन कमाने के तरीके इतने बर्बर और भयावह हो गये हैं कि उनमें नैतिकता की बात करना बेवकूफी समझा जाने लगा है। ऐसे कठिन समय में गोविन्द मिश्र की रचनाएँ अंधेरे में उजास लेकर उपस्थित होती हैं। इनके उपन्यासों, कहानियों में जहाँ एक ओर क्रूर सामाजिक यथार्थ को चित्रित किया गया है वहीं दूसरी ओर आधुनिक जीवन में सौन्दर्य की खोज, मानवीय मूल्यों की कुशल पड़ताल भी की गई है। नारी संघर्ष और उसके अंतर्द्वन्द्व का सफल चित्रण 'धूल पौधों पर' उपन्यास में गोविन्द मिश्र ने किया है।

'धूल पौधों पर' उपन्यास की नायिका घर-परिवार के अत्याचार, शोषण को अपनी सहनशीलता और जिम्मेदारीपूर्ण दायित्वबोध के कारण सहने की क्षमता रखती है तथापि वह विद्रोह भी करती है। उसके द्वारा किया गया विद्रोह ही उसके जागरूकता और स्त्री चेतना का प्रतीक बनता है।

'धूल पौधों पर' उपन्यास में स्त्री जीवन का संघर्ष वर्णित है, उपन्यास की अनाम नायिका एम.फिल. समाज शास्त्र की छात्र है और अपने महाविद्यालय के एक कार्यक्रम हेतु समाजशास्त्री प्रेमप्रकाश को आमंत्रण देने के लिए जाती है। इस प्रथम मुलाकात के बाद आद्यांरभ प्रेमप्रकाश नायिका का साथ देते हैं तथा जीवन को संघर्ष से लड़कर जीने की सीख देता है। उपन्यास में नायिका अपने ससुराल में प्रताड़ित