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A study of repayment behavior of farmers in India: With special reference to kisan credit card scheme

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Abstract

India is an agricultural country. Our farmers are always involved in agricultural activities to produce grain for themselves and also for others. Small farmers take loan for each every small requirement from bankers and private credit company at higher rate of interest. Due to high rate of interest it becomes very difficult for them to repay the loan amount along with interest. As a result they lose their landholdings as well as their houses also. To solve this problem Government introduced KCC, which provide loan to farmers at very low or zero rate of interest.

Present study focuses on Repayment Behaviour of Kisan Credit Card holder Borrowers of Obudullaganj Block. The current study attempts to determine the Loan Repayment Pattern of KCC as seen by farmers. The study was conducted using a sample of 200 KCC holders in the Obudullaganj Block of Raisen district (M.P.), collected during the year 2020 to 2021. In the research area it was found that the average loan sanctioned by banks to KCC holders was 135770.37 per KCC holder every financial year. Results shows that 16 (32) percent of the total KCC borrowers out of 100 (200) percent have closed their accounts by fully repaying the original amount plus interest. It was discovered that 39% of the respondents had paid their debt on time. Closed and regular accounts together account for 55% of the total. This demonstrates the sample borrowers' excellent repayment performance. In addition, irregular and default account for 34.5 percent and 10.5 percent of the total.

Keywords: Agricultural and rural development, NABARD, kisan credit card (KCC), repayment behavior

Introduction

The rural development scenario is rapidly changing as a result of policy design and large-scale implementation of new initiatives. Various international organizations have emphasized the concept of rural development throughout the previous quarter-century. "The World Bank Rural Development policy sector study of 1975" defines rural development as "a strategy aiming to improve the economic and social life of a specific population." This applies to the poorest of those seeking a living in rural areas. It is the corner stone to all Economic Development, whether industrial or agricultural, urban or rural development. There are various dimensions to rural development, such as social, economic, and cultural growth. Dr. Girdhari believes that 'Rural Credit' is essentially an agricultural finance, as opposed to the processing and marketing of agricultural produce, when it comes to economic development issues. Initially, rural development was seen as a government-sponsored effort, but in the recent decade, non-governmental organizations (NGOs), or social service groups, self help groups have been found more involved in sustainable rural development. The concept of rural development has undergone significant changes in three crucial areas: resource planning, personnel development, and idea formation.

The Reserve Bank of India has been interested in agricultural loans since its inception. In our country, the apex bank, RBI maintains a distinct section for agriculture credit. Through Cooperative Credit Institutions and banks, this department of the RBI provides short-term seasonal financing as well as medium-term and long-term credit to agriculture.

The Reserve Bank of India also established the Agricultural Refinance Development Corporation to facilitate refinancing to agricultural credit institutions. With the expansion of bank credit's role from 'agricultural development' to 'rural development,' the government proposed establishing a more broad-based organization at the apex level to provide support and guidance to credit institutions on issues relating to the formulation and implementation of rural development programmes.

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Information and Communication Technology (ICT): A key for enhancing the Current Educational Scenario

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ABSTRACT

Information and Communication Technology (ICT) are increasingly becoming crucial part of the education system. ICT has changed the style of functioning of the educational system and its governance. This study is considering the rapid spread of ICT applications has brought about markedly drastic technological, social and economic transformations. These changes have caused educational institutions, administrators, teachers to rethink their roles, teaching and vision for future. The sustainability of a nation in the era of knowledge economy depends on the effective educational system. Productivity is an economic concept where productivity is considered as the comparative analysis of input and outputs. In educational system, the inputs are teachers, students, classroom material, equipment of teaching, methods of teaching and outputs are quantity and quality of student learning. The proper integration of ICT with teaching/learning environment increases education and increased productivity. ICT provides various opportunities to educational learners and make teachers aware of their new roles & responsibilities in teaching and learning process. The growing use of ICT will change many of the strategies employed by both Teachers and Students in the learning process. The role of ICT in the educational administration is recurring and unavoidable. ICT has enabled us to monitor and evaluate what is learned, how it is learned and when and where learning took place. It is also enable the educational management system to discharge various functions such as, conduction of exams, coordination between potential institutes, alumni network. ICT also work for non traditional students by providing internet based education to them anytime and anywhere and these internet technologies enables innovative ways of teaching. ICT plays a vital role in bringing about qualitative change in every aspect of our life in general and that of governance of education.

Key words: Higher Education, ICT, Teacher Education, ICT –as Pedagogy

INTRODUCTION

Education is the backbone of a nation. Education system plays a major role in development of modern economies. Understanding how education system work and how it evolve over time has been one of the most important research agendas in recent years. The education system of any economy performs following main tasks: first, it handles the basic and higher education; second, it provides better opportunities of income; third it enhances the living standard and helps in social development.

Information, Knowledge, and Communication Technology plays vital role in imparting education in modern scenario. At the height of the Internet boom of the 1990s, a fashionable saying was "the Internet changes everything." The ICT changed the way of imparting education in modern era. Considering the higher education in India has seen the massive growth in post-independence era. At the time of independence 17 universities and about 400 colleges were there in India and today 520 universities, nearly 22,000 colleges, over 10 million students, 0.45 million teachers and one of largest higher education system in the world. Our education system focuses on at creation of high quality and well trained human resources to fulfill the need of ever growing Indian economy, but on other hand it face challenges at operational

A Study of Financial Efficiency Analysis of District Central Cooperative Bank, Sehore (MP)

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Abstract –

A healthy and professionally managed co operative banking system is essential for Indian rural economy to achieve sustainable growth and remain stable in competitive business environment. Due to rapid changes in the banking industry, entrance of Small Payment Banks and consolidation of Regional Rural Banks; these rural cooperative banks i.e District Central Cooperative Banks have changed themselves strategically, become technology savvy, profit earning and now marching towards long term sustainability.

The District Central Cooperative Bank, Sehore is situated in between *Mahwa Region*. Sehore CCB is doing well. As on 31.03.2019 the CRAR of the bank is 14.27% which is moderate and complying with the 9% norms and proposed upcoming 12% norms. At present the bank is countering with some problems like Gross NPA¹ (11.82%), very low operating margin (0.39%), higher transaction cost (1.32%) and low member share capital linking rate (7.875%). In the present scenario context when Commercial Banks and RRBs are undergoing consolidation and merger activities for strengthening themselves to cope up with the cutting edge banking environment, this becomes imperative to study the financial performance of DCCB, Sehore so that proper steps may be taken to achieve the long term sustainability and also would be able to frame the strategy to comply with the upcoming Basel II. This paper attempts to analyze the performance of the DCCB Sehore through banking financial ratios pertaining to period 2015-16 to 2018-19.

Key Words –

CRAR, PACS, Credit, NPA, Profitability

¹ A Non-performing asset (NPA) is defined as a credit facility in respect of which the interest and/or installment of principal has remained "past due" for a specified period of time.

Financial Performance Analysis- A Comparative Study of Bank of Baroda and Axis Bank.

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Abstract

Banking sector has now completely revolutionized in the contemporary scenario. Fast changes in Indian economy has directly affected the Indian banking system for instance demonetization, a big move in Indian economic history after 1991 reforms has now transformed banking operations on large scale. Expansion in financial services to its variety of customers is also one of the important factors of survival of the bank. In India, both public and private sector banks are now serving their customers with numerous banking services. This has led to increased competition among public and private sector banks.

The present study is committed to investigate the financial performance of Axis Bank and Bank Of Baroda by utilizing Ratio analysis technique so as to give significant insights about the Financial competence of Banks in terms of Asset Quality, Management Efficiency and Earning Ratios. The ratios are determined from the critical examination of Balance sheet and Profit and loss account of the selected banks over a period of five years from 2013 to 2018. The study concluded that the Axis Bank, a private sector bank is highly management efficient compared to BOB while BOB is found to have better position in terms of its Asset quality and Earning Ratio.

Key Words- *Ratio analysis, Management Efficiency, Earning Ratio, Asset Quality, Public Bank, Private Banks*

1. Introduction

The financial sector is a standout amongst the most significant instrument of the national improvement, possesses a vital position in a country's economy.

Economic development of the nation is apparent through the soundness of the financial framework. Deregulation in the money related market, advertise advancement, financial changes have seen significant changes in banking industry. Banks are the predominant money related units in India and have gained great ground amid the worldwide monetary emergency; it is clear from its yearly credit development and benefit. The development is conceivable in two different ways, natural or inorganic. Organic development is likewise alluded as inward development, happens when the organization develops from its own business action utilizing assets from one year to grow the organization the next year. Such development is a progressive procedure spread over a couple of years yet firms need to become quicker. Inorganic development is alluded as outer development and considered as a quicker method to develop which is most favored. Inorganic development happens when the organization develops by merger or securing of another business.

Financial performance can not be judged from the records and documents in any organisation. It must be determined by strategic examination. The determination and utilization of strategy is liable to the choice of the person. A portion of the significant and ordinarily utilized strategies are: Ratio Analysis, Comparative balancesheet examination, Time series etc. The present examination is dedicated to investigation of the financial performance of Axis Bank and Bank Of Baroda, a Public and private sector bank, by utilizing Ratio analysis so as to give significant findings about the financial performance of the banks.



AN ANALYTICAL STUDY OF CORPORATE SOCIAL RESPONSIBILITY: BHARTIAIRTEL AND IDEA CELLULAR

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ABSTRACT- Corporate social responsibility basically is a corporate initiative to assess and take responsibility for the company's effects on the environment and impact on social welfare. The CSR generally applies to company efforts towards various social welfare initiatives to benefit employees, customers, and the community at large. Corporate social responsibility may also be referred to as "corporate citizenship" and can involve incurring short-term costs that do not provide an immediate financial benefit to the company, but instead promote positive social and environmental change. This study is descriptive and analytical in nature. The main objective of this study is to analyze the CSR activities carried out by Airtel and Idea. An attempt has been made to analyze and compare the existing CSR practices of both the telecom companies i.e., Airtel and Idea. Data are collected from the secondary sources mostly from concerned Company Annual Report, web sites, newsletters and other secondary sources. Empirical testing is carried out by using paired t test using Excel. It has been found that the selected Telecom companies are directly and indirectly engaged in Corporate social responsibility activities mostly in the area of Rural Development, Education, health and sanitation. The analysis shows that, these companies are making efforts for the implementation of CSR, but are restricted within certain fields. There is a need for better Corporate social responsibility activities by the telecom, which is possible by adding more and more social development issues within their Corporate social responsibility policy of selected companies.

KEYWORDS: Indian Telecom Industry, Corporate Social Responsibility, Private Sector companies, Health, Education, Community.

INTRODUCTION

In 1953 HR Bowen's introduce the concept of "Social Responsibilities of the Business". It has been a topic of continuous debate as what can be called as the concept of social responsibility and how its implementation can be done. While the idea has been around for more than half a century, there is still no clear agreement over its definition. One of the most used definitions is from the World Bank Group, stating, "Corporate social responsibility is the commitment of businesses to contribute to sustainable economic development by working with employees, their families, the local community and society at large, to improve their lives in ways that are good for business and for development". Social responsibility refers to the commitment of a firm, beyond the requisite by law of economics, to pursue long-term goals that are good for society. The idea that organization, corporations, and firms have responsibility towards society leads to the development of the concept of "Corporate Social Responsibility (CSR)" thus evoked widespread interests and concerns among business and academicians. However, CSR is a broad concept and there is little consensus on specific meaning or criteria that define what CSR is (Dahlstrud 2008). In 1999 Holmes and Watts defined CSR as the continuing commitment by business to behave ethically, thus contributing to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.

Nowadays, Indian telecom companies have created their own corporate image in the field of Corporate Social Responsibility (CSR) by taking various social initiatives in the era of social welfare and

A Study of the Impact of Mergers and Acquisition on Employee Efficiency with reference to Merger of State Bank of Indore in State Bank of India

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ABSTRACT

This research paper is focused on an extensive analysis of the impact of mergers and acquisitions on employee efficiency. Mergers and Acquisitions are a matter of great concern of Industrialist, economist, stock traders and employees in terms of financial gains while employees' concern are generally disgraced. This study is based on a pre and post merger analysis of employee efficiency in terms of business per employee and profit per employee of state bank of India after the merger of state bank of Indore. The study concludes that employee efficiency differs significantly after the merger of state bank of Indore with state bank of India.

1. Introduction

The year 1992, has brought tremendous changes in the Indian banking system. The introduction of economic reforms in the banking sector has completely revolutionized the role of banks in society, economic development and resource mobility. To face the challenges arising from these reforms, banks have now transformed its operations into a highly regulated competitive environment in relation to branches, locations, services, customers, advances, loans, deposits and many more. Mergers and acquisitions contribute significantly to these challenges as a major area of development in the Indian banking sector. They have important implications associated with employee efficiency. The state bank of India is the largest bank in India serving thousands of commercial entities and millions of people. The state bank of India is forever attuned with the challenges prevailing in Indian economy and has set higher benchmark of excellence in banking sector. One such change can be seen in the form of merger and acquisition policy of associate's bank adopted by the state bank of India group. The rate at which state bank of India has made decisions on mergers and acquisitions of its associate's bank were very fast. Thus an effective and efficient analysis is required to analyze the gains of merger in terms of human resources aspect. Therefore this research has taken a case study of the merger of state bank of Indore in state bank of India. To ascertain employee efficiency, pre and post merger analysis on business per employees and profit per employee's parameter are used.

2. Review of Literature

Jerjawi Al.Khalili (2011) addressed the role of HR manager as an essential part in merger process. It aimed at understanding the contribution of HR manager in the process of merger for integrating the HR practices and to support business unit transactions. The researcher discussed the prominent role of the HR manager as strategic partner, change agent, employee champion, administrative expert in facilitating HR process such as staffing, dumpling, Right sizing, survival syndrome, cultural integration in process of merger. The study has also presented the forth coming new

responsibilities for HR manager in today's business scenario which according to him can bring radical changes like merger in order to gain competitive advantage. The study further concluded with the opinion that the HR manager should play a more strategic role in merger process and thus can effectively contribute to the performance of the organization.

Aruna (2011) discussed the emerging challenges such as merger and acquisitions, changing workforce profile and newer organization design in Human Resources management in the era of technological changes, globalization and liberalization. The study is focused on the role of the HR manager in rapidly changing environment. The researchers examined that the role of HR manager should focus on strategic issues, designing and taking proactive actions for the development of integrated HR system to respond to such changes relating to mergers and acquisition.

Rizvi, Yasmeen (2011) has found that the development of human capital and organizational performance is positively correlated with the success and failure of mergers and acquisition. Both the quantitative and qualitative research method was used to study the human capital development role of HR during mergers and acquisition. The study conclude that human capital development is a very important role of human resource during mergers and acquisition. It further suggested the recruitment of HR specialist to manage the transformational changes arising during mergers and acquisition.

Natarajan P, Kalaiichelvan J K (2011). The study traced the perceptions of employees in an organizational merger among banks in India. The researcher observed that the job demographic characteristics and the level of attitude of public and private sector banks employees towards "before merging activities" and "after merging activities" are independent. However, communication efforts directed by the top management were somewhat reassuring to them and they expect the management to be open and promptly communicate the organizational change. The study concluded that the employees of merger companies are quite skeptical

Indian Agricultural Funding Body : NABARD

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Indian agriculture is marching towards modernisation. The inspiration of growth and economic independence for India was attained after conquering self-dependence after the mass departure of Britishers in 1947. From the time then India has been following the path to attain the goal of prosperity in Indian economy. The scenario of the year 2018 is quite different since the year 1947. As compared to the agricultural condition immediately after independence, it is encouraging, self-growing, with well equipped abundant resources. Many qualitative and quantitative fluctuations in economy have been observed during this journey of attaining economic planning. Many of these fluctuations have been felt or noticed while some of the changes are indirect or invisible. They are changing at a fast rate at some places while slow at some places. These variations are observed in the national income and per capita income also. These significant changes were also been observed in the form of introduction of startups, infrastructural changes in the transaction of foreign trade, change in the framework of occupation, advancement of basic and heavy industry and so on.

The True picture of India is portrayed through its villages which are the important asset of country like India. The villages are crowded by millions of People who are residing in there since decades. During the last 50 years the main occupation of India i.e. Agriculture has gone through varied changes.

On one hand, Agriculture is the occupation which provides main source of subsistence for a large group of people residing in India and on

the other; it is the key source of raw material for the industrial sector. In India agriculture is a major source of livelihood. It is a key determining sector in the economy of the country. Majority i.e. 70% of population in the country still depends on agriculture. Moreover the farm work-force is very poor. They do not have skills and financial capital required to acquire and adopt new approached and technical innovations that could help them to get out of poverty.

Agricultural sector is characterized by strong forward and backward linkages with other sectors and by high potential for a faster and sustainable growth and development. Its development is however constrained by insufficient infrastructure (transport, water, energy and communication) and limited access to finance, insecure property rights and poor farming systems. There are 5.76 lakh villages which constitutes significant No. In India's population. Every fourth in the lead of five people is an agriculturist or connected with agriculture allied activities for their sustenance. According to the survey conducted by All India Rural Credit Survey, "Indian agriculture is the backbone of the economy and bulk of people depend on it for their livelihood"

Thus, the rise in the production and the productivity of agricultural products is vital for the growth of Indian economy and social aspects of the country. This production can be increased by employing new technology and adopting modern input factor which can contribute in the advancement of agriculture sector. After the introduction of green revolution, it has been

A study of Advertising Expenditure and Sales revenue with reference to Idea and Airtel

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Sales Revenue, Advertisement Expenses, Telecom Companies, advertising effectiveness

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ABSTRACT

Telecom sector is one of the fastest growing sector in Indian Economy. Companies spend a lot of money on advertising to survive in this competitive run. Today many companies are found to be continuously engaging in reviewing and revising their advertising policies in terms of budget, sales, customer liking, customer preference, advertising effectiveness, customer retention and many more. This study seeks to evaluate the effectiveness of advertisement expenses on sales of two companies mainly Idea and Airtel operating in India. To examine the sales effect of advertising over the period from 2006/07 to 2015/16. This study is descriptive and analytical in nature. With the help of different statistical tools and technique the researchers concluded that both the companies advertising expenditure lead incremental effect on sales. The Advertising expenditure is found to have positively correlated with Sales of Product and Service.

1. Introduction

In Telecommunication sector companies spend large amount of money on advertisement to generate sales. Telecommunication being second largest sector in terms of advertising spending as per Pitch Madison reports. Airtel and Idea being the dominant player in telecommunication Industry therefore they become a natural choice. Advertising is a well-known feature of modern business operations. One can encounter advertising messages, while watching TV, reading magazines, listening to the radio, surfing the Internet, while using mobiles or even simply while walking down the street or passing vehicle having advertisement, as it has a stimulating influence on purchasing behaviour of the customer. This mammoth surge of advertisements from every possible source is basically to fulfill the urge of marketers to reach to a large number of people so that their product may receive optimum exposure.

The role of this mass mode of communication in creating brand loyalty, deterring entry and consequently increasing sales revenue and profits of the organisation and causing impact on the business cycle has been emphasized at various points of time by different studies (Robinson, 1933; Kaldor, 1950; Nelson, 1974; Ozga, 1960; Stigler, 1961; Sundaram, 2007). Broadly the role of advertising expenses in an economy can be classified under two heads. According to one school of thought, advertising increases profits and reduces consumer welfare by creating spurious product differentiation and barriers to entry. While the other school of thought focuses on the informative character of advertising, which makes markets more competitive and reduces profits by informing the customers about prices and quality (Greene et al, 2000). In spite of the above mentioned segregation, one cannot deny the fact that ultimate function of advertising expenses is to promote sales revenue. That is why every organisation with the expectation of earning return is investing millions of rupees or dollars on this mode of marketing communication.

Hence, in pursuit of their ultimate objective of increasing sales, every endeavour of each marketer is to make this mode of sales generation more effective. But advertisement effectiveness conveys different meanings to different groups. To the writer or artist, effective advertising is that which communicates the desired message. While to the media buyer, effective advertising is that which reaches to prospective buyers a sufficient number of times. However to the advertising or marketing manager, effective advertising is that which, together with other marketing forces, sells his brand or product. Whereas according to the general manager, effective advertising produces a return on his firm's expenditure. Infact to be effective the advertising must achieve the goal of delivering messages to the right audience and thereby creating sales at a higher profit.

The advertisement has remained a topic of debate either on one pretext or another for decades. At beginning of 19th century, though it was a subject of little interest to the major researchers, but it became a fertile topic for economic research at the turn of 19th century during which, on one side its constructive role in providing information to customers to satisfy their wants at lower cost was recognised and on the other a wasteful confrontational role by offering little information and doing redistribution of customers from one firm to another was acknowledged. Various studies have been conducted to assess the different aspects of relationship between advertisement and sales at different point of time. A brief review of the studies relating to different dimensions of interrelationship of sales and advertisement is presented in the forthcoming paragraphs.

2. Rationale of the Study

Most of the studies have used time series data to capture the long term effects of advertising on sales. However, it is important to know effects of advertising expenses on sales revenue for Indian telecom sector. With this backdrop the

Economic Liberalisation and Indian Economy: A Comparative Study

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Abstract

India witnessed a landmark shift in its economy since the adoption of new economic policy in 1991. Its arrival resulted in more of an ideological debate like capitalism and socialism, but undoubtedly these reforms were unavoidable and compelling. One of the primary reasons to adopt this policy by India was to acquire a seat at a highest table and to deal with a severe balance of payment crisis. Apart from that, many analysts as well as researchers have revealed diverse opinions in this context. Some authors have welcomed its arrival; on the other hand some have made its criticism. With this standpoint, this study is an attempt to compare the position of Indian economy during Pre and Post liberalisation epoch. This study is exclusively based on secondary data collected from various sources more specifically form available government database. It was ascertained during the study that an increased trend during all the decades excluding the third decade (2000-01 to 2009-10), which clearly indicates that new economic reforms have positively affected the Indian economy.

Keywords: Indian Economy; Reforms; GNI; NNI; Per Capita Income; GDI



**Analysis of Development of Infrastructure in Western Central Railway: Make In India
(With special reference of manufacturing luxurious coaches)**

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Abstract

Designing of railway coach plays a vital role in running train from in defining the capacity per coach and overall contributes in the economy of the country. We analyze the financial aspects of manufacturing luxurious coaches in Western Central Railway. The manufacturing of coaches is supported by light weighted durable material and the revenue available to the Railway management. We found that the processing of such material can be possible in India through the concept of "MAKE IN INDIA". The implication of our study helps to increase passenger's capacity per coach and suggest all possible measures that help to support manufacturing of luxurious coaches in Western Central Railway.

Keywords: Luxurious coaches, light weighted durable materials, Indian Economy, Passenger capacity per coach.

Introduction

Indian Railway is oriented for customer services and satisfaction and working regularly in this area from the beginning. Indian Railway is going to put a major revolutionary step forgiving better services to customer through "MAKE IN INDIA".

MAKE IN INDIA is an initiative of government of India to encourage multinational as well as domestic companies to manufacture their products in India. It was launched by Prime minister Narendra Modi on 25 September 2014. As a part of make in India, Indian Railway has also been

A STUDY OF ADVERTISING EFFECTIVENESS: A REVIEW

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ABSTRACT

These paper review the history of advertising research applied to measuring the effectiveness of advertising. To shed light on the theories which had deepen the knowledge about advertising effectiveness subsequent influenced the development of new theories and models. This review paper offers the opportunity of knowing the past and understanding better the present of market research applied to advertising. It is a chronological descriptive analysis to present day, which introduces the development of the explanatory models for the functioning of advertising and the theoretical and empirical contributions in this area.

KEYWORDS: Advertising, Models, Measurement, Effectiveness, Market Research.

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EMERGING TRENDS IN ADVERTISING MEDIA CONSUMPTION: A SOURCE OF BUSINESS PROMOTION

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ABSTRACT

In Today's world businesses are experiencing a dramatic shift in the way product are designed, produce and delivered to the customer as compared to traditional way of mass production and mass marketing. Business has modified their product offering according to individual need of customer, in continuation with the same strategy marketer's are searching for the new venues for promoting their product offering. Promotion encompass a no of alternative right from public relation to advertising. Advertising management has evolved itself be it in terms of content or media. This paper is a conceptual paper based on the secondary data, by this we would explore how advertising management had advanced itself over the period of time and how business organization can benefited by this changes.

Keywords: Advertising, Promotion, product, Media, TV, Print, Radio, Cinema.

1. INTRODUCTION

Role of Advertising management in Promotions mix

Advertising being part of promotional mix, is one of the most important out of four pillars of marketing (along with product, place, and price), promotion covers the variety of techniques which a advertiser uses to communicate with current and potential customer. There are several things which guide the promotional effort of a company. There are many tools available to communicate a brand message to potential consumers, including ads on television and radio, print ads in newspapers and magazines, on the World Wide Web, outdoors on billboards and bus shelters, as well as in store promotions, coupons, direct mail, and many others. In addition, different products, at different stages of the product life cycle, require different promotional strategies to achieve different objectives. Originality is important, since countless other marketing messages are bombarding the same potential consumer each day. There are five general categories of promotion: Advertising, Personal selling, Sales promotion , Public relations and publicity and Direct selling.

State of Global Advertising

Advertising spend data gathered from every global media and entertainment sector, from print publishing to digital advertising, from video games to the box office. Spending on media continues to shift from traditional to digital products and services at a rapid pace. By 2019, we believe digital spending will account for more than 50 percent of overall media spend. Within this, digital video spending will overtake physical spending by 2018, two years earlier

IMPACT OF NEW ECONOMIC REFORMS ON THE BEHAVIOUR OF INDIAN STOCK EXCHANGES WITH SPECIAL REFERENCE TO BSE AND NSE

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ABSTRACT

Initiating in June 1991, the Indian government introduced a number of liberalising measures, including significant tariff reduction, abolition of various restrictions, unification of the exchange rate and adoption of new set of rules for Foreign Domestic Investment (FDI) etc. These changes or reforms represent a radical shift from the existing practices in Indian economy to overcome the pitfalls that impair the functioning and operational efficiency of Indian economy. In the same perspective, these reforms also put remarkable impact on Indian Capital Market, which in fact is an integral part of Indian Economy. With this context, this paper is an attempt by the researchers to study the impact of highly talked new economic reform on the behaviour of Indian Stock Exchanges mainly BSE and NSE. This study is entirely based on secondary data retrieved from various databases of RBI, BSE, NSE, SEBI and other sources. For the purpose of analysis and hypothesis testing ANOVA is applied as with the MS Excel.

KEYWORDS: Economic Reforms, Stock Exchange, BSE, NSE.

Introduction

Theory says that freer trade encourages economic activity and hence raises production and employment (Nambiar et al.1999). In India the practice of economic reformation was initiated with the aim of accelerating the economic growth and eradicating the poverty. The



मध्य प्रदेश में ऊर्जा के नवीन संसाधनों के विकास में, मध्य प्रदेश ऊर्जा विकास निगम को शासन द्वारा उपलब्ध कराई गई राशि का उपयोगित राशि से विश्लेषण

¹ डॉ० अंशुजा तिवारी, ² देवकन्या गुप्ता

¹ व्यापार महकमा यूटीली, बरकातुल्ला विश्वविद्यालय, भोपाल, मध्य प्रदेश, भारत।

² अनुसंधान विद्वान, बरकातुल्ला विश्वविद्यालय, भोपाल, मध्य प्रदेश, भारत।

सारांश
भारत में प्राकृतिक तेल के भण्डार सीमित है, एवं पेट्रोलियम पदार्थों की मांग के अधिकांश भाग की पूर्ति मूलतः आयात पर निर्भर है। जिससे भवित्वासीयों को कई प्रकार की आर्थिक समस्याओं से लबक होना पड़ता है इसका ज्वलंग उदाहरण गैरा टकियों में होने वाली सप्ताही दैर्घ्यत के दारों में दिन प्रतिदिन होने वाली बढ़ोतरी य विजली दरों का पिछले वर्षों ने बढ़ जाना राफ़ तीर पर देखा जा सकता है। तीनों ही उच्चाद प्रत्यक्ष-अप्रत्यक्ष रूप से मनुष्य के व्यवहार में आमूल चूल परिवर्तन लाते हैं, क्योंकि बढ़ती गंभीर आवश्यकताओं की पूर्ति के लिए विलगत मार्ग को अपनाने में भी एक पल नहीं सोचता, इसे हेतु वर्तमान समय की मुख्य रामरथा ये हल करने हेतु आवश्यक हो जाता है जल्दी के समाधान के विभिन्न पद्धतियों पर गौर करे। इन समस्याओं के विविध सामाधानों में से एक है ऊर्जा केन्द्रीयकरणीय संसाधनों का उपयोग करना जैसे सीर कर्जा, पवन कर्जा इत्यादि, इनके प्रयोग से हम ऊर्जा की प्राप्ति में होने वाली विविध बाधाओं से उभर सकते हैं इन हेतु नप्र. मे सन् 1982 में सप्र. ऊर्जा विकास निगम की स्थापना की गई। जिसने विगत लगभग 33 वर्षों में निरंतर सफलता के नये क्रांति स्थापित किये।

कुरी शब्द: अपारापरिक ऊर्जा स्त्रोत, कर्जा, अनुवान, उपलब्धि, वित्तीय स्थिति।

प्रलेखन

हिसी भी व्यवसायिक संस्था की वित्तीय स्थिति का अध्ययन करते तथा उल्लेख पिछले इतिहास का अध्ययन करना आवश्यक होता है। इसी उद्देश्य से इस शोध –पत्र में मध्य प्रदेश ऊर्जा विकास निगम को शासन द्वारा उपलब्ध कराई गई राशि का उपयोगित गति से विस्तृत विश्लेषण प्रस्तुत किया है। पूरे शोध काल के महज हिसी आकड़ों पर आधारित है साथ ही शोध काल के महज संक्षेपों एवं सूचनाओं के एकत्रीकरण य प्रस्तुतीकरण की विधियों में विन्ता नहीं है।

प्रस्तुत शोध पत्र के माध्यम से शोधार्थियों द्वारा मध्य प्रदेश में ऊर्जा के नवीन संसाधनों के विकास में निगम को शासन द्वारा उपलब्ध कराई गई राशि का विश्लेषण कर सुझाव दिये गये हैं य सप्र. डॉ० विकास निगम ने इन स्त्रोतों को बढ़ावा देने हेतु कितनी योजनाएँ कियान्वित की ते इनके कियान्वयन में आने वाली किन कठिनाइयों य समस्याओं का भी विश्लेषण किया है।

शोध सहित्य का पुनरावलोकन

- “हिंद प्रताप राजपूत द्वारा अपने शोध प्रबंध “वृषि विकास एवं पोषण का स्तर में परिवर्तन (2005)“ के अंतर्गत बताया कि ग्रामीणों के पोषण को बढ़ाने के तरीकों में सर्वप्रथम फसल की पैदायार व फसल के अंतर्गत द्वेत्र का विस्तार व फसल लगाने के तीर तरीकों में परिवर्तन करना होगा। अतः आवश्यक है कि हम कृषि हेतु नवीनताम पद्धतियों को अपनाएँ क्योंकि यदि यकित को पर्याप्त साधान संयंत्र व तकनीकें मिलेगी, तो वो उन्नत कृषि कर सकता है।

- ऐसमुख रैता ने अपनी शोध “भारत हेतु इलेक्ट्रिकल्स तिमिटेड का वित्तीय मूल्यांकन (2006)“ में उल्लेखित किया है कि ‘काफी लंबे समय से भेल का विद्युत उत्पादन द्वेत्र पर एकविकर रहा है, परन्तु विगत कई वर्षों से ऐसी स्थिति नहीं

रही है, “क्योंकि प्रतिरप्ती इकाईयों ने कई अपारापरिक स्त्रोतों पर आधारित संयंत्रों पर निर्भरता बढ़ा दी है।

- श्री चिराग ने अपने लेख (Article Preserere articles.com) में लिखा है ऊर्जा की बढ़ती हुई मांग का परिणाम है कि हम जीवश्य ईंधनों कोयला, तेल व गैस पर अधिक निर्भर होते जा रहे हैं, तेल व गैस की बढ़ती हुई कीमतों व उनकी कमी को देखते हुए उनके भविष्य में प्राप्त होने व देश की प्रगति पर एक चिंतनीय दिप्ति है, अतः यहां हमारी प्राथमिक आवश्यकता है कि हम ऊर्जा के नवीनीकृत संसाधनों सौलह, पवन, बायोमास व अपशिष्ट से ऊर्जा प्राप्ति के संसाधनों को और अपना रख करे। भारत की ऊर्जा आवश्यकता तीव्र गति से बढ़ रही, वार्षिक विद्युत उत्पादन की दर सन् 1990 से वर्तमान में 1990 से दुगनी हो गई है कम से कम 2.6 प्रतिशत व अधिक से अधिक 9.5 प्रतिशत की दर से बढ़ी है। वर्तमान में भारत विद्युत उपयोग में सातवीं स्थान रखता है। (विश्व की गुल विद्युत उपयोग क्षमता से 3.15 से गच्छा करने पर)

शोध अध्ययन के उद्देश्य

- मध्य प्रदेश ऊर्जा विकास निगम लिमिटेड भोपाल की विविध योजनाओं व उपलब्धियों का मूल्यांकन करना।
- शोध दिप्ति के प्राप्त निष्कर्षों के आधार पर आवश्यक सुझाव देना।

शोध अध्ययन कि परिकल्पना

परिकल्पना अनुसंधान का दूसरा अत्यंत महत्वपूर्ण पायदान है जिन परिकल्पना के हम शोध कार्य में किसी निष्कर्ष पर नहीं पहुंच सकते यह आवश्यक नहीं है कि हमारी परिकल्पना सत्य हो या असत्य या जिसी विशेष से संबंधित परिकल्पना हो ही। प्रस्तुत शोधकार्य में शोध शून्य परिकल्पना इस प्रकार है :-



मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड की लाभदायकता का विश्लेषण

१ डॉ० अंशुजा तिवारी, २ देवकन्या गुप्ता

१ व्यापार महकमा यूटोडी, बरकातुल्ला विश्वविद्यालय, भोपाल, मध्य प्रदेश, भारत।

२ अनुसंधान विद्वान, बरकातुल्ला विश्वविद्यालय, भोपाल, मध्य प्रदेश, भारत।

सारांश

मध्य प्रदेश ऊर्जा विकास निगम लिमिटेड का मध्य प्रदेश में ऊर्जा के नवीन और नवीनीकरणीय संसाधनों की पुर्ती में महत्वपूर्ण योगदान रहा है। संस्था का भूल उद्देश्य विक्रय कर लाभ कमाना नहीं है यही कारण है कि संस्था को कभी भी लाभ की प्राप्ति नहीं हुई। संस्था द्वारा जो भी विक्रय किया जाता है व न लाभ न विक्रय के आधार पर किया जाता है, तथा संस्था को जो भी आयगत प्राप्तियाँ होती है वह मुख्यतः सेवा शुल्क, हैंडलिंग चार्जेस व अर्जित व्याज से मुख्यतः होती है जिनका उपयोग संस्था के प्रबंधकीय व्यय, स्थापना व्यय तथा अन्य आयगत व्ययों की पुर्ती हेतु उपयोगित की जाती है। इन व्ययों की पुर्ती करने में जो भी राशि कम होती है वह हमारी संस्था की हानि है जिसकी प्रतिपुर्ती मध्यप्रदेश सरकार द्वारा कर दी जाती है।

भूल शब्दः प्रवृत्ति, आयगत-व्यय, प्रतिपुर्ती, आय, अनुपात।

प्रस्तावना

किती भी व्यवसायिक संस्था की स्थिति का अध्ययन करते समय उसके पिछले इतिहास का अध्ययन करना आवश्यक होता है। शोध काल के संमक्ष द्वितीय आंकड़ों पर आधारित है साथ ही शोध काल के तनात संभवों एवं सूचनाओं के एकत्रीकरण व प्रस्तुतीकरण की विधियों में विन्ता नहीं है। मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड के लाभ हानि खाते के विश्लेषण हेतु लाभ-हानि खाते को आय विवरण के रूप में लम्बात्तरित किया है और उसके विश्लेषण के पूर्व उसका सारानीकरण किया है जो विविध तात्त्विकों के माध्यम से व लेखाकृत तकनीकों के माध्यम से आगे विश्लेषित किया गया है।

शोध साहित्य का पुनरावलोकन

- नालवीय गैदालाल (2004) ने अपना शोध कार्य 'वित्तीय विवरणों का विश्लेषणात्मक अध्ययन' ("म.प्र. राज्य सहकारी विषयन संघ नवांदित, भोपाल के विशेष संदर्भ में") विषय को आधार बनाकर पूर्ण किया है, जिसके अंतर्गत शोध कार्य में इन्होंने यह निष्कर्ष निकाला की विट्ठि की स्थिति लाभदायक नहीं है।
- तिंहल गोपेंद (1996) द्वारा अपने शोध ग्रंथ 'सहकारी अधिकारों की संपत्तियों एवं दायित्वों की प्रबंध व्यवस्था का तुलनात्मक अध्ययन (1996)' में पर क्रमशः उत्तरेख किया है कि 'कृषक नुगतान क्षमता से अधिक ऋण प्राप्त कर लेते हैं जिससे ऋण बुकाने में उनको कठिनाई आती है बैंक को समय ऋणों जैसी समस्याओं का सामना करना पड़ता है' कृषकों की समय पर ऋण भुगतान न करना वित्तीय विषय है क्योंकि कहते हैं और अधिकतर यंत्र ऊर्जा पर आज ऊर्जा विकास निगम द्वारा विविध प्रकार की योजनाएँ सौर-चलित पर्यावरण, बायोगैस आदि चौंजे हैं, जिनमें लागत कम आती है व्यवसायिक गोत्रियों को बढ़ाने के प्रयास होना चाहिए। की समस्या भी खत्म हो जाएगी।

▪ श्रीवास्तव जे.सी. (1997) द्वारा में की गई अपनी शोध "कृषि उत्पादों का उत्पादन एवं विषयन प्रबंध" में बताया कि म.प्र. किस तरह कृषि उत्पादनों व उनके विषयन को बढ़ावा देने के लिए किस प्रकार से हर क्षेत्र में प्रयास कर रहा है। जिसमें विधुत भी एक विषय है क्योंकि म.प्र. के अभी भी कई ऐसे गांव हैं जिनका विधुतीकरण अभी भी नहीं हुआ है और विना विधुतीकरण के कृषि उत्पादन में वृद्धि असम्भव है क्योंकि सिचाई, बोआई, कटाई आजकल सभी आधुनिक तकनीकों से की जा रही है। इस हेतु विधुत का पर्याप्त मात्रा में होना आवश्यक है। इसलिए हमें गांव के विधुतीकरण की ओर भरसक प्रयास करने की आवश्यकता है।

▪ गोस्वामी एस.बी. (1998) द्वारा में अपने शोध "आदिवासियों के आर्थिक विकास के संस्थागत ढाँचे का प्रबंधकीय अध्ययन" प्रस्तुत की गई जो म.प्र. के विशेष संदर्भ में थी जिसमें उन्होंने म.प्र.राज्य के आदिवासियों की आर्थिक स्थिति हेतु अपने शोध निष्कर्ष में लिखा कि उनका आर्थिक विकास तभी सम्भव है जब उन्हें आधुनिक उपकरणों व तकनीकों के उपयोग के लिए प्रशिक्षित किया जायें। ताकि वह जो भी निर्माण करें व आधुनिक आवश्यकताओं की पूर्ति के साथ-साथ सुन्दर व आकर्षक भी दिखें। किन्तु आधुनिक उपकरणों व यंत्रों के लिए विधुत एक बड़ी बाधा है। जिसके आभाव में किसी भी प्रकार का यंत्र कार्य नहीं कर सकता और आदिवासी यंत्रों में पूर्ण विद्युतीकरण नहीं हो सकता।

शोध अध्ययन के उद्देश्य

शोध कार्य के उद्देश्य इस प्रकार है

1. मध्यप्रदेश ऊर्जा विकास निगम लिमिटेड, भोपाल के लाभ हानि खाते का प्रवृत्ति विश्लेषण करना व शोध से प्राप्त निष्कर्षों के आधार पर आवश्यक सुझाव देना।
2. मध्य प्रदेश ऊर्जा विकास निगम को प्राप्त अनुदान एवं व्ययों के आधार पर लाभदायकता का विश्लेषण करना।

शोध प्रविधि

प्रस्तुत शोध में द्वितीय समंकों का उपयोग किया गया है द्वितीय

Economic Liberalisation and Indian Economy: A Comparative Study

Dr. Anshuja Tiwari, Firdous Ahmad Paray

Abstract

India witnessed a landmark shift in its economy since the adoption of new economic policy in 1991. Its arrival resulted in more of an ideological debate like capitalism and socialism, but undoubtedly these reforms were unavoidable and compelling. One of the primary reasons to adopt this policy by India was to acquire a seat at a highest table and to deal with a severe balance of payment crisis. Apart from that, many analysts as well as researchers have revealed diverse opinions in this context. Some authors have welcomed its arrival; on the other hand some have made its criticism. With this standpoint, this study is an attempt to compare the position of Indian economy during Pre and Post liberalisation epoch. This study is exclusively based on secondary data collected from various sources more specifically form available government database. It was ascertained during the study that an increased trend during all the decades excluding the third decade (2000-01 to 2009-10), which clearly indicates that new economic reforms have positively affected the Indian economy.

Keywords: Indian Economy; Reforms; GNI; NNI; Per Capita Income; GDI



AN ANALYTICAL STUDY OF CORPORATE SOCIAL RESPONSIBILITY: BHARTIAIRTEL AND IDEA CELLULAR

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ABSTRACT- Corporate social responsibility basically is a corporate initiative to assess and take responsibility for the company's effects on the environment and impact on social welfare. The CSR generally applies to company efforts towards various social welfare initiatives to benefit employees, customers, and the community at large. Corporate social responsibility may also be referred to as "corporate citizenship" and can involve incurring short-term costs that do not provide an immediate financial benefit to the company, but instead promote positive social and environmental change. This study is descriptive and analytical in nature. The main objective of this study is to analyze the CSR activities carried out by Airtel and Idea. An attempt has been made to analyze and compare the existing CSR practices of both the telecom companies i.e., Airtel and Idea. Data are collected from the secondary sources mostly from concerned Company Annual Report, web sites, newsletters and other secondary sources. Empirical testing is carried out by using paired t test using Excel. It has been found that the selected Telecom companies are directly and indirectly engaged in Corporate social responsibility activities mostly in the area of Rural Development, Education, health and sanitation. The analysis shows that, these companies are making efforts for the implementation of CSR, but are restricted within certain fields. There is a need for better Corporate social responsibility activities by the telecom, which is possible by adding more and more social development issues within their Corporate social responsibility policy of selected companies.

KEYWORDS: Indian Telecom Industry, Corporate Social Responsibility, Private Sector companies, Health, Education, Community.

INTRODUCTION

In 1953 HR Bowen's introduce the concept of "Social Responsibilities of the Business". It has been a topic of continuous debate as what can be called as the concept of social responsibility and how its implementation can be done. While the idea has been around for more than half a century, there is still no clear agreement over its definition. One of the most used definitions is from the World Bank Group, stating, "Corporate social responsibility is the commitment of businesses to contribute to sustainable economic development by working with employees, their families, the local community and society at large, to improve their lives in ways that are good for business and for development". Social responsibility refers to the commitment of a firm, beyond the requisite by law of economics, to pursue long-term goals that are good for society. The idea that organization, corporations, and firms have responsibility towards society leads to the development of the concept of "Corporate Social Responsibility (CSR)" thus evoked widespread interests and concerns among business and academicians. However, CSR is a broad concept and there is little consensus on specific meaning or criteria that define what CSR is (Dahlstrud 2008). In 1999 Holmes and Watts defined CSR as the continuing commitment by business to behave ethically, thus contributing to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large.

Nowadays, Indian telecom companies have created their own corporate image in the field of Corporate Social Responsibility (CSR) by taking various social initiatives in the era of social welfare and

MERGERS AND ACQUISITIONS FROM HUMAN RESOURCE PERSPECTIVE: A REVIEW

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ABSTRACT

This article is focused on an extensive review of literature to get well equipped with the human aspects of mergers and acquisitions. It is a fact that whenever, a news of merger or acquisition is announced either globally or domestically, everyone, the industrialist, stock traders, economist talk about its success in terms of financial gains while the human resource aspects are generally found to be neglected. Therefore this review article highlights the proactive management of human resource issues at the time of mergers and acquisitions. The work done by the researchers is the descriptive and analytical in nature to gain insight about the impact of mergers and acquisitions on human resource and its performance. For this purpose a review of ten articles including thesis and research papers is being carried out. The article concludes that employee's issues must be taken seriously by the top management to make mergers and acquisition deals unbeatable and a substantial role of human resource manager is found necessary in managing human resource issues intellectually in such deals.

KEYWORDS: Mergers, Acquisitions, Human Resource Issues, Cultural Integration, Leadership.

Introduction

Mergers and acquisitions are increasingly being used by the firm to strengthen and maintain their position in the market place. The present scenario has created big challenges for business enterprise to grow and survive. Mergers and Acquisitions are among one of the important aspect of corporate strategy which deals with buying, selling, dividing and combining different organization and similar entities. The mergers and acquisitions are deliberately used by the firms to increase market share, accelerate growth opportunities, enhance financial profitability and diversifying risk, lowering financial cost etc. the contemporary scenario has transformed business unit from mere selling of product to building brand and creating customer value the rapid changes in business environment due to globalization, technological advancement and liberalization, the role of human resources manager has been significantly changing . the hr policies need to be strengthen for dealing with the human side of the enterprise. For deals of mergers and acquisitions, the management of human resource practices has become an essential part of such processes. Therefore the researchers have tried to accumulate a wide variety of the work done under the parameters of various issues of human resource management that arises during different stages of mergers and acquisitions.

Review of Literature

- Murithi, Mate, Eliud (2016) in his doctoral thesis on "Role of human resource management in cultural integration process among selected post merged commercial banks in Kenya" deals with analyzing the

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CHAPTER 1

ENERGY ANALYSIS OF INDIAN RAILWAYS: WITH REFERENCE TO GREENHOUSE GASES EMISSION IN TRACTION AND NON-TRACTION SECTIONS

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Introduction

Whether government policies effectively reduce greenhouse gases emission through traction and non traction sections?

Issue of climate change has risen up in recent years in a extremely surprising way. The potential threat of climate change has recognized in recent years, it can affect adversely our ecosystem and ultimately life on earth. The main reason behind climate is emission of greenhouse gases, mainly carbon dioxide through various human activities. Therefore in order make sustainability of life on earth reduction in emission of carbon dioxide needs to be controlled. In order to develop carbon dioxide reduction strategy it is necessary to do detailed carbon auditing and analyze the main sources of carbon dioxide emission and identify those activities on which carbon reduction measures should be targeted.¹ Indian government has established an elaborated system for monitoring carbon dioxide

¹ Available at:

<http://m.economictimes.com/industry/transportation/railways/railways-to-reduce-emission-by-33-per-cent-by-2030/articleshow/58985571.cms> retrieved on 25.06.2019

NEW ECONOMIC REFORMS AND INDIAN CAPITAL MARKET: AN ANALYTICAL STUDY

Dr. Anshuja Tiwari*
Paray Firdous Ahmad**

ABSTRACT

Several studies have suggested economic reforms as a turnaround in Indian economy, by analyzing various key parameters of it. The question about the impact of new reforms on Indian Capital Market, which is one of the vital components of Indian economy, is still unreciprocated. In order to study and access the impact of economic reforms on Indian Capital Market, the researchers have studied and analyzed some important components relating to the Indian Capital Market. During the study, the secondary data have been collected from various official website like SEBI, RBI, BSE, NSE and many others as well. With a view to find out the significance of economic reforms on Indian capital market, various statistical tools have been used, and for testing hypothesis, the researchers have applied Single Factor ANOVA. It has been retrieved during the study that there is significant impact of new economic reforms on Indian Capital Market.

KEYWORDS: Economic Reforms, FIIs, Foreign Exchange Reserves, BSE, NSE.

Introduction

In India the practice of economic reformation was initiated with the aim of accelerating the economic growth and eradicating the poverty. The process of economic liberalization in India can be traced back to the late 1970s. However, the reform process began in earnest only in July 1991. It was only in 1991 that the Government signaled a systemic shift to a more open economy with greater reliance upon market forces, a larger role for the private sector including foreign investment, and a streamlining of the role of Government. The vital point of the reforms was liberalization of the economy, giving more roles to the private sector and opening up of the economy to competition. New industrial policy of 1991 is the heart of the new economic reforms. The philosophy of the new economic policy was enhancing competition based upon more market orientation. During the last twenty-five years, the economic reform has produced significant impact on the economy – mostly positive. The Indian capital market has also observed major reforms in the decade of 1990s and thereafter. It is on the verge of the growth. Government of India and SEBI has taken a number of measures in order to improve the working of the Indian stock exchanges and to make it more progressive and vibrant. This research study is an effort by the researcher to analyze the impact of economic reforms on the Capital Market of India with the help of various parameters.

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RESEARCH ARTICLE

Fractions of *Boswellia Serrata* Suppress LTA₄, LTC₄, Cyclooxygenase-2 Activities and mRNA in HL-60 Cells and Reduce Lung Inflammation in BALB/c Mice



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Abstract: **Background:** Purified fractions from a *Boswellia serrata* Roxb. Ex. Colebr. (Burseraceae) extract (ETOH and DCM) contain biologically active compounds that are well known for having inflammation inhibitory properties. In this work, the purified fractions were tested *in-vitro* for LTC₄, LTA₄ and COX-2 activities using ELISA and qPCR was performed to determine gene regulation in human leukemia (HL-60) Cells. Two D-imaging tomography was performed to determine the anti-inflammatory activities of the fractions in BALB/c mouse model of lung inflammation.

Objective: To evaluate anti-inflammatory activities of bioactive compounds of *Boswellia serrata* purified fractions.

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Methods: *In-vitro* MTT assay was performed in HL-60 cell lines for measuring the toxicity/viability of the cells. ELISA tests were performed for evaluating LTA₄, LTC₄ and COX-2 activities. qPCR was performed to evaluate the expression of mRNA in HL-60 cells. *In-vivo* experiments were performed in OVA sensitized and challenged BALB/c mice at two doses of *Boswellia serrata* purified fraction containing 6% Boswellic acid of 50 and 100mg/kg body weight were given orally and the standard drug dexamethasone (DXA, 4 mg/kg body weight) and reduction in lung inflammation was assessed by using an IVIS Xenogen *in-vivo* fluorescence imaging system.

Results: A purified fraction of *Boswellia serrata* ETOH extracts reduced leukotriene-C₄-synthase activity by 52%, leukotriene-A₄-hydrolase activity by 22% and COX-2 activity by 99% with an IC₅₀ of 12.5µg/ml. Intragastric administration of the purified fraction of *Boswellia serrata* at two doses of 50mg/kg b.w. and 100mg/kg b.w., respectively along with 2-3% HPMC resulted in a ~51% (P value <0.01) reduction in OVA induced lung inflammation in BALB/c mice as observed by imaging tomography. Treatment of the OVA challenged mice with standard drug dexamethasone (DXA) reduced inflammation by ~66% with significant value (P<0.0001).

Conclusion: The present study describes that *Boswellia serrata* ethanolic extracts purified fraction (ETOH-BS) possess significant anti-inflammatory activities in HL-60 and *in BALB/c* and further supports for its use as *Ayurvedic medicines* traditionally in the treatment of lung disorders including allergy and asthma.

Keywords: Ayurveda, leukotrienes, anti-inflammatory, tomography, asthma, allergy, inflammation, bioactive compounds, secondary metabolites.

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MOSQUITO LARVICIDAL ACTIVITY OF EXTRACT'S PURIFIED FRACTION OF *HYPTIS SUAVEOLENS* (L) POIT.

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Keywords:

Larvicidal, *Aedes aegypti*, *Anopheles stephensi*, *Hyptis suaveolens*

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ABSTRACT: Bio-pesticides are playing a very important role in controlling mosquitoes and their larvae. In the present scenario, chemical pesticides are causing several side effects on non-target organisms, particularly in men. Moreover, mosquitoes and their larvae become resistant to chemical pesticides; therefore, chemical pesticides are not much more effective. The conventional use of temephos and pyrethrins creates several health hazards in men, especially in upper and lower respiratory disorders, including allergy, asthma, and rhinitis. The plant *Hyptis suaveolens* is well known for its aromatic properties. Therefore, it was proposed to apply its purified fraction on different strains of mosquitoes for the evaluation of mosquito larvicidal activities. In the present study, identified and authenticated shade-dried whole plant materials were pulverized to get powder, extracted in various solvents through Soxhlet, and percentage yields were noted down. The main phytoconstituents reported in the extract were alkaloids, flavonoids, terpenoids, and tannin in huge amounts. Due to the presence of the pungent smell of flavonoids, terpenoids, alkaloids, and tannin in *Hyptis suaveolens*, mosquito larvicidal activities were reported in the purified fraction.

INTRODUCTION: Nowadays, mosquitoes are causing enormous public health problems. Of these, few are very common in men, including malaria, filaria, dengue, Japanese encephalitis, yellow fever, zika virus, and chikungunya. *Aedes aegypti* mosquito is a vector of Flavivirus virus that spreads yellow fever, dengue fever, and chikungunya fever which are endemic in tropical and sub-tropical regions around the world.

Similarly, various species of female *Anopheles* mosquito transmits various species of malaria parasites, including *Plasmodium vivax*, *Plasmodium falciparum*, *Plasmodium malariae*, and *Plasmodium ovale*, and among humans, approximately 91% of the 216 million malaria cases were reported in 2010, which were only due to *Plasmodium falciparum* transmitted through *Anopheles stephensi*¹.

The major problem associated with the use of chemicals for the control of mosquito is the development of resistance to the chemicals and their undesirable side effects, so the purified fraction of the extract isolated from plants *Hyptis suaveolens* could be served as an alternative source of chemical pesticides, which are biodegradable

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Ichthyofaunal Diversity of Bheemgarh Dam Chhapara, Seoni M.P. (India)

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Abstract

Several types of fresh water fishes found in the Bheemgarh dam, therefore the present study was aimed to investigate ichthyo faunal diversity of the Bheemgarh dam Chhapara, Seoni. In the present study, a total of 19 species of fishes were recorded from 9 families and 6 orders during Jan., 2018 to Dec., 2018 from the Bheemgarh dam, Chhapara, Seoni region of Madhya Pradesh. Among them, family Cyprinidae was the most dominant with 09 (47.37%), followed by the families Bagridae 2 (10.53%), Channidae 1 (5.26%), Siluridae 1 (5.26%), Nandidae 1 (5.26%), Clariidae 1 (5.26%), and Heteropneustidae 1 (5.26%), respectively. Cyprinidae was the most dominant species on sampling site of Bheemgarh. Fishes maintain aquatic ecosystem, therefore, there is a need to follow conservation strategies to conserved ichthyo faunal diversity.

Fish enjoys very important consideration and role in human civilization from ancient periods immemorial. Fish food materials are gastronomic, culinary and having nutritional value and fish food products are beneficial. Most species of fish rank in the category of “gourmet par excellence”. Several others are sought as luxurious food in expensive restaurants. The one general goal of all is “the fish as food materials for the human being.”

The word fish is concerned to a heterogeneous gathering of aquatic chordates animals comprised of hagfish and lampreys, sharks, rays and chimaeras, and the finned bony fishes. The latter is by far the main diverse group and is well shown in fresh water system, while the others are prevalently marine

gatherings. Freshwater fishes have a tendency to be more-or-less confined drainage system, provide relatively a conservative system for examining patterns of distribution that may reflect the imprint of past continental and climate changes. The main role of fish in river food chain and food webs has been hotly debated.

Economically fishes are very important which are used as food in India. For successful fish forming in dams and reservoirs, it is essential to make a detailed hydrological study of the water body. Suitable species that are stocked in dams are the major carps. These are capable of adjusting successfully to ecological condition of the reservoir. The exotic carps also thrives in manmade lakes or dam and are suitable species for culture.



REVIEW ARTICLE

The Role of Leukotrienes Inhibitors in the Management of Chronic Inflammatory Diseases



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Abstract: **Background:** Leukotrienes are powerful mediators of inflammation and interact with specific receptors in target cell membrane to initiate an inflammatory response. Thus, Leukotrienes (LTs) are considered to be potent mediators of inflammatory diseases including allergic rhinitis, inflammatory bowel disease and asthma. Leukotriene B₄ and the series of cysteinyl leukotrienes (C₄, D₄, and E₄) are metabolites of arachidonic acid metabolism that cause inflammation. The cysteinyl LTs are known to increase vascular permeability, broncho-constriction and mucus secretion.

Objectives: To review the published data for leukotriene inhibitors of plant origin and the recent patents for leukotriene inhibitors, as well as their role in the management of inflammatory diseases.

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Methods: Published data for leukotrienes antagonists of plant origin were searched from 1938 to 2019, without language restrictions using relevant keywords in both free text and Medical Subject Headings (MeSH terms) format. Literature and patent searches in the field of leukotriene inhibitors were carried out by using numerous scientific databases including Science Direct, PubMed, MEDLINE, Google Patents, US Patents, US Patent Applications, Abstract of Japan, German Patents, European Patents, WIPO and NAPRALERT. Finally, data from these information resources were analyzed and reported in the present study.

Results: Currently, numerous anti-histaminic medicines are available including chloropheneremine, brompheniramine, cetirizine, and clementine. Furthermore, specific leukotriene antagonists from allopathic medicines are also available including zileuton, montelukast, pranlukast and zafirlukast and are considered effective and safe medicines as compared to the first generation medicines. The present study reports leukotrienes antagonistic agents of natural products and certain recent patents that could be an alternative medicine in the management of inflammation in respiratory diseases.

Conclusion: The present study highlights recent updates on the pharmacology and patents on leukotriene antagonists in the management of inflammation respiratory diseases.

Keywords: Allergy, antagonists, asthma, cyclooxygenase, inflammation, leukotrienes, rhinitis, secondary metabolites.

1. INTRODUCTION

Leukotrienes are potent eicosanoid inflammatory mediators of diseases including allergy, rhinitis, asthma and inflammatory bowel disease [1]. The term leukotriene is coined from the Greek word "leukos" meaning "white" and "trienes" referring to three conjugated double bonds and consists of a family of products of the 5-lipoxygenase pathway of arachidonic acid metabolism [2]. The synthesis of leukotrienes is bifurcated into sub-pathways, with

Leukotriene B₄ (LTB₄) secreted from neutrophils, and cysteinyl leukotrienes (LTC₄, LTD₄ and LTE₄) secreted from macrophages. Biochemically, leukotrienes are lipid mediators derived from arachidonic acid via the 5-lipoxygenase pathway, which was originally identified in 1970 [1-4]. Leukotrienes were previously recognized as the Slow Reacting Substance of Anaphylaxis (SRS-A), a term coined by Feldberg and Kellaway [3], and were renamed to leukotrienes after 40 years [4, 5].

These inflammatory mediators are generated, by the oxidation of arachidonic acid through one of the two pathways: 1) the cyclooxygenase pathway that generates prostaglandins, thromboxanes and prostacyclins, and 2) the 5-Lipoxygenase (5-LOX) pathway that generates the cysteinyl

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A Review on Leukotriene Antagonistic Agents of Plant Origin

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ABSTRACT

Nowadays, leukotriene antagonistic agents are playing an important role in the management of asthma, rhinitis and other inflammatory diseases of the lower respiratory tract. Leukotriene antagonistic agents available in the market are montelukast, pranlukast, zafirlukast, iralukast, cinalukast, zileuton, verlukast and so on. However, due to several side effects of above allopathic medicines, the bioactive compounds of plant origin are playing a very important role as secondary metabolites. These bioactive compounds are still being used by the human beings since time immemorial in the form of herbal preparations for the treatment of various ailments as mentioned in Ayurvedic system of medicine (ASM). Many researches have been reported related to the anti-inflammatory properties of plants in the traditional medicines, which are capable of suppressing, reducing and relieving pain as well as in reducing inflammation. Therefore, there is a need to highlights some plant species and their by-products possessing anti-inflammatory and leukotriene antagonistic properties

KEY WORDS

Phytochemicals, Antagonistic agents, Anti-inflammatory, Leukotriene.

INTRODUCTION

Leukotriene was discovered in 1938 as a smooth muscle-contracting factor in lung perfusates. It was known as slow-reacting substance (SRS) and slow-reacting substance of anaphylaxis (SRS-A) and its structure was reported in 1979, when hydrolytic enzymes released from phospholipids of the cell membrane, then arachidonic acid is oxygenated by a lipoxygenase into 5-hydroperoxy-6,8,11,14-eicosatetraenoic acid. This product is further converted to leukotrienes [1].

Leukotrienes (LTs) are the member of lipid mediators family that play an important role in the pathogenesis of inflammation, which is located in the leukocytes from arachidonic acid metabolism which is a precursor of this pathway. Leukotrienes are reported in two pathways. One is LTB4 that is the mediator of inflammation. LTB4-R1, LTB4-R2 and CysLTs (LTC4, LTD4, and LTE4) are also play important roles in LTB4 pathways in inflammation. They induce their actions with the help of G-protein-coupled receptors, CysLTR-1 and CysLR-2, which play important role in inflammatory disorders especially asthma, rheumatoid arthritis and inflammatory bowel disease (IBD) [2].

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Larvicidal Efficacy Of Purified Fractions Of *Blumea eriantha* (DC) Whole Plant Extracts On Larvae Of Mosquitoes

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The present study was based on larvicidal efficacy of *Blumea eriantha* (DC) whole plant extracts that destroy larvae of *Aedes aegypti* and *Anopheles stephensi* mosquitoes. Mosquitoes have developed resistance against chemical pesticides. Therefore, in the present study, a new approach of control of mosquitoes was developed by applying larvicides which are biodegradable, less toxic and also facilitate the eco-friendly way of pest management. Plant *Blumea eriantha* (DC), after identification and authentication from Botanical Survey of India, Allahabad was collected, shade dried and pulverized to get powder of 50-60 mesh size, which was then extracted in distilled water with 2.63% yield through soxhletion. Obtained extracts were fractionated by thin layer chromatography (TLC) with retention factor (RF) values, namely 0.26, 0.46, 0.64 in benzene: methanol (12:0.5) and same solvents were tried in column chromatography and purified fractions were obtained. Then distilled water extract is purified fraction of *Blumea eriantha* (DC) was applied on larvae of mosquitoes by solvent using water in increasing concentrations (10-100%) and placed in each beaker separately for each concentration. It was observed that purified fraction of *Blumea eriantha* (DC) distilled water extract at 100% inhibitory concentration was found to be much more effective, that is $53.33 \pm 5.77\%$ mortality as compared to the standard drug Temephos ($90.00 \pm 11.55\%$ mortality). LC_{50} and LC_{90} value were found to be 36.97% and 93.25%, respectively against larvae of mosquitoes. Thus distilled water extract of the plant, *Blumea eriantha* (DC) was found to be effective for the management of solvent at moderate concentration.

KEYWORDS

Larvicides, *Blumea eriantha* (DC), *Aedes aegypti*, *Anopheles stephensi*

1. INTRODUCTION

Mosquito causes a number of diseases including malaria, filaria, dengue, chikungunya, Japanese encephalitis and Zika fever which are called vector born diseases. Nowadays, mosquito borne diseases have become a major public health problem. It is transmitted in human by *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus*. Since time immemorial, one of the well known methods being used for controlling the mosquitoes is to use of synthetic insecticides/pesticides. However, mosquitoes have been developed genetic resistance to synthetic insecticides/pesticides. Moreover, synthetic larvicides also affect the environment by contaminating air, water and soil. Therefore, it is an urgent need to find out alternatives to the synthetic insecticides/pesticides/larvicides, which are more potent with no side effects and inexpensive.

Hence, ethno-botanical plants are a rich source of alternative agents for control of mosquitoes, because they possess biologically active chemicals, which act against a limited number of species including specific target-larvae and are eco-friendly as reported by Shivakumar [1]. Recently, researchers have targeted botanicals to prepare larvicides as potential sources of new larvicides without several side effects [2]. Hence, in the present study, the hypothetical background was based on the fact that mosquito in the larval stage are attractive target for pesticides because they breed in water and thus, are easy to deal with them in this habitat.

Besides this, it is well known fact that larvicides play a vital role in controlling mosquitoes in their breeding habitats. Although, various biological control measures are in vogue with their effective control on larval mosquitoes which have been highlighted by using synthetic chemical/pesticides with insecticidal properties, such as organochlorine, organophosphates, carbonate and pyrethroids have proven to be the most important ef-

LIMNOLOGICAL STUDY OF WATER OF BHEEMGARH DAM, CHHAPARA DISTRICT SEONI (M.P.)

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ABSTRACT:- The present study was aimed to investigate limnological parameters of water of the Bheemgarh dam Chhapara, Seoni. Bheemgarh dam that is also known as Sanjay Sarovar Bandh is built up on the Wainganga river in Chhapara tehsil of Seoni district of Indian state of Madhya Pradesh. The Bhimgarh Sanjay Sarovar Dam is located 43km away from the Seoni. It is known as the biggest mud/Earthen dam of Asia. It is situated $22^{\circ}20'41''N$ $79^{\circ}36'16''E$. It has an average elevation of 611metres (2004 feet). The city is 2,043 ft. above the sea level, half-way between Nagpur and Jabalpur. Limnological study was performed to know the present status of water of Bheemgarh Dam from January 2015 to December 2015. Some physico-chemical parameters were also performed including surface water temperature, turbidity, pH, dissolved oxygen, hardness, alkalinity, phosphate and nitrate content. The unmanaged and unwanted anthropogenic activities of surrounding population of the area are deteriorating the quality of water continuously.

KEYWORDS: Physicochemical parameters, turbidity, anthropogenic activities, Limnological study.

INTRODUCTION:-

Water is one of the indispensable renewable natural resources, used for domestic, industrial, irrigation, and electricity generation. Any changes in the water quality are due to the combination of natural and anthropogenic factors like inputs from agriculture, discharge of sediments from erosion and urban and industrial runoff (Huang et al., 2014). These sources hampers the quality of water and its use for agriculture, domestic and aesthetic. Major threat to the domestic use of water is through microbial contamination (Joshua et al., 2015; Matta, 2014). Most of the rivers cater's dam for electricity generation and public water supplies. Hydroelectricity emerged as one of the best alternative for power generation to satisfy the ever-increasing

human demand for electricity and domestic use in a sustainable way (ICOLD,2000).

Water is an inert compound therefore it transports various essential elements unchanged into the cells of biotic components. The water has the properties of cohesion and adhesion due to which high surface tension is advantageous for the existence of many organisms in the water surface.

The water has high specific heat which enhances the water bodies to resist more fluctuation of temperature than the land. Due to this reason the aquatic organisms are not adapted for wide range of temperature and are vulnerable to temperature changes. Water has also high latent heats of vaporization and fusion which is helpful to various organisms found in water bodies.

Water is essential for life on earth without it, life is impossible. Water, due to its great solvent power, is constantly threatened to get polluted easily. The requirement of water in all forms of lives, from micro-organisms to man, is a serious problem today because all water resources have been reached to a point of crisis due to unplanned urbanization and industrialization (Singh, et. al. 2002). Aquatic ecosystem is the most diverse ecosystem in the world. The first life originated in the water and first organisms were also aquatic where water was the principal external as well as internal medium for organism. The inter-relationship between the physico-chemical parameters and plankton production of dam water and its relation with fluctuation of zooplankton are of great importance and basically essential fish culture. Fishes are dependent on physico-chemical parameters. Any changes of these parameters may affect the growth, development and maturity of fish. Different casual influences, which determine the quality of water, show a characteristic change from season to season.

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Bio-Pesticides of Plant Origin for Mosquitocidal and Larvicidal Activities

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ABSTRACT

Plants possess several phytochemicals including flavonoids, saponins, tannins, resins, terpenoids, alkaloids, glycosides, volatile oils and so on, which are synthesized by plants for defensive purposes and are basically secondary metabolites that can be used as bio-pesticides for mosquitocidal and larvicidal activities. Moreover, presently available chemical pesticides in the markets containing pyrethrum, allethrin, and temephos, are causing several chronic side effects on non-target organisms including men especially for causing asthma and allergy. Therefore, the present review was aimed to highlight the ethno-botanical use of plant extracts and its volatile oils as bio-pesticides in the management of pest especially for mosquitoes which are causing several diseases including malaria, filaria, dengue, chikungunya and so on.

Key words: mosquitocidal, larvicidal, bio-pesticides, insecticides, secondary metabolites, Phytochemical.

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Monthly Variations of Zooplankton in a Fresh Water Body, Bheemgarh Dam of Seoni District (M.P.)

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Abstract

Zooplankton is cosmopolitan in nature and they are found to inhabit all freshwater body. The present study deals with the study of monthly changes of diversity and density of Zooplankton in Sat Bheemgarh dam of Chhapara, Seoni. The work was carried out for a period of one year from January 2015 to December 2015. The population status of Zooplankton at Bheemgarh dam consisted of 52 species, categorized into three major groups, viz,

Rotifers>Crustceans>Cladocera>Protozoa>Copepoda.

The Zooplankton sample consisted of 32.69% Rotifera, 26.92%Crustceans, 19.23% Cladocera, and 11.54 % Protozoa and 9.61% Copepoda respectively. The highest qualitative value of total zooplankton recorded in Bheemgarh dam was 938.80 ± 28.27 org/l in the month of August 2015, while the lowest value of total zooplankton was recorded 440.00 ± 15.41 org/l in the month of January 2015. Rotifera were the dominant group of Zooplankton recorded with respect to diversity and species density status. They are also important as an index of productivity, eutrophication and pollution of the aquatic ecosystem.

Keywords: Beemgarh dam, Zooplankton diversity and density.

Introduction

Zooplankton is microscopic animals that act as primary and secondary links in the food webs of all aquatic ecosystems. They feed on phytoplankton which directly provide food source for larval vertebrates and invertebrates as well as related to the growth of juvenile and larger fish. They are also important component in the transfer of energy from primary producers of phytoplankton to higher trophic levels such as fish. Regarding the habitat, zooplankton are cosmopolitan fauna and inhabit all freshwater bodies of the world. These communities are also sensitive to various substances in water such as nutrient enrichment and pollutants. Thus, they have often been used as indicators to assess the condition and change of the freshwater environment. They are endowed with many remarkable features and are often armored with pines, which hamper their predation by higher organisms.

Aims of Study

The aims and objectives of the present study are following:

1. To Conservate the topography of dam.
2. To increase the volume of reservoir.
3. To avoid the siltation in reservoir and human activities.
4. To check the changes in biological parameters and their temporal and spatial fluctuation.
5. To improve the aquaculture and water quality of reservoir.

Study Area

The present investigation has been carried out on Bheemgarh dam Chhapara is located in the Chhapara, Seoni district of the central Indian state of Madhya Pradesh. Bheemgarh dam also known as Sanjay Sarovar Bandh is built Across the Wainganga river in Chhapara tehsil of Seoni district of Indian state of Madhya Pradesh. The Bheemgarh Sanjay Sarovar Dam is located 43 km away from the Seoni. It is known as the biggest Mud / Earthen dam of Asia. It is situated $22^{\circ}20'41''N$ $79^{\circ}36'16''E$. It has an average elevation of 611 meters (2004 feet). The city is 2,043 ft. above sea-level, half-way between Nagpur and Jabalpur. The water of this dam is used for irrigation and fish culture.

RESEARCH ARTICLE

BENTHAM
SCIENCE

A Purified Fraction of *Ocimum tenuiflorum* (L) Inhibits LTC₄, LTA₄ and COX-2 Activities, Down-Regulates mRNA Expression in HL-60 Cells and Reduces Lung Inflammation in an OVA Induced Asthma Model in BALB/c Mice



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Abstract: **Background:** Now-a-days, discovery of bioactive compounds of plant origin is playing very important role in treatment of various ailments without any side effect world widely. Since, time immemorial, plants have been utilized as a source of Traditional System of Medicine and in India, one of the well known system is Ayurvedic System of Medicine that has been flourishing since thousands years for treatment of allergy, asthma and other inflammatory diseases.

Objectives: To inhibit leukotrienes by a purified fraction of *Ocimum tenuiflorum* in HL-60 cell lines. To investigate anti-inflammatory activities of a purified Fraction of *Ocimum tenuiflorum* in an OVA induced asthma model in BALB/c mice.

Methods: Plant materials of *Ocimum tenuiflorum* whole plants were collected after identification and authentication from Vidisha, (M.P.), India and were shade dried, pulverized to powder and extracted after de-fatting in MECH and DCM and then tested for LTC₄, LTA₄ and COX-2 inhibitory activities in HL-60 Cell lines. RTPCR was performed to determine the LTC₄-synthase mRNA expression. The bio-active purified fraction PM-OT was then tested *in vivo* in an OVA-induced asthma model in BALB/c mice and inhibition of inflammation was assessed *via in vivo* imaging tomography.

Results: The PM-OT inhibited activities of LTC₄ by 52%, LTA₄ by 25% and COX-2 by 99% in HL-60 cells and LTC₄-synthase mRNA expression in HL-60 Cells. Intra-gastric administration of PM-OT at 100mg/kg body weight along with HPMC led to a reduction in an OVA-induced lung inflammation in asthma model in BALB/c mice.

Conclusion: A purified PM-OT fraction showed significant anti-inflammatory activities both *in vitro* and *in vivo*, which supported its traditional use in the treatment of inflammatory lung disease and asthma.

Keywords: Asthma, Ayurveda, holy basil, cyclooxygenase-2, inflammation, *in vivo* imaging.

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1. INTRODUCTION

Asthma is a chronic, complex inflammatory disease of the airways causing reversible airflow obstruction and bronchospasm that appear to be associated with allergens, infectious agents, air

BIO-PESTICIDAL EFFICACY OF PURIFIED FRACTIONS OF *Solanum nigrum* (L) WHOLE PLANT EXTRACTS ON INSECT *Tribolium castaneum* (HERBST.) - A RED FLOUR BEETLE

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ABSTRACT

Since many centuries peoples are struggling to protect stored grains which are fed by insects. Synthetic insecticide has led problems such as environmental disturbances, pest resurgence, pest resistance to pesticides and lethal effects on non-target organisms including man. Therefore, natural products isolated from plants have become as potential sources of new pesticides. In present study, the insect *Tribolium castaneum* (Herbst) is a damaging pest of wheat grains and its flour. Looking to the economic importance of host plant *Triticum aestivum* as edible crop that is being fed by the pest *Tribolium castaneum*, it was thought important to develop bio-pesticides of plant origin. Plant *Solanum nigrum* (L.) after identification and authentication from IBD, New Delhi, collected from the Arera colony area of the Bhopal and shade dried and pulverized to get powder which was extracted in different solvents through Soxhletion and percentage yield was noted down 1.67% in benzene. Obtained extract were fractionated by TLC and RF value were measured viz. 0.12, 0.40, 0.48, 0.89 in Petroleum ether :Toluene: Ethyl acetate (50:30:20) and Rf value 0.59, 0.68, 0.78, 0.90 were measured in Chloroform and methanol (50:50) and column chromatography was also used to get purified fraction which was applied on adult insects *Tribolium castaneum* L. Results showed that purified fractions of *Solanum nigrum* benzene extract at 100% concentration was reported with 86.67±15.28% mortality that is compared with standard drug Parad Tikdi which showed 6.67±11.5% mortality and LC₅₀ value was reported 51.50% and upper and lower values at 95% confidence interval are 62.44% and 40.82%, respectively

KEY WORDS : Bio-pesticides, Bio-insecticides, Phyto-chemicals, Mortality, *Solanum nigrum*, *Tribolium castaneum*

Storage of agricultural food grains is much more important task before coming of the monsoon season not only in houses but also in ware houses. These commodities provide perfect breeding places for a variety of pests, particularly storage beetle. The quality and quantity of these commodities attacked by the storage grain pests especially *Tribolium castaneum* resulted in the reduction of volume, germination damage in grains and sufficient weight loss (Phillips and Throne, 2010, Nadeem et al., 2012). The magnification of insect infestation is supported by a number of uncontrolled ecological aspects and reduced storage technologies (Upadhyay and Ahmad, 2011). A basic need of the optimal insect pest management measures are chemical control methods which are still being used even the adverse and toxic effects of synthetic insecticides are well known. Moreover, environmental pollution is a main hazard for the sustainability of the ecological biome due to the uncontrolled use of synthetic pesticides and therefore, in the present scenario plant extracts present a safer solution to all these issues (Sagheer et al., 2013).

The ancient man had deployed different methods of control, including prayers, magic spells, cultivation systems, mechanical practices, as well as application of organic and inorganic substances to protect his crops from the attack of weeds, diseases and insect pests (Kulkarni et al., 2009). Between 500BC and in the 19th century, a number of substances classified as pesticides and defined as any substance and mixture of substances intended for preventing, destroying, repelling or mitigating any pest which were used to control pests which are harmful organism that may be insects or rodents.

The necessary step at recent times is to give consideration to find unconventional substitutes for the control of storage insects pests. Utilizing the plant products and the secondary metabolites present in various plants as natural control materials is one of the methods for the management (Isman, 2000). It is reported by Bakkali et al. (2008) that secondary metabolites which defend plants from external hazard are natural defensive products. Some plants extracts have evidenced as effective against several storage insects especially *Tribolium castaneum*, that is well known

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टी.सी.एस. कंपनी की शोधन क्षमता का विश्लेषणात्मक अध्ययन

प्रो. (डॉ.) एस.के. खटीक*
नारायण जामोद**

प्रस्तावना

शोधन क्षमता का आशय भुगतान करने की क्षमता से है। एक फर्म अथवा कंपनी द्वारा विभिन्न प्रकार के स्रोतों से ऋण लिया जाता है, ये ऋण सामान्यतः 3 प्रकार के होते हैं:-1. अल्पकालीन ऋण 2. मध्यकालीन ऋण 3. दीर्घकालीन ऋण। कंपनी द्वारा इन ऋणों का उपयोग व्यवसाय की आवश्यकतानुसार किया जाता है। ये सभी ऋण बाहरी व्यक्तियों द्वारा प्रदान किया जाता है, जिसे बाहरी दायित्व या बाहरी लेनदार कहते हैं। कंपनी के हितधारक यह भी चाहते हैं कि इनके द्वारा दिया गया ऋण सुरक्षित होना चाहिए, अन्यथा जोखिम की संभावना अधिक होती है, हितधारक कंपनी को उपरोक्त समस्त प्रकार के ऋण प्रदान करती है, परन्तु वह इन ऋणों की सुरक्षा भी चाहती है। बाहरी दायित्व के अंतर्गत विभिन्न शोधार्थियों एवं लेखकों द्वारा 2 प्रकार के ऋणों को शामिल किया गया हैं, अल्पकालीन ऋण एवं दीर्घकालीन ऋण हितधारकों द्वारा दिया गया ऋण तभी सुरक्षित हो सकता है, जब कंपनी की ऋण चुकाने की क्षमता अच्छी हो अतः कंपनी द्वारा लिये गये अल्पकालीन ऋण एवं दीर्घकालीन ऋण को भुगतान करने की क्षमता ही शोधन क्षमता कहलाती है। विभिन्न लेनदारों, बैंकों एवं विनियोगकर्ताओं द्वारा ऋण देने से पूर्व कंपनी की शोधन क्षमता का अध्ययन आव यक है, यदि कंपनी की शोधन क्षमता है अर्थात् ऋण चुकाने में समर्थ है, तो ऐसी स्थिति में जोखिम की मात्रा भी बहुत कम हो जाती है, परन्तु कंपनी की शोधन क्षमता अच्छी नहीं है, तो ऐसी स्थिति में जोखिम की मात्रा अधिक बढ़ जाती है, इसलिये कंपनी के हितधारकों या लेनदारों, विनियोगकर्ताओं एवं बैंकों को कंपनी की शोधन क्षमता का अध्ययन आवश्यक हो जाता है। अल्पकालीन शोधन क्षमता एवं दीर्घकालीन शोधन क्षमता के अध्ययन हेतु विभिन्न अनुपातों के माध्यम से किया जाता है, जो कि कंपनी की शोधन क्षमता का अध्ययन करते हैं, मुख्यतः चालू अनुपात, तरल अनुपात, पूर्ण तरलता अनुपात। ये सभी अनुपात अल्पकालीन शोधन क्षमता का अध्ययन करते हैं, इसी प्रकार ऋण क्षमता अनुपात, शोधन क्षमता अनुपात, स्वामित्व अनुपात, इंटरेस्ट कवरेज अनुपात, विनियोजित पूँजी पर प्रत्याय। ये सभी अनुपात दीर्घकालीन शोधन क्षमता का अध्ययन करते हैं।

शोध विषय के अध्ययन का औचित्य

एक कंपनी की साख एवं ख्याति उसकी शोधन क्षमता पर निर्भर करती है, कंपनी का अस्तित्व भी शोधन क्षमता पर निर्भर करता है, यदि कंपनी की शोधन क्षमता अच्छी नहीं है, तो जोखिम की संभावना अधिक हो जाती है तथा बैंकों, लेनदारों, पूर्तिकर्ताओं एवं विनियोगकर्ताओं की जोखिम में वृद्धि होने लगती है एवं ख्याति तथा साख में भी कमी होने लगती है, जिससे कंपनी के ऋणों के डूबने की संभावना अधिक हो जाती है, इसी प्रकार यदि कंपनी की शोधन क्षमता अच्छी है, तो जोखिम की संभावना कम होने लगती है एवं ख्याति एवं साख में भी वृद्धि होने लगती है, जिससे कंपनी के ऋण डूबने की संभावना कम हो जाती है इस शोध अध्ययन में यह जानने की कोशिश की गयी है कि कंपनी की शोधन क्षमता किस प्रकार की है जिससे कंपनी के ऋणों की जोखिम एवं सुरक्षा करती है। शोधन क्षमता ठीक न होने से व्यवसाय पर नकारात्मक प्रभाव पड़ता है तथा कंपनी समाप्त की ओर अग्रसर होने लगती है, लेकिन शोधन क्षमता अच्छी होने पर कंपनी पर सकारात्मक प्रभाव

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** सहायक प्राध्यापक, वाणिज्य विभाग, बरकतउल्ला विश्वविद्यालय, भोपाल, मध्यप्रदेश।

डालती हैं, जो कि कंपनी की साख एवं ख्याति मे वृद्धि होने लगती हैं, तथा जोखिम मे कमी आने लगती हैं, इसीलिए इस शोध अध्ययन मे यह जानने का प्रयास किया जा रहा है कि टी.सी.एस. कंपनी जो कि आई.टी.क्षेत्र की कंपनी हैं, जिसका शोधन क्षमता का अध्ययन किया जा रहा है, कि इस कंपनी मे ऋणों की सुरक्षा एवं जोखिम कितनी हैं, इस हेतु विभिन्न अनुपात की सहायता ली जा रही हैं यह अध्ययन लेनदारों, विनियोगकर्ताओं, पूर्तिकर्ताओं एवं समाज के लिए उपयोगी हैं, इन समस्त तथ्यों को ध्यान मे रखते हुए इस शोध विषय का अध्ययन आवश्यक है।

शोध साहित्य का पुनर्वलोकन

कई शोधकर्ताओं ने विभिन्न दृष्टिकोण और विभिन्न परिस्थितियों मे शोधन क्षमता का अध्ययन किया हैं, जिसका विश्लेषण इस प्रकार हैः—

चेरियर प्रवीण (2001) द्वारा डी./ई./एन. कनेक्टर लि., कोचिन के वित्तिय वि लेशन पर एक अध्ययन किया गया। अध्ययन का उद्देश्य वर्तमान दायित्व को पूरा करने के लिए कंपनी की क्षमता और संपत्ति का उपयोग की क्षमता का विश्लेषण करना हैं तथा कंपनी की क्षमता एवं समग्र प्रदर्शन का अध्ययन करना हैं। इस अध्ययन से यह निष्कर्ष निकला हैं कि कार्यशील पूँजी के टर्नओवर अनुपात मे पिछले एक वर्ष से लगातार वृद्धि हो रही हैं यह कार्यशील पूँजी के कुशल प्रबंधन को दर्शाता हैं तथा कुल ऋण अनुपात का कम होना यह दर्शाता हैं कि कंपनी बाहरी दायित्व पर कम निर्भर हैं।

राजमणि आर. (2012) द्वारा "समूह कंपनियों का वित्तिय प्रदर्शन का मूल्यांकन पर अध्ययन किया गया। लक्ष्मी समूह कोयम्बटूर के एक केस अध्ययन मे निष्कर्ष निकला हैं कि कुछ कमियों को छोड़कर समूह वित्तिय क्षमता को बनाये रखने से कुशल रहा हैं, जिससे कि समूह अपने व्यवसाय का वर्गीकरण एवं विस्तार कर सकें।

शानमुगम एम.आर.(2012) ने "तामिलनाडु की कर्ताई मिलो की चयनित इकाईयों का अध्ययन किया। अध्ययन के उद्देश्य मे मिलों की तरलता और गतिविधि प्रबंध का अध्ययन करना तथा दीर्घकालीन शोधन क्षमता तथा मिलो के वित्तिय प्रदर्शन का अध्ययन किया। विश्लेषण से निम्न निष्कर्ष बाहर आये:- अन्ना एवं धर्मपुरी मिलो के स्कन्ध मे कमशः 13.72 प्रतिशत एवं 62.75 प्रतिशत की वृद्धि हुई। दूसरी ओर भारती मिल मे सूती धागे के स्कन्ध मे 46.28 प्रतिशत की कमी आयी तथा 3 मिलो की नकद की स्थिति धीरे-धीरे कम हो रही थी।

हालानी (2014) ने भारत मे कुछ चुनिंदा पेपर कंपनियो मे कार्यशील पूँजी की आवश्यकताओं को प्रभावित करने वाले कारकों का अध्ययन करने का प्रयास किया। अध्ययन प्रमुख रूप से प्रकाशित लेखों एवं वार्षिक वित्तिय प्रतिवेदन पर आधारित था। अध्ययन से निष्कर्ष निकला हैं कि आध्यप्रदेश पेपर मिल, बलारपुर पेपर मिल्स, जे.के. पेपर मिल्स, ओरियण्ट पेपर मिल्स, साउथ पेपर मिल तथा स्टार पेपर मिल मे चालू अनुपात की स्थिति संतोषजनक हैं। इसके साथ ही साथ टी.एन.पी.एल. और वेस्ट कोस्ट पेपर मिल मे भी चालू अनुपात संतोषजनक हैं। यह भी पाया गया कि अध्ययन के लिये जिन कंपनियो का चयन किया गया था उनके चालू अनुपात मे भी काफी भिन्नता हैं।

कृष्णमूर्ति एम. (2016) ने कुछ स्टील कंपनी के प्रदर्शन का मूल्यांकन किया तथा निष्कर्ष निकाला कि बड़ी एवं मिड कैप इस्पात कंपनियो द्वारा संपत्तियो से आय प्राप्त करने मे काफी अच्छी हैं, किंतु विसा एवं कल्याणी संपत्तियो पर प्रत्याय मे सफल नहीं रही हैं।

शोध विषय के अध्ययन के उद्देश्य:- शोध विषय के अध्ययन के निम्न उद्देश्य हैः—

- टी.सी.एस. कंपनी की अल्पकालीन शोधन क्षमता का अध्ययन करना।
- टी.सी.एस. कंपनी की दीर्घकालीन शोधन क्षमता का अध्ययन करना।

परिकल्पना

- कंपनी की अल्पकालीन शोधन क्षमता मे अध्ययन अवधि के दौरान कोई सार्थक अन्तर नहीं हैं।
- कंपनी की दीर्घकालीन शोधन क्षमता मे अध्ययन अवधि के दौरान कोई सार्थक अन्तर नहीं हैं।

शोध विषय के अध्ययन की संरचना

इस शोध विषय के अध्ययन में वित्तिय समंको का अध्ययन किया गया हैं, जिसका मुख्य स्रोत वार्षिक प्रतिवेदन एवं इण्टरनेट हैं, इन समंको को अध्ययन की आवश्यकतानुसार वर्गीकरण एवं समूहीकरण किया गया है। इस शोध विषय में ली गई परिकल्पना का भी टी परीक्षण किया गया है।

सीमाएँ

इस शोध विषय के अध्ययन की सीमाएँ इस प्रकार हैं—

- इस शोध विषय के अध्ययन में द्वितिय समंको का उपयोग किया गया है।
- समहों का वर्गीकरण एवं समूहीकरण शोध की आवश्यकता के अनुसार किया गया है।
- शोध अध्ययन की अवधि सीमित है।

टाटा कंसल्टेंसी सर्विसेस की अल्पकालीन शोधन क्षमता का विश्लेषण

अल्पकालीन शोधन क्षमता:— अल्पकालीन शोधन क्षमता का आशय एक वर्ष के दौरान जिन ऋणों का चुकाना आवश्यक होता है, वह ऋण अल्पकालीन ऋण कहलाते हैं। अल्पकालीन ऋण सामान्यतः चालू दायित्व के भुगतान करने से हैं, क्योंकि इन दायित्व का भुगतान एक वर्ष के अन्दर करना आवश्यक होता है। ये अल्पकालीन दायित्व कंपनी पर नकारात्मक प्रभाव डालते हैं, इसीलिये इन दायित्व का भुगतान के अध्ययन हेतु निम्नलिखित अनुपातों का विश्लेषण किया जा रहा है:—

- **चालू अनुपात:**— चालू सम्पत्तियों एवं चालू दायित्व के बीच के अनुपात को चालू अनुपात या कार्यशील पूँजी अनुपात कहते हैं। इसकी गणना विधि इस प्रकार है:—

$$\text{चालू अनुपात} = \text{चालू सम्पत्तियाँ} / \text{चालू दायित्व}$$

सारणी 1: चालू अनुपात

वर्ष	चालू सम्पत्तियाँ	चालू दायित्व	चालू अनुपात
2015-16	63067.39	21975.51	2.87:1
2016-17	68619	10701	6.41:1
2017-18	81224	17828	4.55:1
2018-19	92131	22084	4.17:1
2019-20	90237	27060	3.33:1

स्रोत:— वार्षिक प्रतिवेदन टाटा कंसल्टेंसी सर्विसेस

निर्वचन:— वित्तिय वर्ष 2015–16 में कंपनी का चालू अनुपात 2.87:1 था, जो कि वर्ष 2016–17 में 6.41:1 हो गया। वित्तिय वर्ष 2017–18 में इस अनुपात में कमी हो गयी तथा 4.55:1 हो गया। वर्ष 2018–19 में यह अनुपात 4.17:1 हो गया तथा 2019–20 में यह अनुपात 3.33:1 रह गया।

- **तरल अनुपात:**— इसे कभी—कभी तरल अनुपात या नियर मनी अनुपात भी कहते हैं। यह अनुपात चालू अनुपात के परिपूरक रूप में प्रयोग किया जाता है। तरल अनुपात की गणना के लिए कुल तरल सम्पत्तियों को कुल चल दायित्वों से विभाजित कर दिया जाता है। सूत्र के रूप में,

$$\text{तरल अनुपात} = \text{तरल सम्पत्तियाँ} / \text{चालू दायित्व}$$

सारणी 2: तरल अनुपात

वर्ष	तरल सम्पत्तियाँ	चालू दायित्व	तरल अनुपात
2015-16	57468.77	21975.51	2.61:1
2016-17	67051	10701	6.26:1
2017-18	78577	17828	4.40:1
2018-19	73333	22084	3.32:1
2019-20	82026	27060	3.03:1

स्रोत:— वार्षिक प्रतिवेदन टाटा कंसल्टेंसी सर्विसेस

निर्वचन:- वित्तिय वर्ष 2015–16 मे यह अनुपात 2.61:1 हैं, वर्ष 2016–17 मे इस अनुपात मे वृद्धि हुई है और 6.26:1 हो गया। वित्तिय वर्ष 2017–18 मे इस अनुपात मे वर्ष 2016–17 की तुलना मे कमी हुई तथा 4.40:1 हो गया। 2018–19 मे यह अनुपात 2017–18 की तुलना मे कम हो गया और यह अनुपात 3.32:1 हो गया। वित्त वर्ष 2019–20 मे यह अनुपात वर्ष 2018–19 की तुलना मे कम हो गया तथा 3.03:1 हो गया।

- **पूर्ण तरलता अनुपात :-** यह अनुपात पूर्ण तरल सम्पत्तियों एवं चालू दायित्व के बीच सम्बन्ध को दर्शाता हैं। पूर्ण तरल सम्पत्तियों मे रोकड़, बैंक शेष तथा तुरन्त विपणन योग्य प्रतिभूतियों मे विनियोग का शामिल किया जाता हैं। सूत्र इस प्रकार हैः—

$$\text{पूर्ण तरलता अनुपात} = \frac{\text{पूर्ण तरल सम्पत्तियाँ}}{\text{चालू दायित्व}}$$

सारणी 3: पूर्ण तरलता अनुपात

वर्ष	रोकड़ एवं रोकड़ तुल्य सम्पत्तियाँ	चालू दायित्व	त्वरित तरल अनुपात
2015-16	6784.76	21975.51	0.31:1
2016-17	790	10701	0.07:1
2017-18	4883	17828	0.27:1
2018-19	7224	22084	0.33:1
2019-20	8646	27060	0.32:1

स्रोतः— वार्षिक प्रतिवेदन टाटा कंसल्टेंसी सर्विसेस

निर्वचन:- वर्ष 2015–16 मे यह अनुपात 0.31:10 था जो कि 2016–17 मे 0.07:1, 2017–18 मे 0.27:1, 2018–19 मे 0.33:1 तथा 2019–20 मे 0.32:1 हो गया।

दीर्घकालीन शोधन क्षमता:- दीर्घकालीन शोधन क्षमता का आशय ऐसे ऋणों से हैं, जो 5 वर्ष की अवधि के पश्चात चुकाये जाने वाले ऋणों से हैं, टी.सी.एस. कंपनी की दीर्घकालीन शोधन क्षमता के विश्लेषण हेतु अनुपात विश्लेषण तकनीक का उपयोग किया जा रहा हैं। दीर्घकालीन शोधन क्षमता कंपनी की ख्याति, अंशों का बाजार मुल्यों तथा विक्रय को प्रभावित करती हैं, इसीलिये एक कंपनी की दीर्घकालीन शोधन क्षमता हेतु अच्छी होना अनिवार्य हैं। टी.सी.एस. कंपनी की दीर्घकालीन शोधन क्षमता हेतु निम्नलिखित अनुपात का अध्ययन किया जा रहा हैः—

- **ऋण समता अनुपात:-** एक व्यावसायिक संस्था की कुल सम्पत्तियों का अर्थ—प्रबन्धन स्वामी इकिवठी या ब्राहा ऋणों द्वारा किया जाता होता हैं। इसका सूत्र इस प्रकार हैः—

$$\text{ऋण समता अनुपात} = \frac{\text{ब्राहा ऋण}}{\text{स्वामी फण्ड}}$$

सारणी 4: ऋण समता पैंजी अनुपात

वर्ष	ऋण	समता अंश पैंजी	समता ऋण अनुपात
2015-16	23521.59	65360.56	0.36%1
2016-17	11736	78022	0.15%1
2017-18	20766	85128	0.24%1
2018-19	25044	89446	0.27%1
2019-20	36150	84126	0.42%1

स्रोतः— वार्षिक प्रतिवेदन टाटा कंसल्टेंसी सर्विसेस

निर्वचन:- वित्तिय वर्ष 2015–16 मे यह अनुपात 0.36:1 है। यह अनुपात वर्ष 2016–17 मे बढ़कर 0.15:1 हो गया वर्ष 2017–18 मे इस अनुपात मे वृद्धि हो गयी तथा 0.24:1 रह गया। इस अनुपात मे आंशिक वृद्धि हुई और यह अनुपात 2018–19 मे 0.27:1 हो गया। अध्ययन अवधि के अंतिम वर्ष मे इस अनुपात मे वृद्धि हुई तथा 0.42:1 हो गया।

- **शोधन अनुपात:-** यह अनुपात संस्था की दीर्घकालीन शोधन क्षमता पर प्रकाश डालता है। इसकी गणना विधि इस प्रकार हैः—

$$\text{शोधन क्षमता अनुपात} = \frac{\text{कुल सम्पत्तियाँ}}{\text{कुल ब्राहा दायित्व}}$$

सारणी 5: शोधन अनुपात

वर्ष	कुल बाह्य दायित्व	कुल सम्पत्तियाँ	शोधन अनुपात
2015-16	23521.59	89384.38	0.26:1
2016-17	11736	89758	0.13:1
2017-18	20766	106296	0.19:1
2018-19	25044	114943	0.22:1
2019-20	36150	120899	0.30:1

स्रोतः— वार्षिक प्रतिवेदन टाटा कंसल्टेंसी सर्विसेस

निर्वचनः— वित्तिय वर्ष 2015–16 मे यह अनुपात 0.26:1 है, वर्ष 2016–17 मे इस अनुपात मे कमी हो गयी तथा यह 0.13:1 हो गया। 2017–18 मे यह अनुपात 0.19:1 हो गया। यह अनुपात वर्ष 2018–19 मे 0.22:1 हो गया। अध्ययन अवधि के अंतिम वर्ष मे यह अनुपात 0.30:1 रह गया।

- **स्वामित्व कोष अनुपातः—** इस अनुपात का ज्ञात करने का सूत्र इस प्रकार हैः—

स्वामित्व कोष/ कुल सम्पत्तियाँ

सारणी 6: स्वामित्व कोष अनुपात

वर्ष	स्वामित्व कोष	कुल सम्पत्तियाँ	अनुपात
2015-16	65360.56	89384.38	0.73:1
2016-17	78022	89758	0.87:1
2017-18	85128	106296	0.80:1
2018-19	89446	114943	0.78:1
2019-20	84126	120899	0.70:1

निर्वचनः— वर्ष 2014–15 मे यह अनुपात 26 गुना है। यह अनुपात बढ़कर वर्ष 2015–16 मे 31 गुना हो गया। वर्ष 2016–17 मे यह अनुपात 24 गुना है। यह अनुपात 2017–18 मे कम हो गया तथा 17 गुना रह गया। 2018–19 मे यह अनुपात पुनः कम हो गया तथा 12 गुना रह गया।

- **विनियोजित पूँजी पर प्रत्यायः—** विनियोजित पूँजी पर प्रत्याय दर से निवेशक को यह ज्ञात होता है कि जो पूँजी निवेश किया गया हैं उस पर प्रत्याय दर क्या होगी। यह एक प्रकार का लाभदायकता अनुपात है। इसे ज्ञात करने का सूत्र इस प्रकार हैः—

कर एवं ब्याज से पूर्व लाभ/विनियोजित पूँजी X 100

सारणी 7: विनियोजित पूँजी पर प्रत्याय

वर्ष	कर एवं ब्याज से पूर्व लाभ	विनियोजित पूँजी	अनुपात(प्रतिशत)
2015-16	31675.87	67408.87	0.47
2016-17	30066	79057	0.38
2017-18	34092	88468	0.38
2018-19	41563	92859	0.45
2019-20	42248	93839	0.45

निर्वचनः— वित्तिय वर्ष 2015–16 मे यह 0.47 प्रति तात हैं, वर्ष 2016–17 एवं 2017–18 मे यह अनुपात 0.38 प्रतिशत हैं तथा 2018–19 एवं 2019–20 मे यह अनुपात 0.45 प्रतिशत हैं।

- **संचालन लाभ अनुपातः—** इस अनुपात से यह ज्ञात होता है कि कंपनी अपनी परियोजना से कितना लाभ अर्जित कर रही हैं जो कि कंपनी के विस्तार एवं वृद्धि के लिए उपलब्ध रहेगा। इस अनुपात से निवेशक संबंधित उद्योग की कंपनी से लाभ की तुलना कर सकता है। इसे ज्ञात करने का सूत्र इस प्रकार हैः—

संचालन लाभ अनुपात/ शुद्ध विक्रय X 100

सारणी 8: संचालन लाभ अनुपात

वर्ष	संचालन लाभ	शुद्ध विक्रय	अनुपात(प्रतिशत)
2015-16	31675.87	108646.21	29
2016-17	30066	92693	32
2017-18	34092	123104	28
2018-19	41563	146463	28
2019-20	42248	156949	27

निर्वचनः— यह वर्ष 2015–16 मे 29 प्रतिशत हैं वर्ष 2016–17 इसमे वृद्धि हो गयी और यह वर्ष 2016–17 मे 32 प्रतिशत हो गया। वित्तिय वर्ष 2017–18 एवं 2018–19 मे इस अनुपात मे कमी आई तथा 28 प्रतिशत हो गया। अध्ययन अवधि के अंतिम वर्ष मे यह अनुपात 27 प्रतिशत हैं।

- **ब्याज कवरेज अनुपातः—** यह अनुपात हमे यह बताता है कि एक कंपनी उपलब्ध मार्जिन से कितनी बार ब्याज को कवर कर सकती हैं। इस अनुपात से हमे यह ज्ञात होता है कि कंपनी कितनी आसानी से ब्याज का भुगतान कर सकती हैं, यह अनुपात जितना अधिक होत है अच्छा माना जाता है। इसे ज्ञात करने का सूत्र इस प्रकार हैः—

कर एवं ब्याज से पूर्व लाभ / ब्याज व्यय

सारणी 9: ब्याज कवरेज अनुपात

वर्ष	कर एवं ब्याज से पूर्व लाभ	ब्याज व्यय	अनुपात
2015-16	31695.7	19.83	1598.37:1
2016-17	30082	16	1880.12:1
2017-18	34144	52	656.61:1
2018-19	41761	198	210.91:1
2019-20	43172	924	46.72:1

निर्वचनः— वित्तिय वर्ष 2015–16 मे यह 1598.37:1 है। वित्तिय वर्ष 2016–17 मे यह अनुपात 1880.12:1 हैं। वर्ष 2017–18 मे इस अनुपात मे कमी हो गयी तथा 656.61:1 हो गया। वित्तिय वर्ष 2018–19 मे इस अनुपात मे पुनः कमी आ गयी तथा 210.91:1 हो गया। अध्ययन अवधि के अंतिम वर्ष मे यह अनुपात सबसे कम रहा है।

शोध विषय के अध्ययन की परिकल्पना

शून्य परिकल्पना

H₀ टी.सी.एस. कंपनी की शोधन क्षमता की स्थिति मे अध्ययन अवधि के दौरान सार्थक अंतर नहीं अर्थात् एक जैसी है।

r = + 0.98 जो कि कुल सम्पत्तियों एवं कुल बाह्य दायित्व के सम्बन्ध को दर्शाता है।

$$t = \sqrt{1 - r^2} \times \sqrt{n - 2}$$

$$= .98$$

$$t = \sqrt{1 - .98^2} \times \sqrt{3}$$

$$= \frac{.98 \times 1.73}{\sqrt{1 - .96}}$$

$$= \sqrt{0.04}$$

$$= 1.6954$$

$$= \frac{1.6954}{2}$$

$t=8.47$ t का परिकल्पित मूल्य 8.47 है, जबकि t_0 .05 का मूल्य 2.306स्पष्ट हैं कि t की गणना की गई मूल्य का मान 8.47 t_0 .05 की तुलना से अधिक हैं। $t > t_0$ अधिक हैं।

अतः अध्ययन में ली गई शून्य परिकल्पना अस्वाकार्य हैं।

अर्थात् ली गयी परिकल्पना सार्थक हैं। अर्थात् टी.सी.एस. कंपनी की शोधन क्षमता अच्छी हैं, क्योंकि कंपनी के पास कुल दायित्व की तुलना में सम्पत्तियाँ अधिक हैं जिससे कि कंपनी अपने बाह्य दायित्व का भुगतान आसानी से कर सकती हैं।

निष्कर्ष एवं सुझाव

- **अल्पकालीन शोधन क्षमता**

- टी.सी.एस. कंपनी की अल्पकालीन शोधन की स्थिति अच्छी हैं, क्योंकि अध्ययन अवधि के दौरान चालू अनुपात 2:1 से अधिक रहा हैं, जो कि कंपनी पर सकारात्मक प्रभाव डाल रहा हैं तथा कंपनी अपने चालू दायित्व का भुगतान आसानी से कर सकती हैं, क्योंकि चालू सम्पत्तियाँ चालू दायित्व से अधिक हैं।
- तरल अनुपात की स्थिति भी संतोषजनक हैं, क्योंकि तरल अनुपात सामान्य प्रमाप से अधिक हैं अर्थात् अध्ययन अवधि के दौरान 1:1 से अधिक पाया गया हैं यह अनुपात भी कंपनी पर सकारात्मक प्रभाव डाल रहा हैं, क्योंकि कंपनी अपने चालू दायित्व का भुगतान तुरन्त कर सकती हैं, क्योंकि कंपनी के पास तरल सम्पत्तियाँ चालू दायित्व की तुलना अधिक हैं।
- पूर्ण तरलता अनुपात की स्थिति भी अच्छी हैं क्योंकि शोध विषय के अध्ययन की अवधि के दौरान यह अनुपात 0.5:1 से अधिक रहा हैं, अतः यह स्पष्ट हैं कि कंपनी की अल्पकालीन शोधन क्षमता की स्थिति बहुत अच्छी हैं। कंपनी अपने चालू दायित्व का भुगतान आसानी से कर सकती हैं, क्योंकि चालू सम्पत्तियाँ चालू दायित्व की तुलना में अधिक हैं, जो कि कंपनी के चालू दायित्व का भुगतान करने के लिए पर्याप्त हैं। यह कंपनी की अल्पकालीन शोधन क्षमता में वृद्धि कर रहा हैं, जो कि दिन प्रतिदिन के खर्चों का भुगतान आसानी से कर रही हैं जिसके फलस्वरूप कंपनी की अल्पकालीन उधार लेने की क्षमता में वृद्धि हो रही हैं।

- **दीर्घकालीन शोधन क्षमता**

- ऋण समता अनुपात की स्थिति अच्छी हैं, क्योंकि कंपनी अपने ऋणों का भुगतान आसानी से कर सकती है इसके ऋण समता अंश पूँजी/स्वामित्व कोष से कम हैं, यह स्थिति ऋणपत्र धारियों के लिए अच्छी हैं, परंतु कंपनी के लिए यह स्थिति अच्छी नहीं हो सकती, क्योंकि कंपनी कम ऋण लेकर अपना व्यवसाय कर रही हैं, जबकि कंपनी की प्रत्याय दर अच्छी हैं, ऐसी स्थिति में कंपनी को अपने ऋण पूँजी में वृद्धि करना चाहिए जिससे कि कंपनी के लाभों में अधिक वृद्धि हो सकें।
- कंपनी की शोधन क्षमता अनुपात की स्थिति भी अच्छी हैं, क्योंकि कुल बाह्य दायित्व कुल सम्पत्तियाँ की तुलना में बहुत कम हैं, यहा कंपनी आसानी अपने बाह्य दायित्व का भुगतान कर सकती हैं, जो कि कंपनी पर सकारात्मक प्रभाव डाल रहे हैं। कंपनी को भविष्य में भी अपनी शोधन क्षमता में थोड़ी वृद्धि करना चाहिए अर्थात् कंपनी को अपने बाह्य दायित्व की वृद्धि करके अपने व्यवसाय का विस्तार एवं विविधीकरण करना चाहिए जिससे कि कंपनी के लाभों में और वृद्धि हो सकें।
- स्वामित्व कोष अनुपात की स्थिति भी अच्छी हैं, क्योंकि कुल सम्पत्तियों में अधिकांश निवेश लगभग 80 प्रतिशत के माध्यम से किया जा रहा हैं, जिसका मुख्य कारण कंपनी बाह्य ऋणों के कम से

कम उपयोग कर रही हैं, यह स्थिति भी कंपनी पर सकारात्मक प्रभाव डाल रही हैं, लेकिन एक वित्तिय प्रबन्धक की दृश्टि से यह स्थिति संतोषजनक नहीं कही जा सकती हैं क्योंकि कुल सम्पत्तियों में स्वामित्व कोष से निवेश 70 प्रतिशत के आसपास होना चाहिए। परन्तु अध्ययन अवधि स्वामित्व कोष से निवेश 80 प्रतिशत के आसपास हैं।

कंपनी के संचालन लाभ की स्थिति बहुत अच्छी हैं, क्योंकि कंपनी संचालन लाभ औसत लगभग 29 प्रतिशत हैं। यह स्थिति कंपनी पर सकारात्मक प्रभाव डाल रही हैं, जो कि कंपनी के साथ, अंश मूल्य तथा शोधन क्षमता में वृद्धि कर रही हैं तथा कंपनी अपने खर्चों पर नियंत्रण कर रही हैं तथा विक्रय में भी निरन्तर वृद्धि हो रही हैं, सभी स्थितियाँ कंपनी पर अच्छा प्रभाव डाल रही हैं, कंपनी को अपनी वर्तमान स्थिति को भविष्य में बनाये रखना चाहिए।

- ब्याज कपरेज अनुपात की स्थिति भी अच्छी हैं, क्योंकि कंपनी आसानी से ऋण पर ब्याज का भुगतान कर सकती हैं, क्योंकि ब्याज की तुलना में संचालन लाभ कई गुना अधिक हैं, यह स्थिति कंपनी पर सकारात्मक प्रभाव डाल रही हैं, जो कि ऋणदाताओं के लिये सुरक्षित स्थिति हैं, यद्यपि कंपनी में ब्याज एवं ऋण की राशि बहुत कम हैं। कंपनी जोखिम नहीं लेना चाह रही हैं, कंपनी रुढ़िवादी विचारधारा के अनुसार अपना व्यवसाय संचालित कर रही हैं, जो कि वर्तमान स्थिति में संतोषजनक नहीं हैं। कंपनी को थोड़ी जोखिम लेते हुए ऋणों में वृद्धि करना चाहिए जिसका उपयोग व्यवसाय का विस्तार एवं नवाचार तकनीकियों में उपयोग करना चाहिए, क्योंकि कंपनी में संचालन लाभ की स्थिति 29 प्रतिशत हैं, जबकि ब्याज की दर 14 प्रतिशत के आसपास हैं, इस स्थिति का फायदा उठाते हुए अपने ऋणों में विस्तार करना चाहिये।

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CYTOTOXIC T CELLS AND CANCER THERAPY

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ABSTRACT

The cytotoxic T lymphocyte (CTL, Tc) is a type of T lymphocyte/ white blood cell involved in the host's cell-mediated immune response against cancerous cells, abnormal cells and cells infected with viruses. Signals from infected cells or cancer cells lead to the release of cytotoxins: perforin, granzymes, and granulysin by the T_c cells. The activation of CTLs is mediated by the interaction of various co-stimulatory molecules as well as immune cells. Pre-eminent role of CTLs in combating cancer can be effectively applied for the active and passive immunotherapeutic approaches. Various recombinant cytokines viz., interleukins (IL)-2, 4, 7, 10, 12, 15; tumor necrosis factor (TNF) have been found to augment the production of CTL. CTLs can also be stimulated in antigen specific manner through tumor antigens which are the molecular derivatives over expressed in tumorcells due to differentiation, point mutations or viral origin. Designing and development of vaccines based on such immunogenic candidates can be executed and in majority of cases such antigens are targets for CTLs. Identification as chemotherapy and CTL-mediated killing, and validation of these CTL-specific antigens require

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Does *Bougainvillea spectabilis* protect Swiss Albino Mice from Aflatoxin-induced Hepatotoxicity?

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Abstract | We have investigated the protective effect of oral administration of the ethanolic extract of *Bougainvillea spectabilis* leaves against aflatoxin B₁ (AFB₁) induced hepatic injuries among male Swiss albino mice. AFB₁ exposure has significantly increased ($P < 0.05$) the lipid peroxidase activity and decreased the activities of various antioxidant enzymes viz. superoxide dismutase (57.58%), catalase (24.14%), glutathione peroxidase (44.21%), glutathione S-transferase (44.07%) and glutathione reductase (13.51%). It also declined the level of ascorbic acid, reduced glutathione and protein contents by 47%, 34% and 24% respectively. It markedly decreased lipid peroxidation (TBARS level) with concomitant stimulation ($P < 0.05$) of antioxidants (enzymatic and non – enzymatic both). HPTLC analysis revealed availability of sufficient amount of flavonoids, alkaloids and phenolic compounds in the extract of *B. spectabilis* leaves might be responsible for the improved efficiency of antioxidant system and subsequent protection from aflatoxicity.

Keywords | Aflatoxin, Hepatoprotective, Antioxidant, *Bougainvillea spectabilis*, Swiss albino mice

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INTRODUCTION

Aflatoxins are secondary metabolites produced by several strains of filamentous fungi mostly by *Aspergillus flavus* and *A. parasiticus*. These are closely related to di-furanocoumarin compounds (Steyn, 1995; Williams et al., 2004). Epidemiological studies suggest that elevated dietary exposure of aflatoxin can induce liver cancer in humans (Van Rensburg et al., 1985; Liu et al., 2013; Hamid et al., 2013; Bhakuni et al., 2016). However, Angusbhakorn et al. (1990) have reported that even a single dose of aflatoxin is sufficient to induce liver tumours among rats.

The International Agency for Research on Cancer (IARC) (1993) has classified aflatoxin as a highly potential carcinogenic agent (Class I). Later on several strategies have been evolved for reducing the carcinogenic effect of aflatoxins. These strategies include degradation, destruction, inactivation or removal of mycotoxins through chemical and phys-

ical methods. However, the application of these strategies on food stuffs resulted in alteration of organoleptic characteristics and nutritional values of food (Ellis et al., 1991; Cazzaniga et al., 2001). Moreover, antimutagenic agents have also been suggested to inhibit the genotoxic effects of AFB₁ (Madrigal-Bujaidar et al., 2015), but results were not optimal and had certain side effects. Therefore, researchers switched to natural products. Plant derived natural products are proven to have potential of curing cancer with minimal side effect and economical.

Plant-based products are rich source of antioxidants and secondary metabolites and therefore effectively control several ailments, like oxidative stress (Sen, 1995). Previous studies using *Thonningia sanguinea* (Gyamfi and Aniya, 1998) *Phyllanthus amarus* (Naaz et al., 2007), *Zizyphus spina-christi* (Abdel-Wahhab et al., 2007), *Jatropha curcas* (Balaji et al., 2009) and black tea (Jha et al., 2011) have revealed hepatoprotective effects against AFB₁ induced



Review Article

Consequences of Zika Virus Infection During Fetal Stage and Pregnancy Safe Drugs: An Update

¹Rekha Khandia, ¹Ashok Munjal and ²Kuldeep Dhamma

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²Division of Pathology, ICAR-Indian Veterinary Research Institute, Izatnagar, 243122 Bareilly, Uttar Pradesh, India

Abstract

Zika virus (ZIKV), is a member of the Flaviviridae family and cause congenital microcephaly and Guillain-Barre' Syndrome (GBS). The fetus of the mothers infected with ZIKV during first trimester are suffered from severe neurological damage like change of head shape and circumference celled microcephaly, convoluted scalp, deformed joints and vision and hearing loss. Its capability to infect fetus caused Public Health Emergency of International Concern. The information related to ZIKV infecting pregnant women and safe drugs were retrieved from the authentic published resources available on Medline, Pubmed, Pubmed Central, Science Direct and other scientific databases. The retrieved information has been compiled and analyzed. Microcephaly is a rare paediatric condition, implicated with severe consequences on fetus. The consequences of ZIKV infection to the fetus, statistical analysis summarizing association of microcephaly with ZIKV infection with other teratogenic congenital disease manifestations like ZIKV infection and about the therapies which can work for fetus and pregnant women include the use of chloroquine, amodiaquine, sofosbuvir, macrolide antibiotic azithromycin, niclosamide, albendazole/mebendazole, palonosetron and use of convalescent serum. Present review explains techniques of virus detection in fetus. Detailed case study analysis of affected fetus and the mechanism by which virus cause damage to the tissues and the target of fetus might be helpful in future to prevent the detrimental effects of the virus.

Key words: Zika virus, microcephaly, ZIKV detection, fetal infection, therapies during pregnancy, drugs

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

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



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



Review Article

Cell Penetrating Peptides: Biomedical/Therapeutic Applications with Emphasis as Promising Futuristic Hope for Treating Cancer

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Abstract

The intrinsic property of Cell Penetrating Peptides (CPP) is to deliver various molecules including nucleic acids, large plasmids, therapeutic drugs, imaging molecules, liposomes, nano-molecules to various cell and tissues, which indicates about the potential of CPP as therapeutic vehicle molecules. These are easy to prepare, well characterized, versatile and have ability to link with bioactive cargo through covalent and non-covalent bonds. The interaction between cargo and CPP is highly dependent on physiochemical properties of CPP including size, pH and presence of basic residues in the carrier peptide. Primary mechanism of transport of CPP is endocytosis; however, evidences of endocytosis independent mechanisms including carpet model, inverted micelle model, barrel stave pore model and toroidal pore model are also present. Though, the natural CPP are often non-selective and passive, these may be tuned to become specific and targeted by conjugating them with functional groups and chemicals. In fact several natural CPPs such as penetratin, Tat, polyarginines etc have been modified to achieve maximum penetration and desired characters. Linear CPPs may be brought into multi-branched topology to give dendrimeric structures having more cell penetrating capacity, lower toxicity and hemolysis and higher serum stability. Site-specific targeting of CPP might be helpful in achieving several goals including enhancement in protein expression, gene silencing, formation of pluripotent cells, reduction in inflammation and apoptosis, trans-epithelial transport, neuroprotection, ischemia treatment, treating insulin disorders, delivery of nucleic acids and agricultural pest control. The present review encompasses the detailed information regarding different modes of entry of CPP inside the cells, designing and classes of such peptides, along with their versatile therapeutic applications.

Key words: Cell penetrating peptides, carpet model, inverted micelle model, barrel stave pore model, toroidal pore model, therapeutic, cancer, agriculture

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



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Original Research Article

Evaluation of the ameliorative effects of *Phyllanthus niruri* (Bhumi amla) on the deleterious insecticide imidacloprid in the vital organs of chicken embryos

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ABSTRACT

Objective: The present study is designed to evaluate the ameliorative effects of *Phyllanthus niruri* (Bhumi amla) on the deleterious Insecticide imidacloprid in the vital organs of Chicken embryos

Background: Insecticides are widely used in agriculture to curb the loss caused by insects. These insecticides are incorporated into the food chain and accumulate in the human body, as well disturb the various metabolic pathways. Imidacloprid is an insect neurotoxin commonly used in agriculture to control the insect pests. *P. niruri* is a traditional medicinal shrub widely used as an anti-inflammatory, antipyretic, and anti-lethality agent.

Materials and methods: The embryonated chicken eggs were divided into the four groups (one control and three treated groups); the chorioallantoic membranes of control received 200 µl phosphate buffer saline, whereas group I and group II received 100 µg imidacloprid and 200 µl aqueous extract of *P. niruri* (PNE) respectively. Group III received both 100 µg imidacloprid and 200 µl PNE. The serum was collected on the 18th day its development; which was subjected to the biochemical analysis based on colorimetric assay in semi-automated biochemical analyzer using commercial kits.

Results: We observed significant *in ovo* effects of imidacloprid on chicken embryos; the values of aspartate aminotransferase (AST), alanine aminotransferase (ALT), were increased in imidacloprid treated group I; histopathology also revealed damage to the liver (necrotic areas and dilated blood sinusoids). Alkaline phosphatase (ALP), amylase, cholesterol, triglycerides protein and albumin levels were also altered significantly ($p < 0.05$).

Conclusion: The serum biochemicals were returned back to the nearly normal levels. PNE has ameliorated and overcome the effects of imidacloprid reasonably with the subsequent treatment among group III. Hence, *P. niruri* may be used to minimize the effects of an accidental exposure of imidacloprid.

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1. Introduction

Plants have been sources of food and medicine since antiquity. These play important roles in the hunger satiety, treatment of various diseases, as well as the maintenance of human health. At

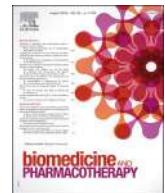
present, development of the pharmaceutical industry and production of over 50% of modern chemical drugs depend on the various phytochemicals.

Phyllanthus niruri (commonly known as 'bhumiyamalaki' in Ayurveda, 'chancapiedra' in Spanish, and 'enyikwonwa' in the *Ibo* dialect of southeastern Nigeria) belongs to the family Euphorbiaceae; it has been studied intensively and is being used in traditional folk medicine. The plant is distributed across almost all tropical and subtropical regions including America, India, and Nigeria. It is a common weed that grows mostly in shady or moist

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Review

Beneficial health applications and medicinal values of *Pedicularis* plants: A review

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ABSTRACT

Pedicularis plants (Orobanchaceae), popularly known as lousewort, are found in Asia, Europe, and North America, and have been used in Sowa-Rigpa, the Himalayan art of healing and a traditional system of medicine for treating various ailments in humans. A comprehensive compilation on this valuable medicinal plant is not available, however. The present extensive review provides insight into the salient medicinal properties of *Pedicularis* plants with respect to various health issues and diseases. Our previous studies on *Pedicularis* plants from the Changthang region of Ladakh (India) and research advances leading to new developments in this field have prompted this review. The information presented here has been compiled and analyzed from authenticated published resources available on Medline, Pubmed, Pubmed Central, Science Direct, and other scientific databases. The *Pedicularis* genus consists of approximately 600 species (83 of which are found in India), with commonly reported species being *Pedicularis longiflora* Rudolph, *P. bicornuta* Klotzsch, *P. oederi* Vahl, *P. cheilanthifolia*, and *P. pectinata*. The major phytoconstituents of the *Pedicularis* sp. are phenols, phenylethanoids, phenylpropanoids, flavonoids, iridoids, lignans, and alkaloids, among others. The existing literature highlights that these compounds possess antioxidant, immunomodulatory, anti-inflammatory, antidiabetic, antibacterial, antifungal, analgesic, antitumor, hepatoprotective, neuroprotective, muscle-relaxing, antifatigue, diuretic, antipyretic, antithrombus, antihemolysis, and DNA-repairing properties. This medicinal herb is used in the treatment of leucorrhoea, fevers, sterility, rheumatism, general debility, collapse, and urinary problems, and for revitalizing the blood circulation, improving digestion, and maintaining vitality. This review emphasizes the various medicinal aspects of *Pedicularis* sp. plants containing a variety of phytoconstituents. Besides phenols, terpenoids, flavonoids, lignans, tannins, iridoid, and phenylpropanoid glycosides are among the active constituents responsible for multiple health effects. However, further extensive research is required to characterize the various phytoconstituents of *Pedicularis* to explore their modes of action at a molecular level and identify other beneficial applications that can exploit the tremendous medicinal potential of this important herb.

1. Introduction

Pedicularis plants, popularly known as lousewort (from the Latin word *Pedicularis*, meaning louse) belong to the Orobanchaceae family (formerly Scrophulariaceae) and are found in tundra, alpine, and

subalpine floras in Asia, Europe, and North America. In India, *Pedicularis* sp. are mostly found in the Himalayan ranges, starting from Ladakh in the west, stretching along the Sikkim Himalayas, and reaching up to Arunachal Pradesh in the east [1,2]. *Pedicularis* consists of approximately 600 species [3–6], 83 of which are found in India (81

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Anti-proliferative role of recombinant lethal toxin of *Bacillus anthracis* on primary mammary ductal carcinoma cells revealing its therapeutic potential

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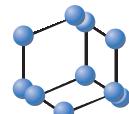
ABSTRACT

Bacillus anthracis secretes three secretory proteins; lethal factor (LF), protective antigen (PA) and edema factor (EF). The LF has ability to check proliferation of mammary tumors, chiefly depending on mitogen activated protein kinase (MAPK) signaling pathway. Evaluation of therapeutic potential of recombinant LF (rLF), recombinant PA (rPA) and lethal toxin (rLF + rPA = LeTx) on the primary mammary ductal carcinoma cells revealed significant ($p < 0.01$) reduction in proliferation of tumor cells with mean inhibition indices of $28.0 \pm 1.37\%$ and $19.6 \pm 1.47\%$ respectively. However, treatment with rPA alone had no significant anti-proliferative effect as evident by low mean inhibition index of $3.4 \pm 3.87\%$. The higher inhibition index observed for rLF alone as compared to LeTx is contrary to the existing knowledge on LF, which explains the requirement of PA dependent endocytosis for its enzymatic activity. Therefore, the plausible existence of PA independent mode of action of LF including direct receptor mediated endocytosis or modulation of signal transduction cascade via unknown means is hypothesized. *In silico* protein docking analysis of other cellular receptors for any plausibility to play the role of receptor for LF revealed c-Met receptor showing strongest affinity for LF (H bond = 19; Free energy = -773.96), followed by nerve growth factor receptor (NGFR) and human epidermal growth factor receptor (HER)-1. The study summarizes the use of rLF or LeTx as therapeutic molecule against primary mammary ductal carcinoma cells and also the c-Met as potential alternative receptor for LF to mediate and modulate PA independent signal transduction.

INTRODUCTION

Cancer remains a deadly malady despite several scientific advances and is one of the leading causes

of deaths and high sufferings to the mankind. Though conventional therapies including of radiotherapy, chemotherapy and surgery are being followed widely; however due to their some limitations and side effects,



Bacterial Toxins: A Hope Towards Angiogenic Ailments



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Abstract: **Background:** Angiogenesis is an essential physiological process for growth and maintenance of the body. Especially its role becomes indispensable during the embryonic development stage but lacks in adults with some exceptions like while wound repair and menstrual cycle. It is a tightly regulated process and relies on the cascade of several molecular signaling pathways with the involvement of many effectors like vascular endothelial growth factor (VEGF), fibroblast growth factor (FGF), platelet-derived growth factor (PDGF), insulin-like growth factor (IGF) etc.

Methods: Related literature/ information were retrieved, analyzed and compiled from the online published resources available in Medline, Pubmed, Pubmed Central, Science Direct and other scientific databases.

Results: Excessive angiogenesis leads to disorders like tumor, atherosclerosis, rheumatoid arthritis, diabetic retinopathy, endometriosis, psoriasis, and adiposity. While, reduced angiogenesis also results in several ailments like cardiac ischemia, low capillary density in brain of Alzheimer's patients and delayed wound healing. Therefore, both angioproliferative and anti-angiogenic approaches may be of use in developing novel therapeutics. Bacterial toxins are known for modulating the process of angiogenesis by mimicking pro-angiogenic factors and/ or competing with them. Furthermore, they inactivate the receptors or keep them in ON status, hence can be used to treat angiogenic disorders. The ease in handling, cultivation and manipulating the toxins structure has enabled the use of bacteria as an ideal choice for novel therapeutic developments.

Conclusion: This review intends to elucidate the molecular mechanisms through which certain bacteria may alter the level of angiogenesis and consequently can work as therapeutics against angiogenic disorders.

Keywords: Angiogenesis, bacterial toxins, Rho signaling, GTPases, endothelial cells, stress fibres, actin bundles, apoptosis inhibition.

1. INTRODUCTION

Bacteria are virtually omnipresent organisms, accessible in the most environmental conditions and are described on the basis of their habitat viz. anaerobic, aerobic, halophilic, acidophilic, basophilic, thermophilic, psychrophilic, osmophilic, barophilic, xerophilic, thermoacidophilic, lithoautotrophic etc. Bacterial toxins are substances which target other bacteria or host cells. The endotoxins are retained inside the cells; whereas exotoxins diffuse out from the cell. The mechanisms of action of different toxins are diverse. The majority of toxins cause damage to cell membranes or cell perforation and exposes internal layer to the outside environment and leading to cell death e.g. pneumolysin. *Streptococcus pneumonia*, which secretes vis-à-vis two endotoxins; autolysin-causes autolysis, while pneumolysin is released by autolysis [1]. Approximately 40 units of pneumolysin toxin assemble to form a punching hole in pulmonary cells, which results in cell death [2]. Few of the bacterial toxin ceases the protein synthesizing machinery of the host cells and eventually lead to cell death viz. shiga toxin, from *Shigella dysenteriae* and diphtheria toxins from *Corynebacterium diphtheriae*, are the classical examples; which cleaves adenine residue of rRNA and inactivate EF-2 (elongation factor 2) by ADP-ribosylation to stop translation machinery [3, 4]. Another category of the toxins acts through secondary messenger pathways e.g. cholera toxin, which upon internalization activates G proteins and remains active upon binding with GTP. Consequently, adenylyl cyclase remains

activated and results in increased cAMP level [5]; which further triggers CFTR (Cystic Fibrosis Trans-membrane Conductance Regulator, an ion transporter protein for Na^+ and Cl^-) and results in water efflux along with sodium and chloride ions from intestinal epithelium. A group of bacterial toxins act as super antigen and possess the ability to evoke as high as 20% of T immune cells (activation under normal circumstances is only 0.001%) accompanied with cytokine storms [6]. Under influence of these toxins, cell starts destroying its own organs. The classical example of this toxin is pyrogenic toxin superantigens of *Staphylococcus aureus*. Another group of toxins is proteases, which includes *Bacillus anthracis* lethal toxin, and after internalization into the host cell it cleaves mitogen-activated protein kinases (MAPK). The latter is a key regulator of signal transduction cascade during growth and differentiation; its cleavage renders normal functioning of the cell hindered [7].

Although, the bacterial toxins are considered harmful, some of their activities have been harnessed for beneficial outcome for human welfare. Many bacterial toxins have been investigated for their medical values and have proven valuable in combating several disorders [8, 9]. For example, *C. perfringens* enterotoxin (CPE), a protein molecule, binds to claudin receptors present in tight junctions, located in cell to cell contact region of epithelial and endothelial cells [10]. Occurrence of cancer has been reported to link with both the upregulation and downregulation of the claudin receptors [11]. In lung adenocarcinoma [12], esophageal squamous cell carcinoma [13] and hepatocellular carcinoma [14], decreased expression of claudin has been reported and conversely higher level of expression was reported in oral squamous cell carcinoma [15] and melanoma [16]. The cancer cell over-expressing claudin receptors

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Research Article

Anti-angiogenic Effects of Cadmium Chloride on the Process of Neovascularization

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Abstract

Background and Objective: Angiogenesis (neovascularization) is an important process of forming new blood vessels, essential for embryonic development, reproduction, wound repair and growth. Present study reports the plausible angiogenic modulatory effects of the cadmium chloride ($CdCl_2$). Cadmium (Cd) is a toxic substance, which have many inhibitory effects but also medicinally important. There are several toxic materials which in low quantity can be used in therapeutic aspects. Keeping in view, the effects of $CdCl_2$ salt were investigated on the process of angiogenesis in chicken chorioallantoic membrane (CAM) model by assessing gross and histopathological alterations. **Materials and Methods:** The two groups of the embryonated chicken eggs (10 in each group, 1 control and 1 treated group) were taken and 200 μL of 0.5 M of $CdCl_2$ was directly introduced on to the CAM. The resealed eggs were incubated for 72 h in a humid incubator chamber at $37 \pm 1^\circ C$. Then the eggs were opened to observe the gross and histopathological alterations for angiogenesis modulation. **Results:** Gross examination of CAM revealed the reduction in the number of secondary and tertiary blood vessels amongst $CdCl_2$ treated group. Histopathological analysis revealed anti-angiogenic effects of $CdCl_2$ due to the less number of blood vessels and presence of breached mesodermal blood vessels, out of which RBCs were oozing out. Occasional abnormal thickening and accumulation of densely arranged cells at chorionic and allantoic sides was also observed. **Conclusion:** The anti-angiogenic properties of $CdCl_2$ can be explored in the therapeutics of cancer and tumor related disorders. However, to avoid any kind of side effects, further qualitative, quantitative analysis and critical dose determination is required before going for clinical trials. Present investigations revealed the anti-angiogenic effect of cadmium chloride salt on chicken chorioallantoic membrane.

Key words: Angiogenesis, chorioallantoic membrane, $CdCl_2$ salt, anti-angiogenic effect, therapeutics

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Anthrax Bacterium: Its Etiology and Possible Therapeutics Against Cancer

13

Rekha Khandia and Ashok Munjal

13.1 Introduction

Anthrax is an oldest recorded disease of grazing animals and is known through several synonyms, viz. ragpickers' disease, charbon, milzbrand, black bain, tanner's disease and splenic fever; the disease among cattle is also known as murrain (Latin *morire* meaning to die). Mainly it infects grazing domesticated animals; however it has also been reported in exotic wildlife animals such as hippos, elephants and Cape buffalo (Bhatnagar and Batra 2001). It causes zoonosis among human due to occupational, accidental, or agricultural exposure.

The *B. anthracis*, causative agent of anthrax, keeps very important place in the history of bacteriology. It is credited to be the first bacterium to be observed under a microscope. It was also the first bacterium known to cause the disease and revealed to be transmitted by inoculation of infected blood. Koch, in 1877, isolated it in pure culture and revealed that it possesses spores. Koch gave his famous postulates about germs based on his study on anthrax bacillus. It was also the first bacterium which was attenuated to use as vaccine (Pasteur 1881).

13.1.1 Morphological Characteristics

B. anthracis belongs to the *Bacillus cereus* group comprising of *B. cereus*, *B. anthracis*, *B. thuringiensis* and *B. mycoides*. It exhibits differential morphological features on a blood-agar plate. It has characteristic flat, greyish-white, mucoid, irregularly “medusa head-shaped” curly margined colony (Parry et al. 1983) and a large encapsulated Gram-positive rod. It grows well aerobically at a temperature ranging from 12 to 45 °C (optimum 35 °C) on sheep or horse blood agar, and most

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Advances in Diagnosis, Surveillance, and Monitoring of Zika Virus: An Update


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Zika virus (ZIKV) is associated with numerous human health-related disorders, including fetal microcephaly, neurological signs, and autoimmune disorders such as Guillain-Barré syndrome (GBS). Perceiving the ZIKA associated losses, in 2016, the World Health Organization (WHO) declared it as a global public health emergency. In consequence, an upsurge in the research on ZIKV was seen around the globe, with significant attainments over developing several effective diagnostics, drugs, therapies, and vaccines countering this life-threatening virus at an early step. State-of-art tools developed led the researchers to explore virus at the molecular level, and in-depth epidemiological investigations to understand the reason for increased pathogenicity and different clinical manifestations. These days, ZIKV infection is diagnosed based on clinical manifestations, along with serological and molecular detection tools. As, isolation of ZIKV is a tedious task; molecular assays such as reverse transcription-polymerase chain reaction (RT-PCR), real-time qRT-PCR, loop-mediated isothermal amplification (LAMP), lateral flow assays (LFAs), biosensors, nucleic acid sequence-based amplification (NASBA) tests, strand invasion-based amplification tests and immune assays like enzyme-linked immunosorbent assay (ELISA) are in-use to ascertain the ZIKV infection or Zika fever. Herein, this review highlights the recent advances in the diagnosis, surveillance, and monitoring of ZIKV. These new insights gained from the recent advances can aid in the rapid and definitive detection of this virus and/or Zika fever. The summarized information will aid the strategies to design and adopt effective prevention and control strategies to counter this viral pathogen of great public health concern.

Keywords: Zika virus, Zika fever, diagnosis, surveillance, monitoring

INTRODUCTION

Zika virus (ZIKV) is the latest emergent virus after the Ebola epidemic. In the past, ZIKV has only been associated with mild disease; however, after subdue activity for six decades, it recently emerged as a significant threat to human health, with evident fetal abnormalities, microcephaly, serious neurological complications, and autoimmune disorders such as Guillain-Barré syndrome



Analysis of Nipah Virus Codon Usage and Adaptation to Hosts



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A recent outbreak of Nipah virus (NiV) in India has caused 17 deaths in people living in districts of Kerala state. Its zoonotic nature, as well as high rate of human-to-human transmission, has led researchers worldwide to work toward understanding the different aspects of the NiV. We performed a codon usage analysis, based on publicly available nucleotide sequences of NiV and its host adaptation, along with other members of the *Henipavirus* genus in ten hosts. NiV genome encodes nine open reading frames; and overall, no significant bias in codon usage was observed. Aromaticity of proteins had no impact on codon usage. An analysis of preferred codons used by NiV and the tRNA pool in human cells indicated that NiV prefers codons from a suboptimal anticodon tRNA pool. We observed that codon usage by NiV is mainly constrained by compositional and selection pressures, not by mutational forces. Parameters that define NiV and host relatedness in terms of codon usage were analyzed, with a codon adaptation index (CAI), relative codon deoptimization index (RCDI), and similarity index calculations; which indicated that, of all hosts analyzed, NiV was best adapted to African green monkeys. A comparative analysis based on the relative codon deoptimization index (RCDI) for host adaptation of NiV, Hendra virus (HeV), Cedar virus (CedV), and Hendra like Mojjiang virus (MojV) revealed that except for dogs and ferrets, all evaluated hosts were more susceptible to HeV than NiV.

Keywords: Nipah virus, codon usage, CAI, RCDI, similarity index, selection pressure, compositional constraint

INTRODUCTION

The Nipah virus (NiV) is an RNA virus in the *Henipavirus* genus, *Paramyxoviridae* family, that infects both wild animals and humans (Gurley et al., 2017). In 1998, NiV disease was reported for the first time in Malaysia and the mortality rate associated with it was very high (40%) (Wacharapluesadee et al., 2010). Human-to-human transmission was not observed in the Malaysian outbreak; however, it was observed during the outbreaks in Bangladesh and India with a high mortality rate of 70% (Hsu et al., 2004; Chong et al., 2008; Wacharapluesadee et al., 2010; Arankalle et al., 2011). Thereafter, the virus has been detected in several countries such as China (Li et al., 2008), Cambodia (Reynes et al., 2005), Malaysia (Mohd Nor et al., 2000), Vietnam (Hasebe et al., 2012), the Philippines (Ching et al., 2015), Indonesia (Sendow et al., 2010), Thailand (Wacharapluesadee et al., 2005), Ghana (Hayman et al., 2008), Madagascar (Iehlé et al., 2007),



Advances in Developing Therapies to Combat Zika Virus: Current Knowledge and Future Perspectives

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Zika virus (ZIKV) remained largely quiescent for nearly six decades after its first appearance in 1947. ZIKV reappeared after 2007, resulting in a declaration of an international “public health emergency” in 2016 by the World Health Organization (WHO). Until this time, ZIKV was considered to induce only mild illness, but it has now been established as the cause of severe clinical manifestations, including fetal anomalies, neurological problems, and autoimmune disorders. Infection during pregnancy can cause congenital brain abnormalities, including microcephaly and neurological degeneration, and in other cases, Guillain-Barré syndrome, making infections with ZIKV a substantial public health concern. Genomic and molecular investigations are underway to investigate ZIKV pathology and its recent enhanced pathogenicity, as well as to design safe and potent vaccines, drugs, and therapeutics. This review describes progress in the design and development of various anti-ZIKV therapeutics, including drugs targeting virus entry into cells and the helicase protein, nucleosides, inhibitors of NS3 protein, small molecules, methyltransferase inhibitors, interferons, repurposed drugs, drugs designed with the aid of computers, neutralizing antibodies, convalescent serum, antibodies that limit antibody-dependent enhancement, and herbal medicines. Additionally, covalent inhibitors of viral protein expression and anti-Toll-like receptor molecules are discussed. To counter ZIKV-associated disease, we need to make rapid progress in developing novel therapies that work effectively to inhibit ZIKV.

Keywords: Zika virus, drugs, therapies, microcephaly, Guillain-Barré Syndrome

INTRODUCTION

Zika virus (ZIKV) is a mosquito-borne virus belonging to the Spondweni serocomplex in the genus *Flavivirus* of the family *Flaviviridae* that has become a new threat following the Ebola virus epidemic (Singh et al., 2016). The expanding ZIKV epidemic was declared an emergency by the World Health Organization on February 1, 2016 (Fajardo et al., 2016; WHO, 2016).



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Advances in Designing and Developing Vaccines, Drugs and Therapeutic Approaches to Counter Human Papilloma Virus

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Human papillomavirus (HPV) is a viral infection with skin-to-skin based transmission mode. HPV annually caused over 500,000 cancer cases including cervical, anogenital and oropharyngeal cancer among others. HPV vaccination has become a public-health concern, worldwide, to prevent the cases of HPV infections including precancerous lesions, cervical cancers, and genital warts especially in adolescent female and male population by launching national programs with international alliances. Currently, available prophylactic and therapeutic vaccines are expensive to be used in developing countries for vaccination programs. The recent progress in immunotherapy, biotechnology, recombinant DNA technology and molecular biology along with alternative and complementary medicinal systems have paved novel ways and valuable opportunities to design and develop effective prophylactic and therapeutic vaccines, drugs and treatment approach to counter HPV effectively. Exploration and more researches on such advances could result in the gradual reduction in the incidences of HPV cases across the world. The present review presents a current global scenario and futuristic prospects of the advanced prophylactic and therapeutic approaches against HPV along with recent patents coverage of the progress and advances in drugs, vaccines and therapeutic regimens to effectively combat HPV infections and its cancerous conditions.

Keywords: human papilloma virus (HPV), prophylaxis, vaccines, drugs, therapy



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Review Article

Advances in Designing and Developing Vaccines Against Zika Virus

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Abstract

The recent outbreaks of Zika virus (ZIKV) infections has changed the ZIKV status from a very mild self-limiting febrile virus to a highly pathogenic virus causing visual impairment, autoimmune response against myelin layer and microcephaly in affected fetus. The serious social impact on society has drawn the attention of the researchers globally. The search for an effective vaccine against ZIKV is on the way. Several researches as well as commercial organizations are indulged in developing vaccine for prophylactic and treatment purposes. In the present review, various vaccine strategies have been described including inactivated, attenuated, DNA, subunit, recombinant viral vectored and nucleic acid based vaccines. The vaccines developed should be clinically tested in animal models, which are susceptible for ZIKV infection like Stat2^{-/-} mice, A129 (IFNAR^{-/-}) Mice, Swiss Jim Lambert (SJL) mice or Rhesus macaques. Efficacy of each vaccination strategy is required to be meticulously evaluated. The use of vaccinomics could also help to discover appropriate vaccine candidate to induce the effective immune response. DNA and subunit vaccines may not be that much beneficial in endemic areas due to poor immunogenic potential; however, by adjuvanting or using specific devise to deliver DNA vaccine construct, efficacy may be improved. Investigations exploring the cross reaction between the already existing immunity and immunity against newly developed vaccines would be of interest and useful for researchers. Further, researches should target whether vaccines and/or antibodies against ZIKV can induce Antibody Dependent Enhancement (ADE) resulting in subsequent enhancement of flavivirus infection. There are utmost requirements of sufficient resources in terms of infrastructure, funding, manpower, along with producing effective and safe ZIKV vaccine in commercial basis.

Key words: Zika virus, zika fever, vaccines

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Advances in Designing and Developing Vaccines, Drugs, and Therapies to Counter Ebola Virus

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Ebola virus (EBOV), a member of the family *Filoviridae*, is responsible for causing Ebola virus disease (EVD) (formerly named Ebola hemorrhagic fever). This is a severe, often fatal illness with mortality rates varying from 50 to 90% in humans. Although the virus and associated disease has been recognized since 1976, it was only when the recent outbreak of EBOV in 2014–2016 highlighted the danger and global impact of this virus, necessitating the need for coming up with the effective vaccines and drugs to counter its pandemic threat. Albeit no commercial vaccine is available so far against EBOV, a few vaccine candidates are under evaluation and clinical trials to assess their prophylactic efficacy. These include recombinant viral vector (recombinant vesicular stomatitis virus vector, chimpanzee adenovirus type 3-vector, and modified vaccinia Ankara virus), Ebola virus-like particles, virus-like replicon particles, DNA, and plant-based vaccines. Due to improvement in the field of genomics and proteomics, epitope-targeted vaccines have gained top priority. Correspondingly, several therapies have also been developed, including immunoglobulins against specific viral structures small cell-penetrating antibody fragments that target intracellular EBOV proteins. Small interfering RNAs and oligomer-mediated inhibition have also been verified for EVD treatment. Other treatment options include viral entry inhibitors, transfusion of convalescent blood/serum, neutralizing antibodies, and gene expression inhibitors. Repurposed drugs, which have proven safety profiles, can be adapted after high-throughput screening for efficacy and potency for EVD treatment. Herbal and other natural products are also being explored for EVD treatment. Further studies to better understand the pathogenesis and antigenic structures of the virus can help in developing an effective vaccine and identifying appropriate antiviral targets. This review presents the recent advances in designing and developing vaccines, drugs, and therapies to counter the EBOV threat.

Keywords: Ebola virus, Ebola virus disease, vaccines, prophylactics, drugs, therapeutics, treatment

Review

A Comprehensive Review of Autophagy and Its Various Roles in Infectious, Non-Infectious, and Lifestyle Diseases: Current Knowledge and Prospects for Disease Prevention, Novel Drug Design, and Therapy



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Abstract: Autophagy (self-eating) is a conserved cellular degradation process that plays important roles in maintaining homeostasis and preventing nutritional, metabolic, and infection-mediated stresses. Autophagy dysfunction can have various pathological consequences, including tumor progression, pathogen hyper-virulence, and neurodegeneration. This review describes the mechanisms of autophagy and its associations with other cell death mechanisms, including apoptosis, necrosis, necroptosis, and autosis. Autophagy has both positive and negative roles in infection, cancer, neural development, metabolism, cardiovascular health, immunity, and iron homeostasis. Genetic defects in autophagy can have pathological consequences, such as static childhood encephalopathy with neurodegeneration in adulthood, Crohn's disease, hereditary spastic paraparesis, Danon disease, X-linked myopathy with excessive autophagy, and sporadic inclusion body myositis. Further studies on the process of autophagy in different microbial infections could help to design and develop novel therapeutic strategies against important pathogenic microbes. This review on the progress and prospects of autophagy research describes

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Advances in Aquaculture Vaccines Against Fish Pathogens: Global Status and Current Trends

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ABSTRACT

In recent years, aquaculture has attained a major economic revolution, however, infectious diseases of bacterial, viral, mycotic and parasitic origin are the most significant restrictive agents in the improvement of intensified aquaculture, which has become a fast blooming seafood industry. For environment-friendly aquaculture and human health concerns owing to the rise in incidences of antimicrobial resistant microbes and food safety hazards, the immunoprophylaxis or vaccination strategies are highly effective and economical in protecting the health of fish and aquaculture animals from various infectious agents. Advancements in science have paved newer avenues in both basic and applied research areas for developing and designing novel and effective vaccines, as well as improving existing vaccines for rendering protection from various types of infectious diseases. Current advances in vaccines and vaccinology offer valuable opportunities to discover new vaccine candidates to combat fish pathogens, including mycotic and parasitic agents, for which vaccines are still lacking. This review focuses on the current knowledge, recent advances and future perspectives of vaccines and vaccination in the aquaculture industry, from traditional inactivated and attenuated vaccines to new generation vaccines comprising of recombinant, subunit, vectored, genetically engineered, DNA and peptide vaccines, reverse vaccinology and plant-based edible vaccines, and nanovaccines.

KEYWORDS

Fish; aquaculture; vaccine; infectious diseases

Introduction: Vaccines and their importance in aquaculture

Aquaculture is currently a fastest emerging global food industry. Nevertheless, intercontinental commercial trading and transport of live fishes, their eggs and fish products had increased the risk of global disease transmission in this viable industry due to the various stages of pathogens in fishes (apparently healthy, subclinical or carrier stages) travelling across the countries, which is a major barrier for safe fish production and healthy aquaculture (Khan et al., 2011). One of the major threats to aquaculture is the economical losses imposed by incidences and outbreaks of infectious diseases on account of high mortality in farmed fishes and commercial

aquaculture systems. Literature suggested that 54.9% bacterial pathogens, 22.6% viruses, 3.1% mycotic agents, and 19.4% parasitic agents are responsible for periodical disease outbreaks in fish cultures (Dhar et al., 2014). The Office International des Epizooties (OIE)/World Organization for Animal Health has listed certain important diseases including of DNA virus diseases such as epizootic hematopoietic necrosis (EHN), koi herpesvirus disease (KHVD), red sea bream iridovirus disease (RSID), and RNA virus diseases such as infectious hematopoietic necrosis virus (IHNV), infectious salmon anemia virus (ISAV), spring viremia of carp (SVC), and viral hemorrhagic septicemia (VHS) to be the causing major catastrophe for large scale aquaculture industry (Crane and Hyatt, 2011; <http://www.oie.int/animal-health-in-the>



A Comprehensive Review on Equine Influenza Virus: Etiology, Epidemiology, Pathobiology, Advances in Developing Diagnostics, Vaccines, and Control Strategies

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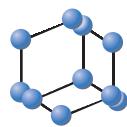
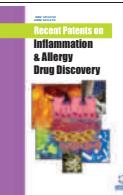
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Among all the emerging and re-emerging animal diseases, influenza group is the prototype member associated with severe respiratory infections in wide host species. Wherein, Equine influenza (EI) is the main cause of respiratory illness in equines across globe and is caused by equine influenza A virus (EIV-A) which has impacted the equine industry internationally due to high morbidity and marginal mortality. The virus transmits easily by direct contact and inhalation making its spread global and leaving only limited areas untouched. Hitherto reports confirm that this virus crosses the species barriers and found to affect canines and few other animal species (cat and camel). EIV is continuously evolving with changes at the amino acid level wreaking the control program a tedious task. Until now, no natural EI origin infections have been reported explicitly in humans. Recent advances in the diagnostics have led to efficient surveillance and rapid detection of EIV infections at the onset of outbreaks. Incessant surveillance programs will aid in opting a better control strategy for this virus by updating the circulating vaccine strains. Recurrent vaccination failures against this virus due to antigenic drift and shift have been disappointing, however better understanding of the virus pathogenesis would make it easier to design effective vaccines predominantly targeting the conserved epitopes (HA glycoprotein). Additionally, the cold adapted and canarypox vectored vaccines are proving effective in ceasing the severity of disease. Furthermore, better understanding of its genetics and molecular biology will help in estimating the rate of evolution and occurrence of pandemics in future. Here, we highlight the advances occurred in understanding the etiology, epidemiology and pathobiology of EIV and a special focus is on designing and developing effective diagnostics, vaccines and control strategies for mitigating the emerging menace by EIV.

Keywords: equine, influenza virus, epidemiology, pathogenesis, diagnosis, vaccine, prevention, control

REVIEW ARTICLE

BENTHAM
SCIENCE

Recent Trends in Nanotechnology-Based Drugs and Formulations for Targeted Therapeutic Delivery

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Abstract: **Background:** In the recent past, a wider spectrum of nanotechnology-based drugs or drug-loaded devices and systems has been engineered and investigated with high interests.

Objective: The key objective is to help for an enhanced/better quality of patient life in a secure way by avoiding/limiting drug abuse, or severe adverse effects of some in practice traditional therapies.

Method: Various methodological approaches including *in vitro*, *in vivo*, and *ex vivo* techniques have been exploited, so far. Among them, nanoparticles-based therapeutic agents are of supreme interests for an enhanced and efficient delivery in the current biomedical sector of the modern world.

Results: The development of new types of novel, effective and highly reliable therapeutic drug delivery system (DDS) for multipurpose applications is essential and a core demand to tackle many human health related diseases. In this context, nanotechnology-based several advanced DDS have been engineered with novel characteristics for biomedical, pharmaceutical and cosmeceutical applications that include but not limited to the enhanced/improved bioactivity, bioavailability, drug efficacy, targeted delivery, and therapeutically safer with an extra advantage of overcoming demerits of traditional drug formulations/designs. This review work is focused on recent trends/advances in nanotechnology-based drugs and formulations designed for targeted therapeutic delivery. Moreover, information is also reviewed and given from recent patents and summarized or illustrated diagrammatically to depict a better understanding. Recent patents covering various nanotechnology-based approaches for several applications have also been reviewed.

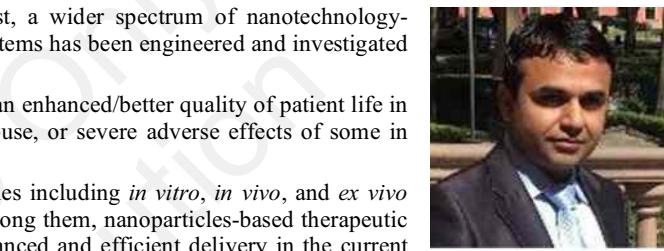
Conclusion: The drug-loaded nanoparticles are among versatile candidates with multifunctional characteristics for potential applications in biomedical, and tissue engineering sector.

Keywords: Biomaterials, biomedical sector, drug delivery, drug-loaded nanoparticles, nanotechnology, therapeutic approaches.

1. INTRODUCTION

In the recent years, a lot of work being done is based on the thematic “nanotechnology” concept which covers both current scientific work and advanced concepts. Based on the applied field and concept, there are different definitions available for this fascinating terminology i.e. “nanotechnology”. Nanotechnology, in its original and traditional concept, mostly refers to engineering multifunctional constructs or even systems *from the bottom up technology* at the nanoscale using high-end tools being or have been developed. In other words, “nanotech” definition includes anything smaller than 100 nanometers with novel characteristics. The U.S. National Nanotechnology Initiative (NNI) provides the following definition:

“Nanotechnology is the understanding and control of matter at dimensions between approximately 1 and 100



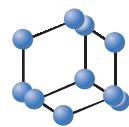
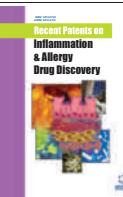
Hafiz M. N. Iqbal

nanometers, where unique phenomena enable novel applications. Encompassing nanoscale science, engineering, and technology, nanotechnology involves imaging, measuring, modeling, and manipulating matter at this length scale”.

Thanks to the key advances in the scientific world, the use of nanotechnology has become an original and accepted concept. So far, nanotechnology has been described and classified into four generations [1]. Figure 1 illustrates a schematic representation of nanotechnology generations (Fig. (1)). The first era which started before the 2000s, was mostly focused on the development of passive nanostructures (more specifically, materials designed to perform a single task). In the second generation from 2000 to 2005, the major focus was shifted from passive nanostructures to active nanostructures with multitasking capability e.g. nano-based sensors and drug delivery devices/systems, etc. The third and fourth generations feature nano-systems with thousands of interacting elements from state of the art at advanced and high-tech level [1, 2]. According to the Roco, from the U.S. National Nanotechnology Initiative, the functioning or engineering of such nano-systems, much like a mammalian cell with hierarchical systems within systems, are expected to be

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REVIEW ARTICLE

BENTHAM
SCIENCE

Recent Trends in Nanotechnology-Based Drugs and Formulations for Targeted Therapeutic Delivery

Hafiz M.N. Iqbal^{a,*}, Angel M.V. Rodríguez^a, Rekha Khandia^b, Ashok Munjal^b and Kuldeep Dhama^c

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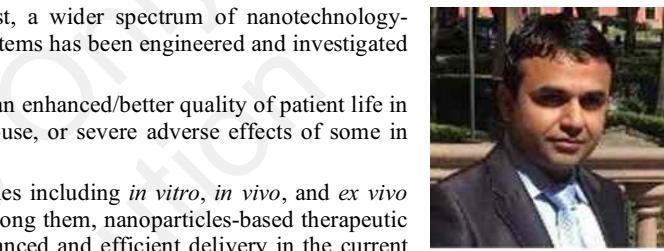
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Pyrosequencing- A Pioneer Technique of New Epoch

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Abstract

Sanger's dideoxy chain termination method was the widely used technology for DNA sequencing since its inception. However, the technique has its own limitations like it is costly, time consuming, labor intensive and faces the problem of clone biasness. Pyrosequencing has emerged as a novel sequencing technique, which offers potential advantages in terms of accuracy, cost effectiveness, flexibility, parallel processing, high throughput and further it can be easily automated. It can be widely accepted for the detailed characterization of nucleic acids. The technique is advantageous in DNA sequencing, genotyping, single nucleotide polymorphism analysis, allelic discrimination, allelic quantification and whole-genome sequencing. The technique may be broadly used in area of biotechnology, clinical genetics and pharmacogenetics. Due to efficacy and reliability, the technique may be used in the high-throughput analysis of bacterial and viral samples as well as metagenomic studies. Currently, the technique is the basis of next generation sequencing platform, offered by 454 Life Sciences as an array-based pyrosequencing technology.

Keywords : Pyrosequencing, real time PCR, diagnosis, luciferase, apyrase, emulsion PCR

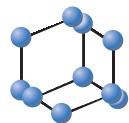
Introduction

The sequencing of DNA molecules started with the development of chemical cleavage method of Maxam-Gilbert during 1970s (1) followed by di-deoxy chain termination method (2). However, the whole genome sequencing of any organism was difficult and time

consuming task, hence leads to search for other alternatives. This has resulted in emergence of numerous sequencing methodologies, which can sequence about 2.8×10^6 base pairs/ day. Most of the modern technologies used for sequencing are modifications of Sanger's method. Ronaghi et al. (3) developed pyrosequencing, a simple technique analysing short to medium length DNA sequences. It can be used to analyse genetic variations like single-nucleotide polymorphisms (SNPs), determination of short sequence repeats (SSRs) and allelic imbalance in RNA, DNA methylation status and assessment of gene copy number (4). It is based on the principle "Sequencing by synthesis" (5). It is able to characterize diverse sequence populations with detection of low frequency variations efficiently. Highly sensitive mutational analysis like discovery of unknown mutations, quantification of alleles in mixed populations, characterization of contiguous and multivariable mutations can be performed. Its precision and accuracy provided with increased discriminatory power and sensitivity is pre-requisite of forensic analysis. This technique involves a cascade of enzymatic reactions; into which new strand is synthesized by addition of nucleotides and after each addition one pyrophosphate (PPi) is released. Because of the release of PPi (6), the reaction is called pyrosequencing. After each addition of nucleotide to the growing end, one PPi is released and visible light is generated, which is proportional to the number of incorporated nucleotides during synthesis of its complementary strand enzymatically (7).

The pyrosequencing completes in four stages: (i) amplification of target DNA by

REVIEW ARTICLE

BENTHAM
SCIENCE

Probiotics in Curing Allergic and Inflammatory Conditions - Research Progress and Futuristic Vision

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Abstract: **Background:** Probiotics constitute the viable and beneficial microbes, which offer a dietary means to sustain the balance of gastro-intestinal (GI) microflora. Owing to their multiple health benefits, these have recently gained wide attention among researchers for exploring their potential in safeguarding the health of humans and animals. Probiotics could also modulate host-immune responses, thereby help in counteracting the immunological dysfunctions. Probiotics can inhibit the systemic invasion of pathogens entering through the GI mucosa/ oral cavity and have been found to possess effective prophylactic and therapeutic utilities against various infectious pathogens as well as non-infectious diseases and disorders.



Kuldeep Dhama

Objective: The present review expedites the role of probiotics in curing the ailments related to allergic and inflammatory disease conditions.

Method: A thorough reviewing of the literature and patents available on probiotics and their role in countering inflammation and allergy was conducted using authentic published resources available on Medline, PubMed, PubMed Central, Science Direct and other scientific databases. The information retrieved has been compiled and analysed pertaining to the theme of the study.

Results: Various micro-organisms have been evaluated for their probiotic efficacy, among these, the lactic acid bacteria viz. *Lactobacillus* sp. and *Bifidobacterium* sp. have extensively been studied and widely exploited. In the current post-globalized era of self and complementary medicines, the concept of probiotics and their therapeutic as well as prophylactic usage is gaining wide acceptance. As more and more bacterial strains are being proven for their pronounced influence on down regulation of immune regulation, atopic, inflammatory conditions, the use of probiotics is getting increased especially in the developed countries where such indications are high in prevalence. Apart from usage in immune related disorders, probiotics have been found to be effective in treating pouchitis, infantile diarrhoea due to infections, bacterial vaginosis, urinary tract infections, dental caries, diabetes, cancers as well augmenting the gut mucosal tolerance to various antibiotics and lactose intolerance.

Conclusion: The resent review gives an insight towards potent utility of this branch of beneficial microbial therapy in allergy and inflammations, which is still in the emerging phase and more scientific evidences need to be explored regarding exploration of the mechanisms of action, further experimental trials and validation of controlled clinical studies in humans along with designing novel strategies for monitoring the possible microbial changes in their composition and metabolism associated with their interaction upon host immune system.

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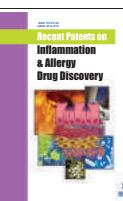
Keywords: Allergy, beneficial microbes, immune response, immunomodulation, inflammation, modes of action, probiotics, treatment.

INTRODUCTION

The gut microflora i.e. microbial population colonized in the gastro-intestinal (GI) tract and found to be beneficial for

the host itself has been termed as probiotics. These are live and viable microbial feed supplements, which functionally improve host health status by maintaining intestinal microbial balance. This health-promoting microbial community was discovered in the late nineteenth century, and apart from strengthening some basic nutritional supplementation, probiotics also provide several additional health benefits [1]. Pro-

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Review Article

Phytochemistry, Modes of Action and Beneficial Health Applications of Green Tea (*Camellia sinensis*) in Humans and Animals

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Abstract

Green tea is an important herb and its products are extensively used in the traditional Chinese medicinal system through various formulations. Several reports have revealed its beneficial usage and medicinal aspects for various ailments. Consumption of green tea has gained special attention and popularity in various sectors of the modern era of changing lifestyle. This review aimed to extend the current knowledge on the modes of action and beneficial applications of green tea in humans and animals for safeguarding different health issues. The nutritional, immunological, pharmacological and physiological functionalities of green tea are because of the available bioactive components like caffeine, L-theanine, polyphenols/flavonoids and others. It possesses multi-beneficial potential in treating and preventing various disorders of animals and humans, as well as promoting animal (dairy, piggery and goatry) and poultry industry. The present review provides insights on the modes of action and beneficial applications of green tea, which will be useful for nutritionists, pharmacists, physiologists, researchers, veterinarians and animal and poultry producers. Future research emphasis and promotional avenues are needed to explore its potential therapeutic applications for designing appropriate pharmaceuticals, complementary medicines and effective drugs to popularize and propagate its multidimensional health benefits.

Key words: Green tea, *Camellia sinensis*, phytochemistry, modes of action, antioxidant, antimicrobial, anticarcinogenic, anti-stressor, medicinal properties, health benefits

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Prevention and Control Strategies to Counter Zika Virus, a Special Focus on Intervention Approaches against Vector Mosquitoes—Current Updates

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Zika virus (ZIKV) is the most recent intruder that acquired the status of global threat creating panic and frightening situation to public owing to its rapid spread, attaining higher virulence and causing complex clinical manifestations including microcephaly in newborns and Guillain Barré Syndrome. Alike other flaviviruses, the principal mode of ZIKV transmission is by mosquitoes. Advances in research have provided reliable diagnostics for detecting ZIKV infection, while several drug/therapeutic targets and vaccine candidates have been identified recently. Despite these progresses, currently there is neither any effective drug nor any vaccine available against ZIKV. Under such circumstances and to tackle the problem at large, control measures of which mosquito population control need to be strengthened following appropriate mechanical, chemical, biological and genetic control measures. Apart from this, several other known modes of ZIKV transmission which have gained importance in recent past such as intrauterine, sexual intercourse, and blood-borne spread need to be checked and kept under control by adopting appropriate precautions and utmost care during sexual intercourse, blood transfusion and organ transplantation. The virus inactivation by pasteurization, detergents, chemicals, and filtration can effectively reduce viral load in plasma-derived medicinal products. Added to this, strengthening of the surveillance and monitoring of ZIKV as well as avoiding travel to Zika infected areas would aid in keeping viral infection under check. Here, we discuss the salient advances in the prevention and control strategies to combat ZIKV with a focus on highlighting various intervention approaches against the vector mosquitoes of this viral pathogen along with presenting an overview regarding human intervention measures to counter other modes of ZIKV transmission and spread. Additionally, owing to the success of vaccines for a number of infections globally, a separate section dealing with advances in ZIKV vaccines and transmission blocking vaccines has also been included.

Keywords: Zika virus, Zika fever, mosquito management, prevention, vector control, arbovirus



Nipah virus: epidemiology, pathology, immunobiology and advances in diagnosis, vaccine designing and control strategies – a comprehensive review



Raj Kumar Singh, Kuldeep Dham, Sandip Chakraborty, Ruchi Tiwari, Senthilkumar Natesan, Rekha Khandia, Ashok Munjal, Kranti Suresh Vora, Shyma K. Latheef, Kumaragurubaran Karthik, Yashpal Singh Malik, Rajendra Singh, Wanpen Chaicumpa & Devendra T. Mourya

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Short Communication

Molybdenum Salts Possess Potent Angiogenic Modulatory Properties: Validation on Chorioallantoic Membrane (CAM) of Chicken

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Abstract

Objective: Angiogenesis plays critical and essential role in various physiological processes of animals and humans. Present study reports the potential angiogenic modulatory effects of the two different molybdenum salts [molybdenum trioxide (MoO_3) and sodium molybdate dihydrate ($\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$)] on chorioallantoic membrane (CAM) of embryonated chicken eggs. **Methodology:** The three groups of the embryonated chicken eggs (1 control and 2 treated groups) were taken and 200 μL of 0.5 M of each of MoO_3 and $\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$ were directly introduced on to the CAM. The resealed eggs were incubated for 72 h in a humid incubator chamber at $37 \pm 1^\circ\text{C}$. Then the eggs were opened to observe the gross and histopathological alterations for angiogenesis modulation. **Results:** Gross examination revealed reduced number of secondary and tertiary blood vessels in MoO_3 treated group, while $\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$ treated group showed reduction in number of blood vessels with occasional haemorrhages. Histopathological analysis indicated pro-angiogenic effect of MoO_3 , with presence of numerous mesodermal blood vessels with normal CAM tissue architecture. However, Chorionic Ectoderm (CE) was absent at few places, with intact CE at most places, indicating requirement of critical dose optimization. The $\text{Na}_2\text{MoO}_4 \cdot 2\text{H}_2\text{O}$ was observed as anti-angiogenic, causing inflammation in CAM tissue with hemorrhage and thus can't be used for therapeutics. **Conclusion:** The pro-angiogenic properties of MoO_3 can be explored to treat ailments related to insufficient angiogenesis like coronary artery disease, chronic wounds, stroke and myocardial infarction. However, to avoid any kind of side effects, further qualitative and quantitative analysis and critical dose determination is required before going for clinical trials.

Key words: Angiogenesis, chorioallantoic membrane, molybdenum salts, endothelial cells, therapeutics

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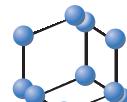
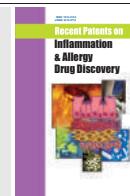
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Data Availability: All relevant data are within the paper and its supporting information files.

REVIEW ARTICLE

BENTHAM
SCIENCE***In vitro And In vivo Immunomodulating Properties of Mesenchymal Stem Cells***

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Abstract: **Background:** Mesenchymal Stem Cells (MSCs) are self-renewing, multipotent progenitor cells with multilineage potential to differentiate into all cell types of mesodermal origin, such as adipocytes, osteocytes and chondrocytes. Mesenchymal Stem Cells (MSCs) are adult stem cells which can be isolated from human and animal sources.

Objective: Besides the differentiation potential of MSCs, these also regulate the immune response in numerous ailments. The present review expedites the immunomodulating prospective of MSCs.

Methods: Scrupulous search of the literature and patents available on MSCs and their role in the immunomodulation was carried out using Medline, PubMed, PubMed Central, Science Direct and other scientific databases. The retrieved information has been analyzed and compiled.

Results: MSCs have unique regulation of microenvironment in the host tissue by secreting cytokines and immune-receptors which results in immunomodulatory effects. MSCs can be used as an effective tool in the treatment of chronic diseases because of its property to secrete anti-inflammatory molecules, having multilineage potential and immunomodulation.

Conclusion: The present review is focused on the use of MSCs due to their unique immunomodulatory characteristics. MSCs reach to the site of inflammation and interact with immune cells to bring immunosuppressive and anti-inflammatory effects. Along with these unique therapeutic properties, MSCs may be a useful therapeutic approach for various disorders.

Keywords: Cytokines, immunomodulation, inflammation, mesenchymal stem cells (MSCs), T-cells, therapeutic properties, Tregs.

1. INTRODUCTION

Mesenchymal Stem Cells (MSCs) have the ability to renew and can differentiate into various cell types such as osteocytes, adipocytes and chondrocytes [1]. Bone marrow is considered to be the eventual source of MSCs [2, 3]; however, these are also isolated from other tissues including adipose tissue [4, 5], placenta [6], amniotic fluid [7] and umbilical cord blood [8]. In addition to their differentiation potential, MSCs have been reported to regulate the immune responses in several diseases [9, 10]. Numerous reports have shown that adult MSCs can affect the T and B-cell

response: (a) adult MSCs suppress T-cell proliferation, cytokine secretion and cytotoxicity [11]. (b) MSCs increase B-cell viability, but also, may inhibit their proliferation and arrest the cell cycle; in addition, these affect the secretion of antibodies and production of co-stimulatory molecules in B-cells [12]. (c) MSCs inhibit the maturation, activation and antigen presentation of dendritic cells [13]. (d) They also suppress the cytotoxic effects of activated NK cells and down-regulate NK-activating receptors [14]. MSCs have been recognized as promising candidates for cellular therapy due to their accessibility and convenient expansion. In addition, MSCs also possess unique characteristics that make them attractive therapeutic agents for the treatment of various ailments. These are multipotent, which lead their application to regenerative medicine and tissue repair.

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Various strategies are being implicated to cure the solid tumor such as the use of toxins [15-17], cell penetrating peptides [18], metal nanoparticles and nanotechnology-based drugs [19-21], antiangiogenic strategies using metal salts [22]. MSCs also have the capacity to migrate towards the site of injury and tumor microenvironment to provide therapeutic benefits by secreting soluble factors like cytokines to induce an immunomodulatory environment. The potential of MSC therapy has been demonstrated in various clinical trials such as Graft Versus Host Disease (GVHD), cardiovascular disease, autoimmune disease and cancer. Clinical trials encompassing the usage of MSCs for diseases such as hematological disease, graft-versus-host disease, organ transplantation, diabetes, inflammatory diseases, and diseases in the liver, kidney, and lung, as well as cardiovascular, bone and cartilage, neurological, and autoimmune diseases have been reviewed [23], which indicate the ability of MSCs to treat these ailments. The present review is mainly focus on the immunomodulating potential of MSCs.

2. CHARACTERIZATION OF THE MSC POPULATIONS

Prior to the International Society for Cellular Therapy (ISCT) recommendations for defining MSCs in 2006, there was an inconsistency in the methods of isolation, expansion and characterization of MSCs, which was making the comparison of data from different laboratories difficult [24]. The ISCT offered a unified characterization criterion, which has reduced the variability in the experimental results and increased its legitimacy. The ISCT has proposed several positive and negative markers for MSCs; negative markers are the antigens present on the surface of hematopoietic cells, however, positive markers include the antigens absent in most of the hematopoietic cells [25], with an exclusion of HLA Class II that may be present on MSCs under cytokine stimulation [26]. CD34, CD45, CD11b and CD14, CD79 alpha and CD19 alpha are some negative markers for MSCs (<https://www.rndsystems.com/resources/articles/markers-and-methods-verify-mesenchymal-stem-cell-identity-potency-and-quality>), where CD73/5'-Nucleotidase, CD90/Thy, CD105/Endoglin are positive markers. The most recent marker to identify MSCs is STRO-1, which is being widely used, however its cognate antigen has not been identified so far. CD271/NGF R and Ganglioside GD2 [27]; that are highly expressed on clonogenic human bone marrow MSCs and exclusively present on MSCs but not on hematopoietic cells as well as Frizzled-9 (CD348), the expression of which might alter depending on the tissue source used for isolating MSCs [28]. Other strategies like cell sorting have been applied based on other antigens including CD49a, PDGFR- α/β , EGF receptor, Insulin-like Growth Factor Receptor (IGFR), and STRO-3, Collagen VI, CD44 and HLA-DR, CD146, CD56, D7-FIB, Nestin and leptin receptor [29].

2.1. Separation of MSCs

MSCs are fewer in number in the heterogeneous bone marrow. These are separated on the basis of their properties of adherence to tissue culture polystyrene, expression of

unique surface antigens and their ability to undergo differentiation into osteoblasts, adipocytes, and chondrocytes [30]. The standard protocol starts with the extraction of whole bone marrow followed by density gradient centrifugation, expansion in cell culture and cell sorting on the basis of surface markers [31]. Some commercial Mesenchymal Stem/Progenitor Cell Enrichment Kits are also available.

2.2. Assessment of Mesenchymal Cell Viability

For testing the viability of MSCs, the same methods are applied which are used for assessing the viability of normal cells growing in cell culture. Using alamarBlue™ assay, cell metabolic activity may be assessed and viable cells appear fluorescent red [32]. With trypan blue dye, dead cells appear blue, where the living cells appear white and transparent [33]. For scanning electron microscopy, the MSCs are fixed with glutaraldehyde and later post-fixed in 1% osmium tetroxide in sodium cacodylate buffer. Final treatment for electron microscopy includes the treatment with hexamethyldisalazane and mounting with gold/palladium sputter coated before observation. Using Calcein AM dye [34], the living cells after taking up the dye, acquire fluoresce green due to metabolized green-fluorescent product calcein. Annexin V and propidium iodide labelling is another method to check apoptosis and necrosis.

3. IMMUNOMODULATORY PROPERTIES OF MSCS IN VITRO

Initially, the immunomodulatory capabilities of MSCs were reported during T-cell proliferation assays. T lymphocyte activation and proliferation have shown to be suppressed by MSCs in *in vitro* system, where T-cell proliferation was induced by allo-antigens [35], mitogens [36] as well as by CD3 and CD28 antibodies [37]. The MSCs inhibit the cytotoxic effects of antigen-primed Cytotoxic T-cells (CTLs) [35]. Similarly, the suppression of T-cell proliferation by MSC has also been observed. Inhibition of proliferation is not prevented after separation of MSCs and PBMCs by a semi-permeable membrane, which indicates that the factor involved in immunosuppression is soluble [38]; however, the supernatant from human and MSCs from mouse did not exhibit inhibitory effect [39]. When MSCs are co cultured with lymphocytes, only then the supernatant from mouse MSCs shows the inhibition of proliferation of lymphocytes [40]. Human induced Pluripotent Stem Cells (iPSCs) differentiated MSC, possess low oncogenicity and strong immunomodulatory properties [41]. Prostaglandin E2 (PGE2) represents another candidate molecule in MSC mediated immunomodulation. Studies have revealed that iPSC-MSCs can inhibit phytohemagglutinin-stimulated lymphocyte proliferation in a dose dependent manner [42]. Upon co culturing with PBMCs, MSC starts constitutive production of PGE2 [43]. MSC-mediated inhibition of T-cell proliferation and cytokine production by T-cells, were observed to be mitigated by inhibiting PGE2 synthesis [43-45]. In the presence of inflammation, gene expression profile of MSCs changes; which further affects cell to cell contact and results in immunomodulation [46, 47].

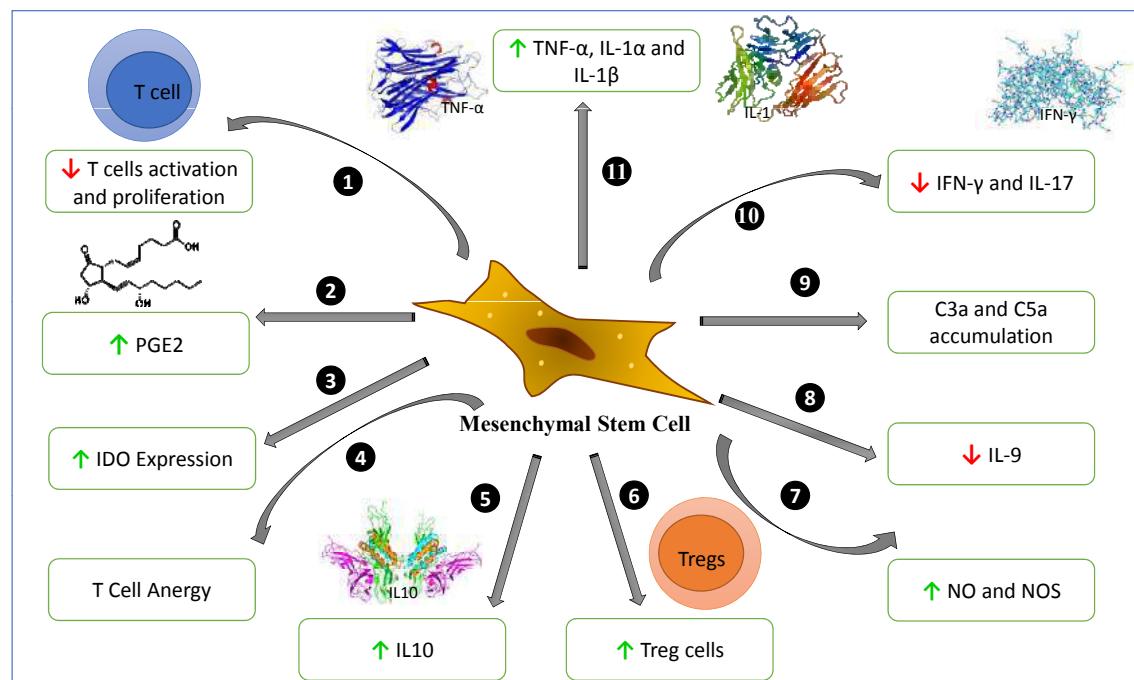


Fig. (1). Molecular mechanisms of MSCs in their immunoregulation (1) Suppression of T-cells activation and proliferation (2) Continuously secrete PGE2, which support suppression of T-cell proliferation and cytokine production by T-cells (3) IDO enzyme degrades tryptophan and inhibits lymphoproliferation (4) Due to absence of CD80 and CD86 on MSCs, cause anergy of T-cells (5) Produce anti-inflammatory IL10 (6) Induce CD8⁺ Treg cells, which inhibit allogeneic lymphocyte proliferation (7) Increase the levels of NO and NOS, which suppress TCR induced T-cells proliferation and cytokine production (8) A decrease in IL9 level is observed in AIA patients (9) HLA mismatched donor causes C3a and C5a accumulation on MSC surface (10) Allogenic MSCs reduce IFN- γ and IL17 (11) Increase in TNF- α , IL1 α and IL1 β , aid in immunosuppression.

The tryptophan catabolizing enzyme indoleamine 2, 3-dioxygenase (IDO) is supposed to play a key role in MSCs mediated suppression of T-cell (Fig. 1) [48]. Upon stimulation with IFN- γ , the IDO enzyme is expressed by MSCs, which degrade tryptophan and result in the inhibition of lymphoproliferation. However, the role of IDO enzyme in MSCs mediated immunosuppression is still unclear [44], but the degradation of this enzyme in proteasome reduces the immunosuppressive potential of clinical grade MSCs [49]. Conversion of tryptophan to kynurenine result in MSCs-induced apoptosis of T-cells [50]. MSC-induced T-cell anergy is considered to be responsible for immune suppression. Co-stimulatory molecules, such as CD80(B7-1) and CD86 (B7-2) are absent on the surface of MSCs and this absence renders the T-cells anergic, however the unresponsiveness of T-cells in the presence of MSC is transient and the removal of MSCs from the media restores the T-cell responsiveness [37], whereas others have demonstrated the T-cell mediated induction of tolerance in murine models [51]. MSCs cells overproducing IL10 reduce the severity of arthritis significantly during the course of murine Collagen-Induced Arthritis (CIA) delays the onset and reduces the clinical severity of CIA, which confirm the protective role of IL10 in inflammatory arthritis [52]. MSCs secreting IL10 is able to attenuate acute liver failure by inhibiting pyroptosis, an intense inflammatory response [53].

Another level of immune modulation by MSCs is through induction of regulatory T-cells (Tregs). CD8⁺

Tregs are induced by MSCs that are responsible for the inhibition of allogeneic lymphocyte proliferation [40, 54]. Furthermore, the induction of Tregs has been evidenced by an increase in the population of CD4⁺CD25⁺ cells, which displays a regulatory phenotype, forkhead box P3 (FOXP3⁺) in mitogen stimulated PBMC cultures in the presence of MSC [55], although the functional properties of these cells have not yet been demonstrated. The immunomodulatory properties of exosomes released from adipose mesenchymal stem cells under stimulation with inflammatory cytokines have been studied very recently against macrophages phenotype [56]. The hypothesis has been tested that adipogenic differentiation of MSCs alters their immunomodulatory properties in a tissue specific manner [57]. Multiple Sclerosis (MS) is a chronic inflammatory neurodegenerative disease of Central Nervous System (CNS). It has been postulated that MSC may be a new therapeutic method in MS therapy as MSC transplantation regulates the immune system in the CNS lesions region [58]. A patent is in application stage, which describes intralymphatic administration of adipose tissue derived MSCs to treat inflammation and autoimmune disorders [59] (Table 1) [60-77].

The “immunosuppressive” effect of MSCs might be attributed to a nonspecific anti-proliferative effect, and the evidence for the same have come from the study, that showed the ability of MSCs to inhibit proliferation of malignant cells

Table 1. Uses of Mesenchymal Stem Cells for Treatment of Various Diseases.

S. No.	Title of the Patent	Number Assigned	Year of Application/Grant	Status of Patent	Authors [Reference]
1.	Adipose-derived mesenchymal stem cells for intralymphatic administration in autoimmune and inflammatory diseases	WO2012095743	2012	Application	Dalemans, W., and Lombardo E. [59]
2.	Mesenchymal stem cells producing inhibitory RNA for disease modification	US20160263160	2016	Application	Nolta, J.A., Olson, S., and Wirthlin, L. [60]
3.	Genetically modified mesenchymal stem cells expressing alpha-1 antitrypsin (AAT)	WO2016110565	2016	Application	Günther, C., Sabine, Geiger-Schredelseker S., Hermann F., Huss R and Forster DL [61]
4.	Mesenchymal stem cells for prevention and treatment of immune responses in transplantation	WO1999047163	1999	Application	Mcintosh, K.R., Mosca, J.D. and Klyushnenkova, E.N. [62]
5.	ABCB5 positive mesenchymal stem cells as immunomodulators	US8455245	2013	Grant	Frank, M.H. [63]
6.	Human mesenchymal stem cells	US5486359	1996	Grant	Caplan, A.I., and Haynesworth, S.E. [64]
7.	Improved differentiation of mesenchymal stem cells into osteoblasts	EP2899266	2015	Application	Munoz, C.J.R., Diaz, T.J.M., Herenci, B.C., Rodriguez, O.M.E., Montes, D.G.A.R., Martinez-Moreno, J.M., Almaden, P.Y., Rodriguez, P.M., Aljama, G.P., Gundlach, K., Mirjam, P., Büchel, J., Steppan, S., Passlick-Deetjen, J. [65]
8.	Mesenchymal stem cells for the treatment of CNS diseases	US9474787	2016	Grant	Kadouri, A., Bar-Ilan, A., Melamed, E., Offen, D., Sadan, O., and Bahat-Stromza, M. [66]
9.	Genetically modified mesenchymal stem cells expressing an immune response-stimulating cytokine to attract and/or activate immune cells	WO2016026854	2016	Application	Günther, C., Theoharis, S., Hermann, F. and Ralf Huss, R. [67]
10.	Mesenchymal stem cell compositions for the treatment of microbial infections	US20140134140	2014	Application	Caplan, A.I. and Bonfield, T.L. [68]
11.	Mesenchymal stem cells producing inhibitory RNA for disease Modification	US20120114618	2012	Application	Nolta, J.A., Olson, S., and Wirthlin, L. [69]
12.	Methods of generating mesenchymal stem cells which secrete neurotrophic factors	WO2014024183	2014	Application	Gothelf, Y., Levy, Y. and Burshtein, A. [70]
13.	Mesenchymal stem cells for oral inflammation treatment	US20160199414	2016	Application	Arzi, B., Borjesson, D.L., and Verstraete, F.J.M. [71]
14.	Encapsulated stem cells for the treatment of inflammatory disease	WO2016086020	2016	Application	Weiss, M., and Grumet, M.H. [72]
15.	Activated mesenchymal stem cells for wound healing and impaired tissue regeneration	US9011840	2015	Grant	Bartholomew, A., Lee, S. and Szilagyi, E. [73]
16.	An isolated multipotent mesenchymal stem cell from human adult glomeruli (hGL-MSC), a method of preparing thereof and uses thereof in the regenerative medicine of the kidney	WO2010052192	2010	Application	Camussi, G., Bruno S., and Bussolati, B. [74]
17.	Stem cell carrier and method for bone regeneration with 3D customized CAD/CAM using the carrier	EP3034102	2016	Application	Lee, J.J. [75]
18.	Management of osteoarthritis using pooled allogeneic mesenchymal stem cells	WO2015022670	2015	Application	Gupta, P.K., House, A.C., Das A.K., Majumdar, A.S., Raj, S.S., Balasubramanian, S., Rengasamy, M. [76]
19.	Hypoxia-cultured mesenchymal stem cells for treating atherosclerotic lesions	US20160113968	2016	Application	Hung, S.C. [77]

from different lineages [78]. In MSC-mediated mechanism of immunosuppression, Nitric Oxide (NO) is considered as one of the prominent candidates [79]. The NO is another soluble factor known to inhibit T-cell proliferation [80]. NO and NO-derived reactive nitrogen species can interact with many enzymes, ion channels, and receptors [81, 82]. NO production is catalyzed by the Nitric Oxide Synthases (NOS). NO has a well-established role in macrophage function, and has been shown to affect TCR signaling, cytokine receptor expression, and the phenotype of T-cells [83]. At high concentrations, NO inhibits TCR induced T-cell proliferation and cytokine production [83, 84]. NO produced by MSCs has been found to suppress Signal Transducer and Activator of Transcription 5 (STAT5) phosphorylation and inhibit T-cell proliferation [79, 85]. One of the salient characteristics of MSCs is the ability to migrate to the sites of damaged tissue [86, 87]. These key properties make the potential use of MSCs in regenerative medicine.

Interestingly, MSCs have also been shown to produce several chemokines [88-90], which may serve to recruit lymphocytes. Since NO is highly unstable, it only acts locally and it is conceivable that immune cells would need to be recruited into close proximity with MSCs in order to be affected by NO produced by the MSCs. According to this premise, chemokine-mediated lymphocyte mobilization would be a key step in MSC mediated immunosuppression. In addition, the effect of wild type MSCs on the suppression of the Mixed Lymphocyte Reaction (MLR) is an *in vitro* reflection of GVHD. It was found that MSCs also suppressed the MLR in a manner dependent on NO and inflammatory cytokines. These results strongly suggest that NO produced by cytokine induced MSCs mediates the suppression of T-cells [91]. Inducible nitric oxide synthase and heme oxygenase-1 expressed by MSCs have also been implicated for their properties [79]. The potent efficacy of systemic MSCs administration has been evaluated for oxidative stress in sulfur mustard-exposed patients. The expression of antioxidant genes such as metallothionein 3, glutathione reductase and glutathione peroxidase 2 level was found to increase post cell therapy [92]. The mechanisms of immune-suppression are not mutually exclusive and the relative contribution of each mechanism in modulating the immune responses varies in different experimental models.

4. IMMUNOMODULATORY PROPERTIES OF MSCS *IN VIVO*

For testing alloreactive immunity (organ and stem cell transplantation), autoimmunity or tumor immunity, various animal models have been tested to see the immunomodulatory effects of MSCs [93, 94]. Investigators had examined the potential of MSCs in immunomodulation in various disease models and they have been tested mainly in the rodent model [95]. The initial *in vivo* studies demonstrated that the systemic infusion of bone marrow derived allogeneic MSCs prolonged the survival of baboons for allogeneic skin-grafts to 11 days compared with 7 days in animals not receiving MSCs [96]. The therapeutic efficacy of MSC has been investigated in rodent models of arthritis. The results obtained from these studies were found to be highly inconsistent with a significant deterioration in arthritis after treatment with

MSC [91]. Infusion of syngeneic host-derived MSCs in a murine allogeneic bone marrow transplantation model has shown reduction in the rejection of allogeneic stem cell grafts [97]. Although, the reason behind the lower allograft rejection rate is still not clear. One of the most important implications of MSCs treatment has been observed in the treatment of GVHD. Adipose tissue derived MSCs are proliferated *in vivo* and are systemically infused to treat GVHD. MSCs treatment prevents post-transplant lethal GVHD in mice, caused by haplo- identical hematopoietic stem cells grafts [11]. Early after the transplantation, infusion of MSCs has been shown to control GVHD. Further, multiple infusions are required to reduce the severity of GVHD at the time of an allogeneic bone marrow transplantation in mice [98].

MSC treatment may be potentially used to treat autoimmunity [99]. Murine MSCs are being used to study Experimental Autoimmune Encephalomyelitis (EAE), a model of human multiple sclerosis, where MSCs induce peripheral T-cell tolerance against pathogenic antigen [51, 100]. The MSCs infusion has been proven to be effective during onset and peak of disease, but not after stabilization of disease. Contrarily, the administration of MSCs has no positive effects on Collagen-Induced Arthritis (CIA) in Rheumatoid Arthritis (RA) murine model [93]. Recently, the therapeutic efficacy of MSCs has been investigated in rodent model of arthritis [101]. The evaluation of the therapeutic paracrine action of bone marrow derived MSCs has been employed on the IL9 level in Adjuvant-Induced Arthritis (AIA) and the decreased IL9 levels were observed in AIA [102]. It has been demonstrated that MSCs can prevent the rejection of allogeneic tumor cells in immuno-competent mice. MSCs infusion near the B16 melanoma cell implants resulted in increased tumor growth, where only melanoma cell implant was removed by immune system [40]. In a rat kidney model of ischemia/reperfusion injury, soluble immunomodulating factors have been secreted by MSCs, which provide protection [103]. In an experimental rat model of glomerulonephritis, MSC infusion accelerated glomerular healing owing to the release of soluble factor [104]. MSCs preferentially migrate to the site of tissue damage or tumor growth [105]. Donor MSC administered intravenously to MHC mismatched recipient baboons before the placement of second and third-party skin grafts which led to prolonged allograft survival [96]. When HLA-mismatched MSC was infused in hematopoietic stem cell transplantation recipient, they are proved to be weakly immunogenic in humans [106]. MSCs from mismatched tumor have been shown to trigger complement-mediated lymphoid and myeloid effector cell activation along with the accumulation of C3-derived fragments iC3b and C3dg on MSCs and generation of C3a and C5a [107]. Culture-expanded human MSCs may elicit an innate immune attack, which has been demonstrated to reduce the survival, and is known as an instant blood-mediated inflammatory reaction. Clinical grade MSCs obtained from low passage cultures, elicit lesser systemic effects, in comparison to those cells obtained after a higher number of passages [108] and this requires careful selection of cell culture conditions, quantity of MSCs to be used and the passage number. Administration of MSCs from allogenic donor, significantly blunts the immune cell infiltration and reduces IFN- γ and

IL17 levels. Pretreatment of allogenic MSCs with IFN- γ leads to higher expression of MHC I, MHC II and CCL2. Allogenic MSCs' administration is able to prevent manifestations of experimental autoimmune encephalomyelitis in mice [109]. Immunosuppression by MSCs is brought by unknown mechanism. Immunosuppressive activity is gained through IFN- γ along with concomitant presence of TNF- α and IL1 α , IL1 β . Together these cytokines enable the expression of other chemokines and inducible nitric oxide synthase by MSCs. Under the influence of chemokines, T-cells are migrated towards the MSCs and due to nitric oxide, T-cell responsiveness is inhibited. Hence the immunosuppression by MSCs is obtained through the combined action of chemokines and NO [110]. It has also been studied that the immunoregulatory ability of murine MSCs can treat myelin oligodendrocyte glycoprotein-induced experimental autoimmune encephalomyelitis in C57BL/6J mice [51].

The immunoregulatory properties of MSCs can effectively interfere with the autoimmune attack in the course of experimental autoimmune encephalomyelitis [111]. It is a state of *in vivo* T-cell unresponsiveness within secondary lymphoid organs. Allogeneic murine MSCs have been found to be able to prevent tissue damage in collagen-induced arthritis. Human rheumatoid arthritis in DBA-1 mice model was studied and it has been shown that MSCs exert their immunomodulatory function by educating antigen-specific regulatory T-cells [2, 39]. MSCs have also been successfully used in the treatment of steroid-refractory GVHD in both experimental animals [112] and in humans [94, 113]. The successful control of GVHD in mice has been reported but the murine MSCs were extracted from a different cellular source (i.e., adipose tissue) (Yanez *et al.*, 2006) [11]. Rather than bone marrow derived MSCs (BMMSCs), the new MSC types i.e. placental MSCs (pMSCs) have been considered to modulate the immune functions of important immune cells involved in alloantigen recognition and elimination. Clinical trials employ MSCs to treat various human immunological diseases, such as Multiple Sclerosis (MS) and Type 1 diabetes [114]. The mentioned studies certainly provide support as well as contradiction about the therapeutic utility of MSCs. Also we can say that there are numerous studies that support the immunomodulatory characteristics of MSCs *in vitro* but there have been mixed findings *in vivo*.

5. MESENCHYMAL STEM CELLS AND DISEASE AMELIORATION

5.1. MSCs in Treating Osteoarthritis

Osteoarthritis (OA) is a major cause of chronic pain in joints. Hyaluronic Acid (HA) intra-articular injections are the current therapies which are routinely used now-a-days. MSCs have the capability to differentiate into osteoblasts, chondrocytes and adipocytes [115]. Autologous MSCs have shown potential to differentiate into cartilage and bone, thereby exhibiting their potential in the treatment of OA [116, 117]. In a goat model, when OA was induced surgically, injection of bone marrow derived MSCs was able to regenerate chondral tissue [118]. Autologous adipose tissue derived MSCs (AD-MSCs) have been assessed for knee osteoarthritis in 18 patients and results showed that high amount of MSCs inoculation in knee resulted in improve-

ment in function and pain of the knee joint without exerting any adverse effects [119]. A patent application has been applied for a kit, which can be used to treat osteoarthritis containing pooled allogeneic mesenchymal stromal cell from multiple donors having diverse HLA genotypes [76].

5.2. MSCs in Treating Inflammatory Bowel Disease

Inflammatory Bowel Disease (IBD) is possibly the outcome of the inappropriate host immune response intestinal microbes and it is comprised of Ulcerative Colitis (UC) and Crohn's Disease (CD). Infused allogeneic MSCs, obtained from the bone marrow or umbilical cord were given as intravenous infusions to 8 patients and there was a significant reduction in Crohn's disease activity index scores [120]. In order to induce chronic IBD dextran sodium 26 Q7 Sulfate (DSS) inoculated in IBD model mice and improvements in bloody and watery stool, weight loss and histopathological profile were observed in MSCs treated mice group in comparison to paired PBS treated group [121]. Systemic infusion of MSCs has been found to ameliorate the clinical and histopathologic severity of colitis [122].

5.3. Chronic Periodontitis

It is considered that undifferentiated mesenchymal cells present in the alveolar bone of the jaws, may be introduced in the root canal space to form new odontoblasts [123]. Dental pulp MSCs when introduced in immune-compromised mice, the two cells formed bone marrow like and dentin-pulp-like complexes respectively [124]. Induced pluripotent stem cells have been evaluated for the production of new cementum, alveolar bone and ameloblast [125, 126]. The meta-analysis of clinical studies revealed that the MSC may have beneficial effects on periodontal regeneration [127].

5.4. MSCs in Ameliorating Atherosclerosis

Atherosclerosis is due to dyslipidemia and chronic inflammation. Signaling pathways encompassing NF- κ B is included in the initiation of atherosclerosis [128]. (MSC treatment has been shown to affect not only inflammatory responses but also significantly reduces dyslipidaemia in mice. This makes MSCs a potent candidate for atherosclerosis [129]. The MSC transplantation modulates cytokine and chemokine secretion, promotes regulatory T-cell function and stabilizes atherosclerotic plaque [130]. A pharmaceutical composition containing cultured MSCs under hypoxic conditions has been applied for patent grant by Hung [77].

5.5. MSCs in Ameliorating Allergy

The MSCs derived from human-induced pluripotent stem cells (iPSCs) result in immunomodulation during the allergic rhinitis *in vitro*. The ovalbumin (OVA)-induced allergic inflammation in mice model, the effects of administration of human iPSC-MSCs and bone marrow-derived MSCs were evaluated for the treatment of allergies and the result suggested that both MSCs reduced serum IgE and also interleukin (IL)-4, IL5, or IL13 in the bronchoalveolar and/or nasal lavage fluids, indicative of their potential in treating asthma and allergic rhinitis [131]. Human umbilical cord mesenchymal stem cells (hUC-MSCs), transplanted in the trachea of ovalbumin (OVA)-induced asthma mouse model, and T17

cells were significantly reduced in comparison to asthmatic mice with significantly suppressed mRNA levels of inflammatory molecules IL6 and TGF- β [132]. huMSC treatment has been shown to reduce OVA-induced allergic inflammation by Tregs [133]. The potent efficacy of systemic MSC administration has been evaluated for inflammation-related genes in sulfur mustard-exposed patients. Upregulation of inflammation-related genes after mesenchymal stem cell therapy was observed [134]. A list of patents has been given in Table 1, among which, mesenchymal cells have been used to treat different inflammatory and autoimmune disorders [59-77].

5.6. MSCs in Ameliorating Hypertension

Hypertension caused by the renovascular system is often problematic as in most of the cases, many antihypertensive drugs, including the RAS blockers, are not always effective. Hence new approaches are needed and MSCs have provided a new ray of hope to such patients. MSC are able to prevent the progressive increase of blood pressure and reduce circulating Ang II and renin levels. MSCs release growth factors and cytokines including VEGF, HGF, IGF-1 and adrenomedullin, which possibly act in a paracrine manner on neighboring cells and when these are administered intravenously, these produce an antihypertensive effect [135]. Though the mechanism is not clear, MSC treatment of hypertensive 2 kidneys-1 clip (2K-1C) rat model brought normalization in the increase in IL1 β , TNF- α angiotensinogen, ACE, and Ang II receptor AT1 and a decrease in AT2 levels post hypertension induction. The treatment reduced gradually increasing arterial pressure and subsided inflammatory cytokines. In 2K-1C model of renovascular hypertension, increased sodium excretion and improvement in glomerular filtration rate by contralateral kidneys were observed post-MSCs treatment [136].

CONCLUSION

The MSCs are multipotent cells with a potential to differentiate into different cell types of mesodermal origin including adipocytes, osteocytes, and chondrocytes. Bone marrow is the major source of MSCs including others also like adipose tissue, placenta, amniotic fluid, umbilical cord blood etc. The potential immunomodulatory capacity, the easy isolation and the potential for multi-lineage differentiation make MSCs an interesting candidate for clinical research. Clinical evidence suggests that MSCs may have great potential in the treatment and prevention of degenerative diseases and immune-mediated diseases. Due to their immunotolerance property, the MSCs are considered as effective universal donor cells. Since MSCs have potential to migrate towards the site of tumor microenvironment, genetic modification of MSCs to overexpress antitumor genes may provide an excellent strategy to combat cancer in clinical settings. The present review mainly focused on the immunomodulatory potential of MSCs *in vitro* and *in vivo* settings and current reports of usage of MSCs in clinical therapies highlight their therapeutic potential. However, additional studies concerning MSCs preparation techniques, immunogenicity, tumorigenic potential, survival as well as their optimal dose, route of administration will improve the safety of MSC based therapeutic strategies.

CURRENT AND FUTURE DEVELOPMENTS

Mesenchymal Stem Cells (MSCs) synthesize several biomolecules, which modulate both positive and negative im-

mune responses. Immunomodulatory properties of MSCs have been well recognized including the expression of the MHC-I antigen, along with co-stimulatory molecules required for T-cell proliferation and activation, as well as various cytokines and other trophic factors. Several mechanisms have been advocated for the immunomodulatory effects of MSCs and ambiguities and inconsistencies still prevail. MSC can induce immune regulatory cells, those cells along with different mediators, are key players for the final outcome either to be tolerogenic or immunopotentiating effect. Scientists are optimistic to develop the technique that would be suitable for improving MSC-based immunomodulatory therapeutic strategies.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

No Animals/Humans were used for studies that are the basis of this research.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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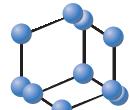
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REVIEW ARTICLE



BENTHAM SCIENCE

Medicinal and Therapeutic Potential of Herbs and Plant Metabolites / Extracts Counteracting Viral Pathogens - Current Knowledge and Future Prospects



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Abstract: **Background:** Recently, there has been a remarkable progress in the field of antiviral herbal therapy owing to increasing concerns about the development of drug resistance and limited advances in the field of antiviral drug discovery. In almost all countries, medicinal plants have been used widely throughout history for the treatment of diseases and infections as traditional healing remedies due to their broad therapeutic spectrum and minimal or no side effects. As synthetic antiviral drugs are not available against most of the viral agents, hence all possible efforts have been focused on the search for new drugs and complementary/alternative medicines from different herbal formulations.

Methods: We have retrieved the related information from the online published resources (Medline, PubMed, PubMed Central, Science Direct and other scientific databases); which were further analyzed and compiled.

Results: Medicinal plants contain extractable biochemical and bioactive compounds, which can target certain viruses or can cure or prevent several viral diseases and infections. Despite their long history of use, the research and scientific evidences regarding the use of medicinal plants and natural products as prophylactics, therapeutics, and their health multiple beneficial applications have only gained momentum in past few decades. Many scientific studies have been undertaken, which range from the separation of active substances to the comprehension of the therapeutic mechanisms of antiviral herbs, their potent applications in the neutralization of viral pathogens and clinical trials. Consequently, hundreds of herbs and plant metabolites have been screened, identified, and tested for their antiviral activities; fortunately, some have shown significant medicinal activity in the amelioration or prevention of various viral diseases in both preclinical and clinical studies.

Conclusion: This review addresses the scientific significance of various herbal formulations of different medicinal plants and their extracts, which have shown promise or been proven effective for the treatment of diseases caused by various viral pathogens, including emerging and re-emerging viruses that infect humans, animals, poultry and fish.

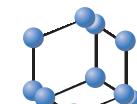
Keywords: Medicinal plants, herbs, viral pathogens, anti-viral activity, modes of action, herbal medicine.

1. INTRODUCTION

Viral pathogens are responsible for substantial mortality and morbidity among humans and animals, worldwide. Infectious viral pathogens are one of the major global threats to livestock animals and public health [1-8]. The limited therapeutic efficiency of the available drugs has led to a dependence on various vaccines for

prevention of viral diseases [9-11]. The preparation of vaccines against some diseases, such as rabies, measles, polio, smallpox, hepatitis and others, has been so far successful; however, many viral diseases still pose high public health concerns and threats to animal population without any specific effective preventive vaccination [12, 13]. Hence, designing and developing effective antiviral drugs and therapies could be a valuable option to counter viral pathogens, especially against deadly viruses and flaring up of emergency situations of emerging and re-emerging infectious viral diseases having high public health significance and posing pandemic threats. The term "antiviral agents" refers to any substance

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BENTHAM
SCIENCE

REVIEW ARTICLE

Molecular Signatures of Biomarkers in Cancer Development, Diagnosis, and its Prognostic Accuracy



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Abstract: **Background:** In many cancers, predictive factors are important for recognition of high-risk patients and amongst individualizing treatment. The understanding of these mechanisms might provide novel and useful approaches for preventing, diagnosing and treating different cancers.

Objective: The main objective of this review is to extend the current knowledge on the various tumor biomarkers targeting prognosis and therapies of human cancers.

Methods: The present review is based on the extensive churning, analyzing and compilation of the salient information on tumor biomarkers from the authentic published literature available in PubMed and other scientific databases. The information also includes the implicative role of nucleic acids, apolipoproteins, inflammatory biomolecules, receptors, DNA modification, carbohydrate antigens and metabolite signatures as biomarkers for cancer.

Results: In this review, we have summarized some tumor biomarkers, which would improve prognostic efficiency and accuracy among patients with cancer particularly for ovarian, lung, breast, melanoma and pancreatic cancer.

Conclusion: This review provides in-depth insights of the use and importance of cancer biomarkers in our understanding as well improve knowledge regarding cancer management in clinical practice that will facilitate a more effective prognosis with least undesired systemic toxicity. However, development and evaluation of cancer biomarkers demand a complete understanding of the molecular processes and cellular mechanisms during the onset of cancer; as well how a little modification in regulatory metabolites, proteins or genes can disrupt various kinds of cellular functions and lead to cancer.

Keywords: Autoantibody, biomarkers, breast cancer, diagnosis, lung cancer, melanoma, prognosis, treatment.

1. INTRODUCTION

Research has long desired to discover biomarkers that could identify cancer at an early stage, or anticipate the optimal cancer therapy for specific patients. Every type of cell has a specific molecular signature, attributed as biomarkers [1]. Genomics, proteomics, and metabolomics can enable

researchers to depict the molecular fingerprints of specific cancers and adjust their classification in accordance with the molecular imperfections they harbor. Gene mutations could alter the gene expression, protein statute as well as metabolites. These processes reveal opportunities for identifying biomarkers. The discovery and development of novel cancer biomarkers could potentially improve cancer monitoring, screening the cancer progression, diagnosis, making a cancer prognosis and the progression of cancer treatment [1, 2]. The significant effects of cancer biomarkers could be the cost-effectiveness of cancer treatment and detection; these could

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APB

Modulation of Dengue/Zika Virus Pathogenicity by Antibody-Dependent Enhancement and Strategies to Protect Against Enhancement in Zika Virus Infection

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Antibody-dependent enhancement (ADE) is a phenomenon in which preexisting poorly neutralizing antibodies leads to enhanced infection. It is a serious concern with mosquito-borne flaviviruses such as Dengue virus (DENV) and Zika virus (ZIKV). *In vitro* experimental evidences have indicated the preventive, as well as a pathogenicity-enhancing role, of preexisting DENV antibodies in ZIKV infections. ADE has been confirmed in DENV but not ZIKV infections. Principally, the Fc region of the anti-DENV antibody binds with the fragment crystallizable gamma receptor (FcγR), and subsequent C1q interactions and immune effector functions are responsible for the ADE. In contrast to normal DENV infections, with ADE in DENV infections, inhibition of STAT1 phosphorylation and a reduction in IRF-1 gene expression, NOS2 levels, and RIG-1 and MDA-5 expression levels occurs. FcγRIIA is the most permissive FcγR for DENV-ADE, and under hypoxic conditions, hypoxia-inducible factor-1 alpha transcriptionally enhances expression levels of FcγRIIA, which further enhances ADE. To produce therapeutic antibodies with broad reactivity to different DENV serotypes, as well as to ZIKV, bispecific antibodies, Fc region mutants, modified Fc regions, and anti-idiotypic antibodies may be engineered. An in-depth understanding of the immunological and molecular mechanisms of DENV-ADE of ZIKV pathogenicity will be useful for the design of common and safe therapeutics and prophylactics against both viral pathogens. The present review discusses the role of DENV antibodies in modulating DENV/ZIKV pathogenicity/infection and strategies to counter ADE to protect against Zika infection.

Keywords: antibody-dependent enhancement, Dengue virus, Zika virus, pathogenesis, counteracting strategies, engineered antibodies

REVIEW ARTICLE

Medicinal and Beneficial Health Applications of *Tinospora cordifolia* (Guduchi): A Miraculous Herb Countering Various Diseases/Disorders and its Immunomodulatory Effects



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Abstract: **Background:** Plants have been known as an integral part of traditional medicine because of their phytoconstituents with their miraculous substances. *Tinospora cordifolia* (Guduchi/ Giloy) is one such plant having pharmacological functions and medicinal values due to its several constituents such as terpenes, glycosides, alkaloids, steroids and flavonoids. Thus, it has been rightly mentioned in old texts as "Amrita".

Objective: The objective of the present review is to extend the current knowledge, importance and beneficial pharmacological applications of guduchi in humans for safeguarding various health issues.

Methods: We extensively reviewed, analyzed and compiled salient information from the published literature available in PubMed and other scientific databases.

Results: The present review describes medicinal applications of *T. cordifolia* in countering various disorders and usages as anti-oxidant, anti-hyperglycemic, antihyperlipidemic, hepatoprotective, cardiovascular protective, neuroprotective, osteoprotective, radioprotective, anti-anxiety, adaptogenic agent, analgesic, anti-inflammatory, antipyretic, a thrombolytic agent, anti-diarrheal, anti-ulcer, anti-microbial and anti-cancer agent. The plant is also a source of micronutrients viz. copper, calcium, phosphorus, iron, zinc and manganese. A special focus has been made on its health benefits in treating endocrine and metabolic disorders and its potential as an immune booster. Several patents have been filed and granted to inventions encompassing *T. cordifolia* as a major component of therapeutics for ameliorating metabolic, endocrinial and several other ailments, aiding in the betterment of human life expectancy.

Conclusion: The information presented would be beneficial for researchers, medical professionals and pharmaceutical companies to design and develop effective medicines, drugs and health products exploiting the multiple as well as specific modes of actions of *T. cordifolia*, and also help in promoting and popularizing this rich herb having promising potentials to prevent and treat various ailments.

Keywords: Adaptogen, anti-hyperglycemic, anti-hyperlipidemic, endocrine system modulation, herb, immune booster, metabolism enhancer, *Tinospora cordifolia*.

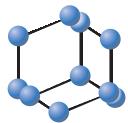
INTRODUCTION

A healthy body can only be a happy body when it can perform all the functions efficiently. In the current era of

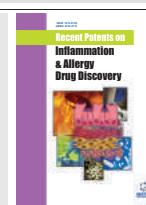
modernization and globalization, there is an increasing trend in the number of infectious and non-infectious diseases due to various predisposing factors viz., the unhealthy dietary habits, stress, work pressure, change in climate, rising antimicrobial resistance in microbial pathogens and others [1-3]. Apart from flaring up of various emerging and re-emerging pathogens, incidences of diseases like diabetes, heart problems, cholesterol, rheumatoid arthritis, blood pres-

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REVIEW ARTICLE

BENTHAM
SCIENCE

Heat Shock Proteins: Therapeutic Perspectives in Inflammatory Disorders

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Abstract: **Background:** Heat shock proteins (HSPs) are highly conserved proteins present in all kingdoms of organisms. These are expressed under stress conditions in order to protect the cells from injuries. The stress induced protein denaturation is rectified by refolding and remodelling. These are intracellular proteins but can be present in extracellular fluid like serum of the patients suffering from trauma, autoimmune and inflammatory disorders. Virtually in most inflammatory diseases, immune response towards HSPs is developed.

Objective: The present review expedites the role of HSPs in inflammatory process and associated disorders, mainly in context to HSP70 and HSP90.

Method: Commencing a thorough survey of the literature and patents available on HSPs and their role in the process of inflammation, from the authentic published resources available on Medline, Pubmed, Pubmed Central, Science Direct and other scientific databases; the information retrieved has been compiled and analyzed.



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Results: HSPs modulate the process of inflammation by producing anti-inflammatory cytokines in chronic inflammatory disease. HSPs mediated expression of IL10 contributes in anti-inflammatory role via TLR2 and TLR4-dependent mechanisms. Necroptosis, a caspase independent programmed apoptosis plays an important role in progression of several inflammatory disorders and its major components MLKL and RIPK-1 are the clients of HSP. Necroptosis is also involved in exposure of several damage-associated molecular patterns (DAMPs) including HSPs in extracellular environment leading to inflammation. Endocytosed or intracellular HSP70, is presented by MHC-II molecules and in absence of proper co stimulation, it lead to expansion of tolerogenic or regulatory T cells (Tregs) responses, which have inflammation suppressive activity by virtue of production of anti-inflammatory cytokines, suppression or killing of effector T cells or bringing the APC into tolerogenic state. HSP induced Tregs play an important role in combating autoimmunity and inflammation.

Conclusion: Present review gives an insight towards the cause of inflammation and an account of different HSPs contributing various inflammatory disorders viz. inflammatory bowel disease (IBD), intestinal inflammation, atherosclerosis, rheumatoid arthritis (RA), multiple sclerosis etc. The importance of HSPs in handling inflammatory disorders has been depicted in recent patents also.

Keywords: Heat shock proteins (HSPs), inflammation, IL-10, molecular chaperon, necroptosis, NF-κB pathway, Tregs, TLR.

INTRODUCTION

Stress proteins or heat shock proteins (HSPs) are the highly conserved proteins expressed in both the prokaryotic and eukaryotic cells with the archetypical role to protect cells [1]. These are molecular chaperones, responsible for correct folding of the proteins and prevent protein aggregation and denaturation within the cell. Mammalian HSPs, on the basis of their molecular size, are comprised of five families viz. HSP110, HSP90, HSP70, HSP60 and the small HSPs (15 to 30 kDa). The small HSPs are ATP independent, whereas the other higher molecular weights HSPs (HSP110, HSP90, HSP70 and HSP60) are ATP dependent. The expression of

HSPs is activated after prototoxic stimuli to the cells; which include thermal stress, ischemia, heavy metals, bacterial or viral infection, nutritional deficit, few IFN inducers and different cytokines [2]. The most common families of HSPs are HSP70 and HSP90. Both have been implicated to affect innate immune response and inflammation. Under stress conditions, the HSPs are secreted outside the cell, where phagocytosis by macrophages increases reactive oxygen species (ROS), reactive nitrogen species (RNS) and pro-inflammatory mediators. Extracellular HSPs activate macrophages promoting local inflammatory reaction [3].

HSPs play a role in the modulation of immune responses and their expression level is altered in different pathological conditions. Different HSP families have different structure with no sequence homology, with the fact that these are governed by different transcription factors and not activated in the co-ordinate manner. These are involved in diverse func-

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Research Article

Evaluation of the Modulatory Effects of Copper Salts on the Process of Angiogenesis (Neovascularization) with Therapeutic Perspectives

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Abstract | Angiogenesis is a vital physiological process of formation and development of new blood vessels (neovascularization) from pre-existing ones, essential for embryonic development and growth especially in the growing stages. Copper (Cu) is known to promote angiogenic factors like VEGF (Vascular Endothelial Growth Factor), FGF (Fibroblast growth factor), angiopoitin and others, and as per previous reports, depending upon the material, Cu sometimes inhibit angiogenesis. We investigated the effects of different Cu salts (Copper chloride, copper acetate, alkaline copper tartrate and copper carbonate) on the process of angiogenesis among chicken chorioallantoic membrane (CAM) model by assessing histopathological alterations. Out of the four Cu salts studied, copper carbonate was found to be pro-angiogenic and did not reveal any detrimental effect, and therefore can have potential to be explored as a therapeutic material under health conditions requiring neovascularization. Rest other Cu salts (Copper chloride, copper acetate and alkaline copper tartrate) investigated were anti-angiogenic and induced inflammation in experimental material. Observing the importance of Cu in neovascularization, its salts can be used in therapeutic strategy either for treating disorders caused by excess angiogenesis or reduced angiogenesis.

Keywords | Angiogenesis, Neovascularization, Endothelial cells, Chorioallantoic membrane, Copper salts, Therapy

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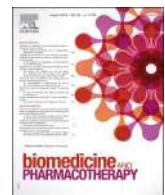
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INTRODUCTION

The term 'angiogenesis' refers to formation and development of new blood vessels (neovascularization) from the pre-existing ones (Birbrair et al., 2014; 2015). It is a multi-step and complex physiological process, essential for development (Yoo and Kwon, 2013), growth (Van Lessen et al., 2015) and wound healing (Johnson and Traci, 2014). Both excessive and insufficient angiogenesis conditions are responsible for pathological interventions. Excessive angiogenesis is associated with disorders like diabetic retinopathy (Prajdou et al., 2010), cancer (Dudek et al., 2012), arthritis (Elshabrawy et al., 2015), age related macular degeneration (Ng and Adamis, 2005) etc. Insufficient blood supply in case of reduced angiogenesis imposes the risk of tissue death in several diseases such as ischemic chronic wound (Frykberg and Banks, 2015) and

coronary artery diseases (Kastrup, 2010). It is also required for bone integration and survival in fracture repair (Saran et al., 2014).

Copper (Cu) is supposed to have pro-angiogenic activity owing to activation of pro-angiogenic growth factors and promoting endothelial cell migration, growth, and tube formation (Saghiri et al., 2015). It stimulates various factors viz. vascular endothelial growth factor (VEGF), fibroblast growth factor-2 (FGF2), tumor necrosis factor (TNF)- α and platelet-derived endothelial cell growth factor (PD-ECGF), which are responsible for pro-angiogenic effects (Gupte and Mumper, 2009). It is also required for the activation and expression of hypoxia-inducible factor-1 (HIF-1), a major transcription factor, responsible for regulating the expression of VEGF (Xie and Kang, 2009). Cu is also associated with cell migration, invasion, proliferation and



Review

Green tea (*Camellia sinensis*) and L-theanine: Medicinal values and beneficial applications in humans—A comprehensive review



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ABSTRACT

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Green tea (*Camellia sinensis*) is a famous herb, and its extract has been extensively used in traditional Chinese medicinal system. In this context, several studies have revealed its health benefits and medicinal potentialities for several ailments. With ever increasing scientific knowledge, search for safer, potential and novel type of health-related supplements quest, scientists are re-directing their research interests to explore natural resources i.e. medicinal herbs/plant derived compounds. Green tea consumption has gained a special attention and popularity in the modern era of changing lifestyle. The present review is aimed to extend the current knowledge by highlighting the importance and beneficial applications of green tea in humans for safeguarding various health issues. Herein, we have extensively reviewed, analyzed, and compiled salient information on green tea from the authentic published literature available in PubMed and other scientific databases. Scientific literature evidenced that owing to the bioactive constituents including caffeine, L-theanine, polyphenols/flavonoids and other potent molecules, green tea has many pharmacological and physiological functions. It possesses multi-beneficial applications in treating various disorders of humans. This review also provides in-depth insights on the medicinal values of green tea which will be useful for researchers, medical professionals, veterinarians, nutritionists, pharmacists and pharmaceutical industry. Future research emphasis and promotional avenues are needed to explore its potential therapeutic applications for designing appropriate pharmaceuticals, complementary medicines, and effective drugs as well as popularize and propagate its multidimensional health benefits.

1. Introduction

Green tea (*Camellia sinensis*), a type of Chinese tea, is a famous herbal plant as an antioxidant with abundant health benefits and also considered as one of the most popular beverages in the world, mostly

due to its prospective health welfares [1–3]. The concept of using tea was proposed for the first time by a Chinese King Shen Nung in 2737 BCE when by chance some tea leaves were boiled in water, and a pleasant fragrance was produced [4]. Leaves of green tea contain antioxidative catechins [5]. Tea catechins have many health benefits such

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Ebola virus – epidemiology, diagnosis, and control: threat to humans, lessons learnt, and preparedness plans – an update on its 40 year's journey



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Brief overview of Phytoplasma associated with pigeon pea cultivated in India

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Abstract

Pigeon pea (*Cajanus cajan* L.) is an important food legume crop predominantly cultivated in tropical and subtropical regions of Asia and Africa and also plays an important role in food and nutritional security due to rich in protein, minerals and vitamins. Pigeon pea has a unique place in Indian farming and India accounts for about 90% of the global production. Pigeon peas have been reported of phytoplasma diseases worldwide associated with the visual symptoms such as witches'-broom, little leaf, floral malformation, stunting of whole plant. Phytoplasma strains belonging to the Pigeon Pea Witches'-Broom (PPWB; 16SrIX group), subgroup IX-A, IX-C, little leaf disease associated with '*Candidatus Phytoplasma asteris*' (16SrI); phytoplasma '*Candidatus phytoplasma aurantifolia*' (16SrII group) have been reported on pigeon pea worldwide. This review article focused brief current status of phytoplasma disease associated with pigeon pea of India as well as abroad.

Keywords: *Cajanus cajan*, witches'-broom, little leaf, *Candidatus phytoplasma* group

Introduction

Pigeon pea [*Cajanus cajan* (L.) Millspaugh] is an important food legume predominantly cultivated in tropical and subtropical regions of Asia and Africa and also plays an important role in food and nutritional security due to rich in protein (23-27%), minerals and vitamins (esp. vitamin B). In India, *C. cajan* grows at altitudes ranging from 150 to 2000 m. above sea level (Van der Maesen 1990)^[1], and even in moderately cold climates.

The major areas of its cultivation and variability are in the states of Uttar Pradesh, Madhya Pradesh, Maharashtra, Karnataka, Gujarat, Andhra Pradesh, Telangana and Bihar. States of Arunachal Pradesh, Chhattisgarh, Kerala, Odisha, Rajasthan, Tamil Nadu and Uttarakhand have lesser cultivated areas of pigeon pea in the country. Madhya Pradesh occupies an area of about 5.79 lakh ha with production of 6.44 lakh tonnes with an average productivity of 1105 kg/ha (Anonymous 2015-16)^[2].

Phytoplasmas are intracellular obligate prokaryotes which lack cell wall, have small genome (680-1,600 kb) and are mainly transmitted by leafhoppers, they are associated with typical yellowing, stunting of whole plant, virescence, phyllody, proliferation of axillary buds, witches'-broom and die back symptoms (Al-Saady and Khan, 2006; Bertaccini 2007; Harrison *et al.* 2008)^[3, 4, 5]. Phytoplasma are also associated with severe yield losses in a variety of plant species of horticultural, agricultural and ornamental importance (Chaturvedi *et al.* 2010)^[6].

In India recent evidence showed that phytoplasma cause diseases in several plant species including vegetable crops, fruits trees, ornamental, sugarcane, grasses & weeds and resulted in serious threat as a source of alternative natural host

for the spread of phytoplasma pathogen to other economically important plants and thereby chances of causing severe losses. Efforts have been made for detection, identification and possible management of phytoplasma diseases naturally occurring in various plant species in India so that their growth and yield may be improved.

The important diseases of Pigeon pea are Wilt, Sterility mosaic disease, phytophthora blight, alternaria blight, powdery mildew and pigeon pea witches'-broom (PPWB) caused by phytoplasma.

Phytoplasma strains belonging to the Pigeon Pea Witches'-Broom (PPWB) group (16S rDNA gene RFLP group IX) has a broad host range which includes herbaceous plants, fruit trees and conifers. Harrison *et al.* (1991)^[7] described for the first time PPWB phytoplasma, subgroup IX-A on symptomatic pigeon pea plants (*C. cajan*). Later Khan *et al.* (2007)^[8] reported the presence of phytoplasmas within the same group, classified in the subgroup IX-C, affecting herbaceous plants in the field such as bristly oxtongue (*Picris echioides* L.) and field scabious (*Knautia arvensis* L.).

The second phytoplasma-related disease reported in Puerto Rico was pigeon pea witches'-broom (PPWB) (Rodríguez *et al.* 1979)^[9]. Witches' broom disease of pigeon pea was noted for the first time in 1980 in several plantings in southern Florida (McCoy *et al.* 1983)^[10]. Harrison *et al.* (1991)^[7] described for the first time PPWB phytoplasma, subgroup IX-A on symptomatic pigeon pea plants (*C. cajan*). Breeder's plots of pigeon pea were affected by a phyllody disease in February 2012 growing at a single trial site at Urrbrae, South Australia, were all shown to belong to the 16SrII phytoplasma taxonomic group, but each host species was found to be infected with a different genotype (Yang *et al.*, 2013)^[11]. The best known



Begomoviruses Infecting *Jatropha* Species Grown for Ornamental Values 18

Sunil Kumar Snehi and S. K. Raj

Abstract

Some *Jatropha* species such as *Jatropha podagraria*, *J. multifida*, and *J. integerrima* are grown in India as ornamental plants. The severe yellow mosaic disease symptoms were observed in these three species at CSIR-NBRI garden, Lucknow, in the year 2009–2011. Infection of begomovirus was suspected based on typical yellow mosaic and infestation of whiteflies. Association of begomovirus with mosaic disease was detected by polymerase chain reaction using begomovirus gene-specific primers which resulted in the ~1.2 kb amplicons in all these ornamental species of *Jatropha*. For molecular identification of associated begomovirus species, the ~1.2 kb amplicons were sequenced and sequence data were analyzed. The highest sequence identities of ~1.2 kb (partial DNA-A) genome that showed close phylogenetic relationships with *Jatropha mosaic India virus* in *J. podagraria*, *Tomato leaf curl Patna virus* in *J. multifida*, and *Papaya leaf curl virus* in *J. integerrima* were identified. We have summarized in this chapter worldwide distribution of mosaic disease associated with begomovirus species of ornamental *Jatropha* species including India based on their genome sequence analysis and genetic diversity.

Keywords

Begomovirus · Mosaic disease · Molecular identification · Sequence analysis · Genetic diversity analysis

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Chapter 11

Diversity of geminiviruses occurring on jatropha (*Jatropha curcas*), a biodiesel crop

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11.1 Introduction

The genus *Jatropha* (family Euphorbiaceae) has 476 species that are distributed throughout the world. Among them *Jatropha curcas*, *Jatropha gossypifolia*, *Jatropha integerrima*, *Jatropha multifida*, *Jatropha podagrica*, and *Jatropha cuneata* are recorded in India. Many excellent characteristics, including high yield, resistance to drought, high oil content, and good quality of the plant oil have generated the interest of many researchers in *J. curcas*, while other jatropha species are of ornamental value or traditionally used for their medicinal values.

In India, *J. curcas* is found in a semiwild condition in the vicinity of villages. It is reported to be cultivated in 200 districts in 19 states of India: Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Gujarat, Goa, Himachal Pradesh, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand, and West Bengal. Gradually its area is increasing in different parts of country.

The natural infection of begomoviruses has been reported in *Jatropha* species across the world: *Jatropha* mosaic virus on *J. gossypifolia* in Jamaica (Kim et al., 1986; Rye et al., 2006); African cassava mosaic virus on *J. multifida* in East and West Africa (Okoth, 1991); a begomovirus closely related to Indian cassava mosaic virus and Sri Lankan cassava mosaic virus on *J. curcas* in India (Aswatha Narayana et al., 2006, 2007; Gao et al., 2010; Raj et al., 2008; Snehi et al., 2012; Tiwari et al., 2007); African cassava mosaic virus on *J. curcas* in Kenya (Ramkat et al., 2011a, 2011b); *Jatropha* mosaic Nigeria virus identified associated with mosaic disease of *J. curcas* in Nigeria (Kashina et al., 2013); full-length sequences of a bipartite begomovirus were characterized on *J. multifida* in Florida showing symptoms of foliar mosaic, distortion, and necrosis (Polston et al., 2014); *Jatropha* mosaic virus with yellow mosaic symptoms on *J. curcas* in Dominican Republic (Melgarejo et al., 2015); a new begomovirus species *Jatropha* leaf yellow mosaic Katerniaghata virus was associated with leaf yellow mosaic disease of *J. curcas* from India (Srivastava, Jaidi et al., 2015; Srivastava, Kumar, et al., 2015); a new begomovirus species designated as *Jatropha* yellow mosaic India virus and Croton yellow mosaic virus was associated with yellow mosaic disease of *J. gossypifolia* in India (Snehi, Khan et al., 2011; Snehi, Raj, et al., 2011); and begomovirus isolates associated with a mosaic disease of ornamental *Jatropha* species from India were also identified (Snehi et al., 2016).

Therefore, begomoviruses have been considered as a main threat to *Jatropha* cultivation. Begomoviruses of the family Geminiviridae are whitefly transmitted and cause diseases to important crops in the tropics and subtropics (Stanley et al., 2005). Their genome consists of one or two circular single-stranded DNA components, referred to as DNA-A and DNA-B, each about 2.6–2.8 kb in size (Fauquet et al., 2008; Stanley et al., 2005). DNA-A encodes replication-associated protein (AC1) that is essential for viral replication; replication enhancer protein (AC3); transcriptional activator protein (AC2) that controls late gene expression and is involved in RNAi suppression; AC4 protein for host range determination, symptom severity and virus movement; coat protein (AV1) for encapsidation and insect transmission; and precoat protein (AV2) for virus accumulation and symptom development. While DNA-B encodes nuclear shuttle protein (BV1) and movement protein (BC1), both of which are vital for efficient systemic spread and symptom

Chapter 2

Molecular detection and characterization of begomoviruses infecting Amaranthus, a protein-rich crop

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2.1 Introduction

The word “Amaranth” is derived from the Greek term “amarantos” means “unwithering.” Amaranth is one of the oldest food crops with evidence of its cultivation reaching back as far as 6700 BCE in the Americas. Amaranths are warm-season annuals that are primarily self-pollinating. Amaranth grain is a traditional food in India, Mexico, Peru, and some other countries (Brenner et al., 2000). The Hindi term for Amaranth is “Ramdana,” meaning God’s own grain. This bountiful seed is grown throughout India ranging from the high slopes of the Himalayas to the coastline. Amaranth (of family *Amaranthaceae*) is used as a high-protein grain or as a leafy vegetable, and has potential as a forage crop. Grain amaranth species have been important in different parts of the world as a staple food. The largest acreage grown was during the height of the Aztec civilization in Mexico in the 1400s. In the past two centuries grain amaranth has been grown in scattered locations, including Mexico, Central America, India, Nepal, China, and Eastern Africa. Research on amaranth by US agronomists began only in the 1970s, so optimum production guidelines and uniform, adapted varieties have not yet been fully developed (Putnam et al., 1989).

Amaranths belong to the family *Amaranthaceae*, which contains about 70 genera and more than 800 species and are native to tropical America and Africa. A number of species have been reported in *Amaranthus*, however, three major species, *Amaranthus hypochondriacus*, *Amaranthus cruentus*, and *Amaranthus caudatus* comes into cultivated broadly as edible amaranths sp. These species are being grown for their edible grains, hence they are also called grain amaranths. *Amaranthus tricolor*, *Amaranthus lividus*, *Amaranthus blitum*, and *Amaranthus dubius* are cultivated as vegetable species for their leaves. Some species are grown for ornamental purposes, such as *A. caudatus*, *A. hybridus* and *A. tricolor*. Other amaranths are not grown commercially and are wild and weedy types of amaranths. *Amaranthus retroflexus* (pigweed), *Amaranthus graecizans* (prostrate pigweed), and *Amaranthus albus* (white pigweed or tumbleweed) are common weeds that grow spontaneously throughout the Europe and Asia and are considered as the world’s worst weeds (Sauer, 1993, 1967).

Grain amaranths (*A. cruentus* and *A. hypochondriacus*) are most important subsidiary food crops in the tropical and subtropical highlands of Asia and South America and are utilized as food grains, leafy vegetables, and forage crops in America, China, Greece, Italy, Russia, Nepal, and India. Grain amaranths are pseudocereals and recognized as an excellent source of high-quality and easily digestible protein worldwide. Amaranths contain a high amount of protein and dietary fiber, that is 5–20 times the content of calcium and iron in comparison to other cereals and grains. Amaranth grain is considered to have a unique composition of protein, carbohydrates, and lipids with regard to quality and quantity (Bressani, 1990). Based on its nutritional properties, it is called the “third millennium grain.”

First report of a Jujube witches'-broom phytoplasma (16SrV) strain associated with witches'-broom and little leaf disease of *Solanum melongena* in India

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KEYWORDS

Jujube witches'-broom phytoplasma, PCR, Sequence analyses, *Solanum melongena*

Solanum melongena (aubergine or brinjal; family Solanaceae) is a popular vegetable grown extensively in India, Bangladesh, Pakistan, China, Japan, Philippines, Egypt, France, Italy, and the United States (Chadha *et al.*, 1993). Brinjal's cultivation is hampered by the Brinjal little leaf (BLL) phytoplasma. A phytoplasma survey was conducted in various brinjal production areas of Hoshangabad in Central India (Figure 1) during May 2019. Phytoplasma-like symptoms such as proliferation of axillary shoots, witches'-broom, excessive branching, little leaf and the absence of flowers and fruits when compared to symptomless brinjal plants were observed (Figure 2).

For molecular detection of phytoplasma, total DNA was isolated from diseased and symptomless leaf samples (100 mg). The phytoplasma 16S rRNA gene was amplified by direct PCR using P1/P6 primers (Deng & Hiruki, 1991) and nested PCR with universal primers R16F2n/R16R2 (Gundersen & Lee, 1996), producing amplicons of the expected size (c. 1.2 kb) for the diseased (4/4) samples but not from the symptomless plant tested. Two nested PCR amplicons were purified (Wizard SV gel extraction kit; Promega, USA) and sequenced bidirectionally (Bioinnovations Pvt. Ltd., India). The consensus partial 16S rRNA gene sequences were identical and the sequence data was submitted to GenBank, Accession Nos. MW025971 (BR01) and MW025257 (BR02).

BLASTn analysis showed that the sequence shared 99% sequence identity with the 16S rRNA gene sequence of Jujube witches'-broom phytoplasma (MH972556, MH972553, MH972548) and 'Candidatus Phytoplasma balanitae' (HG937644, LT558785, MH819290), Periwinkle yellows phytoplasma (EU375835) and the Elm yel-

lows group (16SrV). Phylogenetic analysis (MEGA v 7.1) showed the closest relationships with strains of Jujube witches'-broom phytoplasma (MH972556, H744152 and MH972548) and 'Ca. P. balanitae' (LT558785), a member the group 16SrV, 'Ca. P. ulmi' (Figure 3).

Six phytoplasma ribosomal groups (16SrI, 16SrII, 16SrIII, 16SrVI, 16SrIX, 16SrXII) have been associated with *S. melongena* globally. BLL phytoplasmas were first reported in India in 1995 (Schneider *et al.*, 1995). In India and Japan, a BLL phytoplasma was identified as a member of the group 16SrI, 'Ca. P. asteris' (Kumar *et al.*, 2012). The group 16SrVI, 'Ca. Phytoplasma trifolii' was also associated with BLL symptoms in India (Yadav *et al.*, 2015). However, this is the first report of a 'Ca. P. ulmi' strain (group 16SrV), associated with a witches'-broom disease of brinjal in India.

This finding has a significant impact for future epidemiological studies since brinjal could be an alternative host for 16SrV phytoplasma strain which affect several other important vegetable crops cultivated in Hoshangabad, Central India.

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Distribution and Molecular Characterisation of *Lactobacilli* in the Oral Cavity of Children

Abstract

Background: Dental caries is a chronic and multifactorial disease mainly caused by microorganisms that are accumulated on soft and hard tissues of oral cavity. *Lactobacillus* is one of that kind, produces acid after metabolic breakdown of dietary sugar and reduces the pH of oral environment, resulting in teeth demineralisation or dental caries. **Aim:** The present study focuses on the distribution and characterisation of lactobacilli in the oral cavity of children which are associated with dental caries formation. **Methods:** Total 116 swab samples were collected from different age groups of children by swabbing the caries surface of teeth. Physiological, morphological and biochemical characteristics of *Lactobacillus* were analysed. Whole cell protein profiling using SDS-PAGE was also performed for their characterisation. Molecular characterisation of selected isolates was done using 16S-rRNA sequencing for identification. **Results:** Total 269 isolates were successfully isolated and identified by physiological and biochemical tests according to Bergey's Manual Systematic Bacteriology, which belongs to the seven species of *Lactobacillus* i.e., *L. acidophilus*, *L. casei*, *L. delbrueckii*, *L. helveticus*, *L. plantarum*, *L. rhamnosus*, *L. salivarius*. All the isolates were further differentiated by whole cell proteins profiling and species level identification was done by 16S-rRNA gene sequencing method. **Conclusions:** The present study, suggested that the occurrence of the species of *Lactobacillus* changes with the age of the individual, but *L. rhamnosus* (20.54%) and *L. acidophilus* (18.21%) were abundantly found in age group of 3-12 yr which could be the possible causative agent of dental caries formation in the children of Central India.

Keywords: Dental caries, *Lactobacillus*, oral cavity, SDS-PAGE and 16S-rRNA gene sequencing

Introduction

Dental caries is a chronic and multifactorial disease caused by microorganisms and some environmental factors.^[1] It is the most prevalent disease worldwide, according to World Health Organization (WHO), around 60–90% school children are affected from dental caries in the developing countries and about half of the world population (3.58 billion people) have dental caries in their permanent teeth.^[2,3] Dental caries affected all the age groups and has become more common in both children and adults in the recent year. The scenario of dental caries in India does not differ from other developing countries; it is highly prevalent and severe in indigenous communities of India.^[4] A recent study suggests that one out of two children in India is affected by dental caries and there can be increase in caries burden in the future.^[5] In order to decrease the prevalence of caries, an

improved understanding of the role of the microorganisms in dental diseases is needed.^[6] Previous studies suggested that *Streptococcus mutans* and *Lactobacilli* are the main etiological agent of dental caries formation.^[7,8] Most of the studies reported that *S. mutans* is the initiator of dental caries but some of the studies suggest that bacterial species other than *S. mutans* e.g., *Lactobacillus* and *Actinomyces*, likely play important role in the caries process.^[6,8] Basically, *Lactobacillus* is the safe grade bacteria but in the oral cavity it has been associated with dental caries from over a century back and plays an important role in dental caries formation.^[9,10] *Lactobacillus* is highly acidogenic in the presence of carbohydrates and they can tolerate pH at 3.0. Acid production, biofilm formation and acid tolerance properties of *Lactobacillus* are the enemies of the teeth.^[11] When the count of *Lactobacillus* in saliva reaches at level $\geq 10^5$ it is critical for dental caries formation.^[12,13] *Lactobacillus* is a diverse group of bacteria with over 80 known species, one-fourth of

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Molecular identification of Jujube witches'-broom phytoplasma (16SrV) associated with witches'-broom disease of *Ziziphus oenoplia* in India

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ABSTRACT

Severe witches'-broom disease of *Ziziphus oenoplia* was observed with significant disease incidence in Bhopal, India, during 2019. Phytoplasma was detected from symptomatic leaf samples by polymerase chain reaction (PCR) using phytoplasma 16S rRNA gene specific primers which revealed positive amplification of expected size ~1.2 kb DNA band. The positive amplicons of the phytoplasma 16S rRNA (1.2 kb) were sequenced and sequence data was submitted in GenBank database (Accession no. MK975463 and MK975462). On the basis of highest 99% sequence identities, closest phylogenetic relationships and *In silico* of the under study both the phytoplasma isolates associated with witches'-broom disease of *Ziziphus oenoplia* identified as a species of Jujube witches'-broom phytoplasma as a member of Elm yellows group (16SrV). To the best of our knowledge, this is the first report on the association of Jujube witches'-broom phytoplasma species of Elm yellows group (16SrV) with witches'-broom disease of *Z. oenoplia* in India.

Keywords: *Ziziphus oenoplia*; PCR; Sequence analyses; Jujube witches'-broom phytoplasma

INTRODUCTION

Phytoplasmas are intracellular obligate prokaryotes which lack cell wall, have small genome and are mainly transmitted by hemipteran insect vector of the families Cicadellidae (leafhoppers) and Fulgoridae (planthoppers) [1]. Phytoplasma are associated with typical phyllody, virescences, yellowing, proliferation of axillary buds, witches' broom, stunting of whole plant and die back symptoms on number of plant species worldwide [2,3]. Phytoplasma are also associated with severe yield losses in a variety of plant species of horticultural, agricultural and ornamental importance in India [4].

Ziziphus oenoplia (L.) Mill (Family Rhamnaceae) commonly well known as makai in Hindi and Jackal Jujube in English, is a straggling shrub distributed all over the hotter regions of Pakistan, Sri Lanka, India, Malaysia, and Tropical Asia [5]. The fruits are edible and it is widely used in Ayurveda for the treatment of various diseases, such as ulcer, stomach ache, obesity, asthma, digestive, antiseptic, hepatoprotective, wound healing and diuretic property [6].

There are limited reports available in the literature worldwide related to phytoplasma study in *Ziziphus* species such as 'Candidatus Phytoplasma ziziphi', associated with Jujube witches' broom in China, Japan and Korea [7]. Phytoplasmas associated with witches'-broom disease in *Ziziphus jujube* and *Z. nummularia* in Bahraich district, in India, are considered isolates of 'Ca. Phytoplasma ziziphi' [8]. Presently only one report has been published based on symptomatology on *Ziziphus oenoplia* expressed witches'-broom appearance by proliferation of axillary buds from Dakshin Dinajpur district of West Bengal, India West Bengal [9].

Barkatullah University (BU) campus, Bhopal is rich from plant diversity and various plant species are grown naturally and one of them some plant species may be naturally associated with some phytopathogens. At present no report is available of phytoplasma disease on *Ziziphus oenoplia* from India, therefore, molecular identification of phytoplasma naturally occurring on *Ziziphus oenoplia* grown in Bhopal was carried out in this study.

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Effect of *Staphylococcus aureus* embedded on titanium foam which uses as biomedical implant

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ABSTRACT

*The aim of this research is to investigate the impact of the *Staphylococcus aureus*, on the titanium foam. . It has been attempted to fabricate the foam with different pore size like 50%, 60%, 70% and 80% with different volume fraction of used space holder cenosphere through powder metallurgy route. According to many research papers porosity plays an important role as bio implant material. It has been prepared different size titanium pellets i.e. 15mm and 12mm to see the effect of the surface area of the fabricated sample of implant material. Recently, In medical field, solid implant material is in use like Titanium, Steel, Ni-Titanium rod but due to the lack of porosity these implant material does not perform well osseointegration. It has been attempted to observe the roll of the bacteria *Staphylococcus aureus* in the above said fabricated titanium foam. It has been found that porosity in this foam played the key role as it worked as transporter. Foam has greater pores i.e. 80% is more sensitive to develop the bacteria while 50% porous titanium foam is less sensitive meanwhile another sized porous titanium foam had been showed moderate capability of growing the bacteria. Through the all physical, mechanical, chemical and biological observation, titanium foam can be beneficial for the future use. It can be helpful in medical field as cheap and light weight implant material.*

Keyword: - Biofilm, MTT Assay, *Staphylococcus aureus*; Titanium foam

I INTRODUCTION

Bio implant is not only an emerging subject in the field of medical science [1-3]. In fact, it has become more prominent now. Porous material is becoming more promising compare to solid material due to tailor-made young modulus and cell or tissue proficiency, It has become more significant now [4]. Recently many researchers attempted to synthesize open cell foam by using polyurethane [5]. Titanium attached with the matrix of polyurethane and debind with the further heat treatment to compose grille of titanium. This worked better instead of solid form of metals [6]. There are many methods to prepare metal foam like Gas Injection (Hydro/Alcan) [7], Blowing Agents (Alporas) [8],Solid-Gas Eutectic Solidification (Gasar) [9], foaming of Powder Compacts (Foaminal/Alulight) [10,11], Foaming of Ingots containing blowing agents (Form grip/Foam cast) [12] etc. The new inventions daily revealing in this regard. Although some researchers have trust on this statement that one day will come when injured or crumbled body parts will grow automatically with the

help of either implant or stem cells [13]. Research has been conducted to show the cell viability into the titanium foam [14-15]. Another research revealed the effect of *Staphylococcus epidermidis* on the titanium foam [16].Some previous research pursued on the relation between the titanium foam and the bacteria *Staphylococcus epidermidis* [17]. It was found that Titanium foam didn't help to induce the biofilm itself. It has been proved in another previous experiment. This may be due to the fact that Titanium is corrosion free material [18] in biofluid and helps in cell growth along the cell boundary.

In the present study, titanium foam is prepared through spaceholder technique using cenosphere as spaceholder which has not been studied earlier. The cenosphere might give extra strength to titanium foam and provides porosity for cell adherences. But the cenospheres contain silicate particles and hence it is required to study the cell proliferations in such foams and the influence of *Staphylococcus aureus* on cell growth and biofilm formation.

while different sized Cenosphere i.e. $90.0 \pm 8\mu\text{m}$, $145.0 \pm 11\mu\text{m}$, $185.0 \pm 15\mu\text{m}$, $212.0 \pm 18\mu\text{m}$ (supplied from M/s Cenosphere India) used as a space holder, to create porosity in the titanium foam. Micro structure of cenosphere of $90.0 \pm 8\mu\text{m}$ shown in Fig.No.1(a) while Fig.No.1 (b) presents its higher magnification micro graph

II MATERIALS AND METHODS

(a) **Preparation of the Titanium Foam** - Titanium foam prepared through powder metallurgy route [19]. In this method Spherical shaped Titanium powder (99.9% pure & average size $22\pm3\mu\text{m}$) supplied from Alfa Aesar used as a primary material

EC AGRICULTURE EDITOR'S COLUMN - 2019

Status of Begomovirus Infection on Weed from India

Sunil Kumar Snehi
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COLUMN ARTICLE

Begomoviruses is the largest genera and it is belong to family *Geminiviridae* and have a circular, single-stranded DNA genome. It is transmitted in nature through the *Bemisia tabaci* whitefly, and causes a number of diseases in various economically important crop plants India and abroad [1,2]. Begomoviruses have bipartite (containing both DNA-A and DNA-B) and monopartite genomes (containing only DNA-A) and infects dicotyledonous plants worldwide. It is divided into Old World viruses (Europe, Africa, Asia and Australasia) and the New World viruses (Western hemisphere, Americas and Brazil) based on their genome properties and evolutionary relationships [3,4]. Monopartite begomoviruses mostly reported from Old World and associated with satellite DNAs (betasatellite and alpha molecules) [5]. Monopartite begomovirus and DNA-β satellite molecule association have been detected and identified in numerous economically important plant species grown all over the Old World [6]. DNA-β has involved in symptoms severity and they have not showed any kind of homology with their helper begomoviruses, and they are depend on their replication, encapsidation and movement only (Saunders., et al. 2000). The first begomovirus satellite DNA-β molecule was reported with the association of *Tomato leaf curl virus* from Australia [7]. Some alphasatellites molecule have been reported with association of many begomovirus and produce disease complexes, but their function is unknown [8].

Weed plant are distributed widely in all over the world and have high rich environmental adaptability. Many reports have published that weed plants serve as alternative or reservoir plant hosts for begomovirus [9-12].

India has diverse agro-climatic conditions like temperature, humidity and other environmental factors due to this India has richest sources of flora and fauna in the world but on the other hand it creates good conditions for insects and plant pathogens specially for plant viruses.

Weed plants may be play an important roles in the emergence (due to mutation) of plant virus epidemics affecting crop plants in various parts of the world [13,14]. Only limited research has been carried out to detection, identification and characterization of the begomovirus infecting weed plants in India. The natural occurrence of *Ageratum* enation virus was (AgEV) identified and characterized on *Cleome gynandra* associated with leaf curl disease from India [15]. AgEV and a DNA 1 (alpha satellite) molecule to be associated with leaf curl disease of *Zinnia elegans*, vein yellowing disease of *Crassocephalum crepidioides* and *Ageratum conyzoides* reported from northern India. *Rhynchosia yellow mosaic India virus* a new begomovirus associated with yellow mosaic disease in *Rhynchosia minima* has been identified and reported first time from Thiruvananthapuram, India [16].

Croton yellow vein mosaic virus and Croton yellow vein mosaic betasatellite [17] and a new begomovirus *Jatro-*

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EFFECT OF CENOSPHERE SIZE AND VOLUME FRACTION ON CELL GROWTH KINETIC OF EPITHELIAL CELL LINE KB EMBEDDED IN TITANIUM -CENOSPHERE FOAM

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ABSTRACT

Titanium foam prepared with various porosities (50% to 80%) by using cenosphere (sizes 90.0±8 to 212±18) as space-holder through powder metallurgy route. The synthesized Titanium foams used as biomaterial to enquire its mammalian cell viability by using KB mouth epithelium cell line supplied by NCCS Pune (Maharashtra, India). KB cell line maintained in optimum required medium, temperature and environment by using CO₂ incubator. The influence of micro-porosity and space holder on cell viability has been examined for a time period of 24 hrs., 48 hrs. and 72 hrs. It has been observed that foam made with 50%, 60% and 70% porosity showed better In-vitro mammalian cell viability as compared to 80% porosity. Before the cell viability experiment on titanium foam all essential examination performed like Micro-structure (through SEM, and FESEM), mechanical property and corrosion resistance. The Optimum cell size and volume fraction of pores which present in Titanium foam for the best cell viability noted to be 70% porosity and 212µm cenosphere size.

Key words :Titanium foam, Cenospheres, mammalian Cell viability, MTT assay, biocompatibility.

INTRODUCTION

In the human body, various types of bones do collective works and maintain the body structure. Unfortunately, due to any damage or decay, either through accidental or any disease could occur. Cure is possible in this era. Right now there are many researches occur in this regard to cure /treatment on the fracture. Some accidental fractures can be curable automatically. Some are curable through the use of implant material. In medical field, use of metal implant is in practice. This research focused on the foam form of the titanium powder. Titanium is a well known bio materials (Prasad *et al.*, 2017). The foam of titanium works as a bone-metal integration (Prakasham *et al.*, 2017) also known as osseointegration (Manivasagam, Dhinasekaran & Rajamanickam, 2010) when it's attached to the bone. Here, porosity of the foam plays the key role (Saini *et al.*, 2015). Through the porous portion of the titanium, live cells of the bones enter



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DENTAL CARIES AND *LACTOBACILLUS*: ROLE AND ECOLOGY IN THE ORAL CAVITY

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Keywords:

Lactobacillus, Oral cavity,
Ecology, Dental caries, Biofilm

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ABSTRACT: Dental caries is an infective serious transmittable bacterial disease characterized by a multi-factorial pathology. Main players in the etiology of this disease are cariogenic bacteria, fermentable carbohydrates, a susceptible tooth, the host, and the time. It is still one of the most common disease worldwide. Biological factor such as cariogenic bacteria plays an important role in dental caries initiation, progression as well as tooth decay. Previous studies suggested that the main pathogenic bacteria are *Streptococcus mutans* and *Lactobacillus*. Consequently, *Lactobacillus* is considered the second most cariogenic bacteria of oral flora. It is not the caries initiator but plays an important role in caries progression. Most of the previous studies were quantitative, so till now, researchers not know about the specific species of *Lactobacillus* which are directly associated with dental caries progression. Some species-level identification studies suggested that the most common *Lactobacillus* species are *L. gasseri*, *L. fermentum*, *L. vaginalis* and *L. casei* which were predominantly reported at the most of the oral sites, i.e. saliva, tongue, carious lesion, dental plaque, etc. and maybe plays the main role in caries progression. The present review spotlights the role, pathogenicity of *Lactobacillus* in dental caries and their ecology in the oral cavity.

INTRODUCTION: Now a day's, the oral diseases such as dental caries and periodontal diseases are still the most prevalent diseases worldwide, and WHO considers these pathologies as one of the most important public health issues. The World Health Organization described that 60–90% of school children, and nearly 100% of adults have dental caries. Dental caries can be prevented if a constant low level of fluoride is maintained in the oral cavity.

Severe periodontal disease, which may result in tooth decay, is found in 15–20% of middle-aged (35-44 years) adults. Globally, about 30% of people aged 65–74 have no natural teeth. Cases of oral diseases in children and adults are more among poor and disadvantaged population groups. Risk factors for oral diseases include an unhealthy diet, tobacco use, abusive alcohol use, poor oral hygiene, and other social determinants^{1, 2, 3, 4, 5, 6}.

As we know, dental caries is an infective serious transmittable bacterial disease characterized by a multi-factorial pathology. Main players in the etiology of this disease are cariogenic bacteria, fermentable carbohydrates, a susceptible tooth, the host and the time^{7, 8, 9}. At present, it is still one of the most common disease worldwide. If good oral hygiene is followed, chances of dental caries will

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Biosynthesis of Silver nano Particles from Aqueous Extract of Apple Peel and Its Antimicrobial Activity Against *Fusobacterium nucleatum*

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Abstract

Aim & objective of the study: - The main objective of this study is to evaluate the antimicrobial potential of biologically synthesized silver nanoparticles, against anaerobic bacteria *Fusobacterium nucleatum*. These bacteria are found in oral cavities as a part of the normal human flora and many times responsible for the oral disease like periodontitis. In this experiment silver nanoparticles were used, which are synthesized by using peel of apple.

Result:- Production of Silver nanoparticles was confirmed by UV-Visible and IR spectroscopy. Particle size has determined by Zeta Potential. Antimicrobial activity has done by well diffusion method. Silver nanoparticles made by using aqueous extract of fresh apple peel shown maximum zone of inhibition of 18.25 ± 0.500 mm at 100mg/ml against *Fusobacterium nucleatum* and aqueous extract of apple peel shown maximum zone of inhibition of 20.25 ± 0.500 mm at 200mg/ml

Conclusion:- The result suggested that the biogenic synthesized silver nanoparticle shown effective antimicrobial activity against *F. nucleatum*. Thus these particles can be utilized to produce biomedical product to control microbial population of infection or diseases causing by *Fusobacterium nucleatum*. In this study these antimicrobial effective silver nanoparticle were synthesized by using apple peel, therefore this technic can be replace chemical and physical method of nanoparticle.

Introduction: -

Today there are lots of applications and technologies are comes into the picture with lots of future aspects, Nanotechnology is one of the most popular and widely utilized by the research to revel and analysis the potential of nanoparticle to produce more product based on nanoparticles. Because of its property of having diameter of Nano scale, is become more popular now a day. Initially nanoparticles were made by using chemical and physical methods which can able to cause harmful effect[1], however now a day nanoparticle is synthesis by using less harmful biological material like microorganism (fungal, algae etc.), and plant material therefore this technic is called as biogenic synthesis or green synthesis of nanoparticles. Green synthesis of nanoparticle is more popular among research because of its environmental friendly, less time taking and cost effective properties which having less harmful effects on human being[3,4].

Silver is known as having antimicrobial properties from ancient times. Because of it antimicrobial properties silver is being use in many tradition and day to day life[2]. This properties of silver, made it more suitable for making nanoparticles to develop one kind of antimicrobial agent with less harmful effects. Biosynthesis of silver nanoparticle provides a wide range of environment friendly methodology. Apple is known as very rich nutrient fruit with having many beneficial components like phenolic compound flavonoid compound and many more, therefore apple is always consumed by large group of people and many times selected by researcher as raw material for research. Many researchers have already prof that apple peel contains more beneficial properties than apple flesh. Apple skin has flavonoid like quercetin glycosides and cyanidin glycosides which is not found in apple pulp. Apple is belong to the Kingdom:-



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EFFECT OF PROBIOTIC *LACTOBACILLUS FERMENTUM* MCC3216 ON PROGRESSION OF TYPE 2 DIABETES WITH THEIR ANTI-INFLAMMATORY ACTIVITY IN HIGH FRUCTOSE FED DIABETIC RATS

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Keywords:

Probiotic,
Lactobacillus fermentum MCC3216,
Antidiabetic, Type 2 diabetes,
Anti-inflammatory

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ABSTRACT: The antidiabetic and anti-inflammatory effects of probiotic *Lactobacillus fermentum* MCC3216 was investigated in high fructose-fed type 2 diabetic rats. Type 2 diabetes was induced by feeding high fructose diet to male albino Wistar rats. A single daily dose of 2×10^8 CFU/ml of *L. fermentum* MCC3216 was given to Wistar rats for 8 weeks. The fasting blood glucose, body weight, oral glucose tolerance test, glycosylated hemoglobin, insulin, liver glycogen, lipid profile, and oxidative stress parameters were measured. The level of Interleukin-6 and Interleukin-10 were also measured in serum. Histopathology analysis of pancreas and liver injury were performed. At 8 week *L. fermentum* MCC3216 significantly ($P<0.05$) decrease FBG, body weight, glucose intolerance, HbA1c, insulin, liver glycogen, total cholesterol, triacylglycerol, LDL-C, VLDL-C, lipid peroxidation and IL-6 level as compared to diabetic rats. The values for HDL-C, reduced glutathione, superoxide dismutase, catalase and IL-10 were significantly ($P<0.05$) increased in *L. fermentum* MCC3216 treated group as compared to diabetic rats. Islets of Langerhans and hepatic cells in *L. fermentum* MCC3216 treated group were protected from destruction as compared to the diabetic rats. *L. fermentum* MCC3216 exerts the antidiabetic and anti-inflammatory effect on high fructose-fed type 2 diabetic rats and significantly improves hyperglycemia, hyperinsulinemia, glucose intolerance, dyslipidemia, oxidative stress and regulates immunological responses. These results suggest that further research is required in other diabetic models for clinical application of *L. fermentum* MCC3216 in progression and delay of T2DM.

INTRODUCTION: Diabetes mellitus is a progressive metabolic disease which is linked with the abnormal increase in blood glucose level. The prevalence of metabolic syndrome mainly type 2 diabetes is increasing rapidly due to major changes in dietary habits, lack of physical activity and obesity.

According to recent report of WHO 382 million cases were found with diabetes in 2013 worldwide which will rise to about 592 million by 2035 ¹. Type 2 diabetes mellitus (T2DM) is characterized by insulin resistance, hyperglycemia, dyslipidemia, the relative decrease in insulin secretion from β -cells and β -cell failure ².

Various pathophysiological conditions are involved in the progression of type 2 diabetes. Body weight gain and body mass can increase the amount of NEFA, hormones, a proinflammatory cytokine, glycerol that are involved in insulin resistance ³. Lifestyle improvement that reduces obesity can minimize the progression of type 2 diabetes.

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ANTIDIABETIC AND ANTI-INFLAMMATORY EFFECT OF PROBIOTIC *LACTOBACILLUS PARACASEI* MCC3195 IN HIGH FRUCTOSE FED TYPE 2 DIABETIC RATS

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Keywords:

Lactobacillus paracasei
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ABSTRACT: The aim of this study was to investigate the antidiabetic and anti-inflammatory effects of probiotic *Lactobacillus paracasei* MCC3195 in high fructose fed type 2 diabetic rats. High fructose diet was used to induce type 2 diabetes in male albino wistar rats. *L. paracasei* MCC3195 was administered to rats at a single dose of 2×10^8 cfu/ml per rat for 8 week. The body weight, fasting blood glucose, oral glucose tolerance test, glycosylated hemoglobin, insulin, Liver glycogen level, lipid profile and oxidative stress parameters were analyzed. Interlukin-6 and Interlukin-10 were also estimated in serum. Histopathology analysis of pancreas and liver injury were done. At 8 week body weight, FBG, glucose tolerance, HbA1c, insulin, liver glycogen level, total cholesterol, triacylglycerol, LDL-C, VLDL-C, lipid peroxidation and IL-6 were significantly increased in diabetic rats, while administration of *L. paracasei* MCC3195 significantly decreased these factors. The level of HDL-C, reduced glutathione, superoxide dismutase, catalase and IL-10 were significantly decreased in diabetic rats, whereas administration of *L. paracasei* MCC3195 significantly increased these factors. Administration of *L. paracasei* MCC3195 protects the Islets of langerhans and hepatic cells from destruction as compared to the diabetic rats. Probiotic *L. paracasei* MCC3195 exerts the antidiabetic and anti-inflammatory effect in high fructose-fed type 2 diabetic rats, by significantly improving glucose intolerance, hyperglycemia, hyperinsulinemia, dyslipidemia, oxidative stress and immunoregulatory properties as well as protects the type 2 diabetes induced complications. Further research is needed in other diabetic models for clinical application of *L. paracasei* MCC3195 in delay or prevention and progression of T2DM.

INTRODUCTION: Diabetes mellitus is one of the most prevalent metabolic diseases in almost every country. Worldwide 90% cases were reported of type 2 diabetes mellitus and it is increasing day by day due to major changes in lifestyle such as decreased physical activity and increased cases of obesity ¹.

Type 2 diabetes mellitus (T2DM) is characterized by hyperglycemia, dyslipidemia, peripheral insulin resistance, impairment in insulin secretion by beta cells and β - cell failure ². The major complication of T2DM leads to other severe clinical conditions including hypertension, increase in low-density lipoprotein cholesterol (LDL-C) and decrease in high-density lipoprotein cholesterol (HDL-C) which involve in the incidence of cardiovascular diseases ³.

Life style changes that involve body weight control and obesity management can improve the glycaemic control and delay the progression of

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Molecular identification of a *Begomovirus* associated with yellow vein net disease on *Malva parviflora* L. from India.

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Abstract

Incidence of yellow vein net disease with leaf distortion was observed on *Malva parviflora* grown as a weed in Barkatullah University campus, Bhopal, India during the rainy session. The *begomovirus* disease was suspected on the basis of symptomatology and whiteflies insects' population on the plant. The *begomovirus* was detected by the PCR with the *begomovirus* gene specific primers. The *begomovirus* under study showed highest nucleotide sequence identities and distinct phylogenetic relationships of coat protein gene (*CP*) with several isolates of Tomato leaf curl Kerala virus (ToLCKeV). This is the first report of ToLCKeV associated with yellow vein net disease on *M. parviflora* and it is a new host of *begomovirus* from India.

Keywords: *Malva parviflora*, *begomovirus*, Yellow vein net disease, Sequence identities, and Tomato leaf curl Kerala virus.

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Introduction

Malva parviflora L. (Family Malvaceae) commonly known as cheese weed and it is an exotic annual weed or perennial herb that is native to Northern Africa, Europe and Asia. It is used in the treatment of cough, throat infection and other bronchial problems as well as stomach and intestine irritations. The flowers and leaves are emollient and used for the softening of sensitive area of the skin. Combine with *Eucalyptus*; it makes a good remedy for cough and other chest ailments [1].

Madhya Pradesh is a central region of India and agriculture is one of the main sectors of the state's economy. About 73 percent population of the state is rural, which directly or indirectly depends on the agriculture. The Madhya Pradesh has plant diversity and flexible temperatures, which are favourable to the virus insect vector (aphids, whiteflies, leafhoppers, and planthoppers). There are few reports has been reported of the *begomoviruses* infection on *Jatropha gossypifolia* [2], *Solanum lycopersicum* [3] and *Cnidoscolus aconitifolius* [4] from Madhya Pradesh state, India.

Begomoviruses is the largest genera in the family *Geminiviridae*. *Begomoviruses* have a circular, single-stranded deoxyribonucleic acid (ssDNA) genome and are transmitted in nature by the whitefly (*Bemisia tabaci*), and causes significant yield losses in economically important crop plants worldwide [5,6]. *Begomoviruses* generally have bipartite genomes (designated as DNA-A and DNA-B) and infect dicotyledonous plants. Based on their genome characteristics and phylogenetic relationships, *Begomoviruses* have been divided broadly into Old World (OW) viruses (Eastern hemisphere, Europe, Africa, Asia and Australasia) and the New World (NW) viruses (Western hemisphere, the Americas) [7,8]. Monopartite *begomoviruses* (have DNA-A genome only) are predominantly found in the Old World and are often associated with satellite

DNAs (alpha-and betasatellites), which may or may not contribute to pathogenicity [9].

The first reported of the Malva veinal necrosis virus considered as belonging to the potato X virus group in *Malva parviflora* from Brazil [10]. In Israel, natural infection of Tomato yellow leaf curl virus-Israel (TYLCV-Is) was found in the annual weed *M. Paraviflora* [11]. *M. parviflora* acts as host for many viruses including the South African Cassava mosaic virus [12] and Faba bean necrotic yellow virus in Jordan [13]. In 2003, Antignus et al. reported that Squash leaf curl virus (SLCV) could infect *Malva nicaeensis* and *Ecballium elaterium* (Cucurbitaceae) in Israel [14]. Squash leaf curl virus (SLCV) was also found to occur naturally in *M. parviflora*, with severe leaf curling, yellowing and stunting of the whole plants. The full-length genomes of Squash leaf curl virus-Malva (SLCV-Malva) isolate were amplified using the bacteriophage F DNA polymerase enzyme [15]. Recently, the identified full-length *begomovirus* genome shared maximum nucleotide (nt) sequence identity at 92.5% with Hollyhock leaf curl virus (HoLCV), representing a new strain, *Ageratum conyzoides* symptomless alphasatellite (ACSLA) and *Ageratum* yellow vein India alphasatellite (AYVIA), new isolates of ACSLA and AYVIA identified from *M. parviflora* in Pakistan [16].

We report here, molecular detection and identification of a Tomato leaf curl Kerala virus associated with yellow vein net disease on *M. parviflora* from central region of Madhya Pradesh of India, based on sequence analysis of complete coat protein gene.



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REVIEW ARTICLE

OVERVIEW OF BEGOMOVIRUS GENOMIC ORGANIZATION AND ITS IMPACT

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ABSTRACT

More than 80% of the known geminiviruses are transmitted by whiteflies (*Bemisia tabaci* Gennadius) and belong to the genus *Begomovirus*, which mostly have bipartite genomes designated as DNA-A and DNA-B and infect dicotyledonous plants although numerous begomovirus with a monopartite genome occur in the Old World and there are some of which a single component is not infectious yet no DNA-B component has been found. There have been several of reports of satellite molecules associated with begomoviruses. Genome ORFs plays important roles for host range determination, virus symptom development & severity, virus movement and virus replication. The frequency with which new begomoviruses are appearing shows that these viruses are still evolving and pose a serious threat to sustainable agriculture, particularly in the tropics and sub-tropics. In recent years, some begomoviruses have also moved to temperate regions causing concern in the production of vegetables in greenhouses. In this review we have discuss about the genome organization of begomovirus, its ORFs and their possible pathogenesis n the basis of research findings.

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INTRODUCTION

This is the largest genus in the family *Geminiviridae*. The genus *Begomovirus* is transmitted by whitefly (*Bemisia tabaci* Gennadius) in the persistent circulative manner. *Bean golden mosaic virus* (BGMV) is the type member of the genus. Begomoviruses infect dicots in tropical and temperate climates. The genome of most begomoviruses consists of two ssDNA components, DNA-A and DNA-B, each 2.5-2.8 kb in size. There are two ORFs in the virion sense and four ORFs in complementary sense in DNA-A. DNA-B has one ORF each in virion as well as in complementary sense. In begomoviruses, the tendency for recombination and acquisition of extra DNA components had resulted in emergence of new viruses that infect new hosts and cause new diseases (Varma and Malathi, 2003; Chakraborty *et al.*, 2003). The economically most important, geographically wide-spread and numerous geminiviruses are within the genus *Begomovirus* (type species BGMV), which contains more than 200 species (Fauquet *et al.*, 2008; Brown *et al.*, 1995; Brown and Czosnek, 2002; Jones, 2003; Varma and Malathi, 2003; Brown, 2007; 2010).

Genome organization of begomoviruses

The International Committee on the Taxonomy of Viruses (ICTV) has recommended a classification and scheme of nomenclature, based on complete nucleotide sequences of the genome (DNA-A and DNA-B) of begomoviruses. Begomovirus originating in the New World have a bipartite genome organization whereas those from the Old World have either bipartite or monopartite genomes (Brown *et al.*, 2002). In monopartite begomoviruses such as *Tomato yellow leaf curl virus* (TYLCV) from Israel (Navot *et al.*, 1991) and Sardinia (Kheyri-Pour *et al.*, 1991), only a single component similar to DNA-A of bipartite begomoviruses in genome organization has been identified (Fig. 1a) and shown to be enough for producing infectivity when reintroduced in tomato, fulfilling Koch's postulates and confirming that the single genomic component is solely responsible for disease development. DNA-A and DNA-B components constitute bipartite genome in begomoviruses. DNA-A is essential for replication and encapsidation (Rogers *et al.*, 1986; Townsend *et al.*, 1986; Sunter *et al.*, 1987) while DNA-B plays a role in systemic movement and symptom production (Etessami *et al.*, 1988; Noueiry *et al.*, 1994). The begomovirus replication cycles rely entirely on DNA intermediates and occur within the nucleus of the infected cell through two basic stages: conversion of ssDNA to dsDNA intermediates and rolling circle replication (RCR) (Gutierrez, 2002) (Fig. 1b).

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Molecular Detection of a Begomovirus Species on Chaya (*Cnidoscolus aconitifolia*) from Madhya Pradesh, India which is Distantly Related to Sri Lankan Cassava Mosaic Virus

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Abstract

The natural occurrence of a Begomovirus associated with severe mosaic disease on Chaya (*Cnidoscolus aconitifolia*) has been detected by PCR from Madhya Pradesh, India. The Begomovirus showed highest nucleotide sequence identities and distinct phylogenetic relationships of coat protein gene (CP) with several isolates of Sri Lankan Cassava Mosaic Virus (SrLCMV). To the best of our knowledge, this is the first report of SrLCMV infecting *Cnidoscolus aconitifolia*, and it is a new host of Begomovirus from India.

Keywords: Chaya; Begomovirus; Mosaic disease; Coat protein; PCR; Sequence identities

Abbreviations: SrLCMV: Sri Lankan Cassava Mosaic Virus; ICMV: Indian Cassava Mosaic Virus; JMIV: Jatropha Mosaic India Virus; JCMV: Jatropha Curcas Mosaic Virus; AYMV: Acalypha Yellow Mosaic Virus; ToLCJV: Tomato Leaf Curl Joydebpur Virus; ToLCKV: Tomato Leaf Curl Karnataka Virus; ToLCV: Tomato Leaf Curl Virus; ChLCIV: Chilli Leaf Curl India Virus; CLCPV: Chilli Leaf Curl Pakistan Virus.

Introduction

Cnidoscolus aconitifolia (Family Euphorbiaceae) commonly known as chaya or tree spinach is a large, fast growing leafy perennial shrub native to Mexico that produces lots of attractive, large, dark green leaves. It can grow well on a wide range of soils in both hot, rainy climates and areas with occasional drought [1]. Chaya has been introduced to Central and South America for potential uses as a leafy vegetable and medicinal plant. Chaya has been used for food since pre Columbian times, and is still eaten regularly, especially in Central America and southern Mexico. Chaya is a good source of protein, vitamins, calcium, and iron; and is also a rich source of antioxidants [2].

Only few reports are reported of virus diseases on chaya plant. The Cassava common mosaic virus (CCMV) isolates Genus *Potexvirus* were detected by serologically from chaya associated with mosaic disease in Florida [3] and identified by transmission electron microscopy (TEM), host range (biological) and RT-PCR in Venezuela [4].

The genus Begomovirus is a member of family Geminiviridae, which is the second largest group of plant viruses in all over the world. Begomoviruses are transmitted by whitefly (*Bemisia tabaci*) and cause important diseases in many dicotyledonous crops including important agricultural crop plants [5].

During a survey in February 2016, the Begomovirus-like symptoms including severe mosaic, leaf distortion, leaf curl, yellowing and stunting of whole plant were observed on chaya plant with the ~35-40% disease incidence in Bhojpur, Bhopal, Madhya Pradesh of India (Figure 1) grown by farmers as a hedge to protect crops. Three symptomatic plant samples were collected for detection and identification of associated Begomovirus on these plant species.



Figure 1: Chaya (*Cnidoscolus aconitifolia*) showing severe mosaic, leaf distortion, leaf curl, yellowing and stunting of whole plant (A) symptoms compared with healthy one (B).

To find the Begomovirus species is associated with the severe mosaic disease of chaya plant, the total DNA were isolated from 100 mg from newly emerging symptomatic leaves by the Dellaporta method [6] method and Polymerase chain reaction (PCR) was performed using a pair of Begomovirus coat protein (CP) gene specific primers CPIT-T/CPIT-T [7]. PCRs was set up in a 50 μ l reaction mixture containing: template DNA (100 ng), dNTPs (10 mM each),

2

Role of PGPR in Biofilm Formations and Its Importance in Plant Health

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2.1 Introduction

In modern agricultural processes, indiscriminate use of fertilizers, particularly the nitrogenous and phosphorus, has led to substantial pollution of soil, air, and water. Excessive uses of these chemicals have several negative impacts on the environment and exert deleterious effects on soil microorganism, affect the fertility status of soil, and also pollute the environment [1]. These chemicals and fertilizers are often expensive for farmers, and they also have bad effects on agricultural field as well as human beings. To control this problem, agricultural practice is moving to a more sustainable and environmentally friendly approach worldwide. The search for microorganisms that improve soil fertility and enhance plant nutrition has continued to attract attention due to the increasing cost of fertilizers and some of their negative environmental impacts.

2.2 Rhizosphere: A Unique Source of Microorganisms for Plant Growth Promotion

The rhizosphere probably represents the most dynamic habitat on Earth and certainly is the most important zone in terms of defining the quality and quantity of the human terrestrial food resource. The pleasant environment of microorganisms around plant root called rhizosphere. The term *rhizosphere* was introduced for the first time by Hiltner [2]. In the rhizosphere, very important interactions takes place between the plant, soil, microorganisms, and soil microfauna, influenced by compounds exuded by the root and by microorganisms feeding on these compounds [3]. The rhizosphere region can be classified into three factions: (i) rhizospheric soil that adheres to the root when the root system is shaken manually, (ii) endorhizosphere (interior of the root), and (iii) rhizoplane (surface of the root) [4]. The rhizosphere is the front line between plant roots and soil-borne pests. Therefore, it seems logical that microorganisms that colonize the same niche could be the ideal candidates for sustainable agriculture [5].



Commentary

OMICS International

Molecular Detection and Identification of Begomovirus Isolate on Tomato from Central Region of India

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Abstract

The natural occurrence of leaf curl and blisters disease on tomato was observed at Bhopal, India in the January, 2015. The begomovirus was amplified on symptomatic tomato by polymerase chain reaction (PCR) using coat protein gene specific primers. The purified PCR product (~800 bp) was sequenced and submitted in GenBank database (KU760803) and identified by their sequence analyses. The isolate under study (KU760803) showed 97% to 99% sequence identities and closest phylogenetic relationships with various isolates of *Tomato leaf curl New Delhi virus* (ToLCNDV), therefore, the isolates under study were identified as isolates of ToLCNDV associated with leaf curl and blister disease on tomato in the first time from central region of India.

Keywords: Begomovirus; Polymerase chain reaction; Sequence analyses; Phylogenetic relationship

Introduction

The horticultural crops in India cover approximately 13.6 million hectares of arable land (7% of the gross cropped area) and contribute 18% to 20% of the gross value of India's agricultural output (FAO, 2004). India is the second largest producer of fruits and vegetables in the world.

Madhya Pradesh is a central region of India and agriculture is one of the main sectors of the state's economy. About 73% population of the state is rural, which directly or indirectly depends on the agriculture. In Madhya Pradesh soyabean, mongbean, pea, linseed, tomato, brinjal, potato, okra, chili, cucumber, cotton, and cucurbits vegetable crops are grown commercially throughout the years by the farmers. Commercially cultivated plants/crops of Madhya Pradesh have been affected by several diseases caused by bacteria, fungus, phytoplasma and viruses. Pathogens causing these diseases are still unidentified at species level.

The Madhya Pradesh has plant diversity and flexible temperatures, which are favorable to virus vectors (aphids, whiteflies, leafhoppers, and planthoppers). Now a days there are no reports on virus infection on any crops or weeds on Madhya Pradesh state except one begomovirus on *J. gossypifolia* [1].

Begomoviruses of the family *Geminiviridae* that are whitefly transmitted cause diseases of important crops in the tropics and subtropics [2].

Their genome consists of one or two circular single-stranded DNA components, referred as DNA-A and DNA-B, each about 2.6 kb to 2.8 kb in size [2,3]. Monopartite Begomovirus (have DNA-A genome only) are predominantly found in the old world and are often associated with satellite DNAs (alpha- and betasatellites), which may or may not contribute to pathogenicity [4]. Some nanovirus-like DNA components known as alphasatellites (DNA-1) have also been reported with many begomovirus disease complexes [5].

The tomato (*Solanum lycopersicum* L., family *Solanaceae*) is one of the most important vegetable crops grown commercially worldwide for its edible fruits that have achieved tremendous popularity over the last two century. India is the fourth producer of tomato with an annual production of 7.6 million tons. Within India, major tomato producing

states are Uttar Pradesh, Karnataka, Punjab, West Bengal and Assam (FAO, 2003).

Tomato crop is susceptible to infection by a variety of causal agents generally showing symptoms of any array of diseases mainly caused by insects, nematodes, fungus, bacteria and viruses. Of which, viruses are known to cause huge loss to productivity of the crop. Tomato cultivars are susceptible host for a wide range of DNA and RNA viruses, which cause significant economic losses. Major viruses infecting tomato includes: *Cucumber mosaic virus* (CMV); *Tomato spotted wilt virus* (TSWV), *Tomato aspermy virus* (TAV); *Tobacco mosaic virus* (TMV); *Tomato bushy stunt virus* (TBSV); *Potato Y virus* (PYV) and *Tomato leaf curl virus* (TLCV) [6-10]. Moreover, these viruses can frequently occur in mixed infections [11].

During a survey in January 2015, begomovirus-like symptoms such as severe leaf curl and blisters on tomato accompanied with reduction of leaf size and stunting of whole plant were observed in the agriculture field near at Hoshangabad road, Bhopal, Madhya Pradesh of India (Figure 1). The causal pathogen was suspected to be a begomovirus due to the large population of whitefly (*Bemisia tabaci*) observed in the area. Three symptomatic plant samples were collected for detection and identification of associated begomovirus on these plant species.

To detect begomovirus species on these symptomatic vegetable plant associated with the severe leaf curl and blisters, the total DNA was isolated from 100 mg from newly emerging symptomatic leaves by the Dellaporta method [12] method and polymerase chain reaction (PCR) was performed using a pair of begomovirus coat protein (CP) gene specific primers CPIT-T/CPIT-T [13]. PCRs was set up in a 50 μ L reaction mixture containing: template DNA (100 ng), dNTPs (10 mM each), primers (each 25 pmol), *Taq* DNA polymerase (1.5

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Commentary

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The Current Status of New Emerging Begomovirus Diseases on *Jatropha* Species from India

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Abstract

Jatropha species have many excellent characteristics like bio-fuel, high oil content, resistance to drought and other commercial importance values. The several reports have been indicated that *Jatropha* mosaic disease has been drastically affected the *Jatropha* cultivation in India. The association of begomovirus diseases consists of symptoms like mosaic on *Jatropha* species has been reported worldwide including in India. The status of the work used and the results obtained in methodology for identification and characterization of begomovirus isolates associated with symptomatology like mosaic disease of *Jatropha* species grown in India, are presented in this review article. Because mostly *Jatropha* species are being propagated by cuttings, and new species of Begomoviruses are emerging in newly introduced locations for *Jatropha* cultivation in India. The review articles is highlighted the new emerging begomovirus diseases on *Jatropha* species and will be incited to researchers for better improvements of *Jatropha* cultivations for oil productivity in worldwide.

Keywords: *Jatropha* species; Mosaic disease; Begomovirus; Genome organization; Molecular Characterization, Sequence analysis

Introduction

Begomoviruses, of family *Geminiviridae*, are whitefly transmitted viruses which cause diseases in many dicotyledonous crops including important vegetables and weeds in the tropics and subtropics. They consist circular single strand DNA (monopartite: DNA-A, or bipartite: DNA-A and DNA-B) genome. Most of the described begomoviruses are bipartite containing DNA-A and DNA-B molecules, each being approximately 2.6-2.8 kb in size, which are responsible for different functions in the infection process and their life cycle. DNA A encodes a replication-associated protein (Rep) responsible for viral replication, a replication enhancer protein (REn), the coat protein (CP) and transcription activator protein (Trap) that regulate the expression of gene. DNA-B encodes for two proteins, movement protein (MP) and nuclear shuttle protein (NSP) involved in cell to cell movement within the plant, host range and symptom modulation [1]. However, some Old World begomoviruses lack a DNA-B component and only the DNA-A component is required to infect plants systemically. The satellite molecules DNA-β has been found out to be associated with monopartite (DNA-A) and bipartite (DNA-A and DNA-B) begomoviruses and are responsible for the symptom development and systemic infection [2-6].

The genus *Jatropha* of family *Euphorbiaceae* has more than 400 species distributed worldwide and among them *Jatropha curcas*, *J. gossypifolia*, *J. cuneata*, *J. integerrima*, *J. multifida* and *J. podagrica* are recorded from India (Figure 1).

Jatropha curcas L. is commonly known as physic or purging nut. It is a multipurpose and drought resistant crop which is grown in marginal lands with lesser input. *Jatropha* plants natively occurred in tropical areas of India, Africa, North America and the Caribbean. It is an efficient substitute fuel for diesel engines and forms an essential ingredient in various soaps, dye and wood industries. *Jatropha* extract is also efficacious in dropsy, sciatica and paralysis. Moreover, the plant is very reliable in curing several diseases including rheumatism, leprosy, scabies, eczema, ringworm, chronic dysentery, urinary discharges, abdominal complaints, anaemia, fistula and disease of the heart [7-9].

For *Jatropha* plantation have been identified on the basis of

availability of wasteland, drought land and climatic conditions suitable for *Jatropha* plantation in 19 states of India like: Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Maharashtra, Gujarat, Goa, Rajasthan, Uttar Pradesh, Bihar, Madhya Pradesh, Chhattisgarh, Orissa, Jharkhand, Himachal Pradesh, Haryana, Punjab (Figure 2). In India *Jatropha* is cultivated in large plots of waste land and provide employment to the poor people of rural areas. Government of India has identified 98 million acres of land where *Jatropha* can be grown, and probably will replace ~30% of India's bio diesel consumption.

Unfortunately, the mosaic disease of has been affected drastically the *Jatropha* cultivation in India. The symptoms of diseases is showing on the leaves like mosaic, yellow mosaic, blistering, leaf curl, leaf distortion and stunting of whole *Jatropha* plant (Figure 3). The natural infection of begomovirus has been reported in *Jatropha* species across the world: *Jatropha* mosaic virus on *J. gossypifolia* in Jamaica and Puerto Rico [10-14], African cassava mosaic virus reported on *J. multifida* in East and West Africa [15]. Two strains of African cassava mosaic virus on *J. curcas* from Kenya were reported [16,17]. Recently *Jatropha* mosaic Nigeria virus on *J. curcas* from Nigeria [18] and *Jatropha* mosaic virus-[Jamaica: Spanish Town: 2004] on *J. gossypifolia* [19] reported from Jamaica.

The *J. curcas* crop was introduced first time at Southern India in the year of 2002 for biodiesel production. The mosaic disease caused by begomovirus was noticed for the first time on *J. curcas* with a high disease incidence >46% during September, 2004 in Karnataka, southern India [20,21], incidence of a mosaic disease in *J. curcas* reported from Uttar Pradesh [22] and also about 25% incidence was noticed in northern

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Molecular Detection and Identification of Begomovirus Isolates Associated with Mosaic Disease of Ornamental Jatropha species from India

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Abstract

During surveys severe mosaic disease like symptoms were observed on ornamental species of Jatropha viz. *J. podagrica*, *J. multifida* and *J. integrifolia* grown in CSIR-NBRI garden, Lucknow in the year of 2009-2011. For molecular detection of begomovirus associated with mosaic disease of *J. podagrica*, *J. integrifolia* and *J. multifida* were detected by polymerase chain reaction (PCR) using begomovirus specific primers. The resulting amplicons of ~1.2 kb of in all the ornamental species of Jatropha samples were sequenced and sequence data was analyzed and submitted in GenBank database. Based on highest sequence identities of partial DNA-A genome (~1.2 kb) and close phylogenetic relationships Jatropha mosaic India virus in *J. podagrica* (HQ848382); Tomato leaf curl Patna in *J. multifida* (HQ848381) and Papaya leaf curl virus in *J. integrifolia* (JQ043440) were identified. Present study we report here, molecular detection identification of the begomovirus isolates associated with mosaic disease of ornamental Jatropha species is a new report from India.

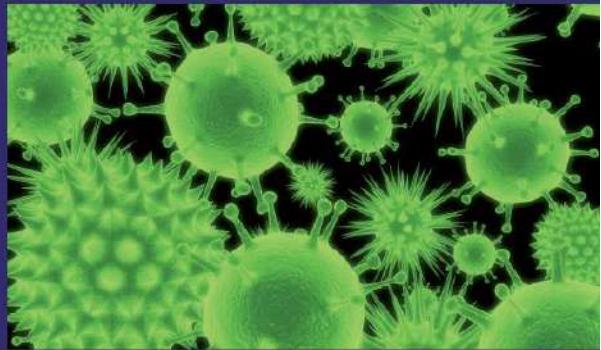
Keywords: Jatropha species; Mosaic disease; Begomovirus; PCR; Molecular identification; Sequence analysis.

Introduction

Begomoviruses of the family Geminiviridae are whitefly transmitted which cause diseases of important crops in the tropics and subtropics [1]. Their genome consists of one or two circular single-stranded DNA components, referred to as DNA-A and DNA-B, each about 2.6-2.8 kb in size [1, 2]. A number of begomoviruses occurring in the Old World (Eastern Hemisphere, Europe,

Africa, Asia) are monopartite and have only a single component equivalent to DNA-A. The cloned genomic component of some of these monopartite begomoviruses has been shown to produce typical symptoms, confirming that single genomic component is solely responsible for the disease [1, 3]. A satellite molecule called DNA-β has also been found to be associated with mono-partite and bi-partite begomoviruses and is required for the systemic infection and symptom development [4-7].

Plant viruses cause major losses to several agricultural and horticultural crops around the world. The present century faces severe epidemics by newly emerging viruses affecting a variety of crops, particularly vegetables, legumes, grains, oil seeds, fruits, tuber crops, spices and ornamental plants. This text book has covered basics of plant viruses like general features, brief history, classification, some economically important plant viruses, its symptoms, transmission study and various protocols (biological, serological and molecular) for detection, identification and characterization of plant viruses that can be applied to the management of plant virus diseases and improve the quality and yield of crop plants. The Laboratory Manual of Plant Virology book guide is intended for the use in detection, identification and characterization of various groups of plant viruses on economically important plants. This book also help to PG students, research scholars and faculty members to handle the plant virus in laboratory, in the field and green houses and identified them at biological, serological and molecular levels.



Sunil Kumar Sneh (Ed.)
Shri Krishna Raj

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Laboratory Manual of Plant Virology

Basics of plant virology and protocols for easy use in the laboratory



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Begomoviruses, of family Geminiviridae, are whitefly transmitted viruses which cause diseases in many dicotyledonous crops including important vegetables and weeds in the tropics and subtropics. They consist circular single strand DNA (monopartite: DNA-A, or bipartite: DNA-A and DNA-B) genome. Keeping in view the economic importance of Jatropha species and the disease caused by begomoviruses, biological and molecular studies have been done for characterization and identification of begomovirus causing mosaic disease in *Jatropha* species. This is the original work and publishing as a text book entitled "Begomovirus Diseases on Jatropha species from India". In this book reviews various studies carried out till date in order to understand the biological and molecular characteristic of begomovirus isolates/species. This book will be help to Research Scholars/Researchers, Professors and Scientists of various Institutes and Universities to working on the begomoviruses disease on agricultural crops especially to improvements of Jatropha cultivations for oil productivity in worldwide.

Begomovirus Diseases on Jatropha



Sunil Kumar Sneh



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Sneh

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Begomovirus Diseases on *Jatropha* species from India

An Empirical Study on the Importance of Technology in Education in Digital India: Scope and Challenges of Indian Society

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ABSTRACT:

Education plays an important role in overall development of individuals thereby contributing immensely to the overall development of a Nation. Education globally is one of the important sectors to witness revolutionary changes in recent times. This happens primarily because of digital revolution taken place all across the globe. The typical Indian classroom was once characterized by students sitting through long hour session, teacher used to discuss the things without any visual presentation. Now, thanks to digital technology, it is making life easier for both students and educators. Digital education is fun learning for all cadres and particularly effective for child learning as the innovative audio-visual feature boosts the cognitive elements in child's brain. Schools are increasingly adopting digital teaching solutions in their academic, and trying to make the classroom environment more inclusive and participatory. Digital technologies are being increasingly used by us in everyday lives from retail shops, to government offices, to education sectors, etc. They help us to connect with each other and also to share information on issues and concerns faced by us. Earlier, technology in education was a debatable topic amongst the society. Everyone had their own views on modernizing education and making it technology aided. Our Hon'ble Prime Ministers Narendra Modi's vision of a digital India, envisions transforming our nation and creating opportunities for all citizens by harnessing digital technologies. There were huge number of positives and negatives to education technology, but, gradually as technology was embraced by the educational institutes, they realized the importance of technology in education. Technology and education are a great combination if used together with a right reason and vision. To elucidate on the topic of this research paper, it is definite that "Technology improves Education" to a greater extent and has now become a need for revolutionalizing education for the better.

Keywords: Education, Technology, Digital Technologies.

INTRODUCTION:

Over the past years, a number of studies have shown benefits from the use of technology in education and digital education in India is evolving at a faster pace. The role of technology in education is vital, and the question is no longer if technology enhances learning, but rather how do we improve our use of technology to enhance learning? Technology in education means digital learning. It is a type of learning that is supported by digital technology or by instructional practice that makes effective use of digital technology. Digital learning occurs across all learning areas and domains. Digital education gives win-win opportunities for the rapid rise for a flexible and alternative option allowing them to study as per their convenient, on the other side teachers and professors too find it convenient to prepare their teaching plans aids by digital technology. Digital learning guarantees more participation from students as the current generations of students are well-versed with laptops, -pads, and smart phones.

With technology, educators, students and parents have a variety of learning tools at their fingertips. Here are some of the ways in which technology improves education over time:
Teachers can collaborate to share their ideas and resources online: They can communicate with others across the world in an instant, meet the shortcomings of their work, refine it and provide their students with the best. This approach definitely enhances the practice of teaching.

Students can develop valuable research skills at a young age: Technology gives students immediate access to an abundance of quality information which leads to learning at much quicker rates than before.
Students and teachers have access to an expanse of material: There are plenty of resourceful, credible websites available on the Internet that both teachers and students can utilize. The internet also provides a variety of knowledge and doesn't limit students to one person's opinion.

An Empirical study on Demonetization and its horrifying impact on Our Society

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ABSTRACT

On November 8th, the government announced its decision to discontinue the legal tender status of Rs.500/- and Rs.1000/- notes. The original objectives were stated as: eliminating fake currency; inflicting losses on those with black money; and disrupting terror and criminal activities. Later new objectives were tacked on: enabling growth in bank credit, turning India into a cashless economy. In a Cost-benefit analysis made it is found that the benefits were relatively small when compared with the costs. The benefits are primarily in the form of losses inflicted upon those with black money, while costs are imposed on legitimate economic and social activities. Ordinary people going about their lives, have suddenly been asked to bear a burden associated with the project of imposing costs upon people who have uncounted wealth. This study is based on the agenda of defining and measuring causes and effects of social exclusion and experiences of elderly people in the Bhopal city. This study examines the problems faced by the ordinary people experiencing demonetization due to the adverse procedure adopted worldwide overnight.

*....those who torment us for our own good
will torment us without end
for they do so
with the approval of their own conscience.*

-C.S.Lewisus R

Keywords: *Fake currency, Black money, Cost benefit.*

INTRODUCTION:

Demonetization is the act of stripping a currency unit of its status as legal tender. Demonetization is necessary whenever there is a change of national currency. The old unit of

Status of National Rural Employment Guarantee Act in Madhya Pradesh with Special Reference to Dindori District

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ABSTRACT

National Rural Employment Guarantee Act is a remarkable initiative of a social protection measure that is demand-driven and has nationwide coverage. It is gender sensitive and provides a minimum wage in form of additional income along with development of sustainable and productive assets in rural area. The paper envisages the comprehensive analysis socio-economic development of tribal community in Dindori district. The research, is an attempt to evaluate the impact of NREGA and to identify the key areas of progress as well as shortcomings in the implementation. It is revealed despite making provision of 100 days of employment in a year, actual employment generation has been much below than 100 days in a year. SC households got highest average wages, followed by small landholders and BPL families. However, tribal got below average wages. Major changes felt and reported under this research by beneficiaries are increase in income and improvement in debt clearance.

Key words: Employment, Rural Development, NREGA, Tribal

INTRODUCTION

In India agriculture and forest are the key factors responsible for the socio-economic changes. As the agriculture economy is backbone of holistic development in India but their contribution to GDP significantly decline since independence i.e. just 9% in 2007. Although ten five years plans has been passed to encourage agriculture growth but lack of inter-sectoral convergence, policies and decentralized governance reflect disproportionate development which causes poverty and slow agriculture growth. Actually, after the independence many public works programmes initiated having provision of

relief. At the same time, overlooked the importance of stimulating sustainable and productive employment. Prior to 1990, 'social protection' policies and programmes in India were limited outreach. Often design for instance social security or social welfare interventions, mainly in organized sectors. Since 1990 there has been shift and focused toward social insurance, micro-credit schemes and national programmes on maternity, old age and health needs. Nevertheless, coverage is only 5 to 6 percent of workers and majority of the workers especially those belongs to informal sector remain excluded and rely on

**LABOUR EMPOWERMENT
UNDER MAHATMA GANDHI
NATIONAL RURAL
EMPLOYMENT GUARANTEE
ACT (MGNREGA)
A STUDY OF DISTRICT
KULGAM IN KASHMIR (J&K)
ISSUES AND CHALLENGES**

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ABSTRACT:

Empowerment is the expansion of assets and capabilities of poor people to participate in negotiate with influence, control, and hold accountable institutions that affect their lives. A large segment of Indian labour still suffers deprivation and discriminatory attitudes. It is necessary to mobilize the vast labour power, if the country has top progress in all sphere of development. Empowerment of labours is a long and complex process which involves various issues and challenges. National Rural Employment Guarantee Act (NREGA) presently known as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is crucial for labour empowerment in our country. The act was enacted by Government of India in September 2005 and brought into force with effect from February 2006. MGNREGA marks a paradigm shift and stands out amongst other rural employment programmes as it empowers the rural population, particularly labour and other backward sections of the society with a legal right and employment guarantee through an act of parliament, unlike other wage employment programmes. Most remarkable feature of MGNREGA is that it pays great attention towards our labour health, something that was virtually unimaginable in rural India. The act plays a significant role to meet the practical as well as strategic needs of labour rights which include self-strength, control, self-power, self-reliance, own choice, life of dignity in accordance with one's values, capable of fighting for one's



महिला पुलिस एवं वर्तमान समाज में उनकी आवश्यकता

शशांक शेखर ठाकुर

शांध सार

वर्तमान परिवृश्य में महिलाओं की भूमिका पारिवारिक तथा आर्थिक क्षेत्रों में पुरुषों की तुलना में कदापि कम नहीं है। महिला पुलिस भी समाज में अपनी अहम भूमिका निभा रही हैं। समाज के लिए एवं महिला मुददों के प्रति संवेदनशीलता के लिए महिला पुलिस की समाज को आवश्यकता है ताकि वह सामाजिक व्यवस्था के कुशल संचालन एवं सामाजिक नियंत्रण के लिए एक एजेंसी के रूप में कार्य कर सके। स्त्रियों के विरुद्ध बढ़ते अपराधों को देखते हुये न सिर्फ सरकार एवं पुलिस विभाग को उनकी आवश्यकता महसूस हुई वरन् स्त्रियों को भी अपनी सामाजिक एवं आर्थिक स्थितियों में सुधार की आकांक्षा ने इस सेवा को अपनाने के लिए प्रोत्साहित किया। इसी संदर्भ में औद्योगीकरण एवं नगरीकरण ने सामाजिक परिवर्तन का एक नया दौर प्रारंभ किया। प्रस्तुत शांधपत्र महिला पुलिस एवं समाज में उनकी भूमिका पर प्रकाश डालता है।

मुख्य बिन्दु: महिला पुलिस, समाज, परिवर्तन

भूमिका

विकासशील देशों में ही नहीं प्रायः सभी समाजों में महिलाओं की भूमिका पारिवारिक तथा आर्थिक क्षेत्रों में पुरुषों की तुलना में कदापि कम नहीं रही है वरन् उनकी स्थिति का आंकलन विसंगतिपूर्ण रहा है, क्योंकि आमतौर पर वर्तमान पुरुष प्रधान समाज में यह भ्रांति व्याप्त है कि स्त्रियाँ शारीरिक एवं मानसिक तौर पर शासकीय एवं निर्देशकीय कार्यों के योग्य नहीं होती हैं। वर्तमान में भी उसे समाज में अपनी पहचान स्थापित करने में अनेक प्रकार के उपेक्षाओं, अवांछित हस्तक्षेपों एवं लक्षणों का शिकार होना पड़ता है। समय के साथ स्त्रियों की स्थिति

डॉ. शशांक शेखर ठाकुर, सहायक प्राध्यापक, समाजशास्त्र एवं समाज कार्य विभाग
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Status of Development of Baiga tribe in Madhya Pradesh: Challenges and Ways Forward

**Dr. S.S. Thakur,
Vishal Nayak,**

Abstract

India has 104.3 million tribal people, constituting 8.61% of the country's population as per census 2011. There are 75 tribal communities, which are identified as most vulnerable on the basis of their low economy, very low rate of literacy, small size of tribe, general backwardness due to seclusion and residing in remote isolated enclaves & area. Madhya Pradesh shares 14.69% tribal population in the Country and stands among the highly tribal populated states. Shariya, Bhariya and Baiga are three vulnerable tribes, which consists of 1.23 million tribals in the state ,out of which one-third belong to Baiga Tribe mainly found in eastern part of the state. They are largely concentrated in and around the forest area, and are amongst the most marginalized and vulnerable tribes. Since last few decades Baigas are constantly adapting to the mainstream of the larger society and many development programmes have been initiated to improve literacy and health indicators.

The paper envisages comprehensive analysis of demographic and socio-economic development of Baiga tribals. The analysis is based on the secondary data such as Censes 2011, research articles and data collected from six Baiga dominated districts i.e. Mandla, Dindori, Shahdol, Anuppur, Umari and Balaghat under the study of PMPSU. To understand the socio-economic and socio-cultural development of Baiga tribe, this paper will present responses of 1754 households from 70 notified Baiga villages. The paper will also help in to understand the impact of rural development programmes on livelihood, health, education and WASH aspects.

network matrix are also proposed. Furthermore, (c) Enzyme immobilization scheme on BC for cell additional activity and Enzyme immobilization on BC nano-network matrix is designed. Finally, a BC/SG single fibril nanocomposite biocatalyst design, for cell incide activity bio-processing is examined. In this scheme individual BC nano fibril is covered by SG. In both layers separately are contained nano-wires, electric tweezers and bioactive molecules, could be transferred in inside cell specific location to liberate the bioactive compound. It is obtained after BC and SG hydrolysis by the entrapped cellulases and amylases enzymes respectively.

IO 039

Clean India Drive Addressing Environmental and Behaviour Changes in the Society

Shashank Shekhar Thakur

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The safe disposal of human excreta contributes significantly in the environmental cleanliness as unsafe drinking water and defecating in open lead to the health hazards. India is off-track in reaching the Millennium Development Goals (MDGs) target by 2015 to provide sustainable access to safe drinking water and basic sanitation. However, Swachh Bharat Mission for universal coverage by 2019 has been recorded a remarkable growth in eliminating open defecation practices through changing behaviour of society. The primordial perceptions of being cleaned have been evolving with the efforts of community leaders. This paper will highlight environmental issues as well as behaviour changes in making Swachh Bharat. The paper will present the role of sanitation workers in changing the societies perceptions and highlight the processes undertaken to develop an open defecation free villages and the sustainability in terms of usage by different group of the society. It will deal with the issue of inclusion of most vulnerable tribes – Baiga - primitive tribes in Madhya Pradesh.

The analysis is based on the secondary data of Swachh Bharat Mission and the case studies of open defecation free villages in central India. The perceptions of the civil society organisations actively involved in the community mobilization component will augment the findings.

IO 040

Understanding Dose-Response Relationships in the context of Air Pollution Epidemiology

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Dose-response relationship is an essential concept in toxicology as well as epidemiology, that is the study of the distribution and determinants of disease. In the context of India and particularly the national capital, air pollution remains one of the prime environmental health concerns. It is

IO 27

(92)

Socio Economic Implications of Demonetisation on Clean India Drive

* Shashank Shekhar Thakur

Abstract- India is considered the epicenter of the world's sanitation crisis and as per censes 2011, only 47% Indians have access to toilets - rural coverage (30.7%) is worst. India has missed the MDG target of 2015 and hence, the SDG-6 determined universal access to sanitation by 2030. Nevertheless, India is striving to achieve it by 2019, which is a huge and ambitious target. Therefore, Swachh Bharat Mission has been launched on 2nd October 2014. In the initial two years it has accounted a significant growth; depicting sanitation coverage of 58.9% in rural India; 30 million rural households have now been provided with toilets and thereby converting 1.4 lakh villages as open defecation free. Demonetisation in the country has effected liquidity of funds and experts assume that it will affect GDP growth and rural economy. The clean India drive requires cash/liquidity on ground to arrange construction material, even the credit worthiness in the market and working capital with local implementers is crucially low to ensure smooth supply chain. In a way demonetization, affected confidence and trust in the rural economy, moreover due to inadequate rural banking services auxiliaries it. After demonetization, the financial progress has declined. The average monthly financial progress under SBM-Rural between September and October 2016 was accounted as Rs. 146278 lakhs, while in November 16, it declined by 18%. If this trend persists, it will have larger implication on achieving universal coverage. The paper is an attempt to identify the socio-economic implications of demonetization on access to sanitation. The paper will talk about its effect on universal coverage and projections on declined trends. This will also look into the role of civil society in behaviour change aspects.

Keywords: Sanitation, Mission, Rural, Development

1. Introduction: International sanitation revolution started in 1981 and in India it was initiated through Centrally Sponsored Rural Sanitation programme in 1986. Interventions have generally been target driven and focused on building household latrines, free of cost or heavily subsidized. Nevertheless, India is considered the epicenter of the world's sanitation crisis under Joint Monitoring Programme (JMP) report of World Health Organization and UNICEF. As per censes 2011, only 47% Indian population have access to a

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Development of Society under the Modern Technology- A Review

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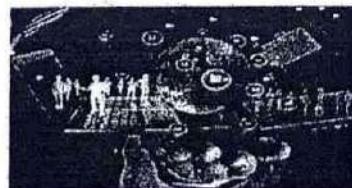
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ABSTRACT

The main objective of the present study is to know the relationship between society and technology, where emphasize have been put on development process under modern science and technology and its perspectives. Technology has completely revolutionized present era in every aspect of life especially dealing with society. Technology has transformed the methods of education, communication, business, art and literature, and has resulted in the enhancement in the core spheres of life, before this blessed gift the knowledge regarding the above mentioned spheres was limited because of the restricted methods and methodologies etc. Due to blessings of science and technology we are now able to check the advancement of every department working around our society with a single click of internet. It is technology which helps us to differentiate about the development process of all sections of society and help us to maintain the development process. Technology has brought our society close to each other where we can take any initiative about any social issue or discuss any matter of concern regarding the society by sitting in our homes like using video or audio conferencing. This paper will elucidate all over development process of our society under the shades of science and technology.

KEY WORDS: Society, Science, Technology, Development.



Introduction:

As a whole science and technology is having a great impact on society. The incorporation of such blessings in society is having a great influence on social interaction. It is apparent from the existing knowledge that new technologies brunt on the social communication within households in many different ways. Technology has bought the new methods of communication which made us easy to identify and interact with someone who is known or unknown on universal level. Science and technology is playing a role of bridge for the rural upliftment and social development. It is technology which transformed the human race from Stone Age to modern industrial age. Science and technology not only influenced our communication method but also enlightened our rural economy by its modern agricultural methods. Modern technology and scientific tools enhanced the economic growth of the country and made every impossible work an easy task to handle. It is technology which impacts globally the social life and provides opportunities for every social person to become conscious about society and to achieve societal goals. The word technology is combination of two words "Techno and Logy" (Techno) means art, application or skill and (Logy) means science and learning. It means technology is the way of methods and tools that a society has created in



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Women empowerment and gender equality under MGNREGA a great revolution in rural life

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ABSTRACT

Women empowerment is the most important need of society, if the society has to develop in all spheres of life rural women has to lead from the front. Empowerment of women is a complex process which needs to gain attention as early as possible, in this regard Government of India has made an Act Mahatma Gandhi national rural employment guarantee act in 2005 to give the equal rights to the rural women to participate in this act and to gain sustainable livelihood for the procurement and upliftment of women society of India. It provides them power to control, participate, hold accountable institutions and provide basic assets and capabilities for their upliftment. The act has a great impact on liberty and decision making power of poor women. It provides them security and protected them from exploitation. They can work with their male partners and also they can look after their Childrens as well during the work site. This act gave an opportunity to the women to become less dependent on male and get equal wages with respect to the men. A lot of women workers from the rural area started small business by the amount they get from the MGNREGA which brought a great enlightenment in the lives of women. This paper will also highlight some issues at the end which need to be addressed to make this act more powerful and purposeful for the women society.

Keywords: Women Empowerment, Exploitation, MGNREGA, Opportunity and Upliftment.

1. INTRODUCTION

Mahatma Gandhi national rural employment guarantee act (MGNREGA) was enacted in 25th August 2005 but it was fully implemented in 2nd February 2006 in all the rural districts of the country MGNREGA has a great impact on Women empowerment because it is a rural development scheme and it was mainly enacted to uplift the rural economy of both the genders. Women society of District Kulgam of Jammu and Kashmir gained a lot of positive measures under the MGNREGA. The act gave them the right to get 100 days employment in a single financial year. MGNREGA has influenced the womens life towards a great enlightenment. The act provided they work within the five kilometers of village before this act women had to suffer too much in the search of work but MGNREGA gave them the welcome relief and they were able to work within their villages and were also able to work and look after their children. MGNREGA provided them opportunity to gain economic power and made them self dependent because the wages they get from the MGNREGA helped them to look after their health and to fulfill their demands. Some of the womens start small business by the money which they got from the MGNREGA. The act also protected them from exploitation because in other places women had to suffer too much and they were used to travel so many kilometers in search of work which was also a big issue for them but under this act they can work with their life partners in their own locality and earn equally for their family. There is availability of water on working sites, first aid medical kits and also arrangement for their children to look after. MGNREGA is the largest employment generation scheme. It also provided government jobs to a lot of women section who are working as panchs, sarpanchs, clerks and BDO'S in the society. Hence we can say that MGNREGA brought the revolution in the life of rural people particularly in the life of women society who can earn, spend and govern authority under this article.

2. OBJECTIVES

- To check the women labour power under MGNREGA in district Kulgam.
- To check the gender equality under MGNREGA in district Kulgam.
- To check the employment generation of womens under MGNREGA in district Kulgam.
- To check the strength of women empowerment under MGNREGA in district Kulgam.



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Performance of MGNREGA in District Kulgam J&K.-A case study of Panchayat Dessen

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Abstract: This paper defines the performance of Mahatma Gandhi National Rural Employment Guarantee Act in the Panchayat Dessen of District Kulgam (J&K). MGNREGA is the rural development act and it provides the provisions to uplift the rural economy as well as the social development. This Act has influenced the life of the rural people because it is the first employment guarantee scheme which made the positive impact by creating the assets in rural villages to change the rural life towards a greater achievement. MGNREGA provides equal rights to both the genders to participate in this act and to earn their livelihood. This act has also a great impact on labour migration because it provides jobs within the five kilometers of village which is a great achievement in the lives of labours. MGNREGA has a great achievement in the agricultural sector by providing roads for transport and communication and the irrigation facilities to the farmers. This paper will also discuss the level of eradication in the rural problems and also it will discuss how much the quality of life changed under the implementation of this Act. This study also highlights some issues in the execution of MGNREGA process which need to be address to make this Act more powerful and more successful.

Key Words: MGNREGA, development, issues, achievement and impact.

Introduction:

National Employment Guarantee Act (NREGA) was enacted in 2005. The programmes like Sampoorna Grameen Rozgar Yojana and national food for work programme were included within this Act when it was implemented in its first stage in 200 backward districts of the country. The act was passed to uplift the rural life by providing livelihood security in rural villages by providing employment of 100 days to every household whose adult members are ready to perform unskilled manual work. India is a country where 72% population is residing in rural areas. So, the need was felt to uplift the rural economy because in the past the other schemes could not bring any positive results they failed to meet the requirement and failed to bring any security in peoples lives. The NREGA goes beyond poverty alleviation and recognizes employment as a legal right. Mahatma Gandhi National Rural Employment Guarantee Act is center sponsored scheme and it is the first employment scheme which works on village level and made its impact on global level. NREGA act was implemented in 2nd feb, 2006 in all the rural districts of the country. The Act has created a great employment generation in the rural life. It is the first Act which provides the equal opportunities to both the genders to work under MGNREGA and to earn equally at the village level. NREGA created a lot of assets in the rural villages such as roads, proper drainage system, irrigational facilities for the farmers, village interconnected streets and performed well in the social development as well.

In 2009 NRECA was renamed as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). This act is a central funded scheme and it is implemented in all the states. It is the main act which is being implemented by government to achieve inclusive growth. The programme has

मलेरिया नामक संक्रामक रोग का समाजशास्त्रीय अध्ययन विदेशा नगर के विशेष संदर्भ में

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सरांश

संचारणीय बीमारियाँ संक्रमण के कारण फैलती हैं, इसलिए इन्हें संक्रामक बीमारियाँ भी कहते हैं। संक्रमण, रोगाणुओं के माध्यम से होता है जो मुख्यतः चार प्रकार के होते हैं। जीवाणु, वायरस, प्रोटोजोआ एवं फंगस। ये संक्रामक बीमारियाँ एक व्यक्ति से दूसरे व्यक्ति में फैलती हैं और समाज में पाये जाने वाले किसी एक रोगी से समाज के समस्त स्वस्थ व्यक्तियों को प्रभावित करती हैं, अतः वर्तमान अध्ययन में रोगियों का समाजशास्त्रीय अध्ययन विदेशा नगर के विशेष संदर्भ में एक प्रयास जो स्पष्ट करता है कि समाज में रह रहे संक्रामक रोगी व पालतू जानवरों का रहन-सहन स्वस्थ व्यक्तियों को संक्रमित करता है। समाज में संक्रामक बीमारियाँ मच्छरों व मक्खियों से भी फैलती हैं जो स्वस्थ व्यक्ति के शरीर में मलेरिया, डेंगू, चिकनगुनिया, पीतज्वर, हाथी पॉव जैसी बीमारियों पैदा करते हैं। समाज में मलेरिया एवं डेंगू प्रचुर रूप से मिलते हैं, जिनके लिए कहीं न कहीं सामाजिक परिवेश जिम्मेदार होता है, क्योंकि समाज में रह रहे मनुष्यों, पालतू जानवरों का रहन सहन ही समाज को सर्वाधिक प्रभावित करता है।

विशिष्ट शब्द - मलेरिया, संक्रमण, पेस्टीसाइड्स, एण्डेमिक, रोगकारक, संक्रामक, संचारणीय

1 प्रस्तावना

मलेरिया विकासशील देशों की बहुत सामान्य बीमारी है, मलेरिया शब्द की उत्पत्ति बुरी हवा वाली जगह से हुई है जिसका मतलब है कि जहाँ पर गंदगी है, वहाँ पर मच्छर पनपते हैं और उनमें से ही मादा एनफिलीज मच्छर के काटने से मलेरिया होता है। प्रत्येक वर्ष मलेरिया के कारण 300 से 500 भिलियन लोग बीमार पड़ते हैं। प्रत्येक वर्ष एक भिलियन बच्चे मलेरिया के कारण मर जाते हैं। भारत में मलेरिया के कारण सबसे अधिक मध्यप्रदेश में लोग पीड़ित होते हैं। मलेरिया से बचने के लिए रसायन जैसे-पाइरेथ्रम

Impacts of Media and Technology on Society

Corresponding Author
Dr. Shashank Shekhar Thakur

Abstract :- Man is a social animal, he cannot live in isolation, so his actions affect not only him but society in general, society affects a man in so many ways. This paper gives a brief definition of what media is and what are the effects of media on society. During the course of this literature various types of Impacts of media on the individual, his family and society are highlighted. This manuscript also deals with the impacts of modern technologies on members of the society and their influences on economic, religious and social aspect, as well as their impact on people's behavior and the responsibility of the society in monitoring the children who are in need of attention by everyone through the guidance of appropriate educational ways.

Keywords :- Technology, Society, Media and Impacts of media.

Introduction :- Human beings express their nature by creating and recreating an organization which guides and controls their behavior in many ways. This organization liberates and limits the activities of men, sets up standards for them to follow and maintain. Whatever the imperfections and tyrannies it has exhibited in human history, it is necessary condition of fulfillment of life. This organization which is responsible for fulfillment of life of every individual is called society. Man in every society has suffered from one or the other problems. Men in modern societies are also experiencing various problems and his behavior gets affected by many things, media is one of them. Media is the plural of the word medium. Media are the vehicles or channels which are used to convey information, entertainment, news, education, or promotional messages are disseminated. Media includes every broadcasting and narrowcasting medium such as television, radio, newspapers, billboards, mails, telephone,

fax, internet etc (the main means of mass communication). The mass media occupy a high proportion of our leisure time: people spend, on average, 25 hours per week watching television, and they also find time for radio, cinema, magazines and newspapers. For children, watching television takes up a similar amount of time to that spent at school or with family and friends. While school, home and friends are all acknowledged as major socializing influences on children, a huge debate surrounds the possible effects of the mass media and findings both in favour and against effects are controversial. The question of effects is typically raised with an urgency deriving from a public rather than an academic agenda and with a simplicity which is inappropriate to the complexity of the issue (we do not ask of other social influences, what is the effect of parents on children or do schools have an effect which generalizes to the home or do friends have positive or negative effects).

Thus, there are increased concerns in the speed at which modern technology spreads as well as its uses and their false and negative impacts. This was due to the absence of effective guidance where some groups have become vulnerable to the negative effects of life-threatening. Since education is an important area of life, the use of modern technologies makes it an essential part in education, not just a simple addition.

Research Objectives :- To demonstrate the social impact of media on society. These are the major objectives of this research:

1. To recognize the use of modern technological techniques by members of the society and their impacts on the social aspects.

The Change Towards Rural Development: A Study MGNREGA in Block Behibagh, District Kulgam, Jammu & Kashmir*

Aasif Ali Naikoo and Shashank Shekhar Thakur

Abstract: This paper discusses the changes occurred due to the implementation of the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in the Block Behibagh of District Kulgam, Jammu and Kashmir. It will also discuss the past conditions of the block and the impact of this Act in the present scenario. MGNREGA brought several positive changes in general and vulnerable sections of the rural population, particularly by securing their livelihood and eradication of rural poverty. MGNREGA has an objective to enhance livelihood security to the rural poor by providing at least one hundred days of wage employment to every household whose adult members are ready to do unskilled manual work. MGNREGA not only provided wage employment as an alternative source of livelihood but also created durable assets such as roads, land development, water conservation, crossings, flood control bunds, lanes and irrigation facilities which have a tremendous influence on different sectors of village economy. MGNREGA created a big labour industry of both genders, particularly the participation of females is a great move towards women empowerment and helps them to stand on their own feet. The Act also changed the village structure towards a modern expansion. In this paper, an attempt has been made to review the progress and performance of the MGNREGA in the block Behibagh of district Kulgam. The paper also contains some suggestions, which if they are implemented at the grass root level it will enhance the performance of this Act.

* The first author of this paper has won the Golden Jubilee Year Young Social Scientist Award - 2017 of Indian Social Science Association, Agra.

Role of police in maintaining law and order

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INTRODUCTION:

Police is one of the most important organisations of the society. It is very difficult to control the process of any country without maintaining its law and order, this work is look after by police. The policemen, therefore, happen to be the most visible representatives of the government. The police remains available 24 hours for our safety and whenever we need to approach them they become visible on the spot to perform their task In an hour of need, danger, crisis and difficulty, when a citizen does not know, what to do and whom to approach, the police station and a policeman happen to be the most appropriate and approachable unit and person for him. The primary role of police forces is to uphold and enforce laws, investigate crimes and ensure security for people in the country. In a large and populous country like India, police forces need to be well-equipped, in terms of personnel, weaponry, forensic, communication and transport support, to perform their role well. The police are expected to be the most accessible, interactive and dynamic organisation of any society. Their roles, functions and duties in the society are natural to be varied and multifarious on the one hand and complicated, knotty and complex on the other. Broadly speaking the twin roles,

which the police are expected to play in a society are maintenance of law and maintenance of order. However, the ramifications of these two duties are numerous, which result in making a large inventory of duties, functions, powers, roles and responsibilities of the police organisation. So it is necessary for a country to have a police force to look after and catch the criminals to maintain the law and order in the society.

METHODOLOGY:

This paper is basically descriptive and analytical in nature. In this paper an attempt has been taken to analyze the role of police in maintaining law and order in India. The data used in it is purely from secondary sources such as books, articles, news papers, manuscripts and media according to the need of this study. To make this paper more interesting all the data related role of police has been framed in this paper. The whole study revolves around the role of police in maintaining law order in the society and this study shows the safety of society under police. The available literature regarding the role of police in maintaining law order has been discussed out to get a clear understanding of our selected research problem. So the researcher tries his best to carry out the study in an appropriate way. In this paper the main stress has been given on the

ROLE OF EDUCATION IN SOCIETY

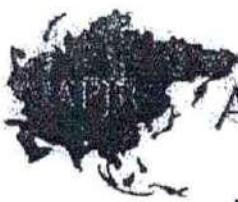
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Abstract: The role of education as an agent or instrument of social change and social development is widely recognized today. Social change may take place when humans need change. When the existing social system or network of social institutions fails to meet the existing human needs and when new materials suggest better ways of meeting human needs. Education is seen as a major vector in society, but that it is largely allocated a conservative role, since its main function is in the socialization of the young and the maintenance of the social order. During times of rapid social change, such as the second half of the 20th century, the role of education in the service of the nation is emphasized. When things are going well, especially economically, more experimentation with education is supported, and more idealistic goals are pursued, such as equity of educational opportunity. It is in the ideological and moral spheres, however, that education is most clearly expected to play a leading role. Social change takes place as a response to many types of changes that take place in the social and nonsocial environment. Education can initiate social changes by bringing about a change in outlook and attitude of man. It can bring about a change in the pattern of social relationships and thereby it may cause social changes.

Key Words: Role of Education and Social change

Introduction: The term 'education' has been interpreted by different people in different ways. Some people refer to it as formal schooling or to lifelong learning. Some others refer to it as acquisition of knowledge, skills and attitudes. Some say that education is nothing, but



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IMPACT OF MGNREGA ON PEOPLES HEALTH AND QUALITY OF LIFE AMONG THE PEOPLE OF BLOCK BEHIBAG OF DISTRICT KULGAM (J & K)

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Abstract: This paper elucidates the impact of Mahatma Gandhi national rural employment guarantee act on the rural health and the quality of life among the people of block Behibag of district Kulgam (J&K). MGNREGA not only provides wage employment as an alternative source of livelihood but also creates durable assets such as road construction, land development, water conservation and irrigation facility, which has tremendous influence on different sectors of village economy and personal lives of the Block. This paper also highlights the impact of MGNREGA on the improvement of overall quality of life of people such as impact on health, income earning levels of household, employment opportunities, expenditure on food and non food items, expenditure on education, impact on social life, women empowerment and impact on labour migration. It also contains some suggestions which if implemented at ground level will help to enhance the quality of life.

Key Words: - Quality, life, Health, Impact, Employment and Empowerment.

Introduction:

MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARENTEE ACT

Empowerment and upliftment of human population is the basic foundation stone to any economy. Indian population which is predominantly rural population accounts to 72.18% according to 2011 census lags far behind from their counterparts in urban India accounts to 27.82%. In many areas such as purchasing power, infrastructure, connectivity, employment etc, prone to seasonal fluctuations because rural economy is predominantly agricultural economy. So a need was felt to improve the living condition and quality of life of the rural India. In order to address this policy was conceptualized and subsequently formulated which came to be known as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) 2005 notified by Ministry of Rural Development, Government of India on 7th September 2005 (Sheikh Irshad²⁰). This law which gives a legal guarantee of at least 100 days of wage employment to rural household whose adult members volunteers to do unskilled and manual work in a financial year. MGNREGA has given the largest economic resources in our country (Dreeze J.N⁴). It is the first employment act which works on the village level and made its impact on international level. The act provides the equal opportunities to both the genders of society to get benefit and to improve the standard of living. The act provides the work to the beneficiaries within the five kilometers of village, it is a big initiative of this act because labours work in their local society and women labours finish their daily tasks in their respective homes then work under MGNREGA. It provides them a chance to look after their homes, their children and also to become helping hand for their families. MGNREGA is a big enlightenment in the rural India because it works for the eradication of rural poverty and rural development (Khera .R¹³, Madhu Sudan Ghosh¹⁴).

Jammu and Kashmir is the northern hilliest state of India situated between 32.15 degree & 37.05 degree North latitude & 72.35 degree & 83.20 degree east longitude. J&K state is the 11th largest having a geographical area of 220000 Sq Kms. accounting to 3.20% of the total area of India. It is the 19th most populous state having a population of about 1.25 crore souls (2011 census) of which 75.19% residing in rural areas. As we know well J&K is known as the disputed area of India. So, it was difficult to come up

crudely and unscientifically, which result in the depletion of these rare species at fast rate. Therefore, it is necessary to conserve these plants by knowing their phyto-chemical properties and therefore proper use. Thus, this study will play an important role to open new doors for the researchers of natural product chemistry.

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Rural Poverty: Cause, Effects & Efforts For Poverty Alleviation In India

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Poverty in Rural India: Its said that Rural India is the heart of India, In reality and the life of people in rural areas is marked with severe poverty. The Report on socio-economic & cast census (2011) Reveal the following facts:-

SC-St: of all the rural household, around 18.46 percent belongs to scheduled castes and around 10.97 percent belongs to scheduled tribes.

Major source of Income: Manual casual labour jobs and cultivation are the major sources of income for rural people. About 51% of House Hold are economically engaged in manual, casual labour and nearly 30% of them is engaged in cultivation.

Deprived: Around 48.5% of rural House Hold are deprived according to the census.

Assets: Only 11.04% of families own a refrigerator, while there is a vehicle etc. (including two wheeler, boats) in around 29.69% of the rural houses.

Income Tax: Only 4.58% of rural House Holds pay income tax.

Land ownership: Around 56% of village house hold doesn't own a land.

Size of Rural Houses: The house of around 54% rural families consists of either one or two rooms out of them, around 13% lives in one room house.

Causes of Poverty:

Poor Agriculture: India is mainly an agricultural country about 80% of people of our country depend on agriculture, but the growing population inflates the problem of poor techniques used in Agriculture.

Unemployment: Poor people move from one town to another in search of employment/work. Since, they are mostly illiterate & unskilled there are very few employment opportunities many poor people are forced to live an unfulfilled life.

Feminization of Poverty: Women & Girl are the most evictions of poverty. Poverty effects greater number of women than men. The causes include low income, gender-inequality etc. They are deprived of proper-diet medicine health treatment.

Illiteracy: Poor people constitutes greater share of illiterate population. Education becomes extremely difficult where people are deprived of basic necessities of life.

Socio-economic conditions of Gujjars in south Kashmir their challenges and strategies.

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Abstract: Kashmir Valley is known as place where people are embraced with multicultural and multilingual atmosphere. Gujjars are the tribal group mostly residing on hilly and mountainous regions of Valley with different traditions, rituals and language. They are economically poor, socially backward, but culturally stable. Their economic profile is poor than the general population of region. They are suffering from so many issues in their day today life. Their housing, sanitation, Education, electricity, health care facilities are very low sub-standard than different sections of population, Also Government has not provided them the basic assets to eradicate the tribal poverty. The literacy rate among Gujjars of south Kashmir is also very low. This paper is based on both primary and secondary data and tries to analyze the magnitude of socio-economic conditions of different parameters and also this paper contains some suggestions, which needs to be implementing on the ground level in order to eradicate their socio economic problems.

Keywords: Gujjars, Poverty, Backward, Illiteracy and Economy.

MGNREGA a well come change: a study of block BEHIBAGH District KULGAM, J&K

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Abstract

Background/Objectives: The present study conducted in Block BEHIBAGH of District KULGAM in J&K, has defined positive changes and its impact on block under Mahatma Gandhi National Rural Employment Guarantee Act [MGNREGA].

Methods/Statistical analysis: To achieve the objective of this study both primary and secondary data was collected. Primary data was collected through a well-designed interview schedule and secondary data was collected from block officials, internet and MGNREGA cell. During the study all the 18 PANCHAYATS were selected and the households of these PANCHAYATS were further simplified on the basis of random sampling to get the purpose of this study.

Findings: MGNREGA has a great impact on the study block. Before this act the current block was suffering from so many miseries but MGNREGA have fulfilled all the demanded tasks like lanes, land irrigation bodies, crossings, flood protection bunds, village interconnected streets, roads and water bodies. MGNREGA provided lot of employment to the households in which 2327 households demanded employment but only 2135 households got employment in the financial year 2015. The executed works in the block is 340 which costs 339.35 lakhs has been spent on the block. Women participation in the block is 12663(out of 20123) participated, in which only 134 women's completed 100 days of work. The act provided substitute income to the labours 540 labours of this block have been taken for the study purpose and they all responded about increment in their income after working under MGNREGA. In the long run we can say that the act benefited each and every one in direct or indirect way and made a positive effect on the life of people.

Improvements/Applications: Study suggested that corruption, improper planning, sub-standard material, low wages and unawareness like issues should be checked at the ground level to provide maximum benefit to the society.

Keywords: MGNREGA, impact, works, employment and benefit.

1. Introduction

Jammu and Kashmir is among the largest states of India. According to the census of 2011 the total population of state was 125 lakhs in which 91.35 lakhs (72.79%) residing in rural areas and 34.14 lakhs (27.21%) population is residing in urban areas. Jammu and Kashmir is an agrarian state; almost 75% population gets their livelihood directly or indirectly from this sector. Rural J&K contains 26.14% (out of 72.79%) population which is below poverty line (BPL). So, there was the obvious need of such schemes which will work for the rural development and for the eradication of rural poverty. J&K is also considered as the disputed territory between India, Pakistan and China by which the state failed to implement any central scheme which made the state backward in development process. Mahatma Gandhi national rural employment guarantee act (MGNREGA) came with a welcome change in the state. Mahatma Gandhi national rural employment guarantee act was enacted in 25th August 2005 and got implemented in 2nd February 2006. It was implemented in three backward districts (DODA, KUPWARA, POONCH) in its 1st phase in 2006, later it was extended to two more districts (ANANTNAG AND JAMMU) in its 2nd phase and in its 3rd phase (2008) it was implemented in entire state[1-3].

Mahatma Gandhi national rural employment guarantee act is a largest employment generation scheme started in country. The act provides 100 days of employment to every household whose adult members voluntarily are willing to do unskilled work under MGNREGA. The main purpose of this act is to provide the social, economic, financial, employment support to the rural population and to work for rural development in

Incidence and Causes of Poverty in District Baramulla of Jammu and Kashmir

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Abstract

Poverty is a curse on any standard of society whether they follow capitalistic, socialistic or mixed pattern of economy. In general, it is a blot on the economy of any country in the World. Poverty is multi-dimensional concept and depends upon numerous social and economic factors. Moreover, Poverty and prosperity are proportional concepts. The statement of UN 1998 which is signed by the head of United Nations agencies indicates that in India nearly 300-400 million peoples are living under below poverty line and not even leaving a singly meal for one day. More importantly, third world countries in Indian subcontinent which includes India, Pakistan, Sri Lank and many others are in a grip of acute poverty since their independence. India constitutes 23.6% of the world's total poor population which is an alarming situation. In this paper, attempt will be made to know the incidence and causes which were responsible for the poverty of Jammu and Kashmir State in general and district Baramullah in particular. Additionally, in this research paper attempt has been made to know the overall status of poverty in Jammu and Kashmir in general and district Baramullah in particular.

Key notes: Poverty, United Nations, Socio-Economic, Prosperity, Incidence

1. Introduction

Poverty is common and universal. Poverty is understood in common idiom as dearth of income. The concept of poverty is as old as human civilization. It is both extensive to intensive and essentially related to socio-economic factor. It is relative term and is understood in relation to prosperity. Poverty and prosperity are proportional concepts. From times immemorial, the poor have co-existed with the rich in India as well as throughout the world. Adam Smith says " Man is rich or poor according to the grade in



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A sociological study on changing family structure in Baramullah Kashmir

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ABSTRACT

Globalization as a process is the outcome of various factors like technological, educational, economic, political and socio-cultural etc. It is a process of conversion of local or provincial things into global ones. With modern ways of life, our traditional values and norms lose their importance and new ideas, values and practices were added to society. Almost every institution in our social structure is affected by modernization and its agents. Change in the organ of society results in changing other institutions as well. Family as a fundamental unit witnessed dramatic changes over a period of time. The change in the rural settlement resulted in the change of the joint family system in our country. Family structure, size, the authority has been changing due to the impact of liberalization, privatization, and globalization in the entire world. In our country, the majority population still resides in the countryside but the family system has changed both in urban as well as rural areas of the country. The present paper will highlight the major alterations in the family system in Kashmir.

Keywords— Modernization, Family structure, Authority, Nuclear family

1. INTRODUCTION

The family system in Kashmir did not witness dramatic changes after the conversion of the majority population from Hinduism to Islam. The joint family system which was dominating during in Hindu socio-religious setup continued to remain in operation for ages and is still prevalent in the society. From the historical scriptures, it is evident that the valley of Kashmir from ages remained under foreign rulers which forced the locals to do forced labour (begar). The head of the family (father) will have to give one of his sons for the purpose of begar to far off regions of Ladakh and Gilgit. The family with multiple male members will send her strongest son as he can survive the harsh working conditions and return back, the weaker ones may perish and die on the way. The joint family system was common keeping in view the socio-political situations of the valley as it gives family members security of life. The climatic and political conditions in the valley are fragile from the very beginning of settled life. With harsh winters and bad road connectivity, low agricultural productivity the joint family system provided them workforce which will collectively make necessary arrangements for the entire family. In family values, morals and ethics were given importance (Walter L: 2005). The primary function of the family is socialization of an individual and in joint family child was loved by uncles, aunts and grandparents and at the same time, his or her conduct was strictly checked by parents. The role of grandparents in the upbringing of the child was of prime importance in this structure. In traditional joint families of Kashmir, parents were often busy in agriculture-related activities; responsibility of their children was on grand-parents. The role of grand-mother is more visible, she is always singing lullabies and cradle songs for her grandchildren in absence of their mother who is working on fields. The famous lyrics are:

"Bishite bishite te byaro khutkho vann
Tiure kyo waloth babray pan
Sue kamen chekoth koutren
Koutre baithe markan
Zoom chay gindaan taarken"

2. REVIEW OF LITERATURE

Khan (1978): The author has described changes in the socio-cultural and political life of people living in Srinagar the capital of Kashmir and its adjoining areas. The author praised new city life with deeply affected by modernization, helped the old taboos and dogmas to get vanished from the city. On the other hand, the author dislikes the growing influence of modernization as old values and cultural traits were replaced by modern tastes and outlooks. The city life was changing as people no more like dried vegetables and bakeries like kulcha and bakarkhani. The introduction of new food items was accepted by the city dwellers and aboriginal food items losing their prominence. The city people also witnessed changes in their dress patterns, the men were no longer wearing long woolen coats locally known as pherans and women in the city were fond of new dress patterns and the

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महिला समूहों ने आमदनी के साथ—साथ जगाई स्वास्थ्य एवं स्वच्छता की ज्योति

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जिला परिचय—

सीहोर जिले के 5 विकासखण्डों के 1016 ग्रामों में आजीविका मिशन का क्रियान्वयन किया जा रहा है। जिले में 3308 समूह का गठन कर 37634 गरीब परिवारों को समूह के दायरे में लाया गया है। समूह को जोड़कर 227 ग्राम संगठन तैयार किए गए हैं। अब यह संगठन आर्थिक गतिविधियों के साथ सामाजिक मुद्दों पर बेहतर भागीदारी कर रहे हैं। जिले में 602 समूहों को 69.26 लाख रुपये का रिवाल्विंग फण्ड प्रदान किया गया है। सामुदायिक निवेश की निधि के रूप में 155 समूहों को 114.5 लाख रुपये की राशि ग्राम संगठन के माध्यम से उपलब्ध कराई गई है, जिनका ग्राम संगठन ने रोटेशन कर बाकी समूहों को भी लाभांवित किया है। जिले में 100 से अधिक परिवार मिशन के माध्यम से आजीविका गतिविधि पूर्ण कर अपने परिवार की आय को 1 लाख से अधिक कर चुके हैं। जिले में 120 से अधिक सीआरपी के माध्यम से मिशन द्वारा सामुदायिककरण की प्रक्रिया जारी है। जिले में महिला समूहों ने आर्थिक गतिविधि से ऊपर उठकर सामाजिक बदलाव के बेहतर उदाहरण प्रस्तुत किए हैं। इसके तहत बुधनी विकासखण्ड में सेनेटरी नेपकिन रिपैकेजिंग को आजीविका गतिविधि के रूप में अपनाया जाना तथा ग्रामीण महिलाओं में इसके उपयोग के संबंध में जागरूकता लाना सामाजिक बदलाव के प्रत्यक्ष प्रमाण हैं।

विषय चर्चा:-

मोप्र० के सिहोर जिले के विकासखण्ड बुधनी की महिलाओं ने स्व-सहायता समूहों में संगठित होकर न सिर्फ सामाजिक समावेशन को पारिभाषित किया गया है, बल्कि आर्थिक सशक्तता की मिसाल

सामाजिक एवं आर्थिक सशक्तिकरण के दौर में की – विकासखण्ड बुधनी के संदर्भ में

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प्रस्तावना

वर्ष 2011 में शुरू किए गए दिनदयाल अन्त्योदय योजना राष्ट्रीय ग्रामीण आजीविका मिशन का उद्देश्य ग्रामीण गरीब परिवार को स्व सहायता समूह के माध्यम से मंच प्रदान कर सामाजिक एवं आर्थिक सशक्तिकरण करना है। आजीविका मिशन गरीब ग्रामीण परिवार को स्व सहायता समूह के माध्यम से सहायता प्रदान करता है, जिससे उनकी आजीविका में उत्तरोत्तर वृद्धि हो एवं उनके जीवन की गुणवत्ता में सुधार हो।

मप्र में राष्ट्रीय ग्रामीण आजीविका मिशन अप्रैल 2012 से प्रारंभ हुआ है। इसे चरण बद्ध रूप से प्रदेश के समस्त जिलों में लागू किया जा रहा है। मिशन का मुख्य उद्देश्य गरीबी रेखा के नीचे जीवन यापन करने वाले परिवारों का संस्थाओं का गठन कर उनकी आर्थिक एवं सामाजिक स्थिति को मजबूत करना है। आजीविका मिशन का यह विश्वास है कि प्रत्येक व्यक्ति में अपने विकास के लिए कार्य करने की दृढ़ इच्छा शक्ति एवं अपार क्षमताएं हैं। आवश्यकता है कि उन्हें स्वयं निर्णय लेने के अवसर दिए जाए। आजीविका मिशन के द्वारा प्रत्येक ग्रामीण परिवार से कम से कम एक महिला सदस्य को समूह में सम्मिलित कर उन्हें सशक्त करने के लिए चरणबद्ध तरीके से सहायता प्रदान करना एवं उनकी क्षमताओं का विकास करना।

वर्ष 2018 से मप्र के समस्त जिलों में आजीविका मिशन का क्रियान्वयन किया जा रहा है। सीहोर जिले के बुधनी विकासखण्ड में विगत 3 वर्षों से मप्र राज्य ग्रामीण आजीविका मिशन के कार्यों का क्रियान्वयन किया जा रहा है।

मधुमेह के रोगियों में अधिक प्यास लगना, अधिक भूख लगना, अचानक वजन घटना, और लगातार कमज़ोरी सहसूस करना थकावट रहना, घाव भरने में ज्यादा समय लगना, बार बार समय लगना, नजर कमज़ोर होना, त्वचा में संबंधी बीमारियों का एक समूह है जिसमें लंबे समय तक उच्च रक्त शर्करा का स्तर होता है। उच्च रक्त शर्करा के लक्षणों में अक्सर पेशाब आना होता है, प्यास में बढ़ोत्तरी होती है और भूख में वृद्धि होती है। मधुमेह केटोएसिडोसिस, स्ट्रोक, कोनिक किडनी की विफलता और आंखों को नुकसान आदि शामिल हैं।

द स्टॉकहोम इन्वायरमेन्ट इंस्टीट्यूट एट द यूनीवर्सिटी ऑफ द यॉक के एक दल द्वारा किये गये सर्वेक्षण की रिपोर्ट इन्वायरमेन्ट इन्टरनेशनल जनरल में प्रकाशित हुई जिसके अध्ययन में यह पाया गया कि 27 लाख नवजात समय पूर्व बच्चे पैदा हुये थे उनमें से 18 प्रतिशत बच्चे फाइन पार्टीकुलेट मेटर के संपर्क में थे। मधेपुरा में केयर इंडिया के डॉक्टर के सुब्रमण्यम के मुताबिक नवजात शिशु के मृत्यु के मुख्य तीन कारण श्वास अवरोध, संकमण, व अपरिपक्व जन्म की जटिलतायें हैं।

स्मार्ट एवं स्वच्छ शहर में स्वस्थ्य- 19 वीं शताब्दी में विलियम ओसलर द्वारा निमोनिया को (मौत बांटने वाले पुरुषों का मुखिया) कहा था लेकिन 20वीं शताब्दी में टीकों के आने से इनकी संख्या को नियंत्रित किया गया लेकिन फिर भी निमोनिया आज भी व्यापक रूप से शिशु मृत्यु का सबसे बड़ा कारण माना जाता है बुजुर्ग एवं महिलाओं बहुत बड़ी संख्या आज भी निमोनिया की बीमारी से पीड़ित है आंकड़ों की बात करें तो हर साल करीब भारत में करीब 12 लाख बच्चों की मौत निमोनिया से होती है एवं बुजुर्गों को निमोनिया से हार्ट अटैक की संभावना निरन्तर बनी रहती है। दुनिया की जनसंख्या का 25 प्रतिशत बच्चों की मौत भारत में हो रही है। निमोनिया का धीसीआर (पोलीमरेज चेन रिएक्शन) टेस्ट की खासियत यह होगी कि इसमें निमोनिया के करीब 125 जीवाणुओं में से पता चल सकता है कि कौन से जीवाणु के कारण निमोनिया हुआ है निमोनिया की जांच कल्चर तकनीकी से की जाती रही है जिससे उपचार स्थायी रूप से कारगर नहीं हो पा रहा था इस विषय पर बायोटेक्नोलॉजी एवं भोलीक्यूलर विभाग के सहायक प्रोफेसर डॉ. हिमांशु रैकवार द्वारा शोध रिपोर्ट में यह तथ्य प्रस्तुत किया कि बहुत ही मूल और दुनियादी तकनीकी से एक साल से छोटे बच्चे में भी निमोनिया की बीमारी का पता लगाना आसान है।

अब बात करें कि निमोनिया वृद्धों एवं बच्चों में एक सामान्य सी बीमारी है जो कि जीवनशैली और खान-पीन के साथ साथ आसपास का वातावरण भी अच्छा खासा प्रभाव डालता है। इस प्रकार से यह देखा गया है कि स्वच्छ भारत अभियान के अन्तर्गत खुले में शौच को प्रतिबंध किया जाना नितांत आवश्यक ही नहीं समुदाय में एक स्वेच्छिक पहल बनाना आवश्यक है। क्योंकि हमारे आसपास का वातावरण जितना स्वच्छ एवं प्रदूषण रहित होगा उतना ही हमारा स्वास्थ्य एवं विकास परिलक्षित होगा। दिक्षित एवं स्वस्थ्य समाज की स्थापना के लिये स्वच्छता को अपनाकर स्वच्छ भारत की परिकल्पना की मिसाल विश्व को पेश की जा सकती है।

संदर्भ -

- 1- दैनिक भास्कर समाचार पत्र
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- 3- आपदा प्रबंधन (तकनीकी एवं प्रकृति) डॉ. महेन्द्र कुमार भिश्मा
- 4- सूचना स्रोत, उपभोक्ता, प्रणाली सेवायें एवं प्रोधोगिकी—डॉ. की. के. शर्मा
- 5- योजना मासिक पत्रिका।

राजनीतिक दलों की महिला कार्यकर्ताओं की सामाजिक परिवर्तन में भूमिका एक अध्ययन

***डॉ. शेखर शशांक ठाकुर, **राखी बाला सिंगारे**

***समाज शास्त्र एवं समाज कार्य विभाग, बरकत्तुल्लाह विश्वविद्यालय**

कोई भी समाज स्थिर नहीं होता परिवर्तन ही प्रकृति का नियम है संसार की सर्वोत्तम रचना मानव है चाहे वह महिला हो या पुरुष परंतु प्राचीन काल से ही हमारे समाज में महिलाओं और पुरुषों में भेद रहा जिसका उल्लेख आज भी कई शोध पत्रों, सेमिनारों, किताबों में है। साथ ही भारतीय समाज अति व्यापक एवं परिवर्तनशील एवं गतिशील रहा है। जिसके परिणाम स्वरूप राजनीतिक, सामाजिक, आर्थिक सांस्कृतिक हर क्षेत्र में भारी परिवर्तन आया है। जिसमें चाहे काई भी काल हो प्राचीन काल, मध्य काल, आधुनिक काल स्वतंत्रता पूर्व एवं स्वतंत्रता पृष्ठात् कई विपरित परिस्थितियों के बावजूद महिलाओं ने अहम भूमिका निभाई है। जैसे रजिया सुल्तान, भोपाल की बेगमों का शासन काल, झांसी की रानी, गाँड़ रानी कमलावती एवं अन्य स्वतंत्रता से पहले व बाद में राजनीति में सक्रिय महिलाओं का उल्लेख संक्षेप में इस शोध पत्र में किया गया है।

Social Opinion on the Punishment of Rape

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Introduction :- With the advent of the news flashed on the 6th December 2019, a huge hue and cry began in the entire India. As a result, peoples started arguing whether or not the encounter was essential and whether it could have been avoided and the culprits punished following all legalities. The most powerful democratic society in the world, which is also known for its Unity in Diversity seemed to be divided into the societies of two likeminded groups, just in a moment. Majority of peoples believed in punishing such accused through such brutal way of punishment, which denies any proper investigation and without having proved beyond any reasonable doubt that the accused had actually committed the said act. Encounters, any way deny of natural justice to the accused, as his version is not heard or considered. Most of the people advocated that in the case of rape accused, this should be the only solution to overcome similar incidents in India.

At the same time, on the other side of the flip the act of punishment as encounter is not more than an overwhelmed emotion and angeriness against the failure in dealing with rape incidences. The other school of thoughts, on the other hand profess that the penal services also must adhere to the law in force and act promptly to follow the procedure in getting verdict legally, at the earliest, thereby avoiding is a mistrust of custodian power on the judicial system. In past it is often seen that the trials in the Court of Law continue for years leading to denied justice to the victim. However, post Nirbhaya case¹ it has been improved through Fast Track Court.

Research Methodology :- They study on rape confined to the work of psychologist and psychiatrists, at the same time, it is important to understand the social perception on the punishment for a rapist. Therefore, paper will

investigate people responses on the factors responsible for increasing rape incidences and social opinion on solid punishment. With a social lens researcher will seeks to understand possible reasons, which affected minds of a rapist, impact of brutal punishments in overcoming and also examine possible remedies to address the issue. The paper is based on the secondary literature review and opinion of peoples on rape against women and its punishment.

Results and Discussions :- The word 'crime against women' has become a "silent epidemic", with more and more cases of rape, molestation and sexual assault being reported from college campuses, while travelling and workplaces. "It's a very complex issue, involving legal, cultural and psychological aspects (Rufus, 2014). Women in urban areas are twice as likely as men to experience violence, particularly in developing countries (Vanderschueren, 2000). According United Kingdom's daughter documentary-2015, UK is rape list, in every day 250 women of UK are getting rape, the studies shows that men who committing rape comes from every economic, ethnic and social group (<http://indianexpress.com/article/india/india-others/united-kings-daughters-an-indian-mans-response-to-bbc-documentary-on-delhi-gangrape/>)

- **Importance of Marriage in Society :-** One of the important accepted customs in every society is marriage. It was emerged in many centuries ago when sex was not in the preview of custom and, both man and women were allowed to have sex with as many opposite gender as they want. As a result of freedom, mothers were found in dilemma to tell the name of father to her children. Moreover, the possessive feeling of a man about the women he admires started

Impact Of Covid-19 On Social Relations & Priceless Efforts Of SHGs

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Abstract: The outbreak of the novel corona virus, COVID-19, has been declared a pandemic by the WHO. The structures of social contact critically determine the spread of the infection and, in the absence of vaccines, the control of these structures through large-scale social distancing measures appears to be the most effective means of mitigation. The impact of social distancing measures - workplace non-attendance, school closure, lock down and their efficacy with duration is then investigated. A three-week lockdown is found insufficient to prevent resurgence and instead, protocols of sustained lockdown with periodic relaxation are suggested. Forecasts are provided for the reduction in age-structured morbidity and mortality as a result of these measures. When authorities and the administration, medical experts and Doctors, Police, Researchers and Scientists are contributing their share during this global crisis, history will also certainly remember the SHG members and their priceless efforts for the greater interest of the rural masses at large.

Keywords- WHO-World Health Organization, MPDAYSRLM-Madhya Pradesh Dayal Antyodaya Yojna Sate Rural Livelihood Mission, NPA-non performing asset, NRLM-National Rural Livelihood Mission, PMGKY-Pradhan Mantri Gareeb Kalyan Yojana, DBT- Direct Benefit Transfer, WCD-Women & Child Development Department.

INTRODUCTION



The novel corona virus, COVID-19, originated in Wuhan and has spread rapidly across the globe. The World Health Organization has declared it to be a pandemic. In the absence of a vaccine, social distancing has emerged as the most widely adopted strategy for its mitigation and control. The suppression of social contact in workplaces, schools and other public spheres is the target of such measures. Since social contacts have a strong assortative structure in age, the efficacy of these measures is dependent on both the age structure of the population and the frequency of contacts between age groups across the population. As these are geographically specific, equal measures can have unequal outcomes when applied to regions with significantly differing age and social contact structures. Quantitative estimates of the impact of these measures in reducing morbidity, peak infection rates, and excess mortality can be a significant aid in public-health planning. This requires mathematical models of disease transmission that resolve age and social contact structures. In this paper we present a mathematical model of the spread of the novel corona virus that takes into account both the age and social contact structure. We use it to study the impact of the most common social distancing measures that have been initiated to contain the epidemic in India: workplace non-attendance, school closure, "JANATA CURFEW" and lockdown, the latter two of which attempt, respectively, complete cessation of public contact for brief and extended periods. We emphasize that models that do not resolve age and social contact structure cannot provide information on the differential impact of each of these measures. This information is vital since each of the specific social distancing measures have widely varying economic costs. Our model allows for the assessment of the differential impact of social distancing measures. The COVID-19 strain, which surfaced in a Chinese Seafood and poultry market late last year, has now spread to at least 210 countries, killing thousands around the world. On March 24, 2020, the Indian Prime Minister announced a 21 day national wide lockdown. This lock down was then extended to May 3. Massive quarantine of people having travel histories, hospital isolation and treatment of all confirmed cases and sanitation of public places is ongoing. A separate Prime Minister's Citizen Assistance and Relief in emergency Situations Fund (PM CARES FUND) has also been set up. Arogya Nidhi has been reactivated and so on.

Changes in Forest Based Practices of Baiga Community in Development Worlds

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Abstract :- The Baiga community is one of the 75 particularly vulnerable tribal groups and known as forest dwellers and hunters who collect food from the forest and also dependent on forests for their subsistence and livelihood. Historically they are nomadic tribe of Central India and Baiga-Chak in Dindori is the home of most of the Baiga now. Traditionally they prefer to hunting and fishing in forests and have indigenous knowledge of herbs, roots, flowers, fruits and their medicinal uses - contraceptives and knowledge of curing common ailments. The relation of Baiga with natural resources are phenomenal. The Baiga community is first tribal community who has received habitation right under Forest Right Act, which indicate vibrant connection with natural resource protection and conservation.

However, they are constantly adapting to mainstream itself with the larger society and in the twenty first century there is significant disconnect of young Baiga from the forest. In the Ph.D. research of the author, it was revealed that there is a significant change in the traditional forest based livelihood practices.

The purpose is envisaged to understand the important of forest right act in terms of Baiga Chak and impact of rural development and forest prohibition on the life of Baiga.

Key Word :- Forest Right, Tribal, Rural Development, Tradition and Culture.

1. Introduction :- The forest inhabits a dominant place in tribal culture and economy. The lie of tribal community is very much uttered by the forest and it starts from the birth and end up to death. It is ironical that in the areas of richest natural resources most backward and poor people of the country are living. Moreover, they are historically pushed to corners owing to

commercial interests of various governing clutches. Nevertheless, the need for land for development in modern India is increasing these incidences. However, government is striving to integrate these tribal communities with mainstream of the development.

Tribals still remain the most backward ethnic group in India and the promise of protection given under the Constitution of India (1950) is still not fulfilled. In fact, the situation of tribals are rated very low on health, education and income aspects, which are most significant parameters of any developed society. In contrast, tribals are not only most backward as compared to the general population, but they are also far behind the Scheduled Caste (Dalits), the other backward caste (OBCs). It is evident that the effects on developmental interventions on the tribal society from 1961 to 1981, has not made any significant impact in improving the socio-economic conditions.

The Primitive Vulnerable Tribal Groups (PVTGs), including Baiga are the most disadvantaged ones among tribals. These groups live in small, scattered habitats in remote, inaccessible areas. Their livelihoods are especially vulnerable because they are linked to the most non-productive forest assets/resources. Baiga tribals are nomadic and known as forest dwellers as well as hunters¹. In fact, they are popular as a magic man among other tribal groups because of their indigenous knowledge of medicinal plants. They collect food from the forests and mostly dependent on forests produces like, minor forest produce and non-timber forest produce. Their

¹ Palta Aruna- (1988), "A Study on the Food Consumption Pattern of the Baigas in Baigachak Region of Madhya Pradesh , Bulletin of the Tribal Research and Development Institute, Bhopal, Govt. of M.P, vol-XVI, page no-29

IMPACT OF FORMAL EDUCATION TOWARDS MAINSTREAMING OF BAIGA COMMUNITY

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ABSTRACT

Every child in India is entitled to get free and compulsory education under the constitutional provisions and formal education institutions are striving to educate children without any discrimination. Primitive tribes like Baiga are among the most vulnerable and have their informal way of learning and grooming, which helps them to survive in the forest area. Formal education is a way to mainstream them with the development. The paper is based on the PhD research work in Baiga Chak of Didnori district and seeking impact of formal education on change in the perceptions of Baiga and ability to learnt eight indigenous and ancestor's skills along with formal education system. Findings indicates that formal education has been introduced in 2nd and 3rd generation back and 2/3rd of the Baiga was aware on the education schemes. Highest awareness was found on mid-day meal programme, followed by uniform and books. Results indicates that there is a significant change in the liking and disliking of a due to formal education, but it does not have any significant contribution in changing the practise related to rituals and customs. The main reason is that more than half of the Baiga families perceived that formal education is not helpful in the development to Baigas. Key words : Tribal Education, Schooling, Rural Development, Primitive Tribes

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CORPORATE SOCIAL RESPONSIBILITY AND COMPANY'S SUPPORT TO TACKLE THE CORONA VIRUS CRISIS IN INDIA

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ABSTRACT

The Companies Act, 2013, envisioned that the private sector can contribute towards achieving the listed sustainable and henceforth, nation-building goals. With that, India is also the first country in the world to make corporate social responsibility mandatory. According to World Business Council for Sustainable Development (WBCSD) definition: "Corporate Social Responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large". If a company falls under the ambit of the Corporate Social Responsibility (CSR) law, it shall invest at least 2 percent of its average net profits in projects in the field of education, water supply, health care, environment, social empowerment, sports, culture, through a registered trust, a registered society, or a non-profit (section 8) firm. There is growing concern and perceived threat about the corona virus among common citizens. The present situation warrants examining the socio economic impact of COVID-19 on the global level in general and India in particular. It is time to discuss the context in which government of India develop its COVID-19 management strategy and the administrative mechanism set up to address the pandemic. To accelerate the process of COVID-19 related the ministry of Corporate Affairs announce that the contribution for the recent crisis in India the companies will be eligible for CSR activity. Corporate Social Responsibility undeniably provides multiple benefits for the company too.

Keywords — Corporate Social Responsibility, Novel Corona Virus, Corporate Affairs

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Status of Education in Baiga of Dindori District: Challenges and Way Forwards

* Vishal Nayak
** Shashank Shekhar Thakur

Abstract- Every child in India is entitled to get free and compulsory education under the constitutional provisions and formal education institutions are striving to educate children without any discrimination. Primitive tribes like Baiga are among the most vulnerable and have their informal way of learning and grooming, which helps them to survive in the forest area. Formal education is a way to mainstream them with the development. The paper is based on the PhD research work in Baiga Chak of Didnori district and seeking impact of formal education on change in the perceptions of Baiga and ability to learnt eight indigenous and ancestor's skills along with formal education system. Findings indicates that formal education has been introduced in 2nd and 3rd generation back and 2/3rd of the Baiga was aware on the education schemes. Highest awareness was found on mid-day meal programme, followed by uniform and books. Results indicates that there is a significant change in the liking and disliking of a due to formal education, but it does not have any significant contribution in changing the practise related to rituals and customs. The main reason is that more than half of the Baiga families perceived that formal education is not helpful in the development to Baigas.

Key Words- Tribal Education, Schooling, Rural Development, Primitive Tribes

1. Background : Article 21 of the Constitution of India assures the right to live with human dignity, free from exploitation. The Right of Children to Free and Compulsory Education Act or Right to Education Act (RTE) was passed by the parliament on 4 August 2009 and from 1st April 2010 education has become a fundamental right of every child in India. A child in India is entitled to get free and compulsory education. In order to bring these provisions to reality, a safe and conducive atmosphere is to be created at places mainly in schools, where education is imparted to children in order to develop them as responsible citizens. Separate toilets for girls and boys as well as availability

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A Sociological Study on the Impacts of Communication and Technology on the Society in the New Century (An Empirical Study)

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Abstract- Communication and Technology has been very important and has come a long way to its current shape where it is playing a very dominating role in our sphere of everyday life. Not only it has made many revolutionary changes in information gathering and dissemination as well as has also included global communication widely. It's promoting a virtually paperless work environment. It has made possible and easy to send and receive messages very easily and at its fastest pace anywhere in the world, within seconds. It has developed most in the fields of Education, Medical, Army, Commuting, etc. Siting a few examples, let's take the education sector, where the instructor could sit in any part of the world and his students scattered in different parts of the world can view through video conference with presentations of study materials as well as question and answer sessions. Same way, a doctor can perform a surgery on any patient lying in another part of the world. Now these are a few technological advancements, which show us where we stand today, as compared to what it was half a century back. But, as we know nothing in this world is purely good, as everything has a dark side. In this paper we would discuss the merits and demerits of implementing IT globally and where we are heading to in future.

Key Words- Information Technology, Impact, Society, Future.

Introduction:

Technology is used to store, manipulate, distribute or create **information and disperse communication**. The type of **information** or data is not important .The **technology** is any mechanism capable of processing this data. Human beings use technology in different forms of daily life, such as to travel, to communicate, to learn, to do business and to live in comfort. **The way we use technology** determines part of whether its impacts are positive to **the society** or negative. Technology has become part of the society's everyday functioning, changing rapidly and providing widespread mobility. Communication has become quicker, cheaper, and much

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Accredited Social Health Activists (ASHAS), their Role in Improving the Health Status of Rural Women: A Sociological Study of Baramulla District

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Abstract- National rural health mission (12-2005) came up with a mission to provide basic medical facilities to the people. National government stressed more on economically weak and backward states of the country. The aim is to utilize funds on the public welfare and health by implementing new policies and programmes. India is a country of villages and still our villages are backward and under developed. Public health is a key factor for the growth and development of economy. In our country the death ratio of new born babies has increased and the health structure of babies is found below average at most instances. There are several causes for this; one among them is the care and diet which the mother lacks during pregnancy. To counter this at the gross root level national health mission appoint a lady known as (ASHA), Accredited social health activist in every community. In Jammu and Kashmir in every district at village level communities have been efficiently constituted for sanitation, drinking water etc. Accredited social health activists conduct household surveys and aware people regarding the benefits of national health mission.

Key Words- Newborn, immunization, institutional delivery, nutrition, sanitation, healthcare

Introduction: Accredited social health activist is a skilled female voluntary village health worker. They would emphasize community action for secure and institutional delivery, immunization and other important and health associated services like preclusion of communicable and water-borne diseases, newborn care and safety etc. They are provided with their basic drug kit which includes some necessary equipment and they are believed to work in coordination with the ANM and AWW. Accredited social health activist holds the contraceptives and IEC materials which are meant for the particular village/mohalla. As per the data in almost every village of Baramulla district of Jammu and Kashmir ASHA has been seen functional but in some cases she has been allotted more than 1000 population which is against the prescribed norms of the scheme. Though she is not paid monthly salary and is paid according to

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Role Of SHGs : Towards Empowerment Of Rural Woman & Rural Development

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Abstract- The very existence of SHGs acts a great boost to make the poor self-reliant and to give them hope. Not only do the SHGs help in increasing their income, improving their status in the society but it's ultimately the nation that reaps the advantages of socialism. The harsh reality is that rural poverty and unemployment still persist in the society and women's earnings positively and directly affect a family's financial condition .Social conventions and gender ideology deprive women of the access to resources which would enable them to increase productivity .Woman Empowerment is setting a woman free to make her own choices, even if those choices go against any one's perception of right and wrong . The most important change that the SHG culture has brought in the country is to change the gender dynamics of power within a family and ultimately the society at large. They now have greater say in the family matters and also are seen as stakeholders and partners in taking the community forward. The financial independence has eventually paved the way for societal upliftment of women and their voices.

I. Introduction

Planned institutional changes implies to Development. According to Prof. Gangrade" 'Economic development without social development is no development'. Development means equitable distribution of fruits of economic growth with Social Justice. Improved and sustained access of the poor, specially the poorest of the poor and poor woman through building strong grass root institution of the poor by way of strong SHGs following Panch sutra principles, linking them with banks for financial inclusion for enabling them to access gainful self-employment opportunities, resulting in appreciable improvement in their livelihoods on a sustainable basis. Nehru said, "Women should be uplifted for the upliftment of the nation, if a women is uplifted, society and nation is uplifted."

II. Rural Development

Rural development takes into account factors other than economic growth- education, Health facilities, infrastructure facilities, employment generation and increase in productivity, distributive justice and equalization of opportunities in rural areas.

Rural development programmes involve a number of rural development projects. It envisages to bring changes in various facets of rural economic and social life.

III. Rural Development Programmes

The rural economy and social structure in our country is characterized by widespread poverty, poor health conditions, illiteracy, exploitation, inequitable distribution of land, lack of infrastructure and public utilities like roads and communications etc. The various dimensions of rural life- growth in agriculture and allied activities, education, health, public works, poverty alleviation and rural employment programmes, all form a part of integrated approach to the problem of rural development.

The community development programme "CDP" was launched in October 1952 with the following objectives.

1. To secure total development of the material and the social resources of the rural areas.
2. To develop local leadership and self governing institution.

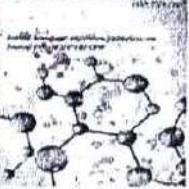


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RESEARCH ARTICLE

DEVELOPMENT OF SELF HELP GROUPS AND ITS IMPACT ON SOCIO - ECONOMIC STATUS OF RURAL PEOPLE

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Abstract

This Paper reviews the vital role of Self-Help Groups (SHGs) in poverty eradication in villages. The SHG Movement has become extensive, successful component of rural India. SHGs are generally small group controlled, consisted of homogenous members who generally belong to poor marginalized sections of the society, who come together in groups and motivate each other to build new opportunities for income generation. The system of SHG has proven to very suitable to the poor and vulnerable women community in the society and this system breaks the exploitation and isolation of women from men. This paper examines the development of SHGs and impact on the socio-economic condition of SHG member's households. The programme has grown at a tremendous pace during last two decades and emerged as the most prominent means of delivering micro-finance services in India. The average annual net income, assets and savings of SHG member's households increased significantly in the post-SHG situation. The average amount of loans and the regularity in repayment of loans increased, and the dependence on moneylenders decreased remarkably. The percentage of loans used for productive purposes and employment per household increased, the incidence of poverty among SHG members declined, and the social empowerment of women improved significantly.

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Introduction:-

SHG and micro-credit movement have initiated in the year 1975 at Bangladesh by Mohammed Yunus. In the eighties, a serious attempt was made by the Government of India to promote an apex bank to take care of the financial needs of the poor, informal sector and rural areas and then, NABARD took steps during that period and initiated a search for alternative methods to fulfill the financial needs of the rural poor. NABARD initiated the effort in 1986-87, but the real effort was taken after 1991-92 by linking the SHGs with the banks. What started as a pilot programme has now become a movement for social empowerment particularly for the rural poor including women. The journey so far traversed by the Self Help Group – Bank Linkage Programme (SHG-BLP) crossed many milestones. According to NABARD, "SHG is a homogeneous group of rural poor, voluntary governed to save whatever the amount they can conveniently save out of their earnings and mutually to contribute to a common fund to lend to the members for making their production and emergency consumption credit needs". SHGs have the power to create a socio-economic revolution in the rural areas of our country. SHGs have not only

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भारत में संयुक्त परिवार की प्रासंगिकता का अध्ययन

डॉ. एस. एस. ठाकुर

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शोध सारांश :-

प्रस्तुत शोध पत्र में भारत में संयुक्त परिवार का महत्व एवं उसकी आवश्यकता का विवेचन किया गया है। इस शोध पत्र में शोधार्थी ने भारत में संयुक्त परिवार प्रणाली किस तरह कार्य करती है का वर्णन किया गया है जिसमें हमने संयुक्त परिवार के आर्थिक, सामाजिक एवं धार्मिक आदि तथ्यों का विवेचनात्मक अध्ययन किया गया है।

मुख्य शब्द — समाज, संयुक्त परिवार, सामाजिक नियंत्रण, निवास आदि।

शोध के उद्देश्य :- प्रस्तुत शोध पत्र के निम्नलिखित उद्देश्य निर्धारित किये गये हैं।

1. भारत में संयुक्त परिवार की प्रासंगिकता का अध्ययन करना।
2. संयुक्त परिवार के कार्य का महत्व स्पष्ट करना।
3. संयुक्त परिवार की आर्थिक दशा का अध्ययन करना।

प्रस्तावना :-

प्रस्तुत शोध पत्र में हमने भारत में संयुक्त परिवार की प्रासंगिकता का अध्ययन किया है जिसके अन्तर्गत संयुक्त परिवार की विशेषताएँ, महत्व आदि का वर्णन किया गया है। देखा गया है कि संयुक्त परिवार में अधिक सदस्यों के होने से इसका आकार बड़ा होता है जिससे इनकी आर्थिक एवं अन्य आवश्यकताएँ भी बड़ी होती है किंतु यह देखा गया है कि अक्सर संयुक्त परिवार में कार्य एवं व्यवहार की दृष्टि से किसी एक व्यक्ति पर अधिक दबाव नहीं होता है। इसकी अन्य विशेषताओं को निम्न गिरुओं के माध्यम से विस्तार पूर्वक दर्शाया गया है —

1) **विस्तृत आकार** :- संयुक्त परिवार का आकार बड़ा होता है अर्थात् रहने वाले सदस्यों की संख्या एकाकी परिवार से अधिक होती है। इसमें पति-पत्नी व बच्चों के अलावा भाई, बहिन, मौं-बाप, काका-काकी, बुआ और दादा-दादी यदि मातृसत्तात्मक परिवार हो तो भाजे-भाजिया, नान-नानी, मामा-मामी, मौसी, आदि भी सम्मिलित रहते हैं। इसके अलावा सौतेल मौं-बाप, भाई-बहन, चचेरे-भाई आदि भी साथ-साथ रहते हैं। सभी सदस्य संयुक्त रूप से साथ-साथ रहते हैं। अतः आकार बड़ा होता है संयुक्त परिवार में रहने वाले सदस्यों की संख्या अधिक होती है।

2) **एक सामान्य निवास स्थान** :- संयुक्त परिवार के सभी सदस्यों का एक निश्चित निवास स्थान होता है जिसे घर कहते हैं। सभी लोग एक घर में साथ साथ रहते हैं, माता-पिता व बच्चों के साथ-साथ बाकी सभी लोग असमें रहते हैं नव-विवाहित दम्पत्ति भी इसी भी में रहते हैं। अपना अलग-अलग घर नहीं बताते। अतः संयुक्त परिवार में सबसे एक ही घर में रहते हैं अलग-अलग घरों में नहीं।

3) **एक सामान्य पाठशाला** :- संयुक्त परिवार में सभी का खाना एक ही जगह बनता है। अर्थात् सभी की क सामान्य रसोई होती है सामान्य घर की तरह। जिसमें एक साथ एक जैसा खाना बनाया जाता है और सब एक समान खाते हैं। संयुक्त परिवार की एक मुख्य विशेषता सामान्य रसोई है।

"Sociological study of Women Participation towards Family Planning" (Especially in District Bandipora of Jammu and Kashmir)

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Abstract

This paper is about to find out the real figure of women participation towards family planning especially in Bandipora district of Jammu and Kashmir in this study we had selected 100 married women with age group of 25 to 45 years. The samples for study were chosen by Random sampling, a type of probability sampling. The fieldwork was carried out in the sample area by collecting data from both primary and secondary sources. Primary data was collected by using researcher tools like observation, schedule and interview. Statistical technique was used for analysis of data. Objective of studies:- to know women participation, knowledge, practice towards family planning. To find out the factors restricted women towards family planning. To know side effect of family planning on the health of women. To know family planning improve the economic growth and poverty alleviation. . Results:- the results showed that 80% women were familiar with family planning and remaining 20% have no perception of family planning. Accredited Social Health Activists (ASHA) informed 71% of women while 9% of women informed through mass media. 42percentage women used contraceptive oral pills, 25% women used tubal ligation and 8% women used Intra –uterine device (IUD) to control unwanted pregnancies. The 5% women did not use any of the methods due to the several factors, which include uncooperative husband, traditional mindset of in-laws, preference of son, fear of side effect and religious offense.

Conclusion: women were actively participated, excellent knowledge and positive thought, but have need of awareness and motivate to couples and in-law to improve the family planning scheme.

Keywords: family, woman, society, planning, participation,

INTRODUCTION

world health organization (WHO) way back in 1971 defined family planning as "a way of thinking and living that is adopted voluntarily, upon the basis of knowledge, attitudes and responsible decisions by individuals and couples, in order to promote the health and welfare of family groups and thus contribute effectively to the social development of a country"

India with the huge number of population has been ranked second in the world. Family planning methods plays important role in minimizing the increased growth rates of population. The Government of India has launched family welfare programme in 1951 to reducing the population growth to increase basic to become stable the population at a level of dependable on the condition of national economy. It launched different awareness program and method to increase the social and economic standard of country with the reducing of the birth rate. However, expected result not came out, because of multi linguistic, multi religious and multiethnic country. India has needed to develop special program to deal with desires of the different group. However, detailed information is important about the fertility and mortality before launching special program. As per UNFPA report fertility rate of India has declined from about 3.6 to 2.3 births per women in the last three decades, India become the world's most populous nation by 2028 with population 1.45 billion. Jammu and Kashmir had fertility rate of 1.7per women. This fertility rate was reduced by offering five modern contraceptive options to women by ministry of health and family welfare. Among these three methods are oral contraceptive devices for spacing and two methods are female sterilization (Tubal Ligation) and Male Sterilization (Vasectomy).

Objectives

- To know the participation of women in family planning.

Trends and Patterns of Urbanisation and Migration in Jammu and Kashmir

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Abstract :- Urbanization is a form of social transformation from traditional rural societies to modern urban communities, migration being its major factor. In fact, the processes of urbanization & migration are highly positively correlated. This paper tries to examine and analyze the trend and pattern of urbanization vis-à-vis migration, with particular reference to the state of Jammu and Kashmir. The analysis shows that there is the great intra-district variation of urbanization in Jammu and Kashmir. The trend of urbanization in this Himalayan state is indicative of the concentration of resources and opportunities in a few larger towns only. The future population and economic growth are likely to concentrate in and around these few major towns, especially Srinagar and Jammu. It is further observed that the demographic trends of urbanization are accompanied by the change in management and financing of urban development as a result of liberalization. The migration data also shows that the movement of people is area specific. There are only a few areas which are attracting people from various districts. The trend of various streams is highly changing as R-R & R-Ustreams are showing an increasing trend. With the growing level of urbanization, the challenge of up gradation of urban infrastructure and improvement of urban environment will pose a major challenge for Jammu & Kashmir. The disparities between infrastructure and services of the rural and urban areas should not be allowed to widen in future in this ecologically sensitive state. This demands acceleration of development process for overall improvement of infrastructure services and quality of life in rural as well as in urban areas. The study ends with a note that there is the need of concrete policies and programmes to check the changing

scenario of urbanization & migration in Jammu & Kashmir.

Keyword :- Urbanization, challenge, migration, quality of life, census, transformation.

Introduction :- Urbanization is a form of social transformation from traditional rural societies to modern urban communities. It is long term continuous process. The study of urbanisation highlights that the process of urbanisation in India dates back as about five thousand years when Indus Valley Civilization saw the birth of the earliest urban settlement in human history. Urbanization is a progressive concentration of population in the urban unit (Kingsley Davis-1965). These changes manifest themselves in the increasing concentration of population in human settlements, larger than villages, in the increasing involvement of the people in the secondary and tertiary production functions, and in the progressive adoption of certain social traits which are typical of traditional rural societies". Urbanization is not only accompanied to industrialization, but it is also interlinked with modernization and these three sometimes work in conjunction. In the countries of the third world, urbanization has not been accompanied by modernization as well as industrialization, i.e. a case of pseudo-urbanization 'or over-urbanization'. In most of the developing countries, the modern process of urbanization is a recent phenomenon, and it is still unfolding. As this process is still unfolding in the developing countries, it is revealing special features. The study of different aspects of urbanization is very important in order to have a proper understanding of the urbanization and migration phenomena as well as policies to deal with it. Census of India

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Impact of Pandemic on Economic Sectors and Students' Perception towards Future Occupations.

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Massey Omega

Abstract- Pandemic has impacted on the thinking process of student youths of India, they are confined with limits in their houses, however, their reflections towards Indian economy and their job aspirations are changing a bit. Economic turmoil, low GDP across the nations has marked a drastic decline in the progression of the tertiary sector of Indian economy, the production led models linked with rural economy triggering in the mindset of the students. This gives enough opportunities for academicians to revisit the curriculum of undergraduate and postgraduate courses. Innovative models within contemporary thoughts should be roped through Indian economic heritage. This paper covers the impact of pandemic on the economy, changing perspectives towards sustainable growth as well as students' perceptions towards inclusive and combating inequitable development.

Keywords- Job, Youth, Economy, Pandemic

Introduction- The COVID-19 pandemic has drastically impacted the year 2020 across the world and 2021 has also in its shadows and put up a fight for human lives along with burgeoning economic development, which seems tough too. Global GDP has drastically declined due to the pandemic. The World Bank came up with the pre-Covid estimation loss to be 4.2% for 'international GDP' in the year 2020, which would further be around 4.6% increase in the year 2021, however, it has to pass acid test as various waves of Covid have been jiggling again.

Being a tropical developing country with low health and sanitation facilities, India is often vulnerable to pandemics. It could be viral, bacterial, protozoan, and infection through other species of the animal kingdom. History has enough evidence to manifest it as in the early nineteenth century; Asiatic cholera infected Indians and caused enormous death counts. In the colonial era, just after the First World War over 500 million people got infected through Spanish flu and led to millions of deaths. Bubonic plague, smallpox, pneumonic episodes, dengue fever and malaria, tuberculosis, etc. also impacted Indians. However, the recent pandemic, which spread in our country in the 2020-2021, has not only affected people at large but also drastically crashed the Indian economy. The coronavirus outbreak has caused losses to the tune of INR 30.3 lakh crore to the national

PSYCHO-SOCIAL IMPACT OF COVID-19 ON DIFFERENT GROUPS OF SOCIETY

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ABSTRACT

The current scenario of Global society has witnessed drastic Psycho-social changes. Despite all resources employed to counteract the spreading of the virus, additional global strategies are needed to handle the related mental health issues. Along with its high infectivity and fatality rates, the 2019 Corona Virus Disease (COVID-19) has caused universal psychosocial impact by causing mass hysteria, economic burden, and financial losses. Mass fear of COVID-19, termed as "Corona phobia," has generated a plethora of psychiatric manifestations across the different groups of the society. This out-break is leading to additional health problems such as stress, anxiety, depressive symptoms, insomnia, denial, anger, and fear globally. If we add other factors, such as loss of health, a loved one, job position, or quarantine, post traumatic effects may last. The psychosocial aspects of older people, their caregivers, psychiatric patients, and marginalized communities are affected by this pandemic in different ways and need special attention. For better dealing with the psychosocial issues of different groups of the society, psycho-social crisis prevention, and intervention models should be urgently developed by the government, health care personnel, and other stakeholders.

Keywords -Psycho-social, Impact, Covid-19, Intervention

Education level, Occupational Aspirations in Mining Affected Districts

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ABSTRACT

This paper covers education interventions in two Mining Affected Districts of India, Betul (Madhya Pradesh) and West Singhbhum (Jharkhand), through District Mineral Foundation under various programs run there but altogether lack of innovation and more bureaucracy restrict effective interventions in education sector. Eventually, occupational aspirations among youths of these districts are more towards government jobs, and they have less interest in entrepreneurship and economic aspects. Proper utilization of mining area funds can help in enhancement of education level in these districts, fear of government officials in innovation failure, less power to decentralized bodies in reality and many more problems at district level to be catered properly so that the Education Level of Mining Districts of India will enhanced as compared to other developed districts. prevention, and intervention models should be urgently developed by the government, health care personnel, and Education in India is being provided by both the sectors -public and private; however, financial controls and supervisions are under the central, state and local government. Constitution of India provides free and compulsory elementary education as a fundamental right to children between the ages of 6 and 14. The rationale behind such a provision was to make all the citizens of the country literate so that they could become productive members of society.

KeyWords: Mining, Occupational Aspiration, Intervention model, Mineral Foundation

SELF HELP GROUP FOR PROMOTION OF RURAL LIVELIHOOD

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Abstract: Poverty and unemployment are the major problems of any under developed countries, to which India is no exception. The rate of growth of women employment in India is very low. This is because of the low growth rate of new and productive employment. The more attractive scheme with less effort is "Self Help Group" (SHG). It is a tool to remove poverty and improve the women entrepreneurship and financial support in India. A Self Help Group is a small economically homogeneous affinity group of the rural poor voluntarily coming together to save a small amount regularly, which is deposited in a common fund to meet members emergency needs and to provide collateral free loans decided by the group. Self Help Groups enhance the equality of status of women as participants, decision-makers and beneficiaries in the democratic, economic, social and cultural spheres of life. The present paper is mainly focusing on the Self Help Group formation, women entrepreneurship and economic empowerment of women after then joining Self Help Groups in Badwani district of Madhya Pradesh (M. P.) India. Badwani district is one of the pioneering district for the implementation of the (MPRLP) Madhya Pradesh Rural Livelihood Project in Rural Areas of Madhya Pradesh state along with three more western districts Dhar, Alirajpur & Jhabua. Presently there are 20 CLFs in Badwani district of Madhya Pradesh consisting of 8,234 Self Help Groups. Out of these, the best five villages, Thikari, Pipari Jarwaha, Khurrampura & Ghatwa were selected for this study, because as entrepreneur the SHG women of these villages were functioning in a very successful manner. Therefore, these villages were selected for the present study.

Keywords: CLF- Cluster Level Federation, SHG- Self Help Group, DAY-NRLM -DeenDayal Antyoday Yojna National Rural Livelihood Mission, HDI- Human Development Index, GDP- Gross Domestic Product

RESEARCH OBJECTIVES:

- To understand the NRLM.
- To examine the role of SHGs for poverty eradication.
- To know the livelihood sources of women.
- To know about NRLM's contribution to their socio-economic development.
- To find out what are the available resources in the study.
- To find out the issues affecting the economic condition of people.

MADHYA PRADESH STATE CONTEXT:

The population of this large state with an area of 3,08,245 sq. kms. is 7.26 Crore. Out of this, 2.14 crore comprises of SC and ST population (29.5% of the state population). The state of Madhya Pradesh has a high concentration of tribal population accounting for 14.51% of the total tribal population of the country. About 30% of the state is covered by forests and is rich in minerals and has good reserves of copper and diamonds. Yet the HDI Value (2011) is just 0.375, with the state ranked as the lowest on the India State Hunger Index. The per capita income of MP for 2010-11 has been Rs.22,460 at constant prices of 2004-2005 and is Rs.33,906 at current prices of the years. It is 62.53% of the National Per Capita Income. The growth rate of GDP in the state is 8.22% In spite of vast geographical space of Madhya Pradesh, the lack of contiguity has been, for long, a deterrent in reaching financial services to the people and in financial institutions expanding their business. Lack of awareness of banking / financial literacy, inadequate bank reach result in high clientele per bank branch (23,000 per bank branch-2011 Census) leaves a high number, about 65% of unbanked population in the state. With this backdrop, it would require the concerted and coordinated efforts of not only banks but also the Government agencies, the civil societies, financial institutions Formal and others, technology providers, educational institutions, industry and other related services providers.

TO REALISE THE VISION

Banks should be a little more liberal in the bulk lending and at affordable costs. Even in the SBLP programmes the Credit to Deposit ratios for SHGs are quite low and requires enhancement significantly to attain the State vision of alleviating poverty. The Banking Correspondent concept needs to be strengthened with appropriate training and incentivisation to retain the BCs and to penetrate into deeper rural areas. It is about time that a serious thought is given to involve Post Offices in lending activities also to make them work as "Microfinance Supermarkets". Capacity building and training is absolute and need based curriculum should be designed by reviewing present systems and training modules. A Centralised Training of Trainers Institute could do well in the state. Various real-time vocational skills need to be increasingly developed to enhance livelihood opportunities. Financial literacy with emphasis

Impact of COVID-19 on Behavioral Change of Indian People

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Abstract: This paper covers knowledge and health seeking behaviour aspects of Indians at large on COVID-19. Through online questionnaire, information has been gathered from metro cities, state capitals and some small cities along with rural segments. It gives a comprehensive picture of the practices adopted by the people for the protection against the infection. Though social stratification can also be seen towards the united responses to control the pandemic. However, a significant relationship between fear and avoid morbidity exists in different segment of society. The paucity of resources, social stratification, economic and social conditions, access of information, pro-activeness from bureaucracy etc. are the factors which directly impacted the mankind at large.

Coronavirus disease (COVID-19) is a disease due to newly discovered coronavirus. Coronaviruses are an extensive family of viruses- subfamily Orthocoronavirinae, family Coronaviridae, order Nidovirales, and realm Riboviria. They are enveloped viruses of positive-sense single-stranded RNA genome and a nucleocapsid of helical symmetry, which may cause illness in animals or humans. In humans, they mainly cause respiratory infections ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS) and

Sociological Impact of Pandemic on Tribal Society

• Shahank Shekhar Thakur

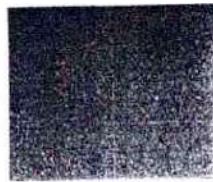
Abstract- After 100 years, world is again facing epidemic of health crisis due to COVID-19 virus. Unfortunately, human body is the carrier of virus and spread by physical contacting. As a result, within a month it has spread across the world. In lieu of appropriate medicine and vaccine to treat the patient, WHO has suggested to keep social distancing and maintain effective hygiene practices. As a result, first time in the history complete lockdown has been imposed – public transports, economical activities, education institutes, social and religious places, basic services and markets were completely shut down. For the survival of human, humans are kept in lock down at their places. In India, complete lockdown was imposed from 22nd March and continue till 31st May in 3 phases. During the course of lockdown of 71 days, restrictions were imposed under section 144 and except essential supplies of medicines, food items, vegetables and milk, other activities were kept shut-down. In fact, in due courses there has been larger impact on the society on economy as well as on social behaviour. The paper is an attempt to understand the sociological changes in the society due to an impact of pandemic.

Key Words- Pandemic, Tribal, Society

1. Introduction- After 100 years, world is again facing epidemic of health crisis due to COVID-19 virus. Unfortunately, human body is the carrier of virus and spread by physical contacting. As a result, within a month it has spread across the world. In lieu of appropriate medicine and vaccine to treat the patient, WHO has suggested to keep social distancing and maintain effective hygiene practices. As a result, first time in the history complete lockdown has been imposed – public transports, economical activities, education institutes, social and religious places, basic services and markets were completely shut down. For the survival of human, humans are kept in lock down at their places.

In India, complete lockdown was imposed from 22nd March and continue till 31st May in 3 phases. During the course of lockdown of 71 days, restrictions were imposed under section 144 and except essential supplies of medicines, food items, vegetables and milk, other activities were kept shut-down. In fact, in due courses there has been larger impact on the society on economy as well as on social behaviour. The paper is an attempt to understand the sociological changes in the society due to an impact of pandemic.

Financial impact of the crisis has been immediate, deep and long-time. The lockdown began in March and about 53% households had lost



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Community Institutions; SHG : A Fighter For Women & Girls Against Violence During Covid 19 Pandemic

• Shashank Shekhar Thakur

Abstract- COVID-19 seems to be similar to the pandemics in the past since this too has resulted in an increase in cases of domestic violence. According to Bradbury-Jones and Isham the lockdown imposed to deal with COVID-19 has granted greater freedom to abusers. Several media reports indicate a surge in cases of domestic violence in various countries. According to Kagi though a drop was observed in the overall crime rates in Australia, the domestic abuse rates increased by 5%. Some charities in Australia also raised concerns about COVID-19 misinformation being used by the openers to further control and abuse the victims of domestic violence. This brief highlights emerging evidence of the impact of the recent global pandemic of COVID-19 on violence against women and girls. It makes recommendations to be considered by all sectors of society, from governments to international organizations and to civil society organizations in order to prevent and respond to violence against women and girls.

Keywords- SHG, Gender, Domestic violence, Covid-19 pandemic, Public health.

Introduction- This brief highlights emerging evidence of the impact of the recent global pandemic of COVID-19 on violence against women and girls. It makes recommendations to be considered by all sectors of society, from governments to international organizations and to civil society organizations in order to prevent and respond to violence against women and girls. At the onset, during, and after the public health crisis with examples of actions already taken. It also considers the economic impact of the pandemic and its implications for violence against women and girls in the long-term. It is a living document that draws upon the knowledge and experience of a wide range of experts who support solutions to end violence against women and girls, attentive to the country context in which the crisis is occurring.

Trends and issues- Violence against women and girls (VAWG) is a human rights violation, a universal issue, with great impact on victims/survivors, their families, and communities. Almost 18 per cent of women and girls aged 15 to 49 years who have ever been in a relationship have experienced physical or sexual Violence by an intimate partner in the previous 12 months. The figure rises to 30 per cent when considering violence by a

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"PRINCIPLE OF MANAGEMENT AT WORK – PERCEPTION AND CULTURE IN INDIA"

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Khalidah sultan

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Abstract

It is an evident that Indian has amazing energy, indefatigable spirit and zeal to do more. Millions are believing that everything is possible here. However, culture is diverse and people are different. Universally there are some core things that people are value. Work is like a worship for them. At the same time, people would like to be respected and motivated at work place and expect appreciation and recognition with good compensations.

Indians are strongly guided by their respective religions and their shared values. Respect for elders and hierarchy are core values that permeate all aspects of Indian society. Indians also place huge importance on family and community. The paper is an effort to elaborate five key principals of the working culture in India. Illustrated five principles of management based on the interview of senior management in the top most corporate, administration and industries. Paper is an attempt to elaborate on hierarchy and decision making, managing relationship and networks, managing work and personal life and managing Effective Communication.

Understand that you will meet the best of people and the worst of people. If you expect punctuality in office, also consider external logistic factors like where and how far people live and which train lines they take. Spend more time preparing prior to almost every meeting. Also, when you walk into a room, be mindful of whom you shake hands with first. Continue to maintain your position in a polite manner, saying don't discuss personal questions. At the last but not the least, be ready with plan B and C also.

Key words: - management, decision making , Effective Communication, managing relationship and networks.

Background

The work culture varies and its depends on the people who works their and the management principals of the workplace adopted. Indeed, Indian and western culture of working is significantly different still the potential is delivery is more or less same. The western part of the world is a cluster of developed nations, and hence, a better standard of living and an upgraded

Impact of Pandemic Covid-19 on Education in India

Chanda Jha
Shashank Shekh Thakur, PhD

Abstract

The outbreak of coronavirus disease (COVID-19) has been declared a Public Health Emergency of International Concern (PHEIC) and the virus has now spread to many countries and territories. Novel Coronavirus (Covid-19) Pandemic has significantly disrupted every aspect of human life. The impact of pandemic COVID-19 is observed in every sector around the world. The education sectors of India as well as world are badly affected by this. According to UNESCO report more than 157 crore students across 191 countries severely impacted by closure of educational institutions due to coronavirus. It has enforced the worldwide lockdown creating very bad effect on the students' life. Around 32 crore learners stopped to move schools / colleges and all educational activities halted in India. The outbreak of COVID-19 has taught us that change is inevitable. It has worked as a catalyst for the educational institutions to grow and opt for platforms with technologies, which have not been used before. The education sector has been fighting to survive the crises with a different approach and digitising the challenges to wash away the threat of the pandemic. This paper highlights some measures taken by Govt. of India to provide

Effect & Influence of Media on the Career Aspirations of Higher Secondary Students

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Abstract:

The media plays a significant part in today's society, and it has an impact on students' goals. Television and digital media, among other types of media, are making it easier for students to seek employment. Though the decision-making process is complex and impacted by those around them, the media has an impact on everyone. Based on a study conducted in three schools of Delhi, this paper examines the impact and influence of the media on the career aspirations of higher secondary students. Under the new education policy, this paper makes pertinent recommendations for the educational system to enhance more rigorous digital-based media tool development in facilitating students.

Context

In general, the term "media" refers to any kind of communication. We become hunks as a result of communication. Communication allows us to express our thoughts and feelings. We become alienated, lonely, and unhappy when we are deprived of conversation. (Michael 2007). The media supplies us with information that allows us to make decisions about not just our everyday activities, but also those that may have life-changing implications, such as job prospects and further educational chances. The

Corporate Social Responsibility and its Role in India

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Abstract :- Corporate Social Responsibility is a way by which the Corporates addresses the larger group of stakeholders. CSR has moved far away from its years old ways of Charity and Philanthropy and reached to an era called Corporate Responsiveness and Social Sustainability. CSR now focuses on addressing the social issues and sustainable business strategy for the development of Society and collective future actions for good governance and its people. The objective of this paper is to understand the reasons and the growth of CSR in Indian context and what are the benefits of it to the Corporates/Companies.

Key Words :- Corporate Social Responsibility, stakeholders and globalization.

Introduction :- The emerging concept of CSR goes beyond charity or philanthropy and requires the company to act beyond its legal obligations and to integrate social, environmental and ethical concerns into its business process. Business for Social Responsibility defines CSR as "achieving commercial success in ways that honour ethical values and respect people, communities, and the environment. It means addressing the legal, ethical, commercial and other expectations that society has for business and making decisions that fairly balance the claims of all key stakeholders. In its simplest terms it is: "what you do, how you do it, and when and what you say". The concept of CSR is constantly evolving. What is generally understood by CSR is that the business has a responsibility towards its stakeholders and society at large that extends beyond its legal and enforceable obligations. The triple bottom line approach to CSR emphasizes a company's commitment to operating in an economically, socially and environmentally sustainable manner. The emerging concept of CSR advocates moving

away from a 'shareholder alone' focus to a 'multi-stakeholder' focus. This would include investors, employees, business partners, customers, regulators, supply chain, local communities, the environment and society at large.

For any business to flourish in this Global world, it's important to consider the world in which they operate. In the late 1960s and early 1970s the use of the term 'Corporate Social Responsibility' becomes a term to use in common, when many multinational corporations developed the term stakeholders. It simply means those on whom organization activities have an impact. According to a book by Edward Freeman, Strategic Management: CSR describes corporate owners beyond shareholder. Any Corporates must do their business in a socially, economically and environmentally responsible manner for long term sustainability. CSR basically, refers to business practices which involves initiatives that benefit society. Business can do a wide variety of practices like giving away a portion of a company's profit to charity, or may implement a "Greener" business operations. The concept CSR is the ideology of give and take. The corporates take and utilises the resources in its raw form and also utilises the human resource, etc from the society. According to the companies Act 2013, CSR comprises of activities which is giving back to the society for the welfare and societal growth. This policy functions as a built-in and self-regulating mechanism which business monitors and also ensures its active compliance with the spirit of ethical standard, law and follows international norms.

The aim of Corporate Social Responsibility is to embrace the company's actions and encourages positive impact by implementing its activities for the welfare of employees, consumers, environment,

Perspectives of Poverty Alleviation & Evolution of SHG in India

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Abstract - This paper considers the strategies of self help group for micro-enterprise development in rural areas. It seeks to answer the question of whether and under which conditions self help groups are an effective vehicle for organizing and representing local people in the development of community based micro-enterprises. Focusing particularly on examples from India in the context of food as a local resource, special attention is paid to success and failure factors of self help groups. While self help group strategies have been applied in the past as a blind replication of success models without considering the intricacies involved in group formation, success of self help groups is based on a thorough understanding of local conditions and possibilities to intervene. India has adopted the Bangladesh's model in a modified form. To alleviate the poverty and to empower the women, the micro-finance has emerged as a powerful instrument in the new economy. With availability of micro-finance, self-help groups (SHGs) and credit management groups have also started in India. And thus the movement of SHG has spread out in India. Self-Help Group (SHG) program is a pragmatic approach to eradicate poverty. It is initiated as a self-employment program in the jargon of poverty eradication measures as well as empowerment program in the country.

Keywords- SHG-Self Help Group, MED- Micro Enterprise Development, CBO- Community Based Organisation, Sustainable development goals (SDGs).

Introduction - Women's self-help groups in India provide an interesting and concrete example of an intervention that is both well aligned with theoretical ideas about development as a process of capability expansion and contributes to policy priorities of gender empowerment such as SDG 5. There has been some rigorous research on self-help groups but as they continue to evolve in their conception and design, it is important to update the evaluation picture: this paper offers such an update. Today SHG movement has acquired more than one objective to alleviate poverty in rural areas and also to empower women particularly the rural and semi-urban folks." According to Raj (2006), "SHGs are the powerful media to solve many of the problems of rural India such as removal of poverty, improvement of standard of living, the development of rural economy, empowerment of women and building democratic way of living." I too endorse the views of both Prof Paul A Rego and Sudhir Raj that The WSHGs have been playing vital role in attainment of assigned goals.



SHGS – Some Background - The policy environment in India has been supportive of SHGs and the ideas of micro-finance, at least since the late 1960s when banks were required to earmark funds for poverty alleviation and development programs, and they have evolved rapidly as a result. Research into early initiatives, for example, Harper (2002) suggested that priority should shift to the improvement of access to financial services and this has been reflected in the design of policies to support poor women in agriculture as a result. It was also found that the main priorities of the poor included the development of opportunities to amass financial surpluses and access easy to use financial services for micro enterprises and to access to loans for consumption needs, as they emerged. This has required a change in thinking about the poor, not just as consumers but also as potential managers and entrepreneurs, which in turn has contributed to the need for Multi-faceted SHG programs, comprising a range of human development initiatives including training for skill development literacy, health, schooling, and gender sensitivity training. Some of the most successful experiences of SHGs have been in Southern India. Notable among them are APMAS (Mahila Abhivruddhi Society, Andhra Pradesh) that even gives quality-rating services and has a research and advocacy wing (Reddy and Manak, 2005) and Kudumbashree in Kerala that is a poverty

Women Empowerment Through Skill Development & Vocational Training

• Shashank Shekhar Thakur
• Sushma Mishra

Abstract- This was the topic of discussion for the skill development of women. How the government participated, to analyze the challenges facing skill development programmes in India, and to highlight the specific needs for improvement in favour of the large number of informal workers, especially women. Women entrepreneurship is gaining importance in India in the wake of economic liberalization and globalization. The policy and institutional framework for developing entrepreneurial skills, providing vocation education and training has widened the horizon for economic empowerment of women. However, women constitute only one third of the economic enterprises. There exist a plethora of successful business women entrepreneurs both in social and economic fields in India. They are performing well. The women group should be indulge with working group in India for better economy development; this comes only through skill development programs & vocational education system. Government of India has also introduced National Skill Development Policy and National Skill Development Mission in 2009 in order to provide skill training, vocational education and entrepreneurship development to the emerging work force. However, entrepreneurship development and skill training is not the only responsibility of Government and therefore other stakeholders need to shoulder the responsibility. In Hindu scriptures, woman has been described as the embodiment of Shakti. But in real life she is treated as Abla. Women are leaving the workforce in droves in favour of being at home. Not to be a homemaker, but as job-making entrepreneurs. The increasing presence of women in the business field as entrepreneurs has changed the demographic characteristics of business and economic growth of the country. Women-owned businesses enterprises are playing a more active role in society and the economy, inspiring academics to focus on this interesting phenomenon. This paper focuses on the problems, issues, challenges faced by women entrepreneurs, how to overcome them with skill development policies of Indian government for and problems faced by them while pursuing the same.

Keywords- Skill development for women, women-empowerment, women-entrepreneurship, Skill training, Vocational education

Introduction- A quiet revolution is taking shape right now among women. Unlike the Quiet Revolution that began in the 1970s which saw women leave the home and enter the workforce in droves, women today are

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Punch - Line : The Ali (Cash study - Ever Greatest Pugilist Mohammad Ali)

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Abstract

Mohammad Ali was an American professional boxer and activist. Cassius Clay was born and raised in Louisville, Kentucky, and began training as an amateur boxer when he was 12 years old. At age 18, he won a gold medal in the light heavyweight division at the 1960 Summer Olympics in Rome and turned professional later that year. At age 22 in 1964, he won the WBA, WBC, and lineal heavyweight titles from Sonny Liston in a major upset. Ali is regarded as one of the leading heavyweight boxers of the 20th century, and remains the only three-time lineal heavyweight champion. During 1964, Ali reigned as the undisputed heavyweight champion. His record of the most wins in heavyweight title bouts in modern boxing history at 22 was

unbeaten for 35 years, 7 months and 11 days until Vladimir Klitschko won his 23rd title bout in 2014. After retiring from boxing at age 39 in 1981, Ali devoted his life to religious and charitable work. In 1984, Ali was diagnosed with Parkinson's syndrome, which his doctors attributed to boxing-related brain injuries. As his condition worsened, Ali made limited public appearances and was cared for by his family until his death on June 3, 2016, in Scottsdale, Arizona.

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INTRODUCTION

The Greatest Boxer Mohammad Ali was an American Olympic and professional boxer activist dominated sports for over two decades. He won and defended the heavy weight championship in epic fights in exotic locations, spoke loudly on behalf of blacks and family and refused to be drafted into the army during the Vietnam War. The 6.3 feet heighted and 210 pound mammoth Ali was never the same fighter after his lengthy lay off. He was the heavyweight champions for two more times and fought for another decade. Mohammad Ali was the champion of spirit of passion. His memorable fight that they had names 'Rumble in the Jungle and thriller in manila'. He had taken 29000 punches to the head and made 57 million-dollar in his career.

Mohammad Ali's childhood name was Cassius Marcellus clay .He was born on Jan 17, 1942 in Louisville, Kentucky us his father Cassius Marcellus clay was a painter and musician his mother name Odessa Grady clay and siblings Rahman Ali.

Beginning of Boxing - At the age of 12, Ali discovered his talent for boxing through an odd twist of fate. His brake was stolen, and Ali told a police officer. Joe martin , that he wanted to beat up the thief. "well, you better learn how to fight before you start challenging people "martin reportedly told him at the time".

That time Ali was 89 pounds but martin began training him at his boxing gym. The beginning at a boy carrier finish with the light heavy weight Olympic gold. After Olympic gold clay come in Professional Boxing under the guidance of Pundi.

Disaster Management in Special Reference to Floods in Bhopal City in 2006 & The Bhopal Gas Tragedy, 1984

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INTRODUCTION

WHO defines disaster as "Any occurrence causing damage, ecological disruption, loss of human lives, deterioration of health and health services on a scale sufficient to warrant any extraordinary intervention from outside the affected community". Earthquakes, floods, droughts, and cyclones come under this category.

Intensity of the Bhopal floods of August 13th and 14th 2006, when the city experienced 32.1 cm rains within less than 15 hours, a record in 80 years inundating not only most of the slums but also some of the posh colonies, could safely be described as a disaster. Before the industrial revolution of nineteenth and twentieth century, floods, droughts and landslides were truly natural in their occurrence. However, now the droughts, floods and landslides, to a large extent, are caused by man's excessive intervention in nature.

The need is to equip cities and settlements both small and large, to face events that are extreme in nature and come as a surprise as far as its timings is concerned. **Better disaster and urban planning practices** are called for to save loss of life and capital. This brief takes up the case example of Bhopal city which faced floods in the month of August 2006.

Bhopal- An Introduction

BHOPAL, capital of Madhya Pradesh, in the central part of India is fascinating amalgam of scenic beauty, historicity and modern urban planning. It is situated on the site of an 11th century city, Bhojapat, founded by King Bhojpal. The founder of the existing city was an Afghan soldier, Dost Mohammed Khan (1708-1740). It is specially known for its lakes and it is the presence of many beautiful lakes that has earned the city the sobriquet, *City of Lakes*.

Bhopal is a hilly but hot area, located on the Malwa plateau, and the land rises towards the Vindhya Range to the south. The average annual rainfall of Bhopal is 1200mm from July to October.

On the night of 13th August, Bhopal received 29cms of rain in a span of 5 hours in a heavy downpour that caused havoc to the city and its dwellers. The record rainfall has happened after a span of about 70 years. Before the recent incidence, it was in 1973 that the city received 27cms of rains in 24 hours. Lakes started overflowing and many major roads of the city were submerged in the flooding water. Recent incidence of flooding has raises a question mark on the city planning and growth the reasons for such a situation are described in the following points.

The After effects and vision for the future

If big and so called planned cities like Bhopal can be so badly hit by a natural event like heavy rains, what would be the fate of the smaller towns and villages where proper planning has not been implemented as yet, is a question that seeks answer. Another important point to be raised is on the present city planning practices and hold of the law on the development that is taking place. Proper

A Compare Study of Reaction Time of Sports Man Participating in Different Games

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Abstract

Reaction time is the time that elapses between a person being presented with a stimulus and the person initiating a motor response to the stimulus. Reaction time is defined as the elapsed interval of the time presentation of a stimulus to initiation of a response it is called response latency, which the time between the onset of a stimulus to the , Initiate an overt response. Reaction time is the time elapsed between conduction time for both incoming and outgoing impulses, and also the time necessary to Integrate input and output within the central Nerves system. Woolworth of Schlosberg (1963) study that reaction time is the S-R time interval, which include sence organ time brain time nerve time and muscle time. The individuals cannot begin to move the instant he observes the stimulus is observed until the response is begun. The sense organ must be aroused, the Nerve must conduct the impulse to the brain and then from the brain to the muscles, and the muscles must contract before an overt response can be affected. These processes involve time thus the occurrence of the S-R time internal or RT. The ability of an individual to respond to an external stimulus is called reaction time. 60 male students of different colleges also participated in inter college tournament where selected as a subjects for this study. Ten subjects each were randomly selected from games Taekwondo, Cricket, Voo ball, Athletic, Judo, Hockey.



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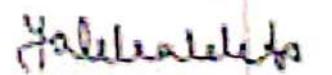
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ROLE OF CONSCIOUSNESS IN SPIRITUAL DEVELOPMENT

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Consciousness is the state of being aware of oneself and the environment. It is associated with wakefulness, responsiveness and arousal. Consciousness is typically measured by verbal reports about experience. Related areas of interest are those functions that are thought to operate without consciousness, such as blindsight and subliminal perception. Consciousness at its simplest is "awareness of internal or external existence". Despite centuries of analyses, definitions, explanations and debates by philosophers and scientists, consciousness remains puzzling and controversial, being "at once the most familiar and most mysterious aspect of our lives.

Spirituality is connecting to the Divine through your own personal experience. It is primarily concerned with finding, experiencing, and embodying one's true spiritual nature. Spirituality can mean different things to different people. For some, it's primarily about participation in organized religion. For others, it's a non-religious experience that involves getting in touch with their spiritual selves through private prayer, yoga, meditation quiet reflection, or time in nature.

SPIRITUAL practice must lead to character building and development but, as my master has emphasised again and again while he gives spiritual wealth to us we have to use our willpower and our intelligence to mould our character to conform to our spiritual level. The conscience is only like a thermometer to judge how good or how bad one is .in spirituality we do not think of good and bad but of samskaras, and they are to be avoided.

Generally we think of human anatomy as being about the physical body, including the nervous system, the organs, the circulatory system, the structure and functioning of cells and DNA, etc. There has been so much scientific research in this field, especially during the last 500 years; we have really specialized in this knowledge. Say Kamlesh D.Patel is the spiritual Guide in the Sahaj Marg system of Raj Yoga meditation.

But this is only one aspect of human anatomy. As we have discussed in previous ~~articles~~, we have three main bodies - the physical, subtle and causal. Over the centuries, the knowledge of these three bodies has developed, and today research in the dynamic field of integrative body- mind-spirit science is unfolding faster than

THE BHOPAL GAS TRAGEDY , 1984: A CASE STUDY

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Introduction

WHO defines disaster as "Any occurrence causing damage, ecological disruption, loss of human lives, deterioration of health and health services on a scale sufficient to warrant any extraordinary intervention from outside the affected community". Earthquakes, floods, droughts, and cyclones come under this category.

Objective : To perform a case study on :

The major drawbacks in the strategies of handling the UCIL plant established for manufacturing methyl isocyanate that led to the catastrophe of December , 1984 so that better planning practices could save loss of life and capital in the future.

Bhopal- An Introduction

BHOPAL, capital of Madhya Pradesh, in the central part of India is fascinating amalgam of scenic beauty, historicity and modern urban planning. It is situated on the site of an 11th century city, Bhojapat, founded by King Bhojpal. The founder of the existing city was an Afghan soldier, Dost Mohammed Khan (1708-1740).It is specially known for its lakes and it is the presence of many beautiful lakes that has earned the city the sobriquet, City of Lakes. Bhopal State was the second-largest Muslim-ruled princely state: the first being Hyderabad. After the inde-

कलात्मक जिमनास्ट की शारीरिक फिटनेस पर शारीरिक व्यायाम का प्रभाव

आयुष त्रिवेदी

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सार – जैसा कि शोधकर्ता कलात्मक जिमनास्ट की शारीरिक फिटनेस पर शारीरिक व्यायाम के प्रभाव का अध्ययन करना चाहते हैं, इस प्रकार अध्ययन प्रायोगिक विधि द्वारा किया गया था। सभी बिंदुओं पर विचार करने के बाद, उद्देश्यपूर्ण नमूना तकनीक को नियोजित किया गया था। मध्य प्रदेश राज्य के उज्जैन के केवल पुरुष जिम्नास्टों की आयु 10 से 17 वर्ष के बीच थी जिन्हें अध्ययन के लिए जानवृक्षकर चुना गया था। कुल 20 नमूनों का चयन किया गया था। चयनित शारीरिक फिटनेस घटक पेट शक्ति सहनशीलता, ऊपरी शरीर शक्ति और पैरों की विस्फोटक शक्ति थे। डेटा संग्रह शोधकर्ता के लिए एक शारीरिक फिटनेस परीक्षणों के बाद प्रशासितय पेट की शक्ति सहनशीलता के लिए एक मिनट सिट अप टेस्ट, अपर बॉडी स्ट्रेंथ के लिए एक मिनट पुश अप टेस्ट और पैरों की विस्फोटक शक्ति के लिए स्टैंडिंग ब्रॉड जंप। परिकल्पना का परीक्षण करने के लिए एकल समूह प्रीस्टर्ट पोर्टस्टर्ट रिसर्च डिजाइन का उपयोग किया गया था। शारीरिक व्यायाम प्रशिक्षण कार्यक्रम को बनाने से पहले चयनित विषयों का परीक्षण किया गया था। शारीरिक व्यायाम प्रशिक्षण कार्यक्रम की अवधि ४: सप्ताह की थी। प्रशिक्षण वैकल्पिक दिनों (प्रति सप्ताह तीन दिन) पर दिया गया था और ४: सप्ताह के प्रशिक्षण विषयों के बाद परीक्षण किया गया था। डेटा के विश्लेषण के लिए स्वतंत्र नमूना 'टी' परीक्षण का उपयोग किया गया था और परिणाम तैयार किए गए थे। अध्ययन के परिणाम में यह पाया गया कि ४: सप्ताह की अवधि के लिए शारीरिक व्यायाम प्रशिक्षण पेट की मांसपेशीय शक्ति सहनशीलता, ऊपरी शरीर की शक्ति और पैरों की विस्फोटक शक्ति को बढ़ाने के लिए प्रभावी था। इसलिए यह निष्कर्ष निकाला जा सकता है कि शारीरिक व्यायाम प्रशिक्षण पेट (कोर) की मांसपेशीयों को मजबूत करता है जो चरम सोमाओं पर बलों को बनाने और स्थानांतरित करने के लिए बहुत महत्वपूर्ण हैं।

कीवर्ड: शारीरिक व्यायाम, शारीरिक फिटनेस, कलात्मक जिमनास्ट।

प्रस्तावना

मनोवैज्ञानिक स्वास्थ्य पर नियमित व्यायाम के लाभों को स्पष्ट रूप से प्रलेखित किया गया है। चिंता और अवसाद के रोगी वेहतर करते हैं यदि व्यायाम प्रशिक्षण अन्य उपचारों के साथ जोड़ा जाता है। इससे भी महत्वपूर्ण बात यह है कि नियमित व्यायाम करने वाले अधिकांश व्यक्तियों में सामान्य सेहत और बढ़ी हुई आत्मविश्वास और आत्म कल्पना की वेहतर समझ है। कई वैज्ञानिक अध्ययनों ने वयस्क आयु सीमा के सभी पुरुषों और महिलाओं के समूहों में व्यायाम के लाभकारी प्रभावों का दर्शावेजीकरण किया है। शोध से यह भी पता चला है कि वचपन और किशोरावस्था के दौरान स्थापित व्यायाम का स्वरूप



कलात्मक जिमनास्ट के मानसिक स्वारथ्य पर मानसिक प्रशिक्षण का प्रभाव

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सार – जैसा कि शोधकर्ता जिमनास्टों के मानसिक स्वारथ्य पर मानसिक प्रशिक्षण कार्यक्रम के प्रभाव का अध्ययन करना चाहता है, इस प्रकार प्रायोगिक पद्धति द्वारा अध्ययन किया गया था। सभी बिन्दुओं पर विचार करने के बाद उद्देश्यपूर्ण प्रतिदर्श तकनीक का प्रयोग किया गया। मध्य प्रदेश राज्य के उज्जैन के केवल 7 से 14 वर्ष के आयु वर्ग के पुरुष जिमनास्ट को अध्ययन के लिए जानबूझकर चुना गया था। कुल 60 नमूनों का चयन किया गया। अध्ययन का चयनित चर मानसिक स्वारथ्य है, जिसे सी.डी. अगाशे और आरडी हेलेडे के मानसिक स्वारथ्य प्रश्नावली के प्रशासन द्वारा मापा गया था। वर्तमान अध्ययन के लिए एकल समूह प्रीटेरेट-पोर्टटेरेट डिजाइन का उपयोग किया गया था। प्रीटेरेट और पोर्टटेरेट के बीच सांख्यिकीय महत्वपूर्ण अंतर का परीक्षण करने के लिए, वर्णनात्मक आंकड़ों और युग्मित नमूनों द्वारा जिमनास्ट के मानसिक स्वारथ्य पर मानसिक व्यायाम कायक्रम की प्रभावशीलता को निर्धारित करने के लिए डेटा का विश्लेषण किया गया था। टी-परीक्षण। परिकल्पना का परीक्षण करने के लिए महत्व का स्तर 0.05 रखा गया था। उपरोक्त विश्लेषण और आंकड़ों की व्याख्या से निम्नलिखित निष्कर्ष निकाले गए। मानसिक प्रशिक्षण कार्यक्रम मानसिक स्वारथ्य में काफी सुधार करता है। निष्कर्षों से यह देखा गया कि मानसिक स्वारथ्य के प्रीटेरेट और पोर्ट टेरेट के बीच महत्वपूर्ण अंतर था। यह इंगित करता है कि मानसिक प्रशिक्षण कार्यक्रम का जिमनास्टों के मानसिक स्वारथ्य पर सकारात्मक प्रभाव पड़ा। अतः शोध परिकल्पना को स्वीकार किया गया। अध्ययन के परिणाम से यह निष्कर्ष निकाला जा सकता है कि जिमनास्टों के मानसिक स्वारथ्य को बढ़ाने के लिए 8 सप्ताह की अवधि के लिए मानसिक प्रशिक्षण सर्वथा प्रभावी था।

कीवड़: मानसिक प्रशिक्षण, मानसिक स्वारथ्य, जिमनास्ट।

प्रस्तावना

शारीरिक शिक्षा और औपचारिक शिक्षा दोनों एक ही सिक्के के पहलू हैं। दोनों का कार्य मनुष्य के व्यक्तित्व को निखारना है। शिक्षा व्यक्ति के जीवन में महत्वपूर्ण भूमिका निभाती है। शिक्षा जीवन की बाधाओं को पार करने और एक संतुष्ट जीवन जीने के लिए आवश्यक उपकरण प्रदान करती है। आज की 21वीं सदी में शारीरिक शिक्षा किसी भी प्रकार की शिक्षा का अभिन्न अंग बन गई है। उसी प्रकार प्रशिक्षण भी शिक्षा प्रदान करने की विधि है, यह किसी कार्य के लिए तैयारी की प्रक्रिया को दर्शाता है। खेलों में सुधार के लिए खेल प्रशिक्षण दिया जाता है। इसके विपरीत, यह खिलाड़ी के संपूर्ण व्यक्तित्व की उपज है। प्रशिक्षण के सक्रिय अभ्यास पर जोर देकर सीखने के दर्शन के अनुरूप रहा है। साथ ही, मानसिक, प्रशिक्षण व अभ्यास पर अपेक्षाकृत कम ध्यान दिया गया है जो प्रदर्शन से पहले,

Studies on the benefits of walking

Dr. Alok Mishra
Associate professor,
Physical Education,
Barkatullah University,
Bhopal

INTRODUCTION -

Walking is a great way to improve or maintain your overall health. Walking is low impact, requires minimal equipment, can be done at any time of day and can be performed at your own pace. You can get out and walk without worrying about the risks associated with some more vigorous forms of exercise. Walking is also a great form of physical activity for people who are overweight, elderly, or who haven't exercised in a long time.

It is helpful in vitalizing the health of the vital organs of the body. Additionally, it improves the functionality of the different system of the body. It is so because during sleep most of the organs of the body are at rest and a morning walk helps to revitalize them. In addition, it removes tiredness and the feeling of fullness from the body. The fresh air of the open area refreshes our body and mind. Walking offers a good work out for the entire body as well. It is good for metabolism and helps control obesity. Those who suffer from diabetes are advised to walk daily for it can bring down their blood glucose levels significantly.

More than half of the body's muscle strength is designed to power walking. The foot, leg and hip muscles and many of the back muscles take an active part in walking, but tummy muscles are also no laggards. They tighten themselves to

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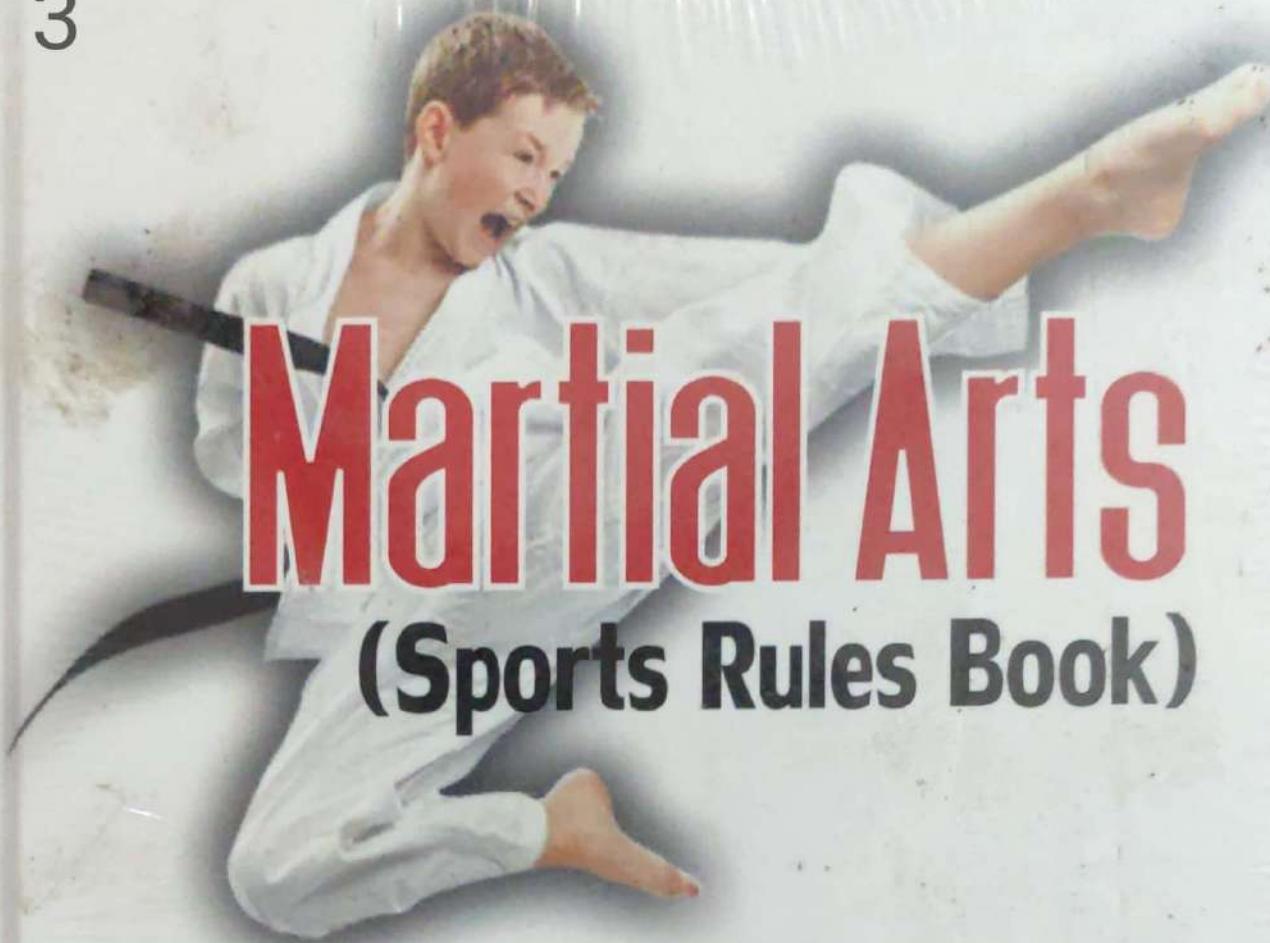
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डॉ. आलोक मिश्र



डॉ. आलोक मिश्र

स्वास्थ्य शिक्षा



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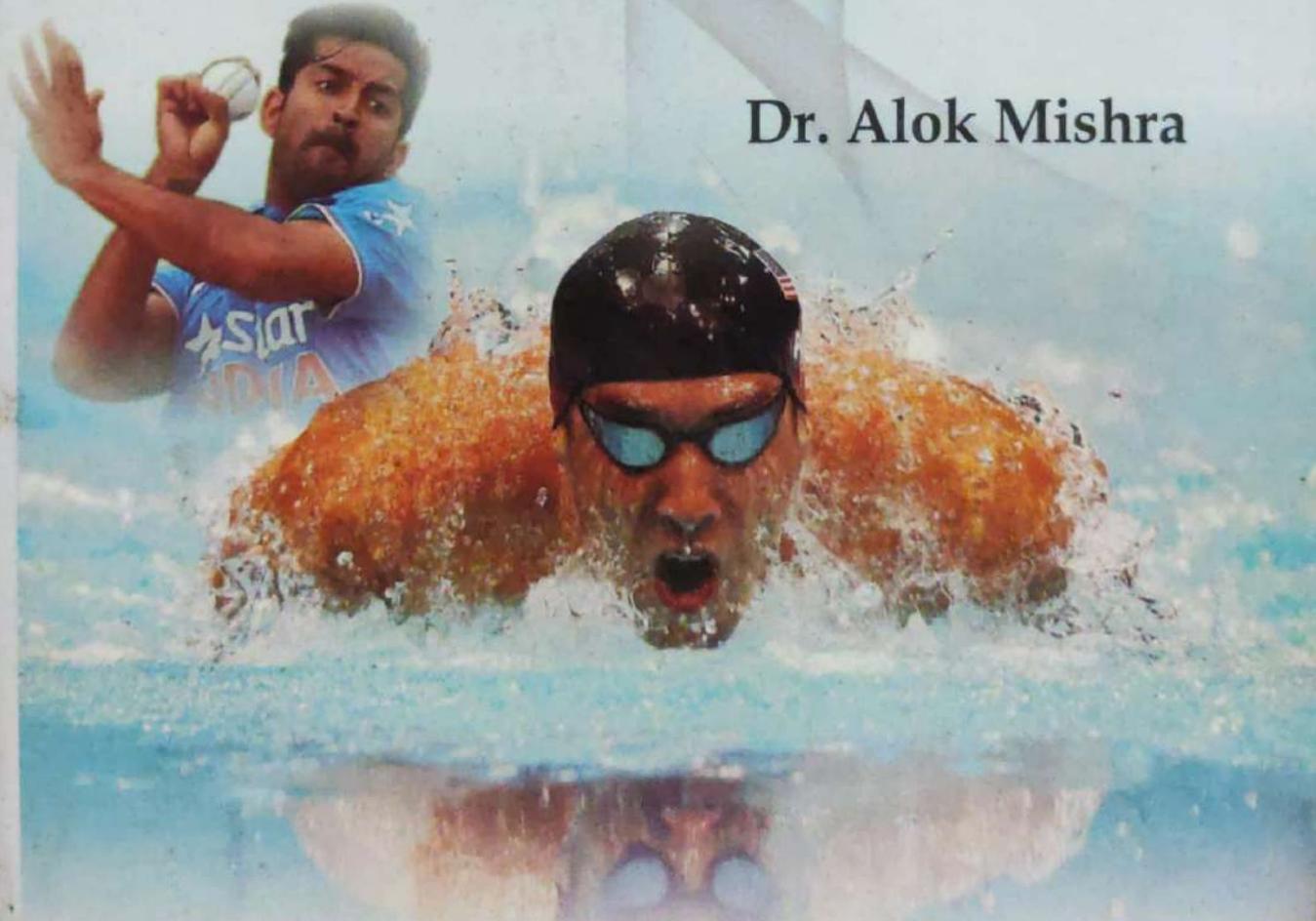
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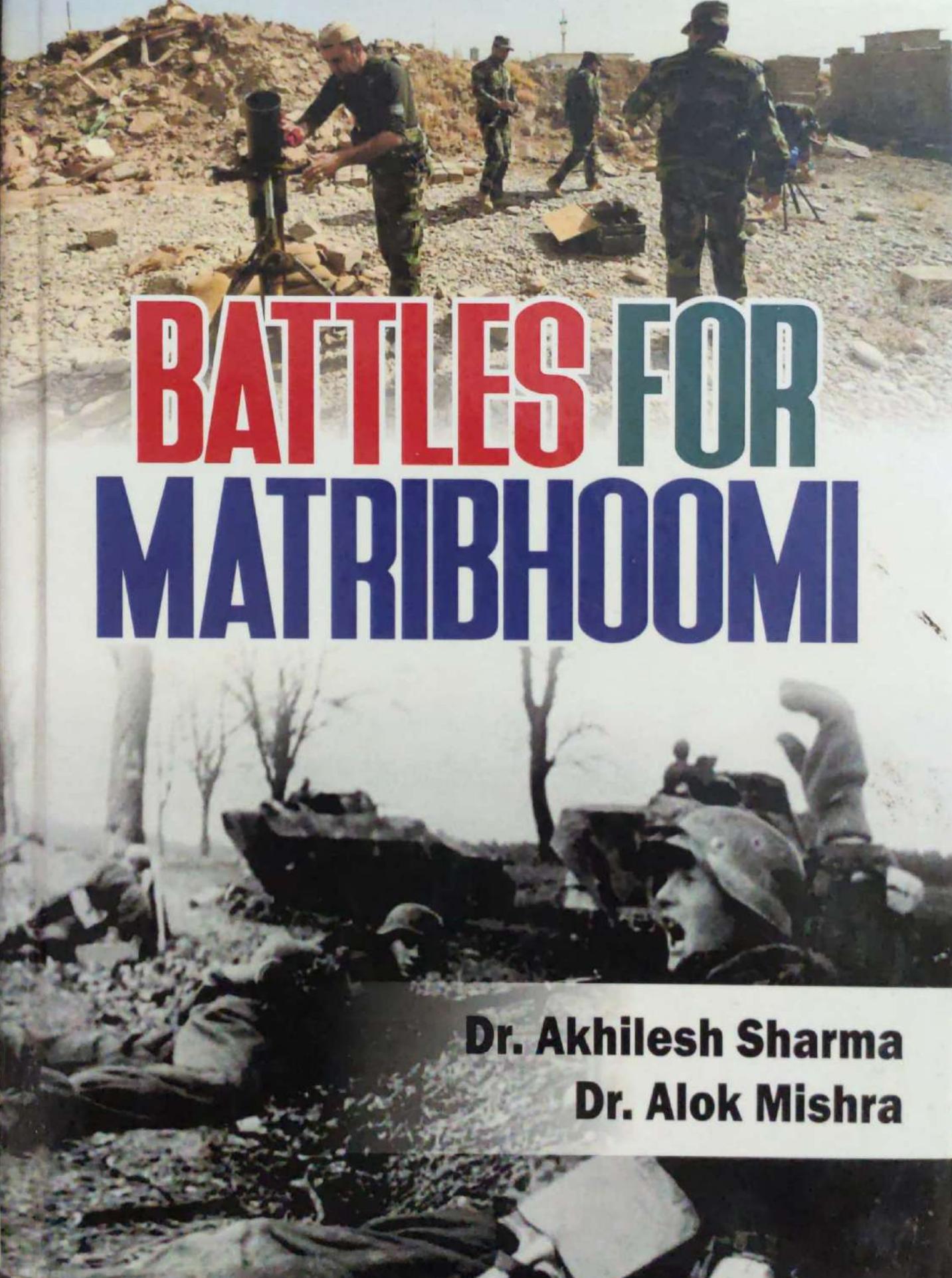




SPORTS RULE BOOK



Dr. Alok Mishra



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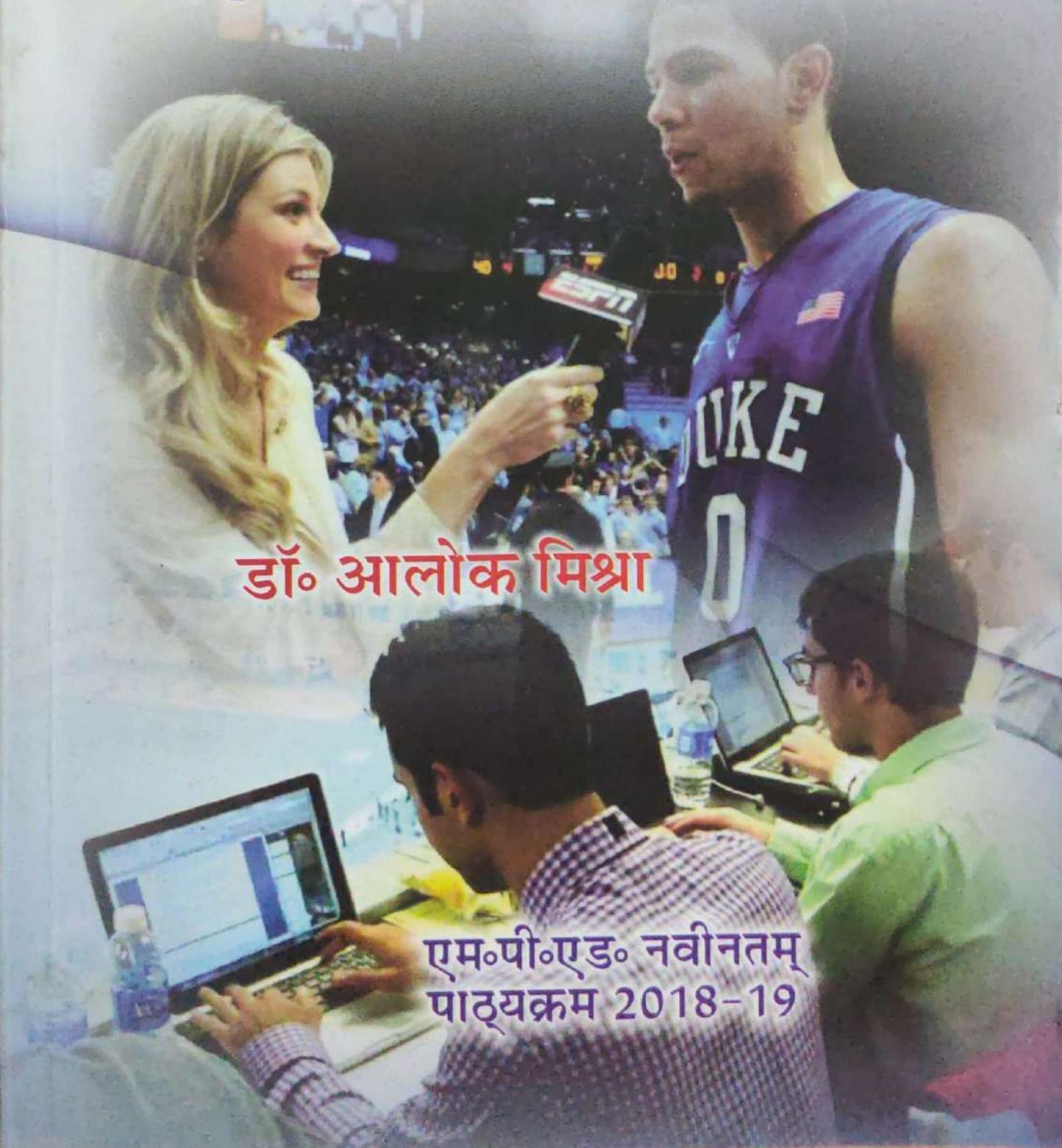
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डॉ. आलोक मिश्रा

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Shielding of Photosynthetic Apparatus by Consortia of Bacterial Endophytes in Tomato Plants Suffering From Fusarium Wilt

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Fusarium oxysporum is one of the most damaging plant pathogens causing Fusarium wilt in many plants leading to serious economic loss. The fungus colonizes the xylem, which leads to resistance in water flow in the plant thereby affecting the rate of photosynthesis. The present study focuses on the selection of bacterial endophytes isolated from tomato plants and evaluating their potential to antagonize *Fusarium oxysporum* in tomato *in vivo*. The results obtained indicated that two endophytic isolates, namely *Pseudomonas fluorescens* BUMD5 and *Bacillus velezensis* BUMD9, could act as efficient biocontrol agents (BCAs) as they inhibited the growth of pathogen by 67.2 and 69.1%, respectively, *in vitro*. Both the isolates were found to produce hydrolytic enzymes chitinase and protease. They also produced siderophore and hydrogen cyanide (HCN). The consortia of both the isolates significantly reduced the infection percentage by about 67% and a 3-fold decrease in disease severity was observed as compared to pathogen control. The treatment of infected plants with these potent isolates was also beneficial in improving the overall photosynthetic performance index (PI). Thus, plants treated with consortia of these isolates exhibited better overall plant growth despite being infected by the pathogen.

Keywords: biological control, endophytes, photosynthetic apparatus, tomato plant, Fusarium wilt

INTRODUCTION

Fusarium oxysporum, an ascomycete, is a major disease-causing pathogen affecting plants in agricultural settings (Fisher et al., 2012). It is listed among the topmost devastating pathogens worldwide. Fusarium wilt is one of the major plant diseases caused by pathogenic *Fusarium oxysporum* strains (Dean et al., 2012). The spores produced by the fungus are known to remain in the soil for decades in a viable form thereby leading to the failure of crop rotation schemes (Nelson, 1981). The spores germinate after encountering plant root exudates and initiate the colonization of the host plant, followed by an invasion of vascular bundles. The water uptake system of the plant gets affected thereby causing severe wilting and sometimes death of the host plant (Altinok, 2005).

Tomato is also vulnerable to Fusarium wilt. The symptoms observed in infected plants include stunted growth, wilting, yellowing of leaves and stems, defoliation, marginal leaf necrosis, and vascular necrosis (Singh et al., 2017). The effect of a pathogen can be traced through the entire plant including shoot tips and fruits. The xylem discoloration might be observed only on one side initially but eventually leads to browning of the entire xylem (Cerkauskas, 2017). There are three



Optimization and Characterization of Indole Acetic Acid Producing Efficiency of *Talaromyces trachyspermus* for Sustainable Agro-practices

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Abstract: The production of indole acetic acid (IAA) by plant growth-promoting microorganisms is one of the most important factors for plant growth. Present research work deals with the characterization and optimization of different physiological conditions for IAA production by the fungus *Talaromyces trachyspermus*. Different environmental factors and medium components were optimized for the production of IAA by fungal culture. Effect of pH, temperature, aeration and concentration of precursor i.e. L-Tryptophan was evaluated on the biomass of fungus along with the IAA production. This work also focused on the effect of different carbon and nitrogen sources in the media for the growth of *Talaromyces trachyspermus* and IAA production. The maximum production of IAA was observed in 15 days of incubation under the condition of 6.5 pH, 28°C temperature, and 140 RPM, in presence of 0.5% of tryptophan, 4% glucose and 0.1% sodium nitrate. After optimization, the yield of IAA by fungal culture was increased up to 0.78 fold as compared to initial production. IAA production by fungal culture was confirmed by thin-layer chromatography and HPLC analysis. Optimization of IAA production by *Talaromyces trachyspermus* can be useful for the large-scale production of agriculturally important bioactive metabolites. Moreover, the plant growth-promoting efficiency of this fungal culture makes it novel bio-inoculants for sustainable agriculture.

Keywords: Indole Acetic Acid, Plant Growth-Promoting Fungi, *Talaromyces trachyspermus*, Optimization, Sustainable Agriculture

1. Introduction

With the increasing population, the demand for food and other agricultural resources is increasing simultaneously. Agricultural scientists have developed various chemical fertilizers to fill the deficit gap in the demand and production of agricultural products. But in the long term, it adversely affects the soil and imbalances the mineral proportion for flora and fauna of that local region. To solve this problem, new scientists are focusing to develop new biofertilizers to rejuvenate soil fertility along with surplus crop production.

Many biotic and abiotic factors of soil affect the growth and development of plants. The layer of soil that surrounds the roots have significant importance due to having immense

metabolic activities of plant and microorganisms [1]. Various microbes such as bacteria, fungi, actinomycetes, protozoa and algae exist in this rhizospheric zone [2]. The establishment of beneficial microflora around the rhizospheric region of the plant depends on the type of organic compounds released by the roots of the host plant [3]. Moreover, this establishment of microorganisms influences other plant growth-promoting activities in and around the host plants. Plant growth-promoting fungi (PGPF) are a group of microorganisms that denotes diverse genera of nonpathogenic fungi that give different benefits to their host plants [2]. It has been reported that meeting the rising feed demands of the increasing population is the biggest challenge [4]. So the application of PGPF is the effective, economic



Amelioration in traditional farming system by exploring the different plant growth-promoting attributes of endophytes for sustainable agriculture

Smriti Chouhan¹ · Leena Agrawal¹ · Anil Prakash¹

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Abstract

Agriculture demands environmentally friendly, economic and stable agro-practices for achievement of global food security challenges. Exploration of beneficial plant–microbe interactions and input of microbial inoculants has been getting great attention for improvement of traditional agriculture system. Endophytes are beneficial partners of plants; they live inside the host with mutual association. The advantageous role of endophytes is gaining great importance from last century in agricultural research due to their valuable role in enhancement of crop yield and disease management. Endophytes exhibit various plant growth-promoting attributes by production of many bioactive metabolites and by different mechanisms. Development of modern biotechnological approaches to explore the hidden interaction of plants and microbes can be useful tools for establishment of novel bioinoculants for particular crop. In this review, we provide the knowledge about the endophytes, mode of action and their role in the development of sustainable agriculture system for human welfare.

Keywords Bioremediation · Plant-growth promotion · Bioactive metabolites

Introduction

Worldwide, many researchers are attracted toward ecology of plants and microorganisms to explore and understand all beneficial interactions for sustainable agriculture system. The ecosystems of plants and microbes are very complex and systemic, containing phylogenetically diverse microbes inside the plant or in the rhizosphere that interact constantly each other (Evangelisti et al. 2014). Early research on plant–microbe interactions was mostly focused on root nodulation by rhizobia in legume plants (Oldroyd et al. 2011), symbiotic interaction between plant and arbuscular mycorrhizae (Parniske 2008) and impact of antagonistic microorganisms in management of plant diseases (Sang et al. 2013). However, the actual role of endophytes on their host plant is still not fully explored. It

has been seen in the field of agricultural microbiology and other related fields from last decades. Many researchers are attracted toward endophytic microorganisms and their role in sustainable agriculture. Many definitions are proposed for endophytes by different scientists; microorganisms that live mutually inside the plant tissues without showing any negative impact on their host (Schulz and Boyle 2006). These microbes make ultimate beneficial association with host plants and also establish a community of other beneficial microbes for plants by secreting different bioactive metabolites. Endophytic microorganisms play diverse role in plants growth and soil health management. They produce various bioactive compounds to control the growth of many plant pathogens and help in disease management (Hardoin et al. 2015). Endophytes are also involved in the bioremediation of different toxic substances such as heavy metals (Lumactud et al. 2016). Improved crop production, healthy biometric characteristics and resistance are exhibited in many crops by the use of endophytes. Endophytes inhabit inside the tissues of fruits, seeds, stem, leaves, roots and flowers of their host plant with different positive interactions (Compan et al. 2016). The type, nature of endophytes and their role in agriculture depend on existing climatic and edaphic factors. It is very essential at primary level to understand the overall associated symbiotic community

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Biosurfactant from *Bacillus* sp. A5F Reduces Disease Incidence of *Sclerotinia sclerotiorum* in Soybean Crop

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- [Richa Agnihotri](#),
- [Anil Prakash](#) &
- [Bhavdish Narain Johri](#)

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Abstract

The present study was conducted to assess the biocontrol activity of biosurfactants obtained from *Bacillus* species A5F. The variables significantly influencing the production of biosurfactants under in vitro conditions were further optimized using response surface methodology. Optimal values of selected culture variables, i.e., glucose, soybean oil, and incubation time were 3.5 g l^{-1} , 3.5 ml l^{-1} , and 78 h, respectively, resulting in 2.14-fold enhancement in biosurfactant levels in 5 l fermentor. Identified biosurfactants had a significant effect on chlorophyll content, shoot biomass, number of pods, and seed weight. Biosurfactants also reduced the disease incidence in *S. sclerotiorum* infected soybean plants and showed antagonistic action against major phytopathogens by disrupting the hyphal cell wall. 16% reduction in *ITS* gene copy number was observed as compared to control with less non-target effect upon biosurfactant spray on foliar parts of soybean. Thus, the study confirms that biosurfactants from strain A5F can be used as a potent biocontrol agent to control sclerotium wilt on soybean plants.



Original article

Glomalin related protein and C16:1 ω 5 PLFA associated with AM fungi as potential signatures for assessing the soil C sequestration under contrasting soil management practices

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ABSTRACT

Arbuscular mycorrhizal fungi (AMF) contribute to the sequestration of soil organic carbon (SOC) by glomalin production through their hyphal network which helps to bind soil aggregates and improve other physical and biological properties of soil. The current study was aimed to assess (i) AMF biomass, glomalin related protein (GRP), SOC stocks and soil quality parameters such as microbial biomass carbon (MBC) and β -glucosidase activity, and (ii) to find out whether GRP production and PLFA C16:1 ω 5 can be used as consistent indicators of soil quality across seven different rhizosphere soil niches such as zero-tillage with *Cenchrus ciliaris* and minimum-tillage with *Chloris barbata*; conventional tillage with soybean-wheat system from soybean rhizosphere and raised beds with four mycorrhizal host plants (Pengueek, maize, marigold and sorghum). Among all the soil niches, AMF biomass, the content of SOC, MBC, soil and root GRP, the activity of β -glucosidase were significantly higher under zero tillage. The AMF biomass, SOC-sequestration and soil quality parameters established a common trend across all the soil management systems and hosts examined. PLFA C16:1 ω 5 was positively correlated with microscopic estimates of AMF biomass, MBC, β -glucosidase activity and both the fractions of total (T) GRP (the easily extractable and difficultly extractable) in soil and roots. A significant positive correlation of both the fractions of soil-GRP with MBC ($r = 0.78^{**}, 0.83^{**}$) and β -glucosidase activity ($r = 0.86^{**}, 0.76^{**}$) was also found. In general, soil T-GRP ($r = 0.93^{**}$), soil T-GRP stocks (0.94^{**}) and PLFA C16:1 ω 5 ($r = 0.68^{**}$) were highly related to SOC stocks. These findings confirm that zero tillage and raised beds favour AMF activity thus improving SOC sequestration potential and soil quality which can be assessed using GRP and PLFA C16:1 ω 5 as potential indicators.

1. Introduction

Soils are the largest organic carbon sink recognized in the terrestrial ecosystems and are of significant interest because of their potential in mitigating atmospheric carbon dioxide (CO₂). As a result, any changes in soil C stocks may influence the concentration of CO₂ in the atmosphere [1]. Several studies have indicated that besides mining of C, the change in land-use of an agroecosystem adversely affects the belowground soil microbiota, and associated ecological functions [1,2]. Hence, the adoption of appropriate agricultural management practices for sequestering high soil organic carbon (SOC) is an important strategy to improve agroecosystem's carbon storage capacity, soil biological health and to mitigate atmospheric CO₂ emissions [3].

Soil microbes are known to contribute to soil C sequestration through various processes primarily mediated by plants and management practices. Arbuscular mycorrhizal fungi (AMF) are an important group of soil microbes present in most agroecosystems and colonize majority of land plants including agricultural crops [4] and are also involved in carbon cycling. These fungi have the potential to increase the plant-root absorptive surface area which enables plants to access soil resources which are otherwise beyond the reach of plants. Thus, AMF help plants in nutrient acquisition, improve plant growth and protect plants from biotic and abiotic stresses [4]. In return, the AMF acquire plant-assimilates which are necessary for their growth. Hence, AMF are significant in regulating C transport from host plants to their hyphae and thus may, directly or indirectly, influence the soil C sequestration [1,

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Changes in Arbuscular Mycorrhizal Fungal Community Structure in Soybean Rhizosphere Soil Assessed at Different Growth Stages of Soybean

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Abstract Arbuscular mycorrhizal fungi (AMF) is the most common type of AMF association colonizing the rhizosphere of soybean [*Glycine max* (L.) Merrill] plants. However, the extent of AMF formation, AMF species composition and diversity at different stages of soybean phenology have not yet studied. The current study was aimed to determine AMF species community composition, species distribution and its affinity in the rhizosphere soil of soybean at the different growth stages of soybean. Root and rhizosphere soil samples were collected at different growth stage pre-sowing, nodulation, maturation and harvesting stage from soybean (cultivar JS-335) and were analysed for AMF root colonization, spore diversity, species richness, and relative occurrence of AMF species. The AMF species principally contributing to the crop growth stage was also examined through principal component analysis (PCA). The extent of root length colonized by native AMF (mainly formed arbuscules) in soybean roots was higher at maturation (79.76%) and lowest (25.33%) at nodulation stages, whereas the spore density showed opposite trend. Irrespective of growth stages, a total of 40 AMF morphotypes were observed from which species, viz. *Glomus aggregatum*, *Rhizophagus fasciculatum*, *Glomus coronatum*, *Glomus etunicatum*, *Glomus* sp (76.92%), were found to be the most frequent and abundant species followed by species of *Acaulospora* (12.82%) and *Gigaspora* (10.25%). The Shannon–Weaver index was the range of 3.22, whereas Simpson's index was 0.95, which indicates the higher diversity of AMF at pre-sowing. The PCA explains the maximum contribution of all AMF species observed at pre-sowing followed by harvesting concludes that AMF diversity and colonization pattern are greatly affected with the soybean phenological growth stages where rhizosphere was found to be mainly dominated by *Glomus* morphotypes than the *Acaulospora* and *Gigaspora*; hence these can be selected for further exploitation in soybean.

Keywords Arbuscular mycorrhizal fungi (AMF) · Diversity · Root colonization · Soybean growth stages · PCA

Introduction

Arbuscular mycorrhizal fungi (AMF) form a symbiosis with roots of 80% terrestrial plants [40]. These fungi positively transfer nutrients and minerals from the soil to the plants in exchange for carbon (C) [41] and provide several other benefits to host plants by conferring tolerance against abiotic and biotic stresses [24, 45]. AMF has also been shown to influence plant diversity and community structure [45, 53, 54].

Globally soybean is the most important oilseed legume besides utilizing the native N-fixing rhizobia also forms AMF symbiosis with the roots of soybean and sustaining the growth [37]. It has been investigated that AMF benefits

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In silico analysis and molecular characterization of Influenza A (H1N1) pdm09 virus circulating and causing major outbreaks in central India, 2009-2019

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ABSTRACT

Background and Objectives: Influenza A/H1N1pdm09 causes respiratory illness and remains a concern for public health. Since its first emergence in 2009, the virus has been continuously circulating in the form of its genetic variants. Influenza A/H1N1pdm09 surveillance is essential for uncovering emerging variants of epidemiologic and vaccine efficacy. The present study attempts *in silico* analysis and molecular characterization of Influenza A (H1N1) pdm09 virus circulating and causing major outbreaks in central India during 2009-2019.

Materials and Methods: We have investigated the antigenic drift analysis of 96 isolates' hemagglutinin (HA) gene sequences (59 central Indian and 37 local Indian and 28 global reference HA gene sequences) of Influenza A/H1N1pdm09 viruses from 2009 to 2019. The study includes mutational (Multiple sequence Alignment), phylogenetic (Maximum Likelihood Method), and statistical analysis (Covariance and correlation) of HA sequences submitted in NCBI, IRD and GISAID from central India.

Results: Phylogenetic analysis indicated maximum clustering of central Indian HA gene sequences in genogroup 6B. Analysis of amino acid sequence alignment revealed changes in receptor binding site (RBS). The frequency of S220T amino acid substitution was found to be high followed by S202T, K300E A273T, K180Q. The Karl Pearson correlation coefficient (*r*) and covariance between the number of mutations and the death toll was found +0.246 and +100.3 respectively.

Conclusion: The study identifies the continuous genetic variations in the HA gene sequences of circulating Influenza A/H1N1pdm09 in central India from the year 2009 to 2019. Further suggesting importance of monitoring the gradual evolution of the virus with regards to an increase in virulence, pathogenicity and vaccine efficacy timely.

Keywords: Influenza A virus, H1N1 subtype; Haemagglutinin; Central India

INTRODUCTION

Influenza A (H1N1) pdm09 is one of a subtype of Influenza A viruses of *Orthomyxoviridae* family,

first appeared in 2009 in North America and caused a global pandemic in 2015 (1, 2). After emergence of 2009 pandemic, all Influenza A (H1N1) viruses called as Influenza A (H1N1) pdm09 (3). Globally, the annual epidemics have accounted for about 3 to 5 million cases of severe illness and 250,000 to 500,000 deaths worldwide (3). Influenza A (H1N1) pdm09 is now considered as a seasonal influenza virus that co-circulates with another seasonal influenza (H3N2) and influenza B viruses humans (3, 4). Un-

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Siderophore from *Talaromyces trachyspermus*: augmentation and characterization

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Abstract

In the present study, a siderophore compound produced by an endophytic fungus, *Talaromyces trachyspermus* was optimized for maximum production, 88.9 % SU by applying Plackett-Burman design and Response Surface Methodology through Central Composite Design that showed the succinic acid (1.141 g/L), sucrose (31.028 g/L) and temperature (27.475 °C) as significant factors. On scale up, a further increase in siderophore yield was obtained (by 3%) The compound was extracted, purified and detected chemically as catecholate siderophore showing max. λ absorbance at 279nm. Contained of hydroxy benzene as shown by GC-MS analysis and further identified as berberine by HRLC-MS studies. The compound berberine is clinically a very important drug with several ethnobotanical properties. This is rare to report fungal catecholate and first to report the production of berberine from *Talaromyces species*.

Keywords: *Talaromyces trachyspermus*, Statistical optimization, Siderophore, Catecholate, Berberine



Techniques for improving formulations of bioinoculants

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Abstract

Bioinoculants are eco-friendly microorganisms having a variety of products commonly utilized for improving the potential of soil and providing the nutrient requirements to the host plant. The usage of chemical fertilizers is not beneficial because it affects the soil microbial communities on large scale. The toxicity of chemical fertilizer decreases the fertility of soil and causes microbial disruption. Bioinoculants that are used as PGPR play an important role in the enhancement of crop production and beneficial for both producers and consumers economically by protecting the soil during unfavourable conditions. The utilization of PGPR in the bioinoculant form imparts successfully sustain agricultural yield production and such formulated products contain living microbial cells of bioinoculants that also helps in seed treatment and enhances the mobilization process of nutrients by the low-cost process. This review mainly focuses on different bioinoculant formulations related to its recent approaches such as metabolite formulations, liquid formulations, solid carrier-based formulations and synthetic polymer-based formulations. This review also gives an overview of some aspects of the bioinoculant efficiency and their appropriate formulation, production and storage condition of microbial cells.

Keywords Bioinoculants · Bioencapsulation · Metabolite · Soil microbial communities · Polymeric substance

Introduction

Bioinoculants are the beneficial soil amendments that use microbes for promoting plant growth and development. They contain dormant or live cells of the efficient strain of nitrogen-fixing, Hydrogen cyanide and siderophore producing microorganisms (Puri and Padda 2017; Lalitha 2017). The interactions between soil-borne microbes and the roots of higher plants play a significant role in plant development

and growth by converting unavailable nutritional elements into available form (Imam et al. 2017). Bioinoculants also help in seed treatment by forming a uniform coating of inoculant over seeds, bioremediation and induce systemic acquired resistance (Dangi et al. 2019; Ma 2019). Several plant growth-promoting microbial strains such as *Azospirillum*, *Rhizobium*, *Bacillus*, *Pseudomonas*, mycorrhiza, *Trichoderma* and yeast have been identified that are used as bioinoculants (Aremu et al. 2017; Tahir et al. 2017). Plants take benefit from microbes in various ways 1. By PGPR (Plant growth-promoting rhizobacteria) that act as bioinoculants 2. By phytostimulation (phytohormones expressed by microbes like *Azospirillum*) that directly promote the growth of plants. 3 By act as biological control agents and also in phytoremediation process (like *Bacillus cereus*, *Trichoderma* and *Pseudomonas*) that protect plants against harmful organisms and heavy metals (Meena et al. 2017; Tang et al. 2020). Schematic descriptive mechanism of several traits shown by PGPR depicted in Fig. 1. For their formulation, many recent approaches such as metabolite formulations, liquid formulations, solid carrier-based formulations, and synthetic polymer-based formulations are used (Arora et al. 2017; Gopi et al. 2019). Many research studies have reported that the

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Chapter

Microbial-Mediated Abiotic Stress Tolerance in Soybean Plants

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ABSTRACT

Abiotic stresses in soybean are a major limiting factor in production and productivity across the world. The continuous and injudicious use of chemicals in the fields causes environmental damage and potential human health risks. Taking sustainability and ecosystem functioning into account, simultaneously without compromising productivity, microbe-mediated stress management is advocated. Many plant growth-promoting rhizobacteria (PGPR), plant growth-promoting fungi (PGPF), and microbial endophytes have various direct and indirect mechanisms involved in increasing plant growth against abiotic stresses and are considered to be the cheapest and environmentally safe means of increasing plant fitness under abiotic stresses. They produce many exo-metabolites such as phytohormones, exopolysaccharides (EPS), siderophore, compatible solutes, antioxidant enzymes, and volatile organic compounds. Moreover, they help in nutrient acquisition via biological nitrogen fixation, phosphorus solubilization, and siderophore production during abiotic stress tolerance in the plants. This chapter addresses the effect of various abiotic stresses on soybean and mechanisms of microbe-mediated abiotic stress tolerance in soybean.

Synthetic biology applied to microalgae-based processes and products

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4.1 Introduction

In recent years, microalgae have gained attention globally as they have the potential to produce a wide range of compounds for industries like pharmaceutical, nutraceutical, food, cosmetic, bioenergy, and biofuel (Moreno-Garcia et al., 2017; Saini et al., 2020). These algae are related to plants as they contain both chlorophylls a and b in their photosystems for performing photosynthesis. They are ubiquitous and found in various habitats, including marine, freshwater, terrestrial, and even in harsh environmental conditions such as hot springs, deserts, etc. (Harwood and Guschina, 2009). They are rich sources for the production of metabolites such as polyunsaturated fatty acids (PUFA), carotenoids, polysaccharides, and particularly biofuels (bioethanol, biodiesel, lipids, etc.) (Nguyen et al., 2019). Microalgae are a diverse group of single-cell photosynthetic microorganisms that have been extensively studied as an



***Talaromyces trachyspermus*, an endophyte from *Withania somnifera* with plant growth promoting attributes**

Sharda Sahu¹ · Anil Prakash¹ · Kishor Shende²

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Abstract

The medicinal plant, *Withania somnifera* is attributed by valuable medicinal properties and is widely cultivated. It is a need to take care of this plant from synthetic agrochemicals that may be hazardous for health and environment. The aim of the present study was to isolate and screen the endophytic fungi of *W. somnifera* that have potential of plant growth promotion and antagonism against plant pathogens. In this study, 22 potential fungal endophytes comprising of species of *Alternaria*, *Aspergillus*, *Fusarium*, *Nigrospora*, *Colletotrichum* and *Talaromyces* identified at National Fungal Culture Collection of India (NFCCL), Pune were isolated. The potential isolate, *Talaromyces trachyspermus* was confirmed by BLAST and phylogenetic analysis of sequences of rDNA ITS, LSU (D1 D2) and β-tubulin genes. Among all the isolates, *T. trachyspermus* exhibited comparatively higher activity for hydrolytic enzymes, protease, chitinase, amylase, cellulase and pectinase that are required for antagonistic property. It was observed to be a promising biocontrol agent against plant pathogen, *Sclerotinia sclerotiorum*. This strain is also characterized with high level of indole acetic acid (IAA), siderophore synthesis, and phosphate solubilization activities that are important for plant growth promotion. This is the first report on endophyte, *T. trachyspermus* from *W. somnifera* having potential plant growth promoting traits and biocontrol, which can be further exploited to enhance the medicinal value of the plant.

Keywords *Talaromyces trachyspermus* · *Sclerotinia sclerotiorum* · Siderophore · Phosphate solubilization

Introduction

The genus *Talaromyces* belongs to fungal species producing ascii in chains. Benjamin (1955) reported *Talaromyces* as the species transferred from the imperfect genus *Penicillium*. *Talaromyces* differs from the other perfect penicillate genus *Eupenicillium* by its soft ascocarps and form a monophyletic group that is distinct from the genus *Penicillium* based on the nuclear ribosomal internal transcribed spacer (ITS) regions, small subunit nuclear ribosomal DNA, and/

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or large subunit ribosomal DNA (Berbee et al. 1995; Ogawa et al. 1997; Peterson 2000). Samson et al. (2011) described *Penicillium* subgenus *Biverticillium* and the genus *Talaromyces* as a taxonomically unified group, and transferred all accepted species of *Penicillium* subgenus *Biverticillium* to the genus *Talaromyces* in accordance with the concept of unified nomenclatural system of fungi. *Talaromyces* species have been isolated from diversified resources like soil samples (Fang and Shi 2016; Adhikari et al. 2015), food samples (Tranquilli et al. 2017), marine sponges of coral reefs (Dethou et al. 2015), coastal plant roots (Kim et al. 2014) and as plant endophytes (Qadri et al. 2013; Romão-Dumaresq et al. 2016). Endophytism, the unique associations of plant and its internally residing symptomless microbes can result in positive effects with respect to plant growth and tissue differentiation, as well as the biotic and abiotic stresses to which the host plants are subjected to (Saikkonen et al. 1998; Schulz and Boyle 2005). Moreover, endophytic fungi can benefit the plant host by providing nutrients and competing with pathogenic organisms (Singh et al. 2011) resulting in the reduction of chemical use in the agriculture, protection

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Expression of autotrophic genes under CO₂ environment and genome mining of desert bacterium Cupriavidus sp. HPC(L)

Leena Agarwal, Anil Prakash, Hemant J. Purohit



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Chapter

Glomalin, the AM Fungi Secreted Soil Protein

Role in Sequestering Soil Carbon and Heavy Metal Reduction

By Richa Agnihotri, Hemant S. Maheshwari, Aketi Ramesh, Anil Prakash, Mahaveer P. Sharma

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ABSTRACT

The atmosphere CO₂ emission has been exponentially increasing for the past two decades, and the current level has reached 400 ppm, which has significant effects on climate change, ecosystem functionality and at the same time influencing the soil quality and productivity adversely. Soil can be a sink for atmospheric CO₂, and therefore adoption of favourable soil and crop management enhancing C-sink (carbon sequestration) will help in the mitigation of atmospheric CO₂. Amongst the several approaches being used to mitigate atmospheric CO₂, the use of soil microorganisms is one of potential approaches being used that is gaining importance. The arbuscular mycorrhizal fungi (AMF) are obligate plant symbionts associating with the roots of more than 80% vascular land plants and are well known for their role in providing the plant with water and mineral nutrients, especially phosphorus, and improving the overall growth of plants (Smith and Read, 2008). Their role in soil quality improvement via hyphal entrapment of soil has been largely demonstrated in various studies under both laboratory and field conditions. However their role in soil quality improvement is not just confined to the hyphae but also lies in the production of a sticky and recalcitrant glycoprotein called glomalin chiefly, which mainly accumulates in the hyphae and spores. The agricultural management practices being followed plays the most crucial role in determining the maintenance of hyphal biomass as well as the extent of glomalin production in soil. In this chapter we summarize the role of glomalin and AMF in soil carbon and heavy metal sequestration and soil quality improvements and also provide insights on how different agricultural practices influence AM formation and consequently carbon sequestration.

Diversity Analysis and Characterization of Antagonistic Endophytic Population from Stevia Rebaudiana

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ABSTRACT:

Antagonistic endophytic fungal community resident in medicinal plant *Stevia rebaudiana* Bertoni was studied at two sites within Bhopal, M.P. Among 339 recovered endophytic isolates from foliar tissues, 40 fungal isolates were found antagonistic against *Sclerotinia sclerotiorum*, casual agent of disease stem rot in stevia and soybean (*Glycine max.*). Antagonistic fungal population (40 isolates) consisted of 52.5% *Hyphomycetes* and 2.5% each of *Coleomycetes*, *Basidiomycetes*, *Ascomycetes* and *Sterile mycelia*. The percent colonization frequency of antagonistic endophytic community in foliar tissues ranged from 0.3%-5.3% whereas percent dominance was of the order, ranged from 2.31%-40.8%. Diversity analysis of the antagonistic endophytic population was determined in terms of Shanon index, Simpson index, Species evenness, Menhinick and Margalef richness index .Antagonistic endophytic population was also evaluated for IAA production, siderophore and phosphorus solubilisation, considered as plant growth promotory attributes. Identification of the antagonistic endophytes was carried out by rDNA sequencing of the ITS region.

Chapter 8

Fungal Endophytes and Their Secondary Metabolites: Role in Sustainable Agriculture



Anamika, Samiksha Joshi, Manvika Sahgal, Sharda Sahu, and Anil Prakash

Abstract In today's constantly changing scenario, there is an increase in the use of novel and useful bioactive compounds for solving myriad of problems mankind faces, viz. appearance of drug-resistant bacteria, emergence of life-threatening viruses, increasing incidences of fungal infections in the world's population and problems in eliminating food scarcity from some areas of the globe to help human populations. Fungal endophytes though not extensively studied yet are potent source of novel natural products useful in industry, agriculture and medicine. Each of the 300,000 plant species existing on earth is host to one or more endophytes. Till date about one tenth of an estimated one million plant species have been studied for fungal endophytes which are considerably diverse. This chapter deals with the range of bioactive metabolites produced by the fungal endophytes studied so far with emphasis on those useful in increasing food production.

Keywords Endophytic fungi · Bioactive metabolites · Volatile compounds · Tripartite interaction · Signalling molecules

8.1 Functional Grouping of Plant-Endophyte Interaction

Plant-endophyte interactions can be mutualistic, symbiotic and parasitic. Various factors such as endophytic infection pattern, its transmission mode, genetic background and environmental conditions (Saikkonen et al. 1998; Rodriguez and Redman 2008) influence plant-endophyte interaction. Endophytes are transmitted vertically (systemic) and horizontally (nonsystemic). Vertically transmitted endophytes are mutualistic, whereas those transmitted horizontally depict antagonism to the host (Schardl et al. 1991; Saikkonen et al. 1998). It is observed that endophytic

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Chapter 11

Bioprotection of Soybean Plants from Drought Stress by Application of Bacterial and Fungal Endophytes



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11.1 Introduction

Soybean [*Glycine max* (L.) Merrill] is one of the major oilseed crops in the world which contains 18–20% oil and 35–40% of good-quality protein (Fatima et al. 2006). Soybean is being used in human and animal nutrition and in the production of biodiesel, disinfectants, lubricants, soap, and cosmetics, among other uses (Sedyama et al. 2009). In the recent agriculture scenario, climate change and food security are the two prominent challenges faced by scientists to cater the needs of burgeoning Indian population. The top five soybean-producing countries are the USA, Brazil, Argentina, China, and India; in Southeast Asia, soybean productivity highly relies on rainfall. In India, the erratic monsoon pattern, incidence of disease and pest, and long dry spell (drought) because of climate change have given rise to uncertainty in the production of soybean in the past few years. Moisture stress decreases the significant yield of soybean every year (Joshi and Bhatia 2003). According to Grover et al. (2011), nearly two-thirds area from parts of arid and semiarid ecosystem in India are affected by drought or soil moisture stresses. Moisture stress is among the most destructive abiotic stresses that increased in intensity over the past decades affecting the world's food security. It affects different growth stages of soybean, for example, the reproductive stages were affected more

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Alterations in growth, photosynthetic activity and tissue-water relations of tea clones in response to different soil moisture content

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Abstract

Key message Significant effect of water stress conditions were observed on morphological and physiological growth parameters of tea (*Camellia sinensis*). Water stress tolerant tea clones suitable for hilly areas have been identified in this study.

Abstract The influence of different levels of water deficit on physiological and morphological parameters in tea [*Camellia sinensis* (L.) O. Kuntze] clones was investigated. Tea clones (BSS-449, BSS-379, P-312, UPASI-9, T-383, RR-17, AV-2 and T-78) growing under controlled condition (under shade, potted condition) were subjected to three irrigation treatment, a control (70.0% soil moisture content), moderate water deficit (38.3% soil moisture content) and sever water deficit (6.9% soil moisture content).

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Plants submitted to severe water deficit showed significant reduced leaf numbers, leaf areas, and plant heights while reduction in plant height and leaf area and leaf numbers was not significant in moderate water deficit. A significant change in chlorophyll content was observed during the water stress condition. Photosynthesis decreased in both water deficit treatments and was related to stomatal factors and photochemical efficiency of photosystem II. Water relation parameters, e.g. leaf water potential, osmotic potential, turgor potential, relative water content and cellular elasticity were also measured to evaluate plant adaptation to water stress. The highest leaf water potential values were found in the control condition, for all the clones. Cell wall rigidity, measured as elastic modulus, increased under severe water stress, resulting in a loss of turgor at lower leaf water potential. Results of the study suggest that the degree of drought tolerance depends on the interactions between the tea clones and the levels of water stress. The available data also indicates that UPASI-9 is capable of tolerating water stress, and should be suitable for dry areas.

Keywords *Camellia sinensis* · Chlorophyll · Photosystem II · Osmotic potential · Water potential · Cellular elasticity · Photosynthesis · Soil moisture content

Abbreviations

SMC	Soil moisture content
WUE	Water use efficiency
Pn	Net photosynthesis
Gs	Stomatal conductance
T	Transpiration
Ci	Internal CO ₂ concentration
RWC	Relative water content

Research Paper

Anti-proliferative role of recombinant lethal toxin of *Bacillus anthracis* on primary mammary ductal carcinoma cells revealing its therapeutic potential

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ABSTRACT

Bacillus anthracis secretes three secretory proteins; lethal factor (LF), protective antigen (PA) and edema factor (EF). The LF has ability to check proliferation of mammary tumors, chiefly depending on mitogen activated protein kinase (MAPK) signaling pathway. Evaluation of therapeutic potential of recombinant LF (rLF), recombinant PA (rPA) and lethal toxin (rLF + rPA = LeTx) on the primary mammary ductal carcinoma cells revealed significant ($p < 0.01$) reduction in proliferation of tumor cells with mean inhibition indices of $28.0 \pm 1.37\%$ and $19.6 \pm 1.47\%$ respectively. However, treatment with rPA alone had no significant anti-proliferative effect as evident by low mean inhibition index of $3.4 \pm 3.87\%$. The higher inhibition index observed for rLF alone as compared to LeTx is contrary to the existing knowledge on LF, which explains the requirement of PA dependent endocytosis for its enzymatic activity. Therefore, the plausible existence of PA independent mode of action of LF including direct receptor mediated endocytosis or modulation of signal transduction cascade via unknown means is hypothesized. *In silico* protein docking analysis of other cellular receptors for any plausibility to play the role of receptor for LF revealed c-Met receptor showing strongest affinity for LF (H bond = 19; Free energy = -773.96), followed by nerve growth factor receptor (NGFR) and human epidermal growth factor receptor (HER)-1. The study summarizes the use of rLF or LeTx as therapeutic molecule against primary mammary ductal carcinoma cells and also the c-Met as potential alternative receptor for LF to mediate and modulate PA independent signal transduction.

INTRODUCTION

Cancer remains a deadly malady despite several scientific advances and is one of the leading causes

of deaths and high sufferings to the mankind. Though conventional therapies including of radiotherapy, chemotherapy and surgery are being followed widely; however due to their some limitations and side effects,



In-silico approach for enhanced photo-fermentative biohydrogen production.

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Abstract : Photo-fermentative biohydrogen production is mediated by nitrogenase enzyme. To improve H₂ yield during the process various approaches are being used. This *in-silico* study is an attempt to find out the probable mutation sites in nitrogenase enzyme that may improve the H₂ production efficiency of Purple Non-Sulfur bacteria. Results indicated that mutations in the conserved sites, Cystine at 84, Cystine at 89, Serine at 152, Isoleucine at 156 and Valine at 166 were found to be sensitive for mutations that may result into loss of protein functionality. Also, the substitutions at selected sites by either Arginine or Asparagine or Glutamine have shown to be effective in lowering the local energy of catalytic pocket and enhancing the stability of structure. Further, wet-lab validation is required to establish the key findings.

***Chaetomium globosum*: A potential fungus for plant and human health**

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ABSTRACT

Chaetomium globosum is a ubiquitous fungus that occurs on a wide variety of substrates, and is recognized as cellulolytic and/or endophytic. *C. globosum* has been also explored as a source of secondary metabolites with various biological activities, having considerable potential in agricultural, medicinal and industrial field. This species of *Chaetomium* is also well known for hydrolytic enzymes and plant growth promotion attributes including biocontrol against phytopathogens, and helping in phytonutrition. *Chaetomium globosum* has also been used extensively for cytotoxic and phytotoxic drug discoveries. This review is focused on the research being carried out on biology and potential applications of *C. globosum* with emphasis on its role in plant and human health.

Keywords: *Chaetomium globosum*, biocontrol, phytonutrition, cytotoxic

INTRODUCTION

The need for new and useful compounds to provide protection and relief to crop plants from pests and thereby sustenance of food production for human consumption and new therapeutic drugs for well being of human health is ever growing. Nature has bestowed us with plenty of worthy microbes to take into account their assistance but still very limited work has been done in response to this quality. Based on the current need, research being carried out on a potent fungus *C. globosum* is reviewed here. Fungus *C. globosum* is a well known mesophilic member of the family *Chaetomiaceae* established by Kunze in 1817 (cited from Von, 1986). *Chaetomium* species are well known as coprophilous, seed and soil fungi (Somrithipol, 2004; Somrithipol *et al.*, 2004). The genus of this filamentous fungus (Phylum *Ascomycota*, Class *Sordariomycetes*) encompassing species that typically possess densely setose, ovoid to pyriform ostiolate ascocarps, clavate ascii and pigmented, one celled ascospores is known for its varied performance (Domsch *et al.*, 1993). *Chaetomium* is a dematiaceous, filamentous fungus belonging to a large genus of saprobic ascomycetes found in soil, air, plant debris, dung, straw, paper, bird feathers, and seeds (Guarro *et al.*, 1995).

More than 100 species of *Chaetomium* have been described, the most common ones being *C. atrobrunneum*, *C. funicola*, *C. globosum*, and *C. strumarium* (Aru *et al.*, 1997). Wang *et al.*, (2016) reassessed *C. globosum* phylogenetically by using β -tubulin (tub2) and RNA polymerase II second largest subunit (rpb2) as DNA barcodes for differentiating *Chaetomium* species; twenty-eight species were reduced to synonymy under *C. globosum*, and two additional species, were tentatively maintained: *C. cruentum* as an albino form of *C. globosum*, and *C. spirochaete* slightly deviating from *C. globosum* by more regularly coiled and thicker ascostomal hairs. Several species, including *C. elatum* and *C. subaffine*, were also considered as close relatives of *C. globosum*.

Chaetomium globosum is frequently encountered and is a very common species in indoor environments. The fungal colonies show rapid growth, initially white in colour with a cottony appearance and on maturation becomes grey to olive, tan to red or brown to even black. Microscopically, *C. globosum* has distinctive small brown 'lemon' or 'football'-

shaped ascospores. The spores, formed inside the fruiting bodies, are forced out of openings and spread by wind, insects, and water splash (Fig.1). This species causes biodeterioration of paper and other cellulosic material. It is considered as a "weed" of mushroom beds, where it inhibits the growth of cultivated mushrooms. *C. globosum* is important to human health as a contaminant in indoor environments by producing mycotoxins and allergic reactions (Dalmont *et al.*, 2017) and by producing many of crucial pharmaceutical drugs. It also contributes to plant health as plant growth promoting fungus (PGPF). The fungus has recently been introduced in the world of nanobiotechnology by Singh *et al.* (2018). These authors synthesized and characterized antibacterial silver and gold nanoparticles using aq. cell-free filtrate (CFF) of endophytic *C. globosum* and found enhanced antibacterial activity

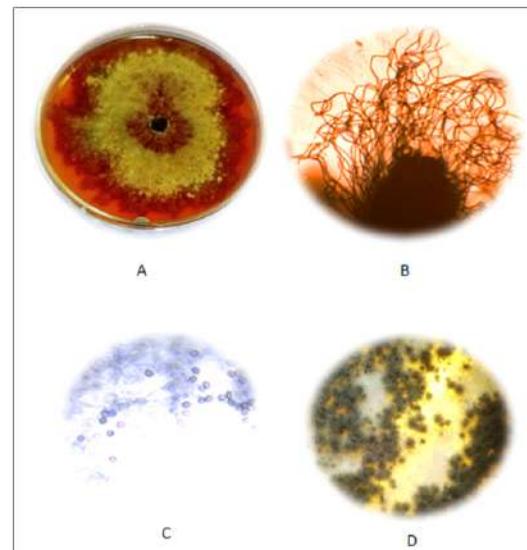


Fig.1. Colony of *Chaetomium globosum* on PDA medium (A). Perithecia and ascospores of *C. globosum* (B and C). Colony texture and ascocarps of *C. globosum* on PDA medium (D).



Identification and Characterization of antifungal metabolite producing *Pseudomonas protegens* strain BNJ-SS-45 isolated from rhizosphere of wheat crop (*Triticum aestivum* L.)

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Abstract

*Beneficial microorganisms play a pivotal role in not only suppressing plant pathogens but also in plant growth promotion. It is prudent to identify such microorganisms with multiple plant growth promoting traits. Among them, fluorescent pseudomonads are widely studied bacteria for these traits. The present study was aimed to evaluate *Pseudomonas protegens* strain BNJ-SS-45 isolated from wheat rhizosphere for its biocontrol and plant growth promoting properties. The strain BNJ-SS-45 was identified as *Pseudomonas protegens* based on 16S rRNA gene sequencing. The bacterium showed in vitro antagonistic activity against phytopathogens such as *Sclerotinia sclerotiorum*, *Macrophomina phaseolina* and *Fusarium graminearum*. Strain BNJ-SS-45 was found positive for cellulase, xylanase and protease enzyme production and plant growth promoting attributes like siderophore production, phosphate solubilization and indole acetic acid (IAA) production. The active metabolites on TLC showed yellow colour appearance upon spraying with DSA (diazotized sulphanilic acid). Further, chemical characterization of bioactive metabolites through gas chromatography coupled-mass spectrometry (GC-MS) led to the identification of two antifungal metabolites, 3-isobutylhexahydropyrrolo [1, 2-a] pyrazine -1,4-dione, and 3-benzylhexahydropyrrolo [1,2-a]pyrazine-1,4-dione. Overall, bacterial strain BNJ-SS-45 appears to be a promising strain and can be used for bio-inoculant for sustainable wheat production after field validation.*

Keywords: Biocontrol, Plant growth promoting rhizobacteria, *Pseudomonas protegens*, antifungal metabolites

I. Introduction

In recent years, there has been an increasing interest in the use of beneficial microorganisms as against continued reliance on chemical fertilizers and pesticides to sustain agricultural productivity [1]. This stems from the fact that these microorganisms possess intricate mechanisms for plant growth promotion through suppression of diseases (biocontrol), enhanced nutrient availability and production of plant growth hormones [4]. Among the beneficial microorganisms, pseudomonads play a significant role in plant growth promotion and disease suppression [11]. Fluorescent *Pseudomonas* strains are ubiquitous bacteria and competitively colonize plant roots and thereby stimulate plant growth through an array of mechanisms [22]. These mechanisms involve production of siderophores, phytohormones, volatile compounds, antibiotics and phosphate solubilization [18,19]. There are numerous reports that indicate the production of antibiotic compounds/ antifungal metabolites by *Pseudomonas* spp. to control plant pathogens. The active molecules include 2,4-

Thermomyces lanuginosus: A True Representative of Thermophilic, Fungal World!

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ABSTRACT

Miehe was first to isolate *Thermomyces lanuginosus* with four other species of thermophilic fungi. Tsiklinskaya, in 1899 found *Thermomyces lanuginosus* (*Humicola lanuginosa*) a chance contaminant on potato inoculated with garden soil. This fungus is explicitly associated with organic substrates such as compost resources, paddy straw, wheat straw, manures of birds and mammals droppings, dried and dead materials of plant like litter fall as leaves, twigs, stems and root, and municipal refuse where the process of decomposition by the mesophilic paves way for its colonization. *Humicola lanuginosus* (*Thermomyces lanuginosus*) grows from 30 to 52-55 °C. The fungus possesses both intra- and extracellular thermozyymes like xylanase, protease, lipase, amylase, etc. However, for cellulose degradation it seems to live as a commensal with cellulose-decomposing species, like *Chaetomium thermophile*. Phylogenetically *Thermomyces lanuginosus* is classified as a mitospore fungus (imperfect fungus), that reproduces asexually by forming aleuroconidia. It is also reported as a member of the order *Entomophales* in a sister relationship with *Talaromyces thermophilus*. *Thermomyces lanuginosus* is a candidate organism for future of bioenergy based technologies by virtue of its colonization capacity, ability to deconstruct wood and wood based products, and release of cellulase-free xylanase.

Keywords: Compost, mycoflora, thermal adaptation, enzyme, biofuel alternative

HISTORICAL PERSPECTIVES

From the medieval time agriculture is one of the most important enterprises in the world as it helps to meet the basic needs of human civilization by providing food, clothing, shelter, medicine and recreation. Soil as prime need acts as a store house of water and nutrients for plant growth but all fertile soils need not be productive due to lack of essential nutrients like nitrogen, potassium, cobalt, copper, organic matter, moisture and microorganism, etc. To maintain the fertility and health of soil without deterioration soil conservation practices of various kinds are followed. One such step is composting, the process of decomposition of organic wastes. For the nutrient cycling to occur at the optimum level for plant growth we need to ensure that the soil is balanced in three ways: chemically-nutrients, biologically-microbiological, physically- structure; the components of an organic nutritional system are made up of compost as the foundation of the biological system, over cropping-green manure, foliar sprays and natural, fertilizer as organic (Sharma and Johri, 1992). The heaped masses of plant material, piles of agricultural and forestry products, and other accumulations of organic matter wherein warm, humid, and aerobic environment provides the basic conditions for the development of thermophilic microflora (Maheswari *et al.*, 1987). During compost exothermic reactions take place through self-heating of composed flora and fauna in a manner that follow the following schedule. At the beginning of the process the mesophilic saprophytes are dominant and later on increase in temperature ~ 60°C, thermophilic spores are favoured to occupy the substratum (Johri and Satyanarayana, 1984). This unique thermal adaptation as a puzzle of stored agricultural products compelled Miehe (1907, 1930) to study the microflora present therein. He was the first to present extensive work regarding thermophilic microorganisms and isolated four species of thermophilic fungi: *Mucor pusillus*, *Thermomyces lanuginosus*, *Thermodium sulfureum*, and *Thermoascus aurantiacus*. Discovery of the ubiquitous

fungus by Tsiklinskaya in 1899 as *Thermomyces lanuginosus*, or *Humicola lanuginosa* was a chance contaminant on potato inoculated with garden soil. Noack in 1920 isolated thermophilic fungi and was intrigued by the fact that in addition to self-heating masses of hay and compost and heaps of leaves, the thermophilic fungi were present in places where temperatures conducive to their growth occur red only infrequently; this then provided the foundation for pioneering discovery of their physiology and associated importance.

DISTRIBUTION

In an ecosystem temperature is a key component which is responsible for frequent distribution and metabolism of any organism. *Thermomyces lanuginosus* is a thermophilic fungus which normally grows at maximum 60°C and minimum of 20°C but the optimum temperature for growth is 50°C (Wang *et al.*, 2012). *T. lanuginosus* is explicitly associated with organic substrates such as compost resources, paddy straw, wheat straw, manures of birds and mammals droppings, dried and dead materials of plant like litter fall as leaves, twigs, stems and root, and municipal refuse where the process of decomposition by the mesophilic as pioneer community leads to a raised temperature of up to 45°C (Chang and Hudson, 1967) and paves way for the growth of resting propagules of thermophilic to active mycelia as it reaches the climax community of the system (Johri *et al.*, 1999; Subrahmanyam, 1999). *T. lanuginosus* has also been studied in other self-heating environments, including self-heating hay, coal soil tips, industrial wood chip piles, stored grains, aerial parts of crops, and freshly harvested grains (Rawat and Johri, 2013). But the occurrence of *T. lanuginosus* is also reported from different types of dry to drenched soil conditions, like from aquatic sediments, water logged mangrove soil, cultivated clay soil to and loamy garden soil to desert soil and rocks (Singh *et al.*, 2003). Isolations have also been reported from air in Indonesia and British Isles and on skin of human patients (Abbas, 2009). Recently *T.*

Relationship between Environmental Quality and Rehabilitation Status on Quality of Life and Residential Satisfaction

Dinesh Nagar and Rakhi Udainiya

Worldwide rapid urbanization together with unchecked migration from rural to urban areas has resulted in the growth of metropolitan cities with an estimated projection that by 2030, three out of every five people on earth will likely to reside in urban areas, and nearly half of the world's population will live in the cities of developing countries (WHO, 2005). Evidence exist that across the period of time an increased influx of population from rural to urban areas has aggravated the housing problem and quality of life of a sizable urban population who are forced to settle for informal solution resulting in mushrooming of low quality slum settlements. Mehta and associates (2005) report on the Jawaharlal Nehru National Renewal Mission (JNNURM) has stated that the slum population in Bhopal over the time is dramatically increasing with 4.9%, 6.2%, 23.5% and 30.7% in 1971, 1981, 1991, 2001 respectively. To improve the quality of life the squatter residents the government

2018-15

Philosophy of Unity

Love as an Ultimate Unifier



Michael Bassey Eneyo

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Scriptures taken from the King James Version of the Bible.

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REVIEW

The author deserves special encomiums for bringing out this useful treatise on philosophy of unity and providing the reader with an insightful framework wherein love as a supreme unifier of all categories of beings is advocated. The book is timely conceived and it is probably the outcome of the prevailing disunity and crises which has adversely affected humankind across the globe. A need was felt to create mass awareness about the benefits of harmonious relationship, mutual coexistence and utmost respect for all entities as essential for the realization of full human potentiality leading towards the solution to many of the human existential problems.

Michael Eneyo has extensively reviewed relevant ancient literatures, religious texts, and philosophical thoughts and has integrated supportive thematic evidences for suggesting how all the living and nonliving elements in the universe are related. He has also shown how each existent with distinctive and unique characteristics are interconnected with one another by separate unifiers and eventually linked with the ultimate unifier which he has labeled as love. The author has presented a case study of the *Efik*, an African ethnic group, aboriginal to Southern Nigeria, and has called upon the society to value, sustain and maintain cordial and affectionate relationship with other human and non-human species which is imperative for the happiness of all.

The book has ten chapters. In the first chapter, the conceptual perspective behind the philosophy of unity is elaborated within the broader framework of cosmology/universe.

Citing the work of early scholars and substituting them with examples from our daily lives, Eneyo has elaborated the concept of the universe and the process of unity among all existing entities. He concluded that universe is the coming together of every creature to form a unifying whole. In the second chapter, the concept of unity and kind of unifiers are explained at length. Furthermore, selected and diverse forms of unity that persists between and among different class of beings are elaborated comprehensively. The various problems in the society that is attributed to disunity are spelled out explicitly as well. In the latter parts of the chapter, the author highlights how we may take advantage of the diversity of culture, languages, religions, sports, professions and so forth, to make our global society better and happier. The route to attain this is scholarly enunciated by the author with illustrations and examples.

In the third chapter, ancient philosophers of the mainstream Western tradition, whose reflections on cosmology are apt, occupy the attention of the author. Their diverse articulations regarding the origin of universe, its possible constituents and how different elements come together and unite on one hand but also maintain their uniqueness and identity on the other hand, are assessed. In chapter four the concept, causes and consequences of disunity in the contemporary society are highlighted by the author. In this chapter, the reasons behind uninterrupted disturbance and crisis of different intensity across many countries are visible wherein religion and the issue of disunity are evident with narrations of accusations and counter accusations and incidents of terrorism, destruction of human lives and properties etc, are extensively documented. In this regard, human insensitivity, political interference and bad

and sense of social cohesiveness have taken the back seat. The case study that highlights the people's ideology of the ancient African (*Efik*) community was used as a foil by the author wherein love for others and strength of unity among community members were explicitly visible. To institutionalize the feeling of love therefore, the rules governing unity and societal norms are to be strictly observed by all citizens.

The positive and altruistic values like hospitality to strangers, kindness, respect and love for others are intrinsically affirmed by all community members.

Preservation and protection of the life of every human being was given paramount importance, while accumulation of money was not considered as real wealth. Money was not given as much importance as the formation of good character and earning of good name which were considered the responsibility, not only of the parents, but of the community at large. The detailed case study presented by the author delineates factors that tend to facilitate elevation of unity; love and overall happiness to all members residing in the community are highlighted. Further, a call is made towards all beings to unite as one and see themselves only as a part that makes up the whole. In other words, every individual is insufficient unless in union with other constituents of the universe. While accepting the premise that human being is a small entity or being in the universe that comprises innumerable living and non-living entities, the focal point of this chapter suggests that whenever one attempts to harm or destroy another, s/he is indirectly working towards his/her own destruction.

The quotation of Buddha captures the essence of chapter nine where the focus on unity between all fragmented entities existing in the universe is highlighted. The chapter stated very nicely that the human mind is responsible for the creation of distinctions and

governance especially in African societies are identified as some of the potent indicators of disunity responsible for the adverse consequences that are replete.

In the preceding chapter, the concept of opposites was discussed within the holistic framework and how the apparently fragmented things in the universe and their opposites are united, has been explained by the author with logical precision. Chapter five discusses the phenomena of fear and its related challenges in terms of hindrance to inclusive unity. As had been generously acknowledged by many lead scholars connected with the Fearsim and Fearlessness movements, Eneyo is credited to have coined many ingenious concepts which includes: fear territory, faculty of fear, fear conflict, Eschatological fear. In this connection, he has created new vocabularies which may be considered to be included in fearism dictionary. Fear is considered as one of the key factors to disunity and a call is been made that fear ought to be managed more effectively in order to build an inclusive society. Hence, chapter five reveals the author's resolve to tackle the idea of fear as one of the stepping stones toward attaining unity, nationally and globally.

In chapter six, the challenges in attempting to initiate unity within groups, especially when such unity involves contrasting opposites is highlighted. In the chapter that follows, Love is identified as an absolute unifier of all categories of beings. Love is defined here in three different historical dispensations: the amoral, moral and immoral. The significance of the law governing the moral code of conduct in human society is also discussed. In chapter eight, a case study of Efik tribal community has been discussed. Evidence exists that in recent years across the world, individual narrow self-interest has taken precedence, while individuals' contribution for the benefit of community is almost missing or neglected. Hence, the feeling of love towards others

differences between beings which in real essence is just an illusion. The ecological mismanagement created by human beings because of selfish attitude and false pride of supremacy of her dominance over nature has resulted in ecological crisis. This crisis which has already adversely affected the air, water, land, human health and well-being of all living and non-living entities is excellently presented by the author. From the author's viewpoint, the world is critically ill and desperately in need of cure. Thus, this symptom becomes advisory signals that suggest the need for human beings to work toward restoring and ensuring harmonious relationship with nature to avert nature's revenge. In other words, ideology of negation and exclusion are to be replaced with the ideology of unity, connectivity and love for all living and nonliving elements in the world. The concept of Nationalism and Internationalism are explained within the framework of unity of all human beings irrespective of the differences in race, color, culture, language or religion. Oneness of all human beings and connectedness with all entities of the universe as a mandate for all is amplified. The last chapter takes insight from ancient philosophical thoughts and the New Testament. A paradigm for a better society is conceived by the author. This paradigm revolves around the notion of love for all entities which is identified as an ultimate unifier. The challenges in the contemporary society like conflicts, war, religious discords, and supremacy of one person or one country over another are explained comprehensively within the supreme constitution of love which is super ordinate to all the other existing laws and conduct is emphasized. By considering love as an ultimate unifier, creation of an ideal society may be visualized where all individuals can be looked beyond own selfish interest and work ceaselessly for the happiness and wellness of all beings. For a healthy and harmonious society to be enthroned, love is the indispensable norm and may be considered the supreme paradigm for unification.

Overall, the book is academically stimulating, interesting and thought-provoking. The author has brilliantly provided a comprehensive theoretical framework of unity where love is the ultimate unifier. All the Chapters are sequentially arranged and cohesively presented, while intricate issues pertaining to unity are analytically explained and comprehensively documented in a scholarly manner. The author has coined a couple of new concepts on fear and has presented some fresh and novel ideas on fearlessness which may give new insights to scholars who are interested in exploring the philosophy of fear. I congratulate Eneyo for creating a philosophical masterpiece were all human beings are to join their hands together to build an ideal society where harmonious relationship with living and non-living entities are to be preserved, protected and sustained.

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Impact of Academic Stress on Academic Achievement: A Systematic Review of Literature

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ABSTRACT

Stress is viewed as a negative emotional, cognitive, behavioral and physiological process that occurs as a person tries to adjust to or deal with stressors. Academic stress refers to the unpleasant psychological situations that occur due to the educational expectations from parents, teachers, peers and family members. Academic achievement is the outcome of education, the extent to which a student, teacher or institution has achieved their educational goals. Academic achievement is commonly measured by examinations or continuous assessment. There is great impact of Academic Stress on Academic Achievement. In This Paper we will discuss the review of literature of Academic Stress impacted on Academic Achievement of students. The main aim of the present study was to examine, provide the Knowledge regarding the impact of academic stress on academic achievement and provide recommendation for its further studies.

Keywords: Academic Stress, Academic Achievement, competition, Future worries.

I. INTRODUCTION

Stress is not a new event actually, “stress has been around and has been noticed for ages” (Neil, 1994 ¹). Stress is viewed as a negative emotional, cognitive, behavioral and physiological process that occurs as a person tries to adjust to or deal with stressors (Bernstein, et al 2008 ²). Stress is widely accepted to have two opposite effects on individuals – good stress (eustress) and bad stress (distress). . A person's response towards stress depends on whether an event is appraised as a challenge or a threat (Lazarus & Folkman, 1984 ³). Stress has become an important topic in academic circle as well as in our Society. Extreme stress results in increased prevalence of psychological problems like depression, anxiety, substance abuse and suicide ideation (Bansal and Bhave, 2006 ⁴). The various types of stress are, Acute stress, Episodic acute stress, Chronic stress. Academic stress refers to the unpleasant psychological situations that occur due to the educational expectations from parents, teachers, peers and family members, pressure of parents for academic achievement, present educational and examination system. Academic Stress among students have long been researched on, and researchers have identified stressors as too many coursework. Academic stress is a mental distress with respect to some anticipated frustration associated with academic failure or even an awareness of possibility of such failure (Gupta and Khan, 1987 ⁵). Stress in family like divorce, intrapersonal conflicts and maternal depression leads to stress in the adolescents which deteriorates functioning (Rex Forehand et al, 1991 ⁶). Students

A study of residential satisfaction in high rise apartment complexes among owner/tenant

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Residential satisfaction in high rise apartment complexes have been emerged as influencing frameworks in psychology and personal life satisfaction, community life style, health and well-being. In the Indian context very few studies on residential satisfaction has been conducted in high rise residential complexes. The present study attempts to examine the main and interactional effects of occupancy status and gender on evaluation of complex amenities, influencing factor for choosing flat in high rise, neighborhood relationship, social support health, happiness and residential satisfaction. Three hundred male and female residents participated in the present survey. A 2x2 factorial design structure involving gender (male vrs females) and two floor levels (owner vrs tenant) was utilized. The main effects of gender and occupancy status on major outcome variables were found significant. While looking at the results it seems very clear that substantially large number of residents exhibited moderately high level of satisfaction with complex amenities, reported moderately high level of residential satisfaction and better community life style in the complex. Some of the results are found consistent with the previous studies. Implications of the results are discussed.

Keywords: Residential satisfaction, satisfaction with amenities, influencing factor for choosing flat in high rise

Housing is related as a very important concern for a large section of people who are residing in big cities. To accommodate a large number of people in a limited space the planners and architects have created high rise apartments. Migration in metropolitan cities has contributed to a large number of high rise apartments. In Mumbai where space shortage is profusely evident more and more people are residing in high rise. In Mumbai city twenty plus storeys buildings are at increase. In Mumbai with growing population large numbers of people are moving to suburbs largely because the shortage of affordable housing in the city. The high-rise residential complexes are fulfilling the affordable housing demands to a large population. These high rise complexes are providing a large number of ultramodern facilities to residents.

The present study attempts to explore residential satisfaction in high rise apartment complexes in one of the prominent Mumbai suburbs. The major objective of the study has been made to examine the satisfaction of residents with regards to complex amenities, influencing factor for choosing flat in high rise, community life style, social support, health and happiness of residents with regards to gender and occupancy status of the flat in high rise apartment complexes.

Scott (1998) has described a high rise building as essentially a building with a small foot prints, small roof area, and very tall facades. A high rise is any structure where the height can have a significant impact on evacuations.

In the standard economic model of urban spatial structure, the above term. Moreover, Residential Satisfaction encompasses neighborhood satisfaction and a residence is more than a physical

structure (Garling & Friman, 2002). The deficits in the basic building features which were experienced by the residents might be detrimental to health, and subject inhabitants to substandard housing. It might be important for policies for public housing to specify standard building features and space standards for dwelling units (Ukoha & Beamish, 1997). The satisfaction level also depends on some economic factors like economy benefit, improvement in quality of life, planning and environmental issues. Residential satisfaction is ones perception that the community meets personal goals and needs of the residents and whether there is a feeling of community connectedness. It is a multi-dimensional construct that focuses on the social environment, such as belongingness and acceptance, and the physical environment, such as availability of community services and housing quality (Grillo et al., 2010; Heller et al., 1984; Hughey & Bardo, 1987; James et al., 2009).

High rise complex amenities signifies specific complex facilities that contribute to the urban living experience of residents (Kelly, 2006). The availability of complex facilities are linked to the daily life needs of residents in a neighbourhood. Some common complex facilities include, grocers, convenience stores, access to public transit, schools and professional services (Randall, 2008). According to Gottlieb (1995), residential amenities may be defined as place where resident's users specific goods or services enter the utility functions. The main reason consistently reported in the literature as to why focusing on the role of urban amenities in the delivery of urban intensification is important.

Purchasing an apartment in any type of residential dwellings is one of the most significant economic decisions that people make because it requires gathering a lot of information regarding its features (Hua & Kiefer, 2007). The buyers' choice and preference for housing are related to the quality of property, specific attributes such as location, neighborhoods or infrastructure improvement etc. (Abelson & Chung, 2005). Furthermore, features of the apartment will be a significant determinant of a household choice of residence (Quigley, 1979). Gabriel and Rosenthal (1989) have noted that

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A Study of migration status and type of courses on academic stress

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Abstract

Academic stress is considered to be the vital source of stress among the students. Academic stress is the result of a combination of academic related demands that surpass the adaptive assets accessible to a person. The present study is an attempt to assess the academic Stress among migrated students pursuing technical and conventional Courses. Migration is an important concept that is always associated with the stress and is defined as the movement of people from one place to another especially in search of suitable environment. Of the total sample of 300 students 3x2 factorial design structure involving six potential categories was used to select equal number of students who differed in terms of their three levels of migration status and pursuing two types of courses technical and conventional. The major ANOVA results revealed that students who have migrated from Kashmir to Bhopal reported higher levels of Academic stress as compared to their Counterparts. Furthermore, the results indicate that students who opted for conventional course reported significantly higher levels of academic stress than students who were enrolled in technical courses. Of the seven components of academic stress no significant difference was found on five components of academic stress across students who were pursuing different type of courses. Implications of the study were discussed.

Keywords: stress, Academic stress, migration, education, technical, conventional

1. Introduction

Stress is a stimulus process that brings thoughts such as increased rate of depression, anxiety, cardiovascular disease, and other potentially life-threatening issues to one's mind. Stress is observed in both biological as well as psychological environment which is viewed as a feeling of tension or fear of failure and is also defined as any change in the equilibrium of the body (Keil 2014) [15]. Academic stress is considered to be the vital source of stress among many students (Hashim, 2003) [12]. Academic stress is the result of a combination of academic related demands that surpass the adaptive assets accessible to a person. Serious psychosocial-emotional health consequences may result if a student is unable to cope effectively with academic stress (Wilks, 2008) [26]. Today's world is very competitive and the expectations are very high, thereby, the education expectations related to academic stress also arises due to parents, teachers, peers and family members etc. The mental distress or frustration caused due to academic failure or even fear of failure is the main cause of academic stress (Gupta and Khan, 1987) [10]. The reason behind the academic stress has also been identified by some researchers as competition with other students, too many academic assignments, failures and poor relationship with other students and teachers. The academic stress among the students is caused by both the expectations arising from their parents and teachers as well as their own expectations (Ang and Huan, 2006) [4]. Migration is an important concept and is defined as the movement of people from one place to another especially in search of suitable environment. Migration is a universal concept for the betterment of life and affected by push as well as pull factors. The factor of push that influences the migration includes lack of employment opportunities and fears of disorder or of persecution on

grounds of race, religion or politics in the areas people live. While as, the factors of Pull comprises favorable employment opportunities, good health and educational facilities, public order and freedom, and a favorable climate, particularly for the retirement in the areas people move to. The lack of quality and higher education facilities in rural and backward areas has been the major cause of migration from rural to urban areas. Furthermore, large number of rural people settles down in the cities for earning a livelihood after completing their education.

Academic stress is the product of a combination of academic related demands that exceed the adaptive resources available to an individual (Wilks, 2008) [26]. Academic stress has been defined as a student's perceived feelings of stress related to academic events (Akram & Khan, 2012) [3]. Academic stress is caused by academic events as perceived by students and is associated with health effects both physically (somatic symptoms) and mentally (depression) (MacGeorge, Samter, & Gillihan, 2005) [18]. The university level stressors are overrowded lecture halls (Ongori, 2007; Awino & Agolla, 2008), [20, 21] semester system, and inadequate resources to perform academic work (Erkutlu & Chafra 2006) [8]. Academic stress is conceptualized as a disturbance encourage by student's appraisal of academic stressors which is common in children and often leads to psychological and somatic distress (Lee & Larson, 2000) [16]. Tung & Chahal (2005) [23] examined the relationship between stress and adjustment and found no significant causal relationship between stress and the adjustment. Busari (2014) [6] indicated that stress immunization technique is an effective method of encouragement and adjustment to academic stress among university students. Agarwal (2011) [2] discovered that there is no significant difference between academic stress of male

Exploring the relationship between internet usage with mental health and academic performance

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The widespread use of Internet has been continuously escalating after 2000 and today almost every Indian adolescent has access to mobile phones and Internet. With easy access, the youths have the autonomy of use and misuse of Internet. A number of scholars have noticed that the excessive use of Internet adversely affects the mental health and academic performance of the adolescents. The major objective of this study is to examine the relationship between internet usage with mental health and academic performance. The sample was drawn from 8 CBSE schools of Bhopal. A total sample size of 237 from eleventh standard was utilized and the sample was randomly selected from PCM, PCB, and Commerce streams. The standardized scales were used to measure Internet addiction and mental health of the respondents. Descriptive and inferential analysis was used to analyze the data. A significant difference was found in academic grades of students in their tenth standard where PCM and PCB students exhibited higher performance followed by Commerce students. However, the ANOVA result revealed no significant difference on Internet usage and academic grades of students who were in eleventh standard. Finally, a significant difference was found with the PCM students reporting possibility of performance improvement in twelfth standard followed by students of PCB and Commerce. The correlational result indicated the high internet usage contributed positively and significantly with ADHD, ODD, Conduct and Mood Disorder.

Keywords: internet usage, social networking sites, mental health, academic performance, adolescents

Internet is a modern age technology which was introduced in 1980s. It is useful in various ways and in various spheres of life. It caters to diverse population, be it an adult or a child. It is critical in areas like education, science and technology, medicine, aviation, online shopping, etc. It is a great source of information which is accessible to us at the click of a mouse or with the help of smart phones. Social networking sites have enhanced interpersonal communication and geographical distances have been reduced, virtually. Even some social networking sites are devised for face-to-face communication. People might also engage in disclosure more easily because of the absence of physical cues and this might enhance the richness of a relationship (Sproull & Kiesler, 2002). The Internet can make communication easier and therefore increase the amount of communication overall (Malone & Rockart, 1991). Internet has facilitated our lives in such a way that we cannot even imagine a world without internet. There are several survey reports showing a humungous increase in the usage of internet across the globe. It is an essential tool for the present tech savvy world.

But, an excess of anything has its adverse effects. The privileges of internet usage have persuaded people in such a way that they find it irresistible to stay away from using internet. There is a fine line between using internet wisely and internet addiction. Many people have crossed this line and they are not even aware of it. Bratter and Forrest (1985) define addiction as "a behaviour pattern of compulsive drug use characterized by overwhelming involvement with the use of drug and the securing of the supply, as well as the tendency to relapse after completion of withdrawal." Internet

addiction disorder was first cited in the U.S. press in 1995, in an article entitled "The Lure and Addiction of Life On Line" which was published in the New York Times.

Goldberg (1995) coined the term 'Internet addiction disorder' to represent those having problematic Internet use behavior. Young (1996) adopted the criteria for pathological gambling defined by DSM IV to diagnose as a compulsive disorder. Some of the symptoms of Internet addiction are spending more time on internet, losing interest in other activities of life, appearing isolated and moody, being irritable, spending more time with virtual friends rather than with real friends, decrease in work performance, etc.

Internet addiction has adversely affected physical and psychological well being of a person. People suffer from physical ailments as hypertension, cardiovascular diseases, diabetes, etc, as they prefer to stay glued to their computers and mobile phones rather than engaging themselves with physical activities.

Mental fitness is equally vital for a person. Mental health comprises of psychological, emotional and social well being of a person. It can influence the behaviour and thought process which in turn can affect physical health and relationships. A person may lose his capacity to strike a balance between life activities and efforts to attain psychological flexibility. World Health Organization has defined mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community". Earlier there was no specific definition of mental health. As per World Health Report "Cultural differences, subjective assessments, and competing professional theories all affect how mental health is defined" (World Health Report, 2001). Internet addiction may lead to mental disorders like ADHD, depression, anxiety, schizophrenia, etc.

A two-year study by Ko et al. (2009) found that depression, ADHD, and social phobia may be the result of Internet

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Effects of COVID-19 Lockdown on Psychological Health (Implications on Police Personnel)



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ABSTRACT

Worldwide the COVID-19 pandemic has posed a very serious challenge to humanity with the virus infecting and causing the death of millions across 215 countries and damaging the economy to inconceivable levels. In India, the virus has caused havoc as the number of infected and causality cases continue to increase with every passing day. A nationwide lockdown with strict preventive measures are imposed by the Indian government. Within this backdrop, the present study was planned to examine the efficacy of precautionary measures and psychological health related consequences on respondents who are confined in their dwelling environment during this emergency lockdown. Furthermore, how male and female respondents of different age groups, marital status, education level, employment status respond to the lockdown and what are its social and psychological health related consequences are also investigated. The data was retrieved from the questionnaire prepared using Google Forms. Of the total sample of 489 respondents, 196 males and 293 females located in 70 cities covering 19 states of India volunteered to participate in the survey. The data collected on these participants was subjected to descriptive and inferential statistical analyses. The results revealed that an overwhelmingly large percentage of respondents have understood and have strictly abided by the precautionary and preventive guidelines issued by the government. Most of the respondents have reported that they are facing problems during the lockdown while a sizeable percentage of respondents were moderately involved in various educational, social and household activities in their residential environment. Finally, approximately fifty percentage respondents reported that they have never and rarely experienced any psychological health problems. In contrast, twenty percentage respondents have often and very often reported psychological health related problems. Implication of the results with special reference to police personnel is highlighted.

Keywords: COVID-19, Pandemic, Lockdown, Quarantine, Preventive measures, Residential Activities, Psychological Health.

Introduction:

A pandemic is an epidemic overstretching its reach across nations and continents. The world has witnessed a number of pandemic

cases such as smallpox and tuberculosis. Before COVID 19, the most devastating pandemic was the Black Death or Plague which killed an estimated 75–200 million people in the 14th century. Other notable

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Effects of age, education and employment status on mental health during COVID-19 pandemic

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ABSTRACT

The rampant outbreak of COVID-19 has spread at an unconceivable rate affecting more than 215 countries across the world. In India, over 343K confirmed, 180K cases are recovered and over 7.82m are attributable to this deadly viral disease (June, 16, 2020). In the wake of this global health crisis, a country wide lockdown and stringent preventive and precautionary measures have been implemented by the government to contain the spread of this virus. Within this backdrop, the present survey was planned to examine the effect of age, education and occupational status on the data was retrieved from the questionnaire prepared using Google Forms. The correlational design with a total sample size of 489 respondents was utilized. An approximately equal number of male and females located in 70 cities covering 19 states of India volunteered to participate in the survey. The data collected on these participants was subjected to descriptive and inferential statistical analyses. The results revealed that an overwhelmingly large percentage of respondents have understood and have strictly abided to the precautionary and preventive guidelines issued by the government. A large number of respondents have reported that they are facing problems during the lockdown. Respondents were moderately involved in various educational, social and household activates in their residential environment. Half of the respondents reported almost no health problems while thirty and twenty percentage respondents reported psychological health related problems sometimes and almost often respectively. The stepwise regression results revealed that Problems encountered during lockdown, Age, Education, engagement in online games in the residential setting uniquely predicted emotional, social and cognitive components of Mental Health. Implications of the results are discussed.

Keywords: COVID-19, Pandemic, Lockdown, Quarantine, Preventive measures, Residential Activities, Mental Health

A virus is a submicroscopic entity which infects living cells and causes several diseases. The recent havoc is created by a novel strain of the coronavirus family. Coronaviruses are RNA (Ribonucleic Acid) viruses which cause mild to lethal respiratory tract infections in human

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Effects of Type of School and Gender on Personality, Social Support, Exam Anxiety and Health

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Abstract: Personality factors pertaining to resilience and hardiness are found to be linked with anxiety and health. Often students encounter adversities and disappointments in their career which adversely affect their health. Similarly, social support derived from others reduces the health-related problems. The present study was conducted to examine the effects of type of school and gender on measures related to personality, social support, exam anxiety and health. Of the total sample 397, 225 males and 172 females' respondents were randomly selected from ninth standard across six English and Hindi medium schools located in Bhopal. The major ANOVA results revealed the students seeking education in Hindi medium school reported significantly higher level of hardiness and exam anxiety. Furthermore, students from English medium of education reported less health problems than their counterparts. However, no significant difference was found across type of school in respect to level of resilience. Gender difference was not found significant related to personality, exam anxiety and health. Implications of the study in the context of developing resilience and hardiness of students by teachers is much needed so that they are mentally equipped to handle any disappointments and failure without being adversely affected.

Key Words: Personality, Resilience, Exam Anxiety, Health, Adversities, Education.

1. INTRODUCTION:

During the last three decades psychological research on personality factors related to resilience and hardiness with an exclusive focus on childhood and adolescents have grown in voluminous proportion (Luthar & Zigler, 1991). Resilience in individual is exhibited by an individual capacity to recover and bounce back from hardship and adversity. (Luthar & Zigler, 1991). Adversity and disappointment are major part of life which are often faced by people in different context like home and school. Some people find it easy to adapt and adjust to these challenges while others find it difficult to deal with adverse conditions. Sufficient empirical evidences exist that people who are unable to stand through adversities face issues which affect their health and well-being (Luther & Zigler 1991). Thus, for healthy development of children and adolescents focus should be on building resilience and hardiness in school and home settings.

1.1. Author's Note:

- The paper is the part of Master's level dissertation done by the first author under the Supervision of second author.
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Evidence exists when adversities are prolonged children exhibits health problems (Gabrielle, 2002). Attention to resilience research is also rising in paediatric research and practices (Gabrielle, 2002). The pioneering studies of resilience are majorly focused upon factors that assist individuals to fight adversities. For example, a study by Kathleen (2004) have suggested the role of intrapersonal and environmental factors. Cognitive and environmental factors that contribute to resilience. One of the crucial factors in building resilience in children is parental interaction. Earlier studies have suggested that parental interactions are moderately to strongly correlated with adolescent resilience in major domains (Brooks, 2006; Raana, 2015).

Hardiness is defined as a personal resilience characteristic that refers to one's ability to effectively manage the challenging situations (Kobasa, 1979). Hardiness has been conceptualized as a personality style that provides a foundation for the development of resilient responses to stressful life events (Bartone, 1999). According to various studies conducted on hardiness concludes hardy individuals are better able to endure stressful situations because they tend to be more positive and confident about their ability to successfully handle the situations (Maddi, 1999). A large number of studies reveal positive links between social support and resilience. Narayan et al. (2016) studied social support and self-efficacy were significant predictors of resilience. The environment in which children is learning,

भारत हैवी इलेक्ट्रिकल्स लि. कम्पनी के तरलता विश्लेषण का अध्ययन

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सारांश

तरलता एक कम्पनी की नकदी या परिसंपत्तियों से अपने बिलों का भुगतान करने की क्षमता को दर्शाती है। त्वरित अनुपात, जिसे एसिड-परिक्षण अनुपात भी कहा जाता है, एक कंपनी की तरलता का सचूक है। लिकिवडी आसानी से संदर्भित करती जिसमें संपत्ति को नकद में परिवर्तित किया जा सकता है। भारत हैवी इलेक्ट्रिकल्स लिमिटेड (बीएचईएल या भेल) भारत में सार्वजनिक क्षेत्र की इंजीनियरिंग व विनिर्माण क्षेत्र की सबसे बड़ी कंपनी है। बीएचईएल आज भारत में ऊर्जा संबंधी मूलभूत संरचना क्षेत्र में विशालतम इंजीनियरिंग एवं विनिर्माण उद्यम है। बीएचईएल लिमिटेड के वित्तीय विश्लेषण के लिए कई तकनीकें हैं। नकद प्रवाह विवरण और अनुपात विश्लेषण है। हमने अनुपात विश्लेषण की तकनीक को चुना है। अनुपात विश्लेषण वित्तीय विवरणों की विश्लेषण और व्याख्या की एक तकनीक है। यह कुछ निर्णयों को बनाने में मदद करने के लिए विभिन्न अनुपातों की स्थापना व्याख्या करने की एक प्रक्रिया है। हालांकि, अनुपात विश्लेषण एक अंत नहीं है। यह एक फर्म की वित्तीय ताकत और कमजोरियों की बेहतर समझ का ही एक साधन है।

संकेतशब्द :- वित्तीय विश्लेषण एवं तरलता ए समेकित विवरण, अनुपात विश्लेषण संपत्ति, दायित्व

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JOB SATISFACTION OF CONSTRUCTION INDUSTRY EMPLOYEES IN BHOPAL MADHYA PRADESH

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Abstract:

Success of an organization is hidden in job satisfaction. Job satisfaction represents a combination of positive or negative feelings that workers have towards their work and causes a series of influences on various aspects of a company. Job satisfaction is a combination of psychological, physiological and environmental situations that make a person truthfully say I am satisfied with my job. There are many factors that effects job satisfaction. In this study, factors, which affect construction employees' job satisfaction, such as communication level at work, social status differences and effects, educational level, gender and fair compensation level were analysed by using a questionnaire. The questionnaire was delivered to both employer and employees construction sector. Answers were analysed by using 4 Level Likert Scale. According to results, despite the fact that the employers say their employees in different status have the same rights in their company, they organize occupational trainings and seminars to increase work efficiency very often and they pay fair wages that meet the employees expectations; employees think that employees in different status somewhat have the same rights in their company, their companies organize occupational trainings and seminars to increase work efficiency once in a few years, and although their wages is fair, it does not meet their expectations.

Key words: Construction industry, Social problems, Job satisfaction, In-job-training, Wage policy, Work efficiency

1. INTRODUCTION

Employees have the power to uplift or ruin a business and they are considered worthwhile resources to companies. Success of an organization is hidden in job satisfaction, which is related with job turn over and life satisfaction. When an employee employed in a company, it brings the needs, desires and experiences together. Job satisfaction represents a combination of positive or negative feelings that workers have towards their work and causes a series of influences on various aspects of a company. Employee loyalty is one of the most significant factors of it. Many studies have shown that job satisfaction has big impact on the motivation and productivity of workers, and hence also on performance of business organizations.

There are different approaches to define job satisfaction. Spector gave one of the most used definitions of job satisfaction in 1997. According to him, job satisfaction is associated with how people feel about their job and its various aspects. Hoppock defined job satisfaction as a combination of psychological, physiological and environmental situations that make a person truthfully say I am satisfied with my job. Vroom defines job satisfaction as affection alignments on the part of individuals toward work duties, which they are presently holding. Davis says that job satisfaction is closely linked to employees' behaviours in the work place. Job satisfaction is the key ingredient that leads to recognition, income, promotion, and the achievement of other goals that lead to a feeling of fulfilment, according to Kaliski. Job

satisfaction can also be defined as the extent to which a employee is content with the rewards he/she gets out of his/her job, especially in terms of intrinsic motivation. Negative and unfavourable attitudes towards the job indicate job dissatisfaction says Armstrong.

There are many factors that effects job satisfaction, job satisfaction factors can be sorted as below:

- Superiors' concern for employees
- Job design (Such as scope, depth, interest, perceived value, etc.)
- Wages (external and internal consistency)
- Working conditions
- Social relationships
- Perceived opportunities
- Levels of desire

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In this study, factors, which affects construction employees' job satisfaction, such as communication level at work, social status differences and effects, educational level, gender and fair compensation level were analysed by using a questionnaire that answered by both employer and employees who work in Bhopal, Madhya Pradesh construction industries.



Strategic Communication for Success: An Organizational Perspective

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ABSTRACT

Strategic Communication as a management practice has received extensive attention and is being recognized as a structurally integrated function in organizations. Although a large body of research focusses on the strategic communication practices and the role of communication practitioners, there is still scope for new avenues of exploration for strategic communication to be developed as a discipline. Strategic communication involves premeditated communication that works to build professional relationships and builds an environment which is not only productive but maximizes impact. In the precipitously evolving digital environment strategic communication skills are vital in creating a mark in not only facilitating organizations to showcase professionalism in wide-ranging functional areas but also to adapt to a challenging business setting. The present study takes an analytical look at the present state of the field of strategic communication and outlines the various aspects making an attempt to contribute to the unique body of knowledge in strategic communication.

1. Introduction

Management executives do not have a choice but to communicate however the discretion is to communicate either explicitly or discreetly. This is where the significance of communication strategy comes into picture. Communication strategy is all the more significant in a topsy-turvy business environment characterized by increased global competition, technological breakthrough and the ever changing marketplace where the parameters of quality change very often. An effective communication strategy is the reflection of the company's image. It determines the flow of information, establishes the connect which in turn facilitates business to efficiently reach its ultimate goals. If clarity and connections are maintained each party has an understanding of the message which leads to synchronization thereby resulting in a more productive environment and efficiency in performance. On the other hand insignificant communication strategy leads to information blockages for employees leading to the inability in understanding the purpose of such communication from management making it tough for managers to monitor employee performance. Hence the need for businesses to clearly communicate their values and purpose through strategic communication cannot be underestimated.

2. Literature Review

The management literature states that there are associations between discourse and the practice of strategizing. Holtzhausen, D. & Zerfass, A. (2015) state that strategic communication is a divergent approach focusing on the practice of communication which offers corresponding comprehensions which open up new fields for interdisciplinary research.

Steyn, B. and Niemann, L. (2014) stated that communication management plays both a strategic as well as a supportive role in framing enterprise and corporate strategy respectively.

wish to associate with a particular set of audiences. Strategic communication also has a key role in determining multi-stakeholder activities involving actors like industries, agencies of government as well as local communities. The settings for strategic communication can be local or national, virtual or face to face or with mediated forms of communication. If a wider picture is looked at 'Strategic communication' is a canopy term meant to embrace a variety of communication related professions as public relations, brand communication, advertising and much more.

Hallahan et al. (2007) defines strategic communication as "the purposeful use of communication by an organization to fulfill its mission" (p. 3). It is multidisciplinary in that it draws from a variety of methods and subject areas.

According to Paul (2011), creating clear goals and understanding "how a certain set of audience attitudes, behaviors, or perceptions will support those objectives" is what makes communication strategic (p. 5).

Argenti, Howell, and Beck (2005) define strategic communication as "aligned with the company's overall strategy, to enhance its strategic positioning" (p. 83).

between getting important messages to reach the intended audience and also to influence and attract the audience. Needless to say that there is more professionalism which brings its own set of challenges and opportunities.

5. Tactical excellence does not guarantee strategic success

Strategy occurs at a higher organizational level and has a long-term orientation which involves thinking at the macro level whereas tactics are the tools of the action plan. Tactics can be described as strategy on wheels. Without a great communication strategy, there can be no tactics. For instance, an organization's communication plan outlines the strategies which would include a good mix of media relations, social media community relations and more. Choosing the right communication strategies depends on an in-depth knowledge of who you are trying to communicate to, what they care about and what influences them. When creating the action plan for your specific strategy, focus around your daily, weekly and quarterly goals. Align your communication efforts on the right channels. If you have media relations as part of your strategy, you need to decide how are you going to pitch your stories, how are you going to make editorial coverage and make announcements etc.





Analysis of Liquidity and Working Capital Trends of Listed FMCG Sector in India

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Abstract:-

Every organisation whether public or private, profit oriented or not, regardless of size or nature of business, requires a sufficient amount of working capital. Working capital management is one of the most important functions of corporate management. It is the most important factor in ensuring the survival, liquidity, solvency, and profitability of any business organisation. A company requires sufficient finance to purchase raw materials and pay day to day operational expenses and the funds used to meet these expenses are referred to collectively as working capital. Considering the importance of working capital management as an indistinctive area of corporate finance function in mind an attempt has been made to examine the working capital trends and practise specificity in the FMCG sectors in India by selection five top listed FMCG companies from Indian Stock exchange. This industry is primarily concerned with the manufacture, distribution, and marketing of consumer packaged goods, or products that are consumed on a regular basis. The study is based on secondary data, specifically the Annual Reports of the chosen companies. The study period is five years, and the traditional method of data analysis and ratio analysis as tools of financial statement analysis have been used to examine the degree of efficiency of working capital management and trend analysis.

Key words: - FMCG sector, Working Capital, trend analysis.

Introduction

Working capital management is regarded as critical to a company's financial performance because it represents the link between liquidity and profitability. As a result, firms must constantly monitor the relationships between assets and short-term liabilities in order to favour the company's survival and development while reducing the risk of financial distress. Working capital management is especially important in developing and emerging economies, where the volatile financial markets and the uncertainties associated with the economic situation cause severe turbulence and general price instability. Considering Indian economic context, SMEs face significant challenges in accessing the credit market, where firms have a greater need for capital. The literature in emerging economies has highlighted the importance of companies managing their working capital efficiently in order to favour profitability and productivity while also favouring employment and economic stability. Many previous studies in developed economies have extensively investigated the relationship between working capital and profitability. Working capital is required for regular business operations such as the purchase of raw materials, payment of direct and indirect expenses incurred during production, investment in stock and store, credit granted to customers while maintaining a balance, and so on. Working capital and short-term financing decisions are referred to as WCM. It is best described as the management of all current assets

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and current liabilities. WCM's goals are to ensure that the company can continue to operate and that it has enough cash flow to cover both maturing short-term debt and upcoming operational expenses. Working capital management is now regarded as one of the most important issues in businesses, with financial managers attempting to identify the fundamental drivers and level of working capital management. The study's objectives are to investigate the sample firm's working capital management. Working capital investments are frequently large in proportion to total assets employed, so it is critical that these funds are used efficiently and effectively. There is evidence, however, that small businesses are poor at managing their working capital.

Current study is an attempt to analyse liquidity and working capital management of five selected listed FMCG companies from Indian stock market. Companies are Hindustan Unilever Limited, ITC limited, Britannia, Marico and Dabur India. Working capital management is concerned with the company's current assets and obligations, which serve as the link between liquidity and profitability. Working capital management that is effective and efficient promotes the continuation of company operations by enhancing the organization's capacity to pay short-term commitments. However, the ideal level of working capital is determined by the company's operating features as well as the reference environment. As a result, determining the appropriate size is challenging, especially in situations of environmental fluctuation, and requires continual monitoring to make the necessary modifications.



महानगर टेलीफोन लिमिटेड के वित्तीय विवरणों का विश्लेषणात्मक अध्ययन

डॉ. पवन मिश्रा *

शोध सारांश - वित्तीय विश्लेषण का प्रबंधकीय निर्णयों में बहुत अधिक महत्व है, यह वित्तीय तथा नियंत्रण दोनों ही कार्यों में सहायक होती है, वित्तीय विश्लेषण मुख्यतः प्रबंधकों को उसके नियोजन तथा नियंत्रण दोनों ही कार्यों में सहायता प्रदान करती है। आर्थिक नियोजन से पूर्व भारतीय अर्थव्यवस्था में सार्वजनिक क्षेत्र का स्थान इतना महत्वपूर्ण नहीं था, जितना की अब है। आर्योगिक नीति ने सार्वजनिक क्षेत्र को अधिक व्यापक बना दिया है जबकि महत्वपूर्ण उद्योगों के नियमण एवं विकास का दायित्व सार्वजनिक क्षेत्र को सौंप दिया गया है। इस शोध का विषय वित्तीय विवरणों का विश्लेषणात्मक अध्ययन है। वित्तीय विवरण कम्पनी अथवा निगम का महत्वपूर्ण प्रपत्र है। जिसके अंतर्गत लाभ-हानि तथा चिट्ठा की स्थिति दर्शाती जाती है। अनुसंधान ने अलेक पूर्वांगों के निदान तथा निवारण में महत्वपूर्ण भूमिका अदा की है। शोध विभिन्न विज्ञानों की शक्तिशाली कुंजी है तथा इससे मानव व्यक्तित्व का अपार बौद्धिक विकास हुआ है। किसी भी निगम अथवा कंपनी की वित्तीय स्थिति का अध्ययन वित्तीय विवरणों के माध्यम से किया जाता है। निगम की आर्थिक दृढ़ता तथा उसकी शोधन क्षमता आदि का अध्ययन इस विवरण के माध्यम से किया जाता है। इन सभी को ध्यान में रखते हुए इस विषय का चर्चा किया गया है, जिससे कि एक सार्वजनिक उपक्रम अपनी आर्थिक एवं वित्तीय स्थिति का आसानी से अध्ययन कर सके।

प्रस्तावना - वित्तीय योजना किसी भी व्यवसाय का प्राण स्वरूप है। कोई भी उद्योग चाहे छोटा हो या बड़ा बिना उचित वित्तीय योजना के सफल नहीं हो सकता। किसी भी व्यवस्था की स्थापना के विचार के जन्म से लेकर स्थितियों में समय अनुकूल एवं आवश्यकता अनुसार वित्त प्रबंध का होना अति आवश्यक है। वित्तीय योजना किसी भी व्यवसाय का प्राण स्वरूप है। कोई भी उद्योग चाहे छोटा हो या बड़ा बिना उचित वित्तीय योजना के सफल नहीं हो सकता। किसी भी व्यवसाय की स्थापना के विचार के जन्म से लेकर स्थितियों में समय अनुकूल एवं आवश्यकता अनुसार वित्त प्रबंध का होना अति आवश्यक है।

वित्तीय योजना का प्राथमिक उद्देश्य पर्याप्त पूँजी की इस प्रकार व्यवस्था करना है ताकि व्यवसाय के संचालक के आवश्यक साधन इस प्रकार उपलब्ध हो की उससे प्राप्त आय में से समस्त व्यय घटाने के बाद शुद्ध लाभ की प्राप्ति हो।

वित्तीय विश्लेषण के माध्यम से वित्तीय विवरणों की सूचनाओं को प्रबंध के समक्ष इस प्रकार प्रस्तुत किया जाता है, जिससे उन्हें जल्दी निर्णय लेने में सहायता प्राप्त हो सके।

वित्तीय विवरणों के एक व्यावसायिक उपक्रम के लेखों का संक्षेप के प्रस्तुत करते हैं आर्थिक चिट्ठा एक निर्दिष्ट तिथि पर सम्पत्तियों दायित्वों व पूँजी को दर्शाता है एवं आय विवरण एक निश्चित अवधि में परिचालन के परिणाम को दर्शाता है। वित्तीय विवरण विश्लेषण विवरणों के किसी एक सेट द्वारा प्रदर्शित एक व्यवसाय के विभिन्न वित्तीय घटकों के मध्य सम्बन्ध के व्यापक अध्ययन है और साथ ही विवरणों की एक श्रंखला में प्रदर्शित इन घटकों की प्रवत्ति का अध्ययन है।

सार्वजनिक क्षेत्रों के उपक्रमों की अंश-पूँजी तक पूर्णत- केंद्रिय सरकार द्वारा अथवा अंशतः केंद्रिय सरकार एवं राज्य सरकारों द्वारा अभिवादन किया जाता है। उल्लेखनीय है कि इन उपक्रमों की अंश-पूँजी पर निर्भरता

उपक्रमों की वित्तीय लीवरेज से प्राप्त होने वाली अनुकूलता से वंचित देता है।

भारतीय महानगर टेलीफोन लिमिटेड कम्पनी भारत का सार्वजनिक क्षेत्र का एक उपकरण है, इसका गठन कम्पनी आर्थिनियम 1986 के अन्त किया गया। यह दिल्ली तथा मुंबई क्षेत्रों में दूरसंचार सुविधाएं देती है। मुंबई, दिल्ली, ठाणे तथा नवी मुंबई क्षेत्रों में दूरसंचार सुविधाएं देती 2000 तक इसका एकाधिकार था। इसके बाद दूरसंचार क्षेत्र को विभिन्न ऑपरेटर कंपनियों के लिए भी खोल दिया गया।

यह भारत सरकार के स्वमित्व वाली एक दूरसंचार वाली कम्पनी महानगर टेलीफोन निगम लिमिटेड का कार्य दूरसंचार सेवाओं (एमटीएनएल) गुणवत्ता में सुधार लाना, इसके नेटवर्क को प्रसारित कर दूरसंचार के क्षेत्र में नई सेवाएं शुरू करना एवं इस क्षेत्र के विकास हेतु उनके स्वतंत्रता का निर्धारण करना है।

शोध अध्ययन के उद्देश्य -

- वित्तीय विवरणों के विश्लेषणों की अवधारणा का अध्ययन करना।
- महानगर टेलीफोन निगम लिमिटेड कम्पनी की अल्पकालीन दीर्घकालीन वित्तीय विवरण का अध्ययन करना।
- महानगर टेलीफोन निगम लिमिटेड कम्पनी की वित्तीय सुधार कार्यक्षमता एवं निष्पातियों का विश्लेषण करना।
- महानगर टेलीफोन निगम लिमिटेड कम्पनी की आर्थिक स्थिति आंकलन कर भावी अनुमान लगाना।
- महानगर कम्पनी की प्रगति एवं विस्तार संभावनाओं का अध्ययन करना।

वित्तीय विवरणों का विश्लेषण - अनुपातों की सहायता से व्यावसायिक वित्तीय विवरणों का व्यवस्थित ढंग से विश्लेषण करना संभव होता है। (अन्तिम पृष्ठ पर)

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Analysis of educational schemes impact on dropouts trends in India

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Abstract

Since Independence, Government of India is constantly aiming to fulfil basic needs i.e. food, shelter, health and education. But even after 68 years of independence, government is still struggling and incapable to increase the living standard of its citizens. According to 2010 data from the United Nations Development Programme, approximately 29.8% of Indians live below poverty line of country. Government of India offering many Scheme for improve status but inefficient because of mass population. The top most essential basic need which can change the entire scenario is 'Education' for that government is running lots of education schemes to improve the figures in positive direction. But unfortunately, people are unaware with the schemes and not able to take advantage for it.

It has been observed, that the number of school going children's are falling down every year has compared the children's are enrolled. There are many reasons which affect the regular attendance of the students and even drop outs. This paper will discuss the government schemes running to motivated 'Education' and analyse its Impact on dropout ratio. Also analyse the cause of drop-outs in primary education. Lastly suggestions and conclusion will drawn.

Keywords: education, government schemes, primary education, dropouts

1. Introduction

It is more than six decades since India gained independence. The state of elementary education has not yet achieved the satisfactory level in state schools (state schools in this assignment refers to state primary school from classes 1st to 5th) (Kaushik, 2010). In 1964 government of India allotted education Commission to recommend government about the national pattern of education in the country and the policies and plans for the holistic development of education at all ages (MHRD, 1968). In National Policy on Education (NPE) 1968, provisions were made for free and compulsory education for all the children till the age of 14 years, after the recommendation of Education Commission (*ibid*). However it was only 1st April 2010 when the Right to Education (RTE) was enforced in India, which made elementary education compulsory for the children from 6-14 age groups (Sengupta, 2010). During this period Indian government made several efforts to ensure the quality and accessibility of primary education throughout the country by introducing NPE (National Policy on Education), NPE 1986 and programmes such as Operation Blackboard (OB) in 1980s, establishment of District Institute of Education and Training (DIET), District Primary Education Plan (DPEP) in 1990s, Education For All (EFA) popularly known as Sarva Shiksha Abhiyan (SSA) in 2000s and many others (Babu, 2009; Little,

2010). They have been conducted for analysing the state wise dropout ratio by ASER in 2016. They have found that some states are having higher percentage of dropout as compared to other states. As compared to 2014 dropouts ratio

has been increased in year 2016 in Madhya Pradesh and Chhattisgarh

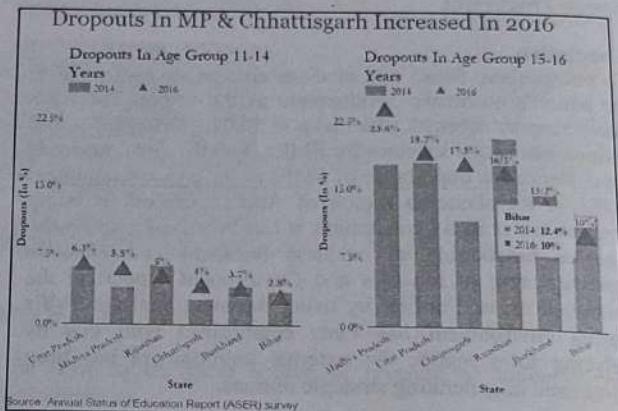


Fig 1

One of the world's largest Mid-Day-Meal program provides 108 million children school meals daily to help retention. In the EFA (Education for All) pantheon, of goals, India has added its own resolve to focus on quality education and to understand whether children's achievements are improving over time in an equitable manner. Three rounds of National Achievement Surveys (NAS) have been completed for class III, V and VIII levels. In the latest NAS report on class III overall Class III Children were able to answer 64% of

"It is impossible to think about the welfare of the world unless the condition of women is improved. It is impossible for a bird to fly on only one wing" – Swami Vivekanand.

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A study of Government led initiatives for the Development of Tourism in India & its SWOT analysis

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INTRODUCTION

Tourism has emerged as one of the largest industries both in terms of gross domestic product (GDP) and employment in the world today (ESCAP 1999; WTTC 2004b). The World Travel & Tourism Council calculated that tourism generated 6.6 trillion (US\$94 billion) or 9% of the global GDP in 2012. It supported 260 million jobs word wide. As per the statistics available for India, the total contribution of Travel & Tourism to GDP (including wider effects from investment, the supply chain and induced income impacts was INR 6385.1 billion in 2012 (6.6% of GDP). The sector is predicted to grow at an average annual rate of 7.9% till 2023 making India the third fastest growing tourism destination over the next decade. The reasons for its growth is that India is gifted beauty by Nature, crowned by the Himalayas on the top & vast seas surrounding it from two sides, India is quite a distinct destination on the world map. It also has a rich cultural & ethnic heritage that makes it one of the most sought after tourist-spot. Its 5000 years old cultural and historical heritage gives it an edge before other tourist destinations. Foreign tourism has been steadily increasing in India. The importance of tourism as a source of foreign exchange for India cannot be ignored. Apart from the contribution it makes in earning the foreign exchange, the importance of tourism industry can be measured in terms of its contribution to the national income, as measured by the tourism GDP and employment. Tourism is widely recognized as a labour-intensive service sector. Moreover, the nature of the sector is such that the multiplier and spillover effects are generally expected to be higher than other sectors. Tourism also generates employment for workers at all levels of skill (ESCAP 1996). It supported 39.5 million jobs, 7.7% of its total employment.

About 7.68 million foreign tourists visited India in 2014. There has been an annual growth of 10.2%. And the number of domestic tourists who visited various states and union territories was 1282 million i.e. and annual growth rate of 11.9%. India is ranked at the 41 position in the world and 12 in Asia and Pacific region in terms of foreign tourist arrival.

Foreign Tourists arrival in India (1997-2014)

Year	Number (millions)	% change
1997	2.37	3.8
1998	2.36	-0.7
1999	2.48	5.2
2000	2.65	6.7
2001	2.54	-4.2
2002	2.38	-6.0
2003	2.73	14.3
2004	3.46	26.8
2005	3.92	13.3
2006	4.45	13.5
2007	5.08	14.3
2008	5.28	4.0
2009	5.17	-2.2
2010	5.78	11.8
2011	6.31	9.2
2012	6.58	4.3
2013	6.97	5.9
2014	7.68	10.2

(Source: Indian Tourism Statistics at a glance 2014)

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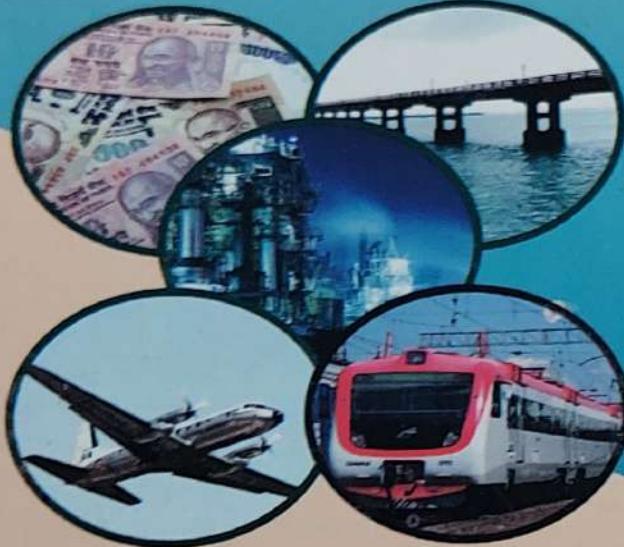
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Phytochemical Analysis and Antibacterial Potency against Pathogenic Bacteria of Aqueous and Alcoholic Extract of *Ziziphus Mauritiana* and *Coriandrum Sativum*

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Abstract

In present research we had selected two plant *Ziziphus mauritiana* commonly known as Indian jujube (Ber) and *Coriandrum sativum* commonly known as coriander for the phytochemical screening and antimicrobial activity against *Klebsiella pneumoniae*, *Clostridium perfringens*, *Citrobacter freundii* and *Staphylococcus aureus* bacteria. All the bacteria selected in this study are highly pathogenic and drug resistant. Phytochemical screening reveals that both the plants are rich in terms of phytoconstituents and potent against pathogenic bacteria.

Introduction

Herbal medicines are the staple of medical treatment in many developing countries like India and many Asian countries. Plants are now becoming the main source of therapeutics, however since ancient times and until the current era humans are using plants for medicinal properties. Although, pharmaceuticals (mostly synthetic drugs) are the dominant drugs in modern medicine, but phytochemical drugs (mostly plant derivatives) are becoming more popular. The WHO reported that, up to 80% of the world population is depends upon drugs derived from plants.

Phytochemical screening of the methanolic extract of root of *Z. mauritiana* reveals the presence of alkaloid, glycosides, volatile oil and saponins. Chloroform extract of leaves of *Z. mauritiana* shows highest amount of phenolic which shows antitumor and anticancer activities which was confirmed by confirms the presence of a natural immunostimulatory in *Ziziphus mauritiana*. Different parts of coriander plant contain monoterpenes, alpha pinene, limonene, Camphor, geraniol, coriandrin, dihydrocoriandrin, flavonoids, and essential oil [1]. Which are responsible for various physiological effect in human health.

Material and Methods

Collection of Plant Material

The leaves of Indian Jujube were collected from Barkatullah University, Bhopal. Coriander was bought from the local vegetable market. The plant material were then matched with the plates of natural wealth of India for identification followed by cleaning with fresh water then air dried before further processing.

Extraction of Plant Material

Sohlet extraction is a very useful tool for preparative purposes in which the analyte is concentrated from the matrix as a whole or separated from particular interfering substances. In conventional Soxhlet, the sample in this case plant leaves of Indian jujube and leaves and stems of Coriander was washed, dried and crushed then placed in a thimble-holder and during operation is gradually filled with condensed flesh solvent (Ethanol) and Water from a distillation flask. When the liquid reaches an overflow level, a stopper aspirates the whole contents of the thimble-holder and unloads it back into the distillation flask, carrying the extracted analytes in the bulk liquid. This operation is repeated until complete extraction is achieved after six rounds of soxhlet cycle. After the completion extraction process the collected extract was dried at 50° C to achieve the desired consistency required for further use, extracted material was then stored in air tight container [2].

% Yield of Extract

After extraction, each cycle was analyzed for % yield. Yield of the extract is calculated in percentage by the formula % yield = wt of the extract / wt of the plant material × 100

Phytochemical Analysis of the Extracts

Total Ash

Presence of ash in any drug (natural) is a limited factor which can interfere with the pharmacological properties of extract. During validation and formulations ash value must be in lower range, lower the ash value higher the potency of the extract. To determine total ash about 2 g of the air-dried extract was placed in a crucible,

BIODEGRADATION AND RAPID REMOVAL OF DIMETHOATE BY CYANOBACTERIA

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ABSTRACT

Mainly pesticide pollution is a serious environmental problem and their remediation is necessary therefore cyanobacteria are used as removal contamination agent. In this study cyanobacteria were used to their growth and utilization of organophosphorus pesticide dimethoate as phosphorus source. These cyanobacteria belong to filamentous heterocystus genera. A sharp decrease in the growth of the cyanobacterial isolate was observed by increasing the concentration of dimethoate. Amongst them *Nostoc* tolerated different concentrations and was recorded as the highest efficient isolate are tolerate of this compound. Moreover, protein content of their cells overtopped the other isolates especially at higher concentrations. The cyanobacterial isolate was further subjected to grow in the absence of phosphorus and presence of dimethoate. Although, the cyanobacterial growth absence phosphorus recorded at very poor level, a massive enhanced growth and phosphorous content of cells were obtained when the dimethoate amended with media. Capabilities of *Nostoc* species to use dimethoate as sole phosphorous is considerably a cheaper and efficient tool for remediation of organophosphorus pesticides from contaminated agriculture soil which is clearly indicated from the above study.

Keywords: Cyanobacteria, Dimethoate, *Nostoc*, Isolate

1. INTRODUCTION

The concept of green revolution has played important role for utilization of variety of pesticides for high yield varieties. The progressive increase of pest problem and demand for agricultural products necessitated the application of agrochemicals and ensure high quality of crop yield [1]. Pesticides are most commonly detected in all aquatic environments [2]. These pesticides are mainly used for agricultural purposes [3]. They enter the aquatic environment via runoff after being sprayed in agricultural fields and can potentially reach groundwater [4]. Pesticides affect environment and health of humans as they are responsible for ground water and marine environmental pollution as well as they pollutes soil and crops.

Pesticide's continuous and excessive use of organophosphorus compounds has led to the contamination of several ecosystems in different parts of the world [5, 6]. Contamination of grains, vegetables and fruits with organophosphorus compounds is also well documented. Use of micro-organisms in detoxification decontamination of organophosphorus compounds is considered a viable and environment friendly approach. Dimethoate [O, O -dimethyl S -methyl carbamoyl methyl phosphorodithioate] is a systemic organophosphorus

insecticide, but is also considered as a carbamate pesticide due to the existence of a carbamate group in its chemical structure. It was patented and introduced in the 1950s by American Cyanamid. Dimethoate is considered one of the most important pesticides in killing a wide range of insects, including aphids, thrips, plant hoppers and whiteflies systematically and on contact. Dimethoate while acting as cholinesterase inhibitor, interfering with the activities of this enzyme is responsible for neurotransmission.

The half-life of dimethoate in soil ranges from 4 to 16 days [7]. Residues of dimethoate and its oxidized analog have been detected in soil, fruits, vegetables, crops and even cow milk [8]. The physicochemical properties of dimethoate are given in Table 1.

Organophosphorus compounds are totally mineralized by the microorganisms. Most organophosphorus compounds are degraded by microorganisms in the environment as a source of phosphorus or carbon or both [9]. Different pathways of organophosphorus decomposition such as hydrolysis, photolytic oxidation, microbial transformations and other biological processes have been reported [10].

Photosynthetic microorganisms, such as cyanobacteria, have potential to remove various pollutants, such as dyes



Hairy Root Culture Through *Agrobacterium rhizogenes* for Enhancement of Secondary Metabolites Production in Medicinal Plants: A Review

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Abstract: Plants are a tremendous source for the discovery of new products with medicinal importance in drug development. Several distinct chemicals derived from plants are used in various important ways. Secondary metabolites are economically important as drugs, flavor, dye, pesticides, and food additives. Plants produce the diversity of secondary metabolites which not only plays an important role in adaptation according to the environment but also represents an important source of active pharmaceuticals. The possibility of altering the production of bioactive plant metabolites through tissue culture technology is one of the emerging fields of biotechnology to investigate and enhance the production of secondary metabolites. This enhancement through field cultivation has many defects such as slow growth and low and variable yield due to the environmental and biotic factors. Therefore, hairy root culture has been developed as a more efficient alternative biotechnological tool for secondary metabolic synthesis, regardless of environmental, seasonal, and climatic variations. *In vitro* hairy roots formed by genetic transformation have been efficiently utilized for the synthesis of higher levels of flavonoids due to their biochemical and genetic stability as well as their fast growth in media without phytohormones. The focus of the present review is a detailed assessment of research on rhizogenesis in different plants using *Agrobacterium rhizogenes* for the last twelve years particularly for the enhancement of secondary metabolites. The study reveals different techniques involved for rhizogenesis in different plants, compatibility trends of the desired gene, and modifications in the techniques during these years.

Key words: Hairy root culture, *Agrobacterium rhizogenes*, rhizogenesis, secondary metabolites.

The rationale of the study

Plant secondary metabolites are unique sources for pharmaceuticals, food additives, flavor, and industrially important biochemicals. Accumulation of such metabolites often occurs in plants subjected to stresses including various elicitors or signal molecules. Secondary metabolites play a major role in the adaptation of plants to the environment and in overcoming stress conditions. Environmental factors (e.g., temperature, humidity, light intensity, the supply of water, nutrients,

and CO₂) influence the growth of a plant and secondary metabolite production.

The principle advantage of recent technology is that it may provide a continuous and reliable source of plant pharmaceuticals and could be used for the large-scale culture of plant cells from which these metabolites can be extracted. Plant cell and tissue cultures hold great promise for controlled production of useful secondary metabolites on demand. The current yield and productivity cannot fulfill the commercial goal of plant

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(RESEARCH ARTICLE)



Optimization and characterization of trypsin of *Labeo rohita* from its visceral waste

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Abstract

The disposal of fish visceral waste, is currently posing a major threat to fishery industries and environment. 35% of the total global catch and 27% of the landed fish is wasted. The inappropriate disposal of fish waste pollutes ground water and soil (by nitrate leaching); surface water (by eutrophication) and harbors insect/rodent infestations due to release of noxious odor such as indole, sketol, cadavarine, putrificine etc. Technical advancement has enabled recovery of value-added products. Present investigation involved isolation of visceral enzyme from widely consumed freshwater fish *Labeo rohita*. The enzyme was purified and characterized as trypsin. Among the different precipitating agents chosen cold acetone was found the best. The amidolytic activity of the enzyme using BAPNA substrate was studied. From the Lineweaver-Burk plot the K_m and V_{max} were calculated. The molecular weight, optimum pH and temperature were 24 KDa, 8.5 and 40°C, resp. The LCMS studies showed that the enzyme exhibited 19.3% similarity with commercial (bovine) trypsin. It was thus, anticipated to minimize the waste burden in an eco-friendly manner.

Keywords: Fish visceral waste; Protease; Trypsin; SDS-PAGE; LCMS; Enzyme kinetics

1. Introduction

The increased demand for seafood throughout the world has contributed to a rapid growth of aquaculture than any other segment of animal culture industry. Fishes are next only to meat and poultry as a staple food of most of the countries. Aquaculture has thus become an important activity in many countries which contributes to 25% of the total world seafood supply [1]. By the year 2025, generation of solid waste is expected to reach 19 billion tones. The developing countries are bound to use polluted water for irrigation [2]. According to World Bank report, by 2030 the global fish supply is estimated to increase by 5 lac metric tons. Of this, only 4 lac metric tons will be consumed and remaining will be wasted. This waste includes by-catch discards and processing wastes. The by-catch include non-targeted organisms such as juvenile fishes, marine benthic mammals etc. whereas, processing waste includes head, frames, fins, tails, viscera, and skin [3]. The wastes generated through processing of fish, is around 30-60% [4]. The global fish production and consumption in the last six years as given by FAO [5] emphasize over increase in waste production.

The dumping of this waste into sea is very unscientific practice [6-7]. Waste present in water body undergoes decomposition and generates toxic by-products. This decreases dissolved oxygen and pH and overloads nitrogen, phosphorus and ammonia content i.e. leads to eutrophication. This in turn promotes biomass of plankton [8]. Also, improper storage, handling and disposal practices of this waste causes environmental and health problems, insect/rodent infestations and noxious odor such as indole, sketol, cadavarine, putrificine etc. The establishment of "zero waste" policy by The European Commission has laid obligations on landings and by-catch [9]. These legislations forbid on discards of landings and by-catch back into the sea [10] and emphasize on utilization of fish waste in an organized manner. The fish waste includes fish head, viscera, skin, scales, air bladder, bones, blood, frame, liver, gonads, guts, etc. [11]. Fish waste is rich in proteins, amino acids, bioactive peptides, collagen, gelatin, calcium,

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BIOCHEMICAL EVIDENCES TO ESTABLISH THE POSSIBLE INTERACTION BETWEEN HOST PLANT *OXYLUM INDICUM* AND ENDOPHYTIC FUNGUS *GEOTRICHUM PSEUDOCANDIDUM*

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ABSTRACT

Oroxylum indicum (L.) Vent. is an important medicinal tree possesses numerous metabolites of medicinal value. Nowadays, research is going on to find out role of metabolic activities of endophytic fungi to support the existence of their host. In this series, present paper describes a deep study of various fractions of Plant root and fungal endophyte of root to observe similarities and differences in both type of metabolite fractions. Endophytic fungi *Geotrichum pseudocandidum* isolated and identified from root of *Oroxylum indicum* on PDA medium. Its metabolic extract showing antibacterial activities has been taken and fractionated with Chloroform, Ethyl acetate and n- butanol solvents. The compounds were analyzed by GC-MS technique. The root extracts (methanol and ethanol) from the tree *Oroxylum indicum* was also screened by the same technique and were analyzed. The main components in all fractions of root and metabolites of endophytic fungi were 3-Cyclohexene-1-ol, 4-methyl-1-(1-methylethyl)-(R) also known as Terpinen-4-ol and (-)-5-oxatricyclo (8.2.0.0 (4, 6) and codexane, 12-TRI which is also known as eupyphellene oxide. The study aims to develop a link between the endophyte and its host plant through biochemical evidences.

KEYWORDS: GC-MS; *Oroxylum indicum*; Endophyte; Host- endophyte interaction.

INTRODUCTION

Endophytes are ubiquitous and have been found in all the species of plants. Many economically important grasses carry fungal endophytes some of which may enhance host growth, may improve the plants ability to tolerate abiotic stress such as drought, as well as improve their resistance to insect and mammalian herbivores (Doty, 2011). Some endophytes protect their host from insect by producing bioactive metabolites (Jalgaonwala, 2010). Recent studies suggest that endophytic fungi are not host specific (Budhiraja, 2013).

Oroxylum indicum (L.) Vent is a small to medium-sized tree with its distribution in tropical and subtropical regions. It is commonly known by various names such as Indian Trumpet, Indian Calosanthes, Midnight horror etc. Each and every part of *O. indicum* is considered to be useful and is used in several traditional and Ayurvedic folk medicines (Raghav et al., 2013). The plant has anti-cancerous (Mao 2002; Prakash et al., 2013), anti-inflammatory (Doshi et al., 2012); anti-oxidant (Kalaivani and Mathew, 2009; Molrangtham et al., 2013); anti-microbial (Radhika et al., 2011) and anti-arthritis properties (Karmali et al., 2013). The plant contains flavonoids like chrysins, oxosylin, and baicalein as active principal components (Choudhury et al., 2011; Raghav et al., 2013). Besides, a number of other compounds have been reported from different parts of this plant (Deka et al., 2013). The contribution of endophytes to their host plant in showing various beneficial properties cannot be overruled as are evident from literature already cited

above. *O. indicum* is not only a potent medicinal plant with a diverse array of useful phytochemicals but also harbor diverse endophytes (Gu et al., 2006; Gupta et al., 2014; Gokhale et al., 2017).

The link between endophyte and the plant can be established by thorough studies of the metabolites, of the plant and the endophyte both, and thereby the characters expressed by both the entities as individuals and as an interactive unit. In the present study, an attempt was made to study the fungal endophyte *Geotrichum pseudocandidum* associated with roots of *O. indicum* and their metabolite interaction.

To make the study simple and easier the crude extract of the plant and endophyte was fractionated into five fractions. In the five fractions, four compounds were common in the metabolites of root and fungal extract.

MATERIALS AND METHODS

Collection of plant samples

Plant material (roots) were collected from healthy plants growing in the reserve forest area in and around Jabalpur, M.P. India. The samples were collected in sterile polypropylene bags and were processed within 24 hours of collection for isolation of endophytic fungi.

Surface sterilization of plant materials

The collected plant materials were thoroughly washed under running tap water, air dried and then cut into approximately 1 cm long pieces with the help of sterile surgical blade. Surface sterilization was performed



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Callus extracts of *Oroxylum indicum* (L.) Vent containing baicalin have *in vitro* antioxidant and antibacterial activities.

Extractos de callos de *Oroxylum indicum* (L.) Vent que contienen betalaina presentan actividad antioxidante y antibacteriana *in vitro*

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ABSTRACT

Oroxylum indicum (L.) Vent is used as a traditional medicine to cure many diseases. The flavonoids baicalin has been detected and extracted from *in vitro* culture. The aim of this research was to determine the *in vitro* antioxidant and antibacterial activities of *O. indicum* callus extracts. Murashige and Skoog medium supplemented with BAP 1 mg l⁻¹ and AgNO₃ 2 mg l⁻¹ was used to induce the formation of callus. Different explants were excised from 15 days old seedlings developed on MS medium. Metabolites were extracted from two-month-old callus. Ethanolic and aqueous extracts were prepared in cold and hot conditions. They were used for phenolic and flavonoid content determination. Extracts of callus were subjected to thin layer chromatography (TLC), UV -Vis spectrophotometry



ISOLATION OF POTENTIAL RHIZOSPHERIC AZOTOBACTER SP. FROM TRIBAL FIELD OF PATAKOT AREA

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ABSTRACT

Tribal community usually follows traditional farming, characterized by application of negligible inputs. At many places they usually practice monoculture and cultivate a crop year after year leading to the erosion of soil fertility. As part of endeavor to inclusive development, scientific communities has responsibility to restore fertility of tribal's farm land for sustainable agriculture especially in view of recent revelation of growing adverse impact of climate change on food grain production. The objective of this study thus was to isolate indigenous isolates of Azotobacter from the rhizosphere of wheat and maize of tribal's farm land of Patakot (District Chhindwara, MP). Subsequently, their effect (as-a-via exotic A. chrysostomum 5576 (positive control) and native isolates) plant (negative control) on growth and yield of little millet (*Panicum miliaceum*) under pot conditions studied. Potential bacterial isolates RGW1, HRM1 and HGW1 showed nitrogen fixation rate (mg) per gram of sugar consumption 19.04, 19.32, and 19.13, phosphatic solubilization index +24, +35 and +38 and percentage production of siderophore 40.74, +1.10 and +1.76 respectively. Importantly, inoculation with RGW1, HRM1 and exotic Azo-5576 (positive control) observed enhanced grain yield by 10.77%, 17.79% and 14.97% respectively and enhanced total biomass yield by 25.78%, 22.77% and 17.8% (Azo-557) respectively as compared to un inoculated plant (negative control).

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1. INTRODUCTION

Millets, wheat and maize are the crops the tribal people cultivate in their farmland. Tribal agriculture however has general characteristics of low input rates and continuous practice of monoculture that lead to erosion of soil fertility. Other causes for low productivity of crops in the state are ascribed to poor soil depth and fertility, soil erosion, lack of awareness regarding scientific package of practices, inadequate input supply and lack of good quality seeds/ Varieties [1, 2].

Little millets (*Panicum miliaceum*) colloquial names are kodo or amra and realize that excellent nutritional composition of these grains they are now called as nutritional grain or nutric cereals. Madhya Pradesh tribal area is a most important state for little millets cultivation and it is having tribal food nutrition security [1]. Recent hours and ones all over the world about climate change and its adverse impact on crop productivity has led to the initiation of research effort to mitigate climate impact such as the soil microbial ecology and restoration of

proper microbial community especially those directly benefiting the plants constitute some of the important efforts in this work. Inclusion of tribal farmland in this effort is also important as this is of utmost importance for inclusive development. Isolation, identification, multiplication and addition of potential growth-promoting microbes also called PGPR (plant growth-promoting rhizobacteria) microbes to act as biofertilizers form the main research areas in this regard.

The biofertilizers have potential to transform nutritionally important growth element from unavailable to available form through biological mechanism [3]. The uses of inoculants as a biofertilizer to enhance plant growth and productivity offers better alternative to costly chemical fertilizers [4]. Few bacteria have the capacity to fix atmospheric nitrogen and solubilize unavailable form of phosphorus to soluble form. Plant growth promoting bacteria special reference to Azotobacter has the capacity to convert nitrogen and phosphorus in the soil [5, 6]. Several species of Azotobacter are able to produce

Facets of rhizospheric microflora in biocontrol of phytopathogen *Macrophomina phaseolina* in oil crop soybean

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Abstract

The use of microbial bioinoculants for managing plant diseases and promoting plant growth is an effective alternative approach to integrated farming. One of the devastating phytopathogens is *Macrophomina phaseolina* (Tassi) Goid. It is an omnipresent fungus infecting more than 500 plant species. It causes charcoal rot disease in soybean leading to 30–50% yield loss. Soybean (*Glycine max* (L.) od seed crop produced globally is highly susceptible to *M. phaseolina*. India is the fifth largest producer of soybean in the world. Madhya Pradesh is the largest soybean-producing state in India. Around 70% yield loss of soybean is accounted to *M. phaseolina* infection in India. Control of charcoal rot is the requisite of the current situation. Chemical control is not feasible due to saprophytic nature and prolonged survival of *Macrophomina phaseolina*. Chemical fungicides are expensive, toxic, hazardous, and cause pollution. Biological control is an effective approach to control this devastating fungus. The rhizosphere of soil is rich in beneficial-microflora competent to suppress plant pathogens and also promote plant growth. PGPR have well-developed mechanisms that impart antagonistic traits to them. PGPR produces various antifungal metabolites siderophores and HCN which inhibit fungal growth, and can be used as potent BCA. *Pseudomonas* and *Bacillus* species have been reported effective against *M. phaseolina*. The mechanisms and antifungal compounds produced by these bacteria to control charcoal rot can be studied extensively. BCA or the metabolites secreted by them have the potential to develop effective bioformulations for soybean at the commercial level for sustainable agriculture.

Keywords Soybean · *Macrophomina phaseolina* · Charcoal rot · BCA · Sustainable agriculture · Bioformulations

Introduction

With the increasing population, it has become indispensable to increase crop productivity using sustainable approaches in agriculture. The important constraint in crop production worldwide is plant diseases accounting for 10–30% yield loss (Strange and Scott 2005). Biological control manifests to be one of the most promising strategies for reducing disease incidence, thereby increasing agricultural productivity. Beneficial microbes present in the soil exhibiting antagonistic traits against plant pathogens are employed in

biomanagement of diseases. The use of botanical extract, microorganism, or their products for control of pathogen or pest is safe and effective biocontrol for disease management (Sreeridya and Gopalakrishnan 2012). The rhizosphere of soil is rich in microflora that has fascinating properties, suppressing phytopathogens, and promoting plant growth.

These attributes have made biological control an effective and alternative measure to the use of agrochemicals which are toxic to humans and animals, pollute the environment, and are expensive. The use of biocontrol agents in agriculture reduces the problem of pollution as they decompose quickly and do not leave residues. Microbes belonging to bacteria, fungi, and actinomycetes are effective biocontrol agents (BCA) inhibiting many plant pathogens. Bacteria belonging to *Bacillus*, *Burkholderia*, *Streptomyces*, *Candidatus*, and *Serratia* are known to exhibit biocontrol traits (Mark et al. 2004). They are also known as plant growth-promoting rhizobacteria (PGPR) as they promote plant growth. There are various mechanisms underlying antagonism via competition for nutrients and space (Spadari) and Dorby

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POTENTIAL OF AZOTOBACTER IN SUSTAINABLE AGRICULTURE

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ABSTRACT

The problem of climate change has started to hit stomach of world population through its adverse effect on crops and soil microbes. A comprehensive approach is required to deal with this situation so that continuous and enough food supply to the people can be ensured. Breeding of variously resistant crop plants may be one of the approaches, but to adopt an agricultural practice that can sustain the agriculture production at higher level should be the best one. Replacing chemical inputs with the biofertilizers, especially the highly efficient strains of *Azotobacter* constitutes one of the most important components of such agricultural practice. Since its discovery in 1901, *Azotobacter* has been seen as an important agricultural input due to its multiple beneficial effects on plant growth. Therefore, extensive works have been carried out leading to much advancement in the techniques to isolate, identify, and apply this plant growth promoting rhizospheric (PGPR) bacterium to the crops has been made. Also, huge data as to multiple agricultural roles of this bacterium have been generated. The aim of this review is to recapitulate various aspects of *Azotobacter* highlighting its importance in sustainable agriculture.

Keywords: *Azotobacter* sp., Sustainable agriculture, PGPR

1. INTRODUCTION

Climate change is currently the most important environmental issue affecting all life forms including crop plants. Agriculture production is thus facing serious threat. Agriculture on the other hand is the most crucial activity shouldering the responsibility to feed billions of current and future stomachs across the world. It has thus to be sustained.

Currently, agricultural production is highly dependent on the application of chemical fertilizers. In India and many other countries, the much talked about green revolution in its wake brought large number of fertilizer manufacturing units whose products have been applied relentlessly to the soil. The practice has further been encouraged by the short term spur in agricultural production. But very soon in India, as in other parts of world, the consequence of such non-judicious use of fertilizers has been realized [1, 2]. Consequently, a global demand to reduce dependency on chemical inputs is now well in air. This can be done by introducing suitable strains of plant growth promoting (PGP) microbes in the soil. By doing so, not only the negative effects of fertilizers can be overcome, but already damaged soil can be remediated and maintained, and

considerable savings on fertilizers bill can also be achieved [3-5].

PGP microbes, especially rhizosphere occupying bacteria (PGPR) have multiple roles to play in the soil viz., enhancing root's access to nutrients in soil, fixing atmospheric nitrogen to available forms, solubilizing complex phosphates to ready-to-use form, providing chemicals/molecules for promoting plant growth and controlling soil-borne pathogens. *Azotobacter* has been universally recognized as one of the most important PGPRs (Fig. 1). In 1901, Dutch microbiologist and botanist Beijerinck discovered the bacterium, *Azotobacter* and its species *A. chroococcum* was reported to be the first aerobic non-symbiotic nitrogen fixing microbe. This bacterium has ability to grow vigorously and establish in the rhizosphere of crop plants when applied to the latter [6]. Moreover, its own capacity to produce cyst under unfavorable condition allows it to survive in the harsh environment of the soil and its seemingly strong ability to adapt to various environmental adversaries has led to evolution of enormous pheno-genotypic variations suitable for various non-leguminous crops and agro-climate regions. The latter feature has especially been important to serve as catalytic force for carrying out



Expression of H19 long non-coding RNA is down-regulated in oral squamous cell carcinoma

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Long non-coding RNAs (lncRNAs) are a group of non-protein-coding RNAs which are longer than 200 nucleotides. lncRNAs play important roles in epigenetic modification, transcription and post-transcriptional regulation, maintenance of normal tissue development and differentiation. lncRNA could serve as a biomarker for diagnosis and prognosis as well as a molecular target for therapy in oral squamous cell carcinoma (OSCC). Therefore, we have determined the expression profile of 5-lncRNAs namely UCA1, TUG1, HOTAIR, MALAT1, and H19 by quantitative real-time PCR in tumor tissues and adjacent normal tissue of 32 OSCC patients. To determine the expression, methylation status and genomic alterations in lncRNAs across pan-cancer, TCGA datasets were analyzed by UALCAN, MEXPRESS and cBioPortal database. Then, we determined the association between lncRNA expression and clinicopathological attributes of patients by Spearman's rank test. Expression of UCA1 and TUG1 genes was up-regulated in 54.83% and 53.12% OSCC tumors, respectively. Importantly, expression of MALAT1 and H19 was down-regulated in tumor tissues of 62.5% and 81.25% respectively of OSCC patients. Except for MALAT1, our experimental data showed concordance with the TCGA analysis. Expression of HOTAIR in OSCC tumors was positively correlated with tumor volume, whereas MALAT1 and H19 negatively correlated with the smoking status of patients.

Keywords: H19; long non-coding RNAs; oral cancer; oral squamous cell carcinoma; TCGA analysis

I. Introduction

Head and neck cancer (HNC) is the sixth most common cancer in the world. HNC arises in the oral cavity, pharynx, larynx, paranasal cavity, nasal cavity and salivary glands (Bray *et al.* 2018). As per GLOBOCON 2018 data, the age-standardized rate per 100,000 for cancer of the lip and oral cavity in males is twice in developing countries compared to developed countries (Bray *et al.* 2018). The majority of oral cavity, oropharyngeal, hypopharyngeal and laryngeal cancers are squamous cell carcinoma (SCC) in histology and are referred to as oral squamous cell carcinoma

(OSCC). OSCC is the most common cancer in Indian men, accounting for one-sixth of all cancers (Mallath *et al.* 2014). The global incidence of OSCC is more than 350,000 (Bray *et al.* 2018), out of which approximately one-fourth of the cases are contributed by South-central Asia (Mallath *et al.* 2014). Rapid advances in diagnosis, early management protocols, and widespread availability of prognostic markers have not increased the 5-year survival rate. Depending on the tumor site and Tumor Node Metastasis (TNM) staging at the time of diagnosis, the average 5-year survival rate for OSCC patients is between 40% to 50% (www.cancer.org). A study from northern India has

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Valorization of Catla Visceral Waste by Obtaining Industrially Important Enzyme: Trypsin



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Abstract:

The fish visceral waste is currently posing a major problem to fisheries and environment sustainability. India has generated fish waste around 50% of the production in the year 2015–16. The indiscriminate practices of waste disposal cause physical and ecological imbalances in the ecosystem. Hence, its management has become very important. The visceral organs are known sources of biologically active compounds; therefore, value-added products can be recovered. The present study focused on isolation of visceral protease of popular fish species, *Catla catla*. The proteins were precipitated using various precipitating agents among which cold acetone was found best (352.9 mg ml⁻¹ protein). The kinetic study of the enzyme was performed using BAPNA substrate and enzyme activity (15.54 U ml⁻¹, Km (2.47 mM) and Kmax (0.40 μM·min⁻¹) were calculated. The molecular weight of the protease was 24 kDa, optimum pH was 8.5, and optimum temperature was 40°C. The enzyme was found 19.3% similar with mammalian (bovine) trypsin. Henceforth, the enzyme may be thought to solve the fish visceral waste problem with an ecological approach.

Keywords: Fish visceral waste; Protease; Trypsin; Enzyme kinetics; Litewave®-Burke slot; SDS-PAGE

Abbreviations: BSE: Bovine Spongiform Encephalopathy; BSA: Bovine Serum Albumin; TIC: Total Ion Current Chromatogram

Introduction:

Trypsin (EC 3.4.21.4) a serine peptidase, is prevalent throughout the animal kingdom. It digests the proteins and peptides by attacking at the Lys and Arg residues from their C-terminal end. It is synthesized as trypsinogen, as an inactive form by the pancreas into the intestine where it activates other intestinal enzymes along with itself Kanno [1]. The catalytic triad of trypsin is made up of Ser, His and Asp and has a negative charged pocket to recognize positive charged residue of substrate. Thus, Arginine derivatives are used as substrates to study trypsin activity. So far, many mammalian trypsin has been studied, but fish trypsin possesses a high catalytic activity even at low temperature. This unique property makes their applicability in many industries and biotechnology Virtur dos Santos [2]. Moreover, fish visceral waste can be valorized optimally by obtaining visceral protease trypsin Aissaoui [3]. The economic importance of waste derived trypsin can be assessed by the fact that the waste can be utilized in a cost-effective manner Das et al. [4]. According to Kundhlan & Benjakul fish visceral waste produced upon processing of fish comprises around 20–30% of the fish weight.

Fish trypsin from diverse habitats has been isolated including marine, freshwater and gulf. Wang et al. [5] have purified and

characterized trypsin from tilapia (*Oreochromis niloticus* L. O. auratus). Trypsin exclusively from fish waste has been isolated by Jellouli et al. [6]; Silva et al. [7]; Umajak et al. [8]; Costa et al. [9]; Blanco et al. [10]; Xhandagale et al. [11]. The application of fish waste-derived trypsin in industries demands its compatibility with commercial (bovine) trypsin. This existing source carries a high risk of bovine spongiform encephalopathy (BSE). In this context, fish waste-derived trypsin can prove to be a safer alternative. Thus, scientists compare trypsin from different sources on the basis of activity, amino acid sequence and structure Toyota et al. [12]. The present study focused upon isolating and purifying trypsin from visceral waste of freshwater fish *Catla catla*, one of the most preferred Indian major carps. The purified enzyme was characterized by studying enzyme kinetics and measuring kinetic parameters. Also assessment of its potential industrial application was done using a high throughput proteomic technique O-HPLC/MS. This is a 'bottom-up' approach, used to identify the MS spectra of the peptides by generating a sequence coverage map. Based upon this map, the similarity with commercial trypsin was established. Besides, using bioinformatics tool, BLAST, similarity with other fish trypsin was also recognized.

Research Article

SCREENING OF POTENTIAL POLYHYDROXYALKANOATE (PHA) PRODUCERS ISOLATED FROM WASTE DUMPING SITE OF BHOPAL (M.P.), INDIA

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ABSTRACT

The excessive use of mineral based polymeric plastics have caused major problem regarding waste generation that causes environment pollution due to its recalcitrant property. The major use of these xenobiotic synthetic polymers is due to its versatile nature such as moulding ability, durability, and varied strength, low cost of production has made its way to almost irreplaceable commodity for humans and is employed in every facet of human activity ranging from small gimmicks to large heavy duty machines. The need of the hour is to find a replacement to these synthetic polymers that show similar properties as conventional polymers and plastics with an exception of being degradable. Scientists and researchers are constantly trying to find a replacement that are bio-based and one such polymer is polyhydroxyalkanoates or PHAs which alleles mimic the qualities as shown by synthetic mineral based polymers. The current aim of this research was to identify the mineral oil degraders isolated from waste dumping site followed by screening of potential petrol degrading bacteria using Bushnell and Haw media to determine whether they can degrade petrol. Out of 20 isolates only 6 isolates grew on Bushnell and Haw which were then subjected to screening for PHA. Out of these bio-augmenters only P19 was found positive for PHA production.

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INTRODUCTION

With the advent of synthetic mineral based polymers generally termed plastics has taken over the human lives due to its versatile properties and has created a revolution. Plastics are employed in various packaging and manufacturing industries. It is used in various areas such as in building vehicles for transportation including aerospace development, building of small sockets of machineries and electronic appliances to home utilities and even in manufacturing of toys for children, plastic has single handily monopolized the entire industry's due to their unique qualities such as durability, mouldable nature, light weight and long lasting capacities as a result of its recalcitrant properties that make them high in demand. But being recalcitrant has its downside as it creates wastes that cannot be decomposed easily and hence harm the environment in the long run. The mass dumping of plastic wastes in soil and results in serious problem of pollution due to its xenobiotic nature. Thus there is a need to replace these synthetic, non-biodegradable and non-renewable polymers with a biodegradable and renewable polymer which show similar properties as mineral based polymers except being recalcitrant as polymers such as polythene, polycarbonate, PVCs etc. One such natural polymer is polyhydroxyalkanoate (PHA) that show such promise due to

its versatility similar to polythene but being a natural polymer yielded by biological sources like microorganisms(algae, bacteria, fungi), plants and animals are biodegradable [2-4].

Polyhydroxyalkanoates are storage lipids(intracellular fat bodies) stored as a reserve material in various organisms and are produced in time of stress conditions and excess of carbon source in bacteria while others produce PHA without any growth limiting conditions.[7,11,18] A wide variety of bacterial sources that are either Gram positives or Gram negatives are capable of producing polyhydroxyalkanoates some such bacteria that have been studied are *Bacillus*, *Acinetobacter*, *Ralstonia*, *Pseudomonas*, *Escherichia*, etc.[5,19] PHA consists of monomeric unit of 3-hydroxy fatty acids which are linearly arranged structure present in the polymeric structure, it has been reported that almost more than 450 types of PHAs have been identified as of now and the size, type and quantity of polymer produced depends upon various factors such as type of organism, nutrient provided, carbon sources and induction of stress condition if any along with growth period and extraction method utilized. All of these factors affect the properties, length, structure and physicochemical properties of the PHA produced[6]. The varieties and dynamic properties of PHA has made it a unique and potential replacement as its

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Antagonistic Efficiency of Indigenous Rhizospheric Bacteria against *Macrophomina phaseolina* causing Charcoal Rot in Soybean

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ABSTRACT

Charcoal rot caused by *Macrophomina phaseolina* (Tassi) Gold. is one of the economically important diseases of soybean. 30-50% yield losses in soybean have been reported due to charcoal rot worldwide. Being a devastating disease, its management is of utmost concern for sustainable crop production. Chemical fungicides are neither ecofriendly nor safe for other life forms. Biological control is safe, economically and environmentally friendly approach to combat plant diseases. The present study aimed at isolating indigenous bacteria from soybean rhizosphere and evaluate their antagonistic activity against *M. phaseolina* by dual- culture technique. 20 bacterial isolates were able to inhibit *M. phaseolina* in vitro. Isolate IKK7 and IOK16 exhibited strong inhibition (40.15% and 39.43%) while isolate ISKK64 moderately inhibited the fungus (28.79%) respectively. Potential isolates were identified on the basis of morphological and biochemical characters. The isolates IKK7 and IOK16 were gram positive rods and biochemical characters revealed that IKK7 and IOK16 belong to *Bacillus* species. The isolate ISKK64 was identified as *Serratia* species. These isolates have the potential to be used as biocontrol agents against *Macrophomina phaseolina*. Bioformulations utilizing the biocontrol traits can be developed for management of charcoal rot in soybean and other crops; thereby increasing crop productivity.

Key words: *Macrophomina phaseolina*, Charcoal rot, Biological control, Biofungicide, Bioformulations

Soybean *Glycine max* (L.) Merrill is an important oil yielding crop worldwide, known as the "Golden Bean" of the 21st century [1]. It is a leguminous crop with high quality protein and oil content. It is majorly produced in USA, Brazil, India, Argentina and China. Its production ranks first among the oil seed crops in India. Madhya Pradesh is the largest soybean producing state in India named as Soya State. As per the reports of Directorate of Economics and Statistics, DAC and FW the area under cultivation of soybean in Madhya Pradesh was 5.4 million hectare with a production of 6.65 million tons (2016-2017). In present times, the major source of income for farmers is soybean having 95% marketable surplus. The low productivity of soybean is attributed to its susceptibility to various pathogens causing serious damages.

One of the major pathogen affecting its yield is *Macrophomina phaseolina* which causes charcoal rot in soybean. *Macrophomina phaseolina* (Tassi) Gold. is devastating fungus infecting many agronomically important crops viz. soybean, maize, sorghum and cotton [2]. It is a soil

borne pathogen and infects the crop mainly due to moisture stress [3]. The yield loss in soybean crop due to *Macrophomina phaseolina* was reported between 30 to 40% by [4]. *M. phaseolina* being soil inhabitant remains in the soil as sclerotia for prolonged period of time causing infection under adverse conditions [5-7]. It infects soybean plant during vegetative developmental stages. Microsclerotia germinate at a temperature of 20-40°C and infect the plant. Soybean roots get infected early in the season then fungus systematically colonizes the root system and basal stem [8]. Microsclerotia are scattered throughout the tap roots and lower stem giving them charcoal like gray discoloration. Infected plants may wilt and prematurely die with dead leaves remaining attached to the petioles.

Management of charcoal rot is difficult due to saprophytic nature of *Macrophomina phaseolina*. Since it is soil borne pathogen and its propagules are distributed randomly in soil, it is difficult to be controlled by chemical fungicides [9]. Fungicides are expensive, harmful to beneficial microflora of the soil, toxic to humans and animals and cause pollution; their use is not an effective strategy to control fungal pathogens. Biological control proves to be a promising control measure for management of disease. Biocontrol involves the use of beneficial microflora bacteria, fungi and actinomycetes to suppress plant diseases. Rhizosphere provides the initial barrier to the root against pathogen attack; microbes in the rhizosphere are ideal for use as biocontrol

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(REVIEW ARTICLE)

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Review on drug delivery system for phytomedicine through mechanism of encapsulation

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Abstract

Natural products have limitation in the bioavailability of active components because of numbers of reasons which includes poor solubility of the ingredient, poor stability due to gastric and colonic acidity, poor metabolism by the effect of gut microflora, poor absorption across the intestinal wall, poor active efflux mechanism and first-pass metabolic effects these factors make the failure of clinical trials and efficacy of natural phytochemicals used for human consumption both in cell culture and preclinical animal model systems is distinctly addressed by various researchers. Over the past decades, extraordinary advances have been made successfully on the development of novel drug delivery systems for encapsulation of plant active metabolites including organic, inorganic and hybrid nanoparticles. Various nanosystems and advanced biotechnology systems have been introduced to improve the therapeutic efficacy, safety and market appeal of nutraceuticals and phytochemicals including liposomes, polymeric micelles, nanoparticles, and phytosomes. The advanced formulas are confirmed to have extraordinary benefits over conventional and previously used systems in the manner of solubility, bioavailability, toxicity, pharmacological activity, stability, distribution, sustained delivery, and both physical and chemical degradation.

Keywords: Nano-medicine; Phytomedicine; Biomedical application; Nutraceuticals; Drug delivery system

1. Introduction

From the literature it is evident that herbal drugs show their pharmacological action either due to specific constituent or due to combination of constituents. Various ecological factors as well as the time of collection of plant material play crucial role on concentration of phytochemicals which may varies in batch to batch and directly induce affect on pharmacological response of that particular batch of drug. Best response can be obtained only if phytochemicals are available in concentration ranges within the therapeutic range of that particular molecule. Any fluctuations above or below the therapeutic concentration lead to either toxic effects or no response. So the titration of dose as well as the determination of dose is necessary. To overcome such cases and to enhance the efficacy of the herbal drug Novel Drug Delivery System (NDDS) play important role, which is a unique blend of various branches of science such as polymer technology, pharmaceuticals, immunology, molecular biology, etc. The various novel herbal formulations like polymeric nanoparticles, nanocapsules, liposomes, phytosomes, nanoemulsions, microsphere, transferosomes, and ethosomes has been reported using bioactive phytoconstituents and plant extracts [2]. The novel formulations are reported to have remarkable advantages over conventional formulations of phytochemicals and extracts which include enhancement of solubility, bioavailability, protection from toxicity, enhancement of pharmacological activity, enhancement of stability, improved tissue macrophages distribution, sustained delivery, and also provide protection from physical and chemical degradation of active phytoconstituent [4].

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Formulation and evaluation of antibacterial efficiency of nanoparticles of *Tinospora cordifolia*

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Abstract

The green synthesis of nanoparticles by using a plant extract is safe and effective way to increase the efficiency and potency of phytochemicals. Silver has been used since ancient time due to its potent antimicrobial effect and now it is recognized as a nontoxic and safe for human beings. Silver nanoparticles have attracted keen interest due to its specific size ranges 1-100 nm and its unique physical, chemical and biological properties. Out of three methods of preparation biological method are cheap, reliable, safe and nontoxic over physical and chemical methods. Green synthesis technique is a promising approach for synthesis of silver nanoparticles showing antimicrobial effect as it not uses any toxic chemicals and specific higher temperature and pressure. Antimicrobial resistance is, thus, one of the major threat to human health, since it determines an increase of morbidity and mortality as a consequence of the most common bacterial disease. In present study nanoparticles were prepared from *Tinospora cordifolia* aqueous and ethanolic extract and tested for antibacterial potency against various multidrug resistant bacterial isolates.

Key Words: *Tinospora cordifolia*, antibacterial, nanoparticle, targeting, potential

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1. Introduction

Color greenish yellow, bloom time December, February height – 0.5 to 3 ft. difficulty leaves easy to grow, water medium sunlight full sun to partial shade temperature 28 °C, is required for proper growth and propagation(Gitanjali, 2020). *Tinospora cordifolia* is a glabrous, suckles woody climbing shrub native to India. It thrives well in the tropical region often attain a great height and climbs up the trunk of large trees. The stem is gray and creamy white, deeply cleft spirally and longitudinally, with the space between spotted with large rosette like lenticels. The wood is white, soft and porous and the freshly cut surface assumes a yellow tint when exposed to air leaves are simple, alternate, estipulate long petiolate, chordate in shape showing multicellular reticulate venation(Joshi et. al, 2016). Kingdom: plantae, Order- Ranunculales, Family – menispermaceae, Genus- *tinospora*, Species – *T. cordifolia*, Clade- Angiosperms, Binomial name- *Tinospora cordifolia*.

II. Material And Method

Maintenance of bacterial culture

Pure culture of *Klebsiella pneumoniae*, *Staphylococcus aureus*, *Clostridium perfringens* and *Citrobacter freundii* were obtained from Department of Biotechnology of Barkatullah University.



Fig-1: Plant of *Tinospora cordifolia* (original)

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Novel sulphur-oxidizing bacteria consuming sulphur deficiency in oil seed crop

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Dave²

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Abstract

Plants absorb sulphate, the oxidized form of elemental sulphur (S⁰), from soil. Sulphur-oxidizing bacteria play a key role in transformation of sulphur in soil. Oil seed crops require high amount of sulphur and it plays an important role in the formation of proteins, vitamins and enzymes. It increases yield, oil content and protein content in oil seed crops. Sulphur is the important constituent of amino acids, viz. methionine, cystine, and cysteine. It necessitates various enzymatic, metabolic processes such as photosynthesis and nitrogen fixation. In the last few years, the prominence of sulphur in oil seed crop nutrition has been accepted as widespread occurrence of its inadequacy in agricultural soil. Approximately 41% of Indian soil is deficient in sulphur. The soil microbial population is the major

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Green synthesis and characterisation of Indium Tin oxide nanoparticles using toddy palm from *Borassus flabellifer*

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ABSTRACT

In the present study, the green fabrication of Indium Tin oxide bimetallic nanoparticles using toddy palm from *Borassus flabellifer* was studied. The precursors used were for the fabrication of Indium-tin oxide nanoparticles were Indium acetylacetone and Tin Bis (acetylacetone) dichloride and Toddyl palm from the plant *Borassus flabellifer*. The particles were characterized by UV-Vis, SEM-EDAX, FTIR and XRD. It was found that the obtained nanoparticles reached the size of 16 nm. The synthesized nanoparticles were found to have spherical shape when observed under Scanning Electron Microscopy. The study shows a novel method of fabrication of bimetallic Indium Tin oxide nanoparticles using toddy palm which is a biologically mediated synthesis.

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1. Introduction

In recent time's generation of nanoparticles by green biological methods have generated more interest as the synthesis is eco-friendly, simple, economic, non-toxic and preferable to other techniques. Nanoparticles are generated by various approaches like chemical, physical and biological methods but biological methods are more advantageous when compared to other kinds of methods which are not ecofriendly or energy intensive [1]. The Fabrication of Nanoparticles have been reported to have toxic effects on human health, [2]. Biopolymers and extracts from plants are abundant and can be used for this purpose [3]. Since nanoparticles have "large surface area to volume ratio", the size and morphology are an important factor which determines the fabrication of the devices [4,6]. ITO (Indium tin oxide) has been widely used in solar cells and many display devices [5,7]. Nanomaterials are found to have varied applications [8]. Due to this factor environment friendly synthesis of nanomaterials has been given a high priority [9–11] due to advantages over other methods which are mostly physical or chemical. There is a lot of literature which has been reported regarding the synthesis of nanomaterials using biological methods [12,13]. Synthesis of bimetallic nanomaterials has

garnered good attention as the combined activity of both the nano-sized materials would be superior when compared to using only monometallic nanoparticles [14]. In the field of medical science, "the synthesized Au-Ag and Ag-Se bimetallic nanoparticles" have shown good activity against cancers and other diseases [15]. Due to their "high surface area to volume ratio", they are used for drug delivery to any specific location of the body [16]. These nanoparticles are also demonstrated to have good antimicrobial and antitumor activity [17]. More research is required to optimize and produce bimetallic nanoparticles using biological methods [18]. In the present study, we have reported the facile synthesis of Indium Tin oxide Nano composite using Indium acetylacetone and Tin Bis acetylacetone dichloride by toddy palm. Using toddy palm as a cheap precursor for the current simple method provides high yield nanosized material with well crystal structure and better optical properties. The metal oxide nanoparticles formation has been characterized by various physical techniques such as SEM-EDAX, UV-Vis spectroscopy, XRD and FT-IR.

2. Materials and methods

In the present investigation, Indium Tin oxide (ITO) nanometal oxides were synthesized by using toddy palm of the plant *Borassus flabellifer*. The toddy palm was obtained from the *Borassus flabellifer* palm "near Mahatma Gandhi University, Nalgonda, Telangana,

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Microscopic techniques for characterisation of nanomaterials: A minireview

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ABSTRACT

Microscopy methods have been around for decades. Since the samples being tested are becoming smaller and smaller, the field is evolving. This is true as nanomaterials have made their way into many fields of research. The techniques such as Transmission Electron Microscopy, Scanning Electron Microscopy and Scanning probe microscopy (SPM) have become indispensable techniques for characterizing nanomaterials. Helium ion microscopic technique can also be used as a complimentary technique along with other methods of characterisation. Microscopic methods can be used as the main tools for studying the synthesis and application of nanomaterials. In the present communication, the different types of microscopic techniques which are being used for the study of nanomaterials are discussed.

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Selection and peer-review under responsibility of the scientific committee of the International Conference on Futuristic Research in Engineering Smart Materials.

1. Introduction

Nanomaterials are being used for the past thirty years due to their applications in different types of industries. These materials at nano-sizes show different characteristics due to their "large surface-to-volume (S/V) ratio" [1]. For understanding the properties of nano materials, use of several methods and techniques are required. For better decisions to be made there is still a need for testing methods which can accurately measure the levels of nanoparticles. Since the sizes of the particles are very small, development of new techniques is the need of the hour. The limitation of analysis includes absence of reference materials, difficulties in sample preparation and the interpretation of the data. The techniques of nanoscale imaging include Electron Microscopy (EM), High resolution optical microscopy and Scanning probe microscopy (SPM). Optical microscopes cannot observe materials having a dimension less than 100 nm. Scanning helium-ion microscopy (HIM) is a strong imaging technology with sub-nanometer resolution that can reveal some of biology's nanosized structures. The HIM has significant advantages such as higher surface sensitivity, a broader depth of field, lower cost and enabling imaging of non-conductive samples, rendering HIM a promising high-resolution

imaging technique for biological samples. In physics and materials research, the helium-ion microscope (HIM) has become a well-established instrument for nanoscale imaging and nanoscale production. It combines high-resolution imaging of insulating material with nanoscale milling capabilities in a single device. The use of heavier ion species, such as Ne or G, can also improve milling efficiency. Despite many research reports on the utilization of the different microscopic techniques for nanomaterial characterisation, there are few updated reviews are available on nanomaterial characterisation using microscopic techniques. Diverse microscopic techniques for nanomaterial characterisation techniques are classified as per the idea of the method used, the data that can be generated for the nanomaterials. Explanation of the major uniqueness of the methods and their function are presented. Hence, the main aim of this review is to sum up the present understanding on the application, advances, advantages and disadvantages of large microscopic techniques that are available for the characterization of nanomaterials.

2. Electron Microscopy

The electron microscope uses an electron beam to form the image of a sample. The path of the electron is controlled by the use of electrostatic or electromagnetic lenses. It can also be used to direct the interpretation of findings from other techniques [2,3].

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ORIGINAL RESEARCH PAPER

Pharmaceutical

FORMULATION AND EVALUATION OF NANOPARTICLES WITH NEURO PROTECTIVE CHEMICALS OF NATURAL AND SYNTHETIC ORIGIN.

KEY WORDS: Nanoparticles, Phytoconstituents, Biodegradable, Targeting

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ABSTRACT Most of the active phytoconstituents under development are poorly water soluble or have poor bioavailability. Nanotechnology is an approach to overcome the challenges of conventional drug delivery systems and limitations of phytochemicals. Solid Lipid nanoparticles show interesting features concerning therapeutic purposes. The main advantage is that they are prepared with physiologically well-tolerated lipids. Solid Lipid Nanoparticles (SLNs) as novel lipid based nanocarriers with size range between 10 to 1000nm, SLNs were introduced to overcome problems of polymeric nanoparticles. In present research formulation and evaluation of nanoparticles with ethanol extract of two plants *Celastrus paniculatus* and *Sarcopa monnierii*, along with Donepezil as a standard drug was undertaken here for the production methods for preparation of SLNs, and pharmaceutical approach of SLNs in drug delivery. The focus of nanoparticle design over the years has evolved toward more complex nanoscopic core-shell architecture using a single delivery system to combine multiple functionalities within nanoparticles which combine the mechanical advantages of biodegradable polymeric nanoparticles and biomimetic advantages of liposomes, have emerged as a robust and promising delivery platform.

Solid liquid nanoparticles having plant extracts were successfully formulated and characterized for their stability. A biodegradable polymeric core is surrounded by a shell composed of layer(s) of phospholipids. This architecture can provide advantages such as controllable particle size, surface functionality, high drug loading, entrapment of multiple therapeutic agents, drug release profile, and good serum stability of phytochemicals.

INTRODUCTION

Solid lipid nanoparticles are at the forefront of the rapidly developing field of nanotechnology with several potential applications in drug delivery, clinical medicine and research, as well as in other varied sciences (Thevenot et al., 2007). Due to their unique size-dependent properties, lipid nanoparticles offer the possibility to develop new therapeutics. The ability to incorporate drugs into nanocarriers offers a new prototype in drug delivery that could be used for secondary and tertiary levels of drug targeting (Thevenot et al., 2008). Hence, solid lipid nanoparticles hold great promise for reaching the goal of controlled and site specific drug delivery and hence have attracted wide attention of researchers. It is a novel approach to prepare SLN, which has following advantages over other production methods like use of pharmacologically acceptable organic solvent, easy handling and fast production process without technically sophisticated equipment. It is based on lipid precipitation from the dissolved lipid in solution. For the production of nanoparticle dispersions by precipitation in o/w emulsions the lipophilic material is dissolved in water-immiscible organic solvent that is emulsified in an aqueous phase (Li et al., 2010). Upon evaporation of the solvent nanoparticle dispersion is formed by precipitation of the lipid in the aqueous medium. cholesterol acetate as model drug and lecithin/sodium glycocholate blend as emulsifier.

MATERIAL AND METHOD**Preparation of solid lipid nano particles using solvent injection method**

In this technique the solid lipid was dissolved in water-miscible solvent (e.g. ethanol, acetone, isopropanol) or a water miscible solvent mixture. Then this lipid solvent mixture was injected through an injection needle into stirred aqueous phase with or without surfactant.

Formulation of drug loaded solid lipid nanoparticles

Solid lipid nanoparticles were prepared by using solvent injection technique using ethanol as organic solvent for nanoformulation ethanol extract of *Celastrus paniculatus* and *Sarcopa monnierii* was selected and for standard drug

Donepezil was selected. Soya lecithin, drug and stearic acid is dissolved in the ethanol in definite ratio and warmed to 70°C. To the phosphate buffer solution (pH 7.4) a definite amount of tween 80 is added to prepare aqueous phase and kept for stirring which is maintained at 70°C. The organic phase was added drop wise with stirring to the pre-warmed aqueous solution with the help of hypodermic needle. The mixture was then sonicated (Ultrasonicator, Bath type, Electronic India) for varying time to obtain nanoparticles. The optimum parameters i.e. tween 80 concentrations in definite ratio and maximum sonication time resulted in maximum entrapment efficiency and controlled release were used for the preparation of SLN using similar method. Twelve formulations were prepared by using different concentrations of tween 80 and sonication time to determine the effect of surfactant and sonication time on the potency of the SLNs.

Effect of formulation process variables

The effect of formulation variables such as Amount of Soya lecithin, stearic acid, Tween 80, Sonication time on the particle size was studied. From the results obtained, optimum level of those variables was selected and kept constant in the subsequent evaluations. However, molecular dispersion of the drug in the stearic acid matrix led to a reduction in the crystallinity of stearic acid.

Evaluation of Prepared Solid Lipid nanoparticles**Differential scanning calorimeter**

Thermograms were recorded using a differential scanning calorimeter. Samples (5-10mg) were weighed and hermetically sealed in flat bottomed aluminium pans. These samples were heated over a temperature range of 50-400°C in an atmosphere of nitrogen (200ml/min) at a constant rate of 10°C per minute, with alumina being the reference standard.

FTIR Spectra of prepared formulation:

IR spectra of physical mixture of drug and excipients were recorded by KBr method using Fourier Transform Infrared Spectrophotometer. A base line correction was made using dried potassium bromide pellet. The potassium bromide-drug pellet of approximately 1 mm diameter was prepared by grinding 3-8 mg of physical mixture of drug-excipients with



Formulation and Characterization of bi-metallic nanoparticles of *Musa paradisiaca* pulp and peel for antibacterial potency .

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ABSTRACT

Metal nanoparticles possess large surface energy; hence have the ability to absorb small molecules. Smaller nanoparticles containing 10^4 or less atoms are referred as to nanoclusters. Metal nanoclusters are complicated in their bonding. Metals can be used for the preparation of nanoparticles can be used as the delivery system like: Na, K, Mg, Zn, Cu, Fe, Mn, Au, Ag, Co etc. The biosynthesis of inorganic nanoparticles including metallic nanoparticles, sulfide nanoparticles, oxide nanoparticles and other typical nanoparticles. The application of biosynthesized nanoparticle in wide spectrum of potential areas is presented including targeted drug delivery system, cancer treatment, gene therapy. Nanocarriers with optimized physicochemical and biological properties are taken up by cells more easily than larger molecules, so they can be successfully used as drug delivery tools for currently available bioactive natural molecules. The decreased particles size approx 1-100 nm in nanoscaled; they are used in drug delivery system as a carrier for the various molecules (synthetic as well as natural). In present study bimetallic nanoparticles using bimetallic salts and pulp and peel *Musa paradisiaca* were prepared and evaluated for antibacterial potency against drug resistant bacterial population. Results indicates the potency of these bimetallic nanoparticles against the selected isolates.

KEY WORDS: Bimetallic, Nanoparticles, Antibacterial, Drug resistance

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I. INTRODUCTION

Musa paradisiaca (banana) selected due to the presence of various phytoconstituents and high nutritive value .Leucocyanidin, quercetin, 3-O-glucoside, sitosterol gentiobioside, and sitosterol myo-inositol-β-D-glucoside have been isolated from fruit pulp. Bimetallic nanoparticle using phytochemicals can be exploited for antibacterial potency (Mittal et al,2013). Catecholamine such as norepinephrine serotonin, dopamine, tryptophan, indole compounds and pectin were reported in fruit pulp of banana (Anhwange,2008). Yin et al., 2008 was studied the effect of banana in human and found that significantly reduced of plasma oxidative stress, this effect may be due to the presence of dopamine, ascorbic acid and other antioxidants present in banana. Banana fruit showed good antibacterial activity against *Staphylococcus aureus*, *Bacillus subtilis*, *Shigella dysenteriae*, *Salmonella paratyphi*, and *Escherichia coli* (Ahmad and Beg, 2001).

II. MATERIAL AND METHOD

Fabrication of Zinc and Copper Nanoparticles from banana pulp

Musa paradisiaca fruit collected from local market then fruit pulp was collected in vessel (beaker) and eight was measured. Copper (30 mg) and Zinc (30 mg) were added in form of salt to the pulp (60 g) followed addition of 60 ml of phosphate buffer saline solution (PBS) to the mixture. Mixture was kept on magnetic stirrer for 12-13 hrs continuously with mild heating upto 30-40°C (Kanchana et al,2018).



Fig.1: Fruit of *Musa paradisiaca*

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Research Article

MICRO-REMEDIATION: AN INTEGRATED ECO-SUSTAINABLE APPROACH FOR ORGANIC WASTE MANAGEMENT

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Micro-remediation, consortia, detoxification, humification, mineralization.

ABSTRACT

The world is facing an existential threat due to industrialization and urbanization resulting in simultaneous contamination. Immense dependency on harsh chemicals and secondary waste disposal problems have limited the use of both physical and chemical remediation strategies against numerous contaminants for sustainable mitigation of innumerable polluting agents. Therefore, there is a constant search for green technologies to treat a wide range pollutants and dire necessity of the modern world. Micro-remediation is a growingly favoured alternative to traditional methods for treating polluting agents with the prospect of degrading contaminants where microbial consortia of different microbial strains can remediate different mixture of pollutants. Diverse biotechnological mechanisms leads to target pollutants desiccation, mineralization, humification or partial transformation. Since to remove the contaminants, microbial degradation is the major route, therefore screening of ideal microbial consortia to remove the mixture of pollutants is a novel means of micro-remediation process.

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INTRODUCTION

The issues related to environmental problems have a global impact and became one of the priority subjects for scientific, political, economic, and ethical discussions all over the world in recent years. The intensification of manufacturing industries and agriculture has led to the pollution of the environment with xenobiotic compounds. Organic (hydrocarbons, dyes, pesticides, etc.) and inorganic (heavy metals) hazardous compounds are the main polluting agents. Even with the extensive efforts that have been made over the recent years to clean up polluted sites, the global issue of the environmental pollution is still pervasive, and has led to international efforts for the remediation efforts either by restoration or cleaning up of the contaminated sites. It remains a difficult issue even though a number of approaches have been used to mitigate this problem. Researchers are attempting to find new sustainable ways of removing pollutants as interest in the microbial remediation has increased in recent years [1,2]. Micro-remediation is the use of living microorganisms for the reduction or removal of organic or inorganic wastes to innocuous state. Therefore, for the reduction of the toxicity of the contaminants (either by transforming, immobilizing, degrading), the usability of various living organisms such as bacteria, algae, fungi etc. in the more eco-friendly and sustainable approach.

Need of Bioremediation

Over the recent years, various physical, chemical or combination of both the techniques (precipitation, flotation, solvent extraction, oxidation, membrane filtration) have been used to decontaminate the polluted sites [3-5].

Each treatment has limited approach due to the various factors such as feasibility, practicability, sludge production, pre-treatment requirements, reliability, toxic by-products, cost [4,6]. Therefore, economical and feasible new alternatives to these techniques are currently the topic of concern and research.

Micro-remediation is one such alternative option that uses biological activity of the microbes to destroy or transform into harmless contaminants. Due to low cost, high efficiency, minimization of sludge production and low technological techniques, it has found high public acceptance [7]. The ability of the microbes to grow and metabolize using pollutants is one of the major advantages as compared to conventional techniques.

Bioremediation Techniques

Bioremediation techniques are broadly classified as: *ex situ* or *in situ* depending on the site of action as shown in fig 1. Different factors such as the degree of the pollution, cost, feasibility, environmental impact, location, etc. influences the

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Book Chapters

1. Ramchander Merugu ,Pallav Kaushik Deshpande, Rahul Kumar, Ragini Gothwal ,Swati Mohapatra. Sustainable Production of Hydrogen by Algae: Current Status and Future Perspectives Perspectives "Clean Energy prod. Technologies, Manish Srivastava et al.(Eds): New Insight into Bioenergy Research Volume-I,978-981-33-4610-9, 505641_1_En,
2. Ramchander Merugu ,Pallav Kaushik Deshpande, Rahul Kumar, Ragini Gothwal ,Swati Mohapatra M. Mukunda Vani .Bioprocess Parameters for Thermophilic and Mesophilic Biogas Production: Recent Trends and Challenges "Clean Energy prod. Technologies, Manish Srivastava et al.(Eds): New Insight into Bioenergy Research Volume-I,978-981-33-4610-9, 505641_1_En,
3. Ramchander Merugu, Ragini Gothwal, S. Girisham, S. M. Reddy . Bacterial Hydrogen Production: Prospects and Challenges Bioenergy Research: Biomass Waste to Energy , Manish Srivastava et al(Eds) Clean Energy Production Technologies ISBN 978-981-16-1861-1 ISBN 978-981-16-1862-8 (eBook)<https://doi.org/10.1007/978-981-16-1862-8>
4. Prashant Kumar Sharma ,Ragini Gothwal .Changes in perceptions derived from research on *Trichoderma* Species.Microbial services in Restoration Ecology,Edited by Jay Shankar Singh and Shobit Raj Vimal. Elsevier .<https://doi.org/10.1016/B978-0-12-819978-7.00012-9>

Chapter 7

Sustainable Production of Hydrogen by Algae: Current Status and Future Perspectives



Rabul Kumar, Ragini Gothalwal, Swati Mohapatra,
Pallav Kaushik Deshpande, and Ramchander Merugu

Abstract With energy costs reaching historical highs, biohydrogen as an alternate fuel is progressively attracting attention. Production of gas from algae is being thought of as an alternate to other forms of fuels. However, industrial production of biohydrogen remains not practically possible as a result of low biomass concentration and expensive downstreaming processes. Biohydrogen is a zero-emission fuel and is an alternate to conventional fossil fuels. Nowadays, photobioreactors and outdoor systems are being used for gas production from algae. Numerous factors affect the production of hydrogen. These factors need to be optimized for enhancing algal biohydrogen. Significance and challenges of algal hydrogen production are discussed in this communication.

Keywords Algae · Immobilization · Bioreactors · Microalgae · Macroalgae · Biomass · Biohydrogen · Sustainability

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Chapter 8

Bioprocess Parameters for Thermophilic and Mesophilic Biogas Production: Recent Trends and Challenges



Rahul Kumar, Uttam Kumar Neerudu, Ragini Gothalwal, Swati Mohapatra, Pallav Kaushik Deshpande, M. Mukunda Vani, and Ramchander Merugu

Abstract The latest advancements in technology have led to the progress in designing more efficient anaerobic digestion (AD) systems which have incorporated modifications such as feedstock pretreatment methods, bioprocess improvements, techno-economic gas upgrading, and superior digester designs among others. The different types of feedstocks being used, the mechanism of biogas production, the operation of a biogas plant, and the different types of digesters used for anaerobic digestion are explained. The various process parameters like pH, temperature, electrical conductivity, etc. are also discussed. Challenges in anaerobic digestion along with the advantages and disadvantages of biogas generation are deliberated. Further, the microbial population involved in various stages of process is presented. In this chapter, the existing state of biogas technology highlights the latest advancements in its applications as well as production.

Keywords Biogas · Anaerobic digestion · Feedstock · Mechanisms · Process parameters

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Bacterial Hydrogen Production: Prospects and Challenges

8

Ramchander Merugu, Ragini Gothwal, S. Girisham, and S. M. Reddy

Abstract

Hydrogen is extensively thought of as the most hopeful fuel of the future. At present, most of it is generated from the nonrenewable fuels. Biological hydrogen production has several advantages over hydrogen production by other processes. Biological hydrogen production requires the use of a simple solar reactor such as a transparent closed box, with low energy requirements while electrochemical hydrogen production via solar-battery-based water splitting requires high energy. Microbial hydrogen production especially bacterial hydrogen production by mesophilic, thermophilic and phototrophic production has been described in this chapter.

Keywords

Hydrogen - Mesophilic - Thermophilic - Phototrophic bacteria - Bioreactors - Prospects

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CHAPTER 12

Changes in Perceptions Derived From Research on *Trichoderma* Species

PRASHANT KUMAR SHARMA • RAGINI GOTHALWAL

12.1 INTRODUCTION

A large number of crop pests cause about 40% reduction in the world's crop yield, and control measures adopted by using synthetic chemicals alone have remained formidable, as data suggests that approximately 5.6 billion pounds of pesticide are used worldwide and are responsible for the unbalancing of our environment. The heavy use of pesticides has already caused grave damage to health, ecosystems, and groundwater. Therefore it is very urgent to identify alternatives to chemical pesticides for plant protection without sacrificing the productivity and profitability of agriculture. Microbial biopesticides are preparations containing living microorganisms (bacteria, fungi, viruses, or protozoans) that are pathogenic for the pests and pathogens of interest [Singh et al., 2001; Singh et al., 2011]. Microbial pesticides include biofungicides (*Trichoderma*), bioherbicides (*Pseudomonas*), and bioinsecticides (*Bacillus thuringiensis* [Bt]) and can control many different kinds of insect pest diseases and weeds. The widely used microbial pesticides are bacteria, e.g., Bt, *Pseudomonas fluorescens*; fungi, e.g., *Trichoderma viride*, *Beauveria bassiana*, *Verticillium lecanii*, and viruses, e.g., baculovirus and nucleopolyhedrosis virus. The active ingredient of a microbial pesticide is typically the microorganism. They suppress pests and plant pathogens by producing toxic metabolites, preventing establishment of other microorganisms through competition, or various other modes of action [Jelison, 2001]. In the total biopesticide market for all crop types bacterial biopesticides claim about 74%, fungal biopesticides about 10%, viral biopesticides 5%, proteinaceous biopesticides, 8%, and other biopesticides 3% [].

In Latin America, a proportion of biopesticide products cover about 40% of the market. In Argentina, Bt products were first used in 1950 against *Coffea lombi* in alfalfa [Pozzo, 1996]. In Africa, application of fungus-based

products of *Meteorus aciculatus* has proven to be effective to pest management []

Asia is the largest continent in the world and is known for its diverse biodiversity. China is producing biopesticides since 1960, most of them being in the form of unformulated dried cultures []. Japan is one of the pioneer countries as far as the use of biopesticides is concerned. In the past few years, Japanese research in biocontrol field has resulted in the identification and characterization of several new insect pathogens []. The promotion of biopesticides is going on in Thailand, and by 2003, there were six major biopesticides in the market from fungal products of *Trichoderma harzianum*, entomopathogenic fungi, entomopathogenic nematodes, and nuclear polyhedrosis virus (NPV) []. In India, microbial pesticides evolved as an emergent need when chemical insecticides failed to control *Helicoverpa armigera*, *Sapotina blana*, and other pests of cotton [].

In the past few years, microbes exhibiting good biocontrol potential have been discovered by many workers and are commercially exploited for large-scale biopesticide development []

Trichoderma is considered as most efficient biological agent and has attracted considerable scientific attention as they are considered as a promising alternative to chemical fungicides against many plant pathogens. Major mechanisms involved in the biocontrol ability of *Trichoderma* spp. are competition for space and nutrients and production of diffusible and/or volatile antibiotics and hydrolytic enzymes such as chitinase and β-1,3-glucanase. These hydrolytic enzymes partially degrade the pathogen's cell wall and lead to its parasitization. Many recent findings suggest that plant development and biochemistry are strongly affected

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Conference Presentations

1. Ramchander Merugu, Ragini Gothwal, (2021) Paper presentation “Microscopic techniques for characterization of nanomaterials: a mini review at ,International conference on Futuristic Research in Engineering Smart Materials,FREMS21 held on line on 23-24th April 2021 ,Organized by Department of mechanical engineering,CMRIT ,Bengaluru,India
2. Ramchander Merugu, Ragini Gothwal, (2021) Paper presentation “Green synthesis and characterization of Indium Tin Oxide nanoparticles using toddy palm from *Borassus flabellifer* “at ,International conference on Futuristic Research in Engineering Smart Materials,FREMS21 held on line on 23-24th April 2021 , Organized by Department of mechanical engineering,CMRIT ,Bengaluru,India
3. Rashmi Bathri, Ruchira Choudhary, Ragini Gothwal (2020) Innovative Role of Paraoxonase-1 in COPD Management. In Souvenir of “International Conference on Environmental Pollution and Health Management” (EPHM-2020), held on 28-29 February 2020 at Career College, Bhopal.pp-26.
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6. Jhili Sarkar, Ragini Gothwal, Nidhi Tripathi (2020). Bacteriological Analysis and Identification of Enterobacteriaceae isolated from Fresh Vegetables. In Abstract Book of 6th International Conference on Environment and Ecology (ICEE 2020) (ISBN: 978-81-943461-2-8) held at University Of Allahabad, Prayagraj, Uttar Pradesh, India.
7. Mangesh Kumar Mankar, U.S. Sharma, Sanjay Sahay, Ragini Gothwal (2020). Extraction and In Vivo Mass Multiplication of Native Arbuscular Mycorrhizal Fungi from Agriculture Soil. In Abstract Book of 6th International Conference on Environment and Ecology (ICEE 2020) (ISBN: 978-81-943461-2-8) held at University Of Allahabad, Prayagraj, Uttar Pradesh, India.
8. Shweta Sahu , Ragini Gothwal ‘Agricultural Scientists Meet’ conducted from 22-12-2020 to 25-12-2020 as part of INDIA INTERNATIONAL SCIENCE FESTIVAL 2020 (IISF 2020) organized by Ministry of Science and Technology; Ministry of Eath Sciences, and Ministry of Health and Family Welfare, Govt. of India in collaboration with Vijnana Bharti (VIBHA) by Council of Scientific & Industrial Research (CSIR).
9. Swati Sharma , Ragini Gothwal ‘Young Scientists conference’ conducted from 22-12-2020 to 25-12-2020 as part of INDIA INTERNATIONAL SCIENCE FESTIVAL 2020 (IISF 2020) organized by Ministry of Science and Technology; Ministry of Eath Sciences, and Ministry of Health and Family Welfare, Govt. of India in collaboration with Vijnana Bharti (VIBHA) by Council of Scientific & Industrial Research (CSIR).
10. Srishti Chandra participated in Essay Competition at ‘Clean Air’ conducted from 22-12-2020 to 25-12-2020 as part of INDIA INTERNATIONAL SCIENCE FESTIVAL 2020 (IISF 2020) organized by Ministry of Science and Technology; Ministry of Eath Sciences, and Ministry of Health and Family Welfare, Govt. of India in collaboration with Vijnana Bharti (VIBHA) by Council of Scientific & Industrial Research (CSIR).
11. Rehma Rizwan, Ragini Gothwal Poster Competition on the topic ‘Deciphering the Microbiome of Medicinal Plants, at ‘Agricultural Scientists Meet’ conducted from 22-12-2020 to 25-12-2020 as part of INDIA INTERNATIONAL SCIENCE FESTIVAL 2020 (IISF 2020) organized by

Ministry of Science and Technology; Ministry of Earth Sciences, and Ministry of Health and Family Welfare, Govt. of India in collaboration with Vijnana Bharti (VIBHA) by Council of Scientific & Industrial Research (CSIR).

12. Tanuja Murab participated in Webinar Session on “ICT ENABLEDMENT IN HIGHER EDUCATION” conducted by Shri Shivaji Vidhya Prasarak Sanstha’s-Bhausaheb NS Patil Arts and MFMA Commerce College Dhule and MasterSoft ERP Nagpur on dated 12/11/2020.
13. Tanuja Murab completed the e- Refresher Course on 21st Century: The Era of Biotechnology – To Innovate by Advanced Biotechnology Learning during 3rd September-28th October 2020 organized by Department of Biotechnology, AKS University, Satna (M.P.) in Biotechnology.
14. Tanuja Murab participated in National Webinar on “ Institutional Best Practices and Distinctiveness” organized by the Internal Quality Assurance Cell, RBVRR Womens’s College, Narayanguda, Hyderabad in collaboration with Sardar Patel College, 14- Padmarao Nagar, Secunderabad, Telangana on 14th December 2020

Extraction and *In Vivo* Mass Multiplication of Native Arbuscular Mycorrhizal Fungi from Agriculture Soil

¹Mangesh Kumar Mankar, ²U.S. Sharma, ³Sanjay Sahay and ¹Ragini Gothwal

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Plants in their natural habitats are surrounded by the different kinds of microorganisms. Some microbes directly interact with host plants in a mutually for beneficial manner whereas others microbes colonize the plant only for their own benefit. Soil micro flora special reference to fungi develops beneficial symbiotic associations with plant roots and contributes in plant growth is called mycorrhizal fungi (Schenk *et al.*, 2012). Almost 90% of the land plants having those types of beneficial relationship. Initially AMF have been placed in the Phylum Zygomycota and order Glomales. Subsequently changes in classification now they have been grouped into the phylum Glomeromycota (Redecker *et al.*, 2000; Schusler *et al.*, 2001). Characterization of AM fungi by the presence of their unique extra radical mycelium branched haustoria like structure in the cortex cell called arbuscules (Smith and Read, 2008). Plant-AMF relationship greatly extends the absorptive surface area of the host plant root. AMF hyphae penetrate into surrounding soil and plant is able to obtain mineral nutrients specially phosphorus from the soil stock. In return the plant provides carbohydrates to the fungus for their metabolic activities. The fungi utilize these carbohydrates to synthesize and emit molecules like Glycoprotein called 'Glomalin' which has a cementing capacity to maintain soil particles together and is mainly involved in soil aggregation. Some examples AMF are *Glomus*, *Gigaspora*, *Acaulospora*, *Entrophospora* and *Scutellospora*. *Glomus* is the most common fungus found in the rhizospheric soil (Wright *et al.*, 1996). The fungi are obligate biotrophs and do not grow on synthetic media. Moreover, AM fungi have improved host plant growth due to production of growth hormones, increase tolerance to drought and synergistic interactions with other rhizospheric microbes. Native strains having ecological adaptation and more efficient in performance in comparison of exotic inoculums. It is not only more efficient but also cost effective (Wangiyana *et al.*, 2006) AM fungi are one of the fungal biofertilizer has proven potential in plant production sustaining the low input and organic agriculture.

The aim of this study was to extraction, quantitative estimation, morphological identification of native AMF spore and there *In Vivo* mass multiplication.

Extracted native AM Fungal spores by the procedure of sieving and wet decanting method (Gerdemann and Nicolson, 1963) form rhizosphere soil of little millet. AMF spores identified morphologically (spore size, shape, color and wall structure) accordingly mycorrhizal fungi

To,

Date:- 25/4/2022

The Honorable Vice Chancellor

Barkatullah University, Bhopal

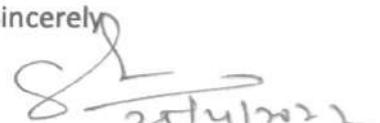
Subject: - Regarding Publication of papers in the last five years, during the period 1st July 2016 to 30th June 2021

Respected Sir,

With reference to your letter no. 120/VC/2022 dated 22.04.2022 that I am herewith enclosing my Publications for the above mentioned period. This is for your kind perusal.

With Regards.

Yours Sincerely



25/4/2022

Prof. (Dr.) S.K. Khatik

Head, Department of Commerce

Professor (Dr.) S.K. Khatik

Head, Department of Commerce

Barkatullah University, Bhopal 462026

Publication Period 1st July 2016 to 30th June 2021



**Total Paper published 40: International Journal (17) + National Journal (20)+
Papers published in ISBN Books (02)**

International Journals

2021

1. **Khatik S.K. & Patel Praful (Mar-2021)**, Covid- 19 Crisis- Impact on Trade and Indian Economy, Vol.11, Issue 41, Jan-March, 2021, Shodh Sanchar Bulletin, Pp. 67-72, ISSN:2229-3620. UGC Approved Care Listed Journal.
2. **Khatik S.K. & Shrivastava Geetanjali (2021)**, Why Good Corporate Governance is important for the Effective Corporate Social Responsibility? Evidence from Leading Private Sector Banks of India – HDFC and ICICI,, International Journal of Developmental Studies, Vol. XIV, Issue- I, January – June PP 96-101, ISSN No. 0975-5799 Impact Factor 5.09
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COVID-19 CRISIS – IMPACT ON TRADE AND INDIAN ECONOMY

□ Dr. S.K. Khatik*
Praful Patel**

ABSTRACT

The pandemic disease of COVID-19 has causing lots of difficulties to human life. This research work highlights the impact of Coronavirus on import & export, GDP growth rate, and different sectors of Indian economy. Coronavirus has a significant impact on human life and it affects Indian economy adversely because India is a developing country and mostly depends on its human resources and its negative effects have been also seen on the world economy. In India government imposed a nationwide lockdown to prevent the transmission of Coronavirus in humans, resulted in total shutdown of all the activities and services except for some essential services and activities. The worst hit of Coronavirus induced lockdown was on the population which earn on daily basis and weaker section of the society like daily wagers, migrant workers, etc. After removal of lockdown, human life and all the sectors of Indian economy are slowly recovering but the danger of Coronavirus has not averted because cases of new variant of COVID-19 was reported in India.

Keywords : GDP, Fiscal deficit, Second wave.

INTRODUCTION

COVID-19 is an infectious disease; it primarily affects the lungs and airways of human body leading to serious respiratory symptoms. Coronavirus has a significant impact on human life and it affects Indian economy adversely because India is a developing country and mostly depends on its human resources and its negative effects have been also seen on the world economy.

In India, during the first wave of COVID-19, Indian government imposed a nationwide lockdown in 4 phases (68 days) to prevent the human-to-human transmission of Coronavirus, resulted in total shutdown of all the activities and services except for some essential services.

After the imposition of lockdown around 10 million migrant workers lost their jobs and returned to their hometown. India's \$3.0 trillion economy remains

clocked during the lockdown period. The impact of COVID-19 has mainly seen on biggest component of GDP which are manufacturing, consumption, import, export, services, investments, etc resulted in huge decline in GDP for at least two quarters.

The second wave of Coronavirus pandemic massively hits the economy of India at that phase when Indian economy is coming back on track from the first hit of COVID-19. At this time more casualties occurred, resulted in state-wise lock down as per state government orders.

Second wave impact were far more devastating than the previous one, as the death toll increased at a significant rate. This wave is pushing back India from its weak economy recovery.

JUSTIFICATION OF THE STUDY

Every nation's development and growth has been measured through its economic growth rate and people's

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**Why Good Corporate Governance is Important for the Effective Corporate Social Responsibility?
Evidence from the Leading Private Sector Banks of India-HDFC and ICICI**

Dr. S.K Khatik *and Dr. Geetanjali Shrivastava**

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Corporate Governance in India is a set of internal controls, policies, and procedures which form the framework of a company's operations and its dealings with various stakeholders such as Customers, Management, Employees, Government, And Industry Bodies. The framework of such policies should be such to uphold the principles of Transparency, Integrity, Ethics, And Honesty. The Companies Act, 2013 provides a formal structure for Corporate Governance by enhancing Disclosures, Reporting and Transparency through enhanced as well as new compliance norms. The ideology behind corporate governance is to ensure the ethical working of companies towards society. With the introduction of Section 135 of the Companies Act 2013, every company is now more serious in the implementation of CSR spending. Corporate Governance (CG) and Corporate Social Responsibility (CSR) go hand in hand and are directly related. Companies need to be very careful in the process of compliance with Corporate Governance. The purpose of this research is to investigate that how Corporate Governance (CG) affects the Corporate Social Responsibility (CSR) of a company. To examine and to understand the interrelationship between the two, we have selected the two banks of the country i.e., HDFC and ICICI. This research paper is an attempt of exploratory research, based on the secondary data sourced from the Annual Reports, Journals, Articles, Newspapers, and Media Reports. The data so collected was structured, analyzed, organized to identify the CSR of both the Banks in India and how the CG of both the banks has affected the CSR (tested by Student's t-test). It was found that the HDFC bank is far ahead with a sustained growth rate in terms of spending on CSR activities than the ICICI Bank.

Keywords: CSR, corporate governance, private sector, ICICI bank and HDFC bank.

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Introduction

Corporate Governance in India: The unseen force behind an organization-In the last few years, we have seen how banking has been rapidly changing in the country and have experienced turmoil like Demonetization, Jandhan Yojna, Companies Act 2013, or the new guidelines of the RBI in the times of Covid-19. For the banks, it is challenging to strike a balance with all the stakeholders of the company. The bank is the one which is not only governed by the RBI but also by the many other Regulatory Bodies like Banking Regulation Act, Companies Act, FEMA, SEBI Act, etc. By default, these acts make the bank's governance strong.

On April 1st, 2014, India became the first country in the world to make corporate social responsibility (CSR) mandatory for Indian companies. Companies with a net worth of Rs 500 crore or more, a turnover of Rs 1,000 crore or more, or a net profit of Rs 5 crore or more are required to spend 2% of their average net profit over the previous three years on CSR activities every year. Eligible companies need to form a CSR committee, formulate policies, and implement projects in alignment with Schedule VII of the Act. CSR-

related disclosures need to be made in the Annual Report in the format prescribed by the Act.

It is the profit-making companies who are entrusted to contribute to the CSR which automatically attracts the attention of the stakeholders towards those companies who are ethical and sensible towards their stakeholders and society. In the last 20 years, corporate governance in the corporate sector has changed drastically. All over the world, many committees were set up to look into this aspect like the Cadbury Committee, OECD Code, Combined Code of London Stock Exchange, the Blue-Ribbon Committee, and Kumar Mangalam Birla Committee in India.

The purpose of corporate governance in the banking sector without any doubt is to build and strengthen accountability, credibility, trust, transparency, and integrity. If there won't be any regulatory watchdog that regulates the governance of the corporates, then they can decide things by their whims and fancies. Corporate governance in the banking sector protects not just the economy of the country but also the shareholders, employees, supervisors, customers, and the public at large.

Role of Artificial Intelligence in Indian Education Sector

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*Corresponding Author

Abstract: Artificial Intelligence is the most advance technology of our time. It is a smart device capable of performing tasks that normally require human intelligence. We are just at the beginning to see the possibilities of artificial intelligence in education. There is a prediction that in future participation of human teacher in classrooms would up to maintain discipline and assist Artificial Intelligence devices while machines will do the real job of teaching. In India, Gross Enrolment Ratio (GER) in schools and colleges is increasing but there is a problem of poor learning outcome and low retention rate (dropout of students). There are many factors that pose challenges to improving the quality of education like there is a single teacher for multi-grade classroom in small and remote villages where students of different grade sit in same classroom, large teacher vacancies due to uneven distribution across location, low adoption and lack of knowledge about how to use these existing technologies. Artificial Intelligence is the solution for problems like quality of education, prediction of dropouts, assessment of student needs and access issues etc. observed in Indian schools and colleges but there are some challenges in adoption of Artificial Intelligence in India, if we replace men with artificial man then there is a situation of mass unemployment because one artificial man equals to hundred men. Overall, we conclude that, today India is not ready for Artificial Intelligence because India is a developing nation and mostly depend on its human resource but future holds a lot of possibilities for Artificial Intelligence in India.

Keywords: Artificial intelligence, Artificial men, Dropout, Education.

JEL CODE: I25, O31, O32, O33

I. INTRODUCTION

Artificial intelligence (AI) is a branch of computer science concerned with developing smart devices capable of performing tasks that normally require human intelligence, these smart devices are capable of high-level cognitive processes like

thinking, learning, perceiving, problem solving and decision making, alongside with advances in data collection, analytics and computer processing power. Artificial Intelligence has the power to enhance people's way of living and working.

In the year 1956, American Computer scientist John McCarthy coined the term AI at the Dartmouth Conference, at that time the enthusiasm for artificial intelligence was very high. In the year 1997, Deep Blue became the first Computer to beat a world chess champion Gary Kasparov. In present time artificial intelligence has developed to an astonishing level. Google, Apple and Amazon are creating Voice assistants and amazing devices like Google Assistant, Siri and Amazon's Alexa with the help of AI technology, these Voice assistants are very helpful for searching on iOS and Android mobile. In future, Artificial Intelligence will come with high intelligence.

India is the fastest growing economy with the second largest population in the world, has a significant stake in the artificial intelligence revolution. In India, school education has a substantial growth in Gross enrollment ratio (GER) but there is a low retention rate and poor learning outcome. There are many factors that pose challenges to improving the quality of education like multi-grade classroom in small and remote villages where students of different grade sit in same classroom, large teacher vacancies due to uneven distribution across location, low adoption and lack of knowledge about how to use these existing technologies. Artificial Intelligence is the solution for problems like quality of education and access issues observed in the Indian education sector. The role of artificial intelligence in education sector is continuously increasing, there is a prediction that the participation of human teachers in classroom would up to assist artificial intelligence devices and maintain discipline while machines take over the real job of teaching.

NITI Aayog introduce an approach paper to set up Artificial Intelligence based cloud computing system called as AIRAWAT (Artificial Intelligence Research, Analytics and Knowledge Assimilation platform), under this the challenges associated with lack of access to computing resources would tackle by the Indian government. Cloud computing system will help teachers,

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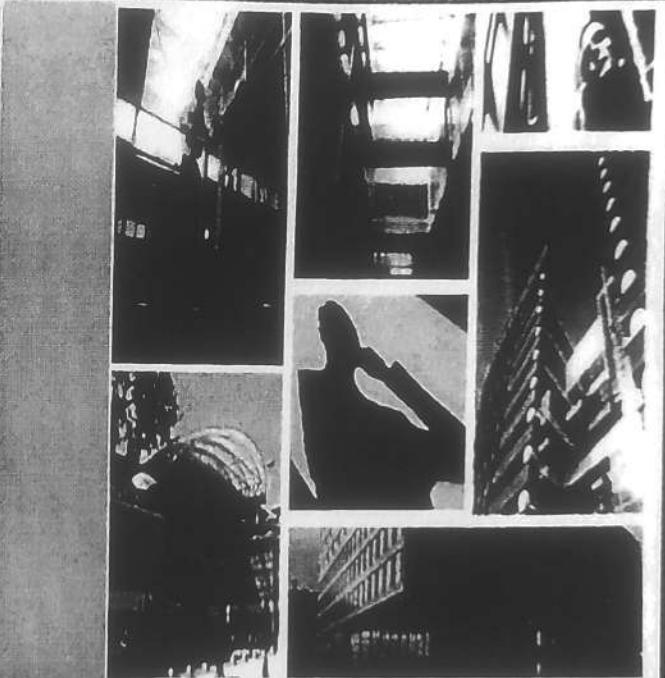
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Rural Development in India Through Entrepreneurship: Its Problems and Challenges

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Entrepreneur is a person who starts a business or willing to take business risks. Entrepreneurship which appears in the rural areas are called Rural Entrepreneurship and related to different fields such as agriculture, industry, business, etc., and its contribution to the development of an economy is also important. India is a developing nation and major part of its population lives in rural and backward areas and their livelihood is supported by agriculture and they are engaged in rural activities. India's economic development depends upon the level of development which has actually taken place in the rural areas. Due to economic growth, rapid urbanization, unemployment in rural areas, marriage and increased means of transportation and communication, the rate of migration of women in metropolises cities of India has increased as compare to men in recent time. Entrepreneurship is a solution and a good job opportunity for the population that lives in rural area or migrate from rural areas or backward areas to urban cities. This paper highlights the difficulties faced by rural entrepreneurship in India especially in the field of finance, marketing, management, human resource and other basic facilities like regular supply of water, electricity facility, facilities of transportation and communication. In this research paper we find out that, there is a need to provide financial assistance, technological, marketing and training & development assistance by government to rural entrepreneurship for rural development as well as economic development of a nation. If the government of India should stress and emphasize more on rural entrepreneurship, then unemployment, poverty and poor infrastructure will be improved and employment are easily available in rural areas.

Keywords: Rural entrepreneurs, migration, economic development, problems and challenges.

Introduction

Defining entrepreneurship is not that easy, for some people it's just innovation and for others it means risk taking. The person who starts a business or willing to take risks is called entrepreneur and promotor is a person who gives better ideas to start and expand the business. An entrepreneur is also a promotor but promotor is not an entrepreneur. In general, rural entrepreneurship means 'entrepreneurship which appear in the rural areas and related to different fields such as agriculture, industry, business, etc., and contribute to the economic development of a nation'. In today's world entrepreneurship has developed as a dynamic concept. Rural entrepreneurs are those persons who are willing to take business risks or the person who starts a business.

India is a developing country and its major population lives in backward or rural areas and their livelihood is supported by agriculture and they are engaged in rural activities. In India, lands are limited due to this, agricultural activities are also limited. The problem of migration and rural unemployment in India is solved by development of industries in rural areas. Thus, India's economic development depends upon the level of development which has actually taken place

in rural and backward areas. Rural entrepreneur's growth leads to rural development which further contributes in reducing unemployment, levels of poverty etc. In India, unemployment is a major problem in rural areas that increases migration percentage of village population into urban towns, migration is a major problem in India and rural entrepreneurship is a solution and a good employment opportunity to those who live in rural and backward areas.

In rural areas of India, only some local leaders and NGOs are capable of using government policies and schemes for the betterment of rural people and their efforts are very useful in stopping migration and to attract people in the rural areas. It means not only stopping people from migration but also attract them back in rural areas from the towns and cities where they migrated. This will only be possible when everyone sees rural areas as a place of opportunities. Despite all the problems in rural areas they should back up on their strengths to make village a place of opportunities. Rural industrialization is an effective way of increasing the speed of rural development. Indian government has been regularly giving financial and non-financial support and all the necessary help to rural entrepreneurs in India for the growth

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टी.सी.एस. कंपनी की शोधन क्षमता का विश्लेषणात्मक अध्ययन

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प्रस्तावना

शोधन क्षमता का आशय भुगतान करने की क्षमता से है। एक फर्म अथवा कंपनी द्वारा विभिन्न प्रकार के स्रोतों से ऋण लिया जाता है, ये ऋण सामान्यतः 3 प्रकार के होते हैं:-1. अल्पकालीन ऋण 2. मध्यकालीन ऋण 3. दीर्घकालीन ऋण। कंपनी द्वारा इन ऋणों का उपयोग व्यवसाय की आवश्यकतानुसार किया जाता है। ये सभी ऋण बाहरी व्यक्तियों द्वारा प्रदान किया जाता है, जिसे बाहरी दायित्व या बाहरी लेनदार कहते हैं। कंपनी के हितधारक यह भी चाहते हैं कि इनके द्वारा दिया गया ऋण सुरक्षित होना चाहिए, अन्यथा जोखिम की संभावना अधिक होती है, हितधारक कंपनी को उपरोक्त समस्त प्रकार के ऋण प्रदान करती हैं, परन्तु वह इन ऋणों की सुरक्षा भी चाहती है। बाहरी दायित्व के अंतर्गत विभिन्न शोधार्थियों एवं लेखकों द्वारा 2 प्रकार के ऋणों को शामिल किया गया है, अल्पकालीन ऋण एवं दीर्घकालीन ऋण हितधारकों द्वारा दिया गया ऋण तभी सुरक्षित हो सकता है, जब कंपनी की ऋण चुकाने की क्षमता अच्छी हो अतः कंपनी द्वारा लिये गये अल्पकालीन ऋण एवं दीर्घकालीन ऋण को भुगतान करने की क्षमता ही शोधन क्षमता कहलाती है। विभिन्न लेनदारों, वैंकों एवं विनियोगकर्ताओं द्वारा ऋण देने से पूर्व कंपनी की शोधन क्षमता का अध्ययन आवश्यक है, यदि कंपनी की शोधन क्षमता हैं अर्थात् ऋण चुकाने में समर्थ हैं, तो ऐसी रिप्टि में जोखिम की मात्रा भी बहुत कम हो जाती है, परन्तु कंपनी की शोधन क्षमता अच्छी नहीं है, तो ऐसी रिप्टि में जोखिम की मात्रा अधिक बढ़ जाती है, इसलिये कंपनी के हितधारकों या लेनदारों, विनियोगकर्ताओं एवं वैंकों को कंपनी की शोधन क्षमता का अध्ययन आवश्यक हो जाता है। अल्पकालीन शोधन क्षमता एवं दीर्घकालीन शोधन क्षमता के अध्ययन हेतु विभिन्न अनुपातों के माध्यम से किया जाता है, जो कि कंपनी की शोधन क्षमता का अध्ययन करते हैं, मुख्यतः चालू अनुपात, तरल अनुपात, पूर्ण तरलता अनुपात। ये सभी अनुपात अल्पकालीन शोधन क्षमता का अध्ययन करते हैं, इसी प्रकार ऋण क्षमता अनुपात, शोधन क्षमता अनुपात, स्वामित्व अनुपात, इंटरेस्ट करेज अनुपात, विनियोजित पूँजी पर प्रत्याय। ये सभी अनुपात दीर्घकालीन शोधन क्षमता का अध्ययन करते हैं।

शोध विषय के अध्ययन का औचित्य

एक कंपनी की साख एवं ख्याति उसकी शोधन क्षमता पर निर्भर करती है, कंपनी का अस्तित्व भी शोधन क्षमता पर निर्भर करता है, यदि कंपनी की शोधन क्षमता अच्छी नहीं है, तो जोखिम की संभावना अधिक हो जाती है तथा वैंको, लेनदारों, पूर्तिकर्ताओं एवं विनियोगकर्ताओं की जोखिम में वृद्धि होने लगती हैं एवं ख्याति तथा साख में भी कमी होने लगती है, जिससे कंपनी के ऋणों के डूबने की संभावना अधिक हो जाती है, इसी प्रकार यदि कंपनी की शोधन क्षमता अच्छी है, तो जोखिम की संभावना कम होने लगती हैं एवं ख्याति एवं साख में भी वृद्धि होने लगती है, जिससे कंपनी के ऋण डूबने की संभावना कम हो जाती हैं इस शोध अध्ययन में यह जानने की कोशिश की गयी है कि कंपनी की शोधन क्षमता किस प्रकार की है जिससे कंपनी के ऋणों की जोखिम एवं सुरक्षा करती है। शोधन क्षमता ठीक न होने से व्यवसाय पर नकारात्मक प्रभाव पड़ता है तथा कंपनी समाप्त की ओर अग्रसर होने लगती है, लेकिन शोधन क्षमता अच्छी होने पर कंपनी पर सकारात्मक प्रभाव

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Impact of Human Capital in GDP of India: A Study on Selected Variables of Human Capital

*Dr.S K.Khatik

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Abstract

Human capital is the stock of knowledge, skill, habits, social and personality attributes. The present research paper studied the impact of selected variables of human capital i.e. health expenditure, secondary school enrollment, total labor force and gross capital formation on GDP of India. The study reveals that there is a positive correlation between GDP and health expenditure, school enrollment, gross capital formation and total labor force. The research paper used regression analysis to determine the impact of human capital variables on GDP of India and revealed that to achieve long- term sustainability in GDP of India. The government should increase the health expenditure and education.

Keywords: - *Human Capital, GDP per capita, health expenditure per capita, secondary school enrollment*

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IMPACT OF GST ON INDIAN HOTEL AND RESTAURANT BUSINESS

Dr. S.K.Khatik*

Dr. Amit Kumar Nag**

ABSTRACT

A 32 years old dream to have indirect tax reform finally comes true on July 1, 2017. The process of indirect tax reform started in the year 1986 with the introduction of Modified value added tax (MODVAT), followed by the proposal to have a single tax system in the form of Goods and Services Tax for the country as a whole in 1999 was finally introduced on July 1, 2017. Goods and services tax is a non-discriminatory indirect tax and is applicable throughout the country. The present research work attempts to highlight the impact of Goods and services tax on Indian Hospitality and Tourism Industry. The industry with a contribution of around US\$ 136200 million¹ to the GDP at the end of 2016 is the one which is expected to witness major changes post GST. The present research paper will cover impact of GST on the pricing of Hotel room tariff, on restaurant food bills, on restaurant owners purchase bills as well as its Pros and Cons on the Indian hospitality and tourism industry as a whole.

Keywords: Goods and Services Tax, Service Tax, VAT, Krishi Kalyan Cess (KKC), Swatch Bharat Cess (SBC) & Input Tax Credit (ITC).

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¹ <http://www.financialexpress.com/money/how-gst-will-impact-hospitality-industry/609363/>

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A Study on Cash Economy to Cashless Economy: Challenges and Opportunity

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Cashless economy plays an effective role in curbing the large parallel economy in India. It would make recording of financial transaction easier and increase the tax base and drastically reduce the need to handle cash and risk of physical theft. Cashless society offers many advantages to the government and public such as convenient mode of payment, lower risk, reduce the cost of printing money, decrease in crime rate, efficient banking sector, and increase in transparency and monitoring. In the study it has been observed that after demonetization government took variety of steps to motivate people to use various digital modes like lucky grahak yojana for consumer, digi dhan vyapar yojana for merchants, vittiya saksharta abhiyan, BHIM app, Ru Pay, Aadhaar payment app. In the study it has been also observed that during study period from Nov-16 to July-17, compound annual growth rate registered in the digital mode of payment was USSD(59.25%) followed by UPI(57.23%), IMPS(8.08%), NEFT(4.07%), CTS(1.99%) and RTGS(1.32%)

Keywords: Digitalization, Demonetization, Parallel economy, RTGS and NEFT.

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INTRODUCTION

A cashless economy is an economy where cash are not used in any financial transactions. It is an alternative means of exchange. In the past cashless economy were based on the barter system where people exchanged their livestock for food crops or other goods. In the present concept of a cashless economy is a completely new thing. In this economy cashless transactions are made with the help of digital currencies like the BITCOIN. In a cashless economy, money is exchanged and recorded only in the electronic digital forms.

In the year 1990's, the peoples belong to the advanced nations of the world got attracted towards the electronic banking which made the use of non-cash transactions and settlements of transactions. In the year 2010 the digital payment methods became established in almost all countries across the world. Online tools like Real Time Gross Settlement, NEFT, IMPS, and payments by Smartphone or electronic cards, digital wallet systems operated by Apple, electronic banking and bill payment systems helped people make cashless transactions online.

Several points have been raised about the negative effects of cashless transactions. The main drawback of cashless country is that complete information about the monetary transaction of individuals or firms is with third party providers like VISA. Resulted into hacking of individuals accounts.

There are several positive effects of cashless transactions in the economy. The primary mode of transactions in money laundering and terrorism financing is cash. A cashless economy

would depress such laundering and terrorism. It would become easier for central governments to control over money supply, as government can monitor, income tax paid by individuals and proper payment of tax would strengthen the nation's economy. The level of corruption present in the country will also reduce.

The idea of a cashless economy is to move from fiat money to digital money with the aim of curbing the flow of black money and increasing the transparency of the flow of money. All transactions are made with debit card or credit card or through digital means-whether one has to pay bills, purchase fruits or take bus or ride a taxi. Just like traditional pocket wallets-wallets do not require cash in its physical form these are linked to individual bank accounts and payments are made directly. Internet banking and Unified Payment Interface (UPI)

Justification of the Study

Indian economy is the fastest growing economy in the World. The size of real GDP as compare to USA, UK and China has not been increasing due inflation, corruption and fake currency. Corruption is the biggest problem in India because of this fake currency in the economy has increased tremendously. All these issues are responsible for poverty, unemployment, high rate of inflation and low growth rate in GDP. Therefore there is a need of combating corruption, black money and fake money. So the government of India has taken decision to scrap Rs500 and Rs1000 notes from the system have brought drastic changes in the digital payment. Few months back, credit and debit cards

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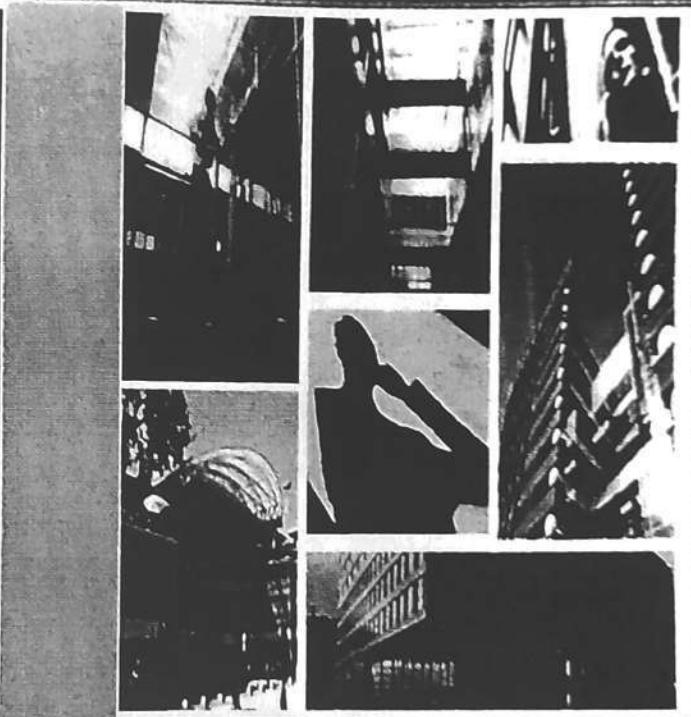
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Rural Development in India Through Entrepreneurship: Its Problems and Challenges

Dr. S.K. Khatik* and Praful Patel**

* Professor and ** Research Scholar, Department of Commerce, Barkatullah University, Bhopal (M.P.)

Entrepreneur is a person who starts a business or willing to take business risks. Entrepreneurship which appears in the rural areas are called Rural Entrepreneurship and related to different fields such as agriculture, industry, business, etc., and its contribution to the development of an economy is also important. India is a developing nation and major part of its population lives in rural and backward areas and their livelihood is supported by agriculture and they are engaged in rural activities. India's economic development depends upon the level of development which has actually taken place in the rural areas. Due to economic growth, rapid urbanization, unemployment in rural areas, marriage and increased means of transportation and communication, the rate of migration of women in metropolises cities of India has increased as compare to men in recent time. Entrepreneurship is a solution and a good job opportunity for the population that lives in rural area or migrate from rural areas or backward areas to urban cities. This paper highlights the difficulties faced by rural entrepreneurship in India especially in the field of finance, marketing, management, human resource and other basic facilities like regular supply of water, electricity facility, facilities of transportation and communication. In this research paper we find out that, there is a need to provide financial assistance, technological, marketing and training & development assistance by government to rural entrepreneurship for rural development as well as economic development of a nation. If the government of India should stress and emphasize more on rural entrepreneurship, then unemployment, poverty and poor infrastructure will be improved and employment are easily available in rural areas.

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Introduction

Defining entrepreneurship is not that easy, for some people it's just innovation and for others it means risk taking. The person who starts a business or willing to take risks is called entrepreneur and promotor is a person who gives better ideas to start and expand the business. An entrepreneur is also a promotor but promotor is not an entrepreneur. In general, rural entrepreneurship means 'entrepreneurship which appear in the rural areas and related to different fields such as agriculture, industry, business, etc., and contribute to the economic development of a nation. In today's world entrepreneurship has developed as a dynamic concept. Rural entrepreneurs are those persons who are willing to take business risks or the person who starts a business.

India is a developing country and its major population lives in backward or rural areas and their livelihood is supported by agriculture and they are engaged in rural activities. In India, lands are limited due to this, agricultural activities are also limited. The problem of migration and rural unemployment in India is solved by development of industries in rural areas. Thus, India's economic development depends on the level of development which has actually taken place

in rural and backward areas. Rural entrepreneur's growth leads to rural development which further contributes in reducing unemployment, levels of poverty etc. In India, unemployment is a major problem in rural areas that increases migration percentage of village population into urban towns, migration is a major problem in India and rural entrepreneurship is a solution and a good employment opportunity to those who live in rural and backward areas.

In rural areas of India, only some local leaders and NGOs are capable of using government policies and schemes for the betterment of rural people and their efforts are very useful in stopping migration and to attract people in the rural areas. It means not only stopping people from migration but also attract them back in rural areas from the towns and cities where they migrated. This will only be possible when everyone sees rural areas as a place of opportunities. Despite all the problems in rural areas they should back up on their strengths to make village a place of opportunities. Rural industrialization is an effective way of increasing the speed of rural development. Indian government has been regularly giving financial and non-financial support and all the necessary help to rural entrepreneurs in India for the growth

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**8. A Study on Pre- and Post-Analysis of Demonetization Period:
Issues and Challenges**
S. K. Khatik

56-65

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A Study on Pre- and Post-Analysis of Demonetization Period: Issues and Challenges

S. K. Khatik*

Abstract

The principle pointed of demonetization was to address defilement, black money, fake money and fear financing. The measure impact of demonetization on consumption, production, investment and savings of the economy. Although demonetization have huge potential benefits in the medium to long term working of the economy but caused some short term disruption in the economy. This paper studies the issues and challenges faced by the common man during demonetization period and analyzed the pre- and post-period of demonetization. The investigation in this paper observed that demonetization affected different area of the economy in the month of Nov-16 and Dec-16 and the effect directed fundamentally in Jan-17 onwards. An increase in banks deposits by 15.7% and 14.9% in Nov-16 and Dec-16 respectively created large surplus liquidity conditions. These were overseen by RBI by the monetary policy. There has been a sharp increment i.e. 9.02% in the number of accounts under Pradhan Mantri Jan Dhan Yojana and the deposits in such accounts have also increased. The paper has also studied the impact of demonetization on the new gateway of electronic payment i.e. NEFT, CTS, IMPS and NACH. During Dec-16 and Jan-17 the IMPS registered the maximum y-o-y growth rate of 157.2% and 177.7% respectively.

Keywords: Demonetization, Black Money, Digitalisation, RBI, GDP

Introduction

Demonetization of currency means when face value of a coin or paper currency loses its legal tender status in the economy. It is an act of replacing old unit of currency with a new currency unit. Alternatively, we can say withdrawal of a specific currency from the market. By demonetization

of currency, in the short run the cash in circulation would be substantially reduced from the economy. There would be two reasons for demonetization one being to control counterfeit notes that could be contributing to terrorism and second reason is to eliminate black money from the economy.

History of Demonetization

The process of demonetization is not new for the world. In the past many countries of the world like Soviet Union, North Korea, Libya, Zaire, Ghana, Myanmar, Nigeria, Zimbabwe, Australia, Libya, Iraq and the European Union. In February 1971, the United Kingdom and Ireland had likewise decimalized their monetary standards. In 1982, 50 cedi notes were pulled back in Ghana, in 1984 Nigeria's military government under Muhammadu Buhari had supplanted old notes with new once to kill defilement in the nation and in 1987 Myanmar's around 80% of the estimation of cash available for use was nullified by the military junta, which had come about into political agitation in the nation.

In January 1991, the past Soviet Union had pulled back extensive rubles bills with the purpose of going up against the dull money. The invalidation of 50 and 100 rubles notes had incited the invalidation of around 33% of trade accessible for use out the Soviet Union. Be that as it may, this cash change to battle with danger of dark cash neglected to give any positive outcome and the legislature could not stop the expanding high swelling.

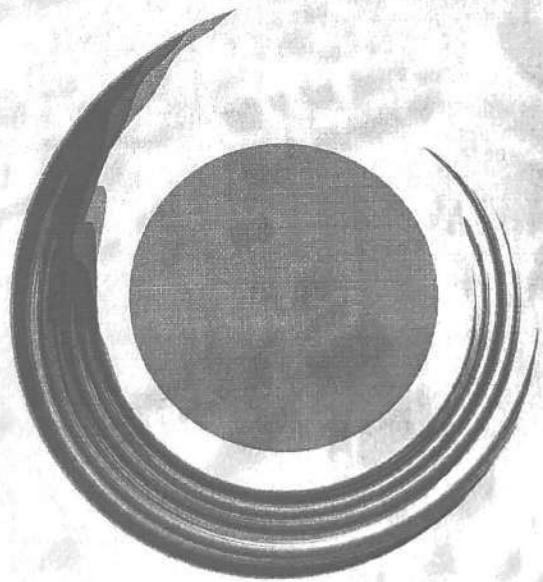
Individuals lost their confidence in the administration of Mikhail Gorbachev lastly on December 25, 1991, this came about into the separation of Soviet Union. In 1993, the Zaire government under the autocracy of Mobutu Sese Seko had attempted the way toward pulling back

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Working Capital Management of National Aluminum Company Limited

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Abstract: The focus of this research paper is on the short term aspects of corporate finance activities i.e. working capital management. The goal of effective working capital management is to ensure that a company has adequate funds necessary for day to day operation of a firm, while at the same time making sure that the company's assets are invested in the most productive way. Achieving this goal requires a balancing of concerns. Insufficient access to cash could ultimately lead to severe restructuring of a company by selling off assets, reorganization via bankruptcy proceedings, or final liquidation of the company. On the other hand, excessive investment in cash and liquid assets may not be the best use of company resources.

Keeping this in view, we have tried to evaluate working capital and working capital management policy of NALCO during the financial period from 2007-08 to 2016-17. This research paper highlight concept of working capital, working capital policy, components of working capital and factors affecting working capital of NALCO during the last 10 years and identify which factors are responsible for the improvement of working capital of the company. Working capital position of NALCO has been analyzed by using financial ratio technique i.e. current ratio, quick ratio, cash ratio, stock turnover, debtor's turnover, debtor collection period, days of stock on hand and impact of working capital on the profitability of the company.

During the study period from 2007-08 to 2016-17, it was found that there is no significant impact of working capital on profitability position of NALCO. Profit of the company has been changed due to sales and other factors not by working capital.

I. INTRODUCTION

"Working capital could be defined as the portion of asset used on current operations. The movement of funds from working capital to income and profits and back to working capital is one of the most important characteristics of business. This cyclical operation is concerned with utilization of funds with the hope that they will return with an additional amount called income. If the operation of a company is to run smoothly a proper relationship between fixed capital and current capital has to be maintained"

Sufficient liquidity is important and must be achieved and maintained to provide sufficient funds to pay off obligation as they arise of mature. The adequacy of cash and other current assets together with their efficient handling, virtually determine the survival or demise of the company. A businessman should be quick enough to raise the required funds to finance the working capital needs.

Every business needs funds for two purposes for its establishment and to carry out its day-to-day operations. Long term funds are required to create production facilities through purchase of fixed assets such as plant and machinery, land, building, furniture, etc. investment in these assets represents that part of firms capital which is blocked on a permanent or fixed basis and is called fixed capital. Funds are also needed for short-term purposes for the purchase of raw materials. Payment of wages and other day-to-day expenses, etc. these funds are known as working capital. In simple words working capital refers to that part of the firm's capital which is required for financing short term or current assets such as cash, marketable securities, debtors and inventories. Funds thus, invested in current assets keep revolving fast and are being constantly converted into cash and this cash flow out again in exchange for other current assets.

Company Profile

National Aluminum Company Limited (NALCO) is a Navratna CPSE under Ministry of Mines. It was established on 7th January, 1981 in the Public Sector, with its registered office at Bhubaneswar. The Company is a group 'A' CPSE having integrated and diversified operations in mining, metal and power. Presently, Government of India holds 60.20% equity of NALCO. NALCO is one of the largest integrated Bauxite-Alumina-Aluminum- Power Complex in the Country. The Company is low cost producer of metallurgical grade alumina in the World as per Wood McKenzie report with sustained quality products. The Company was rated 2nd highest net export earning CPSE in 2015-16 as per Public Enterprise Survey report. NALCO is the first Public Sector Company in the country to venture into international market in a big way with London Metal Exchange (LME) registration since May, 1989.

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Impact of GST on FMCG Products and Automobile sector in India

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ABSTRACT

Goods and service tax (GST) is an indirect tax structure designed by the Indian government with the objective to remove tax burden of the society. Its basic objective to reduce multiple cascading taxes levied by the central and state governments like VAT, service tax, entertainment tax, luxury tax etc. The reform process of indirect tax started in the year 1986 with the introduction of the Modified value added tax (MODVAT). The present paper highlights the impact of GST on FMCG products and also on automobile sector in India. In this study it is found that GST has significant impact on FMCG products and has a positive impact on the prices of cars in India except the hybrid cars ,this would positively affect the car buying decisions of the people.

Keywords: GST, MODVAT, Cascading.

Introduction

GST is a single and nation tax market introduced by Indian prime minister to make Indian market more elastic. This is the tax implement on Goods and services right from the manufacturer to the consumer at the national level. GST was rolled out from 1 July 2017 with the purpose to boost our Indian economy. Earlier in the years consumers pays indirect tax in the form of various kinds such as central excise duty, central sales tax, special additional duty on customs, services tax counter veiling duties whereas state indirect taxes of state government like VAT (Value Added Tax), octroi, Purchase tax, tax on lottery and gambling will be replaced by state goods and service tax, but while introducing GST (Goods and Service tax) consumer have to pay one tax for one nation that is called GST. The Goods and service tax bill or GST bill also referred to as the constitution (one hundred and twenty second amendment) bill, 2014 initiated a value added tax to be implemented on a national level of India. As per the union revenue secretary Hasmukh Adhia "The GST will give a major boost to the "Make in India" initiative by making goods and services produced or provided in India competitive in the national and international markets"

GST was first introduced by France in 1954 and almost 150 countries have introduced GST in some form. While countries such as Singapore and New Zealand tax virtually everything at a single rate, Indonesia has five positive rates, a zero rate and over 30 categories of exemptions. In China, GST applies only to goods and the provision of repairs, replacement and processing services. GST rates of some countries are given below.

Country	Australia	France	Canada	Germany	Japan	Singapore	Sweden
GST Rate	10%	20%	5%	19%	8%	7%	25%

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DEMONETIZATION-IMPACT ON INDIAN ECONOMY

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Abstract

Demonetization of currency means when face value of a coin or paper currency loses its legal tender status in the economy. It is an act of replacing old unit of currency with a new currency unit or withdrawal of a specific currency from the market. In the history of Indian currency, India has experienced three times the demonetization of currency. In the year 1946 Rs1000 and Rs10000 banknotes were withdrawn. The second demonetization has taken place in the year 1978 to withdraw Rs1000, Rs5000 and Rs10000 and the third demonetization has happened recently on 8th November 2016, to withdraw Rs500 and Rs1000 banknotes from the circulation of the currency. The objects behind towards all these demonetization were to abolish black money, corruption and fake money. This paper analyzes the causes and effect of demonetization on Indian economy and also includes the government initiatives before the demonetization such as Jan Dhan Yojana, Digitalization and Income Declaration Scheme(IDS). While analyzing the effect of demonetization on Indian economy it has been observed that online transaction has increased significantly which make the system more accountable and efficient.

Keywords: Demonetization, Cashless transaction, GDP, Corruption, Black Money, Fake Money.

JEL Classification Code: E00, E20, E23, E26.

Introduction

The Indian rupee (INR) is the official currency of the Republic of India. The rupee is subdivided into different denominations like Rs 1, 2, 5, 10, 20, 50, 100, 500 and 2000 which is controlled, managed and issued by the Reserve Bank of India (RBI). The Reserve Bank of India was established in the year of 1934. The circulation of the currency and demonetization has been done by RBI with the guideline of government of India. The demonetization had been done three times in India. The first time it happened in the year of 1946 the denomination of Rs.1,000 and Rs10,000 notes, in the year 1938 the RBI introduced first time the largest currency denomination notes of Rs10,000, the reason behind to control over black money and inflation. The second time it happened in the year of 1978 when Rs1000, Rs5,000 and Rs10,000 denominated notes were demonetized. In the year 1954, these notes were re-introduced in the Indian economy as a result it gives momentum to inflation and black money. On account of high inflation and piling up of black money in the economy the Janata party coalition Government(BJP), in the year of 1978, the Finance Minister H.M Patel gave instruction to RBI Governor I.G Patel to withdraw high denomination notes of Rs1000, Rs5000 and Rs10000 from the circulation of money. In the month of October, 1987 and November, 2000 the RBI re-issued Rs500 and Rs1000 notes respectively. The move was then justified to control the volume of banknotes in circulation due to inflation. The third time on 8th November 2016, the old denominated notes of Rs500 and Rs1000 were demonetized and re-issued new denominated notes of Rs500 and Rs2000 under the leadership of Honorable Prime Minister Shri Narendra Modi. This demonetization has been done to control over corruption, black money and fake currency.

- Bank notes in Ashoka Pillar watermark series in Rs 10 denomination were issued between 1967 and 1992, Rs 20 in 1972 and 1975, Rs 50 in 1975 and 1981 and Rs 100 between 1967-1979.
- The banknotes issued during this period contained the symbols representing science and technology, progress and orientation to Indian art forms.
- In the year 1980, the legend Satyameva Jayate — 'truth alone shall prevail' — was incorporated under the national emblem for the first time.
- In October 1987, Rs 500 banknote was introduced with the portrait of Mahatma Gandhi and Ashoka Pillar watermark. Mahatma Gandhi (MG) series banknotes – 1996 were issued in the denominations of Rs 5, (introduced in November 2001), Rs 10 (June 1996), Rs 20 (August 2001), Rs 50 (March 1997), Rs 100 (June 1996), Rs 500 (October 1997) and Rs 1,000 (November 2000).
- The Mahatma Gandhi Series – 2005 bank notes were issued in the denomination of Rs 10, Rs 20, Rs 50, Rs 100, Rs 500 and Rs 1,000 and contained some additional/new security features as compared to the 1996 MG series.
- The Rs 50 and Rs 100 banknotes were issued in August 2005, followed by Rs 500 and Rs 1,000 denominations in October 2005 and Rs 10 and Rs 20 in April 2006 and August 2006, respectively.

Concept

Demonetization refers to an act of stripping a currency unit of its status as a legal tender. Demonetization is necessary whenever there is a change of national currency. The old unit of currency must be retired and replaced with a new currency unit.

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**COMPARATIVE PROFITABILITY ANALYSIS THROUGH
OPTIMUM CAPITAL STRUCTURE OF GAIL (INDIA) LTD. AND
ONGC LTD.**

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ABSTRACT

Every concern needs to build an appropriate capital structure decisions. Capital structure decisions and profitability have direct relationship because it affects the profitability of the concern. Capital structure decisions are mainly concerned with the proper determination of debt and equity of the company. The ultimate objective of optimum capital structure is to maximizing overall cost of capital and maximizing profitability and value of the firm. In this paper comparative profitability analysis will be done through optimum capital structure of GAIL (India) Ltd. and ONGC Ltd. In this study we have taken some accounting ratios which affect the capital structure of the companies. From the study it is found that financial leverage position of GAIL (India) Ltd. is not satisfactory but the financial leverage position of ONGC Ltd was highly satisfactory. Operating leverage ratio of GAIL (India) Ltd. was average which was only 1.53 times where as ONGC Ltd. has satisfactory position. Interest coverage ratios of both the companies are not satisfactory. Return on equity of GAIL (India) Ltd. is better where ROE of ONGC Ltd. is also good which was on an average 701.45%.

KEYWORDS : - Capital Structure, Debt-Equity, Profitability, GAIL (India) Ltd. and ONGC Ltd.

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CHANGING MANAGEMENT PERSPECTIVE FOR GLOBAL COMPETITIVENESS

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Abstract

In the present scenario our firms need to be globally competitive. This paper highlight some pillars which can be play an effective role to make our firm globally competitive. Our culture, belief and tradition have a deep impact on the work culture of an organization but these should not act as a hindrance in multilateral trade with other country. We have to shed the narrow thinking which comes in the way of national interest from the economic point of view and develop a broad outlook and absorb a global thinking in our work culture and management practices.

Keywords: Management Perspective, Global Competitiveness.

Introduction

India is a developing country. Since independence we have come a long way in providing a better standard of living to our citizens but still we have to go a long way to see our country emerge as one of the developed nation of the world. We have been applying our traditional thinking in managing our businesses for a long time but it is high time when we have to change our way of thinking so that we can become globally competitive. Our first Prime Minister Jawaharlal Nehru was the first person to coin the term scientific temper. He emphasized that if India has to progress it is through science and science alone. Therefore we need to develop a scientific temper and look at all our problems from a scientific point of view. Just as the developed countries have reached their present conditions have reached their present countries through the use of science and technology and extensive industrialization, India also needs to follow their path without sacrificing our social and cultural traditions. We need to manage our human resources in a better way and equip them with technologies so that they can give their optimum to the achievement of organizational and national goals. They also need to be motivated appropriately to achieve higher level of excellence.

In order to change the management perspective for global competitiveness we also have to look at the markets and management principles from the point of view of foreign universities and put them into practice, without sacrificing our national interest. We need to give emphasis on cross cultural communication in our organizations to understand the global prospective. The initiative taken by our Prime Minister Mr. Narendra Modi in this regard is a welcome step. In the era of globalizations, global competitiveness has become central to the strategy in the business world. Competitiveness is important to the economy from the business point of view, competitiveness shows the ability of the company to produce and sell a product which can match with a competitor's product on the basis of lower cost, higher quality. A global competitive environment encourages business to expand and sell their products in market at home and abroad.

Justification of the Study

India is a developing country. Since we are a part of world trade organization we cannot keep ourselves aloof from what is going on in the world market. We have to be globally competitive to sell our products in the world market to earn foreign exchange and economically strong. By adopting different strategies given in the paper our country can come at par with the other advanced nations. So by paying attention to the highlights pillars we can change our management prospective and make it globally competitive.

Review of Literature

Marthak Piyush (2017) studied the global competitiveness: A strategic perspective. According to the author, global competitors have the capacity to think and act in different ways. The company should design their strategies in such a way so they manage the cost and revenue simultaneously. The researcher studies the certain factors such as market factors, economic factor, environment factors and competitive factors for achieving global competitiveness. In the recent past, Indian industry was undergoing tremendous transformation.

Ivan vateries (2015) studied the leadership Vs management from competitiveness intelligence perspective. The author identifies the main characteristics and essential differences in the approaches of the actionable information needs. The author suggested various models of possible approaches in the information analysis and intelligence production activity in order to fulfill the role as decision support in global competitiveness.

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एचईजी लिमिटेड की शोधन क्षमता का विश्लेषण

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सारांश

एचईजी लिमिटेड की शोधन क्षमता का अध्ययन दो भागों में किया गया है प्रथम अल्पकालीन शोधन क्षमता का विश्लेषण किया गया है। इस विश्लेषण हेतु चालू अनुपात, तरल अनुपात, रोकड अनुपात, ग्रण समता अनुपात, स्वामित्व अनुपात, दीर्घकालीन ग्रण का कुल सम्पत्तियों से अनुपात, चालू दायित्वों का कुल सम्पत्तियों से अनुपात एवं निश्चियता का कुल पूँजीकरण में अनुपात इत्यादि के माध्यम से शोधन क्षमता का अध्ययन किया गया है। इस शोध अध्ययन में कम्पनी की अल्पकालीन शोधन क्षमता अच्छी है। लेकिन दीर्घकालीन शोधन क्षमता संतोषजनक है जिसमें सुधार की भी आवश्यकता है। कम्पनी की औसत रूप से दोनों प्रकार की शोधन क्षमता की स्थिति शोध विषय अध्ययन की अवधि के दौरान संतोषजनक रही है। लंगिन दीर्घकालीन शोधन क्षमता में थोड़े सुधार हेतु आवश्यक सुझाव भी दिए गए हैं।

कुन्जी शब्द: चालू अनुपात, तरल अनुपात, ग्रण समता अनुपात, स्वामित्व अनुपात एवं दीर्घकालीन ग्रण का कुल सम्पत्तियों में अनुपात।

प्रस्तावना

प्रत्यंक व्यावर्गायिक कम्पनी या संस्था के विनियोजन में कम्पनी की शोधन क्षमता को

मूलिकता करना आवश्यक है। योग्य शास्त्र का अध्ययन कामनी द्वारा द्वय पर भाग लायली का पृथग्य करने की शास्त्र का है। अल्पकालीन शोधन क्षमता में कामनी के चालू लायिली पर दीर्घकालीन शोधन क्षमता में कामनी के दीर्घकालीन लायिली का पृथग्य करने की शास्त्र की तरीकी है। योग्य शास्त्र को कामनी की दीर्घकालीन योग्य शास्त्र एवं विनियोजित का मूल्यांकन किया जाता है। योग्य शास्त्र का योग्य शास्त्र को बनाए रखने में राहायक है। कामनी की योग्य शास्त्र को बनाए रखना आवश्यक है। जब देश विभिन्न प्रभावान की स्थिति उत्पन्न हो और कामनी के पास भूत्तान के लिए पर्याप्त कोष उपलब्ध हो। यही स्थिति कम्पनी की उत्तम शोधन क्षमता कहलाती है।

अध्ययन का औचित्य

यह विषय अध्ययन इसलिए भी और महत्वपूर्ण है कि शोधन क्षमता की स्थिति किस प्रकार बाहरी लेनदारों तथा कम्पनी को प्रभावित करती है। इन महत्वपूर्ण तथ्यों का ज्ञान होन आवश्यक है ताकि इन विन्दुओं को ध्यान में रखकर कम्पनी भविष्य में अपनी व्यावसायिक नीतियों को वास्तविकता प्रदान कर सके जिससे कम्पनी की विधमानता व लोकप्रियता में वृद्धि हो।

शोध विषय अध्ययन के उद्देश्य

- शोधन क्षमता की अवधारणा का अध्ययन करना।
- एचईजी लिमिटेड की शोधन क्षमता का विश्लेषणात्मक अध्ययन करना।

शोध विषय अध्ययन की परिकल्पनाएं

H_{01} शोध विषय अध्ययन की अवधि में चालू सम्पत्तियों एवं चालू दायित्वों में कोई सार्थक अन्तर नहीं है।

H_{02} शोध विषय अध्ययन की अवधि में दीर्घकालीन ग्रण पूँजी एवं स्वामित्व पूँजी में कोई सार्थक अन्तर नहीं है।

शोध विषय अध्ययन की संरचना

शोध विषय अध्ययन के उद्देश्यों की पूर्ति के लिए द्वितीय समंकों का उपयोग किया जाएगा। जिसमें

भारत हेवी इलेक्ट्रिकल्स लिमिटेड की शोधन क्षमता का विश्लेषण

डॉ. एस. के. खटीक * शहाना राईद **

शोध सारांश - भारत हेवी इलेक्ट्रिकल्स लिमिटेड की शोधन क्षमता के विश्लेषण हेतु अनुपात विश्लेषण तकनीक का उपयोग किया गया है। तथा इस अनुपातिक तकनीक के अन्तर्गत अल्पकालीन शोधन क्षमता हेतु चालू अनुपात, तरल अनुपात, रोकट अनुपात तथा दीर्घकालीन शोधन क्षमता के विश्लेषण हेतु कुल ऋण समता अनुपात, स्वामित्व अनुपात, चालू दायित्व का कुल सम्पत्तियों से अनुपात, निधि ऋण का कुल पूँजीकरण से अनुपात के माध्यम से विश्लेषण किया गया है। इस विश्लेषण से यह निष्कर्ष निकलता है कि कम्पनी की अल्पकालीन एवं दीर्घकालीन शोधन क्षमता संतोषजनक नहीं है क्योंकि सम्बन्धित अनुपात एक निश्चित प्रमाण से कम है। इसलिए कम्पनी की अल्पकालीन एवं दीर्घकालीन शोधन क्षमता में सुधारन के आवश्यक प्रयास किया जाना चाहिए इस हेतु इस पेपर में आवश्यक सुझाव भी दिये गए हैं।

कुंजी शब्द - चालू अनुपात, तरल अनुपात, ऋण समता अनुपात, स्वामित्व अनुपात एवं दीर्घकालीन ऋण का कुल सम्पत्तियों से अनुपात।

प्रस्तावना - प्रत्येक व्यावसायिक कम्पनी या संस्था के वित्तीय नियोजन में कम्पनी की शोधन क्षमता को सुनिश्चित करना आवश्यक है। शोधन क्षमता का आशय अल्पकालीन एवं दीर्घकालीन ढोनों प्रकार के देय का भुगतान देय तिथि पर करने से है। जो कि कम्पनी की साख क्षमता तथा ख्याति ढोना रखने में सहायक है। कम्पनी की शोधन क्षमता बनाए रखना तभी सम्भव है, जब कक्षी भी भुगतान की स्थिति उत्पन्न हो उस समय कम्पनी के पास भुगतान के लिए पर्याप्त कोष उपलब्ध हों। यहीं स्थिति कम्पनी की उत्तम शोधन क्षमता कहलाती है।

अर्थात् शोधन क्षमता कम्पनी की वह क्षमता होती है, जिससे कम्पनी स्वयं के दीर्घकालीन वित्तीय दायित्वों का भुगतान कर सके। शोधन क्षमता किसी भी कम्पनी के व्यवसाय को स्थिर रखने में उपयोगी है। यह दीर्घकालीन व्यायों एवं स्थायी वृद्धि की क्षमता को दर्शाती है। यह शुद्ध तरलता के मापन का महत्वपूर्ण छोत है। जो कम्पनी के कुल दायित्वों एवं कुल सम्पत्तियों के मध्य सम्बन्धों को प्रकट करती है। शोधन क्षमता की गणना से यह भी ज्ञात होता है कि कम्पनी की कुल सम्पत्तियों के प्रबंध में वाह्य दायित्वों के कितने भाग का प्रयोग किया गया है। कम्पनी की सम्पत्तियों से वसूल होने वाली रेशि से वर्या कम्पनी के वाह्य दायित्वों का भुगतान किया जा सकता है या नहीं।

कम्पनी की शोधन क्षमता की गणना का मुख्य उद्देश्य कम्पनी के ऋणों का भुगतान करने की क्षमता के मापन से है, जो कम्पनी के ऋणदाताओं को महत्वपूर्ण सूचनाएँ एवं सुरक्षात्मक आवारण प्रदान करती है। शोधन क्षमता भावी नियोक्ताओं के लिए कम्पनी के पूँजी ढाँचे के परीक्षण का महत्वपूर्ण छोत है, जो कम्पनी के भावी नियोजन में पथ प्रदर्शन का कार्य करती है। कम्पनी में अल्पकालीन एवं दीर्घकालीन देय का भुगतान करने की आवश्यकताओं की पूर्ति के लिए उचित शोधन क्षमता को बनाए रखना आवश्यक है। कम्पनी के भावी भुगतानों का उचित पूर्वानुमान कम्पनी की शोधन क्षमता के नियोजन में सहायक होता है।

अध्ययन का औचित्य - व्यावसायिक परिवेश में कार्यरत कोई भी कम्पनी अपने व्यवसाय को सुचारू रूप से संचालित करने एवं डैनिक क्रियाओं व दायित्वों के भुगतान के लिए पूर्ण रूप से वित्त पर निर्भर रहती है। यह वित्त कम्पनी अल्पकालीन एवं दीर्घकालीन समय अवधि के उपयोग के लिए बाहरी छोतों से प्राप्त करती है। कम्पनी वित्त के उचित प्रबंध द्वारा ही अल्पकालीन एवं दीर्घकालीन शोधन क्षमता की सामान्य स्थिति को बनाए रखने में सक्षम होगी। अन्यथा कम्पनी की शोधन क्षमता कम्पनी के प्रत्येक विभाग को प्रभावित करेगी। जिससे कम्पनी का व्यवसाय व ख्याति कम होगी। इसीलिए कम्पनी की शोधन क्षमता का उचित ज्ञान होना आवश्यक है। जिससे व्यवसाय के प्रतिस्पर्धात्मक वातावरण में कम्पनी की सुदृढता व सफलता को व्यवस्थित रूप में स्थापित किया जा सके।

यह विषय अध्ययन इसलिए भी और महत्वपूर्ण है कि शोधन क्षमता की रिथिति किस प्रकार बाहरी लेनदारों तथा कम्पनी को प्रभावित करती है। इन महत्वपूर्ण तथ्यों का ज्ञान होना आवश्यक है ताकि इन बिन्दुओं को ध्यान में रखकर कम्पनी भविष्य में अपनी व्यावसायिक नीतियों का वारतविकास प्रदान कर सके। जिससे कम्पनी की विद्यमानता व लोकप्रियता में वृद्धि हो।

शोध साहित्य की समीक्षा -

साहू 2002 - भारत की पेपर उत्पादक कम्पनियों का अध्ययन किया अध्ययन में यह पाया कि तरलता एक सफल कम्पनी में महत्वपूर्ण भूमिका निभाती है। अतरलता की स्थिति किसी भी व्यवसाय को असफलता की और अव्यास करती है एवं व्यवसाय को संचालित नहीं होने देती है। व्यवसाय में अधिक तरलता लाभदायकता के लिए भी हानिकारक होती है। अध्ययन में यह पाया कि भारत की पेपर उत्पादक कम्पनियाँ अधिक खराब स्थिति में पाई गई हैं। जिससे वह उभरने वा प्रयत्न कर रही हैं।

भुनिया 2010 - टाटा स्टील लिमिटेड एवं लोडस स्टील इन्डस्ट्रीज लिमिटेड का (वर्ष 1997 से 2006 तक) अध्ययन किया। अध्ययन में पाया कि

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Comparative solvency analysis through optimum capital structure of GAIL (India) Ltd. and ONGC Ltd.

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Abstract

The word solvency is used to identify whether the companies have a capacity to meet with its long-term commitments. In this paper solvency analysis is done to measure the long term financial obligations. Under this study debt-equity ratio, capital gearing ratio, solvency ratio, proprietary ratio and capitalization ratio has used to analyze the capital structure of GAIL (India) Ltd. and ONGC Ltd. During the study period it is found that debt-equity position, capital gearing ratio and proprietary fund position of the companies are not satisfactory. Solvency position of GAIL (India) Ltd. was satisfactory but the ONGC Ltd. has highly satisfactory solvency position. Capitalization ratio of GAIL (India) Ltd. is also satisfactory but the capitalization ratio of ONGC Ltd. is not satisfactory during the study period.

Keywords: Capital Structure, Debt-Equity, Solvency, GAIL (India) Ltd. and ONGC Ltd.

1. Introduction

The term solvency is used to meet long term financial obligations of the firm. Solvency plays a vital role in maintaining the stability of the firm. In common parlance, solvency position of the firm not only depends upon the liquidity but also on the capital structure of the firm. They both are interrelated to each other. Solvency means a company is able to pay its debt obligations. In this regard certain ratios are to be calculated to measure the solvency position of the company. In this competitive era, every company needs to maintain long term financial solvency position of the firm, for the smooth functioning of the business a firm needs to have adequate fund to meet its long-term debts. In this regard capital mix is also play a crucial role in deciding optimum capital structure of the firm. Capital structure refers to the way a firm is financing its assets through a combination of equity and debt. The form of financing and types of funding sources will define the firms' capital structure. The process of financing takes a very important place in firms' management because it must ensure financial continuity necessary for growth and maintaining competitiveness in their environment.

In the competitive environment every firm need adequate funds to meet its financial obligations. Now the question arises that at what proportion various source of long term finance should be used to raise the amount of capital. If the company needs to survive for a long run so it should correctly measure and managed the present and future need of capital which will help the company to run its financial operations smoothly. Capital structure helps the organization to manage a proper combination of debt and equity capital. Capital structure of a company refers to a proper mix of debt and equity capital and it includes all long term resources like loans, reserves, shares and bonds. Equity includes paid up share capital, share premium, reserves and surpluses (Retained earnings) while debt includes debentures and long term loans. Capital structure also suggests a firm, how to finance its overall operations and growth by using the different sources of funds. It is one of the

pillar on which the entire organization stands. Capital structure is an important tool to control the cost of capital of the company. The purpose of capital structure is to minimize the cost of capital (K_o) and to maximize the value of the firm which would increase the wealth of the companies.

1.1 Justification of the topic

The reason behind to take this topic is to examine the solvency position through capital structure analysis of GAIL (India) Ltd. and ONGC Ltd. because the profitability and solvency of the concern depends upon the capital structure of the firm. In this study various ratios have been taken to measure the solvency position of both the companies. These ratios help to examine the debt and equity capital of GAIL (India) Ltd. and ONGC Ltd. An analyzing all these ratios the company can easily manage and control its capital structure of the firm. Solvency not only beneficial for the company itself but it is also one of the important aspects for the investors of the company. Every investors of the company are more interested to know about the solvency position of the company.

1.2 Review of Literature

Chandha Saurabh & Sharma Anil (2014), highlights the key determinates of capital structure of 422 Indian manufacturing companies listed in BSE. The researcher found that size, age, growth, asset tangibility, profitability, non-tax shield, business risk, uniqueness and ownership structure of the firms are significantly correlated with the financial leverage. Apart from these other variable such as dividend pay-out, liquidity, interest coverage ratio, inflation and GDP growth rate are found to be insignificant to determine the key factors of capital structure of companies in Indian manufacturing sector.

Babu N. Suresh and Chalam G.V. (2014), studied the key factors influencing capital structure decision of Indian computer software industry. The researcher examines the characteristics such as profitability, size, growth opportunities, asset tangibility, non-debt tax shield, risk (volatility) and

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नवम वर्ष, चतुर्थ अंक

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डॉ साधना दोनेरिया

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प्रायः ऐसा समझा जाता है कि तनाव आधुनिक भौतिक युग की देन है। परंतु यह कथन पूर्णतया सत्य नहीं है, क्योंकि जब से मनुष्य इस पृथकी पर आया तनाव किसी न किसी रूप में उसके साथ है। आदि मानव को दो वक्त का भोजन जुटाने के लिए, प्राकृतिक आपदाओं से स्वयं को बचाने, जंगली जानवरों से स्वयं व परिवार की रक्षा इत्यादि तनाव आज के तनावों से अधिक ही थे।

सभ्यता के विकास के साथ जब मनुष्य ने इन तनावों पर कुछ सीमा तक नियंत्रण प्राप्त किया तब मानव द्वारा निर्मित तनावों ने उसे आ घेरा। परंतु मनुष्य शीघ्र ही इन तनावों पर नियंत्रण प्राप्त करने में सफल तब हुआ जब ऋषि - मुनियों के प्रयत्नों से आश्रम व्यवस्था के प्रथम चरण ब्रह्मचर्य के कर्तव्यों का ज्ञान कराकर उसे आरंभ से ही अन्य चरणों (गृहस्थाश्रम, वानप्रस्थ एवं सन्यास) में तनाव मुक्त सुव्यवस्थित जीवन बिताने के लिए प्रशिक्षित कर दिया जाता था।

यम, नियम जीवन के अभिन्न अंग होने के कारण मनुष्य का जीवन बहुत कुछ सीमा तक तनाव रहित था। आज यदि हमने कुछ खोया है तो वह है सदाचारी जीवन जिसके कारण वर्तमान जीवन तनावग्रस्त हो गया है।

वर्ण व्यवस्था जो कि श्रम बैंटवारे के सिद्धांत पर आधारित थी। समाज को तनाव रहित बनाने में इस वर्ण व्यवस्था का भी बहुत योगदान था। हालाँकि वर्तमान में वर्ण व्यवस्था के विकृत रूप ने समाज में तनावपूर्ण वातावरण निर्मित कर दिया है।

आधुनिक वैज्ञानिक युग तथा उससे जनित औद्योगीकरण एवं नगरीकरण ने मानव मूल्यों को मनुष्य के जीवन से दूर कर दिया है। स्वस्थ अर्थात् स्व में स्थित परमात्मा का एक अभिन्न अंग अपने स्वरूप को भूलकर विज्ञान का गुलाम बन गया है। फलस्वरूप अस्वस्थ तन, अस्वस्थ मन, अस्वस्थ समाज और अस्वस्थ वातावरण सभी ने मिलकर एक तनावपूर्ण जीवन पद्धति को जन्म दिया है।

इस तनावपूर्ण स्थिति में मनुष्य के शरीर में अनेक परिवर्तन होते हैं, जिसके परिणामस्वरूप विभिन्न प्रकार के दोष उत्पन्न हो जाते हैं, इनमें से कुछ निम्नानुसार दृष्टव्य हैं -

- उच्च रक्ताप बढ़ जाता है।
- शर्करा का उत्पादन ज्यादा होने लगता है।
- पाचन तंत्र ठीक ढंग से कार्य नहीं करता।
- आँखों की पुतलियाँ फैल जाती हैं। श्वसन-गति तेज हो जाती है।
- एड्रीनल ग्रंथि का स्राव ज्यादा होने लगता है।
- नींद नहीं आना, चिढ़- चिढ़ेपन का बढ़ जाना इत्यादि।
- खाद्य पदार्थों का अत्यधिक मात्रा में सेवन या बहुत कम।
- आत्म विश्वास एवं निर्णय लेने की क्षमता में कमी।
- मादक द्रव्यों के सेवन में अधिकता।
- असन्तोष।
- सामाजिक कार्यक्रम में भाग न लेना एवं अकेले बंद कमरे में रहना।
- एकाग्रता में कमी परिणाम स्वरूप निर्णय क्षमता का कमज़ोर पड़ना।
- हर समय चिन्ताग्रस्त रहना।
- एक ही बात को बार - बार बोलना।
- स्वभाव में जिदीपन एवं कठोरता का होना इत्यादि।

यद्यपि इनमें में कुछ एक परिवर्तन अल्प समय के लिये हों तो किए जाने वाले कार्य के लिए सकारात्मक साबित होते हैं। अर्थात् किसी कार्य को करने के लिए कुछ मात्रा में उत्पन्न तनाव मनुष्य की कार्यक्षमता को बढ़ा देता है। ऐसे तनाव को मनोविज्ञान की भाषा में Eustress कहा गया है। परंतु यही तनावपूर्ण स्थिति यदि बहुत देर तक बनी रहे और मनुष्य उस चुनौतीपूर्ण कार्य को करने में अक्षम होकर हताश होने की स्थिति में आ जाय तो उसे Distress कहते हैं और तब यही स्थिति मनोदैहिक विकारों को जन्म देती है, जैसे- मधुमेह, अस्थमा, ब्लडप्रेशर, कब्जियत, गठिया

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ABSTRACT

आज निराश्रित छात्राओं की समस्याओं को गंभीरता से समझने की आवश्यकता है। इनको शारीरिक एवं मानसिक रूप से स्वस्थ एवं सबल बनाना है। जिसके लिए उत्तम साधन है “योग”। इस शोध पत्र में “निराश्रित छात्राओं के मानसिक स्वास्थ्य पर योग का प्रभाव” विषय पर अध्ययन किया गया है। इस अध्ययन में आकस्मिक प्रतिचयन विधि का प्रयोग करते हुए 60 प्रयोज्यों का चयन किया गया। शोध पत्र में प्री-पोस्ट डिजाइन के माध्यम से 20–25 वर्ष की छात्राओं को जिनका शैक्षणिक स्तर समान था, उनको 3 माह तक निरंतर योगाभ्यास कराया गया, निराश्रित छात्राओं में योगाभ्यास द्वारा होने वाले मानसिक स्वास्थ्य सुधार हेतु डॉ. श्रीमती कमलेश (डॉ. भीमराव अम्बेडकर शोध संस्थान, इंदौर) द्वारा निर्मित मानसिक स्वास्थ्य मापनी का प्रयोग किया है। अध्ययन उपरांत यह निष्कर्ष निकला कि नियमित योगाभ्यास का मानसिक स्वास्थ्य पर सार्थक प्रभाव पड़ता है। योगाभ्यास द्वारा शारीरिक, मानसिक एवं भावनात्मक स्थिरता के साथ बौद्धिक सृजनात्मकता का विकास सहजता से होता है। अतः योग निराश्रित छात्राओं के मानसिक विकारों को दूर कर विपरीत परिस्थितियों में मानसिक संतुलन एवं स्थिरता बनाए रखने में सक्षम है।

कूट शब्द : योगाभ्यास, मानसिक स्वास्थ्य

प्रस्तावना

योग भारतीय संस्कृति की सबसे प्राचीन सम्पत्ति है। यह एक ऐसी विधा है जिसकी साधना से अनेक लोग देह सहित सिद्धता को प्राप्त हो गए। योग एक ऐसा सहज और सरल मार्ग है जिस पर चलकर साधारण साधक भी शारीरिक एवं मानसिक स्वास्थ्य को सहजता से प्राप्त करता हुआ आध्यात्मिक स्तर को भी सहज रूप से स्वस्थ और सबल बनाता है। आध्यात्मिक स्तर के स्वस्थ और सबल बनने पर एकाग्रता भी स्वतः उत्कृष्ट हो जाती है। उत्कृष्ट एकाग्रता सभी प्रकार के मनोकायिक विकारों से स्वतः दूर कर एक सकारात्मक सोच उत्पन्न करती है यह सकारात्मक सोच ही एक सर्वांगीण विकास का निर्माण करने में सहायक हो सकती है। आज समाज में अनेक प्रकार की विकृतियां दिखायी देती हैं। जिससे किशोरवर्ग भी अछूता नहीं है। आज किशोरवर्य को सही दिशा देने की नितांत आवश्यकता है। किशोरवर्य का शारीरिक, मानसिक एवं भावनात्मक विकास तेजी से होता है, जिससे शारीरिक एवं मानसिक स्तर पर बदलाव के कारण सांवेदिक परिवर्तन का उत्पन्न होना स्वाभाविक है। इस समय परिवार एवं परिवारजनों की अहम् भूमिका होती है। जो परिवारजनों के कारण सकारात्मकता के साथ नियंत्रित हो सकते हैं। प्यार व सहानुभूति का पाठ सबसे पहले परिवार में ही सीखते हैं। परिवार ही भावी जीवन का निर्माता हैं। किंतु कई बच्चे ऐसे होते हैं, जिनके माता-पिता नहीं होते हैं ऐसी परिस्थिति में बच्चों को अनाथ आश्रम में जीवन व्यतीत करना पड़ता है। जिसमें किशोरवर्य छात्राओं को अनेक मुश्किलों का सामना करना पड़ता है। किशोरवर्य छात्राओं में शारीरिक परिवर्तन अत्यंत तेजी से होता हैं इन परिवर्तन के कारण अनेक मानसिक परिस्थितियों का सामना करना पड़ता है, जो माता-पिता की छत्र-छाया द्वारा दूर किये जा सकते हैं। परंतु अनाथ आश्रम में माता-पिता से वंचित रहने के कारण अनेक तरह के शारीरिक एवं मानसिक अनेक सामान्य एवं असामान्य परिस्थितियों का सामना करना पड़ता है। जिसकी निरंतरता ही मानसिक विकारों को जन्म देती है। अतः मानसिक विकारों को दूर करने का एक मात्र सहज उपाय योग है। योगाभ्यास के नियमित अभ्यास से निराश्रित छात्राओं को सही दिशा और मार्गदर्शन प्राप्त हो सकता है। योगाभ्यास आत्मबल प्रदान करता है, जो विपरीत परिस्थितियों में भी मानसिक संतुलन और स्थिरता बनाने रखने का संबल देता है।

इस शोध पत्र का प्रमुख उद्देश्य है “निराश्रित छात्राओं के मानसिक स्वास्थ्य पर योग का प्रभाव”

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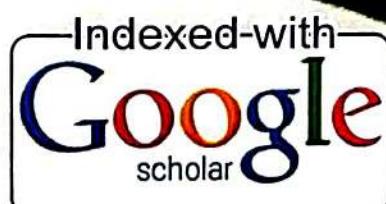
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महिलाओं में रजोनिवृत्ति काल की समस्याओं पर योग का प्रभाव

Effect of Yoga on Menopausal Problems In Women

Paper Submission: 12/08/2020, Date of Acceptance: 26/08/2020, Date of Publication: 28/08/2020

सारांश

महिलाओं के जीवन में दो चरण बहुत ही महत्वपूर्ण होते हैं पहला जब मासिक धर्म की शुरुआत होती है और दूसरा जब मासिक धर्म बंद होता है। मासिक धर्म का स्थाई रूप से बंद होना रजोनिवृत्ति कहलाता है। इस समय महिलाओं के शरीर एवं मनःस्थिती में अनेक परिवर्तन होते हैं। ये परिवर्तन उनकी मनोकार्यिक अवस्था को नकारात्मक रूप से भी प्रभावित करते हैं। रजोनिवृत्ति के समय तनाव, अनिद्रा, मोटापा, हृदय रोग, ऑस्टियोपोरोसिस, थायराइड, खून की कमी इत्यादि अनेक मनोकार्यिक विकार उत्पन्न होते हैं। रजोनिवृत्ति के संबंध में पर्याप्त जानकारी न होने के कारण अधिकतर महिलाएँ इन परिवर्तनों को समझने में असमर्थ होती हैं और जीवन का लगभग एक तिहाई हिस्सा इसी परेशानी में गुजार देती हैं। इन सभी समस्याओं के नियंत्रण में योग की महत्वपूर्ण भूमिका है। यौगिक क्रियाओं का अभ्यास महिलाओं के शारीरिक, मानसिक, भावनात्मक एवं आध्यात्मिक स्तर पर संतुलन स्थापित कर स्वास्थ्य प्रदान करता है।

Two stages are very important in the life of women, first when menstruation starts and second when menstruation stops. Permanent stop of menstruation is called menopause. At this time many changes take place in the body and mind of women. These changes also negatively affect their psychological state. During menopause stress, insomnia, obesity, heart disease, osteoporosis, thyroid, anemia etc., many psychiatric disorders arise. Due to lack of adequate knowledge about menopause, most women are unable to understand these changes and spend almost one third of their lives in this problem. Yoga has an important role in controlling all these problems. The practice of Yogic Kriya provides health by balancing women's physical, mental, emotional and spiritual levels.

मुख्य शब्द : रजोनिवृत्ति, यौगिक अभ्यास।

Menopause, Yogic Practice.

प्रस्तावना

परिवर्तन प्रकृति का नियम है। यह परिवर्तन कई अवस्थाओं से होकर हुजरता है, तथा संसार के प्रत्येक पदार्थ में कोई न कोई परिवर्तन समय के साथ तक समय के साथ परिवर्तन होते हैं। इसी प्रकार महिलाओं में भी बढ़ती उम्र के सृष्टि की उत्पत्ति के साथ ही स्त्री का सूजन हुआ, स्त्री से ही संपूर्ण संसार का हुई मानव को संसार चक्र चलाने के लिए सक्षम बनाती है। एक स्त्री बहन, माँ घर के लिए समर्पित गोंद की भाँति है। जिन्होंने जीवन के बहुत से हिस्सों को महिलाओं का श्रेष्ठ स्थान है। आज आधी आबादी अनेक विकारों से ग्रस्त है। जिस कारण अपनी सेहत पर ध्यान नहीं दे पाती और अस्वस्थ होने लगती है। महिलाएँ अपने जीवन में अनेक परिवर्तनों के दौर से हुजरती हैं जहां पर वह बदलाव का अनुभव करती है। रजोनिवृत्ति की अवस्था में हार्मोन असंतुलन के

सुधा राजावत

शोधार्थी,
योग विभाग,
बरकतउल्ला विश्वविद्यालय,
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Frontiers

The role of 'Selective Yoga Practices' for Anger Management in Adolescents

Dr.SadhnaDauneria¹ & Manjula Rohilla²

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ABSTRACT

The human life has evolved from ancient civilizations to the present age 'internet enabled' modern life, and with every perk naturally comes the associated disadvantages. In this case, we are referring to the everyday stress that results in behavioral conditions such as 'anger'. Anger is defined as an emotion which can be identified by opposition or hatred towards an individual or a situation one feels directly responsible for wrongdoing to them. Anger and its management have become one of the most critical concerns of modern society affecting both professional and personal aspects of an individual's life, in almost every age group. And anger treatments have relatively low quantifiable success rates due to the fact that anger is not catalogued as a disorder at a diagnostic and statistical level.

In this paper, we will focus on the implications of anger, related disorders and anger management in adolescents. We have chosen to focus the research on the adolescents' age group as it has been proven by several researchers that younger age groups are able to grasp anger management skills and inculcate them in their daily life, being able to solve related problems. Yoga practices have been long recognized to be of healing and rejuvenating effects on the human mind and body. We propose to use these yogic practices for the initial and long-term control and remediation of anger in adolescents and measure the effectiveness of such practices. Suggested outcome is expected to prove that the introduction of selective yogic practices in adolescents can help aid anger management. We believe that post successful anger management, research participants will exhibit overall improvement in their mental and emotional balance and will be more constructive.

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Keywords:

Anger, Anger Management,
Adolescents, Yoga, Yoga
Practices.

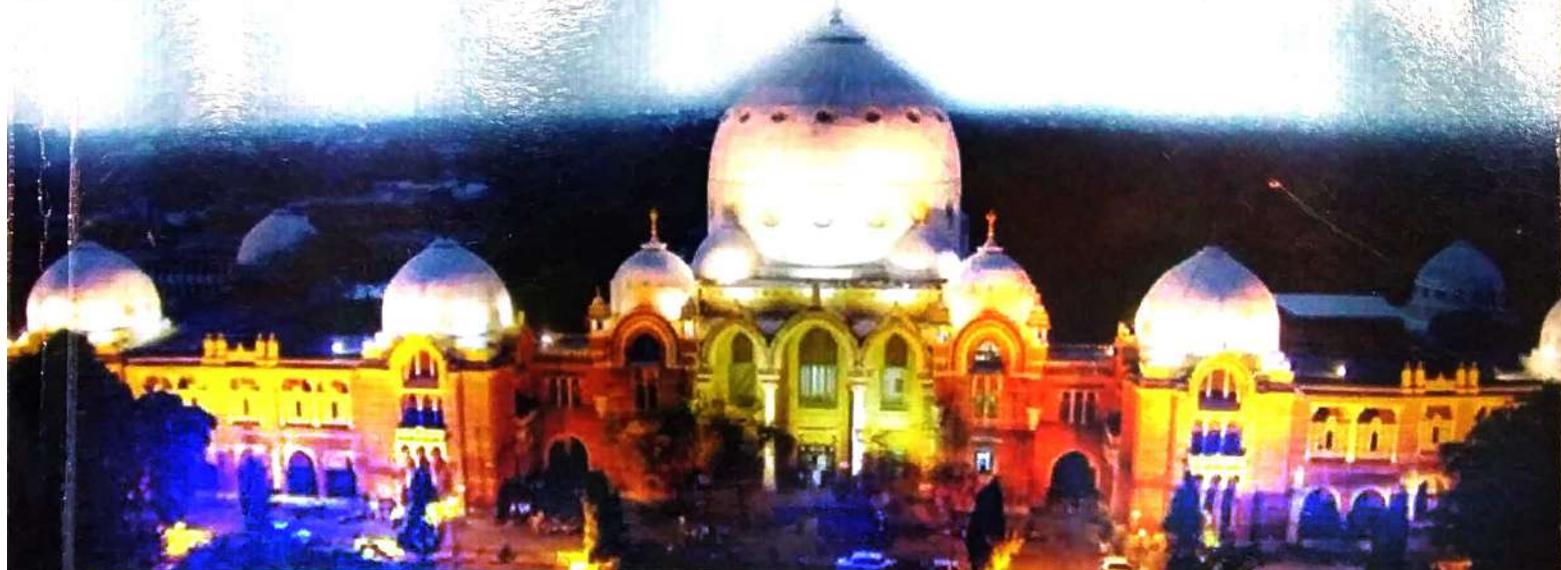
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Manisha Dadhore Ph.D Research Scholar, Department of Yoga, Barkatullah (M.P.),

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Abstract:-
Adolescents it is considered to be the springtime of one's life. This is the age when a child undergoes many physical and mental changes as the development takes place. These physical changes bring in mental instability among teenagers. Orphan teenagers do not get parental support. They have to face all these mental and physical changes without any guidance. This situation results in many psychological disorders such as insecurity hypertension depression and inferiority complex among the orphan teenagers. In order to cope up with all these disorders yoga is the most reliable remedy. Yoga not only heals physically but also deals with mental and psychological disorders. Yogic practices are essential for these orphan children to keep their physical and psychological development. Yogic practice brings many crucial changes in these orphan teenagers and it also eliminates unnecessary ideas from their brain and soothes their souls by alleviating stress. This helps them to stabilize their mental and psychological conditions and keep a balanced frame of mind. Using random modeling selection method sixty students work apt into this practice for three months and they were given continue yogic practice. The results revealed that after undergoing continue yogic practices the level of insecurity and inferiority level among search orphan children went down.

Key word: Yoga, Insecurity, Inferiority

INTRODUCTION

Yoga is the vision of life which teaches selfdiscipline. It takes to you on a journey of healthy and peaceful life. It is supreme devotional skill for soul healing and self analysis. It is a teaching that transforms a normal selfish being into a spiritual being. Yoga is not only an optional treatment that makes you disease free but based on results it is a certified treatment that permanently cures the diseases. There are so many deformities in the mindset of present human being. Teenagers are also not an exception to this. These teenagers need proper guidance & direction. It is considered the most stressful age of one's life. In this age teenagers receive their fastest growth. These mental and physical changes bring so many novelties (challenges) in life. Due to the lack of maturity a teenager always flies in the world of imagination. And if the desire doesn't get fulfill it causes stress. Teenagers are usually very much emotional and the lead a sentimental life. They are usually either very enthusiastic or seriously depressed.

There are many changes because of which they have to face many difficulties. However there are some children who are orphans or those who lose their parents. These children grow up in the orphanage thus they not get the love of parents which consequentially leads to many physical and mental health problems which can be treated by yoga. Yoga gives them a healthy living by allowing them to control mental and physical health. Yogic technique builds self confidence and makes them holistically healthy which acts as an anchor and keep them stable in various difficult life situations.

HYPOTHESIS

Swami Ramdev, PranayamRahsy, pg.no.29

There is a positive effect of yogic technique on orphan adolescents.

Positive impact of yogic practices on insecurity level among adolescents.

Positive impact of yogic practices on inferiority level among adolescents.

RESEARCH METHODOLOGY:

The research design used for the present study was experimental research. There are two groups in this research. For the study 60 samples were chosen for experiment. 30 Samples were assigned for experimental group and other 30 samples were for controlled group. This samples are selected from Volume-54, No.2 (X) 2020

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महिलाओं के हार्मोन संतुलन में योग की भूमिका

श्रीमती सुधा राजावत्

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सारांश:-

हार्मोन्स का संतुलन महिलाओं में सुचारू रूप से शारीरिक प्रक्रियाओं के कार्य करने, मानसिक एवं भावनात्मक संतुलन बनाए रखने में महत्वपूर्ण भूमिका निभाते हैं। हार्मोन्सनलिका विहीन ग्रन्थियों में बनने वाले रासायनिक स्राव सीधे रक्त में पहुंचकर दूत के रूप में शरीर के अंगों को अलग-अलग कार्य के लिए निर्देश देते हैं तथा दूसरे प्रकार के हार्मोन्स के निर्माण व स्राव को नियंत्रित करते हैं। रासायनिक स्राव की उपयुक्त मात्रा से कम या ज्यादा होने पर हार्मोन असंतुलन होता है। अधिकतर महिलाओं में रासायनिक स्राव में असंतुलन मासिक धर्म गर्भावस्था एवं रजोनिवृत्ति की अवधि में होता है। इस असंतुलन का असर महिलाओं के शारीरिक एवं मनोदैहिक स्वास्थ्य पर पड़ता है। योग स्वस्थ जीवन यापन की वैज्ञानिक पद्धति है। यौगिक क्रियाओं का अभ्यास महिलाओं के शारीरिक, मानसिक, भावनात्मक एवं आध्यात्मिक पक्ष में संतुलन स्थापित कर उन्हें पूर्ण रूप से स्वस्थ बनाता है। यौगिक क्रियाएं आसन प्राणायाम बंध मुद्रा एवं ध्यान का अभ्यास अंतःस्रावी ग्रन्थियों के रसायनिक स्राव के संतुलन में सकारात्मक भूमिका का निर्वहन करते हैं।

प्रस्तावना:-

भारतीय आध्यात्मिक परम्परा में योग साधना का बहुत ही महत्वपूर्ण स्थान है। इसीलिए विभिन्न परंपराओं में योग विषयक अनेकानेक बहुमूल्य एवं उत्कृष्ट अनुभव दृष्टव्य हैं। योग आध्यात्मिक एवं वैज्ञानिक साधना प्रक्रिया है, जो शरीर को स्वास्थ्य से, चित्त को पवित्रता से और आत्मा को परमात्मा से जोड़ती है। इस कारण प्राचीन काल से ही योग भारतीय जीवन शैली का अभिन्न अंग है। योगाभ्यास द्वारा ही भारतवासी प्राचीन काल में सुखी, समृद्ध एवं स्वस्थ जीवन बिताते थे। परंतु आज आधुनिक युग में भौतिकता, विलासिता पूर्ण जीवन एवं

अस्वस्थ प्रतिद्वंदिता ने महिलाओं में तनाव, निराशा, शारीरिक एवं मानसिक असंतुलन को बढ़ाया है। आज जितनी तेजी से विज्ञान ने तरकी कर सुख सुविधाएं उपलब्ध कराई हैं वहीं कई गंभीर बीमारियों ने समाज को अस्वस्थ भी बनाया है। प्राचीन जीवन पद्धति में परिवर्तन का होना भी समाज में स्त्रियों के तनाव का कारण है। वर्तमान सामाजिक व्यवस्था में महिलाओं के लिए कर्तव्य एवं अधिकारों के बीच एक बड़ा असंतुलन है। जिसका असर महिलाओं के शारीरिक मानसिक एवं भावनात्मक स्वास्थ्य पर पड़ा है जिसे हार्मोन असंतुलन के रूप में स्पष्ट देखा जा सकता है। W.H.O. ने भी महिलाओं के मनो शारीरिक स्वास्थ्य के गिरते स्तर को लेकर चिंताजनक आंकड़े दिए हैं। जिस प्रकार मन में उठने वाली भावनात्मक तरंगों एवं विचारों का शरीर पर असर पड़ता है उसी प्रकार शारीरिक अवस्था, आदतें, खान-पान, रहन-सहन का भी मन पर प्रभाव पड़ता है। मन का एवं हार्मोन्स का गहरा संबंध है।

हार्मोन (HORMONE) :-

अंतःस्रावी ग्रन्थियों द्वारा स्रावित एक विशिष्ट रसायन होता है। जो रक्त प्रवाह द्वारा शरीर के समस्त भागों में परिसंचरित होते हैं, किंतु इनकी क्रिया केवल विशिष्ट लक्ष्य कोशिकाओं पर ही होती है। हार्मोन्स अति सूक्ष्म मात्रा में उत्पादित होते हैं और इनका एक निश्चित कार्य होता है। ये मुख्यतः प्रोटीन यौगिक होते हैं, लेकिन कुछ स्टीरोइड्स भी होते हैं। इन्हें रासायनिक दूत भी कहा जाता है जो किसी अंग अथवा ऊतक में पहुंचकर उसकी क्रियाविधि और गतिशीलता को तेज कर देते हैं अथवा उसमें शिथिलन उत्पन्न कर देते हैं। अंतःस्रावी ग्रन्थियाँ हार्मोन का स्राव निरंतर करती हैं लेकिन शरीर की आवश्यकताओं के अनुसार स्राव की मात्रा कम या अधिक हो सकती है। हार्मोन्स का रक्त में सामान्य मात्रा से कम या अधिक होना स्वास्थ्य के लिए हानिकारक है। महिलाओं के शरीर में सभी हार्मोन्स का

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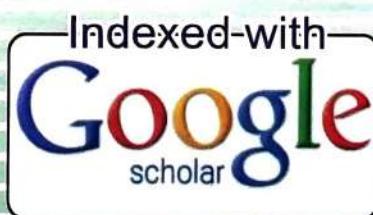


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Anger Management in Teenagers through Yoga

Abstract

The human life has evolved from ancient civilizations to the present age 'internet enabled' modern life, and with every perk naturally comes the associated disadvantages. In this case, we are referring to the everyday stress that results in behavioural conditions such as 'anger'. Anger is defined as an emotion which can be identified by opposition or hatred towards an individual or a situation one feels directly responsible for wrong doing to them. Anger and its management have become one of the most critical concerns of modern society affecting both professional and personal aspects of an individual's life, in almost every age group. And anger treatments have relatively low success rates due to the fact that anger is not categorised as a disorder at a diagnostic and statistical level.

In this paper, we will focus on the implications of anger, related disorders and anger management in adolescents. We have chosen to focus the research on the adolescents' age group as it has been proven by several researchers that younger age groups are able to grasp anger management skills and inculcate them in their daily life, being able to solve related problems. Yoga practices have been long recognized to be of healing and rejuvenating effects on the human mind and body. We propose to use these yogic practices for the initial and long-term control and remedy of anger in adolescents and measure the effectiveness of such practices. Suggested outcome is expected to prove that the introduction of selective yogic practices in adolescents can help aid anger management. We believe that post successful anger management, research participants will exhibit overall improvement in their mental and emotional balance and will be more constructive.

Keywords: Anger, Anger Management, Adolescents, Yoga

Introduction

Anger is a powerful emotion that people feel from time to time when someone or something frustrates or annoys them. One of the root cause of anger is a strange thing (ankone- Greek word) which is the perfect description of anger that one actually feels. It is a uncomfortable emotion response.

Anger may have physical and mental consequences Physical correlations such as increased heart rates, blood pressure and level of adrenaline and non adrenaline. External expressions of anger can be found in facial expressions, body language. Anger causes loss in self monitoring capacity. The facial and skeletal muscles are strongly affected by anger including action for attack, defence nostrils flare. Secretion by adrenaline gland provides sympathetic system affects that mobilises the body for immediate action. Too much cortisone will decrease serotonin that is the hormone responsible for making one happy. Decrease in serotonin can make one to feel anger and pain more easily, as well as increase aggressive behaviour leads to depression. An angry person is like a pressure cooker which bursts without release of steam. When steam is released there is no harm to the cooker. If he or she understands the trigger and harm of anger to physical, mental and emotional health. He should know the optimum level of anger to his body and learn skills to channelize the pressure of physical, mental and emotional influence; otherwise he will burst like a pressure cooker.

Effects of anger on body are as below-

1. Cardiovascular system. (Herd, J.A. 1991) It has been found that stress causes the increase of heart rate in human body. This also results in increased tension arteries. Due to these several factors, the overall blood glucose level increases.

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अलक्ष्य दृष्टि

ALAKH DRISHTI

(भाषा, दर्शन, साहित्य, संस्कृति एवं मानविकी की संवाहिका त्रैमासिक शोध पत्रिका)

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“यज्ञ का मानसिक स्वास्थ्य पर सकारात्मक प्रभाव”

डॉ. साधना दौनेरिया, मनीषा डढ़ोरे

सारांश

प्रस्तुत शोध पत्र का मुख्य उद्देश्य “यज्ञ का मानसिक स्वास्थ्य पर सकारात्मक प्रभाव” हैं। इस अध्ययन में आकस्मिक प्रतिचयन विधि का प्रयोग करते हुए कुल 60 प्रयोज्यों का चयन किया गया। प्रस्तुत अध्ययन में प्री-पोस्ट डिजाइन के माध्यम से 17-22 उम्र की छात्राओं जिनका शैक्षणिक स्तर समान था को एक माह तक निरन्तर यज्ञ कर्म कराया गया। छात्राओं में यज्ञ द्वारा होने वाले मानसिक स्वास्थ्य में सुधार हेतु मानसिक स्वास्थ्य मापनी का प्रयोग किया गया। डॉ. श्रीमती कमलेश (डॉ. भीमराव अम्बेडकर शोध संस्थान, इन्दौर) द्वारा मानसिक स्वास्थ्य मापनी का प्रयोग किया गया। इस अध्ययन से प्राप्त आंकड़ों द्वारा यह निष्कर्ष निकाला गया कि यज्ञ करने से मानसिक स्वास्थ्य पर सार्थक प्रभाव पड़ता है। शोध कार्य से यह निष्कर्ष निकलता है कि मनुष्य के अंदर अनंत शक्तियाँ हैं यदि इन शक्तियों का सही प्रयोग किया जायें तो शारीरिक व मानसिक परेशानियों से छुटकारा पाया जा सकता है। यज्ञ करने से चिंतन में परिवर्तन कर उसके अंतः करण को शुद्ध बनाया जा सकता है साथ ही जब यज्ञ करते हैं तो उस समय हमारे मस्तिष्क की विद्युत सक्रियता बहुत अधिक प्रभावित होती है। अल्फा, बीटा, वेक्स का ई.ई.जी. द्वारा विश्लेषण कर पाया की मस्तिष्क की क्रियाशीलता बढ़ती है। इससे यह निष्कर्ष निकलता है कि यज्ञ से मानसिक स्वास्थ्य संबंधी समस्याओं का समाधान हो जाता है।

कूट शब्द : यज्ञ एवं मानसिक स्वास्थ्य।

प्रस्तावना :- वर्तमान समय तकनीकी भौतिकवादी युग है आज मनुष्य में बौद्धिक क्षमता बहुत अधिक है। वैज्ञानिक तकनीकी क्षेत्र में उसने बहुत अधिक प्रगति की है, वहीं सर्वेदनात्मक एवं भावनात्मक क्षेत्र में पिछड़ गया है अपने ही लोगों के बीच तालमेल नहीं



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Effect of Yoga on Attention and Concentration in Primary School Students (6 to 10 Years)

Dr. Sadhana Dauneria¹ & Chitra Subramanian²
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Abstract

This paper studied the effects of yoga on attention and concentration. The main aim of this paper is to study the effect of yoga on attention, attention in level of work, attention in listing and concentration. The data was collected from primary school in Bhopal. One Experimental group has been taken from CBSE School. 10 primary schools students were randomly selected for the study Between the Age group of 6 to 10 years. The check list was developed by the researcher herself. It is revealed that there exists significant effect of yoga on Attention (level of work & listing), and Concentration in primary school students of (6 to 10 years) Experimental group. It is also found that yoga Improves Performance, Health, Achievement and Progress of individual students.

Key Words: Attention, Concentration, working level, physical, spiritual, peacefulness

Introduction:

Yoga is purification of the human body and mind, The most common benefits of yoga for a growing personality are related to maintaining a healthy body, mind and fighting illness. Yoga brings together physical and mental disciplines to achieve peacefulness of body and mind.

Education has a big role to play in the development of the overall personality of a student, which comprises of five principal activities of human being: the physical, the mental, the emotional, the intellectual and the spiritual. All these aspects are looked into in our ancient system of yoga. Yoga is purification of the human behavior.

Yoga can benefit different age groups (from school children to older persons), people with different occupations (such as soldiers who are involved in active combat and sedentary office workers).

However yoga practice has gained popularity in the world over for the promotion of positive health, and for the prevention and management of disease. Practicing yoga is especially useful for those conditions where the association between the mental state and the disease is well established. Several techniques are included under the term yoga, such as yoga

postures, cleansing practices, regulated breathing and meditation. While practicing these techniques, it is ideal for the practitioner to keep in mind and achieve a mental state based on certain principles of yoga philosophy.

Attention and Concentration play a vital role in Education, and Education has a big role to play in the development of a holistic student. The following study reveals that the components of Yoga namely Asana, Pranayama and Meditation, when applied on the Primary School children (6 to 10 years), have tremendous effect on their Attention. The hyper active children who were unable to focus on anything, were found enthusiastically having improved their attention, with the effect of Yoga, now are able to concentrate for a long time.

Objectives:

The major objectives for the study are said to be different fold and are classified are as under

- 1) To study the effect of different aspect of yoga on behavioral problems.
- 2) To study the effect of yoga practice on concentration.
- 3) To study the effect of yoga practice on

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PSYCHOSOMATIC DISORDERS AND THEIR MANAGEMENT THROUGH YOGA

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BU Bhopal (M.P)

Dr. Jyoti Keswani

Asstt. Prof. SHR, Yoga & Naturopathy
Medical College, Bairagarh

Stress, we have become much too familiar with the name. It is indeed a necessary evil. Stress only drives us to put efforts in order to survive. In fact, stress is the sole reason for our survival. So stress is also vital and hence has been called a necessary evil. But, if stress is so important for our survival, why it has become a problematic issue in today's life.

To understand this, we will have to understand what is stress.

What is Stress?

Oxford dictionary defines Stress as "Pressure or worry resulting from mental or physical distress or difficult circumstances.

Stress is a psychological and physiological response to events that upset our personal balance in some way. It is a state of mind which distorts comfortable way of living

Stress is defined as a non-specific conventional phylogenetic basic basic response pattern which prepares the body for physical activity such as fight or flight.

The Body's Stress Response:

The "fight-or-flight" stress response involves a series of biological changes that prepare us for emergency action. When danger is sensed, a small part of the brain called the hypothalamus sets off a chemical alarm. The sympathetic nervous system responds by releasing a flood of stress hormones, including adrenaline, norepinephrine, and cortisol. These stress hormones circulate through the bloodstream, thus making us ready to face the emergency situation. This is done by various changes in the different systems of the body. Heart rate and blood flow to the large muscles increase so we can run faster and fight harder. Blood vessels under the skin constrict to prevent blood loss in case of injury, pupils dilate so we can see better, and our blood sugar ramps up, giving us an energy boost and speeding up reaction time. At the same time, body processes not essential to immediate survival is suppressed. The digestive and reproductive systems slow down, growth hormones are switched off, and the immune response is inhibited.

The above changes are aimed at safeguarding us from different kinds of danger. In the primitive times, when the man's sole aim in life was to secure food and protect him from variety of dangers, stress response was must for survival.

Types of Stress:

Depending on the long term effects of stress, there are two types of stress:

- 1) **Eustress**, which is good, healthy and essential stress as it promotes us in life.
- 2) **Distress**, which is bad or morbid stress causing various physical and mental health problems. Prolonged exposure to distress increases the risk of heart disease, obesity, infection, anxiety, depression, and memory problems.

Thus, Stress affects the mind, body, and behavior in many ways- all directly tied to the physiological changes of the fight-or-flight response.

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प्रथम सम्पादक

डॉ० राधेश्याम मोर्य

सम्पादक

डॉ० शिवेन्द्र कुमार मोर्य

प्रकाशक : जन सेवा एवं शौथ शिक्षा संस्थान, प्रतापगढ़, उपराज

गर्भावस्था के दौरान तनाव प्रबंधन में योग की भूमिका

डॉ साधना दौनेरिया* व वन्दना दूबे**

सारांश : प्रस्तुत शोध पत्र का मुख्य उद्देश्य "महिलाओं में गर्भावस्था के दौरान उत्पन्न तनाव के प्रबंधन का योगाभ्यास द्वारा अध्ययन करना है।" इस पायलट अध्ययन में पूर्व-पश्चात् द्विसमूह अभिकल्प का प्रयोग करते हुए प्रासंगिक प्रतिचयन विधि द्वारा 20 से 35 वर्ष की 40 प्रयोज्यों का चयन महा पंडित राहुल सांकृत्यायन जिला महिला विकित्सालय, आजमगढ़, उत्तर प्रदेश में किया गया। प्रस्तुत अध्ययन में प्रयोगात्मक समूह (N-20) प्रयोज्यों को प्रतिदिन एक घंटा चयनित यौगिक क्रियायों का अभ्यास कराया गया तथा नियंत्रित समूह (N-20) प्रयोज्यों को कोई अभ्यास नहीं कराया गया। आँकड़ों के परीक्षण के लिए Personal Stress Source Inventory (PSSI-SSS) प्रश्नावली का प्रयोग किया गया एवं परीक्षणों की विवेचना साखियकीय विश्लेषण द्वारा की गई। परिणामतः महिलाओं में गर्भावस्था के दौरान तनाव प्रबंधन में यौगिक क्रियायों के नियमित अभ्यास का सकारात्मक प्रभाव पड़ता है।

मुख्य शब्द : योगाभ्यास, गर्भावस्था, तनाव आदि।

प्रस्तावना : आधुनिक युग में तनाव एक गंभीर समस्या है। वर्तमान समय भौतिकवादी युग होने के कारण जीवन विभिन्न विषमताओं एवं समय विशेष की चुनौतियों से भरा हुआ है। मातृत्व एक अलौकिक अनुभव है, परन्तु तनावग्रस्त जीवनशैली ने मातृत्व के आनंद एवं उसकी गरिमा को प्रभावित किया है। सामान्यतः ऐसा समझा जाता है कि तनाव आधुनिक युग की देन है परंतु यह कथन पूर्णतया सत्य प्रतीत नहीं होता है क्योंकि अधिकांशतः होता है तब निश्चितरूप से लाभप्रद होता है परंतु जब इसका रूप नकारात्मक हो जाता है तो मनुष्य के स्वास्थ्य पर मानसिक स्वास्थ्य की स्थिति चिंताजनक होती है जो तनाव को जन्म देती है। जब यह तनाव सकारात्मक होता है तब निश्चितरूप से लाभप्रद होता है परंतु जब इसका रूप नकारात्मक हो जाता है तो मनुष्य के स्वास्थ्य को नकारात्मक रूप से प्रभावित करता है। प्रायः ऐसा देखा जाता है कि महिलाएं भावनाशील होती हैं। विशेषकर को नकारात्मक रूप से प्रभावित करता है। जब वह गर्भ धारण करती हैं तब उनके स्वभाव में बदलाव आना स्वाभाविक होता है। वह स्वभावतः संकोची एवं जब वह गर्भ धारण करती हैं तब उनके स्वभाव में बदलाव आना स्वाभाविक होता है। वह स्वभावतः संकोची एवं सरल चित्त की होने के कारण अपनी मनोदशा को अभिव्यक्त करने में भी संकोच करती हैं। ऐसे में छोटी-छोटी बातें भी उन्हें दुःखी कर जाती हैं। जब वे अप्रिय बातों पर भी अपनी प्रतिक्रिया व्यक्त नहीं कर पाती हैं तो यहीं से उनके मन में तनाव उत्पन्न होना प्रारंभ हो जाता है। गर्भावस्था के दौरान अत्यधिक तनाव घातक सिद्ध होता है। वैज्ञानिकों के अनुसार अत्यधिक तनाव गर्भस्थ शिशु के शारीरिक विकास को भी नकारात्मक रूप से प्रभावित कर सकता है। तनाव न केवल मां के लिए बल्कि गर्भस्थ शिशु के लिए भी नुकसानदायक है। इस दौरान यदि मां तनाव ग्रस्त होती है तो गर्भिणी के ब्लड प्रेशर का बढ़ना, नींद में व्यवहार पड़ना जैसे इत्यादि प्रकार के विकार उत्पन्न होने की संभावना बढ़ जाती है। फलस्वरूप गर्भिणी के साथ-साथ गर्भस्थ शिशु के विकास में नकारात्मक प्रभाव पड़ सकता है। तनाव के कारण शिशु का मानसिक विकास भी भली-भांति नहीं हो पाता है। इसके अलावा जन्म के समय शिशु का वजन भी कम हो सकता है। साथ ही माँ के तनाव झेलने से प्रसव के बाद भी उसका स्वास्थ्य खराब रहने की संभावना रहती है। इसलिए इस दौरान तनाव लेना नुकसानदायक बताया गया है। तनाव को नियंत्रित करने के लिए इस समय यौगिक क्रियाएं उत्तम मानी गई हैं। शारीरिक स्वास्थ्य के लिए योगाभ्यास एक स्वाभाविक प्रक्रिया है। इससे माँ-सपेशियां सुगठित होती हैं, शरीर क्रियाशील रहता है, पाचन क्रिया सुचारू रूप से कार्य करती है जिससे भूख-प्यास की प्रक्रिया सामान्य रहती है। तथा शरीर व मन ताजगी से परिपूर्ण व स्फूर्तिदायक रहता है। सामान्य महिला तो यौगिक अभ्यास कर ही सकती हैं किंतु गर्भावस्था में इसका महत्व और अधिक बढ़ जाता है। नियमित योगाभ्यास गर्भिणी को स्वास्थ्य लाभ प्रदान करता पहुंचाता है, जिससे प्रसव

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सारांश-

किशोरावस्था मनुष्य के जीवन का बसंतकाल माना गया है। यह काल सभी प्रकार की मानसिक शक्तियों के विकास का समय है। परंतु निराश्रित किशोरों में यही समय मानसिक अस्थिरता लाता है। निराश्रित किशोर माता-पिता के सुख से वंचित रहते हैं। जिसके कारण उनमें अनेक तरह के शारीरिक एवं मानसिक परिस्थितियों का सामना करना पड़ता है। जिसके कारण अनेक मनोविकार जैसे - असुरक्षा, तनाव, अवसाद, आत्महीनता की भावना निराश्रित किशोरों के मन में जगह कर लेती है। इन मनोविकारों को दूर करने के लिए योग सबसे महत्वपूर्ण विद्या है। जो कि शारीरिक रोगों का ही नहीं बल्कि मानसिक रोगों का भी चिकित्सा शास्त्र है। योग साधना निराश्रित किशोरों के लिये विशेष उपयोगी है क्योंकि इससे शारीरिक, मानसिक तथा बौद्धिक उन्नति होती है। योगाभ्यास से निराश्रित किशोरों के जीवन में अमूल परिवर्तन आ जाता है, और अन्तःकरण के मल विक्षेप तथा आवरण को दूर कर अन्तःकरण में शान्ति विराजती है। जो निराश्रित किशोरों के मानसिक विकारों को दूर कर विपरीत परिस्थितियों में मानसिक स्थिरता एवं संतुलन बनाए रखने में सक्षम है। शोध अध्ययन में उद्देश्यपूर्ण प्रतिचयन विधि का प्रयोग करते हुए 60 प्रयोज्यों का चयन किया गया जिन्हें 3 माह तक निरंतर योगाभ्यास कराया गया। अध्ययन उपरांत निष्कर्ष निकला कि नियमित योगाभ्यास से निराश्रित किशोरों में असुरक्षा एवं आत्महीनता की कमी पायी गई। यद्यपि योग सभी वर्गों के लिए अमृत तुल्य है लेकिन असुरक्षित एवं निराश्रित किशोरावस्था के समग्र स्वास्थ्य एवं सकारात्मक जीवन के लिए योग एक ईश्वरीय वरदान स्वरूप है। जिसको जीवन शैली में शामिल करने पर जीवन की सार्थकता स्वतः सिद्ध हो जाती है।

कृट शब्द- योग, असुरक्षा, आत्महीनता
प्रस्तावना

योग जीवन दर्शन है जो आत्मानुशासन सिखाता है। योग

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एक जीवन-पद्धति है जो व्याधिमुक्त व समाधियुक्त जीवन की संकल्पना की ओर ले जाता है। योग आत्मोपचार एवं आत्मदर्शन की श्रेष्ठ आध्यात्मिक विद्या है। जो व्यक्तित्व को वामन से विराट बनाने की समग्र रूप से स्वयं को विकसित करने की विद्या है। योग एक मात्र वैकल्पिक चिकित्सा पद्धति नहीं अपितु योग का प्रयोग परिणाम के आधार पर एक ऐसा प्रमाण है जो व्याधि को दूर करता है। आधुनिक मनुष्य के जीवन में कई प्रकार की विकृतियाँ हैं जिससे किशोरवर्ग भी अछूता नहीं हैं। किशोरों को सभी दिशा देने की नितांत आवश्यकता है। इस अवस्था को अत्यधिक तनाव का समय भी कहा जा सकता है। इस समय किशोर का विकास तेजी से होता है। शारीरिक व मानसिक परिवर्तन के फलस्वरूप अनेक नवीनताएं आती हैं। उसमें परिपक्ता का अभाव होता है अतः वह कल्पना की उड़ाने भरता है और इच्छाएँ पूरी न होने पर तनावग्रस्त रहता है। वह काफी भावुक होता है, तथा अत्यन्त संवेदनात्मक जीवन व्यतीत करता है। उसमें अत्यधिक उत्साह और गंभीर निराशा देखी जा सकती है। इन परिवर्तन के कारण अनेक मानसिक परिस्थितियों का सामना करना पड़ता है। किंतु कई बच्चे ऐसे होते हैं जिनके ना तो पिता होते हैं ना माता होती है या माता-पिता की मृत्यु हो जाती है। ऐसी परिस्थिति में बच्चों को अनाथ आश्रम में जीवन व्यतीत करना पड़ता है अनाथालय में जिन किशोरों का पालन पोषण होता है वे माता-पिता के सुख से वंचित रहते हैं जिसके कारण उनमें अनेक तरह के शारीरिक एवं मानसिक विकारों का सामना करता पड़ता है जो योग के अभ्यास से दूर की जा सकती है। योग शरीर और मन पर नियंत्रण कर स्वास्थ्य प्रदान करता है। इस प्रकार योग शरीर और मन का संतुलन करके आत्मोन्नति के लिए प्रेरित करता है योगाभ्यास आत्मबल प्रदान करता है, जो विषम परिस्थिति में भी संतुलन एवं स्थिरता बनाये रखने का संबल प्रदान करता है। परिकल्पना

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सामान्य प्रसव में योग की भूमिका

वन्दना दूबे* व डॉ साधना दौनेरिया**

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सारांश : प्रस्तुत शोध पत्र का मुख्य उद्देश्य "महिलाओं में गर्भवस्था के दौरान सामान्य प्रसव में योग का सकारात्मक प्रभाव पड़ता है।" इस पायलट अध्ययन में पूर्व-पश्चात द्विसमूह अभिकल्प का प्रयोग करते हुए प्रासंगिक प्रतिचयन विधि द्वारा 20 से 35 वर्ष की गर्भावासन के तीन महीने के बाद वाले 40 प्रयोज्यों का चयन महा पंडित राहुल संकृत्यायन जिला महिला चिकित्सालय, आजमगढ़, उत्तर प्रदेश में किया गया। प्रस्तुत अध्ययन में प्रयोगात्मक समूह (N-20) प्रयोज्यों को प्रतिदिन एक घंटा चयनित यौगिक क्रियायों का अभ्यास कराया गया तथा नियंत्रित समूह (N-20) प्रयोज्यों को कोई अभ्यास नहीं कराया गया। औँकड़ों के परीक्षण के लिए स्वास्थ्य संबंधित प्रश्नावली का प्रयोग किया गया एवं परीक्षणों की विवेचना सांख्यिकीय विश्लेषण द्वारा की गई। परिणाम स्वरूप ज्ञात होता है कि महिलाओं के सामान्य प्रसव में यौगिक क्रियायों के नियमित अभ्यास का सकारात्मक प्रभाव पड़ता है।

मुख्य शब्द : योगाभ्यास, गर्भवस्था, सामान्य प्रसव आदि।

प्रस्तावना : योग प्राचीन भारतीय संस्कृति की अमूल्य देन है। मानव जीवन के उद्देश्यों को पूर्ण करने में योग की सक्रिय भूमिका है। योग वह वैज्ञानिक प्रक्रिया है जो तन-मन को स्वस्थ कर आत्मोन्नति का पथ प्रष्ट करता है। योग का सामान्य अर्थ है—जोड़ना। योग वह साधन है जो शरीर को स्वास्थ्य से, चित्त को पवित्रता से और आत्मा को परमात्मा से जोड़ता है। यह स्वास्थ्य एवं कल्याण का पूर्णतावादी दृष्टिकोण है। समग्र स्वास्थ्य की प्राचीन तकनीक योग न केवल हमारे शरीर, मन एवं आत्मा को शक्ति प्रदान करता है। बल्कि मातृत्व की ओर ले जाने वाले एक स्वस्थ मार्ग को भी तैयार करता है। प्राकृतिक रूप से शरीर में होने वाले परिवर्तनों को सहजता प्रदान करता है। वर्तमान समय में शारीरिक कार्यप्रणाली निष्क्रिय होती जा रही है। जिस कारण लोग शारीरिक एवं मानसिक रूप से विकारों से प्रभावित होते जा रहे हैं। आज सभी स्वस्थ तो रहना चाहते हैं लेकिन भौतिकता में इतने मन्न हो गए हैं कि उनकी जीवनशैली अव्यवस्थित हो गयी है। चाहकर भी वे शारीरिक कार्य नहीं कर पाते हैं। यही अव्यवस्थित जीवनशैली अनेकों मनोकार्यिक विकार जैसे—कब्ज, अपच, अनिद्रा, आदि का कारण है। जिसमें महिला, पुरुष एवं युवा सभी सम्मिलित हैं। परिवार को स्वस्थ रखने के लिए सर्वथम महिला का स्वस्थ होना आवश्यक है क्योंकि परिवार का आधार ही महिला है। एक स्वस्थ महिला ही घर, परिवार एवं आने वाली पीढ़ी को नई दिशा देने में सक्षम हो सकती है। अव्यवस्थित जीवनशैली तनाव उत्पन्न करती है और तनाव की निरन्तरता शरीर की कार्यप्रणाली को नियंत्रित करने वाले हार्मोस को असंतुलित करती हैं। यही असंतुलन शरीर पर दुष्प्रभाव डालता है, ऐसी स्थिति का निरन्तर बने रहना सामान्य जन के लिए हितकारी नहीं है तो एक गर्भिणी के लिए कैसे हितकारी हो सकता है? अतः ऐसी स्थिति गर्भिणी एवं गर्भस्थ शिशु दोनों के लिए अहितकर है। योग का नियमित अभ्यास माता एवं शिशु दोनों के स्वास्थ्य लिए हितकारी है। अभ्यास के अन्तर्गत माँ एवं शिशु के लिए आसन,

प्राणायाम एवं ध्यान आवश्यक रूप से दिमाग और शरीर को स्वस्थ बनाये रखने में मदद करता है। नियमित योगाभ्यास गर्भवती महिलाओं को स्वस्थ करता है एवं प्रसव के दौरान होने वाली समस्याओं को भी नियंत्रित करता है, गर्भवस्था के उपरान्त स्वास्थ्य लाभ शीघ्र होता है। यदि गर्भवती महिलाएं नियमित आसन करें तो माँ के साथ-साथ गर्भस्थ शिशु पर सकारात्मक प्रभाव पड़ता है। जहाँ नियमित आसनों के अभ्यास से प्रजनन अंगों की मांसपेशियों में मजबूती के साथ शिशु को जन्म देने की प्रक्रिया सहज बनती है। इसके अतिरिक्त गर्भाशय ग्रीवा को तनाव मुक्त एवं अंतःआवी तंत्र को संतुलित करता है। गर्भ में पलने वाले शिशु को रक्त तथा पोषक तत्वों की पूर्ति ठीक प्रकार से होने लगती है। वहीं प्राणायाम एवं ध्यान के नियमित अभ्यास से गर्भिणी तथा शिशु दोनों को भरपूर मात्रा में ऑक्सीजन की पूर्ति होने के कारण माँ का शरीर गर्भवस्था एवं प्रसव उपरान्त भी स्वस्थ रहता है। जिससे माता एवं गर्भस्थ शिशु दोनों ही प्रसन्न रहते हैं। गर्भवस्था के दौरान होने वाली समस्याओं को नियंत्रित करने तथा सामान्य प्रसव के लिए योगाभ्यास का निश्चितरूप से सकारात्मक एवं स्वास्थ्य संवर्धनात्मक प्रभाव पड़ता है।

शोध पत्र का उद्देश्य : प्रस्तुत शोध पत्र का उद्देश्य है "महिलाओं के सामान्य प्रसव में योग के सकारात्मक प्रभाव का अध्ययन करना है।"

परिकल्पना : प्रस्तुत शोध पत्र में सकारात्मक परिकल्पना को लिया गया है। महिलाओं के सामान्य प्रसव में योगाभ्यास का सकारात्मक प्रभाव पड़ता है।

शोध प्रविधि

प्रतिदर्श एवं प्रतिचयन : प्रस्तुत शोध पत्र में 40 महिला प्रयोज्यों को गर्भावासन के तीन माह पश्चात प्रतिदर्श के रूप में लिया गया। इन प्रयोज्यों का चयन प्रासंगिक प्रतिचयन विधि द्वारा किया गया। जिसमें 20 प्रयोज्य प्रयोगात्मक तथा 20 प्रयोज्य नियंत्रित समूह में रखे गये हैं। सभी प्रयोज्यों का चयन उत्तर प्रदेश जिला आजमगढ़ के महा पंडित राहुल संकृत्यायन जिला महिला चिकित्सालय से प्रासंगिक प्रतिचयन विधि द्वारा किया गया है जिनकी उम्र 20 से 35 वर्ष है।

शोध अभिकल्प : प्रस्तुत शोध पत्र में पूर्व-पश्चात द्वि समूह अभिकल्प का प्रयोग किया गया। जिसमें एक प्रयोगात्मक समूह तथा दूसरा नियंत्रित समूह है। प्रयोगात्मक समूह को प्रतिदिन चयनित यौगिक क्रियाओं का अभ्यास कराया गया तथा नियंत्रित समूह को कोई अभ्यास नहीं कराया गया।

प्रयुक्त उपकरण : प्रस्तुत शोध पत्र में प्रयोगात्मक एवं नियंत्रित समूह के पूर्व-पश्चात परीक्षण के लिए स्वास्थ्य संबंधित स्वनिर्मित प्रश्नावली का प्रयोग किया गया है। जो जिला महिला चिकित्सालय आजमगढ़ उत्तर प्रदेश की मुख्य चिकित्सा अधिकारीका डॉ. अमिता अग्रवाल द्वारा तैयार किया गया है।

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ज्योतिर्वेद - प्रस्थानम्

संस्कृत वाङ्मय की शैद्धपत्रिका - संस्कृत छात्रों की मार्गदर्शिका

नवम वर्ष, षष्ठ अंक जनवरी-फरवरी 2021



एक कदम स्वच्छता की ओर

₹ 30

दो गज की दूरी - मास्क है जरूरी

योग और समग्र स्वास्थ्य

डॉ. साधना दौनेरिया

विभागाध्यक्ष, योग विभाग

बरकतउल्ला विश्वविद्यालय, भोपाल

भूमिका

योग भारतीय संस्कृति की महत्वपूर्ण धरोहर है। पुरुषार्थ सम्पादन में समर्थ बने रहने के लिए स्वस्थ रहना अत्यावश्यक है आयुर्वेद के अनुसार स्वस्थ पुरुष का लक्षण है- मन एवं इंद्रियों के प्रसन्न रहने के साथ-साथ शरीरस्थ दोष-अग्नि, धातु, मल एवं क्रियाओं का सम-अवस्था में रहना। यथा -

समदोषः समाग्निश्च समधातुमलक्रियः।

प्रसन्नात्मेन्द्रियमनः स्वस्थ इत्यभिधीयते ॥ सुश्रुत - 15/41

'जिस पुरुष के दोष धातु मल तथा अग्निव्यापार सम हो अर्थात् सामान्य या विकार रहित हों तथा जिसकी इन्द्रियाँ, मन एवं आत्मा प्रसन्न हो, वही स्वस्थ है।'

हठयोग के अनुसार शारीरिक एवं मानसिक विकारों को दूर करने के लिए आसन, प्राणायाम, मुद्रा, ध्यान एवं शोधन क्रियाओं का अभ्यास आवश्यक है। पातंजल योग दर्शन में विकारों के मूल कारण क्लेशों की निवृत्ति के लिए आसन-प्राणायामादि के अतिरिक्त चित्तप्रसादन भी एक उपाय बताया है -

**मैत्रीकरूणामुदितोपेक्षाणाम् सुखदुःखपुण्यापुण्यं भावनात्-
श्चित्प्रसादनम् ॥ पा. यो. सू. 1/33**

क्लेश रहित चित्त ही सदाचारयुक्त उत्तम ज्ञानानुकूल आचरण (कार्य) करने में सक्षम है। योग एक सम्पूर्ण विद्या है और योगासन वैज्ञानिक पद्धति है। यह एक ऐसा अभ्यास है जो शारीरिक स्तर के साथ-साथ मानसिक और आध्यात्मिक स्तर पर भी अनुकूल प्रभाव डालता है। इसलिए नियमित योगाभ्यास को जीवन भर स्वस्थ रहने की औषधि कहा गया है। विश्व स्वास्थ्य संगठन द्वारा दी गई स्वास्थ्य की परिभाषा स्वास्थ्य केवल रोगों एवं अपंगता की अनुपस्थिति मात्र नहीं है बल्कि यह एक पूर्ण शारीरिक, मानसिक तथा समाजिक कुशलक्षेम की स्थिति है। **स्वास्थ्य किन बातों पर निर्भर करता है ?**

स्वास्थ्य हमारे शारीरिक, मानसिक और आध्यात्मिक कार्य एवं सकारात्मक विचारों पर निर्भर करता है, जिसके लिए निम्न

बातें आवश्यक हैं -

1. नियमित योगाभ्यास
2. सम्पूर्ण विश्राम
3. सकारात्मक सोच

जिस प्रकार अच्छे स्वास्थ्य के लिए भोजन और जल की आवश्यकता होती है उसी प्रकार स्वस्थ शरीर और मन के लिए योगासन भी आवश्यक है। योग एक सम्पूर्ण विद्या है और योगासन वैज्ञानिक पद्धति। यह एक ऐसा अभ्यास है जो शारीरिक स्तर के साथ-साथ मानसिक और आध्यात्मिक स्तर पर भी अनुकूल प्रभाव डालता है। इसलिए नियमित योगाभ्यास को जीवन भर स्वस्थ रहने की औषधि कहा गया है।

योग के अनुसार शरीर के दोषों को दूर करने एवं सुन्दर स्वास्थ्य के लिये घटकर्म, आसन, प्राणायाम, बन्ध, मुद्रा एवं ध्यान का नित्य अभ्यास करना चाहिये। घटकर्मों का अभ्यास त्रिदोष - वात, पित्त एवं कफ के मध्य सममात्रा स्थापित करना है। धौति द्वारा कंठ से अमाशय तक के मार्ग की शुद्धि होती है जिसके फलस्वरूप कफरोग समूल नष्ट होते हैं वस्ति द्वारा गुदामार्ग एवं छोटी आंत के निचले भाग की शुद्धि होती है फलस्वरूप आंतों के रोग एवं कब्ज का नाश होता है एवं जठराग्नि प्रदीप होती है। नेती द्वारा नासिका मार्ग का शुद्धिकरण जिससे कपाल की शुद्धि, उत्तम दृष्टि एवं शिरो रोग नष्ट होते हैं। त्राटक द्वारा आलस्य का नाश एवं एकाग्रता का विकास होता है। नौलि द्वारा उदर रोग तथा कपालभाति द्वारा कफदोष दूर होते हैं।

आसनों के नियमित अभ्यास से शरीर का आलस्य, जड़ता एवं चंचलता की निवृत्ति होती है और शरीर में स्थैर्य, धैर्य आरोग्य एवं लघुता, उत्पन्न होती है। शरीर के समस्त अंग स्वस्थ होते ही हैं साथ ही सकारात्मक व्यक्तित्व निर्माण की प्रक्रिया भी सम्पन्न होती है। शरीर मन और आत्मा के मध्य उचित सामन्जस्य स्थापित करने में आसनों की महत्वपूर्ण भूमिका है।

आसनों का प्रथम उद्देश्य शारीरिक और मानसिक स्वास्थ्य

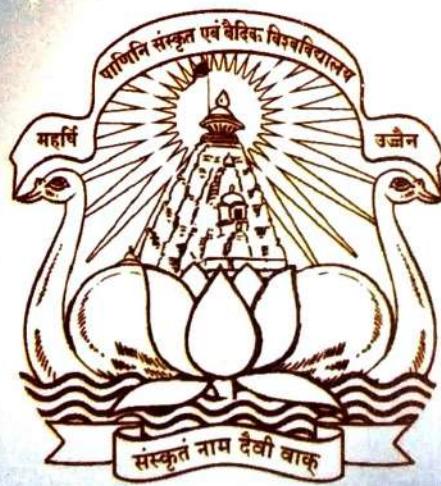
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यौगिक आहार का श्रेष्ठ स्वरूप : अंकुरित अमृतान्न

डॉ. साधना दौनेरिया* एवं डॉ. ज्योति केसवानी**

मानव जीवन में स्वास्थ्य का बहुत अधिक महत्व है। स्वास्थ्य शब्द का अर्थ है ‘स्व में स्थित होना’। इसके लिए न केवल शरीर बल्कि मन का स्वस्थ होना भी अति आवश्यक है। वास्तव में शरीर और मन का स्वास्थ्य एक दूसरे पर निर्भर करता है। कहने का तात्पर्य यह है कि यदि शरीर को स्वस्थ रखना हो तो मन की प्रसन्नता आवश्यक है। वहीं दूसरी ओर मन को स्वस्थ एवं प्रसन्न रखने का उत्तम उपाय है शरीर को स्वस्थ रखना।

यथार्थ में जीवन की यात्रा शरीर रूपी रथ पर ही सम्पन्न होती है। मन की शुद्धि एवं निर्मलता का साधन भी शरीर ही है। आध्यात्मिक पक्ष देखें तो शरीर की ही सहायता से परम सत्य को प्राप्त करने के लिए योग, जप, तप आदि किया जाता है। इसलिए सर्वप्रथम शरीर को स्वस्थ रखना अनिवार्य है जिसमें नियमित जीवनशैली अर्थात् व्यवस्थित आचार, विचार, आहार एवं विहार की अहं भूमिका है। इन सभी की एक सीमित एवं उपयुक्त मात्रा होने पर मनुष्य का अन्तः एवं बाह्य (मानसिक एवं शारीरिक) दोनों ही स्तर स्वस्थ, शुद्ध और जागृत होते हैं।

आज के मशीनी युग में स्वास्थ्य को प्रभावित करने वाले अनेक कारक हैं जिन्हें हम नियंत्रित नहीं कर पाते हैं। परन्तु आहार का चुनाव और नियमन एक ऐसा कारक है जो हमारे नियंत्रण में है। आवश्यकता स्व-नियंत्रण एवं स्व-जागृति की है। आहार अंतर्गत भी सात्त्विक आहार की चर्चा ग्रन्थों में की गई है जिसमें ‘अंकुरित आहार’ का प्रमुख स्थान है। उत्तम स्वास्थ्य और रोगों के बचाव में अंकुरित आहार की महत्वपूर्ण भूमिका है। पोषक तत्त्वों की प्राप्ति का सरल और सहज साधन है - अंकुरित अन्न।

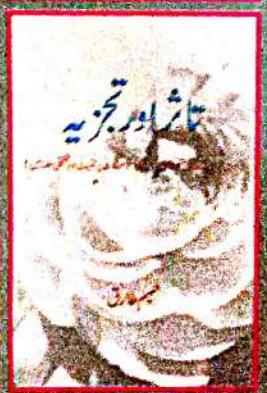
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پروفیسر طاہرہ وجید عباسی



راکھ میں چنگاری

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مشمولات

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ممبئی اور ممبئی کے ادبی مرکز	ممبئی اور ممبئی کے ادبی مرکز
ٹگوئے اور سازشیں	ٹگوئے اور سازشیں
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شیم طارق بحیثیت شاعر	شیم طارق بحیثیت شاعر
شیم طارق بحیثیت محقق	شیم طارق بحیثیت محقق
شیم طارق بحیثیت نقاد	شیم طارق بحیثیت نقاد
شیم طارق بحیثیت زبان دان یا لفظ و معنی کے رشتے کے پارکھ کی بحیثیت سے	شیم طارق بحیثیت زبان دان یا لفظ و معنی کے رشتے کے پارکھ کی بحیثیت سے
شیم طارق بحیثیت کالم نگار	شیم طارق بحیثیت کالم نگار
شیم طارق بحیثیت منظم	شیم طارق بحیثیت منظم
(اجمن اسلام کریمی لاہوری کے ڈائریکٹر کی بحیثیت سے)	(اجمن اسلام کریمی لاہوری کے ڈائریکٹر کی بحیثیت سے)
شیم طارق اور مطابعہ تصوف	شیم طارق اور مطابعہ تصوف
شیم طارق اور قابلی مطالعہ	شیم طارق اور قابلی مطالعہ
ضمیر	ضمیر

پروفیسر طاہرہ عباسی کے مشاہدات

اکثر اوقات بات کہاں سے شروع ہوتی ہے اور کہاں ختم ہوتی ہے کچھ پڑتے نہیں چلتا۔ دو روز قبل زیر نظر و قیع اور مفید مسودہ ”راکھ میں چنگاری“ (علمی مرکز سے دور تصدیق، تحقیق اور تخلیق کی شمع روشن کرنے والے شیم طارق کی فکری جہات) مرتبہ و مؤلفہ پروفیسر طاہرہ وجید عباسی، ایک غیر مترقبہ نعمت کی صورت میں ہدست ہوا تو تقریباً ۱۳ سال قبل کی خوش کن یادوں کے درست پچ اس کی فاضل ولایق مرتبہ پروفیسر طاہرہ وجید عباسی صاحبہ سلمہ کے دولت کرده پر متن روزہ قیام کی یاد کے ساتھ واہونے لگے۔

بات یوں شروع ہوتی ہے کہ مخدوم زادہ گرامی ممتاز مولانا سید شاہ ابو الحسن علی میاں ندوی پختگی صابری کے فاضل استاد گرامی مولانا خلیل عرب صاحب جن کی تعلیم و تربیت اور گنبدکاری کی بدولت پر قول حضرت علی میاں صاحبؒ، ان میں عربیت کا حقیقی ذوق اور ادبیت کا سمجھ شعور پروان چڑھا اور جن کے حکم پر انہوں نے عربی کی کلاسیکی کتابوں کے بڑے بڑے اقتباسات بچپن میں ہی از بر کر لیے تھے جنہوں نے بعد میں ان کی عربی ثناواری میں مہیز کا کام کیا، ان کی لائیق و فائق صاحبزادی محترمہ پروفیسر عطیہ خلیل عرب انصاری صاحبہ مرحومہ (شعبہ عربی کراچی یونیورسٹی) اس خاکسار ذرہ بے مقدار پر بڑی شفقت و محبت فرماتی تھیں۔

RAKH MEIN CHINGARI

by

Prof. Tahera Waheed Abbasi

معاصر اردو ادب کے منظر نامے پر جن ادیبوں نے اپنی تجھیقی، تنقیدی اور تحقیقی صلاحیتوں کی بنا پر اپنی ادبی انفرادیت قائم کی ہے ان میں ایک اہم نام شیم طارق کا بھی ہے۔ ان کی شخصیت بڑی پہلو دار ہے۔ وہ بیک وقت شاعر، محقق، فقاد، کالم نگار، منظم کار اور بہترین خطیب کے طور پر ادبی حلقوں میں اپنی ایک مستحکم شناخت رکھتے ہیں۔ علم و ادب میں انہوں نے جن موضوعات پر خامہ فرمائی کی ہے وہ آن چھوئے تو نہیں ہیں لیکن اپنی تحقیقی صلاحیتوں، تنقیدی شعور، تحریاتی مطالعے اور دیدہ و دریافت کے بنا پر جو اتنباٹ نتائج پیش کیے ہیں وہ روایت شکن ہیں اور اردو میں اضافے کا حکم رکھتے ہیں۔ جامعات سے باہر فی الواقع کسی ادیب کو شاید ہی اتنی شہرت یا اعزت ملی ہو جو شیم طارق صاحب کے حصے میں آئی۔ علمی و ادبی سطح پر یہفت خواں انہوں نے یوں ہی طے نہیں کیے۔ بلکہ اس سفر میں ایک طرف جہاں ان کی جدوجہد، بلند عزائم اور ایمانداری، نیک نیتی و خدا ترسی کو دھل ہے تو اس کے پہلو بہ پہلو گھر سے باہر تک ایسے حاسدوں کی بھی کمی نہیں جوان کی ترقی سے کبھی خوش نہ ہوئے ہر چند کہ ان کی شخصیت کو محروم کرنے کی کوششیں بھی کی گئیں تاہم شیم طارق کی شخصیت کا کمال یہ ہے کہ خاردار را ہوں کو اپنی حکمت، دانائی اور صبر و تحمل سے عبور کیا ہے۔ علم و ادب یا اصلاح و فلاح سے متعلق شخصیات کے مطالعے کے دوران میں ان کی خدمات کا ہی اعتراف نہیں کیا جاتا بلکہ شخصیت کی تعمیر و تشکیل کے دوران ان عناصر اور رویوں کی نشاندہی بھی لازم ہے جس سے نبرد آزمہ ہو کر فرد کو کامیابی و کامرانی نصیب ہوتی ہے۔

اس لحاظ سے پروفیسر طاہرہ عباسی صاحبہ کی کتاب ”راکھ میں چنگاری“ کی اہمیت دو چند ہو جاتی ہے۔ اول یہ کہ جہاں انہوں نے عہد روائی کے ایک متاز ادیب اور دانشور جناب شیم طارق صاحب کی علمی و ادبی خدمات کا بڑی محنت اور عرق ریزی سے محاسبہ کیا ہے وہیں ان منفی رویوں کو بھی دلائل و براہین سے نشان زد کیا ہے جسے تحریر کرنے میں اردو والے عموماً مصلحت پسندی سے کام لیتے ہیں۔ مصنفوں کی یہ جرأت مندی اور بیباکی لائق تحسین ہے۔

پروفیسر طاہرہ عباسی کی تحریر میں بڑی شکفتگی، روانی اور وفور ہے جو اس بات کی دلیل ہے کہ وہ مخفی زبان و میان پر ہی قدرت نہیں رکھتیں بلکہ موضوع کے ساتھ انصاف کے ہنر سے بھی وہ بخوبی واقف ہیں۔ میں اس تصنیف پر مبارکباد پیش کرتا ہوں۔ امید قوی ہے کہ ان کی اس تصنیف کو ادبی حلقة میں قدر کی نگاہ سے دیکھا جائے گا۔

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Review Article

Environmental Impact of the Presence, Distribution, and Use of Artificial Sweeteners as Emerging Sources of Pollution

Ab Qayoom Naik , Tabassum Zafar, and Vinoy Kumar Shrivastava 

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Artificial sweeteners are posing a new threat to the environment. The water ecosystem is the primary recipient of these emerging contaminants. Once ingested, sufficient amount of these artificial sweeteners escape unchanged from the human body and are added to the environment. However, some are added in the form of their breakdown products through excretion. Artificial sweeteners are resistant to wastewater treatment processes and are therefore continuously introduced into the water environments. However, the environmental behavior, fate, and long-term ecotoxicological contributions of artificial sweeteners in our water resources still remain largely unknown. Some artificial sweeteners like saccharin are used as a food additive in animal feeds. It also forms the degradation product of the sulfonylurea herbicides. All artificial sweeteners enter into the wastewater treatment plants from the industries and households. From the effluents, they finally reside into the receiving environmental bodies including wastewaters, groundwaters, and surface waters. The global production of these sweeteners is several hundred tons annually and is continuously being added into the environment.

1. Introduction

Artificial sweeteners (ASs) are the food additives used in thousands of food products throughout the world. Among many food products containing ASs are food and beverages, desserts, chewing gums, pastries, and breads especially for diabetic and/or obese people. Besides, these are also used in other personal care and pharmaceutical products [1–4] such as toothpastes and cough syrups. The most popular ASs exhibiting countless food chemistry applications are saccharin (SAC), cyclamate (CYC), aspartame (ASP), acesulfame (ACE), sucralose (SUC), alitame (ALT), neotame (NEO), and neohesperidine dihydrochalcone (NSDH) [5–7]. The use of ASs in drugs and sanitary products has also been confirmed [4, 8].

ASs are primarily used for the processing of low-calorie foods without sugar in the food industry. These sweeteners are widely used in human diet as they do not induce any glycemic effect/insulin reaction once ingested. Besides, they do not release any calories and do not have any adverse effect on the dental plaque microflora, unlike sugar [6]. CYC is

currently the most developed artificial sweetener among sulfamates, followed closely by SAC [8]. In diet soft drinks, ASP and ACE-K-k are the leading brands, while SUC has been the leader in the main market for tabletop sweeteners. A class of pollutants that have entered the environment for years and have not been thoroughly studied so far in terms of occurrence, environmental fate, and toxicity assessment and/or protected by current worldwide regulations are classified as “emerging pollutants” or “emerging contaminants” [9–11]. ASs are a newly found class of environmental contaminant because of their prolonged existence and universal occurrence in various aquatic ecosystems.

It is believed that the number of emerging pollutants is more than 700 that are being added to the environment on daily basis [12]. In view of the growing pollution stress, these emerging pollutants should be explored and addressed in a systemic manner to understand their potential risk to the environment and human health [11]. The global consumption of ASs is reported to be more than 159,000 metric tons. This amounts to the market value of USD \$2 billion. China is currently the leading country

Aspartame: Effects and Awareness

Review Article

Abstract

Aspartame is very popular artificial sweetener with very low calorific value. Since last few decades use of aspartame has been drastically enhanced among the population worldwide. Not only the diabetic persons but also diet conscious young and teen-agers are also consuming aspartame without any concern or much knowledge. Consumers are using the aspartame irrespective of their clinical conditions and age. Sugar free diet products are very much popular among children and teenagers. It has been also noticed that, aspartame issued under commercial trade without any warning or specific intake limit on label. Presently aspartame consumed widely by the population via cold drinks, diet soda, low calorie sweet products, sugar free sweet products and medications. Although, many research studies indicate clearly about the associated side effects of aspartame consumption. So, in the light of available scientific research, the use of this synthetic sweetener is questionable and controversial. Purpose of this review is to spread the awareness about the possible adverse after effects of unconscious aspartame consumption. Present review is an interactive and comprehensive presentation of facts and information related to aspartame for the awareness of researchers and mass population.

Keywords: Aspartame; Artificial sweeteners; Low calorie sweeteners; Non-sugar sweeteners

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Introduction

Aspartame (E951) is a synthetic, dipeptide, intense sweetener, which is almost 180-200 times sweeter than sucrose, with a respective low calorific value. Aspartame is widely used in more than 6000 products worldwide with a huge commercial outcome under many brand names [1]. Aspartame is very much popular owing to its reduced costs, low caloric intake, attractive advertisements and assurance to contribute in weight management. The popularity of aspartame among consumers lies down within the problems associated with sucrose consumption [2]. In diabetic individuals difficulty in regulating their blood sugar levels restrict the consumption of normal sugar. This is due to the fact that diabetics do not have sufficient levels of insulin, a hormone that controls sugar uptake in the bloodstream. Aspartame helps in limiting the sucrose intake in the form of substituting sugar and releases very low amount of energy respectively. It is metabolized more slowly than sucrose, allowing blood sugar levels to remain more stable over time. Individuals with reactive hypoglycemia produce an excess of insulin after quickly absorbing glucose into the bloodstream [3]. This causes their blood glucose levels to fall below the amount needed for physiological function. Like diabetic, high glycemic food avoidance often force to choose artificial sweeteners as an alternative. Sucrose promotes tooth decay due to the fact that bacteria that naturally occur in the human oral cavity are able to efficiently use sucrose as a food source, releasing wastes that degrade enamel. Unlike sucrose, the micro flora present in the dental plaque does not utilize aspartame. Due to this property use of aspartame is recommended in the form of prescribe sugar free medicines whenever possible [4,5]. For these reasons, aspartame increasingly introduced into commonly consumed

foods such as diet sodas, cereals and sugar-free desserts, yoghurt, chewing gums, syrups, mouth fresheners, candies, health drinks, nutritional supplements and are being recommended for weight loss and for individuals suffering from glucose intolerance and type 2 diabetes mellitus [6].

Chemical information related to aspartame

Discovery: In 1965 a chemist named James Schlatter working in the G. D. Searle research laboratories accidentally has been discovered aspartame. During one intermediate reaction of gastrin inhibitor preparation, accidentally some of the solution spilled on his hand. Irrespective of all safety measures he licked his finger to pick up the piece of paper and came to know about the intense sweet taste of chemical [7]. In 1970 Cloninger and Baldwin published report in Science to propose its use as an artificial sweetener [8].

Synthesis

However synthesis of aspartame is slightly complicated a direct incubation of L-aspartic acid and methyl ester of phenylalanine along with some microorganisms also yield aspartame at commercial level. Chemical synthesis of aspartame involves two major chemical processes named Z-and F-processes. The Z-process mainly involves the dehydration of the benzyloxycarbonyl-L-aspartic acid with acetic anhydride. The anhydride is then coupled with the methyl ester of L-phenylalanine in toluene to give a mixture of benzyloxy carbonyl α -and β aspartames. The protecting groups are removed by hydrogenolysis. After crystallization mixture of α -and β aspartame isomers yield aspartame [9]. The F-process involves the protection of the amino group of aspartic acid with a formyl group followed by natural dehydration to form anhydride. The anhydride is then coupled

Does Monosodium Glutamate Induce Obesity in Female Mice?

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Abstract

Objective: Female metabolism is highly responding towards diet associated changes. Monosodium glutamate is a popular flavor enhancer, which is widely used to develop umami taste. Young female generation nowadays deals with more issues related to metabolism and fertility. Present study is an effort to monitor the effect of monosodium glutamate oral consumption on female mice health and obesity.

Materials and Methods: Adult female Swiss albino mice *Mus musculus* were divided into two groups named control and treatment. Treated group received 4 gm/kg body weight/day dose of monosodium glutamate dissolved in double distilled water by oral gavage. Control group received only double distilled water. After the completion of experiment, lee index was calculated to determine the induced level of obesity.

Results: Present study states that lee index of monosodium glutamate treated mice were significantly higher than control mice. This increment of lee index indicates that monosodium glutamate is contributing factor for induction of obesity in female mice.

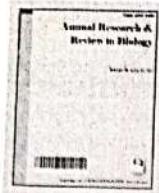
Conclusion: Obesity is the main cause of metabolic syndrome, which comes with many associated feminine health issues. Our findings strongly discourage prolonged consumption of high doses of monosodium glutamate to avoid obese young female population.

Keywords: Obesity, Lee index, Monosodium Glutamate

Introduction

The adverse effects of obesity on female health are documented in literature since past many decades (1). Overweight is a primary alarming symptom that indicates nutritional imbalance, which converts easily into obesity. Central abdominal obesity is not just a disorder but also a contributing factor for progression of metabolic syndrome (2). Metabolic syndrome is a group of symptoms, which commonly include abdominal obesity, dyslipidemia, glucose intolerance, and hypertension along with many other clinical symptoms (3).

Because of several circumstances specific to women like pregnancy, polycystic ovarian syndrome, oral contraceptive therapy use, and menopause females are more prone to metabolic syndrome progression. Due to specific circumstantial change in hormones levels, mood swings females have more tendencies to satisfy their taste buds with variety of foods incorporated with food additives, food colours and other processing materials (4). Busy working schedule of independent women followed by sedentary life style also facilitate the consumption of pre-



Monosodium Glutamate Induced Haematological Alterations in Female Swiss Albino Mice *Mus musculus*

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Authors' contributions

This work was carried out in collaboration between both authors. Author TZ performed the experiment, carried out the statistical analysis, wrote the first draft of manuscript and prepared the art works. Author VKS carried out the analysis of data and critical evaluation of final draft of manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: The sodium salt of most abundant naturally occurring amino acid glutamic acid is a popular flavour enhancer used to generate savoury or umami taste in a variety of foods. Apart from various health implications, high doses of MSG are widely used in a variety of commercial, processed and junk foods. The objective of the present study is to observe haematological alterations in female mice after long-term oral exposure of high dose of MSG.

Methodology: Female Swiss albino mice have been divided into two groups named control and treatment for each duration. Mice were given 4 gram/kg/day MSG by oral gavage for thirty and sixty days respectively and then sacrificed for the assessment of haematological parameters.

Results: High dose of MSG consumption contributes significantly (p value ≤ 0.05), in the reduction of hemoglobin percentage (p value < 0.05) red blood cells (p value ≤ 0.01) white blood cells count (p value ≤ 0.05). Serum bilirubin concentrations (p value ≤ 0.05) were elevated significantly in MSG

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Review Article

Health Implications Associated with Aspartame Consumption: A Substantial Review

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Abstract

Aspartame, an artificial sweetening agent belongs to dipeptide chemical category with a very strong sweetening potential. Although research findings in humans and non-human primates have demonstrated numerous negative effects of aspartame (biochemical, histological, neurological, behavioral, genetic etc.), the status of aspartame is still debatable. Present manuscript is a critical review of the substantial research findings related to aspartame intake on different research models. Purpose of this review was to spread the awareness about adverse effect of aspartame intake to outline the occurrence of health issues among the population. The process of uptake, storage, compartmentalization and distribution of aspartame within the body is associated with metabolic disorders and various clinical conditions. Available research literature indicates that higher amount of aspartame ingestion should be monitored carefully to avoid health implication within society.

Key words: Aspartame, artificial sweeteners, dose dependent toxicity, oxidative stress, systemic toxicity

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

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

SHORT REPORT

Open Access



Effect of cold stress on infanticide by female Swiss albino mice *Mus musculus*: a pilot study

Tabassum Zafar¹, Ab Qayoom Naik and Vinoy K. Shrivastava

Abstract

Background: Mice are widely accepted research models of great clinical significance. Maintenance of laboratory mice breed is an essential aspect for performing research activities in various fields of science. Infanticide is one of the prominent causes of litter loss during maintenance of laboratory mice stock. The present study is an effort to monitor the effect of change in ambient temperature of female mice below the normal range on cannibalism and infanticide during early postparturition phase. Adult female Swiss albino mice have been divided into two groups of control and treatment. On the day of litter group one was maintained under controlled temperature conditions (minimum 20 °C to maximum 23 °C) throughout, while female mice belong to group two have been exposed to variation of room temperature (maximum 15 °C to minimum 10 °C for two nights and one day) until 36 h postparturition.

Results: The effects of temperature changes were observed on the infanticide behaviour of dams along with the survival of pups in early postparturition phase till 36 h after delivery. The significant statistical difference ($P < 0.05$) was reported in infanticide behaviour of dams when control and treatment group was compared. It is observed that decrement in surrounding temperature promotes decrement in the ambient body temperature of dams during early postparturition. It is proposed that alteration of hypothalamic homeostasis due to temperature change induces cannibalism and infanticide behaviour. Lack of thermoregulation during early postparturition creates the sense of insecurity, in-satiety, anxiety and stress.

Conclusions: Authors strongly recommend the maintenance of body and surrounding temperature to prevent infanticidal behaviour and cannibalism within Swiss albino mice population. Further investigations are advisable to authenticate the active behavioural and biochemical pathway behind the phenomena.

Keywords: Cannibalism, Mice stock maintenance, Infanticide, Pups mortality, Cold stress

Background

Cannibalism is the phenomena in which one individual of a species consumes whole or parts of the individuals of the same species. It is widely seen in rodents, insects, and lower vertebrates. Cannibalism in the form of infant consumption is termed as infanticide. Infanticide refers to the act of killing infants by their own parents [1]. Swiss albino mice *Mus musculus* is a widely used mouse strain, which is used for many research investigations due to its small size, short life span, and easy maintenance. Maintenance

of mice stock is an essential need for research facilities due to their widespread use in clinical studies related to biomedical research. Importance of mice as a research model is not only limited to toxicity assessment, drug delivery, stem cell research, cancer biology, endocrinology, and infertility assessment but also extended beyond the imagination [2, 3].

Successful mice breeding are crucial aspect of mice stock maintenance and many other experiments such as mating assay and fertility assessment. Any direct or indirect modifier can lead ambiguities in experimental findings of researchers. Loss of pups or entire litter loss by infanticide behaviour of dams is relatively a common problem, which is poorly understood. However, there

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Biotechnology Products In Everyday Life pp 221–228

Pharmaceutical Biotechnology in Herbal Neuroprotection

Tabassum Zafar , Vinoy K. Shrivastava & Bashirulla Shaik

Chapter | First Online: 04 November 2018

660 Accès

Part of the EcoProduction book series (ECOPROD)

Abstract

Plant-based herbal formulations were the only possible hope for health care management in ancient times. Along with the advancement of social and medical sciences, various drugs came in fashion to treat different diseases and clinical conditions and for a time, the interest in naturally derived compounds is waned. In the current era of biotechnology, where health sciences are at the peak of their advancements, herbal alternatives to synthetic drugs are again gathering tremendous interest. Why are herbal drugs of such interest? Maybe it is good to mention here about the less detrimental side effects of naturally derived compounds. Pharmaceutical biotechnology is a relatively new branch of science, which covers the advancements in pharmaceutical science by the involvement of biotechnological approaches and techniques. Along with the recent advancement of pharmaceutical biotechnology, utilization of compounds derived from medicinal plants for neuroprotection has increased worldwide. Although many synthetic compounds are commercially available nowadays for the patients of neurodegenerative disorders, search for novel herbal options for neuroprotection is still of great significance because of their less non-toxic and long-lasting nature. Without claiming to deal with all features of this topic, this chapter aims to provide a substantial and concise overview of the pharmaceutical biotechnology with a special emphasis in the area of herbal neuroprotection.



Opinion

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Neuroendocrine Management of Mental Peace: Prevention is Better than Cure

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Opinion

In the fast pacing 21st century, where scientific and medical advancements are at their peak, still there are many challenges to overcome for the mankind. With each passing day, we are growing faster than fast to changeover our status developed from developing, but in between somewhere the most neglected part is physical and mental health. We are now standing on an edge where on one side the first humanoid robot "Sophia" has become a legal citizen of country and on the other side millions of human beings facing malnutrition, stress and psychological illness worldwide [1,2]. Mental peace and pleasure have become most desired but less achieved targets nowadays. Stress is the simplest type of psychological illness, but it remains the root cause of many neurological and physiological disorders once left unmanaged [3,4].

Mental peace is actually a condition in which all neurotransmitters of the vital system work in proper coordination with endocrine and other peripheral physiological systems of the body. The relationship between physical and mental health is reciprocal. Mental health is a result of various biochemical co-ordinations between hormones, enzymes and metabolites, which are essential for physical health too. Cortisol, endorphins/enkephalins, dopamine, oxytocin, endocannabinoids, acetylcholine, norepinephrine, epinephrine, glutamate, and histamine are few most effective chemicals, which play important role in achieving healthy nervous system [5,6]. Apart from all available resources and technologies for identification, management and diagnosis of neurological disorders, still it is not possible to overcome each and every disorder. It is rather a better option for society to manage the stress and achieve mental peace to avoid progression of severe neurological implications.

Achieving mental health helps the body to balance the levels of melatonin, which boosts good sleep to balance circadian rhythms. Mental peace enhances the production of serotonin "the pleasure chemical" which initiates the sense of peace security, satisfaction and contentment. Mental peace improves

the circulation of growth hormones for better management of vitality, vigor and physical strength. Mental peace helps the immune system to respond better against any of the available infection. Mental peace enhances the production of endorphins during various physical activities to maintain "the feel good factor". Mental peace achievement enhances the production of gamma amino butyric acid (GABA), which calms down the nervous system and brain. Mental peace is the source requirement for longevity as mental peace also enhances the production of dehydroepiandrosterone hormone (DHEA). Significant reduction in cortisol levels followed by the serotonin increment achieves the inner feeling of happiness to signal the brain that everything is favorable and pleasant [7,8].

The next biggest challenge among health industry is not to search cure for newly discovered diseases but to maintain the health management by natural means. In author's perspective management of mental peace has a strong health perspective behind, which is ignored very much nowadays, as everyone is busy enough in rat race to achieve physical materialistic goals at the cost of own health. In my opinion the use of synthetic molecules to treat neurological disorders will reduce significantly if the natural cycle of happiness and peace is restored, by preventing the imbalance of mental peace. Authors appreciate and strongly recommend the concept of prevention rather than cure. "Prevention is better than cure" is not just an ancient proverb but also an insight of health to maintain biochemical management of sociopsychological health issues.

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Oxytocin: An Important Aspect for Designing Neuropsychiatric Drugs

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Mini Review

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Abstract

The hormone oxytocin (OT) has a central action where it acts as a neuromodulatory peptide and exerts its action depending upon the distribution of OT receptors (OTR) in the target site. OTRs are G-protein-coupled receptors (GPCRs) comprising different subunits (Gq, Gi, and Gs) and have the ability to activate different pathways, but specific agonists and antagonists may show different affinities to OTRs, depending on the specific G-protein isoform to which they are coupled. In recent study it has been found that OTR distribution varies with age and species and in regions of the brain, region-specific expression of different receptors could be important in the development of new drugs targeting specific neuropsychiatric disorders.

Keywords: Neuropeptide; Neurotransmitter; Receptor; Neuromodulation

Introduction

OT (oxytocin) is a neuropeptide synthesized in the hypothalamus by paraventricular (PVN) and supraoptic nuclei (SON), and secreted by the posterior pituitary lobe into blood circulation [1,2]. In central action OT is a neurotransmitter but, in peripheral action, OT is a hormone and is involved in different physiological and pathological functions like sexual activity, penile erection, ejaculation, pregnancy, uterus contraction, milk ejection, maternal behavior, social bonding etc. [3].

Brain neuropeptide OT has been shown to affect social processes in animals; this molecule and its receptors participants in the treatment of neurodevelopmental disorders [4]. Classical neurotransmitters are packaged in small synaptic vesicles and are localized at vesicles [3].

However, peptides are stored in large dense-core vesicles (LDCV) which are distributed in soma, dendrites, axonal, as well as nerve endings of magnocellular neurons of the paraventricular nucleus in different regions of the brain [5]. Oxytocin from the hypothalamus reaches different regions of the brain by axonal release from the OT containing fibers that specifically target areas of the brain expressing its receptors [6].

Oxytocin receptors (OTR) are members of the G-protein coupling receptor (GPCR) superfamily. The gene of the OTR contains 3 introns and 4 exons and is located in a single copy on chromosome 3p25, and the structure of GPCRs is characterized by seven transmembrane (7-TM) α -helices connected by three intracellular (IL-1 to IL-3) and three extracellular loops (EL-1 to EL-3) [1]. These receptors can be coupled to different G-proteins, and

Oxytocin: The Neurohormone

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Mini Review

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Abstract

Oxytocin is a peptide hormone, which serves important functions in body including labor management and lactation. Induction of milk ejection and easy delivery there are many other aspects of *in vivo* oxytocin functions. Neurotransmission within the body is one of the important vital functions of oxytocin, which validates involvement of oxytocin in emotional, neuronal and behaviour balance of body. Present mini review discusses important facts and phenomenon's associated with oxytocin.

Keywords: Oxytocin; Love Hormone; Neurohormone

Introduction

Oxytocin is a neuropeptide endocrine secretion produced by the paraventricular nucleus of the hypothalamus and released by the posterior pituitary. In 1906, Sir Henry Dale coined the term 'Oxytocin' for the chemical released from posterior pituitary to promotes 'swift birth' by affecting the uterine contractions in pregnant cats. After 47 years of this, Vincent du Vigneaud had received Nobel Prize in 1955 for sequencing and synthesizing the oxytocin [1].

Oxytocin is an evolutionarily conserved neurohypophysial hormone, which is made up of nine amino acids. It is almost similar to the neighbouring hormone vasopressin except the presence of leucine as third amino acid, while vasopressin contains an arginine at the same [2]. Oxytocin has class I G protein-coupled receptor with a requirement of Mg²⁺ and cholesterol. In humans many peripheral organs such as kidney, heart, thymus, pancreas, adipocytes, uterus, and brain differentially express the oxytocin receptors [3]. The oxytocin receptor density varies in between males and females. Apart from humans oxytocin receptors are also distributed in pigs, rats, sheep, bovine, mice, and rhesus monkey [4].

Oxytocin is mainly responsible for inducing sufficient uterine movement during the child birth and it also induces lactation in postpartum phase. Oxytocin has evident scientific association with various biological and cognitive process including empathy, trust, sexual activity, and relationship-building, social bonding, sexual reproduction and most importantly childbirth and breast feeding [5].

These amazing qualities of this neurohormone makes it an interesting candidate for treatment of a number of clinical conditions such as artificial assistance to childbirth, depression, anxiety, autistic spectrum disorder, intestinal problems, irritable bowel syndrome etc. [6].

In aid to reproductive functions of oxytocin, it also plays various major roles in expression of physical and psychological characters. Oxytocin is many times synonyms with "love hormone," and "cuddle hormone" because it is secreted during romance, love making, hugging and orgasm [7]. Oxytocin is an active influencer of emotions, when oxytocin releases in the blood stream it creates a feeling of trust, affection and social attachment. It is assumed that the first stage of romantic attachment is under the influence of persistently high levels of oxytocin,

Fluorometric Method to Quantify Monoamines: A Brain Region-Based Study Using Milligram Amounts of Brain Tissue

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Key words: Catecholamine; Neurotransmitter; Monoamine; Dissection; Fluorophore

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Abstract

BACKGROUND: The predominant catecholamines in the brain are dopamine, noradrenaline, and adrenaline. Catecholamines exist in low (micromolar) concentrations in the brain when compared to amino acid neurotransmitters such as glutamate and γ -aminobutyric acid. Although monoamines are distributed in the mammalian central nervous system, concentrations vary in different regions of the brain. Therefore, we investigated the regional distribution of monoamines to understand the metabolism and complex pathways involved in neurotransmission.

NEW METHOD: In this study, we purpose a novel methodology of analysis of monoamine in milligram amount of brain tissue. The small tissue size of tissue required a standard technique for dissection and an appropriate referencing system to calculate concentration. Therefore, we presented a definitive volume of reagent concentration with respect to tissue weight and detailed calculation of concentration as well as conversion of fluorescence reading into nmol/g of tissue weight.

RESULTS: Recovery for this assay depends on tissue size, definite reagent volume proportion and calculation.

COMPARISON WITH EXISTING METHODS: This is a new approach for the representative values for brain parts from control mice dissected and assayed for DA, NA, and 5-HT. While it is possible to process with ease about 50 samples of frozen tissues per day.

CONCLUSION: This is a very useful assay procedure especially in any experiment that generates many samples. This procedure should greatly facilitate the correlation of neurotransmitter levels in brain regions with changes in behaviour produced by experimental manipulations.

ORIGINAL ARTICLE

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Seasonal variations in diversity of aquatic macrophytes of Upper lake, Bhopal

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ABSTRACT

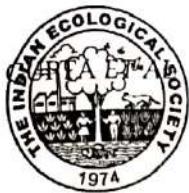
Macrophytes are used as biological indicators of the aquatic environment, allowing detection of ecosystem response to different stressors, i.e. pollution, eutrophication etc. These stressors lead to a reduction in macrophyte diversity and threaten the faunal diversity of aquatic ecosystems favouring the establishment of exotic species, at the expense of native species. To analyse the ecological status of a lake different diversity indexes (IVI, H' index) are used which describes the quality of natural areas. The present study was carried out in Behta village to determine the macrophyte species diversity (H' index) and importance value index (IVI) in three different seasons. A random sampling was done along several transect line carried out with the help of a 1 m² light plastic quadrat. During the whole study period, a total of 17 macrophyte species belonging to 12 families and 8 orders were found distributed in the lake. During our observation it has been noticed that out of 17 macrophyte species the *Eichornia crassipes* (IVI=16.49) has the highest Importance value index in summer season while the highest Shannon-Wiener Index (H'=1.657) was observed during winter season. The diversity of species is not uniformly distributed and showed mosaic of low and high diversity patches. Therefore, this study highlights the loss of species richness and dominance of pollution-tolerant species showing that the western part of the lake is severely disturbed during the summer season.

Key words: Bhopal Wetland, Macrophytes, Shannon-Wiener Index (H').

Introduction

Aquatic macrophytes are one of the most abundant life forms on the earth and its diversity leads to a richness of life and beauty to the lakes. Macrophytes are hydrophytes of freshwater which can be easily seen with the naked eye and are normally found growing in or on the surface of water (Gecheva *et al.*, 2013). They provide shelter and food for small animals, release oxygen during photosynthesis and are reliable indicators of ecosystem health (Schneider, 2007). Aquatic plants integrate physical, chemical,

and biological features of an ecosystem so their abundance and distribution are affected by variations in the environmental conditions and nutrient status of lake (Ciecielska and Kolada, 2014). The Upper Lake is a hotspot of biodiversity and lifeline of the Bhopal city, Madhya Pradesh, India. It is one of the most heavily used and exploited water body for sustainability and well-being, thus facing a great threat (Biswal, 2019). Unethical human activities near lake have changed the nutrient dynamics, favouring the growth of invasive species of macrophytes at the cost of native species, thus losing



Effect of Physico-Chemical Properties of Water on Macrophyte Diversity with Special Reference to Bhoj Wetland

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Abstract: The present study was carried out to characterize the impacts of physico-chemical properties of water on the diversity of macrophytes with special reference to Bhoj Wetland. During the study, a total of 12 macrophytes species belonging to 8 families were recorded, with 2 dominant species at 5 sites of wetland. The deplorable water quality with invasive species was found in all sites except site III as it is colonized by submerged vegetation with high level of DO and low TDS. Unethical activities of the local inhabitants have not only decreased the diversity, distribution, density and productivity of macrophytes but also the overall health of the lake ecosystem.

Keywords: DO, Quadrat method, Ramsar site, upper lake, Water chemistry

Wetlands are the biological indicators of aquatic ecosystem and are known as hotspots of biodiversity (Biswal 2019). Globally these ecotones are considered as the most productive natural ecosystems on the earth. (Sarkar et al 2019). They provide vital services for plants and animals while maintaining moderate atmospheric temperature (Singh and Parikh 2020). Macrophytes and their litter create much of wetland's physical structure and they modify the local environmental conditions of water (Van der Valk 2006). The varied assembly of these plants have different adaptations, life history strategies and environmental tolerances that facilitate their survival in both saturated and flooded water (Bradley 2005). Therefore, the growth of these plants gets easily influenced by the addition of allochthonous nutrients and organic loading into the water.

Due to pollution native species of macrophytes decline and gets replaced by foreign and exotic species (Pandiarajan 2019). Thus, aquatic macrophytes act as indicators of ecological conditions of surface water quality (Sethu 2019). A part from this, mismanagement of the resources have also destabilized these fragile ecosystem raising problems like shrinkage of surface area, poor quality of water causing eutrophication etc.

(Upadhyay et al 2012). This is all due to the necessity to fulfil the human need for pure water. The present study was carried out to characterize the impacts of physico-chemical properties of water on the diversity of macrophytes with special reference to Bhoj Wetland, India. Madhya Pradesh is the second largest geographical unit in the Indian country with an area 3,08,252 km². It is rich with different aquatic ecosystem 0.46 million hectares are under reservoirs and has the maximum water spread area under man-made lakes.

MATERIAL AND METHODS

Study area: Bhopal city with a current population of approximately 23 lakhs according to UN World Urbanization Prospects is located at 23.2599° N and 77.4126° E with a highest elevation of 550 m above mean sea level spreading over seven hills (Chouhan et al 2009). Being the oldest man-made lake in the central India, the Upper Lake was created in the early 11th century by king Bhoj across the Kolans River, a rain fed tributary of the Betwa River. This lake is an east westerly elongated shallow lake with irregular margins and has a dense growth of aquatic macrophytes and algae. The catchment area of this lake is 370 sq km, maximum water area is 3105 ha, storage capacity 100.8 million cubic meters with a

Growth Performance of Grass Carp fed on *Potamogeton crispus* and *Vallisneria spiralis* in Laboratory Conditions

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ABSTRACT

The Context: Aquaculture plays a vital role in present and future world food production. It involves the optimum utilization of artificial fish feeds. Every day the cost of fish feed components is increasing so it is a necessity to identify alternative raw materials for feeding fishes. Aquatic weeds which are regarded as 'menace' by the general people have great economic value as they can substitute high cost feeds for most of the fishes. This kind of utilization of aquatic weeds is one of the best environmental friendly weed controlling method in lakes. In this experiment grass carp's were fed on fresh *Potamogeton crispus* and *Vallisneria spiralis* plants in 6 aquariums for a period of 75 days.

Result: Grass carp fed with F_{RC} have significantly higher body weight gain 71.33 ± 8.99 ($F= 34.8$) compared to carps fed with F_{VS} 67 ± 10.23 ($F= 6.76$). The plant biomass reduced by the fingerlings fed on F_{VS} 0.0046 ± 0.00045 gm was significantly higher than F_{RC} 0.0018 ± 0.0003 .

Conclusion: The finding supports the higher growth rates with lower FCR, which clearly proves that these macrophytes can act as an alternative fish feed in place of commercial feeds. Thus, it appears that if utilized properly, the aquatic weeds are not at all a 'menace' but can be a 'boon' to aquaculture industry.

Key Words: *Ctenopharyngodon idella*; *Potamogeton crispus*; *Vallisneria spiralis*; Aquaculture.

Introduction:

Aquaculture plays a vital role in present and future world food production (Cruz *et al.*, 2011). It is the cultivation of aquatic animals in water and it is fully dependent on the use of artificial feeds (Taher, 2017). Thus, its use is increasing competition for commercially available nutrient ingredients (Mondal, 2018). Researches have therefore been carried out worldwide for substitutes of fish foods (Franklin *et al.*, 2008) and replacing them with cheaper source of protein. Aquatic macrophytes proteins are a logical choice for

replacing fish meal in diets of fishes. They can substitute up to 25% of formulated diets and up to 50% of commercial feeds (having 35% protein) without any negative effect on fish growth (Cruz *et al.*, 2011). In tropical lakes of Bhopal, such macrophytes are widely distributed and are considered as plague. Owing to the rapid growth of these weeds, many studies are focussed on their control or alternative uses (Kalita *et al.*, 2007; El-Sayed, 2003; Pipalova, 2003). Some of them, namely, *Lemna minor*, *Wolffia* sp., *Eichornia crassipes*, *Vallisneria spiralis* and *Potamogeton crispus* are widely distributed. These plants

The Perspective of Coronavirus Disease Outbreak: Epidemiology, Transmission, and Possible Treatment

Ab Qayoom Naik, Tabassum Zafar, and Vinoy K. Shrivastava

Abstract

The outbreak of coronavirus disease 2019 (COVID-19) which emerged in Wuhan city of China has now spread to 214 countries and territories around the world and two international conveyances (the Diamond Princess cruise ship harbored in Yokohama, Japan and the Holland America's MS Zaandam cruise ship) as of October 11, 2020. The disease has been named as a coronavirus disease (COVID-19) and the virus causing the disease is known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). There are currently about 36,754,395 confirmed COVID-19-infected cases and 1,064,838 confirmed deaths as of October 11, 2020. The study is intended to understand the origin, transmission and impact of the coronavirus disease (COVID-19). The virus has not been encountered by humans previously and is therefore known as a novel. SARS-CoV-2 is spreading to new areas and has become a serious challenge for the scientific community in particular and the whole world population in general. The focus of the study is based on the transmission, epidemiology, genetic makeup, and possible remedies to control and contain the disease. It also includes the global impact of SARS-CoV-2 on health care and the world economy. The present review summarizes the current knowledge highlighting the symptoms, epidemiology, transmission, pathogenesis, phylogenetic analysis, and future directions to control the spread of this fatal disease.

Keywords: COVID-19, pandemic, transmission, epidemiology, symptoms

Introduction

THE OUTBREAK OF COVID-19 (coronavirus disease 2019) in China has spread panic, fear, and uncertainty throughout the world. The number of infected persons is increasing day by day at an alarming rate along with the number of deaths due to the infection. The origin, transmission, and severity of the infection have put the whole world in a state of despair.

Corona viruses are new to the world. Many virus strains are available as human pathogen even before the confirmation of severe acute respiratory syndrome coronavirus (SARS-CoV) and SARS-CoV-2. Some of the common human pathogenic coronaviruses are 229E (alpha coronavirus), NL63 (alpha coronavirus), OC43 (beta coronavirus), and HKU1 (beta coronavirus) (Killerby et al. 2018). These are responsible to show symptoms of mild-to-moderate upper respiratory tract illness similar to common cold. The modification in genome is quite common in the case of RNA virus that used to be very sudden and unpredictable but it enhances the virulence of viruses by enhancing the potential to virus identification and survivability (van der Hoek 2007). The circulation of these

human viruses are not much harmful to mankind until the virulence of SARS, Middle East respiratory syndrome (MERS), and SARS-CoV-2 have raised an alarm for mankind.

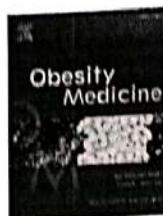
Structurally, SARS-CoV-2 (Fig. 1) comprises, along with other accessory proteins, four structural proteins, including spike (S) glycoprotein, small envelope (E) glycoprotein, membrane (M) glycoprotein, and nucleocapsid (N) protein (Jiang et al. 2020). A transmembrane protein with a molecular weight of around 150 kDa is the Spike (S) glycoprotein present in the outer portion of the virus. It forms homotrimers, facilitating the binding of the virus to the host cells by attracting the lower respiratory tract cells with angiotensin-converting enzyme 2 (ACE2). This glycoprotein is cleaved into 2 subunits, namely S1 and S2 by the host cell furin-like protease. Part S1 is responsible for assessing the spectrum of host viruses and cellular tropism with the receptor-binding domain (RBD) make-up, whereas S2 is responsible for mediating host cell transmission by virus fusion (Fehr and Perlman, 2015; Guo et al. 2020; Walls et al. 2020).

Coronaviruses have a crown-like enveloped particle, thus known as coronaviruses. The genome of CoV is a positive-

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Female obesity: Association with endocrine disruption and reproductive dysfunction

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ABSTRACT

Obesity affects female fertility and fecundity through a complex set of mechanisms involving an imbalance of hormones, changes in the adipose tissue, reproductive system, adipokines, cytokines, metabolic perturbation, dysbiosis, and ovulatory and embryonic malfunction. Obesity is an important factor for hyperandrogenism, hyperinsulinemia, and the development of polycystic ovarian syndrome (PCOS). PCOS impairs the functioning of gut microbes which in turn interrupts inflammatory signalling in the hypothalamic-pituitary-gonadal (HPG) axis and oocyte development. It causes abnormalities in the reproductive cycle, an increase in the body mass index (BMI), and alters the outcome of assisted reproductive treatment. Furthermore, kisspeptin-dependent leptin pathways augment the regulation of gonadal releasing hormone (GnRH) secretion to maintain ovarian function. The level of ghrelin and leptin is associated with the onset of puberty and inflammatory factors, mainly tumor necrosis factor (TNF)-α and interleukin (IL)-6. These affect the fertility of females by exacerbating oocyte development, insulin resistance, and PCOS. This article highlights the effect of obesity on the female reproductive system with the involvement of the interaction of various hormones, binding protein, inflammatory agents, metabolic perturbation, dysbiosis, obesity-induced alteration in the hypothalamic-pituitary-ovarian (HPO) axis and sustainable goals to manage obesity.

1. Introduction

1.1. Global obesity

The data from the last few decades revealed the prevalence of obesity in developed and developing countries. The rates are high in western countries and are associated with childhood obesity and abdominal obesity in adults (James, 2004). Recent reports of the World Health Organization (WHO) found 650 million adults, 340 million adolescents, and 38 million children below five years to be obese (Organization, 2020). A recent study showed that one-third of the global population can be categorized as obese or overweight, with a higher prevalence in women and old individuals (Chooi et al., 2019). Based on its worldwide prevalence in the last few decades, obesity is now considered to be the key cause of mortality and comorbidities in developed countries, and the cases of obesity among children are growing rapidly (Pi-Sunyer, 2009). Additionally, obesity is the sixth most important risk factor in the world (Haslam and James, 2005). Obesity is closely associated with different metabolic disorders and severely affects health (Djalalina et al., 2015). It leads to working disability and various health ailments, and the worldwide impact of obesity occurs as comorbidities like

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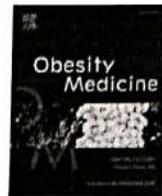
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Metformin treatment ameliorates endocrine-metabolic disturbances in letrozole-induced PCOS mice model by modulating adiponectin status

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ARTICLE INFO

Keywords:

Polyzystic ovarian syndrome (PCOS)

Metformin

Oxidative stress

Letrozole

Adiponectin

ABSTRACT

Background: In reproductive aged women, polycystic ovarian syndrome (PCOS) is a complex endocrine condition. It's generally linked to metabolic diseases (MDs), thereby increasing the risk of infertility, cardio metabolic events, and other comorbidities in PCOS women. Adiponectin is a circulating protein made by adipocytes that has been shown to have an inverse relationship with MDs. Metformin, an insulin-sensitizing biguanide, is the world's most widely prescribed treatment for type 2 diabetes and PCOS. The effects of Metformin and the involvement of adiponectin in endocrine-metabolic abnormalities in experimentally induced PCOS mice were examined in this study.

Methods: Letrozole (6 mg/kg) was administered per orally (p.o) for a period of 21 days for the induction of PCOS, followed by dose of Metformin (150 mg/kg, p.o) for 60 days using 0.9% saline water as vehicle.

Results: The findings revealed that LET-treated mice experienced PCOS-like symptoms, including increased Serum LH, decreased Serum estrogen, progesterone and FSH levels, increased body weight, altered ovarian cytoarchitecture, with multiple cysts. In addition, there was an increase in serum cholesterol, triglycerides, fasting blood glucose, plasma interleukin-6 (IL6). In the ovary we observed a decrease in levels of superoxide dismutase (SOD), glutathione (GSH) and increase in lipid peroxidation (MDA). These changes were linked to lower levels of circulating adiponectin and were altered when the mice were given metformin.

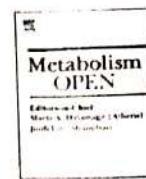
Conclusion: The findings revealed that metformin, via altering circulating adiponectin, appear to alleviate endocrine-metabolic abnormalities and inflammation-related comorbidities associated with LET-induced PCOS.

1. Introduction

Throughout the world polycystic ovarian syndrome (PCOS) is usually complicated and diverse endocrine-metabolic disorder affecting six to twenty one per cent of reproductive aged women accounting to 70–80% of infertility cases (Brakta et al., 2017; Zafar et al., 2019). PCOS is characterised by multisystem endocrinopathy and accompanying metabolic disorders. The syndrome is characterised by enlarged cystic ovaries, and hyperandrogenism. Although the specific cause of PCOS is unknown, evidence suggests that there is a link between the PCOS and metabolic issues such as insulin resistance, obesity, and type 2 diabetes. Due to, genetic predis-

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Effects of oxytocin and antagonist antidote atosiban on body weight and food intake of female mice, *Mus musculus*

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ARTICLE INFO

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Energy metabolism

ABSTRACT

Growing evidence suggests that oxytocin (OT) plays an important factor for the control of food intake, body weight, and energy metabolism in human and non-human animals. It has reported previously, the down-regulation in oxytocin receptors (OTRs) expression is linked with the development of obesity, but exogenous OT reverse body weight and food intake in obese animal model. It is important to know that, whether intraperitoneal administration crosses blood brain barrier. Therefore, in the present experiment, we study the impact of intraperitoneal administration of synthetic OT 0.0116 mg/kg and antagonist atosiban (OTA) 1 mg/kg on food intake, and body weight of female mice, *Mus musculus* for different duration i.e. 30, 60, and 90 days. In this study, it was observed that there was significant decrease ($p < 0.001$, one-way analysis of variance [ANOVA]) in the body weight (BW), food intake, and gonadosomatic indices (GSI) after the intraperitoneal exposure of OT at dose 0.0116 mg/kg up to 90 days and inhibits via antagonist atosiban. These results indicates that intraperitoneal administration of OT can be used for treatment for longer duration without any side effects and maintains homeostasis in physiologic system regulates body weight and gonadal weight in female mice, which represent an important therapeutic tool for the obesity and metabolic disorder in female.

1. Introduction

Oxytocin (OT) is a hypothalamic peptide synthesized by paraventricular (PVN) and supraoptic nuclei (SON) [1] binds with oxytocin receptor (OTRs) the member of G-protein coupled receptor (GPCR) and regulates different physiological function in central and periphery system. The oxytocinergic neurons of PVN and SON release oxytocin through dendritic diffusion to different regions of the brain i.e. the arcuate nucleus (AN) [2], ventral tegmental area (VTA) [3], nucleus accumbens [4], spinal cord [5,6], and nucleus tractus solitarius (NTS) [6,7] and play an important role in energy metabolism. Furthermore, magnocellular neurons projection to posterior pituitary and traditionally known for various endocrine and neuroendocrine function [8,9]. It has also reported previously, OT also released in gastrointestinal tract [10] via the activation of OTRs and shows autocrine and paracrine

function [11,12]. Various evidences suggest that the downregulation in OTRs expression is linked with the development of obesity. Along with this, haploinsufficiency of single minded 1 (SIM1) gene necessary for the formation of PVN, results downregulation in the OTRs in hypothalamus and associated with hyperphagic obesity and significant increase in susceptibility to diet induced obesity in mice [13–16] and human [17,18], but exogenous OT reverses weight gain as well as excessive food intake [14]. These studies suggest that the OT signaling plays an important role in energy metabolism regulation, and supported by a study on mice deficient with either OT [19] or OTRs [20] results in the development of obesity in later stage.

It has also reported in previous research exogenous administration of OT by central or peripheral route in mice, monkey, and rat showed decrease in body weight, increasing energy expenditure, and enhance lipolysis [5,21–26], indicates therapeutic targets for obesity and

* OT, Oxytocin; OTRs, Oxytocin Receptors; OTA, Antagonist Atosiban; ANOVA, One-Way Analysis of Variance; BW, Body Weight; GSI, Gonadosomatic Indices; PVN, Paraventricular Nuclei; SON, Supraoptic Nuclei; GPCR, G-Protein Coupled Receptor; AN, Arcuate Nucleus; VTA, Ventral Tegmental Area; NTS, Nucleus Tractus Solitarius; SIM1, Single Minded 1 Gene; BBB, Blood Brain Barrier; CNS, Central Nervous System; ICV, Intracerebroventricular; I.P., Intraperitoneal; SEM, Standard Error of Mean; GI, Gastrointestinal; VP, Vasopressin; HPG, Hypothalamic-Pituitary-Gonadal Axis; PCOS, Polycystic Ovary Syndrome.

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MINI-REVIEW ARTICLE

Oxytocin as a Potential Adjuvant Against COVID-19 InfectionPratibha Thakur^{1*}, Renu Shrivastava² and Vinoy Kumar Shrivastava¹¹Bioscience Department, Barkatullah University, Bhopal, India; ²Zoology Department, Sathya Sai Women College, Bhopal, India**ARTICLE HISTORY**Received: June 17, 2020
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Abstract: This study summarized the benefits of oxytocin in the attenuation of coronavirus disease (COVID-19) pathogenesis. The recent outbreak of COVID-19 has become a pandemic with 7,323,761 infected patients and has created a health emergency worldwide. On the basis of the clinical study, COVID-19 shows homology with other coronavirus pathogenesis, i.e., inflammation, oxidative stress, and hyperactivation of the immune system, resulting in cytokine storm and causing acute lung infection (ALI), acute respiratory distress syndrome (ARDS), and kidney dysfunction. Oxytocin is a peptide of nine amino acids and a well-known anti-inflammatory, anti-oxidant, and immune-modulator, which is protective against ALI/ARDS, nephrotoxicity, sepsis, and ischemia-reperfusion medical condition. Oxytocin is a neuromodulator, effective for stress, anxiety, social behavior, and depression, which may be helpful for better outcomes in patients with COVID-19. Significant data show that oxytocin can be useful in the treatment of COVID-19 pathogenesis. A direct application of OT in COVID-19 is unclear; however, its use in an experimental model and humans has continuously demonstrated its safety, and its use in patients with COVID-19 is predicted to be highly beneficial.

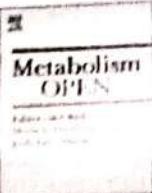
Keywords: COVID-19, SARS-CoV-2, oxytocin, immunomodulation, anti-inflammatory, antioxidant.**1. INTRODUCTION**

Coronaviruses belong to the virus family of Coronaviridae, order Nidovirales [1, 2]. The coronaviruses are the largest RNA virus family having approximately 31 kilobases (kb) genome [2, 3]. They are important pathogens of humans and several other vertebrate species, causing several respiratory complications in humans [4, 5]. These viruses are further classified into four subgroups: alpha, beta, gamma, and delta. Apart from this, seven coronaviruses cause diseases in humans: 229E (alpha coronavirus), NL63 (alpha coronavirus), OC43 (beta coronavirus), HKU1 (beta coronavirus), MERS-CoV (beta coronavirus), SARS-CoV (beta coronavirus), and SARS-CoV-2 newly identified novel coronavirus in 2019 (COVID-19) [6]. The recent outbreak of COVID-19 has created a health emergency worldwide.

In late December 2019, the Wuhan city of China reported a series of unexplained cases of pneumonia of unknown etiology [7] with symptoms of common viral pneumonia such as fever, cough, and shortness of breath [6], which is now rapidly spreading to the rest of the world [8]. Until June 10th, 2020 approximately 7,323,761 patients infected with COVID-19 and 413,731 death cases were reported [9]. India has reported 276,146 infected and 7,750 death cases until date [9]. After analyzing the updated data from the Worldometer report dated June 10th, 2020, the fatality rate was significantly higher in the more than 80 years of age group.

In addition, different reports published by the Indian Council of Medical Research of India have stated older age and comorbidities as high-risk factors for COVID-19 fatality, and has put the effect of aging and comorbidity on the immune system in the spotlight. Aging is a multifactorial dynamic physiological process ongoing with time [10] and also responsible for immunosenescence and decrease in immunity and fitness, which are major factors for the lethality of infectious disease [11]. Moreover, the Worldometer report has presented the sex ratio of COVID-19 fatalities: the confirmed death cases were 4.2% in males versus 2.8% in females in China, which may be because of gender-related behavioral effects such as, smoking, alcohol consumption, and biological differences in the immune system of males [12-14], which enhance the probability of respiratory infection. Moreover, male dominance in COVID-19 pathogenesis may be because of the activation of androgen receptive element (AREs) of transmembrane serine proteases type 2 (TM-PRSS2) gene [12]. Serine proteases enzyme plays an important role in spermatogenesis, homeostasis, and food digestion. It has been previously reported that viruses hijack these enzyme functions and assist their own entry into host cells [15-17]. Recently, a study from Wuhan city, China, has reported that COVID-19 significantly increases inflammatory cytokines and infection-related biomarker and novel COVID-19 directly acts on T lymphocytes [18], which may be a crucial factor of early screening, diagnosis, and treatment of COVID-19. Until date, there is no effective targeted treatment against COVID-19, and persistent infection may involve both stages of silent and productive infection of the host cells [19]. Thus, COVID-19 infection highly challenges the immune system.

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Turmeric extract alleviates endocrine-metabolic disturbances in letrozole-induced PCOS by increasing adiponectin circulation: A comparison with Metformin

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Polycystic ovary syndrome
Adiponectin
Turmeric extract (*Curcuma Longa*)
Metformin
Oxidative stress

ABSTRACT

One of the most common causes of female infertility is polycystic ovarian syndrome, which affects 6–21% of the population. Regrettably, the currently available treatments are mostly symptomatic and ineffective. As a result, safer options are needed now more than ever. In a letrozole PCOS albino mouse model, the current study compares the therapeutic advantages of Turmeric extract (*Curcuma longa*) to metformin. Adiponectin is a circulating protein generated by adipocytes that has been linked to metabolic diseases (MDs) in an inverse relationship. The effects of Turmeric Extract (*Curcuma Longa*) in contrast to Metformin, as well as the involvement of adiponectin in endocrine-metabolic abnormalities in experimentally induced PCOS mice model, were studied in this study. Letrozole (6 mg/kg) was administered orally (p.o) for 21 days to induce PCOS, followed by a dose of Turmeric Extract (*Curcuma longa*) (175 mg/kg and p.o) and Metformin (150 mg/kg) for 30 days, both with normal saline water (0.9%) as the carrier. The findings revealed that LET-treated mice displayed PCOS-like characteristics, such as higher LH levels, increased body weight growth, and ovarian morphology with numerous cysts, increase in fasting blood glucose, lipid profile, plasma lipid peroxidation (MDA) and IL-6, as well as a decrease in serum Progesterone, Estrogen, FSH, SOD and GSH levels in the ovary. These changes were linked to lower levels of circulating adiponectin and were reversed when treated Turmeric extract. By altering circulating androgen-adiponectin balance, the data implies that Turmeric extract alleviates endocrine-metabolic abnormalities and inflammation-related comorbidities associated with LET-induced PCOS.

1. Introduction

Polycystic Ovarian Syndrome (PCOS) is a prevalent complex and heterogeneous endocrine-metabolic illness in women of child-bearing age that affects 6–21% of women and accounting to 70–80% of infertility occurrences in women globally [1–3]. According to a recent study by Joham et al., 72% of women with PCOS are infertile, which is nearly 15 times greater than women without PCOS [4]. According to reports, PCOS is characterised by hyperandrogenism, persistent anovulation, multiple cysts in ovaries, and disrupted physiological functions, such as acne, hirsutism, changed basal metabolic index, insulin resistance, sleep disturbances, anxiety, and depression [3,5]. The etiopathology of this complex condition is mainly understood. However, because of the unknown aetiology, the diagnostic criteria are still inadequate, which explains why many women with PCOS go undiagnosed and untreated. According to epidemiological data, 75% of people with PCOS go to their

doctors without being diagnosed [6,7]. As a result, a greater understanding of the pathophysiological mechanism could lead to a better diagnostic and therapeutic approach for PCOS management. In addition to endocrine disturbance, metabolic and associated illnesses, such as insulin resistance, obesity, type 2 diabetes, and cardiometabolic events, continue to play a role in PCOS aetiology [3,4,8]. Metabolic tissue, particularly adipose tissue, is an active endocrine organ that produces adiponectin and other proteins [9,10].

Adiponectin is an essential adipocytokine with insulin-sensitizing capabilities, as well as anti-inflammatory and anti-atherogenic effects [11,12]. It regulates energy, insulin, glucose, and lipids. However, metabolic problems have been linked to decreased secretion and, as a result, a drop in circulating levels [9,12]. Similarly, previous researchers has found an inverse relationship between circulating adiponectin and adipocyte mass and visceral adiposity, both of which are important factors in metabolic and related disorders [9,13,14], implying that an

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Studies on ground water quality in Narsinghgarh area of Madhya Pradesh, India

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ABSTRACT

In the present study, physicochemical analysis of ground water samples were carried out from 20 sampling stations of Narsinghgarh rural area. The analysis of different parameters viz., pH, conductivity, total alkalinity, total hardness, chloride, TDS were carried out as per standard methods given in APHA (1998). The objective of the present study was to calculate the water quality index (WQI) in order to assess the suitability of water for drinking purpose in the rural area of Narsinghgarh. The results showed that water quality at different stations come under 'good' to 'excellent' categories.

Keywords: WQI, Narsinghgarh area, ground water, water quality.

INTRODUCTION

Ground water is an invisible natural resource. It is present beneath our feet, in the dark pores and fissures of sands and rocks of the upper portion of the earth's crust. Due to its hidden dimension the general public is much less familiar with ground water than with the more visible components of the water cycle, such as rain and surface water [1].

Ground water is a source of drinking water and more than half of the world's population depends on ground water for its survival [2]. Also, it is the most important source of water supply for irrigation and industrial purpose but increasing population and its requirements have lead to the deterioration of surface and sub-surface water quality [3]. Hence, a continuous monitoring on ground water becomes mandatory to minimize its pollution and have control on the pollution causing agents [4].

The safe potable water is absolutely essential for healthy living. Ground water is most suitable for human consumption in both urban as well as rural areas. The importance of ground water for existence of human society cannot be overemphasized. There are several states in India where more than 90% populations are dependent on ground water for drinking and other purpose [5]. The present investigation was carried out in order to identify the quality of ground water in rural area by calculating water quality index for waters of Narsinghgarh area.

MATERIALS AND METHODS

Study area

The present study was conducted in rural area of Narsinghgarh area in Rajgarh district of Madhya Pradesh. The samples were collected from different locations and observations were made at 20 selected sampling stations. The villages selected for conducting present survey were Raghunathpura, Elahipura, Ramgarh, Ninor, Barkhedaveer, Shympura, Khari, Ganiari, Dharmakhari, Berasia, Ambedkar nagar, Gandhi gram, Devgarh, Bihar, Kotra, Chainpurkala, Gadhia, Karhia, Achalpura, Adalhera.



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Original Article

Assessment of the socioeconomic status of fishermen communities: a case study from a selected reach of River Narmada, India

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Abstract

Fishing is an important income source contributing to the economy of fishing communities living on the banks of River Narmada (India). The aim of this study was to collect information on economic and livelihood conditions of these fishermen communities to identify key issues that might be considered in sustaining their livelihood and ensure their participation in conservation of fish biodiversity. Data were collected using a questionnaire administrated to the fishermen families inhabiting at both banks of the selected reach of river in a single "snap-shot" survey. The study reveals that income pattern of fishermen is not enough for their annual expenditure which affects their lifestyle and forcing them to change their traditional source of income and dependency on other sources of income for their livelihood activities.

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Key words: India, Socioeconomic status, Fishermen communities, Livelihood conditions, River Narmada.

Introduction

River Narmada, the fifth largest river of the country, occupies a pre-eminent position among the west flowing rivers of India. Thousands of people inhabiting the basin land and many are dependent on the riverine fisheries known as fishermen community which occupied dominant position with 62.1%, while other communities occupied 29.9%, whereas non-respondents occupied only 8% [1]. The role of fishermen community in fish and fisheries is important for most of the developing and developed countries of the world for income and employment generation point of view. The role of fisheries in the economy of India is gaining a momentum as a result of introduction of advanced techniques to increase the yield per unit area of water and due to its role in earning foreign exchange. Nevertheless without proper infrastructural development, introduction of advanced techniques, proper and planned utilization of available local resources through involvement of local people in fisheries may not be completely fruitful [2].

Socioeconomic status refers to information on a variety of aspects of a community, such as demography, income, living cost, boat transport, fishing gear, marketing infrastructure etc. and provides information for understanding of social, cultural and economical conditions

of people, households and community [3]. During the present study, a survey on the socioeconomic status of fishermen community was carried out on a selected reach of River Narmada between Shahganj and Barandur (Bandua) village. The livelihoods the families inhabiting the villages of the zone are dependent on fish resources of the river. The survey of the area basically brings out the information on the salient demographic details of the fishing families, the income from fishing and other sources and pattern of fishing adopted in the area. Also, attention is given on aspects like role of women, status of fishing activities, gear used, attitude towards fish resource conservation, migration undertaken by fishermen etc. since research studies on this aspect are very scanty and fragmentary in India, present study is a step towards getting baseline information about socioeconomic status of fishermen communities inhabiting on the banks of River Narmada. The aim of the study was to collect information livelihood conditions of fishermen communities of a reach of River Narmada that will be useful to understand the status of the population and suggest action to improve their condition.

Materials and Method

Study Area

The study area of the research comprised the reach of River

Diversity of benthic macro-invertebrates in four tributaries of River Narmada in the central zone, India

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Manuscript details:	ABSTRACT
Received: 03.02.2016	The present study examines the distribution of benthic macro-invertebrate fauna in the four seasonal tributaries of River Narmada in the central zone to evaluate the benthic macro-invertebrates community assemblages in predicting the water quality status. During the present investigation, total 8 sampling stations (two sampling stations on each tributary) were identified and from these stations 30 taxa of benthic macro-invertebrates were recorded. Among the major taxonomic composition phylum arthropoda was found at dominant (63%) position, whereas values of Shannon-Wiener diversity index was found between 1.12 – 2.10 which indicates moderate pollution status at all stations. Values of Pielou evenness index (0.67-0.96) showed equability in the apportionment of individuals among the species at all stations while, range of Margalef diversity index varied from 0.94 to 3.58 indicates extremely low species richness and low abundance with physically disturbed areas in poor condition of colonization by aquatic organisms.
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Acknowledgement Authors would like to thanks Miss Anjali Chaurasiya, Mr. Vikram Singh and Mr. Bilal Nabi for their help and support during field visits. Sincere thanks to Mrs. Reetu Sharma who helped during identification of benthic macro-invertebrates.	Keywords- Benthic-macroinvertebrate, Tributary, Central Zone, River Narmada
Copyright: © 2016 Author(s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.	INTRODUCTION The benthic macro-invertebrates community of the lotic ecosystem, like other communities has a series of attributes that do not reside in its individual species components and have meaning only with reference to the community level of integration such as species diversity, growth in the form and structure, dominance, relative abundance and trophic structure. One of these attributes many of these or all, depending upon situation may be changed with the changing ecology of the water body concerned. Species are distributed individualistically according to their own genetic characteristics and population of most of the species tends to change gradually along the environmental gradients. Most species are not in obligatory associations with other species, which suggests that



Molluscan Diversity in River Sip- A Tributary of River Narmada in Central India

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ABSTRACT

The survey was conducted to assess the freshwater molluscan diversity of the river Sip. The Sip River is a tributary of River Narmada, and joins in the Narmada at right bank just upstream of the Indira Sagar reservoir. This riverine system is poorly studied till date and, mainly lack of information about the molluscan fauna in this particular water body. During present investigation, a total of 17 species of molluscs were recorded from Sip River. Among collected molluscs, 17 species were identified from nine families i.e. Viviparidae, Thiaridae, Pilidae, Lymnaeidae, Planorbidae, Amblemidae, Unionidae, Corbiculidae, Pisidiidae included in class Gastropoda and Bivalve. The molluscan community could be used as good bio-indicator for ecologically diverse freshwater habitat.

Key words: Sip River, Molluscs, Gastropoda, Bivalve, Bio-indicators.

INTRODUCTION

The freshwater Molluscs are one of the most diverse groups of benthic fauna, considered as second largest phylum next to Arthropoda. They constitute an important part of the ecosystem and found to be beneficial economically, medicinally and ecologically¹⁴. The Indian freshwater harbor a rich diversity of molluscs, representing 212 species belonging to 21 families, of these, 164 species were recorded from rivers and streams¹⁷. Molluscan are important component of aquatic ecosystem because they form the food for fishes and their productivity play an important role in food chain²⁰. Their

participation in aquatic ecosystem has made them significant partners in ecological communities. Many molluscan species are also good bioindicators for water quality or population on the basis of their tolerance power against extremes of physico-chemical component of water⁸. The presence of molluscan indicates the water is not acidic; hardly molluscs survive below a pH of 5¹. Several investigations were undertaken on major benthic animal groups of freshwater system. Notable contribution to our knowledge of molluscan fauna has been made by few authors.

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Groundwater Quality Assessment of Ghattia Block in Ujjain District of Madhya Pradesh, India

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ABSTRACT

Groundwater is one of the most useful water sources. Contamination of such water sources are a big problem creating health hazards. Present study was carried out to assess the quality of groundwater in Ghattia block of Ujjain district for its suitability for drinking purposes. Water quality parameters taken into consideration are pH, colour, turbidity, conductivity, total dissolved solids, chloride, fluoride, total alkalinity, total hardness, calcium hardness, magnesium hardness, nitrate, total coliform and fecal coliform. Many of the groundwater samples were found beyond the permissible limit of Indian as well as International standards. In a nutshell, groundwater of Ghattia block was found unsatisfactory for drinking purposes.

Keywords- Groundwater, Ghattia block, Water quality parameters

INTRODUCTION

People around the world have used groundwater as a source of drinking water, and even today more than half the world's population depends on groundwater for survival (UNESCO, 1992). The value of ground water lies not only in its wide spread occurrence and availability but also in its consistent good quality, which makes it an ideal supply of drinking water (UNESCO, 2000). Intensive use of natural resources and the large production of wastes in modern society often pose a threat to groundwater quality and have already resulted in many incidents of groundwater contaminations. Industrial waste, agricultural and domestic

wastes land use practices, geological formation which is subjected to reaction with percolating rainwater, reaches the aquifer system and contaminates the groundwater (Srivastava and Pandey, 2012). Consequently number of cases of waterborne diseases has been seen which the cause of health hazards is. Therefore, a continuous periodical monitoring of groundwater quality is necessary so that appropriate steps may be taken for groundwater resource management practices. Present study was carried out at Ghattia block of Ujjain district for assessment of groundwater quality which is mainly used for drinking and other domestic purposes.



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Histopathological effect of lead nitrate on the gills of freshwater fish, *Channa striatus*

Shivani Sharma, Sadhna Tamot and Vipin Vyas

Abstract

The present study was carried out to investigate the effect of lead nitrate on the gills of fresh water fish, *Channa striatus*. Fish were exposed to sub-lethal concentration of lead nitrate (28 mg/l) over a period of 30, 60 and 90 days. The lesions observed in the gills included severe loosening of cartilaginous core, deformed gill lamellae and ruptured gill epithelium. Simultaneously, cartilaginous core showed damage and distortion whereas the distal portion of gill lamellae showed broadening which resulted in maximum histopathological changes. Swollen gill lamellae, shortening of tips, necrosis in gill lamellae and damaged gill lamellae were also observed. The results of the present study clearly indicate that chronic exposure to lead nitrate caused adverse effects on the gills of *C. striatus*.

Keywords: Lead nitrate, *Channa striatus*, Histopathology, Gills

1. Introduction

Aquatic environment is mainly polluted due to the pollutants discharged from the industries and due to the growth of human population. Even at sublethal concentrations, the pollutants change the chemical composition thereby affecting natural aquatic ecosystem which are manifested as changes in biochemical processes in aquatic organisms. Environmental pollutants such as metals create severe risks to many aquatic organisms thereby affecting genetic, physiological, biochemical and behavioural parameters^[1]. Nowadays, heavy metal pollution has become a major global issue, which causes detrimental effects to aquatic life as well as human health and it has received a substantial attention of the scientists all over the world.

Among the heavy metals, lead is a major aquatic pollutant in many parts of the world. The natural waters are persistently being polluted by lead due to increased anthropogenic activities and industrial utilization^[2]. Lead is a ubiquitous metal in the environment and is toxic to aquatic organisms. Major sources of this toxicant include mining, smelting, coal burning, cement manufacturing, storage batteries, paints and use in gasoline^[3]. In the midst of aquatic habitants, fish are most sensitive that can be used to monitor the health of aquatic ecosystems having tendency to accumulate variety of xenobiotics through different mechanisms. Therefore, the present study was carried with the aim to investigate the histopathological alterations in the gills of *Channa striatus*.

2. Materials and Methods

Live *Channa striatus* (length 20-25 cm and weight 50-60 gm) were collected for experimental study from different fish markets of Bhopal, Madhya Pradesh. They were acclimatized in the laboratory conditions for a period of 15 days prior to the start of experiment. Fishes were divided in two groups having 10 fish in each aquarium. The first group was kept as control and was maintained in normal water without any treatment while the second group was exposed to 28 mg/l of lead nitrate. Exposure concentration was decided on the basis of 96 hrs LC₅₀ value of lead nitrate which was observed to be 284.32 mg/l. Water of each aquarium was changed on every alternate day to maintain the desired concentration of lead nitrate throughout the experiment duration of 90 days.

At the end of experimental period, gills of the controlled and treated fishes were removed aseptically and preserved in aqueous Bouin's fixative for 48 to 72 hours. Preserved tissues were washed under tap water, dehydrated in graded series of ethanol and embedded in paraffin blocks. They were cut at 5-6 µm thickness by using rotatory microtome and stained routinely with haematoxylin and eosin (H & E) for histopathological examination.

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Research Article**ASSESSMENT OF SOME ECOLOGICAL PARAMETERS FOR GADARIA STREAM- A TRIBUTARY OF RIVER NARMADA IN THE CENTRAL ZONE, INDIA**

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ABSTRACT

Ecology is lifeline of any stream or river ecosystem and it cannot be ignored. Life is dependent on ecological factors as abiotic and biotic component. So study on ecological parameters is very much important nowadays because tremendous pressure has been created on ecosystem through human interventions. Present study is an example of ecological investigation of Gadaria stream which is a tributary of River Narmada in the central zone. Here physical habitat assessment, status of riparian buffer zone, visual observation of substrate characterization, physico-chemical analysis and diversity of macrozoobenthos has been chosen as ecological parameters. After investigation of these ecological parameters results suggested that human interference is playing a key role in degradation of ecosystem and it needs proper attention for conservation and management of the stream.

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INTRODUCTION

Streams and rivers play vital role in biogeochemical cycle so that they are an integral part of biosphere. They provide habitat, food and shelter for variety of organisms and plants. Humans are also dependant for various activities on them as streams and rivers are the main sources of water for domestic uses, agriculture, industries, transport, power production, recreation etc. These human interventions may induce changes in sensitive stream ecosystems and ecological conditions of many streams and rivers in developing countries are deteriorating as a result of human population explosions, change in land use, intensified agricultural practices and increased industrialization are affecting natural conditions of streams [1]. Therefore, ecological parameters of any stream or river should be studied and is necessary for future to evaluate ecological conditions. At present, assessment of ecological parameters to evaluate ecological condition of Gadaria stream is designed and this study is a small step towards the assessment of ecological status of Gadaria stream which is a tributary of River Narmada in the central zone.

MATERIALS AND METHOD**Study Area**

Gadaria is a seasonal tributary (stream) of River Narmada which originates from the Vindhyan hilly ranges in the central zone. Basin of this stream falls in Sehore and Raisen districts of Madhya Pradesh (Figure- 1).

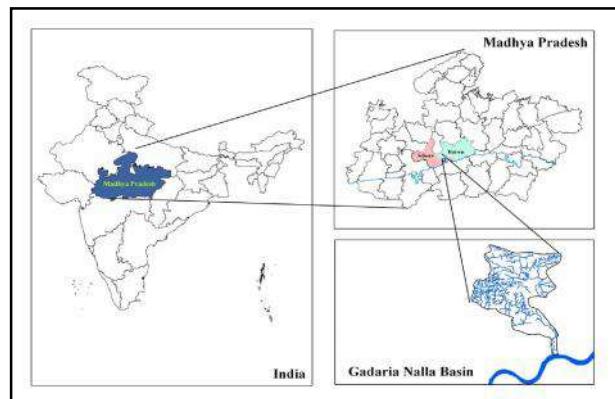


Figure 1 Location map of the study area

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Diversity of Macrozoobenthos in Dudhi River- A Tributary of River Narmada in the Central Zone, India

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ABSTRACT

Around the world, freshwater habitats are being subjected to increased levels of human disturbance results strong indications that inland water ecosystems are suffering the greatest negative impact from human activities at present. Importance of biomonitoring and identifying areas of riverine biodiversity for long term conservation of the freshwater habitats aims at characterising and monitoring the conditions of the aquatic resources. Present study was focused on the diversity of macrozoobenthos which are known as ecological indicator. In the present investigation 26 taxa of macrozoobenthos were recorded from eight sampling stations chosen on Dudhi River which is a tributary of River Narmada in the central zone. On major sharing of taxonomic composition arthropods was found dominant (77%) than mollusca (23%), while in the composition of functional feeding group predators was found dominant than others and range of Shannon diversity index was found between 1.53 to 2.28 indicates alteration in habitat structure.

Key words: Dudhi River, Macrozoobenthos, River Narmada, Tributary

INTRODUCTION

Macrozoobenthos, an important component of aquatic ecosystems breakdown organic matter and cycle the nutrients and, in turn become food for fishes^{1,2}. They are used for biological monitoring of aquatic ecosystems worldwide because they are found in different types of habitats having limited mobility, relatively very easy to collect using different types of sampler as well as with established sampling techniques and there is a diversity pattern of macrozoobenthic fauna ensures a wide range

of sensitivities to change in both water quality and habitats^[3, 4]. Survival, distribution and abundance of macrozoobenthos depends on the characteristics of their environment such as organic matter content, soil texture, sediment particles, substratum and depth^{5,6}. Dudhi River is a tributary of River Narmada in the central zone and a rapid survey of the river was done. In present study diversity of macrozoobenthos was assessed which provides baseline and first hand information about Dudhi River.

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Comparative length-weight relationship, condition and form factor of Indian major carp, *Cirrhinus mrigala* (Hamilton 1822) in the Ganges basin, India**A. K. Dwivedi¹, U. K. Sarkar², J. I. Mir³, P. Tamot⁴ and V. Vyas⁵**¹Regional Centre, ICAR-Central Inland Fisheries Research Institute, Allahabad, Uttar Pradesh, India²ICAR-Central Inland Fisheries Research Institute, Barrackpore, West Bengal, India³ICAR-Directorate of Coldwater Fisheries Research, Bhimtal, Uttarakhand, India⁴Department of Zoology, Government Motilal Vigyan Mahavidyalaya (MVM), Bhopal, Madhya Pradesh, India⁵Department of Limnology, Barkatullah University, Bhopal, Madhya Pradesh, India

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Abstract

Indian major carp, *Cirrhinus mrigala* commonly known as Mrigala/Nain, is a commercially important species, originally inhabitant of the Ganga river system. In the present study, a total of 250 samples of *C. mrigala* were collected from six rivers of the Ganges basin to observe intra-basin variation in length-weight relationships, condition factor and form factor. In all the studied rivers, homogeneity in length-weight relationship of male, female and pooled populations with high coefficient of determination ($r^2=0.97-0.99$) and positive allometric growth ($b>3$) except in female of river Betwa where isometric growth ($b=3$) was noticed. Fulton's condition factor (K) ranged from 1.20-1.51 in male, 1.14-1.40 in female and 1.17-1.45 in pooled populations. K of River Gomti showed significant differences ($p<0.05$) with other rivers and river Ken and Betwa showed significant differences with river Ghaghra in male populations while river Ganga and Sharda showed significant differences with river Ghaghra in female and pooled populations. The relative condition factor (K_n) ranged from 0.99-1.79 in male, 0.94-1.23 in female and 1.09-1.23 in pooled populations. K_n of the Ken and Betwa rivers showed significant differences ($p<0.05$) with other rivers and river Ken showed significant differences with river Ghaghra in male and female populations respectively. Form factor ($a_{3.0}$) in male populations ranged from 0.004786-0.005404, in female populations it ranged from 0.004786-0.008669 while in pooled populations it ranged from 0.004775-0.005296. These attributes have been found very useful to evaluate the wellbeing of this species among different populations of *C. mrigala* across the Ganga basin which was lacking in the recent past.

Keywords: *Cirrhinus mrigala*, length-weight relationship, condition factor, form factor, Ganges basin, India**Introduction**

The study on relationship between length and weight of fishes is of practical index appropriate for understanding their survival, growth, maturity, reproduction and general wellbeing (Le Cren 1951). The Fulton's condition factor (K) and relative condition factor (K_n) are the important features which specify the suitability of a specific water body for growth of fish (Le Cren 1951). Form factor is used for the evaluation of the significant changes in the body shapes of fish from different populations (Froese 2006). The various reports are available on the comparisons among populations of the same species from different habitats based on relationship between weight and length (Haniffa *et al.* 2006, Sarkar *et al.* 2009). But no information is available on comparison of length weight relationship among the populations

of this important Indian major carp, *C. mrigala* in the past.

C. mrigala commonly known as Mrigala/Nain (family: Cyprinidae) is a warm water teleost inhabitant to the Indus and Ganges river systems. The natural distribution of *C. mrigala* is in the freshwaters of northern India, Bangladesh, Burma, Nepal and Pakistan. The species has also been transplanted successfully from the natural range within India and to parts of Asia as well as Europe (Chondar 1999, Froese & Pauly 2006, Dwivedi *et al.* 2016). It is commercially exploited from the Ganga river system in 20th century (Mayank & Dwivedi 2015, Dwivedi & Mayank 2017). Now a days, the species is of commercial significance due to its aquaculture potential and high consumer preference. This fish is widely cultivated with other Indian major carps as an

Study on the groundwater quality of Badnagar block in Ujjain district of Madhya Pradesh, India

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Abstract:

Groundwater quality of Badnagar block was assessed for its suitability for drinking purposes. Various water quality parameters viz., pH, colour, turbidity, conductivity, total dissolved solids, chloride, fluoride, total alkalinity, total hardness, calcium hardness, magnesium hardness, nitrate, total coliform and fecal coliform were measured. Majority of the samples do not comply with Indian as well as WHO standards for most of the water quality parameters measured. Overall water quality was found unsatisfactory for drinking purposes.

Keywords- Groundwater, Badnagar block, Water quality parameters.

Introduction:

Water is the most important in the shaping the land and regulating the climate. It is one of the most important compounds that profoundly influence life (Gorde and Jadhav, 2013). Groundwater is used for domestic and industrial water supply and also for irrigation purposes in all over the world. In the last few decades, there has been a tremendous increase in the demand for fresh water due to rapid growth of population and the accelerated pace of industrialization. According to WHO organisation, about 80% of all the diseases in human beings are caused by water (Kavitha and Elangovan, 2010). Consequently number of cases of water borne diseases has been seen which a cause of health hazards. In India, approximately 62 million people including 6 million children suffer from fluorosis because of consumption of water with high fluoride concentrations. Once the groundwater is contaminated, its quality cannot be restored back easily and devise ways and means to protect it. Considering the above aspects an attempt has been made under the present study to assess the various physical and chemical properties of ground water of Badnagar block of Ujjain district of Madhya Pradesh, which is mainly used for drinking and other domestic purposes.

Materials and Method:

Study Area:

Badnagar is a tehsil, a city and a municipality in Ujjain district in the state of Madhya Pradesh. It is situated on the bank of River Chamla at an elevation of 497 m. Badnagar tehsil headquarters is Badnagar town. It belongs to Ujjain division. It is located 45 km towards west from district headquarters Ujjain, 244 km from state capital Bhopal towards east and 72 km from Indore. Tehsil is bounded by Badnawar tehsil towards west, Depalpur tehsil towards south, Khachrod tehsil towards north, Ujjain tehsil towards east. Indore city, Ujjain city, Ratlam city and Dhar city are the nearby cities to Badnagar. This block consists of 196 villages and 108 panchayats. Badnagar is in the border of the Ujjain district and Dhar district. Dhar district Badnawat is west towards this place. Base map of Badnagar block is shown in Figure- 1.

Sampling Stations:

During the present study, 10 sampling stations were chosen in Badnagar block (Figure- 2).

Details of all stations with their geographical coordinate are given in Table- 1.

Table- 1: Details of sampling stations located in Badnagar block:

S. No.	Station Code	Village	Location	Latitude	Longitude	Altitude
1	B- 1	Kuldada	Kamal Gujarati ke Ghar ke pass	23°9'56.7"N	75°35'30.0"E	447
2	B- 2	Dangwara	Ashram Mandir ke pass road	23°5'36.0"N	75°31'53.0"E	438
3	B- 3	Narsinga	Middle School, Road Side	23°2'40.9"N	75°31'43.6"E	448
4	B- 4	Daulatpur	Old Primary School, Aaganwadi	23°3'24.6"N	75°27'38.5"E	440
5	B- 5	Dotarari	Middle School	23°0'29.2"N	75°30'1.1"E	441



Note

Effect of lead nitrate on the ovaries of the striped snakehead *Channa striatus* (Bloch, 1793)

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ABSTRACT

The effect of sublethal concentrations of lead nitrate (0, 8, 18 and 28 mg l⁻¹) on the ovaries of the freshwater murrel *Channa striatus* (Bloch, 1793) (average length : 20-25 cm; average weight : 50-60 g), randomly distributed (ten fishes per group) into four groups (control, Exp-1, Exp-2 and Exp-3, respectively), were studied in triplicate. Each group of fishes were exposed to lead nitrate for 90 days with the aim to assess the histoarchitectural alterations in the ovaries, at different time intervals. Loosening of connective tissue, deshaped primary oocytes, damaged epithelial layer of oocytes, decreased number of yolk granules in secondary oocytes, upliftment of epithelial layer of secondary oocytes, comparatively decreased number of primary oocytes, necrosis, damaged and irregular shaped oocytes and inflammation were common features in all the three experimental groups exposed to sublethal concentrations of lead nitrate. Severity of the above features increased with increased lead nitrate concentration and duration of exposure.

Keywords: *Channa striatus*, Histoarchitecture, Lead nitrate, Murrel, Ovaries

Heavy metal contamination is an ongoing problem leading to damage of aquatic life, especially fishes and therefore, it has become a major researchable environmental issue of concern (Gill *et al.*, 1990; Hunaiti and Soud, 2000). There are number of routes by which heavy metals enter aquatic habitat causing cytotoxic, mutagenic and carcinogenic effects in aquatic organisms (More *et al.*, 2003; Thirumavalan, 2014). Lead is abundantly found in the earth's crust and has widespread industrial applications (Palaniappan *et al.*, 2008). Once introduced into the aquatic ecosystem lead causes severe intimidation to aquatic life and it is notorious to cause severe histological and metabolic alterations in fishes. Histopathological and histoarchitectural changes are being widely used as reliable indicators to study the health of fishes exposed to contaminants (Wester and Canton, 1991; Hinton *et al.*, 1992; Schwaiger *et al.*, 1997; Thophon *et al.*, 2003; Dar and Jha, 2013). Histoarchitectural changes emerge as a medium-term response to sub-lethal stressors and histology also provides a quick technique to identify effects of pollutants in various tissues of organisms (Johnson *et al.*, 1973; Dar *et al.*, 2014). Therefore, the present study was designed with the aim to investigate histoarchitectural changes induced by chronic exposure to lead nitrate in the ovary of the freshwater murrel *Channa striatus* (Bloch, 1793).

Live specimens of *C. striatus* (length 20-25 cm and weight 50-60 g) were collected from different fish markets in Bhopal, Madhya Pradesh and acclimated to laboratory conditions for a period of 15 days prior to the experiment. Fishes were divided into four groups of 10 fishes each (Control, Exp-1, Exp-2 and Exp-3) and were exposed to sublethal concentrations (0, 8, 18 and 28 mg l⁻¹ respectively) of lead nitrate (Ranbaxy India Ltd.), in triplicate for a total period of 90 days. Exposure concentration was decided on the basis of 96 h LC₅₀ value of lead nitrate. The median lethal concentration (LC₅₀) values at 95% confidence limits for different exposure period were calculated using the software "Trimmed Spearman Karber method", version-1.5 (Hamilton *et al.*, 1977). The LC₅₀ value was observed to be 284.3 mg l⁻¹. To maintain desired lead nitrate concentration throughout the experimental duration of 90 days, water in each aquarium tank was changed on every alternate day. At regular intervals of 30 days (at the end of 30th, 60th and 90th days of experimentation), three fishes from each group were sampled and the ovaries were dissected out and fixed in aqueous Bouin's fixative for 48 to 72 h (Luna, 1992). After fixation, the tissues were processed (Luna, 1992), embedded in paraffin wax and 5-6 µm thick sections were cut with the help of rotatory microtome and

Toxic Effect of Lead Nitrate on Lipid Peroxidation and Protein Carbonyl Content in the Muscle of Freshwater Fish *Channa striatus* (Bloch, 1793)

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ABSTRACT

Lead nitrate is one of the most common heavy metal that effect adversely on fresh water fishes. In the present study an attempt has been made to find out the mechanism of adverse effects of lead nitrate in fresh water fish, *Channa striatus* after exposure to various concentrations of lead nitrate. We measured changes in lipid peroxidation and protein carbonyl content in the muscle of *C. striatus* as a marker of oxidative stress after exposure to different concentrations (8, 18 and 28 mg/l) of lead nitrate for a period of 30, 60 and 90 days. Our observations showed a significant increase ($P<0.05$) in lipid peroxidation and protein carbonyl content with increase in concentration of lead nitrate at various time intervals in the muscle of fish. Results of the present study revealed an increase in oxidative stress in the muscle of *C. striatus* with increased concentration of lead nitrate and duration of exposure.

Key words: Lead nitrate, Muscle, *C. striatus*, Lipid peroxidation, Protein carbonyl content.

INTRODUCTION

Contaminants emerge as a major researchable issue that can cause severe effects in the environment¹. Heavy metal contaminants pose a serious environmental threat because of their persistence and toxicity in aquatic ecosystems². Heavy metals like copper, lead, cadmium, mercury etc. are reported to be present in aquatic ecosystem and create a number of health hazards in aquatic organisms resulting in great loss to fish production³. In aquatic environment, many xenobiotics cause

oxidative stress in organisms which leads to the production of reactive oxygen species and change in the antioxidant defense system⁴ thereby causing damage in the membrane of lipids and proteins. Several studies showed higher level of lipid peroxidation in aquatic organisms exposed to high concentrations of pollutants⁵.

The primary causative agent identified in the pathogenesis of lead poisoning is lead induced oxidative stress.

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Physical Habitat Assessment of the Ganjal and Morand River Using GIS Techniques

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Abstract Physical habitat is the living space of in-stream biota which is an important factor that can affect both the quality and quantity of available habitat and the structure and composition of resident biological communities. It is a spatially and temporally dynamic entity determined by the interaction of the structural features of the channel and hydrological regime. Ganjal River is a left bank tributary of River Narmada and Morand river is the major tributary of it. At these rivers Physical Habitat Assessment was carried out using USEPA Rapid Bioassessment Protocols to know habitat suitability conditions in rivers for aquatic life thrive in. In the study habitat assessment parameters were scored according to the existing conditions for each section of the rivers and were categorised under four conditions i.e. optimal, suboptimal, marginal and poor. On the basis of result obtained from the study Habitat Suitability Map (HSM) was generated using GIS as an interface and it suggests that the habitat quality of both rivers is suitable for aquatic life.

Keywords Physical habitat assessment (PHA) · Ganjal river · Morand river · Rapid bioassessment protocol · Habitat suitability map (HSM) · GIS

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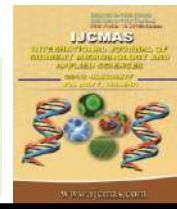
Introduction

Physical habitat is an important factor which affects the quality and quantity of available habitat structure and composition of resident biological communities. This can be considered as unique characteristics of substrate, depth and velocity within a stream for evaluating river health, since it provides the natural link between the physical environment and its inhabitants (Maddock 1999). Habitat assessment is evaluation of the structure of the surrounding physical habitat that influences the quality of the water resource and the condition of the resident aquatic community. Through this approach, key features can be rated or scored to provide a useful assessment of habitat quality of any aquatic resource. In the present study, habitat assessment parameters were scored according to the available habitat conditions and Physical Habitat Assessment (PSA) of Ganjal and Morand River was done using USEPA Rapid Bioassessment Protocols (Barbour et al. 1999).

Materials and Method

Study Area

Ganjal is a rain fed river and one of the important tributary of River Narmada in the central zone. It originates from Satpura hilly ranges near Borpani village at 77° 34'E longitude and 22° 00'N latitude from Betul district of Madhya Pradesh. This river flows in the north westerly direction to join the Narmada and meets near Gondagaon village at 77° 12'E longitude and 22° 33'N latitude in Hoshangabad district of Madhya Pradesh from left bank (Fig. 1). Morand River is the major tributary of Ganjal River which originates from Satpura hilly ranges near Chicholi village of



Original Research Article

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Ecological and Ethnomedicinal Values of Sacred Plants in Some Major Temples of Bhopal, India

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A B S T R A C T

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The present research paper describes the sacred plants found in the vicinity of five major temples of Bhopal, India. In addition, the ethnomedicinal and ecological values of these plants were also reported. The information was obtained from priests and knowledgeable local people about the sacred value of plants associated with religious rituals. A total of 13 sacred plants species belonging to 10 families were identified during the survey. The study concludes that propagation of sacred plants contributes to the conservation of floral diversity. Thus, religious activities associated with sacred plants boosts up the protection and maintenance of the biodiversity.

Introduction

Plants are nature's major processors of solar energy which is essential for our existence. The ancient beliefs showed that there is significant relationship between human beings and plants. Plants have been traditionally considered sacred due to its close association with a deity. For example Bel tree (*Aegle marmelos* L.) is associated with Lord Shiva.

Sacred plants are considered to be incarnations or symbols of God or deities and therefore their worship became more common. They

play a very important role in the myths and customs of India. Without the use of sacred plants and their products, the religious and cultural rituals are not completed (Pandey and Pandey, 2016).

The trend of sacred plant worshipping was also present during the Vedic period (Bhatla *et al.*, 1984).

Furthermore, all people celebrate religious festivals with a scientific background and use one or several plant parts in their ceremonies (Bajpai *et al.*, 2016). The various parts of

Comparative pattern of reproductive potential of Indian major carp, *Cirrhinus mrigala* (Cypriniformes: Cyprinidae) in the Ganges basin, India

Arvind Kumar Dwivedi · Uttam Kumar Sarkar · Javaid Iqbal Mir · Praveen Tamot · Vipin Vyas

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Abstract A total of 250 samples of *C. mrigala* were collected to evaluate and compare gonadosomatic index, size at first maturity and fecundity from six rivers of the Ganges basin. Minimum GSI was recorded for river Ken in male and female both while maximum GSI was recorded in river Ganga and river Sharda in male and female respectively. The length at first maturity (L_{50}) in male ranged from 46.0 cm in river Sharda to 52.0 cm in river Ganga and Ghaghra. In female, L_{50} was lowest in river Gomti and highest in river Ken and Ghaghra. Lowest absolute fecundity was recorded from river Ken and highest for river Ganga. No significant differences were noticed ($p>0.05$) in absolute and relative fecundity between the rivers. Linear relationship and positive correlation ($r^2=0.97-0.99$) was noticed between absolute

fecundity and total length (TL), total weight (TW) and ovary weight (OW) in all the populations. This study will provide new baseline information for fisheries biologists about the current stock structure of this fish across the river Ganga basin.

Keywords *Cirrhinus mrigala*, gonadosomatic index, fecundity, wild populations, Ganga basin, India.

Introduction

Biological parameters have been widely used by ichthyologists to examine the population structure of a species (Ihsen et al., 1981). Reproductive parameters have been used to describe the dynamics of a fish stock and provide the basis for stock differentiation. The gonadosomatic index (GSI) is useful in determining the stages of gonadal maturation and period of greatest reproductive intensity (Hojo et al., 2004). Knowledge of the fish length at first sexual maturity is indispensable in order to estimate size of the spawning stock (Neja, 1992). Size at maturation is tightly linked to lifetime fecundity of individuals (Stearns, 1992). Fecundity is effective in evaluating the commercial potentialities of its stock, variations in fish population, life history, fish culture for appropriate planning of the hatching and nursery operations and management of the fishery (Marimuthu et al., 2009). The amount and size of the brood stock to be maintained for achieving a certain target of fish seed production related to life processes such as age and growth also depends on the fecundity of the species in

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The Ganges basin fish *Cirrhinus mrigala* (Cypriniformes: Cyprinidae): detection of wild populations stock structure with landmark morphometry

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Abstract: *Cirrhinus mrigala* (Hamilton, 1822) is an Indian major carp originally inhabitant of the Ganga river system in Northern India. No information is available on morphometric variation in natural populations of *C. mrigala* from Ganga river basin. Therefore, to promote management optimization, this study was undertaken to evaluate the population structure on landmark-based morphometric variations of this commercially important species in Ganges. A total of 381 fish samples of *C. mrigala* were collected from 10 locations of 10 rivers belonging to Ganges basin. A 12-landmark truss network system was used to generate 66 morphometric variables were transformed (standard length was excluded from the final analysis retaining 65 variables). Transformed measurements were employed to univariate analysis of variance, principal component analysis (PCA) and discriminant function analysis (DFA). Univariate analysis of variance showed significant differences in all the 65 transformed morphometric characters studied. Eight principal components were extracted from 65 significant characters accounting for 94.1 % of the variation. Forward stepwise discriminant function analysis of the 65 significant variables produced eight discriminating variables. DFA extracted eight discriminating functions contributed overall to the variance. The first discriminant function (DF) accounted for 37.9 % while second DF accounted for 23.5% of the among-group variability. In DFA, 45.7 % original while 39.1 % of cross-validated grouped cases were correctly classified in the overall assignment of individuals, indicating low distinction among the stocks of all the species i.e. low isolation of the stocks for the morphometric measurements. Common ancestry in the prehistoric period and migration of individuals between the rivers could be the possible reason for the observed low level of morphometric differentiation among wild mrigal populations. In future, the application of molecular genetic markers along with morphometric studies would be an effective method to examine the genetic component of phenotypic relatedness between geographic regions and to facilitate the development of management recommendations.

Key words: Mrigal carp; stock; Ganga river; morphology; discriminant function analysis.

Dwivedi, A. K., Sarkar, U. K., Mir, J. I., Tomat, P., & Vyas, V. (2019). The Ganges basin fish *Cirrhinus mrigala* (Cypriniformes: Cyprinidae): detection of wild populations stock structure with landmark morphometry. *Revista de Biología Tropical*, 67(3), 541-553.

Over the past few years, science of taxonomy has been suffering from dwindling number of experts (Rodman & Cody, 2003). Moreover,

the pace of traditional taxonomy is also very slow. However, in the recent past, the pace of data gathering and analysis in taxonomy has



Research Article

Status of Riparian Zone of River Narmada in the Central Zone using QBR index

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Abstract Riparian zone is a transit zone between Aquatic and terrestrial ecosystem. It is an integral part which plays an important role in the present study. Riparian zone assessment was carried out in the reach of river Narmada from Umardha to Joga village to assess its condition. The status of riparian zone assessment was carried out in the central zone of River Narmada and this reach of river is located from Umardha village (Junction of Dudhi with Narmada) to Joga village (Backwater of Indra sagar reservoir). The riparian zone of any river is an integral part from the ecological point of view and keeping this in mind survey of riparian zone for this reach was done. During the survey of riparian zone QBR index was used to assess its condition. According to the values which was given in QBR index for each parameter of sampling station it was observed that riparian zone of the above said river stretch is in very poor condition with extreme or moderate degradation. Very few locations were found under fair or good condition with minimum or least degradation. Human activities such as construction, sand mining, soil mining, and conversion of forest land for agriculture (deforestation) are noticed under the stretch of river which are being damaged the riparian area. Sand mining the major activity in this area was observed on the largest scale. Livelihood dependence is more responsible for vanishing riparian zone condition on the river banks which are posing adverse impact on the riverine ecosystem.

Keywords Central zone; QBR index; Riparian zone; River Narmada

1. Introduction

Riparian zone provides ecosystem services for riverene ecosystem; also plays an important role for balancing abiotic and biotic components. It provides shelter and food for fauna living nearby the river and helps in water filtration and aquifer recharge. Riparian zone helps in maintaining water quality, control sediment erosion, flooding & temperature control, decreasing hydrological risk and construct stable river banks (Fu et al., 2017).

Assessment of riparian zone using protocols and indices are in globally practice. During the present study, QBR index was chosen among them. The QBR index ("qualitat del bosc de ribera" or riparian forest quality) is an easy-to-use field method for assessing the habitat quality of riparian forests. This was designed and developed for use in Mediterranean streams in Spain (Díaz-Pascacio et al., 2018).

Analyzing the Water Quality of River Sip: A Tributary of River Narmada

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ABSTRACT River Narmada, the fifth longest river of the Indian subcontinent, flows through the Vindhya and Satpura ranges. It has 41 principal tributaries and river Sip is the left bank tributary of the river Narmada. During the present study, the ecological health of the river Sip was assessed using benthic macroinvertebrates community. Benthic macroinvertebrates act as a biological indicator in the evaluation of ecological functioning of the riverine system. In the present study, various biological indices such as biological monitoring working party (BMWP), average score per taxa (ASPT), and family biotic index (FBI) were used for biomonitoring purposes. The results of biological indices show that the river Sip falls under the moderate category of pollution as per ASPT and BMWP indices, while it falls under fair category as per FBI index. The polluted condition of the river is due to the various anthropogenic activities including land use changes. The findings of the present study suggest that proper policies and management of river should be taken up by the local government which will be helpful in sustain the livelihood of the local communities.

KEY WORDS Biological indices, Livelihood, Macroinvertebrates, Narmada River, Sip River

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INTRODUCTION

In nature, the healthy ecosystem encompasses factors of well-being, prosperity, and vitality. An environment is healthy when it works in such a way that all of its goods and services required by human beings and other animals are sustained (Karr, 1999). A river is healthy when all of its components such as physical, chemical, and biological are working properly. In biological community, benthic macroinvertebrates play an important role in context of riverine ecosystem. Their presence and functioning in the system dynamics are vital as they provide essential ecosystem services by accelerating detritus decomposition. They supply food for both aquatic and terrestrial vertebrate consumers (e.g., fish, turtle, and birds). They are ideal for use in bioassessment due to their ubiquity in aquatic systems. Aquatic macroinvertebrates are used as biological indicator of ecosystem health which helps in nutrient recycling, completion of food chain, and energy flow (Hilsenhoff, 1998). They are used as biological indicator because they show the effect of short- and long-term pollution conditions, affect the physical, chemical, and biological events, and indicate

cumulative impacts of pollution, less pollution tolerant, and easy to sample (Ojija *et al.*, 2017). In Central India, river Narmada is the lifeline for the people associated with the river and its water is used as drinking, agriculture, industry, bathing, and washing purposes. Benthic composition of Narmada basin has been studied by several researchers (Varshney *et al.*, 1981; Govindan *et al.*, 1983; Vyas *et al.*, 2012; Kumar and Vyas, 2012; Vyas and Bhawsar, 2013; Shukla *et al.*, 2016; Khichi, 2019), however, there is little work on the tributaries of river Narmada such as Sip (Sharma *et al.*, 2013; Bhawsar *et al.*, 2015; Gowalkar *et al.*, 2016; Raina *et al.*, 2016). Hence, to assess the impact of pollution and its effects on the ecological health of river Sip, this research work has been conducted and riverine health is evaluated using the indices based on macroinvertebrate community.

MATERIALS AND METHODS

Study Area

The present study was conducted on Sip River, a tributary of river Narmada which originates from hilly ranges of

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Ecological Status of Riparian Zone of Sip River: A Tributary of River Narmada in Central Region

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Abstract

Riparian zone is an interface between the terrestrial and aquatic ecosystem which provides a variety of resources to the organisms. The present study was carried out on Sip River which is a tributary of River Narmada. During the study, QBR (*Qualitat del Bosc de Ribera*) index was used for the assessment of quality of riparian forest. It was observed that out of seven sampling stations, two stations were found in bad quality and extreme degradation on riparian habitat, three stations were found in Fair quality and strongly altered riparian habitat where as two Stations were found in Good quality and some disturbances were observed in these areas. The current status of riparian zone was due to human activities like construction, sand mining, soil mining, deforestation and expansion of crop land for agricultural activities. Livelihood dependence is the major cause of present condition of riparian zone.

Riparian areas are generally long strips of vegetation adjacent to the water bodies such as streams, rivers, lakes, reservoirs and other inland aquatic systems. It occupies one of the most dynamic areas of the landscapes and plays an important role for balancing abiotic and biotic components. Riparian vegetation can help in reducing contaminants inputs by filtering runoff, promoting denitrification and uptake of nutrients by vegetation. It also provides food and shelter for the fauna living nearby the river and helps in aquifer recharge.

Riparian areas are globally assessed by using different protocols and indices. In the present study, QBR index was chosen among them. The QBR index (“*qualitat del bosc de ribera*” or riparian forest quality) is an easy-to-use field method for assessing the habitat quality of riparian forests. This was designed and developed for use in Mediterranean streams in Spain⁶. It is a score based index divided into four main aspects of the riparian zone which are total riparian cover, cover structure, cover quality and channel alteration. It is used to contrast sites, to compare sites, to ideal conditions and to assess the success of

Ecological Health Assessment of River Sip, a Tributary of Central Indian River Narmada by Using Habitat Assessment

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Abstract

Habitat study is one of the most important tool for assessment of fish survival as it defines their health and abundance. The objective of this study is to assess the impairment of river ecosystem by the anthropogenic activities. For evaluating the aquatic health, physical habitat condition was taken as a tool. Sip River is a Tributary of River Narmada which is a Central Indian River, joining Narmada at right bank just upstream of Indira Sagar Reservoir. Seven sites were selected from the sip river. In the present study, the physical habitat condition was assessed by using Rapid Bioassessment Protocol (RBP's) in terms of visual assessment. It is found in the study that the two sites are Optimal, two sites are suboptimal and three sites are Marginal. The change in land use pattern and increasing developmental activities near the banks is affecting the habitat of the organisms residing in the aquatic ecosystem.

Water is the primary need of all living organisms. It provides the habitat for the aquatic communities. The habitat includes the biological, chemical and physical properties of an ecosystem which directly and indirectly affects the existence of the resident species. The habitat assessment includes complex and dynamic properties of the physical structure of the aquatic ecosystem. The physical habitat is majorly affects the instream organisms of the aquatic ecosystem.

The Rapid Bioassessment Protocols (RBP)³ has been used as a tool to assess the integral health of the aquatic ecosystem⁹. The

study of physical habitat is one of the important factor in the bioassessment protocol. Physical habitat is a potential technique to evaluate the perturbation in the aquatic ecosystem. For the study of physical habitat, a visual-based habitat assessment approach has been used to measure the degree of disturbance in the stream and river³. This approach is minutely observes the condition of the site by taking into consideration several attributes. The assessment scoring includes the observation of channel morphology, riparian cover, substrate structure, bank stability etc.

In the present study river sip, a

Studies on Ichthyofaunal diversity from River Sip, a Tributary of River Narmada

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ABSTRACT In the Central Indian highlands of India, Narmada River flows across the Vindhya and Satpura ranges in the states of Madhya Pradesh, Maharashtra, and Gujarat. It has 41 principal tributaries and river Sip is situated in the Vindhya ranges where it meets with river Narmada. Local fish assemblage, diversity and species difference among the sampling sites selected along the River Sip were studied. A total of 25 fish species belongs to four orders and eight families were found during the study. Cyprinidae was the most dominant with 60% species followed by Ambassidae with 12%, Bagridae with 8%, Nemacheilidae, Cobitidae, Gobiidae, Channidae, and Mastacembalidae with 4%, respectively. Species of Mahseer (*Tor tor*) is also found in the present study which is under the Near Threatened (NT) category of IUCN. The cluster analysis based on the Bray Curtis similarity Index and the diversity analysis showing the heterogeneity among the different sampling sites were also determined and site 2 was found as the most diverse while site 5 was as the least diverse.

KEY WORDS Aquatic biodiversity, River ecology, Narmada, Conservation, Central India

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INTRODUCTION

The freshwater ecosystem is the habitat for numerous organisms. It supports aquatic life and maintains the integrative and adaptive equilibrium. It encompasses several factors of physical, chemical, and biological indicators that show interrelation with each other. The most important part of the trophic guild of the aquatic system is fish. In the freshwater ecosystem, they play a key role in being highly visible and sensitive to environmental changes (Simon and Lyons, 1995). According to IUCN, 868 species are found in freshwater ecosystems of India, out of which 192 species are endemic, and 327 are under threatened category (Lakra *et al.* 2010). Among the various biological communities, fishes act as the Biomonitoring tool due to their prolonged existence and spatio-temporal effects (Karr, 1981). The fish diversity and habitat management aspects are a major issue of concern in

today's era (Dudgeon *et al.* 2006). In the Central highlands of our country, fishes of the Satpura Range (Hora and Nair 1941) have been the most important work that describes the ichthyofauna and outlined the detailed information on the streams of River Narmada, the fifth-longest river of India. Previously, there have been many studies reported on River Narmada using fishes (Vyas *et al.* 2006; Bakawale and Kanhere 2006; Vyas *et al.* 2007; Khedkar *et al* 2014; Kumar *et al.* 2017) and macroinvertebrates (Kumar and Vyas 2012; Kumar and Vyas 2014; Bhawsar *et al.* 2015; Raina *et al.* 2016). However, studies on fish fauna of tributaries of Narmada has not been studied by only very few researchers (Vishwakarma and Vyas 2016; Shukla and Bhat 2017).

The main purpose of this study is to assess the local fish density, diversity, and species difference among the sampling sites of the river Sip, a tributary of river Narmada.

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Study on odonata as health indicator of riparian ecosystem of Betwa River, Bhojpur, Raisen

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DOI: <https://doi.org/10.22271/j.ento.2020.v8.i6r.8018>

Abstract

An indicator species is an organism that serves as a measure of the environmental conditions. In the present study Odonates (Arthropoda: Insecta) are used as a health indicator of the riparian ecosystem of Betwa river, Raisen (Division: Bhopal). A total of 30 species including 22 species of Anisoptera and 8 species of Zygoptera were recorded in four different Sites during the study period from July to December 2019. 23 species recorded from Site A (Riparian zone adjoining to Forest), 22 species recorded from Site C (Bhojpur Ghat), 21 species from Site D (Riparian zone adjoining to Agriculture field), and 16 species from Site B (Jain Temple). Site A was the most abundant habitat with 582 individuals (379 Anisopterans and 203 Zygopterans), followed by Site C with 517 individuals (338 Anisopterans and 179 Zygopterans), followed by Site D with 435 individuals (318 Anisopterans and 117 Zygopterans) and Site B with 200 individuals (184 Anisopterans and 16 Zygopterans) was the least abundant.

Keywords: Anisoptera, Betwa river, indicator species, Odonata, Zygoptera

Introduction

Odonates are usually known as ‘guardians of the watershed’^[1]. Anisoptera (Dragonflies) and Zygoptera (Damselflies) are collectively called Odonates, are one of the most common insects flying over forests, fields, meadows, ponds, and rivers. About 6000 extant species are distributed all over the world. India is highly diverse with more than 500 known species^[2]. Odonata are one of the ancient orders of insects. It first appeared during the Carboniferous period of the Palaeozoic Era^[3]. Odonates are primarily aquatic in their pre-adult stages and their life is closely tied with flowing and stagnant water bodies. Even though species are usually highly specific to a habitat, some have adapted to urbanization and use man-made water bodies. Being primarily aquatic, their life history is closely linked to specific aquatic habitats. Naturally, these insects become a marker, an indicator of wetland health^[4].

Madhya Pradesh is a landlocked State of India, it is completely surrounded by land, hence rivers are the dominant water sources of the state. Madhya Pradesh is also known as ‘NADIYO KA MAYKA’ meaning originating point of rivers, approximate 207 small and large rivers flow in Madhya Pradesh. Betwa is the 5th largest river of MP^[5].

The Betwa or Betravati is a river in Northern India and a tributary of the Yamuna. The length of the Betwa is 480 km. It rises in the Vindhya Range (Kumragaon; Raisen) just north of Hoshangabad in Madhya Pradesh and flows north-east through Madhya Pradesh and Orchha to Uttar Pradesh. In the present study the riparian ecosystem of Betwa river of Bhojpur region was studied using odonates as marker of its health, their Abundance, Richness, diversity and similarity between various sites were recorded during the study

Material and Methods

The present study was conducted in the Riparian zone of Betwa river in its Bhojpur region, District Raisen, Madhya Pradesh, India from July to December 2019.

Study Area

Bhojpur is situated on the Betwa River, 28 km from Bhopal, the state capital of Madhya Pradesh. The site is located on sandstone ridges typical of central India, next to a deep gorge through which the Betwa River flows. Two large dams, constructed of massive hammer-dressed stones, were built in the eleventh century to divert and block the Betwa, so creating a large lake. Bhojpur is located between 23°6'54"N latitude and 77°35'43"E longitude in the state of Madhya Pradesh, India.

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Seasonal Evaluation of Microbiological Status of Groundwater in Industrial Estate of District Raisen-464551 Madhya Pradesh (India)

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Abstract

One of the major challenges of modern time is the bacteriological contamination in drinking water which is becoming a growing concern throughout the world. The presence of microorganisms poses a threat to water quality due to its capability to cause most of the waterborne diseases. The main objective of current study was to determine the microbiological status of groundwater of twenty-four selected sites of rural area of Mandideep industrial estate of district Raisen for drinking purpose. *T. coli*, *F.coli* and *F. streptococcus* were studied by using multiple tube fermentation technique method for premonsoon, postmonsoon and winter season. The results were analysed following the drinking water standards as per IS10500: ¹² and WHO,²⁴. It was observed from the results that highest concentration of these bacteria was found in postmonsoon season in comparison to winter and premonsoon season. It construed as a warning of presence of pathogenic bacteria and great risk of health issues and disease breakouts. Thus, it is desirable to identify and eradicate the sources of bacterial contamination and continuous disinfection of water is necessary for ensuring safe drinking water for human consumption.

Water as a natural resource is globally sine qua non for life on earth and groundwater is a vital source of drinking water and much of the world's population depends on this natural resource for human consumption⁸. In Indian villages, people rely heavily on groundwater as a source of drinking water and other domestic purposes. But the contamination of groundwater is deteriorating the quality and making it unsuitable for drinking purpose. Various factors contribute to the contamination

like unplanned urban development without adequate attention to sewage, waste disposal and discharge into pits, open ground, or unlined drains. In rural areas, the excessive use of fertilizers and other insecticides for a long duration coupled with over irrigation is also contributing to the groundwater pollution¹⁸.

Many micro-organisms may be present in drinking water that may deteriorate its quality and make it unsuitable for human

A Study on Species distribution and Diversity of macro-fauna of River Tawa - A Tributary of River Narmada in Madhya Pradesh, India

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Abstract

This study is aimed to collect information about the macrofauna diversity of Tawa River. The Tawa River joins to Narmada at district Hoshangabad (Madhya Pradesh). During the study 8 sites were selected for the investigation. collections of samples were done from the eight sampling sites of the river. Collected samples were identified up to species level and their diversity and richness were analyzed. Shannon index for diversity and margalef index for richness were used for the study. Total 48 taxa of macrofauna have been recorded from the identified sampling stations. Benthic fauna of phylum Arthropoda was found in dominant position in the study and phylum Mollusca was found in second position.



Article History

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Keywords

Benthos;
Distribution and Diversity;
Macrofauna;
Margalef Index;
Shannon Index;
Tawa River.

Introduction

River ecosystems are most important lotic fresh water habitats for many aquatic animals and benthic animals are one of these animal. Benthic animals are generally found in both of fresh water habitats i.e. – lotic habitats and lentic habitats. Benthos spends their whole life in bottom of aquatic ecosystem because of their feeding nature. Basically they are detritus feeders and divided in to two types –

microzoobenthos and macrozoobenthos. Macro benthos are those animals which can be seen with naked eyes. Their diversity and distribution are good indicators of water quality of an ecosystem that's why they are known as bioindicators. In the present investigation diversity and distribution of Macroinvertebrates were recorded for the period of two years from July 2017 to June 2019. The study was focused on two main phyla of

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Physicochemical analysis of water quality of Tawa River at Hoshangabad District of Madhya Pradesh

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Abstract

Rivers provide balanced habitat to many animals and plants. The physicochemical parameters indicate the quality of water and health of river. Tawa river stretch 172 km. from origin upto confluence in Narmada river. During the study chemical values show moderate or less moderate pollution due to land use pattern and Sarni power plant ash discharge. The study shows increased level of some parameters at sampling sites. Continuous monitoring of quality of water is needed to river health and also ecosystem because aquatic organisms need ideal conditions of ecosystem to live and grow.

Fresh water resources of the world are subjected to human disturbances and water quality deteriorations. Urbanization and industrialization are main causes of water pollution in India. Rivers and other water sources are now easy sites for waste water disposal. Different pollutants and their concentrations are determining factors of water quality of the water resource. Many chemicals present in water become toxic to human as well as aquatic fauna. Above the standard level of pollutants & chemicals of water are not fit for human use and aquatic life. The situation of Tawa river is not very different from other rivers of India. Rivers are the major source of water for different uses of human population specially drinking water, but the same population pollutes the river system. Water quality of river systems have become an issue of concern for the world.

Tawa river is an important river of Central India. It originates from Satpura range of Betul and Chhindwara District and joins to the Narmada at Bandrabhan in Hoshangabad District of Madhya Pradesh, India. Water is the binding element and plays vital role for healthy river ecosystem¹⁶.

Water quality sampling has focussed primarily on the collection of chemical and physical measures¹⁴. Rivers have the capacity to treat themselves through natural processes from pollutants during normal flow of river to certain distances. The whole catchment area is rich in the field of agriculture due to good sources of irrigation. The agriculture area covers almost 90% of area of watershed basin¹². River Tawa is an important source of potable water for the riparian community and also a source rich diversity and aquatic

Age and Growth of the Indian Major Carp, *Cirrhinus mrigala* (Hamilton, 1822) (Cypriniformes: Cyprinidae) from Six Drainages of Ganges Basin, India

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Abstract—*Cirrhinus mrigala* is an Indian major carp originally inhabitant of the Ganga River system in Northern India. There is paucity of knowledge on age and growth of this commercially important species from Ganges basin. To fulfill this gap, 250 samples of *C. mrigala* were collected from the main channel of Ganga River and its five major drainages to evaluate intra-basin variations in age and growth composition. Maximum 8+ year age class was recorded from River Betwa. Back-calculation method revealed significant variation ($p < 0.05$) in different year age classes among the studied rivers. With increase in age, specific rate of linear growth (C_L) and specific rate of weight (C_w) decreased in all the studied rivers. This study will provide new baseline information to fisheries biologists on the current status of biological attributes of *C. mrigala* across the River Ganga basin.

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INTRODUCTION

Biological parameters have been widely used by ichthyologists to examine the population structure of a species (Ihsen et al., 1981). Age and growth studies are the most important aspects because age determination provides information on age structure, age at first maturity and are an essential prerequisite for understanding the population dynamics of the fish (Pawson and Jennings, 1996).

Cirrhinus mrigala (Hamilton 1822) commonly known as mrigal (subfamily: Cyprininae, family: Cyprinidae) is a warm water teleost endemic to Indo-Gangetic riverine systems. The natural distribution of *C. mrigala* is in the freshwaters of Northern India, Bangladesh, Burma and Pakistan. The species has also been transplanted successfully from the natural range within India and to parts of Asia as well as Europe (Chondar, 1999; Froese and Pauly, 2006). In natural waters, *C. mrigala* is known to attain a length of 99 cm and a weight of 12.7 kg (Talwar and Jhingran, 1991). According to Food and Agriculture Organization (2014), aquaculture production of *C. mrigala* was over 414719 tonnes. However, over the last few decades, wild capture fisheries of *C. mrigala* in Ganga basin appear to be reduced (Payne et al., 2004). Changes in

distribution, phenotypic traits and biological characteristics of *C. mrigala* have also been reported (Rao, 2001; Sharma, 2003). This could be an indication that alteration in population size is taking place in this species as well, or it might be a simple fluctuation in the landings.

Various aspects of the biology of *C. mrigala* have been investigated in detail by several authors (Chacko and Ganpati, 1951; Jhingran, 1957, 1959; Chakrabarty and Singh, 1963; Jhingran and Khan, 1979). Age and growth of *C. mrigala* was examined by Kamal (1969), Johal and Tandon (1983) and Desai and Srivastava (1990). However, there is scarcity of knowledge on age and growth of *C. mrigala* from Ganges basin. The present study was therefore conducted to evaluate the comparative pattern of age and growth of *C. mrigala* among different rivers of the Ganga basin.

MATERIALS AND METHODS

Sampling Methods

The present study is based on the sampling of 250 specimens comprising 132 males including 70 mature individuals and 118 females including 64 mature individuals from different tributaries of Ganges River

Assessment of Seasonal Groundwater Quality of Rural Areas of Mandideep, District Raisen Using WQI

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ABSTRACT

The present study was conducted to assess the seasonal variations in groundwater quality of rural areas of Mandideep, district Raisen (Madhya Pradesh) for drinking purpose from March 2018 to March 2020. The study was carried out for physico-chemical parameters such as pH, TDS, total hardness, calcium hardness, magnesium hardness, alkalinity, chloride, fluoride, nitrate, sulphate and iron. Results were concluded as water quality index (WQI) using arithmetic weighted method for above parameters. Based on results of WQI, it was observed that overall water quality index of pre-monsoon, post-monsoon and winter season was 83.37, 52.27 and 66.44, respectively. The study also revealed that water quality in post-monsoon season improved after percolation of rain waters and dilution helped in improving the water quality. The study of the village sites also indicated the requirement of conventional treatment of groundwater before consumption by local residents to prevent adverse health effects.

Key words : Water quality index, physico-chemical parameters, seasons

INTRODUCTION

Groundwater is one of the most important natural resources for life, agriculture and other production processes at many places. But in present times, its quality is being deteriorated and adversely affected by anthropogenic activities and local climatic conditions. India is not only a developing country but also one of the fastest growing economies in the world. For the economic growth, the country has developed an industry base in the rural areas in order to boost the employment and to develop it on the model of urban area. This development has led to the excessive use and exploitation of the groundwater. At the same time discharge of the human sewage and industrial effluents has also affected the quality of groundwater. On account of this, the groundwater is getting more polluted and unsafe for drinking purpose in the industrial and adjoining areas. Most of the people living in such areas use drinking water without treatment or filtration and this may lead to the health issues.

The quality of the groundwater has been assessed in the present work with the aid of weighted arithmetic water quality index. This

method incorporates data of multiple physico-chemical water quality parameters into mathematical equation and provides a single number. This number expresses the overall water quality of a certain location based on water quality parameters. In this way, water quality index turns the complex water quality data into simple and usable form that is understandable by common person (Bansal and Dwivedi, 2018). Thus, it depicts the possible problems related to water quality of certain sites and accordingly control measures can be taken by the local residents and concerned authorities.

The main objective of the present study was evaluation of selected sites for physico-chemical parameters of the groundwater quality using Weighted Arithmetic Water Quality Index. This was to ensure the suitability of the groundwater for domestic and drinking purposes.

MATERIALS AND METHODS

Raisen district is situated between the latitude 22° 47' and 23° 33' north and the longitude 77° 21' and 78° 49' east. It falls in Vindhyan region in central part of Madhya Pradesh. This region

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DNA Barcoding depicts cryptic diversity within *Barilius bendelisis* (Cypriniformes: Cyprinidae) from India

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Abstract: Members of the genus *Barilius* are known for their economic values. However, due to human activities and natural calamities, *Barilius bendelisis* faces massive population loss, especially in eastern India. We applied both morphology and molecular approaches to identify *Barilius bendelisis* from transboundary river Torsa, Raidak-1 and Mansai (Jaldhaka), West Bengal, India. Further, we compared genetic divergence of *Barilius bendelisis* from other members of the genus *Barilius* available in India. The Bayesian (BA) phylogeny clearly distinguishes all the studied species with reciprocal monophyletic criteria and represents multiple clades within *Barilius bendelisis*, indicating cryptic diversity and probable occurrence of allopatric speciation within India.

Keywords: *Barilius bendelisis*, DNA barcoding, cryptic diversity, allopatric speciation, India.

1. INTRODUCTION:

India comprises of diverse Ichthyofauna with 868 freshwater fishes, of which 192 species are enlisted as endemic and 327 species as threatened by IUCN. The Genus *Barilius* are small to moderate-sized fishes commonly known as Bariline fishes, inhabits in medium to fast-flowing torrential mountain streams of Asia (Dishmaand & Vishwanath 2012). Members of the genus *Barilius* are characterized by compressed body, blue-black bars or spots on the body and dorsal fin inserted behind the middle of the body (Hamilton 1822). So far, 36 species of bariliine fishes are reported globally, and 24 have been enlisted in India (Fricke et al. 2019, Qin et al. 2019). The conservation status of this *Barilius* species are marked as 'lower risk near threatened' (LRnt) according to the CAMP (Conservation Assessment and Management Plan) report for freshwater fishes of India (Molur & Walker

DISTRIBUTION AND ABUNDANCE OF ODONATES, IN PALAKMATI STREAM OF NARMADA RIVER BASIN

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ABSTRACT

During the present study, odonatan diversity of Palakmati stream was evaluated, using Shannon-Weiner diversity index and Margalef's richness index. Within a 100 m transect, encircling the variety of habitats, odonates were sampled from all the major habitats. A total of 11 species, belonging to 6 families of odonates were recorded, during the study. It was observed during the investigation that, aquatic vegetation forms the favorable habitat for odonates, while it gets negatively affected by the limited shade cover and less riparian vegetation, along the stream banks. During the present survey, low species diversity and richness of odonates were observed in Palakmati stream, possibly due to limited shade cover.

KEYWORDS: Odonates, Stream, Narmada River, Riparian Zone

INTRODUCTION

Odonates are one of the ancient orders of insects, found flying over forest, fields, meadows, ponds and rivers. The dragonflies and damselflies make up this single order in the class Insecta. It first appeared during the Carboniferous era, about 250 million years ago along with mayflies-Ephemeroptera (Subramanian, 2005). However, first attempt to use dragonflies as indicators have been made in South Africa (Clark and Samways, 1996). Odonata nymphs occupy an important position in the aquatic insect community (Kaushik *et al.*, 1990a; 1990b). The adults are terrestrial and the larvae are aquatic. Nowadays, they are explicitly used as an ideal candidate for biomonitoring (Needham *et al.*, 2000 and Bhawsar *et al.*, 2015). Globally 5,740 species of odonates are known of this 470 species in 139 genera and 19 families exist in India. Based on morphology, the order Odonata are divided into three groups, viz. damselflies (Zygoptera), Anisozygoptera and dragonflies (Anisoptera). However, recent studies groups Anisozygoptera with Anisoptera, or some authors brings them together, under a new name Epiprocta (Anisoptera + Anisozygoptera) (Subramanian, 2005). The predatory nymphs of odonates are an important part of aquatic food webs. Also, the aquatic stages of mosquitoes comprise a significant part of the diet of many immature odonates (Ward, 1992). Indeed, odonates were one of the first arthropods to be examined as biological control agents against mosquitoes, but difficulties with colonization, production and handling impeded their deployment (Legner, 1995). The present study was conducted on the Palakmati stream in order to know the diversity of odonates with respect to their habitat. Earlier, only a few works was done on the diversity of odonates in water bodies of Madhya Pradesh (Kaushik *et al.*, 1990a and 1990b). This preliminary compilation of the dragonfly and damselfly fauna may serve as a baseline for future studies and to understand the ecology of odonates.

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Research Article**Neemax Induced Histological Changes in the Liver of *Cyprinus carpio*****Prerna Pahariya¹, Rajendra Chauhan², Vipin Vyas³**¹*Department of Environmental Science and Limnology, Barkatullah University, Bhopal, M.P. India.*²*Government Motilal Vigyan Mahavidyalaya, Bhopal, M.P. India.*³*Department of Bio Science, Barkatullah University, Bhopal, M.P. India.*

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Abstract

Objective: The aim of this study, was to evaluate the toxicity effect of Neemax on liver of common carp (*Cyprinus carpio*) as histological biomarkers through acute and chronic exposure with different concentrations. **Material and methods:** The toxic effects of Neemax on liver of fish, *Cyprinus carpio* were studied. Fishes were starved for first 24 h and then fed with rice bran mixed mustard oilcake in the ratio of 2:1 during acclimatization. There are 6-10 specimens exposed to the sub lethal dose for the 15, 30, 45 days with a control group simultaneously. After a particular time, fishes were sacrificed and liver tissue was muscle dissected for histology. **Results and conclusion:** The result showed remarkable effect of Neemax toxicity as compared to the control group. Liver appeared with multiple markers such as hepatocytes degeneration, increased sinusoids and marked degeneration with necrosis and none of these morphological changes were found in control fish.

Keywords: Toxicity, *Cyprinus carpio*, Histological markers, Neemax

Introduction

Pesticides have been one of the most effective weapons discovered by man to protect agricultural products from pests. However, they are the major cause of concern for aquatic environment due to their toxicity, persistency and tendency to accumulate in the organisms (Joseph and Raj, 2010) and it is difficult to remove them from any aquatic ecosystem. Pesticides applied in the environment can find their way into water bodies either from the air or by runoff or by percolation to groundwater. There are four major routes through which pesticides can reach the water bodies: it may drift outside of the intended area when it is sprayed, it may percolate, or leach, through the soil, it may be carried to the water as runoff, or it may be spilled, for example accidentally or through negligence. They may also be carried to water by eroding soil. Factors that affect a pesticide's ability to contaminate water include its water solubility, the distance from an application site to a water body, weather, soil type, presence

of a growing crop, and the method used to apply the chemical. Once pesticides enter water bodies they have a potential to cause harmful effects on human health, aquatic organisms and can cause disruptions of the aquatic ecosystems. This may result into a loss in fish production in streams and large water bodies especially where fishing is one among the major economic activities of a particular community (Zacharia, James Tano et al. 2011).

Fishes are considered good indicators of environmental contamination because they are aquatic organisms that bio-accumulate several classes of pollutants in their tissues from water and food sources. In particular, the common carp *C. carpio* is an economically important fish spread worldwide in cultures in Asia, Europe and Latin America and is easily maintained in laboratory.

The studies on histopathological changes in fishes have been carried out by Das and Mukerjee, (2000), Cengiz and Unlu, (2002), Parashar and Banerjee, (2002), John et al. (2007). (Kunjamma et al. (2008), Velmurugan et al. 2009, Rani and Venkataramana, (2012). In view of above it was felt that it would be worthwhile to study the histological changes in the liver of the fish which would throw a clear light on the extent of effect that it causes. Hence in the

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ASSESSING ECOLOGICAL QUALITY OF RIPARIAN HABITAT OF STREAMS OF NARMADA RIVER BASIN USING QBR INDEX

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ABSTRACT

The present study was conducted to assess the ecological quality of riparian habitat of streams of Narmada river basin using QBR index. QBR index is used to determine the riparian habitat quality of Barna and Jamner streams. The rapid survey was carried out on the left and right banks of the streams. The results showed that Barna stream showed fair riparian quality due to the presence of a large number of trees on both the banks whilst, Jamner stream is coming under bad riparian quality due to anthropogenic pressure and less vegetation along the banks causing degradation of riparian habitat quality.

KEYWORDS: Anthropogenic Pressure, Barna Basin, QBR Index, Riparian Habitat

Article History

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INTRODUCTION

The word ‘riparian’ is derived from Latin word ‘*riparius*’ meaning land adjacent to the water body (Naiman and Decamps, 1997). The transitional zone between these rivers and the land is known as the riparian zone. These riparian areas are considered to be one of the biodiversity rich ecosystems mainly as they act as transitional zones between the terrestrial and aquatic ecosystems, thereby serving as functional interfaces mediating energy and matter between these two ecosystems (Peterjohn and Correll, 1984; Gregory *et al.*, 1987).

Riparian zone are one of the most valuable ecological elements of river systems. They maintain high levels of biological diversity and productivity and provide dynamic habitats for different species (Bennett and Simon, 2004). They also provide many other ecological and social benefits and ecosystem services. Riparian zone is an extremely important component of aquatic ecosystem and it influences physical habitat characteristics and processes of riverine ecosystems (Naiman *et al.*, 2005). The reduction and alteration of riparian forests have resulted in habitat fragmentation and destruction of habitat of diversity in the river system (Mohite and Samant, 2012). The present study was conducted to assess the riparian habitat quality of Barna and Jamner stream by using QBR Index.



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Comparative study of ichthyofaunal diversity of Sip and Jamner Rivers: A tributary of river Narmada (Central India)

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Abstract

River consist of a complex mixture of distinctive habitats, which make it among the most productive and valuable ecosystem on earth. The Sip and Jamner rivers are the tributaries of the Narmada basin, which afford a lucrative field of ichthyological importance. River with its tributaries is a unique type of ecosystem which generally covers different types of climatic zones, landscapes and biogeographically regions. River is the natural drainage system of the land mass of the earth which move continuously. The findings from the study will benefit the planning and management of fish community structure and conservation of natural resources at national level. During the present investigation, rich ichthyofaunal diversity was observed in the Sip and Jamner tributary of River Narmada represented by 52 fish species, 34 genera, 12 families and 6 orders. The Cyprinidae family is dominant group.

Keywords: River Narmada, Conservation, Fish diversity, Ecosystem

1. Introduction

Water is a basic need of all living organisms on the earth. Lakes, Rivers and Reservoirs are most important water resource and used for several purposes. River Narmada is one of the most important natural sources of water and important ecological diversity in the state of Madhya Pradesh. Rich biodiversity of fishes present in Narmada River, therefore fishing commonly practiced in the river is responsible for the livelihood for a large number of fishermen families living in the vicinity of the river. Riverside capture of fisheries in The Narmada region is a very important source of household welfare for many of rural poor, particularly for providing nutrition (specially the much need protein), income and employment.

Fish constitute almost half of the total number of vertebrates in the world 21,723 living species of fish out of 39,900 species of vertebrates are so far recorded [13]. In India, there are about 2,500 species of fishes, of which 930 freshwater and 1,570 marine, are estimated [11]. Fishes have been found to exhibit enormous diversity in their morphology, habitat and their biology. They live in almost all conceivable aquatic habitats. India is one of the mega biodiversity countries in the world and occupying ninth position in terms of freshwater biodiversity. A clear manifestation of the most well known global diversity gradient, namely species diversity increases with latitude. Narmada River has been extensively studied for its fish fauna for the past seven decade by various workers.

A few recent works on different aspects of fish diversity were also confined main stream in central part of Narmada [27]. Very first record of fish diversity of Narmada was on hill stream of Satpura ranges [9]. Later Tawa and Barna tributaries were dammed to form reservoir and studies were done on these reservoirs. 52 species belonging to 28 Genera, 13 Families and 7 Orders was recorded in main tributaries of central Narmada [28]. Recently few studies on fish diversity was carried in Sip and Jamner rivers, 29 species belonging to 17 Genera, 8 Families and 3 Orders was documented in Sip River a tributary of River Narmada [24]. While Jamner River recorded 27 species belonging to 4 order, 9 families and 16 genera [25]. The comparative study of Sip and Jamner River was also carried out which documented 34 species belonging to 17 Genera, 8 Families and 3 Orders [23]. Documented 57 species, belonging to 35 genera, 13 families and 6 orders from Middle Stretch of River Tawa [5]. The Barna Stream Network in Narmada basin reported 33 fish species belonging to 5 orders, 9 families and 21 genera [22].

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STUDY OF GREEN ADVERTISEMENTS OF ELECTRIC 2 W VEHICLE FOR ENVIRONMENTAL SUSTAINABILITY IN BIOPAL MADHYA PRADESH

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Abstract—Electric vehicles are looked at as an alternative to petrol 2 Wheelers which are environment-friendly easy to charge and safe for those customers who are new to use a two-Wheeler. But there is a sense of hesitancy in customers who want to travel long distances within the city or even intercity distance, and they have a doubt that this electric scooter cannot be used to reach their destination daily.

There has been a steady revolution in the country since the launch of electric 2 Wheelers in India customers have been hesitant to use this new technology, and they are evolving as time passes and better technology comes into the market. With new technologies coming into the market this ideology has been changing rapidly many OEMs are coming up with great innovative ideas to increase the range of an electric scooter and decrease the charging time as well. The manufacturers are trying their level best to understand customers' requirements and make their adoption and acceptance as easy as possible for new customers who are willing to try this new technology, but they have some doubts in their mind. This paper discusses about the level of awareness among the customers and the factors which encourage them to buy the electric two Wheelers as well as the factors which stop them from buying an electric two-Wheeler and what they expect from the manufacturers to eradicate their doubt about electric two Wheelers. Based on the findings it is suggested that the government should belt greater charging infrastructure among the city and more dealerships should be opened to attract the customers and educate them about the benefits of electric 2W over petrol 2W in terms of reliability, maintenance, performance.

Keywords—EV, electric 2W, high speed, low speed, charging points, FAME 2

INTRODUCTION

We all have been driving petrol two-wheeler for many years, but over the period fossil fuel has been depleting, therefore, the prices of petrol have been increasing year after year and there is demand for an alternative power source to drive these vehicles. Electric vehicles in the two-wheeler category have been selling in India for over a decade now. They do not make pollution or noise and are low maintenance when compared to petrol two-wheelers. These vehicles run on electricity stored in a huge battery and there are two kinds of battery, lead-acid and lithium-ion and they give a driving range of 50 km to 80 km, and they can be charged at the home, office or at any charging station just like charging mobile or a laptop. In December 2020 petrol two-wheeler sales were more than 10,00,000 Even though there are many sales petrol two-wheelers, there is a large concern among consumers who are using these vehicles as there is a linear increase in petrol prices from November 2020 May 2021, there has been an increase of Rs.10 in petrol prices within last six months. This has created a lot of economic problems for daily commuters who use petrol two-wheelers daily to ride to the office, college and for other activities,

DIGITAL BANKING: A STUDY OF FRAUDULENT PRACTICES IN INDIAN BANKS

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ABSTRACT:

This research study envisaged an extensive analysis of the impact of digitalization of banking operations on raising banking frauds and cyber frauds. The present technological savvy banking environment has offered wide range of facilities to its customers. By using these facilities a customer can conveniently pay and settle his due amounts while sitting at home or work place. Growing dependency on technology has offered many advantages but at the same time it is largely misused by many persons consequently responsible in raising frauds. Thus this research study has tried to covers the growing prospects of banking digitalization under the period of 2012-13 to 2018-19 and its impact on raising frauds. The study concluded with the significant impact of digitalization on raising banking frauds and cyber frauds in Indian banking sector.

Keywords: Digitalization, Banking frauds; Cyber frauds; Real Time Gross Settlement (RTGS), CCIL Operated Systems, Retail Electronic Clearing, Cards, Prepaid Payment Instruments (PPIs) and Mobile Banking.

I. INTRODUCTION:

In the contemporary scenario growing dependence on technology has created revolution in banking industry particularly in

highly populated country like India. The process of digitalization in banking covers a broader prospective in terms of extensive use of electronic medium to carry out banking operation. The digitalization helps customers to avail banking product and services though mobile phones, computers. The course of digitalization occurs without human involvement. Generally digitalization is also known as online banking or internet banking or e banking. The excessive use of smart androids phone by customers has provided a greater access to online transactions. Now they can easily order purchase or sell products and services while sitting at home. Digital banking has made transfer of payment easy. One can pay directly in bank account of the recipient.

II. REVIEW OF LITERATURE:

Florian.D & Spacek.M (2021) discussed the digitalization as one of the major aspect facing the banking industry. The study followed an exploratory research approach to assess the obstacles in digital transformation of both commercial and private sector banks. The study revealed that Management and Strategy, Employees and Customers, Technology and its regulation, need to be paid high attention compared to other obstacles related to public benefit, customer participation market knowledge and products under the preview of

A Critical Evaluation of Safety and Service of Public Rail Transport in Madhya Pradesh

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Abstract

Rail transport is very important in India. Passengers expect the rail transport should follow punctuality and time schedules. Safety and service provided by rail transport need to critically evaluated for the users prospective. Safety during travel, safety at terminals, availability of guard, safety of luggage, fire safety, prohibition of dangerous material, night security check are main safety criteria for public rail transport. Service provided by staff, washroom availability, service quality of amenities, service availability at rush time, adequacy of railway station, adequacy service at ticket counter, behaviour of staff, are main identified criteria for this study. User satisfaction on services provided and user satisfaction on safety is measured in five-point Likert scale. Primary data for present study collected through questionnaire. Questionnaires are designed to access user satisfaction with respect to safety and service provided by rail transport. It is found that passengers are satisfied with safety available during journeys and safety at railway stations. Passengers are concern about safety of luggage. Passengers are satisfied with the efficiency of staff, behavior of staff, number of railway stations but passengers want more wash rooms facility in public rail transport.

Keywords

Public Rail transport, safety, service, satisfaction, fire safety, efficiency of staff



Study to establish impact of Preparedness on Disaster Management: a Case of Madhya Pradesh, India

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ABSTRACT

Disasters have been part of human life since ages, and its management has become crucial in light of several devastating happenings in the recent past. Governments at various levels are now sensitive towards disaster management, and accordingly several plans at regional, district and local level are being prepared. The study highlights the importance of preparedness in disaster management and based upon expert opinion survey, conducted across 250 respondents engaged in the field of disaster management, and well aware about disaster management process of Madhya Pradesh, a central state of India. The respondents were enquired about various aspects of disaster management and preparedness based upon an empirically designed questionnaire. A null hypothesis was developed that there exist no relation between preparedness and efficient disaster management. ANOVA technique was used to check the validity of the Hypothesis, from the responses of the expert opinion survey. The study found that the null hypothesis is rejected and concludes with a set of findings and conclusions based upon outcome of the statistical analysis.

Keywords: Disaster, Madhya Pradesh, Management, Preparedness

INTRODUCTION

Disasters have always been present in human history (Haddow et al. 2011). The previous disasters have been recorded in the history has provided measures to be adopted to deal with the same in future. According to the definition provided by the Government of India and United Nations Development Program, a disaster is the product of a hazard such as earthquake, flood or windstorm coinciding with a vulnerable situation which might include communities, cities or villages. The Disaster Management Act, 2005 of India defines a disaster as - a catastrophe, mishap, calamity or grave occurrence affecting any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area. To fight with the same a proper disaster management plan is laid down. The plans can be divided into 3 phases:

- *Pre Disaster Phase-* Pre disaster phase is the before disaster phase. At this stage disaster management plans, mainly includes the preparedness, mitigation, prevention and other Pre disaster planning strategies.
- *During Disaster Phase-* During disaster phase is the current stage of any disaster. It mainly includes the response, community participation, rescue, relief and other during disaster planning strategies.
- *Post Disaster Phase-* Post disaster Phase is the after disaster stage. It mainly includes the damage assessment, community health, restructuring, rehabilitation and other post disaster planning strategies.

ELEMENTS OF DISASTER PREPAREDNESS

Risk Assessment

Risk Assessment can be defined as the process of evaluating the potential value of risk in relation to a situation or place and the threat called disaster (Jakob, 2009). Determining the quantity value of risk takes into account components such as magnitude or potential loss to be calculated or acknowledged in relation to the probability that the loss will eventually occur (Lerche and Glasser, 2006). This process usually determines the acceptable risk or the ones which can be tolerated. According to Smith and Fischbacher (2009) risk assessment is the process which helps to enhance the analysis of the prevention and preparedness measures based on capacity for planning, which helps to improve disaster management, as well as the development of essential policy for disaster management.

Concept of Risk Assessment and Management

From the definition mentioned above we can conclude that risk can be based on threat or scenario (Regester and Larkin, 2008). Scenario-based risk takes into account and includes risk in events and situations which involve a place, time and processes. Risks which are associated to disaster management is usually threat and scenario based, which



Selling & Marketing Expenses and Profitability analysis of selected Telecom companies

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Abstract

This study focuses on importance of relationship between Selling & Marketing Expenses with profitability of selected Telecom companies in India for a period of 10 years (2006 - 2016), with a total of 20 firm years. To determine the effectiveness of marketing expenditure with respect to net profitability Multiple Correlation and Regression Analysis were used. Net Profitability (NP) is used as dependent variable. Three independent variables were used. There is a positive correlation among all the independent variables i.e. the selling and marketing expense, dealers' commission, advertising expenses of the selected companies. There is no significant impact of Selling & Marketing Expenses on Net Profitability. However, other components of Selling and Marketing Expenses viz. dealers commission, advertising expenses have significant effect on the profitability of these firms.

Keywords: Profitability, Selling & Marketing Expenses, Telecom companies

1. Introduction

Industry are considered as the engine for the development of a country's economy. Different industries / sectors contribute in development of national economy of a country but their contribution differ in varying degrees. Most dominant role in economy of any country is played by Telecommunication sector as it is vital for growth of other sector. Evolution of technology and customers make these sector as most dynamic. Thus, there is a constant need keep pace with technological changes, companies need to continuously update and upgrade their technologies. This calls for huge amount of capital investments in technology. At the other end there are customers who are difficult to acquire, serve and retain. To serve the customers better there is needs to deeper understanding of target customers and their expectations from the product, service and the company. So, all the companies keep a marketing and sales budget to acquire new customers and retain the current customers. But it comes with an enormous cost. Hence, the efficacy of Sales & Marketing expenses in making



A Critical Evaluation of Road Transport Management System in India with Special Reference to Madhya Pradesh

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Abstract

Transportation is very important for all economic activities. Transport system is one of the tools of economic development. Transportation system provides mobility of people, freight which is just like the blood of the economy. Effective transportation systems reduce cost in many economic activities. The transport system should be safe, effective, and economical for travel of passengers and transportation of goods. It can be achieved only by effective management of the transport system as a whole. Modern transportation system is a management of road and another transport system. The freight and passenger movement are shared by all transport modes however road transport are the dominant modes in India. In the transport management system, the service quality and passenger satisfaction are very important concepts that transport companies must understand. Passenger satisfaction does have a positive effect on organization profitability. The aim of this study is to critically evaluate the service quality in the field of road transport management in India with special reference to Madhya Pradesh.

Present Study Dealt with evaluation of Road Transport management system in India with special reference to Madhya Pradesh. In order to examine user's satisfaction towards Madhya Pradesh Road Transport management system certain dimensions selected and discussed such as Comfort, Time and Safety. This study is based on primary as well as secondary data. Primary data has been collected through questionnaire method. In this process 21 set of questionnaire distributed among those peoples who have used road transport for moving from one place to another. The MS excel and Statistical Package for Social Sector (SPSS) version 22.0 have been used to analysis primary data as well as testing of hypothesis of the study.

Keywords

Road transport system, comfort, time, safety, satisfaction level



Cover Page

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(7)

INNOVATIVE TALENT RETENTION STRATEGIES IN ORGANIZATIONS POST COVID-19

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Abstract

Strategies for Acquisition and Retention of employees post the pandemic

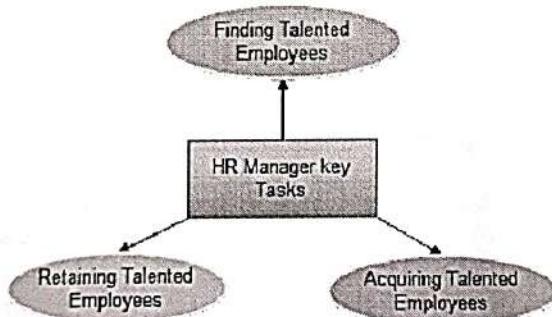
This paper examines how HR Strategies contributes in the success of "Talent Acquisition" process of corporate sector. In the present scenario, lots of dynamism and challenges could be noticed in the globalized world due to the pandemic covid -19 occurrence and the success is entirely based on the strategies to achieve the objectives of acquiring and retaining proper talents, assign responsibilities, measuring success and evaluating results. For managing the country's economic conditions "Talent acquisition process" is a systematic approach which utilizes the ethical principles and strategies of management in order to identify the talented crowd and fulfill the organizational objective or goal of any organizational establishment, specifically in this challenging scenario around the world.

Keywords: Talent Acquisition, Strategic Management, Development, Business.

Introduction

In today's era a progressive movement is going on, to transform the Human Resource functions with a view of establishing Human Capital Management System, in which the employee workforce actually acts as weapons in this huge competitive business world. The economic world is adopting globalization, Talent Acquisition has a vital impact on the economic world, so with a view of satisfying the ongoing requirements, which are essential for acquiring the organization's goal, the HR Personnel of the companies, adopted the approach of "Talent Management" to recruit the most efficient manpower in order to accomplish the organizational objective smoothly.

Figure 1.1 depicts the Talent management process in its early phases.



Source – www.whatishumanresource.com

Traditionally people understand the term Talent Management as the development and replacement of top executive level however nowadays the term lead to a broad sense of recognition, attracting and retaining the talented employees at all levels of the organization. All the previous researches on Talent Management reveals the fact that the companies which acquire such practices ensure competency factors, consistencies, to attract and retain their employees. Top Management of these organizations are fully involved in such activities, to the priority level, to sustain in the global competitive environment so far.

A web based survey, considering a sample size of 37 multinational corporations was designed and finally implemented, on the basis of which the revealed fact was that these MNC's not only design and implement the best practices, but even focuses on the internal alignment, of the talent resources of the company in order to sustain competitive advantage and global coordination. Some MNC's such as Infosys and few other, emphasizes on global branding to get the potential employees. Definitely companies prefer skills related to jobs to prove the proverb "Right people at the Right place."



Impact Of Digitization On Students Performance: A Study With Reference To Selected Higher Secondary Schools In Bhopal City

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Abstract

Now Days digitization has become one of the necessary needs for each and every person in order to convert information in to digital format. Without having the use of digital technology transformation of any type of information's from one person to another is not easy. In another word digitization has become essential part of people's daily routine from morning to night and people frequently spend time online and use social media to make connectivity with others. The present study dealt with the use of digitization in selected higher education

schools in Bhopal city. In order to define relationship between use of digitization and students performance certain aspects of digitization has identify and discussed from the students point of view. These aspects are Video Conferencing, Power Point and Social Media. study based on primary and secondary, primary data collected directly from students of higher secondary through questionnaire. Findings of the study suggested that, among all the aspects of digitization few are significantly related with student's performance and few are not.

Key Words: Digitization, Social Media, Power Point Presentation and Video Conferencing

Statement of the problem

At present age of globalization, digitization has become necessary needs for both peoples as well as organizations in order to convert information in to the digital format. Without having the use of digital technology transformation of various types of information from one to another is not easy. In the other word, digitization has become 'part of' people's daily routine from morning to night, peoples frequently spending time online and using social media in order to make connectivity with others. It is regularly observing that, Digitization is converting increasingly popular and is growing at a very fast pace in the world, different

activities of digitization can be seen in each and every field such as Public Project, Private project, Colleges, Schools and every organization; Digitization can be explained as the conversion of data into digital format or digital media, The digital format data is in the computer or in a soft copy format. The present study deals with the impact of digitization on students of various secondary level schools Bhopal, in this process three different aspects of digitization has been identified such as , ***Videoconferencing, Power Point Presentation and social media Social Media,*** The aim of research is to describe relationship between student's



IMPACT OF TRAINING & DEVELOPMENT ON EMPLOYEE PERFORMANCE WITH SPECIAL REFERENCE TO SELECTED PUBLIC AND PRIVATE SECTOR BANKS

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ABSTRACT

In the present scenario of the business training & development has become one of the essential tools for each and every organization however it is important for both employees as well as organization. The present study dealt with relationship training & development a employee performance with respect to selected public and private sector banks. In order to examine this relationship certain aspects training & development has been identified and discussed. Present study based on primary and secondary data, primary data has be collected through questionnaire method. After testing of hypothesis, findings of the study suggested that, among various aspects of train and development two aspects such as Learning and Productivity is related with employee performance and on the other hand there is r significant relationship between employee performance and Motivation

STATEMENT OF THE PROBLEM

In the present scenario of global competitive word training & development have been played a significant role in the economic development of countries as well as whole nation. Without having effective utilization of training & development program survival for a long time is r possible. Therefore now days each and every organization is effectively implementing training & development program frequently amo the employee to improve their performance.

Training defines as an “efficient process of getting Information’s, abilities, knowledge, skills and behavior in order to fulfill t requirement of the job”. Training & development helps employee to meet their existing job requirements or helps them to increase the productivity to improve their performance. On the other hand its benefit may increase during the employee’s carrier and help them to me their future responsibilities. The present study dealt with impact of training and development program in order to measure employ performance of selected private and public sector banks. In this process of research certain dimensions of training and development has be identified from the employee point of view and assess their impact on employee performance

A Study on Deposit Insurance Guarantee Limit with respect to the Depositors of Primary Agriculture Credit Cooperative Societies of Madhya Pradesh

A Research Paper by Rajkumar Gangele¹, Vivek Sharma, Simrina Singh

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Abstract -

In Indian Banking System, money of the depositors with all Public Sector Banks, Regional Rural Banks, Cooperative Banks, Private Banks, Small Finance & Payments Banks, and Foreign Banks operating in India are insured under the Deposit Insurance and Credit Guarantee Corporation (DICGC) Act 1961 of DICGC, a subsidiary of Reserve Bank of India. Only the deposits of the depositors of Primary Agriculture Credit Cooperative Societies² (PACCS) are not covered under DICGC as these PACCS are not banks.

In Madhya Pradesh state, out of total 4526 Primary Agriculture Credit Cooperative Societies, 3376 PACCS are accepting the deposits from their member farmers. As on 31.03.2019, INR 133051.00 Lakh is deposited into these 3376 PACCS. This huge deposit is insured under the aegis of Deposit Guarantee Insurance Scheme (1994) issued by the Government of Madhya Pradesh. As per extant rules, all types of deposits of each depositor of PACCS is guaranteed up to a maximum of INR 50000.00 cumulatively for both the principle and interest amount on deposits held by him in that particular PACCS.

¹ Rajkumar Gangele is an employee of MPSCB, Bhopal. The views expressed in this paper are solely of the author and do not necessarily reflect those of his employer MPSCB, Bhopal, Madhya Pradesh.

² In European countries they are called "Credit Unions".

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A study of Problems faced by MSME's in Madhya Pradesh

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Abstract- In developing countries like India MSME's play a vital role in the development of economy. As per the population of India this sector has a wide scope. MSMEs are the backbone of the Indian economy and have become engine of economic growth in India. If MSME's are developed other problems of economy can be dissolved automatically. But in completion with other large scale industries these have to face so many problems. If efforts are taken these problems can be solved and this sector can help in the development of India.

Key Words- Micro Small and Medium enterprises, growth rate, Problems.

Introduction: Indian Micro Small and Medium Enterprises (MSME) area has developed as a very energetic and dynamic segment of the Indian economy in the course of the most recent five decades. SMEs not just assume urgent job in giving substantial work openings at similarly bring down capital expense than extensive enterprises yet in addition help in industrialization of provincial regions. MSMEs are reciprocal to substantial businesses as auxiliary units and this area contributes colossally to the financial improvement of the nation. In spite of their high excitement and inalienable abilities to develop, MSMEs in India are likewise confronting various issues like imperfect size of activity, mechanical oldness, inventory network wasteful aspects, expanding residential and worldwide rivalry, working capital deficiencies, not getting exchange receivables from vast and multinational organizations on time, lacking gifted labor, change in assembling methodologies and violent and indeterminate market situation.

Objectives: The main objectives of the present study are:

- To study the growth and performance of MSME's.
 - To analyse the problems of micro small and medium scale industries.
- Research Methodology:** The Data required for the study has been collected from Primary and secondary sources.

The primary data is collected through questionnaire. The Secondary Data Collection includes (i) Annual Reports of Ministry of Micro, Small and Medium Enterprises, Government of India, (ii) Various Websites related with

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Moving Towards Differential Premium Model – A Study of Financial Performance of Urban Cooperatives Banks of India with respect to Deposit Insurance System.

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Abstract - In Indian Banking System, Deposit Insurance and Credit Guarantee Corporation (DICGC) is entrusted for the deposit insurance of the money deposited by the depositors in the banks. At the end of March 2018, 2109 banks were operating in India including all Commercial banks, Regional Rural Banks and Cooperative Banks. During the 1990s, the Urban Cooperative Banks (UCBs) were registered in a great momentum and at the same pace most of them got failed due to peculiar reasons.

Still, Urban Cooperative Banks are deregistering at the moderate speed. As on March 2018, 1551 Urban Cooperative Banks were operating in India which constitutes 74% of the entire banks of India. At present Deposit Insurance and Credit Guarantee Corporation is charging the premium from the banks over the deposit outstanding on Flat Rate Basis. This paper argues that the Risk Based Premium needs to be charged from the Urban Cooperative Banks in the light of risk they exposed on Deposit Guarantee fund of the DICGC on account of their financial performance.

Key Words – CRAR, Deposit, NPA, Premium, UCBs

JEL Classification – G21; G28; G30

I. INTRODUCTION

Way back from 1904, cooperative institutions have been playing a great role in Indian financial system, particularly in the area of rural credit. They have been instrumental in the counter balance of the informal rural credit channel dominated by the *Sahukaars* and *Mahaajans*. At the same time, in the urban area, urban cooperative credit institutions were performing far better than the rural credit cooperative channels. With the peculiar "Localized" characteristics, these institutions were instrumental in developing the confidence of the people in cooperative credit delivery system. How these credit cooperative channels build the repo in the general mass may be noted from this fact that, during the crisis of 1913-14, not less than 57 joint stock banks got collapsed and the money kept in these banks was transferred by the depositors into the urban credit cooperatives.

The MacLagan Committee (1915) observed that, these urban credit institutions are more suited to serve the needs and also the development of thrift amongst the urban people particularly in lower- & middle-class strata. The committee also appreciated that the urban cooperative credit movement was more viable than agriculture credit societies. Committee made on records the role of urban credit cooperatives in 1913-14 crises on account of its local character and publicity of cooperative institutions. With this positive note, committee paved the way for establishing the urban cooperative movement on self-sustainable model.

The Varde Committee (1963) introduced the concept of minimum capital and the norms of population for defining the urban centre for the incorporation of Urban Cooperative Banks (UCBs). Before the augmentation of Licensing Policy of New Urban Cooperative Banks (1999), the earlier licensing policy of RBI was broadly based on the recommendations of the Marathe Committee (1992). Under the recommendations of Marathe Committee, licensing of a new UCB was allowed on the basis of the need and future potential for mobilization of deposits and purveying of credit. The formula was number of urban cooperative banks functioning at a given centre (excluding the presence of commercial banks) and the Average Population per Bank Office (APPBO). The recommendations of Marathe Committee led to the sharp growth in number of UCBs in India.

In March 1999, 1936 UCBs (including 29 schedules & 1907 non schedules) were operating in India. To check the mushrooming growth and on the account of heavily deteriorating financial position of UCBs, the Reserve Bank of India came up with the Vision Document in 2005 inculcating the prudent regulatory and supervisory control over the functioning of these UCBs. The Vision

The Impact of Consumer Perception Based Advertisement and Celebrity Endorsement on Brand Acceptance

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ABSTRACT

Celebrity endorsement has been established as one of the most admired tools of advertising in modern instance. It has turned out to be a trend and is seeming to be as a winning method for product, marketing and brand building. It is effortless to choose a celebrity but it is tough to create a strong association between the product and the endorser. While the magnitude impact of celebrity endorsement remains very powerful, this paper is an effort to analyze the impact of consumer perception based advertisement and celebrity endorsement on brand acceptance. The result of the study prove that consumer perception based advertisement and celebrity endorsed advertising positively impacts the purchase intention of the customer.

Keywords: Consumer Perception, Celebrity Endorsement , Brand Acceptance

INTRODUCTION

In today's competitive world consumers are exposed to thousands of voices and images in magazines, newspapers and on billboards, websites, radio and television.

"Advertisements that use celebrity endorsers enjoy high popularity among brand managers. Each year, companies spend vast amounts of money to convince celebrities to endorse their products and brands for instance; In India approximately 45 percent of all televised commercials feature celebrities; in US, approximately 25 percent of all advertising campaigns employ the celebrity endorsers. This communication strategy benefits from the widespread belief that celebrities positively influence the image of the advertised brands, such that a key outcome is a favorable effect on brand image" (Erfgen, 2011). The latter part of the '80s saw the growing of a new trend in India brands started being endorsed by celebrities. Hindi film and TV stars as well as sportspersons were roped in to endorse prominent brands. Probably, the first to cash in on star power in a strategic, long term, mission statement kind of way was Lux soap. This brand has, perhaps as a result of this, been among the top three in the country for much of its lifetime. India is one country, which has always adored the stars of the celluloid world. Therefore it makes tremendous sense for a brand to procure a celebrity for its endorsement. In India there is an exponential potential for a celebrity endorsement to be perceived as genuinely relevant, thereby motivating consumers to go in for the

study on factors assessing teacher's awareness and usefulness of Information Communication Technology in higher education in Delhi

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Abstract: Today is the age of technology and information, where consumer attitude and beliefs are important factors deciding the technological adoption and its usage. Their perceptions changes with time as they gain experience with the technology use. This research has been carried to examine the factors which assess teacher's level of awareness and usage of Information Communication Technology in higher education. The objective of the research is to identify the most influential factors for the awareness and usage of technology by teachers in higher education and to study the impact of gender on it. The data collected for our research showed significant evidence in support of our hypothesis. The study provides a holistic view of technology usage and significantly improves the understanding of technology acceptance behavior of teachers in higher education which will prove valuable to both researchers and practitioners.

Keywords: Technology Adoption, Information Communication Technology (ICT), higher education.

INTRODUCTION

Today the effect of ICTs has been greatly realized at the workplace and in everyday life, these days educational institutions put many efforts to redesign their educational curricula and classroom facilities, so that they can bridge the prevailing technology gap in learning and teaching. (Buabeng-Andoh, 2012).

The capability of teachers got enhanced with technological innovations, to manage and disseminate knowledge, and students have got new opportunities to enhance their knowledge in different aspects (Chai, Koh & Tsai, 2010, Hong & Songan,2011). Computer skills and knowledge have more positively affected success, both occupational and personal. In majority of cases, the teacher play crucial role in effective implementation of computers use in the educational system and as it is known that teachers have tremendous potential to develop beliefs and values in students, there is dire need to study the biases and stereotypes that teachers may have about the computers use and the factors that play the role of facilitators to teachers' favourable computer usage (Teo et al,2008).

Teacher's attitudes towards computers decide the extent of computers use in the classroom and these positive or negative attitudes, result into how teachers respond to technologies. This further affects the way

“An Exploratory Study of Sustainable Financial Inclusion through Pradhan Mantri Jan Dhan Yojana and Digital India Mission”- A Leap towards Global advancement.

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Financial inclusion (FI) is emerging as new paradigm of economic growth aims at providing banking and financial services to every individual in the society without any prejudice. In India 68.84% (census 2011) population lives in rural area and rural finance helps to propel the socio-economic development of nation. Sustainable Financial Inclusion refers to access to timely, economic, adequate and affordable credit for all the sections of society, especially the underprivileged section is a concept which is well known but not well understood. Government is taking various initiatives including Digital India Mission, PM Jan Dhan Yojana (PMJDY) for the overall sustainable development of nation. The current study is intended to analyze the impact of these recent initiatives on Sustainable Financial Inclusion in India. This paper reviews trends in banking sector for financial inclusion and growth of technology in India. The paper underlines the recent initiatives taken by Government of India boost to promote financial inclusion across the Globe and concludes that Sustainable financial inclusion is essential for driving away the poverty and also to strive for Inclusive Growth in India.

Key Words: Sustainable Financial Inclusion, PMJDY, Digitalization Inclusive Growth.

Introduction

Financial Inclusion is a Flagship Program of RBI which aims at bringing the people under the ambit of formal financial environment. It focuses on offering timely, economic and reliable financial services to all sections especially the underprivileged without any prejudice. India is a country having 68.5 % of people still residing in rural areas. To meet the needs of this population which is also referred as Bottom Pyramid, it is essential to have effective Financial Inclusion. For inclusive growth of rural economy there should be easy access to finance at affordable cost that will ultimately create employment opportunities in rural areas. RBI has defined Financial Inclusion as “process of ensuring access to appropriate financial products and services needed by all sections of the society in general and vulnerable groups such as weaker sections and low income groups in particular, at an affordable cost in a fair and transparent manner by regulated mainstream institutional players”. Financial access is a component of Financial development, along with length, breadth and depth. Access to transaction account is a first step towards broader financial inclusion as it serves as a gateway to other financial services like credit or insurance etc. Initiation and Growth of Financial Inclusion (FI) can be delineated as under:

A Review Based On Study Of Applications And Usage Of ICT In Economic, Educational And Industrial Development

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Abstract: Current research aims to review the literature available on the role or applications of ICT in the economic development, educational and industrial development. The study is purely conceptual in nature, and based on the secondary data. Researchers has collected the studies conducted by researchers across the globe on the role of ICT in different areas; using various data bases such as; EbSco, ProQuest, Emerald etc. Overall, it was found that ICT has gained significant importance in the last decade, all the studies across the globe confirms the fact that increased use of ICT in different areas, can lead to high level of economic growth and development. At the same time ICT can be make a useful tool to improve the quality of education and also plays an important role in industrial development by simplifying the industrial processes and increasing the industrial output at its optimum level.

Keywords: Economic development, education, industrial development, India, ICT, E-governance etc.

Introduction: ICT sector in India traces its history to the initial period pre 1990's i.e. pre liberalization era when it was in a primitive stage. With the advent of many private & Global players the ICT sector in India has seen a meteoric rise both in terms of tools & services. But still till the end of the 90's decade owning a Mobile phone was considered to be a luxury available to the elite few. But in the last decade or so the technology has grown leaps & bounds, especially the wireless technology. Not only a lot of new innovations have been happening at a very fast pace but also the user base has increased drastically due to availability of affordable smart phones. Today more than 50% of mobile phones users have smart phones. It is expected that in next 4 years the no of Smart Phone users will reach 442 Million while just a year ago the population was just 300 Million. At the same time there are approximately 420 Million Internet connections as well. The low tariffs for calls & data, thanks to the competition amongst players, have been the enablers. However, with this rapid growth in users especially after the introduction of smart phones there have been certain concerns as well with regards to the efficiency of the data services & constant call drops which is forcing the telecom operators to address these needs on a priority basis. ICT has been one of the fastest growing sectors in India with its contribution to GDP increasing year on year. Its contribution to Government coffers is next only to Income tax collection. Not only that but it is also one of the significant contributor to FDI in India. An extensive information communication & technology infrastructure across the country has played an important role in this growth & in fact all the components of ICT such as Consumer & Industrial electronics, computers etc have registered a ballistic growth in last decade or so. In 2016 India's approximate revenue from ICT sector was USD 160 Billion, an increase of 9.2 % over previous year. Out of this major contribution of approximate 70% (USD 110

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Fueling Agricultural Growth In Madhya Pradesh Through Formal Credit- A Way Towards Financial Inclusion

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ABSTRACT

Financial inclusion is emerging as new paradigm of economic growth. In India 68.84% (census 2011) population lives in rural area out of which 25.70% people are poor and rural finance is a matter of credit concern in the economy. Madhya Pradesh has reported the best productivity growth in terms of Agriculture over past few years, and has improved its infrastructure. This kind of change in one sector – agriculture – is initiating growth in the entire economy of the state. Agriculture in Madhya Pradesh (MP) grew at 9.7 per cent per annum during the decade (2008-18). The last five years have been spectacular when agricultural growth rate stood at 18% per cent per annum. The study intend to examine the influence of access to credit on agricultural productivity in Madhya Pradesh, It is based on the secondary data compiled from several sources, has revealed that the formal credit to agriculture in real terms has increased during the past decade. The nature and availability of panel dataset constrained the study to examine the pooled data analysis for arriving at results. The analysis was carried out with the data of selected districts of Madhya Pradesh over the period 2008-2018. The findings of the study shows the evidence of long run relationship between agriculture production and agricultural credits provided to small and marginal farmers. The results revealed that total credit to agriculture has a positive and significant impact on the level of agriculture production in the region. The Study also examines nature of the relationship between formal agricultural credit and productivity of crops which ultimately led to an improvement in state GDP. One of the major findings was related to inadequacy of credit to small and marginal farmers. Therefore more innovative models are required to be formulated using Econometric Financial Models for making the credit

A STUDY ON CONSUMPTION BEHAVIOUR IN FOOD RETAIL INDUSTRY IN INDIA

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Introduction

Food retail sector in India has changed drastically after liberalization of Indian economy in 1995. The food retailing format has evidenced major developments and restructuring with the introduction of major multiplies than dominant independent traders. This change has been so drastic and has been said as 'Retail revolution' (Fitch, 2004). Organised retailing is still in development phase especially in for food retail chains. It has rather adopted this revolution slow that has been rapidly adopted by all other Asians countries known as Asian tigers. This was basically due to the efficient food retailing system by kirana (mom and pop) stores which continued to fulfil the demand.

According to Mc Kinsey Report, The rise of India consumer market is it will grow four fold. India is one of the most prominent countries across the globe due to its current retail growth. The food and grocery segment is still the primary segment consisting of 65% of share in Indian retail market. As per Euro monitor international's consumer data base it has been projected that Indian consumers will spend more on fresh food and it will add 130 million new consumers by 2015.

The total sales of food retail industry are approximately \$ 176 billion, almost half of total retail sales of \$330 billion. The industry has experienced about 10% per annum over the past few years slightly more than the GDP growth rate. Food retail sector generates employment for approximately 50% of people who are employed in retail. As far as the food retail outlets numbers is concerned it has one

third of all retail outlets and major chunk of retail revenues 63% of total retail sales. Tata Strategic management Group projects that the organised food & grocery retail industry could grow to Rs. 1750 billion (at current prices) by the year 2015 taking out 11% of overall Food and Grocery sales.

The Indian food retail industry is highly fragmented and is often said as being "unorganised" or part of "unorganised" sector. There are approx 12-15 million outlets, including push carts, wet market and kirana stores, scattered all over the country selling food and related items. These kirana stores are dominating the entire retail food sector throughout urban and rural areas. These outlets generate employment for millions of Indian people whose interests are represented by different trade groups.

Current size of Modern Food Retail

Retail food sales are estimated at \$270 billion which caters to 60 percent of total retail sales and a \$225 per capita annual expenditure on food. As per the estimates modern grocery retailers managed to crave out an estimated one percent share of food retail sales in 2005 and that share has reached to two percent in 2011 or \$ 5.4 billion.

Traditionally Indian food retail industry comprised of two formats: Kirana (mom and pop) stores and pushcart vendors. Kirana stores were mostly family owned, being small in size and having limited number of items in its merchandise, basically run by family members and supplemented with some people hired. The numbers of such outlets were

Impact of Demographics on Online Buying Behaviour: An Exploratory Study of Consumers of Bhopal

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Abstract

Online buying is a latest trend in the field of E-commerce and will definitely going to affect the future trends in buying and will be the future of shopping in India too. Most of the companies have opened their doors for customers on Internet too to buy product and services. All the big brands are today showcasing their products online. Indian market is although new to this phenomenon but still considered to be a large strategic market. With this view in mind, this study is being triggered to study the online shopping habits in Bhopal. Buyers shopping perception is studied on the basis of various demographic factors such as Age, Gender, Profession, Qualification and Income. The primary data of respondents was collected through Questionnaires and a sample size of 270 respondents is being collected. The quantitative and qualitative approach to conduct the research study is being applied. The results of the study proved that demographic factors in Bhopal does not significantly impacts the online buyers purchase intension. The results of the study could be used for further study in different cities in India.

Keywords: On-line Buying behaviour, Demographics, Age, Income, Gender, Qualification, Profession.

Introduction

Online business or e-business is a broader term used instead of Electronic commerce or e-commerce which includes all the activities done online for the major purpose of doing business online. E-commerce is basically a subset of big term online business which exactly means buying and selling of product and services on Internet. With the advancement in technology and a boom in a dot.com era e-commerce is at the front seat of the businesses being driven online. After China, India is emerging as a fastest growing region for online retailing showing a great potential. According to a report published in newspaper by ASSOCHAM "India's e-tail market was near about \$3.59 billion in 2013, it went up to \$5.30 billion in 2014 and is expected to touch unexpected \$17.52 billion mark by 2018. Also, the total retail sales in India will increase from \$717.73 billion during 2014 and it is going to touch \$1,244.58 billion in 2018" (The Hindu, New Delhi, 10 January, 2017).

Buying Behaviour of Consumer in Digital Environment:

Consumer

"A consumer is a person or group of people, such as a household, who are the final users of products or services.

Any person who purchases products or services for personal use and not for manufacture or resale. A consumer is someone who can make the decision whether or not to purchase an item at the store, and someone who can be influenced by marketing and advertisements. Each and every time when someone goes to a store and purchases a product such as a toy, trouser, bag, beverage, or anything else, they are making that decision as a consumer."(Chheda, 2014)

"Consumer behaviour is the study of individuals, groups, or organizations and the processes they use to select, secure, and dispose of products, services, experiences,

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Impact of social networks on students of Bhopal

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Abstract

India is a developing country in terms of every field whatever we talk about. With the advent of high speed internet services and the burgeoning use of smart phones has affected the lives of students in various aspects. Whether it is communication or their studies everything is captured easily with the help of Internet. Due to the fast growing use of internet has given birth to various types of Social networks i.e. Facebook, Instagram, Pinterest etc. Before the introduction of SNS, students were seen using internet services via laptop or P.C. The students get limited time for interaction but due to the inauguration of smartphones and launching of various mobile based applications which has filled the gaps of the user and the internet applications. Hence, students can linger on with their smart phones for 24x7 times for any reason. It has been also found that students spend more time on Online Social Networks(OSN) rather doing personnel email, surfing net for educational purposes. It is surprising to see that students are connected to their friends despite of geographical boundaries and demographic factors. With the easy availability of Internet has made students 'dependent'. For any queries, whether related to their studies or their career they don't even refer to their books or ask teachers to clear their doubts. The students now a day not even note their timetable nor takes short notes, they click the camera for it. This is degrading their writing habits due to which they fight problems in writing exams. They are indulging themselves into a never ending array of technology which has made today's students more handicapped. This shows reduced interest in studies and less focus on learning. Current study is focussed on finding out the most popular SNS used by students of Bhopal and various activities in which students are engaged in. Also it will throw light on the impact of age and gender of students on usage of SNS and their performance academically.

Keywords : Social Networking Sites, Academic Performance, Age, Gender, Entertainment activities.

Introduction

As the internet is circumventing its presence everywhere and is acting as a loaf of bread in the hands of youngsters. The Internet has shown a tremendous evolution from communication to business medium and then transformed itself from a business to a more powerful information sharing medium. And this facility is grabbed by today's youth who are more techno savvy, interactive and social. In today's era, communication is a buzzword for young generation or we can also call them as e-generation.

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Sales Promotion and Its Impact On Consumer Behaviour

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Abstract

Modern marketing relies heavily on sales promotion, an industry technique that has been researched for years. Promoter's goal is to reach and convince the targeted customers. To market products and services, or a concept, sellers must coordinate all of their efforts. An important part of a promotional mix is sales promotion. Consumer purchasing behavior will be examined in this research. Overall, this research sought to determine the impact of sales promotion tools and methods on consumer purchasing behavior. Consumer purchases are increased as a result of sales promotion marketing efforts. It is thus important to contact the targeted customers and convince them to purchase. To reach more customers, the apparel retail company has effectively entered the consumers' market and quickly expanded from metros to tier-II cities. As a strategic move, contemporary clothing stores provide youthful customers a wide range of worldwide brands, styles, and fashions at a reasonable price. Retailers use a variety of promotional techniques to entice customers and make them aware of the idea of "best deal". These include price reductions, discounts and buy-one-get-one offers, and each has a varying degree of acceptability and efficacy among consumers. On the developing market, the purpose of this study is to evaluate the effect of various promotional methods.

Keywords: Consumer, Sales, Promotion, Marketing , Internet..

1. INTRODUCTION

Merchandise acceptance and sale are promoted via advertising, publicity, or discounting, according to Merriam-Webster (Merriam-Webster OnLine, internet, 2010). As of today, promotion includes "the coordination of all promotional efforts (media advertising, direct mail, personal selling, sales promotion, public relations, packaging, shop displays, website design, staff) to create a cohesive, customer-focused message" (Ferrell & Hartline, 2008, p. 282). This is mostly due to promotions being one of the most noticeable marketing activity. The importance of understanding which promotions consumers like, as well as their impact on customers and customer behavior, cannot be overstated.

We want to acquire a better knowledge of promotion techniques and evaluate them as they have been used in supermarkets. This study project also aims to determine whether there are any specific marketing techniques that have a significant impact on the buying behavior of Tesco Lotus consumers. Any company that wants to distinguish itself from its rivals should examine the numerous promotions it has used and the outcomes it has achieved (both successful and failed). What promotion techniques work and which don't, why they work and what impact they have on customers and consumer behavior may be the determining factor in whether or not a company can continue to exist.

In the marketing mix, sales promotion is an essential component. A few hours or a few days is all that is required for sales marketing efforts. A major benefit of this instrument is that it has a direct impact on consumers' willingness to try out new products. It is unable to maintain consumer loyalty over the long run. As a marketing strategy, both manufacturers and merchants use sales promotion to promote their products. In order to increase sales, merchants and wholesalers must engage in a variety of communication initiatives.

Online and Offline shopping in India. study of electronic goods purchase

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Abstract

Online shopping is not a very new but also not a very old phenomenon in this time. It can be said that it is old for those who are habitual with this but it is new for those who still get it very tough and insecure to deal with. The present study is to find out the consumer behavior towards online shopping in India for the purchase of electronic goods. Researcher has tried to find out the motives that instigate the consumers to go for online shopping and if not, then what are the reason behind it. The objective of the research is to study the behavior of consumer while doing shopping whether it is online or offline. In the study it is found that people go for online as well as offline both. But they do not prefer online shopping for electronic goods purchase. They are still more comfortable with the offline shopping for the same.

Keywords: - *Online Shopping, Offline Shopping, Consumer, Electronics Goods.*

1. INTRODUCTION:-

In today's world no one can think to live without internet, even on villages. Everywhere it is spread like a wind. If someone wants to talk to their closed one, they can, they see them they can send msg free of cost, they can search anything on google, they can find someone, they can send their love with gifts to their special ones and so on. This is the power of advancement of technology. Now a day's people are more knowledgeable than ever, they spend their time in collecting the information about various thing, because they are very curious about everything. They first gather the proper information then they decide that whether they want do it or not. It is said that humans think twice before they act. It is absolutely true when it comes to spend their hard-earned money. Yes, here researcher is talking about shopping. The most important part of human life. Everyone loves shopping. Sometime it is for the fulfillment of need and sometime it is for just the enjoyment.

However, it consists time and money both, the role of technology is very necessary over here. The advancement of technology is also the part of shopping, and the online shopping is the result of this advancement. Online shopping brings a lot of changes into the traditional market. This facility provides a lot of choices in product, convenience, comparison between the product category and very easy to find anything at one place. Major consumer who choose to go for online shopping is because they need convenience and speed at same time. So as there are always two faces of every coin, there are some consumers, who still feel uncomfortable in online shopping. Because of security issue, trust issue and sometime because it is very much convenient. They believe in touch and feel concept, which is not allow them to go for online shopping. They want to touch the product, get an idea about it with friends and family, then they will invest on it.

The researcher has tried to first provide the theoretical and conceptual framework that includes the differences between consumer buying behavior for online and offline shopping. Further it will add some factors that are responsible for choosing any one of them, and last but not the least there are some managerial implication that will help the online sellers to improve their sales.

2. BACKGROUND OF STUDY

Online and offline shopping

Online shopping and offline shopping are two major factor that has to be considered, whenever the concept market is discussed. It cannot be denied that without considering these two, the definition of market will

ELECTRONIC HRM IN ITeS SECTOR

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Abstract:

Human Resource Management takes care of two main categories of functions i.e. "Managerial" and "Operative". HRM performs managerial functions by executing operation function for the purpose of achieving organizational goals.

In past Human Resource Management (henceforth HRM) and Information Technology (henceforth IT) domains used to be seen as stand-alone divisions which cost money and they were treated as overhead expenses; but in 21st century, they more act as a single entity for managing enterprise management i.e. electronic human resource management (henceforth e-HRM). Hence, e-HRM attracted attentions of various researches for being a key point of the enterprise management and to be competitive in today's business environment. Even though the e-HRM is a huge investment to begin with for the organizations, it can save the cost in long run and increase the effectiveness.

This paper highlights the significance of numerous options available within e-HRM and various benefits it offers, also tries to uncover the patterns of awareness, attitudes, acceptance and behaviours pertaining to IT/e-HRM amongst human resource professionals and employees in IT & IT Enabled Services (ITeS) industry for organizational advantage.

Keywords: Human Resource Management (HRM), Information Technology (IT), HR functions, Electronic Human Resource Management (e-HRM), IT Enabled Services (ITeS).

I. INTRODUCTION

Human Resource Management performs managerial functions (Planning, Organizing, Staffing, Directing and Controlling) by executing operation functions (Procurement, Development, Compensation, Maintenance and Motivation, Integration and Industrial Relation) for the purpose of achieving organizational, individual and societal goals.

Data and Information are the main drivers of the 21st century and Information Technology plays a role of guiding factor in a knowledge base industrial 4.0 revolution for gaining competitive business advantage and for achieving organizational goals.

The term "e-HRM" was first used in the 1990's to reference HRM "transactions" conducted via electronically (Intranet or Internet) and it refers to doing "HR Managerial/Operative activities" by at least two individuals/actors with the help of IT/e-HRM.

E-HRM is still a relatively new research area for scholars, but there is still a well-established knowledge on the use of e-HRM. Use of e-HRM over the past decades surged due to its administrative and strategic benefits, as adoption of e-HRM is supposed to change the HRM configuration within companies. However, empirical evidence suggests that the tangible attainment of expected benefits (especially strategic transformation of the HR function), is scarce. Therefore, several authors have questioned the relevance of a deterministic view of e-HRM as change agent in itself and suggested that e-HRM is the outcome of strategic choices which HR makes. The adoption of e-HRM technology does not necessarily mean organizational effectiveness. Recent literature suggests that the deployment of e-HRM can both be a predecessor of strategic HRM as the successful implementation of IT solutions depends on strategic inputs from HRM. However, E-HRM's outcome depend on the broader context in which organizations exist. Therefore, understanding how e-HRM is to be adopted is more important.

In order to answer all the above questions and to study the conceptualization of e-HRM adoption, we treated e-HRM configuration as a combination of the actual degree of technological presence and the degree to which the technology is used to enable HRM activities.

Our study is based on a configurational approach in order to provide methodical knowledge, moreover, as recommended by Strohmeier & Kabst, we determine which factors drive the emergence of these configurations via our research design. Therefore, our research questions are:

1. Which configurational type of e-HRM implementation actually occur with both IT & HRM focus?
2. Which factors explain the occurrence of a certain configurational type of e-HRM?

The business world is changing, new technologies (internet, smartphones, etc.) have made information available 24x7. Smart phones give applicants access to countless job searching websites like monster.com, naukri.com, timesjob.com, etc. and their mobile app's on android &/or apple platform. Most young professionals now a days use social media sites (Facebook, Twitter,



A Study of Hr Audit in Print Media Organization of Madhya Pradesh

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Abstract

A systematic HR audit can help to develop strong relationship between departments and working manager on the other hand HR audit creates discipline among the employees and encourages them to move out from natural technique to be more accurate assessment of the probable benefit to be achieved. HR audit also helps organizations in to the following areas such as identification of various essential HR activities in order to achieve the organizational objective, analyze that how well the HR department is working on these program, assess HR work to insure continues progress and encourage change and creativeness. The present study dealt with Study of HR audit in Print media organization of Madhya Pradesh, in order to examine impact of HR audit on various HR practices we have selected and identified few dimensions such as Job Analysis, Performance appraisal and reward management. Study based on primary as well as secondary data which has been collected through various instruments such as questionnaire and different sources such as published sources. Findings of the study clearly indicated that all the dimension of HR practice significantly and positively related with HR Audit of Print Media Organization.

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I. Introduction

In the present competitive scenario of business, it has become necessary to analysis of various human resource activities and reviews their contributions in to more systematic and disciplined manners. Recently the Indian industry has insistently adopted various innovative methods such as human resource audit and balanced scorecard to balancing performance management system across the organization. Human resource audit is not only tools for majoring human resource activities of an organization but also an essential dimensions of complete human resource system. Human resource audit essentially assess the effectiveness of various human resource practices. HR audit provide feedback about HR function to operating managers and also provide useful information to HR department about operating managers working performance that how they are full filling their duties. HR audit is systematic process to control and insure the human resource activity in to public as well as private organization. The present research study dealt with the study of human resource audit in to the selected print media organization in Madhya Pradesh in this process it has been discussed that how HR audit is implementing in print media organization in order to ensure effective functioning of various HR functions as well as practices

Human Resource Audit

As we know that audit is normally related with financial accounting and also a procedure to examine and verifies any company accounting records on the other hand HR audit is similar idea in the field of HR. HR audit engage in examination and evaluation of organization and policies and practices regarding training and development, recruitment and selection, job evaluation, orientation and placement, compensation, motivation, health and safety, social welfare and industrial relations etc.



MANAGING HUMAN CAPITAL USING IT TOOLS & TECHNIQUES

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Abstract

The This paper discusses the necessity of overseeing Intellectual capital by integrating concepts of HRM and tools & techniques of IT especially DW and DM, so as to achieve e-HRM.

During 21st century, HRM has entered into the "digital age", and HR managers must keep up the pace to meet the faster demand of a lot younger Generation Y and Z workforce.

Keywords: e-HRM (Electronic Human Resource Management), HR (Human Resource), IT (Information Technology), DW (Data Warehousing), DM (Data Mining)

I. INTRODUCTION

HRM deals with two groups of functions i.e. "Managerial" and "Operative". HR management deals with managerial functions by carrying out task function for the purpose of contributing to organizational and individual goals.

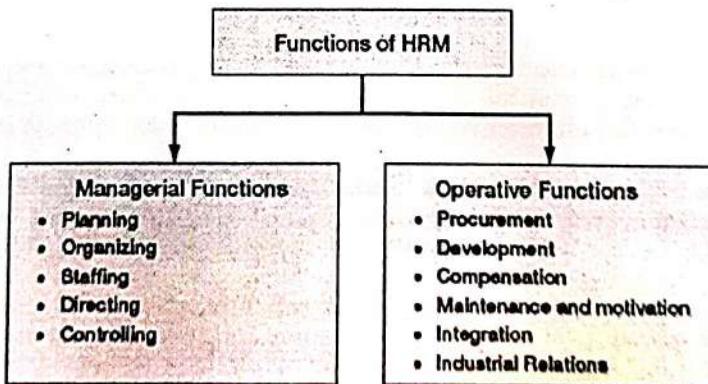


Figure: 1 (Pravin Durai, 2010)¹

IT plays a key role in achieving organizations goals and providing competitive advantage. Information and IT are the main drivers and guiding factor in a knowledge based industrial revolution of the 21st century. In today's networking era, business use IT as leverage to survive, grow and thrive in a highly competitive environment.

¹ Durai, Pravin (2010). *Human Resource Management*. New Delhi: Pearson.

A Critical Evaluation of Safety and Service of Public Rail Transport in Madhya Pradesh

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Abstract

Rail transport is very important in India. Passengers expect the rail transport should follow punctuality and time schedules. Safety and service provided by rail transport need to critically evaluated for the users prospective. Safety during travel, safety at terminals, availability of guard, safety of luggage, fire safety, prohibition of dangerous material, night security check are main safety criteria for public rail transport. Service provided by staff, washroom availability, service quality of amenities, service availability at rush time, adequacy of railway station, adequacy service at ticket counter, behaviour of staff, are main identified criteria for this study. User satisfaction on services provided and user satisfaction on safety is measured in five-point Likert scale. Primary data for present study collected through questionnaire. Questionnaires are designed to access user satisfaction with respect to safety and service provided by rail transport. It is found that passengers are satisfied with safety available during journeys and safety at railway stations. Passengers are concern about safety of luggage. Passengers are satisfied with the efficiency of staff, behavior of staff, number of railway stations but passengers want more wash rooms facility in public rail transport.

Keywords

Public Rail transport, safety, service, satisfaction, fire safety, efficiency of staff

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Name of Author, Year, Title of Paper, Name of Journal, Volume, Issue, Page no., Impact Factor/ Indexing.

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Conferences attended:

1. "People, Resources and Development", Paper presented in National conference 31st Indian Geography Congress at Rani Durgawati University, Jabalpur during 19-21 November, 2009.
2. "आदिवासी क्षेत्रों में गरीबी का तुलनात्मक अध्ययन: मण्डला जिले के संदर्भ में", Paper presented in National Seminar on Tribal Society of India at Institute for Social Development and Research, Gari Hotwar, Ranchi (Jharkhand) during 18-20 February, 2012.
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4. "National Assessment and Accreditation Council (NAAC) Awareness Programme (NAP) on Assessment and Accreditation Workshop", Participation in National Workshop Sponsored by An Autonomous Institution of the University Grant Commission Bengaluru, India Organised by Internal Quality Assurance Cell (IQAC) at Barkatullah University, Bhopal during 11th January, 2019.
5. Member, National Seminar "Challenges of Regional Development and Inclusive Growth in India", Organised by Department of Regional Planning and Economic Growth, Barkatullah University, Bhopal, During 06-07 March, 2020
6. National Webinar on "Impact of Covid-19 on Higher Education System", Organised by Deapartment of Applied Science SIRTE Bhopal on 23rd July 2020.
7. National Webinar on "Impact of COVID-19 on Indian Agriculture and Economy", Organized by Department of Geography, sponsored by Internal Quality Assurance Cell (IQAC) , L. V. H. College Panchavati, Nashik on 6th August 2020.
8. National Webinar on "Environmental Issues & Livelihoods", organized by Department of Geography & IQAC, Vasundhara College, Ghatnandur, Dist. Beed, Maharashtra & Late Shankar Rao Gutte College, Dharampuri, Dist. Beed, Maharashtra on 29th August 2020
9. Faculty Development Program on "Online Training Tools" from 6thOctober, 2020 to 8th October, 2020 organized by University Institute of Technology, Barkatullah University, Bhopal.

Member of Professional bodies:

1. Editorial Member of International Journal of Bhopal.

(Dr. Chhote Singh Armo)

Muslim Marriage in Kashmir : Socio-Cultural Overview

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ABSTRACT :- Kinship represents the classification of all those who are considered to be related and encompass all the social usages and patterns of behavior among the relatives. In this regard, the kinship system provides the most useful index of social organization. It gives rise to series of structural relations and levels of interactions in the Muslim community. A large number of Hindu rituals, for instance, those related to childbirth, death, and marriage, etc were to a greater extent accepted by the Muslims as social usages. These new customs became so deeply rooted that even on the religious and sacred occasions their performance became common. Actually, the transfusion and adoption of these socio-cultural traits brought the two communities closer to each other.

Kinship among Muslims :- Man is a social animal. At every step in his life, he realizes the importance of society and its different groups that lend towards his existence. These groups help him in the development of his personality tying him in bonds of affinity and compassion and equip him with human values. Kinship is the most important of these bonds. It incorporates even strangers into a group to make it more homogeneous, helpful and efficacious for man. Hence the importance of kinship can never be denied in any society. Kinship represents the classification of all who are considered to be related and encompass all the social usages and patterns of behaviour among the relatives. In this regard, the kinship system provides the most useful index of social organization. It gives rise to series of structural relations and levels of interactions in the Muslim community. The extended families are generally designated as

parivar. But generally, the term parivar indicates an extended family i.e. an agnatic kin group of three generation depth made up of patrilineally related men, their wives and unmarried children (ibid: 118). Besides the agnatic kin group, there are also the affinal and uterine kin clusters, which are of fundamental importance for structural integration in the Muslim society at the micro level. The affinal and uterine kins are commonly referred by the village Muslims as mehaman, who are behaviorally distinct from the agnatic kins, the relations among the kutums are characterized by distance, formality, and respect whereas the relations among the agnates are informal, face to face and intimate (ibid: 119).

Influence of Hindu culture on Muslim community came from different directions, in different forms and at different rates. A large number of Hindu rituals, for instance, those related to childbirth, death, and marriage, etc were to a greater extent accepted by the Muslims as social usages. Mujeeb also observes that "There are no accepted traditions which justify and provide a legal basis for the actual relationship between Muslims and Hindus, though many practices borrowed from the Hindus which became a part of the ceremonies of marriage, childbirth, and death were furnished ex-post facto with a legal basis"

Supporting the same viewpoint Yasin says, "In spite of jarring elements of political dissensions and in spite of the corrosive influence of religious antagonism, centuries of constant association and the growth of a common language and culture had brought the two communities near". Actually, the transfusion and adoption of

The Gujjars of Kashmir: Overview

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Abstract

The word Gujjar is derived from the Sanskrit Gurjara- the original name of Gujarat. A fanciful version is that their name comes from gau-charana meaning "to graze cattle". A uniformly imaginative origin is the Hindi word Gajar (Carrot), from the belief that the Gujjars fed their cattle on carrots (Bahadur, 1978). Sanskrit dictionary compiled by pandit Radhka Kanth (Shakabade, 1181) explains Gurjar Gur (Enemy) + Ujjar (destroyer). Gujjar means destroyer of the enemy. It is masculine gender. Its feminine gender is Gurjarani (Gujarani) (Chauhan, 2003). Gujjar is a tribe about which very little known to the people in general. There are different notions created by different people to describe the Gujjars. There are some sections and circles where the Gujjars are considered to be milkmen. There are the other people who when talk of Gujjars, in obvious response thinks of gypsy people with best outlook (Javed, 2003)

The Gujjars of Kashmir: Overview

The term "tribe" originates about the occasion of the Greek city-states and the early creation of the Roman Empire. The Latin term, "tribus" has since been changed to mean "A cluster of persons form a hamlet and claiming a descent from a general ancestor" (Fried, 1975). The range of meanings however, has grown ever further over the intervening years, for example, "Of various systems of social organization

Older Adults And Covid 19: Concerns, Challenges and the Way Forward

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Abstract :- The COVID-19 pandemic has spread over the world, wreaking havoc on the populace. While people of all ages are susceptible to getting the virus, the elderly are at a larger risk. The elderly are particularly susceptible to this disease due to a weakened immune system, physiological changes associated with ageing, reliance on others, and the presence of co-morbidity. In 2011, India's elderly population reached 104 million. The old-age dependency ratio in the country as a whole has climbed from 10.9 percent in 1961 to 14.2 percent in 2011. This is due to the growing population of elderly people. COVID-19 is expanding in India, and persons over the age of 60 accounted for 63 percent of COVID-19-related deaths at first. For elderly people, this reality creates a number of direct and indirect obstacles. With this perspective, the study aims to examine the senior population's concerns and issues in the aftermath of COVID-19.

Keywords :- COVID-19, Elderly population, Challenges, India

Introduction :- The COVID-19 pandemic broke out in December 2019 and spread throughout all of the world. It has a significant impact on the world's population. While people of all ages are at danger of catching this virus, the elderly are at a higher risk of developing serious sickness if they contract it. The elderly are more susceptible to infection due to physiological changes associated with age, diminished immune function, and the presence of co-morbidity. As a result, individuals are more prone to have severe COVID-19 disease, as well as more significant consequences.

According to the United Nations' Policy Brief on COVID-19's Impact on Older Persons, approximately 95 percent of COVID-19 fatalities in Europe have been adults aged 60 or older. Adults

aged 65 and up accounted for 80% of deaths in the United States. In China, persons aged 60 and more accounted for nearly 80% of all deaths. For elderly people, this reality creates a number of direct and indirect obstacles (UN, 2020).

When pandemics like COVID-19 strike, older people have a harder time getting medical treatment and health care. Lockdowns and concentrations of health resources to combat the pandemic may marginalize older people and create barriers to accessing health care for their underlying diseases, some of which may make them more vulnerable to COVID-19.

Slow economic growth and disrupted production cycles as a result of the lockdown are expected to affect the elderly in a variety of ways, including their ability to meet basic requirements such as food, clothes, shelter, and medical bills.

According to the Ministry of Health and Family Welfare in India, adults over the age of 60 accounted for 63 percent of the 109 deaths caused by the new corona virus at first. This creates a number of concerns and challenges for those over the age of 60, as well as their caregivers. In the light of the above, the paper aims to examine concerns and challenges of the elderly population in India during COVID-19 pandemic.

The review of literature :- The National Senior Citizens Policy classifies anyone above the age of 60 as elderly. This policy deals with concerns that affect older citizens in the country. In the coming years, many senior persons will require improved access to physical infrastructure due to increased longevity and crippling chronic conditions. Physical infrastructure is a significant impediment to delivering comfort to the elderly. Many senior citizens require improved physical infrastructure in both their homes and public settings. Because there is

Gender and Patriarchy (Understanding Social Typification)

Kumares Skandan Kashyap

Abstract

The institution of Patriarchy sows the seed of sex and social parameters of reality transforms it to gender. Gender affects and permeates every aspects of life leading to conflict at societal and individual level. Understanding the role of gender in conflict is best accomplished through an analysis of individual levels, interactional levels and the societal levels. The social construction of reality at these levels can be visualized cumulatively. Workplace problems challenges the traditional values of male dominance. Any analysis of gender without sexual component can turn out to be a futile imagination. Chronologically the status of women needs attention where the exhibition cum action is visualized in post marriage phase. Lack of persistent and continual effort leads to un-accommodative struggle for gender and gender role stereotypes cause problem. In this paper the focus is on how one stage leads to other and makes the reality very complex to understand.

Keywords: Gender, Patriarchy, Oppression, Sexual Vulnerabilities

Historically, when Indian women started to write their life stories It is, of course, a complex and contradictory fact that women's autobiography writing was a by product of colonialism. By all accounts, this genre had its roots in western literary and cultural traditions and was born out of a new wave of individualism and selfhood, social reform, and in particular, the movement for female education, women's life-writing was interlinked with western notion of individualism. More importantly, still, the writing of autobiographies by women denoted the growth of a sense of selfhood.

By the 19th century, the position of women in upper caste Hindu society had badly declined and they were subjected to wide-ranging oppressive

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