3.4.6 Number of books and chapters in edited volumes published per teacher during the last five years

3.4.6.1: Total number of books and chapters in edited volumes / books published, and papers in national/international conference-proceedings year wise during the last five years: 112

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S. No.	Documents	Page No.
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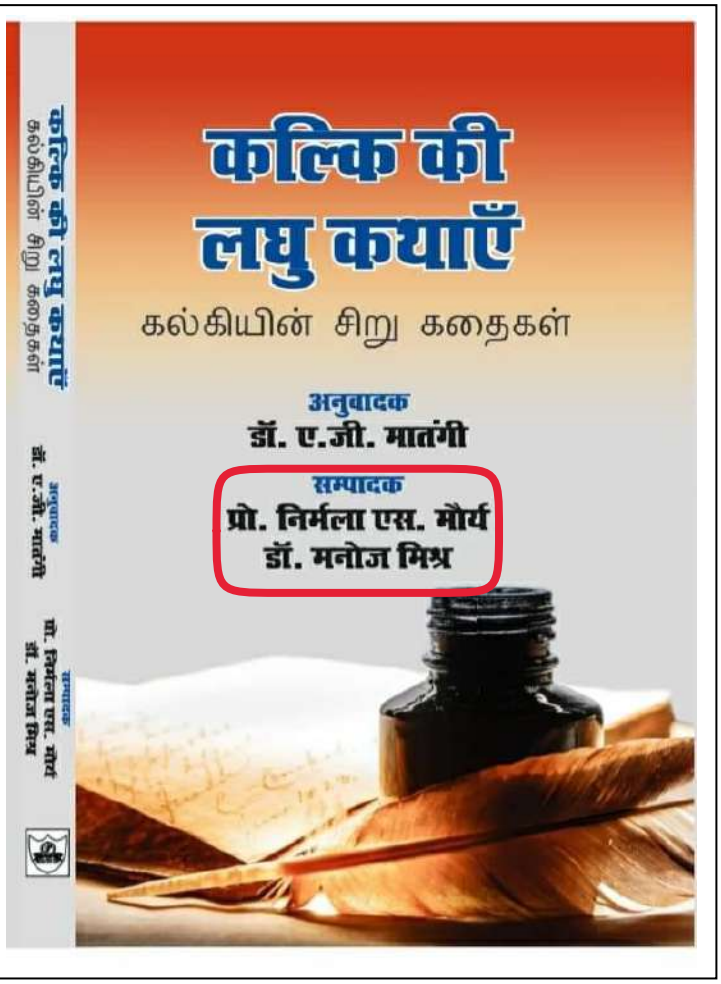

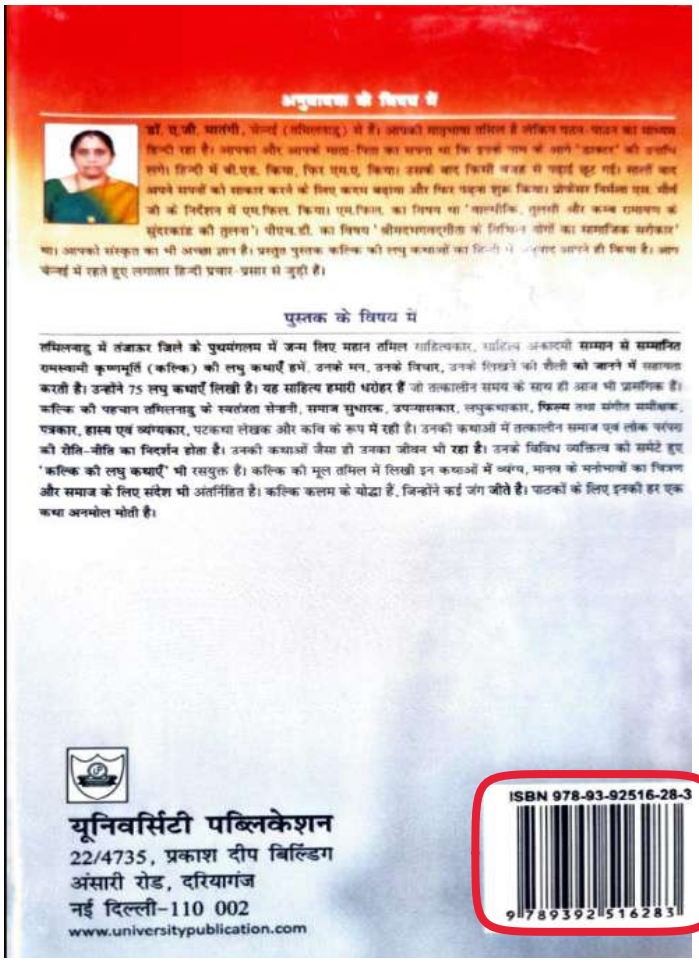

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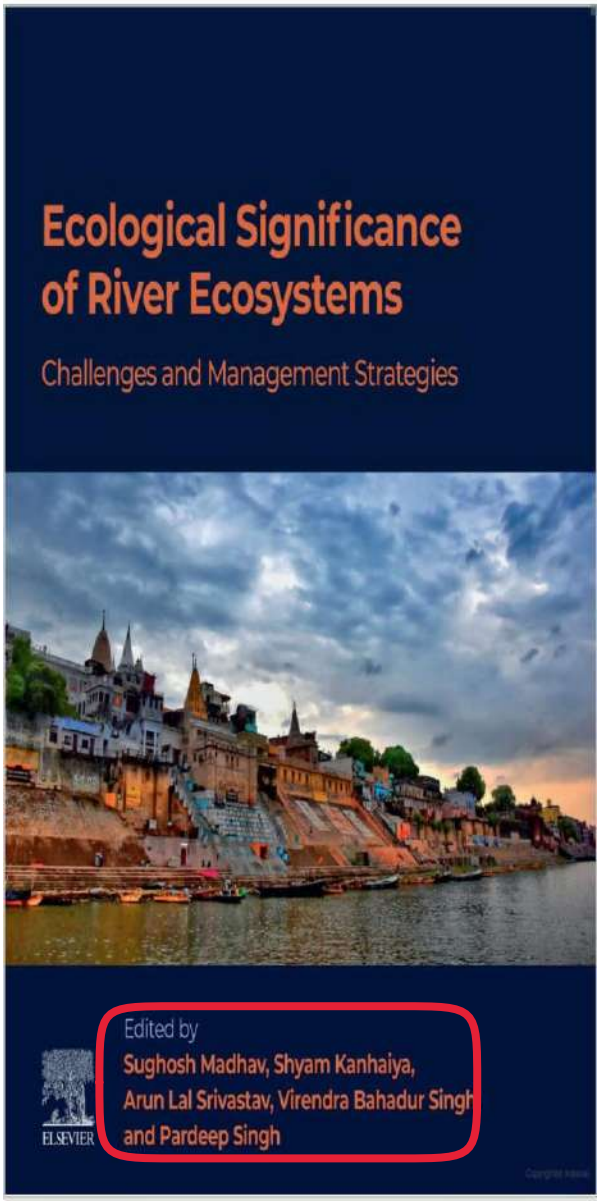

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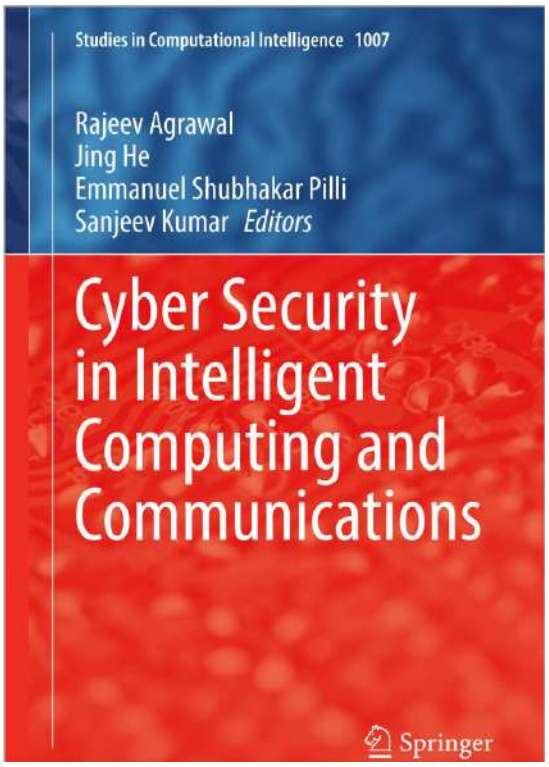

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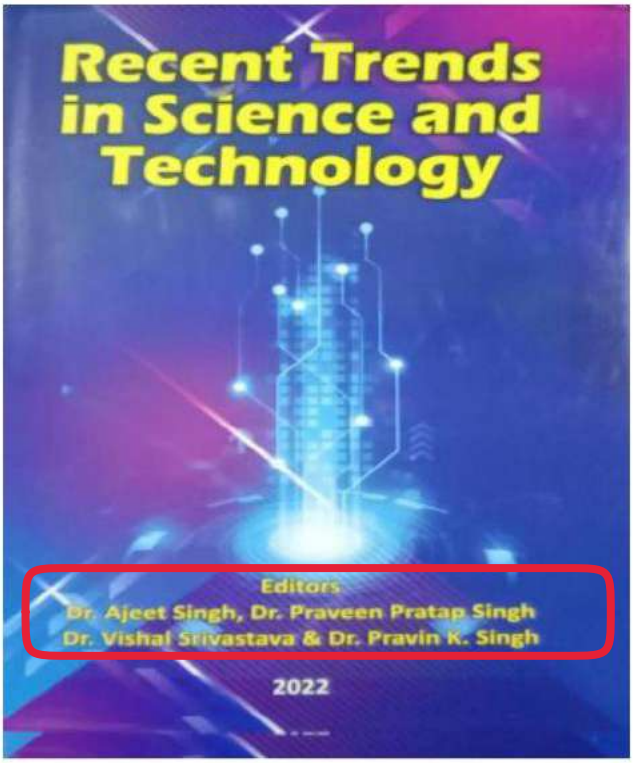
Contents

Abstract

As we can see, covid-19 is becoming a global pandemic. At first, it was seen in India on 30 January, 2020. In such situation, there has been two important challenges before the government of India. The first is to fight the pandemic and second is to make awareness about it. Since analyses of social networks reveal technological advancement and show how World Health Organization's post is beneficial for awareness and prevention from covid-19 as well as showing impact of algorithm and identifying 'networkx' technique. We are trying to show through this article, about the interaction of all public health organizations on Facebook portal and how it could be used by employing random forest machine learning



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Chapter 6

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Cellulose Nanocrystals: A versatile Emerging Material for Potential Applications

Mithilesh Yadav[1], Pramod Kumar[1], Dinesh Kumar Verma[1] and Sujeet Kumar Chaurasia[2]*

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1. Introduction: The adverse impression of non-renewable polymers (petroleum-based) on the atmosphere, and the possible uses of natural biopolymers requests for the modification from petroleum to sustainable and biodegradable -based polymers. The current research in green chemistry put forward for the growth of eco-friendly, efficiency, sustainable materials products, and applications. Such a change insists a considerable task for researchers and companies demanding novel replacements and the valid techniques improving the possible use of these resources. In recent years, the application of natural biopolymers in various field has received extensive attention, including food packaging, sensing technology, drug delivery, biomedical engineering [1-2], etc. These natural biopolymers occur in many forms e.g. agar, starch, pullulan, alginate, carrageenan, chitosan, gellan gum and so on [3-5].

Cellulose, plant based polysaccharide, is most abundant biopolymer in the nature [6]. It makes the core constituents of trees cell walls. Cellulose in involvement with lignin and hemicellulose establish the essential plants material. The plants of cotton are generally used to produce the purest form of cellulose. Cellulose contains glucose unit polymer (Fig.1). Cellulose, a colourless solid, is soluble in Schweizer's reagent but insoluble in water/organic solvents.

The cellulose contained fabrics entertain superb physical and chemical nature such as better mechanical properties, low cost, higher surface area, lower density, higher aspect

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CONTENTS

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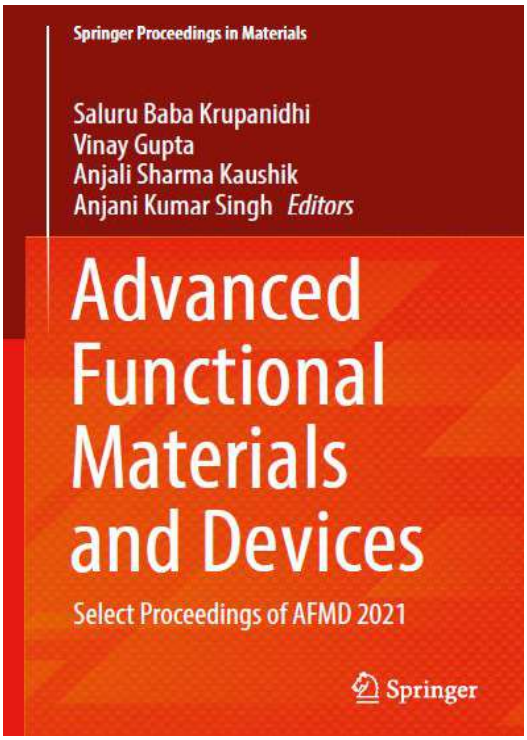

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Investigation on Ionic Conductivity and Raman Spectroscopic Studies of Ionic Liquid Immobilized PEO-Based Polymer Electrolytes

Sujeet Kumar Chaurasia, Abhishek Kumar Gupta, Sarvesh Kumar Gupta, Shivani Gupta, Pramod Kumar, and Manish Pratap Singh

Abstract The ionic conductivity and Raman spectroscopic studies are reported for ionic liquid (IL)-based polymer electrolyte [PEO:$LiPF_6$ (as salt)] + $BMIMPF_6$ (as IL) in which the dopant salt and IL have common anion PF_6^-. These results are compared with another IL-based polymer electrolyte system with mixed anions (ClO_4^- & PF_6^-). X-ray diffraction (XRD) results showed that the structural modification in the polymer PEO matrix due to the change in its crystalline structure after the incorporation of salt and/or IL that gives reduced crystallinity (or enhanced amorphous content) of the polymer electrolyte films which, in turn, is accountable for enhancement in ionic conductivity. Raman spectroscopic analysis confirmed the occurrence of ion–polymer and ion–ion association/interaction phenomena in these polymer electrolyte membranes which is partly responsible for determining the number of mobile ions concentrations and hence ionic mobility. Furthermore, composition-dependent ionic conductivity results are discussed on the basis of changes in ion–polymer and ion–ion interactions as well as changes in the degree of crystallinity/amorphicity of the membranes.

Keywords Polymer electrolyte · Ionic liquid · Raman study · Ion–ion interaction

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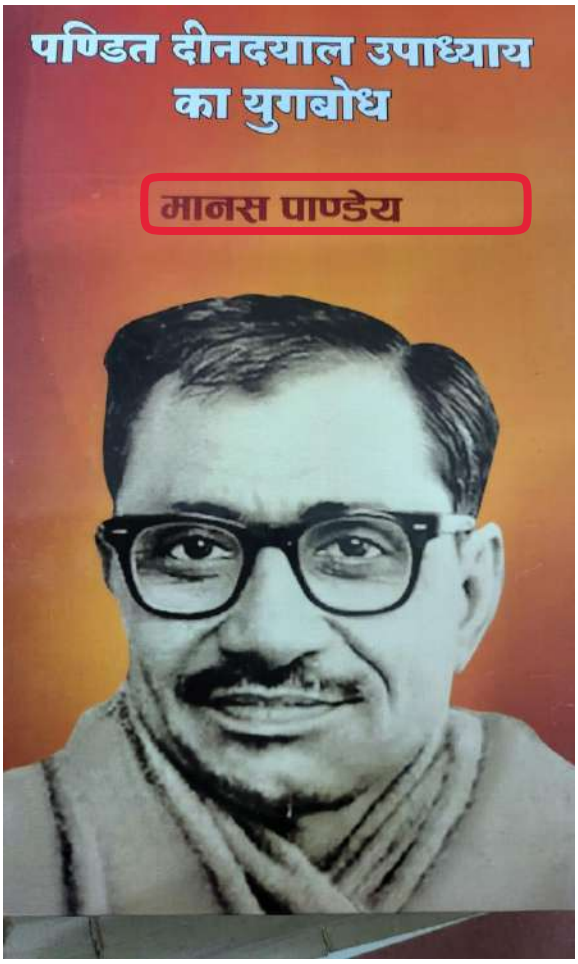

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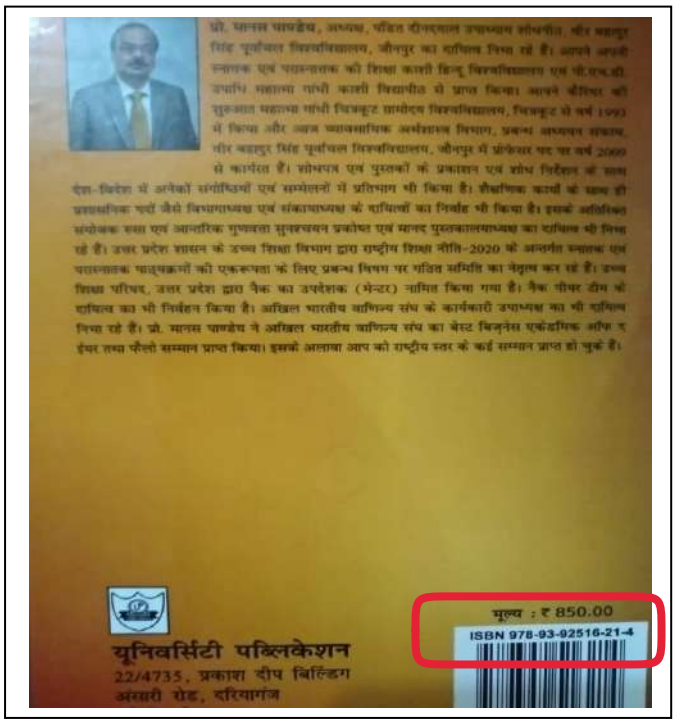

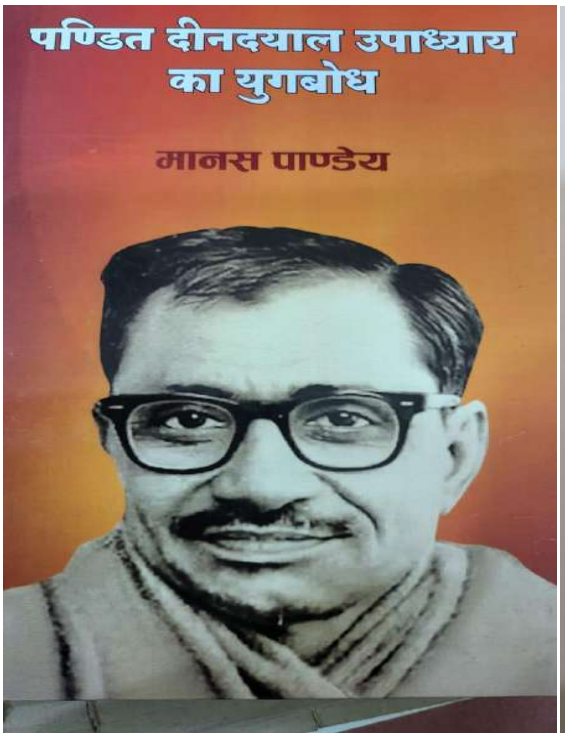

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• प्रियंका कुमारी[1]

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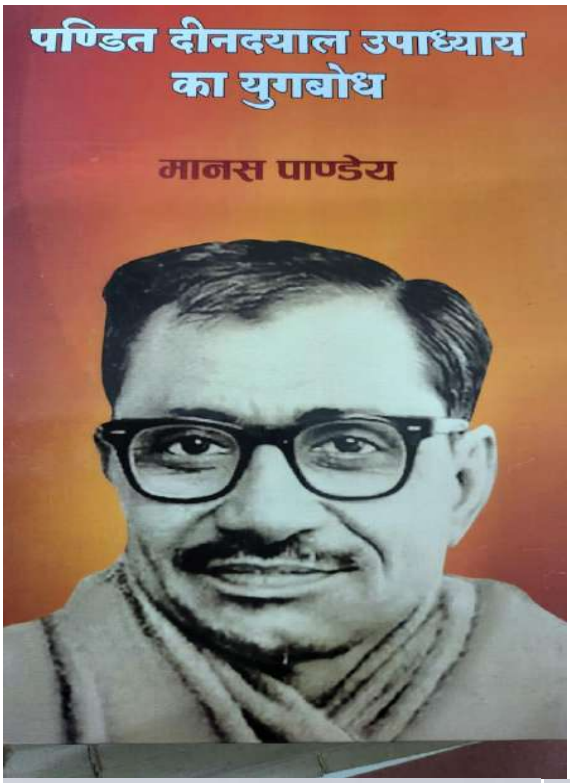

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पण्डित दीनदयाल उपाध्याय जी के चिन्तन में राजनीतिक नीतिशास्त्र का स्वरूप

• अनुराग मिश्रा[1]

सामान्यतया नीतिशास्त्र का तात्पर्य मानव के आचरण में सही एवं गलत का अध्ययन है, परन्तु जब इसका सम्बन्ध हम राजनीतिक नीतिशास्त्र से करते हैं तो इसका स्वरूप वृहद हो जाता है, और यह व्यक्ति और समाज के साथ सम्पूर्ण राष्ट्र को प्रभावित करता है। परिभाषिक रूप से इसे राजनीतिक कार्यवाही और राजनीतिक एजेंडों के बारे में नैतिक निर्णय लेने का अभ्यास भी कहते हैं। प्राचीन भारत में आचार्य कौटिल्य अपनी प्रसिद्ध कृति अर्थशास्त्र में राजनीतिक नीतिशास्त्र उल्लेख करते हैं तथा राष्ट्र की एकता एवं अखण्डता के लिए इसे आवश्यक माना है। वही यूनान में अरस्तु राजनीतिक नीतिशास्त्र पर बल देता है, एवं शासन पर पड़ने वाले इसके प्रभाव की भी चर्चा करता है।

मध्ययुग तक आते-आते निकोलो मैकियावेली जैसे विचारकों ने तो अरस्तु की धारणा के विपरीत राजनीतिक नीतिशास्त्र को तिलांजलि देते हुए कहा कि नेता को अपने अधिकार को बनाये रखने के लिए यदि आवश्यक हो तो बुरे तरीके से व्यवहार किया जा सकता है, वही माइकल वाल्जर जैसे पाश्चात्य विचारक ने एक नयी प्रकार की परिभाषा दी। वाल्जर कहते हैं, कि कभी-कभी सही करने के लिए गलत करना चाहिए।

भारतीय सन्दर्भ में राजनीतिक चिन्तन में राजनीतिक नीतिशास्त्र प

[1] दीनदयाल शोध संस्थान, बीबीएस पूर्वांचल विश्वविद्यालय, जौनपुर

Recent progress on materials, architecture, and performances of hybrid battery-supercapacitors

18

Manoj K. Singh[a], *Sujeet K. Chaurasia*[b]
[a]Department of Applied Science & Humanities, Rajkiya Engineering College Banda, [illegible], [b]Centre for Nanoscience and Technology, Institute of Physical Sciences for Study and Research, Veer Bahadur Singh Purvanchal University, Jaunpur, Uttar Pradesh, India

Abstract

Nowadays, a large amount of energy storage devices is required for wireless and miniaturized electronics devices such as mobile phones, smartwatches, laptops, including electric vehicles. Hybrid battery-supercapacitor (BatCaps) devices emerged by replacing any one of the electrodes of a symmetric supercapacitor with a battery type electrode, which has wider cell voltage, higher capacity, and cyclability. The hybrid BatCaps are generally required in the thin film, flexible, lightweight, high energy and power densities, and higher charge-discharge rate capability, along with a large number of cycle stabilities. It should also be have low cost and charge within a much shorter time. In this chapter, progress on materials, structure-property relationship, and factors affecting the different kinds of hybrid BatCaps device performances, and challenges faced in future developments are discussed.

Keywords: Activated carbon; Battery electrode; Electric double-layer capacitors (EDLCs); Hybrid battery-supercapacitor (BatCap) devices; Pseudo-capacitors; Redox reaction

18.1 Introduction

Supercapacitors and batteries are two important technologies being developed that acquired worldwide much attention because of their applicability as flexible, high efficiency, and long durable power sources for many portable electronic devices such as computers, mobile phones, and low power medical equipment, hybrid electric vehicles, etc.[1,2]. Generally, the specific power of supercapacitors is higher than that of rechargeable batteries whereas the energy density of rechargeable batteries is higher than supercapacitors, therefore, they are complementary to each other [3,4]. In approaching applicable chemical technologies for electrochemical energy generation and energy storage very considerable care and attention is necessary to optimize the properties and formulations of electrode and electrolyte materials of supercapacitors. In view of the charge storage mechanism, supercapacitors are categorized into three types: (1) electric double layer capacitance (EDLC) that is, nonfaradaic/electrostatic charge storage at the electrode-electrolyte interfaces (2) pseudo-capacitance that is, fast faradaic redox reaction at the electrode-electrolyte

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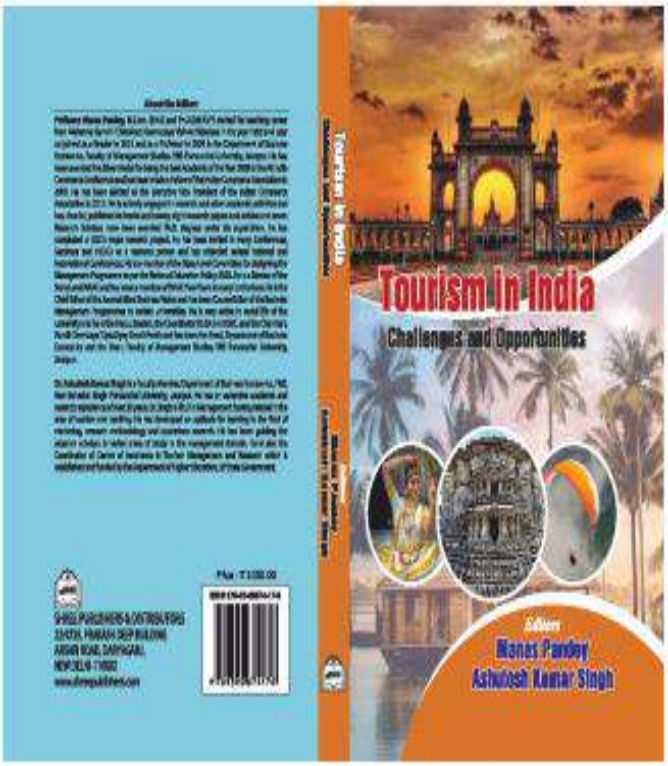

Tourism in India :
Challenges and Opportunities

Editors

Prof. Manas Pandey
Dr. Ashutosh Kumar Singh

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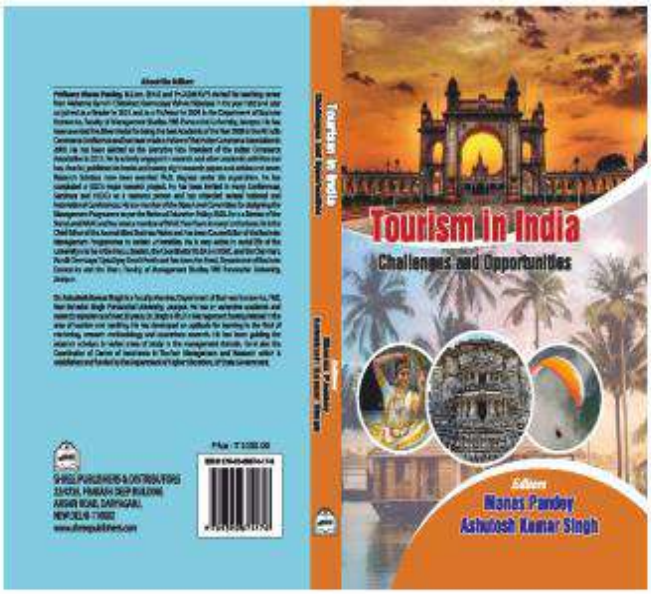

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Contents

CHAPTER – 2

Analysis of The Relationship between Tourism Sector Output and GSDP of J&K Economy

Shahid Ali Khan[1]
Ashutosh Kumar Singh[2]

Abstract

Jammu and Kashmir has a massive potential to become one of the major tourist destination in Indian federation. In the given paper an attempt has been made to examine the role of tourism sector in the economic growth & development of J&K state. Since in the state like Jammu and Kashmir where the scope of large- scale industrialization is restrained and the prospects of agricultural improvement are scarce, therefore, role of tourism sector gets enhanced. This paper highlights the economic contribution of tourism sector in Jammu and Kashmir economy and analyses its performance during the period from 2004-05 to 2019-20. In addition to it, OLS regression equations have been employed to examine the bi-directional relationship between tourism sector and economic growth. The findings of the study clearly revealed that there is a significant contribution of tourism sector in Jammu and Kashmir economy, as on an average it contributes 9 per cent share in state income (GSDP) during reference time period. But, so far potential of tourism sector of our state is concerned, it has not been actualized yet as there is high probability that this contribution

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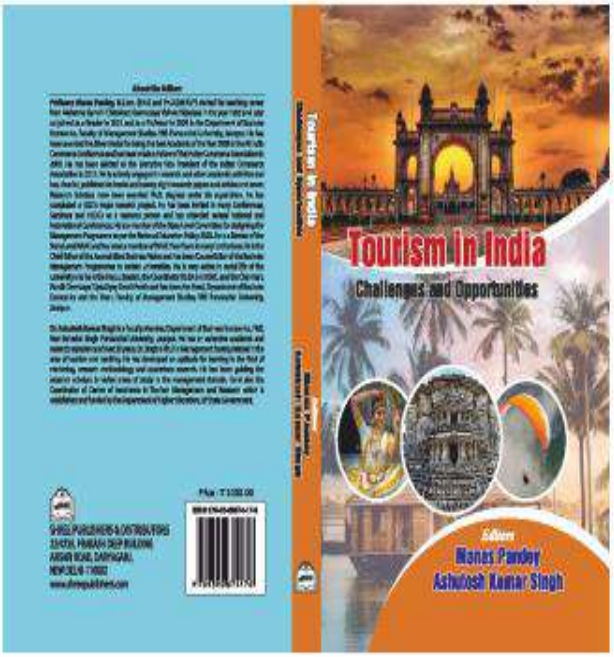

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CHAPTER – 5

Boost in Tourism: Harnessing Digital Media to Promote Travel Industry

Shifali Ahuja[1], Digvijay Singh Rathod[2]

The use of social media has exploded in the last few years, and there is no question that it is having a major effect. It has started to have an impact on practically every aspect of our life. We are now becoming very dependent on it. Whether we have to plan things or to buy something we look toward social media platforms or websites for ideas, suggestions, reviews, specifications, and many more. Tourism is such an industry in which we saw a major change after the arrival of social media. Communicating with the use of various social media platforms has now also become very easy and fast from the older ways. People share their ideas, thoughts, feelings through content in many attractive ways by using these digital platforms. In comparison to where it was merely a few years ago, the tourism industry's digital footprint has expanded.

Individuals from all over the world are using digital platforms. Now it has become very easy for individuals to search for places all over the world, understand the actual situations, and the cost of the trip of various locations using various digital platforms.

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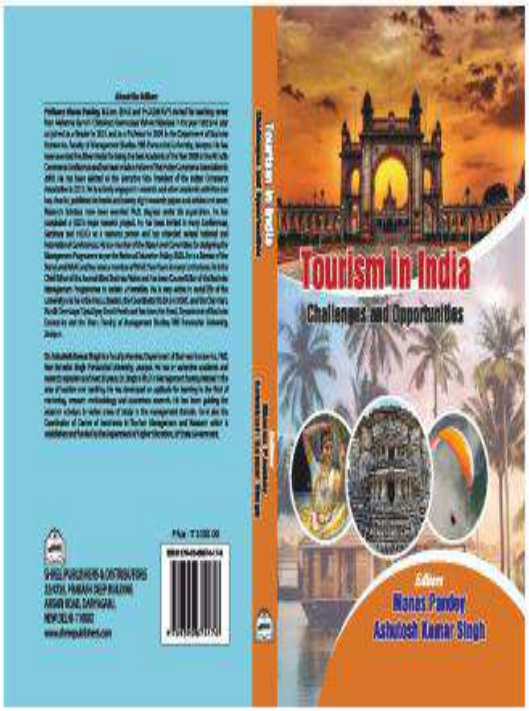
2 Assistant Professor, Veer Bahadur Singh Purvanchal University, Jaunpur, UP



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CHAPTER – 15

Impact of Covid 19 Pandemic on Tourism Sector of India

Chandra Prakash Agrawal[1]

Abstract

The COVID-19 pandemic has been catastrophic for the tourism industry, causing a big financial loss and creating a crisis for the government to tackle and recover from. UNWTO estimates the reasonable economic effects of this on going pandemic. The main aim to write this paper is to study the effect of COVID-19 on the tourism sector of India. Tourism can provide employment opportunities in addition to being a credible source of Foreign exchange, but due to this pandemic, the tourism industry has become very unsteady and unbalanced. Apart from restricting travel, COVID-19 hindered the tourist sector around the world. Even India had to impose restrictions on travel to prevent the spread of the virus. Ultimately, the shocking outbreak of this novel corona virus was devastating for tourism. It lead to the huge economic loss for the developing country like India. This paper attempts to understand the significance of Tourism sector in an Indian Economy and examine the impact of COVID- 19 on Indian tourism sector and examine various measures undertaken by the Indian government to overcome from the crisis.

Keywords: Tourism, COVD-19, Lockdown, UNWTO, Indian Economy.

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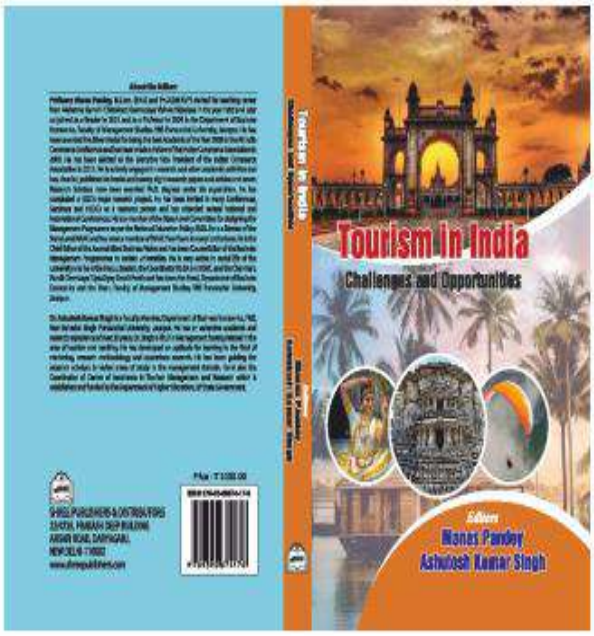

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CHAPTER – 12

Promoting Religious Tourism in UP through Prayag Kumbh Mela: Issues and Challenges

Rakesh Kumar Upadhyay [1]

Abstract

This article is the effort to examine the various aspects of management in the KUMBH (Kumbh Mela) organised by UP government from 15-01-19 to 04-03-19 in Triveni Prayag. Here we analyse the various aspects of Management provided by a team, that is appointed by UP government. This article include crowd Control Management, supervision with drones, waste management, health management, financial availability and budget, security review on the basis of terrorist threat etc. We try to present a review 'Kumbh Mela' on the basis of such points. In review of these points many defect have come on the front, for avoiding these defects, some suggestions have been made. By following these suggestions, this Mela can be made safe and convenient for pilgrims.

In these suggestions, many are also recommended by Controller and Auditor General (CAG) to improve the work efficiency of Mela management.

Introduction

The literal meaning of Kumbh is pitcher. The word Kumbh is generally used for water utensil. The word Kumbh also describes in Rigveda having the same meaning. In Purans and other Hindu

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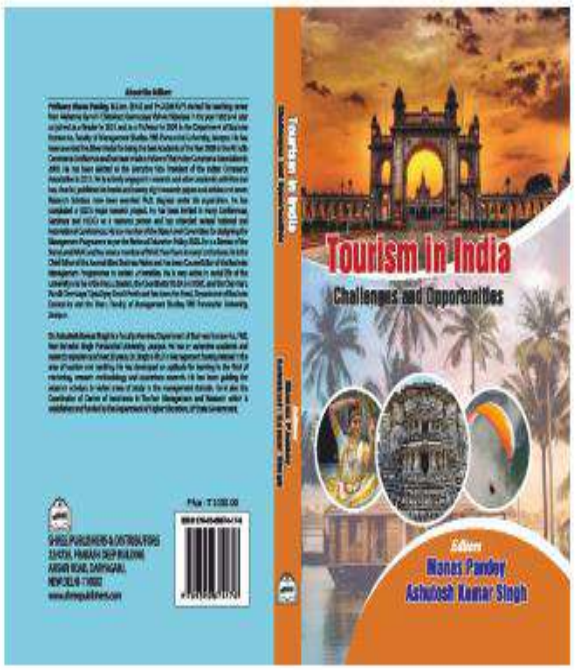

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CHAPTER – 14

Role of Travel and Tourism Sector in Economic Development of India: An Overview

Deepak Kumar[1]
V.D. Sharma[2] *and*
Sandeep Kr Singh[3]

Abstract

Travel and tourism have been the primary activities of the people since the beginning of civilization. Since ancient times people have been curious to know about unknown things and places. They also wanted to travel to new places for many reasons - such as to spread their religion and ideas, to increase their intelligence and skills, to find new and valuable minerals and elements, to discover new fertile land, to discover new natural resources etc. From that time till today, tourism has remained a multi-useful means. Many countries in the world are strengthening their economy through travel and travel. India is a vast and diverse country. Since ancient times, India has been attracting people from all over the world. History records the names of many travellers, who travelled to India and wrote about it. By reading the accounts written by him, many people came to know about India and tried to come here. Even at present, people of many countries of the whole world want

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15

Measure the superior functionality of machine intelligence in brain tumor disease prediction

Dhyan Chandra Yadav[a] and Saurabh Pal[b]

[a]VBS PURVANCHAL UNIVERSITY, JAUNPUR, INDIA [b]DEPARTMENT OF MCA, VBS PURVANCHAL UNIVERSITY, JAUNPUR, INDIA

15.1 Introduction

"Magnetic resonance imaging" process that produces great images of anatomical structures in the context of the "human body," notably in the cerebrum, and facilities valuable knowledge for disease analysis and biological research. The automated and exact characterization of the MRI images greatly amplifies the MRI's suggestive estimations. With the help of MR images, "magnetic resonance imaging" has shown to be an excellent tool in locating brain tumors. Some abnormal cells are organized in the format of brain tumor. It may affect anyone at any age, appear in any location, and come in a variety of forms and sizes. Radiotherapy or chemotherapy can be used to treat them. This turns out to be a serious issue that can lead to death. Tumors are also divided into two types: "malignant and benign." "Malignant tumors have a heterogeneous structure" and include malignancy cells, whereas benign tumors have a homogenous structure and do not include illness cells. Benign tumors are crushed either radiologically or surgically and have a low chance of returning. Malignant tumors are life-threatening tumors that can be treated with "chemotherapy, radiation," or "a combination of the two." MRI is a beneficial tool for dealing with brain tumors since it shows all fine features of the brain, allowing us to readily pinpoint the tumor's location. Segmentation is used to detect contaminated tumor tissues using "medical imaging modalities." Segmentation provides facilities to divide an image into multiple sections with their common attributes. These attributes provide help in brain tumor identification. Data mining aids in dealing with such minute details to a larger extent. The ability to diagnose "a brain tumor at an early stage" is critical for better therapy. Once "a brain tumor is detected clinically, a radiological examination is necessary to assess its location, size, and influence on the surrounding regions." The optimal treatment, whether surgery, radiation, or chemotherapy, is chosen based on this information. It is self-evident that detecting a tumor in its early stages increases "the odds of survival for a

Artificial Intelligence-Based Brain-Computer Interface. https://doi.org/10.1016/B978-0-323-91197-9.00005-9
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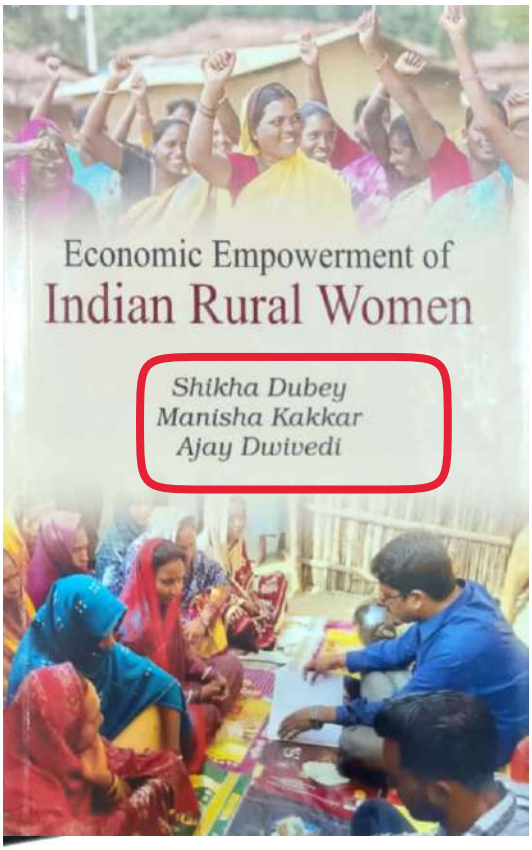

Economic Empowerment of Indian Rural Women

Shikha Dubey
Manisha Kakkar
Ajay Dwivedi

Author's Biography

Shikha Dubey is Ph.D. Research Scholar (Junior Research Fellow) at Department of Financial Studies, Veer Bahadur Singh Purvanchal University Jaunpur, Uttar Pradesh. Her research interests span areas such as Microfinance, Financial Literacy, Cashless economy, Women Empowerment, and Rural Development. She has published numerous research papers in SCOPUS, UGC Care, and UGC Care, and UGC-approved journals and also authored a Book named 'Business Management Lexicon' available globally.

Manisha Kakkar is pursuing a Ph.D. from Jayoti Vidhyapeeth Women's University Jaipur, besides this working as an Assistant professor in the area of economics and commerce at Goel Institute of technology and management Lucknow, and also working as a research assistant at Lucknow University. She has also published papers in various national and international journals and UGC care journals and published various chapters in multidisciplinary books and editor in the book "Green Banking and Environment".

Professor Ajay Dwivedi is a Professor of Finance at the Department of Financial Studies, VBS Purvanchal University, Jaunpur. He is also occupying the position of Dean, Students Welfare of the University along with senior academic positions in different boards and committees. Before his services at VBS Purvanchal University, he has been an Associate Professor at the Faculty of Business and Economics, Mekelle University, Ethiopia. He has broad exposure to academics and research internationally and worked closely with the United Nations Development Program. He has served the University and institutions of reputation across the country and contributed immensely through his academic and research deliberations. His area of teaching and research included Corporate Finance, Investment Banking, Financial Derivatives, Financial Modelling, Business Valuation, Microfinance, and Entrepreneurship. He has published many research papers and articles on the areas cited above and on other contemporary issues of concern. He has also authored a Business Lexicon and edited many books prior to this.

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Contents

1

Economic Empowerment of Indian Rural Women

Dr. Ajay Dwivedi & Shikha Dubey***

Abstract

The term "Economic Empowerment" initially referred to women's financial independence. As a result of this empowerment, women have more control over their level of living, purchasing decisions, and lifestyle choices, and they have more influence over the course of their lives. The study focused on the economic situation of rural Indian women. A questionnaire was created as a result of the literature review, which included observations about rural women's economic position. The study reveals that the institutional framework such as laws, policies, and institutions that support women has a Significant Impact on Economic Empowerment and economic security of women, Women's economic empowerment is unaffected by economic opportunities and entrepreneurship, and Building women's agency by improving their ability to recognize and act on economic possibilities has no significant impact on Women's Economic Empowerment.

Keywords: *Women's Empowerment, Economic Independence, Financial Inclusion, Economic Security, Rural Development.*

Introduction

Women make up half of the world's population, and gender inequality exists in every country. Discriminating

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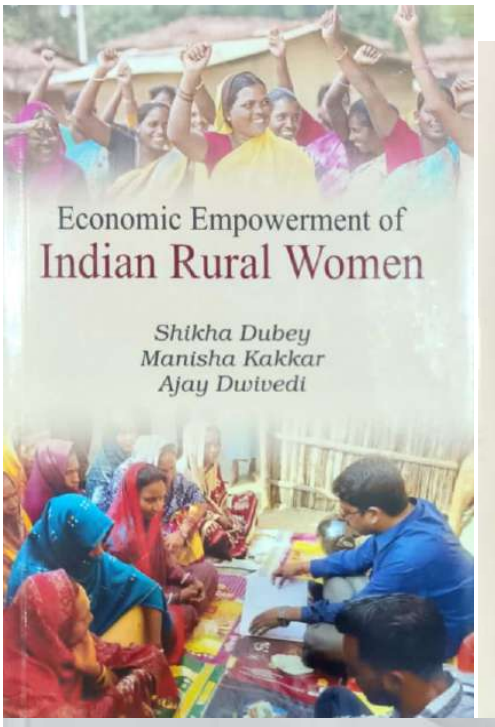

Economic Empowerment of Indian Rural Women

Shikha Dubey
Manisha Kakkar
Ajay Dwivedi

Author's Biography

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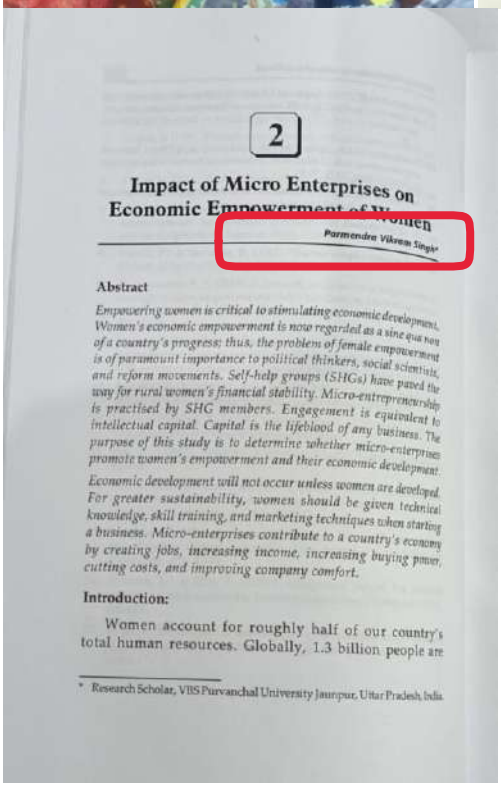

2

Impact of Micro Enterprises on Economic Empowerment of Women

Parmendra Vikram Singh*

Abstract

Empowering women is critical to stimulating economic development. Women's economic empowerment is now regarded as a sine qua non of a country's progress; thus, the problem of female empowerment is of paramount importance to political thinkers, social scientists, and reform movements. Self-help groups (SHGs) have paved the way for rural women's financial stability. Micro-entrepreneurship is practised by SHG members. Engagement is equivalent to intellectual capital. Capital is the lifeblood of any business. The purpose of this study is to determine whether micro-enterprises promote women's empowerment and their economic development. Economic development will not occur unless women are developed. For greater sustainability, women should be given technical knowledge, skill training, and marketing techniques when starting a business. Micro-enterprises contribute to a country's economy by creating jobs, increasing income, increasing buying power, cutting costs, and improving company comfort.

Introduction:

Women account for roughly half of our country's total human resources. Globally, 1.3 billion people are

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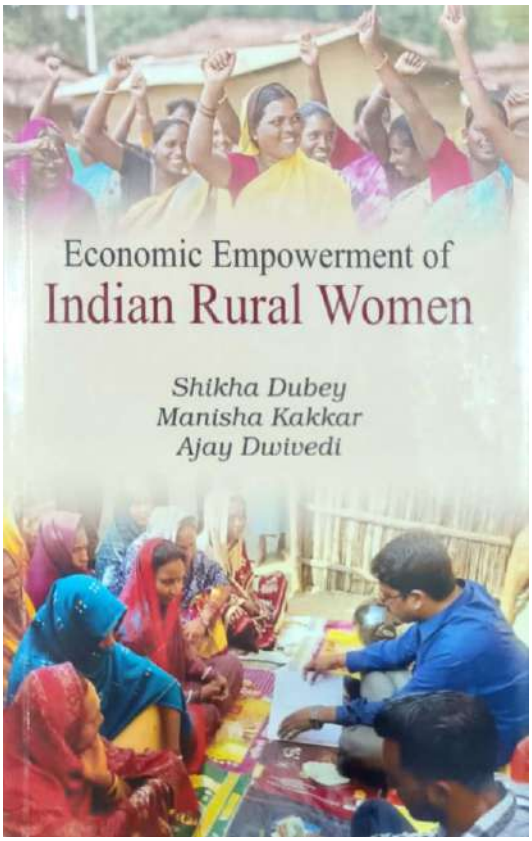
Contents



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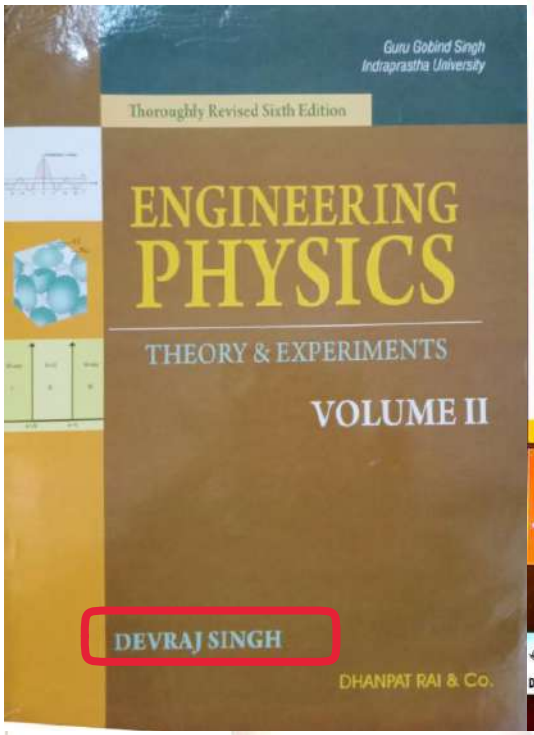

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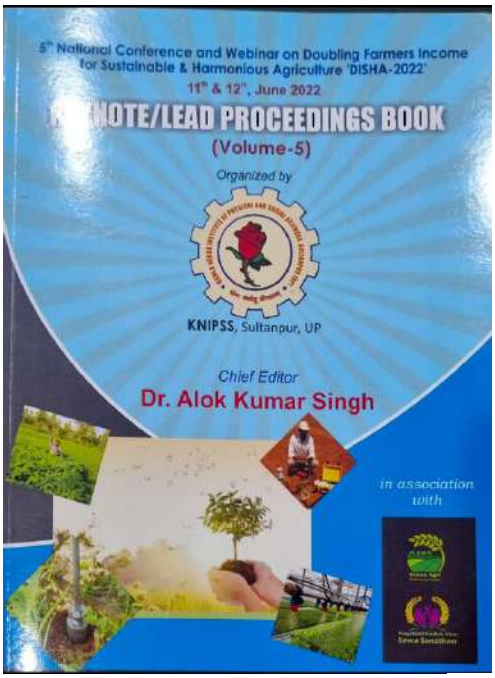

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11

BIOFERTILIZER: A POTENTIAL ASSET FOR SUSTAINABLE CROP GROWTH PERFORMANCE TO MANAGE FOOD SCARCITY AND HEALTH

Sudhir K. Upadhyay and Manoj Mishra*

Department of [illegible] Science, V.B.S. Purvanchal University, Jaunpur, India
Department of Mass Communication, V.B.S. Purvanchal University, Jaunpur, India
Corresponding author: Dr. Manoj Mishra (manjulmanoj1@gmail.com)

ABSTRACT:

Our too much dependence on chemical fertilizers and pesticides to quench the huge demand for food by growing populations has encouraged the industries to produce life-threatening chemicals such as a kind of pesticides or fertilizers. These chemicals are not merely hazardous for human consumption but also profoundly affect the ecological balance in the environment. In this adverse situation, biofertilizers can act as a potent likelihood that not simply can feed the emerging population but also can save agriculture from the seriousness of various environmental and health stresses. Biofertilizers, the gift of recent agricultural sciences, retard nitrification for an acceptably longer time and boost soil fertility. Biofertilizers are essential aspects of integrated nutrient management. This would play an essential role in the productivity and sustainability of soil, while protecting the environment, and being the profitable environmentally friendly, and replaceable source of plant nutrients to supplement chemical fertilizers in the sustainable agricultural system. Unlike inorganic fertilizers, bio-fertilizers do not supply nutrients directly to plants. These are the microbial inoculants comprising the living cells of effective stains adopted for a way to seeds, soil, or composting areas with the purpose to advance the microbial process to increase the accessibility of nutrients that can conveniently be absorbed by plants. capture the interior of the plant and inspire growth by converting nutritionally

CONTENT

Dhananjay Shukla
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Colon Cancer Diagnosis and Therapy Vol. 3

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Colon Cancer Diagnosis and Therapy Vol. 3 pp 361–382

Bacterial Cancer Therapy: Promising Role in the Treatment of Colon Cancer

Rishi Srivastava, Shweta Sonam, Naveen Kumar Vishvakarma, Rajesh Sharma & Shree Prakash Tiwari

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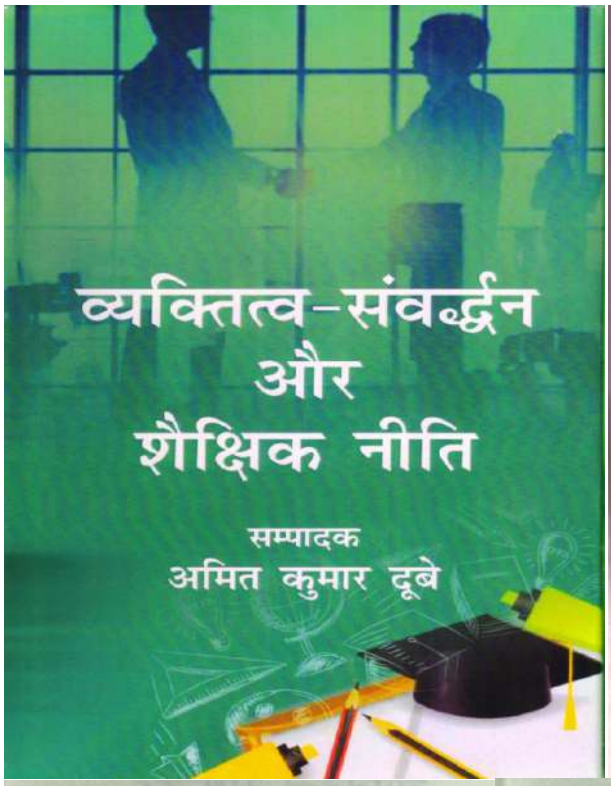
Abstract

Bacterial colonization and subsequent inflammatory consequences have been associated with the onset of colon carcinogenesis. However, recent shreds of experimental evidence suggest that bacteria and their products can be implemented for therapeutic benefit in malignant disorders including those of colon origin. The use of bacteria or their components for antineoplastic therapy is known as bacterial cancer therapy. Limitations associated with conventional antineoplastic therapeutic approaches like surgery, chemotherapy, and radiotherapy include nonspecific toxicities, chemoresistance, and immunosuppression. Therefore, recently bacterial cancer therapy gained attraction among oncologists. A diverse range of mechanisms has been suggested for underlying antineoplastic activities of bacterial cancer therapy. Direct cytotoxicity to neoplastic cells and preferred colonization in the hypoxic core of tumors are few among suggested.



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जौनपुर

नई शिक्षा नीति 2020 एवं 29 जुलाई 2020 को केन्द्रीय मंत्रिमण्डल एवं भारत सरकार द्वारा अनुमोदित किया गया। नई शिक्षा नीति भारत में नई शिक्षण विधियों के सन्दर्भ में बनायी गयी। यह नयी शिक्षा नीति 2020 राष्ट्रीय शिक्षा नीति 1986 के 34 वर्ष बाद आयी है।

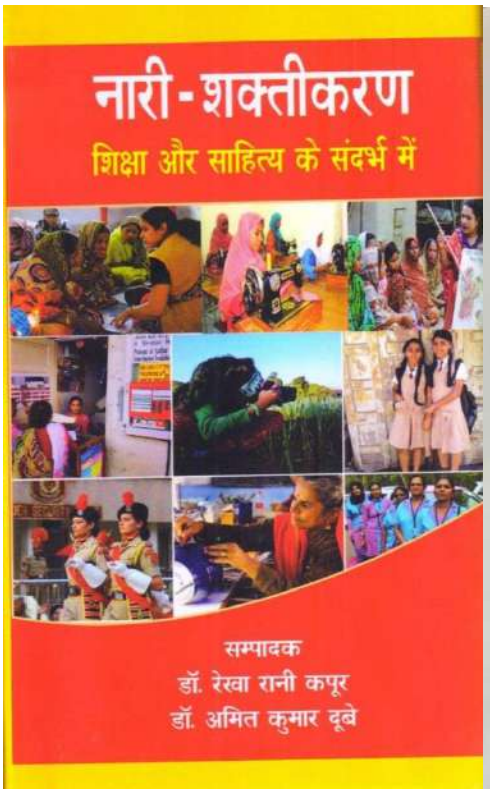
मनोवैज्ञानिक दृष्टि से यह जानना आवश्यक है, कि एन.ई.पी. 2020 लागू होने से छात्र एवं छात्राओं का व्यक्तित्व विकास किस तरह से होगा। सर्वप्रथम हम व्यक्तित्व को समझते हैं :

आलपोर्ट (1937) के अनुसार, "व्यक्तित्व व्यक्ति के भीतर उन मनोशारीरिक तंत्रों का गतिशील या गत्यात्मक संगठन है, जो वातावरण में उनके अपूर्व समायोजन का निर्धारण करता है।"

बेरोन (1993) के अनुसार, "व्यक्तियों के अनूठे संवेगों, चिंतनों तथा व्यवहारों के सापेक्ष रूप से स्थिर पैटर्न के रूप में व्यक्तित्व को समान्यतः परिभाषित किया जाता है।"

सामान्य शब्दों में कह सकते हैं, व्यक्तित्व व्यक्ति व्यवहार, समायोजन एवं स्थायित्व से सम्बन्धित है।

स्वामी विवेकानन्द जी कहते है, "जिस शिक्षा से हम अपना जीवन निर्माण कर सकें, मनुष्य बन सकें, चरित्र गठन कर सकें और विचारों का सामंजस्य कर सकें, वही वास्तव में शिक्षा कहलाने योग्य है।"



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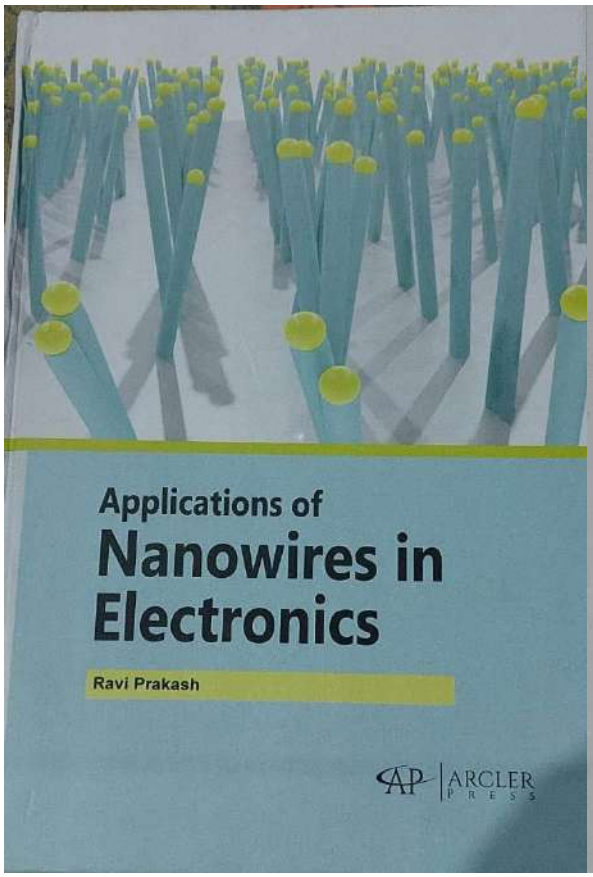
'चुप्पी तोड़ो खुलकर बोलो'

लोकतान्त्रिक शासन व्यवस्था का जो ढाँचा हमारे संविधान के अन्तर्गत जिस प्रकार है उसमें महिलाओं की उन्नति को ध्यान में रखते हुए उनके मौलिक कर्तव्यों, समानता का दर्जा तथा इसके साथ ही साथ राज्य को महिलाओं के पक्ष में सकारात्मक कदम उठाने के उपाय की भी शक्ति प्रदान करता है।

उ0प्र0 राज्य सरकार 17 अक्टूबर 2020 को महिलाओं के पक्ष में सकारात्मक कदम उठाते हुए महिला सशक्तीकरण के उद्देश्य से 'मिशन शक्ति' अभियान का मेगा लांच किया जिसमें सभी विभाग द्वारा एक साथ महिला सशक्तीकरण हेतु एक ही दिन मेगा लांच किया गया इसमें प्रशासन, पुलिस विभाग, शिक्षा विभाग आदि सभी विभागों ने मा0 मुख्यमंत्री योगी आदित्य नाथ जी के आह्वाहन पर अपने अपने स्तर पर जागरूकता कार्यक्रम रखे।

इस अभियान का उद्देश्य महिलाओं की सुरक्षा, स्वाभिमान एवं स्वावलम्बन के लिए वातावरण बनाना जिसमें कि उनकी पूरी क्षमता को विकसित किया जा सके ताकि वो राजनीतिक, आर्थिक, सामाजिक, सांस्कृतिक और सिविल सभी क्षेत्रों में पुरुषों के साथ कंधे से कंधा मिलाकर गर्व के साथ खड़ी हो सकें। अपने लिए स्वयं निर्णय ले सकें, महिलाओं से सम्बन्धित जो कुप्रथाएँ व्याप्त हैं समाज में उनके विरोध में आवाज उठा सकें, विकास की प्रक्रिया में भागीदारी हो सके ताकि सभ्य



Applications of Nanowires in Electronics

Ravi Prakash

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Applications of Nanowires in Electronics

Currently, semiconductor nanowires (NWs) are gaining immense attention due to their excellent electronic characteristics. The unique properties of nanowires are observed because of their one-dimensional nanostructure. The contemporary applications areas of nanowires include high-speed transistors, nanoelectronics, chemicals, and biosensors, and LEDs (light-emitting diodes) with little power consumption. Nanostructured materials (especially nanowires) have emerged as an excellent green solution to combat the issues of conventional electronic materials. The huge need for the development of efficient electronic devices and the limitations of the existing methods based on lithographic procedures to realize a few nanometer-sized constituents require the establishment of novel approaches. Regulation of the manufacturing and surface characteristics of nanowires may unravel new prospects in the field of nanoelectronics. The advancements are underway for the synthesis and use of nanowire components in the manufacturing of nano-biosensors and nano-circuits.

This book is divided into eight chapters. Each chapter contains a detailed discussion about a particular topic. Apart from Chapter 1, all of the chapters deal with applications of nanowires in a particular electronic industry. Chapter 1 focuses on the fundamentals of semiconductor nanowires discussing different growth routes and doping of nanowires. The chapter also illustrates the concepts behind the phenomenon of strain relaxation and electrical transport in nanowires. Presently, extensive research is being conducted in the area of nanostructured solar cell development. Chapter 2 deals with key concepts involved in the synthesis, characterization, and applications of nanowire solar cells. Nanotechnology has immensely benefited the medical sector due to its wide-ranging applications. Chapter 3 focuses on the applications of nanowires for the development of nano-biosensors. The major challenge of energy storage systems is their efficiency. However, modern materials can combat this challenge by providing energy-efficient structures. Chapter 4 illustrates the development in the hierarchical nanowires in terms of their synthesis, merits, performances, and classification in energy storage instruments. Chapter 5 illustrates the applicability of nanowires for the synthesis of lasers. In common semiconductor lasers, several gain media (like quantum dots, multiple quantum wells, and nanowires) are usually created through the epitaxial growth of the whole vertical heterostructure to produce an efficient lasing system. Chapter 6 contains essential information regarding the synthesis and characterization of light-emitting diodes (LEDs) from semiconductor nanowires. Piezoelectric materials are manufactured to perform the conversion of mechanical stress into electrical energy. Chapter 7 offers a detailed discussion of the working mechanism, simulations/modeling, and the experimental development of piezoelectric nanogenerators as per the structure of the nanogenerators comprising the lateral-aligned nanowire networks, the nanowire-based nanocomposites, and the vertically aligned nanowire arrays. Numerous fabrics are being developed and being used for wearable sensing applications by means of building conducting paths with metal-based or carbon-based nanostructures. Finally, Chapter 8 thoroughly explains the fundamentals of wearable electronics and their synthesis from nanowires.

This book is equally beneficial for students, researchers, teachers, and professionals in the fields of electronics and nanotechnology. However, people from multidisciplinary fields can also benefit from this book which contains knowledge about various areas of the electronics industry.

Prof. Ravi Prakash is working as an assistant Professor in Electronics and Communication Engineering Uma Nath Singh Institute of Engineering and Technology Veer Bahadur Singh Purvanchal University Jaunpur, Uttar Pradesh, India. He was born on January 19, 1973, in Jaunpur, U.P., India. He received the B. Tech. degree in Electronics and Telecommunication Engineering from University of Allahabad, Allahabad, U.P., India in 1997, and M. Tech. degree in Electronics Engineering (Communication Technology) from University of Allahabad, Allahabad, U. P., 2001. He is gold medalist at his graduation level and rank holder in board examination. He has almost 21 years teaching experience at B. Tech., M. Tech. and Ph.D. level in engineering. He had worked as head of department of Electronics Engineering at Veer Bahadur Singh Purvanchal University Jaunpur for almost ten years. He received the Ph.D. degree in Electronics and Communication Engineering from University of Allahabad, U.P., India. His current research interests include Communication Technology. He has published several research articles in reputed international journals related to wireless, optical and digital communication. He has worked as several research and reviewer committee member, and he has excellent work in the field of digital communication, wireless and mobile communication. He had worked as Nodal officer, academic in the Technical Education Quality Improvement Program (TEQIP) supported by World Bank at university level.

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हिन्दी-शिक्षण में विविध कौशल का संवर्द्धन

सम्पादक
डॉ. अमितकुमार दुबे

वैधानिक चेतावनी
पुस्तक के किसी भी अंश के प्रकाशन- फोटोकॉपी, इलेक्ट्रॉनिक माध्यमों में उपयोग के लिए लेखक/ संपादक/ प्रकाशक की लिखित अनुमति आवश्यक है। पुस्तक में प्रकाशित शोध-पत्रों में निहित विचार तथा संदर्भों का संपूर्ण दायित्व स्वयं लेखकों का है। संपादक/ प्रकाशक इसके लिए उत्तरदायी नहीं है।

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Edited by Dr. Amit Kumar Dubey

हिन्दीभाषा-शिक्षण-प्रविधि का महत्व

डॉ० जाह्नवी श्रीवास्तव

प्रस्तावना - भाषा-शिक्षण व्यक्ति के व्यक्तित्व को उजागर करती है और अंतर्निहित शक्तियों को विकसित करती है। व्यक्ति की तेजस्विता भाषा शिक्षण द्वारा प्रस्फुटित होती है। व्यक्ति ही नहीं समाज की प्रगति भी भाषा शिक्षण पर निर्भर है। व्यक्ति की ही भाँति समाज भी भाषा शिक्षण के माध्यम से अपने अस्तित्व को सुरक्षित रखता है। तथा अपने भविष्य की प्रगति के पथ पर अग्रसर करता है। भाषा शिक्षण अद्भुत शक्तिदायी प्रक्रिया है और मनुष्यत्व में देवत्व में आरोपण करने की इसमें क्षमता विद्यमान है। किन्तु भाषा शिक्षण अपनी शक्ति और क्षमता का स्वतंत्र उपयोग नहीं कर पाती। यह सामाजिक गतिविधियों से जुड़ी होती और सामाजिक, आर्थिक, वैज्ञानिक परिवर्तन में महत्त्वपूर्ण भूमिका निभाती है। उचित स्थान देने के अनुकूल हेतु भाषा शिक्षण अपनी गौरवमयी भूमिका निभाएगी, अन्यथा वह शिक्षित बेरोजगारों की भीड़ बढ़ाने में सहायक होगी। भाषा शिक्षण से शिक्षक प्रशिक्षक के व्यक्तित्व में निखार आ जाता है। मानक भाषिक संप्रेषण किसी शिक्षक का प्रभावी शिक्षण उपकरण होता है जिसके बल पर शिक्षक अपनी प्रतिभा, ज्ञान, अनुभव को अभिव्यक्ति प्रदान करता है। नई शिक्षानीति के अनुपालन हेतु योग्य एवं अनुभवी शिक्षक की कमी महसूस की जा रही इस कमी को पूरा करने हेतु व्यावहारिक एवं प्रयोजनमूलक हिंदी का मानक प्रशिक्षण सुनिश्चित करना आज की आवश्यकता है। जब शिक्षकगण को उत्कृष्ट प्रशिक्षण दिया जाएगा तो उत्कृष्ट शिक्षक बनकर निकलेंगे। इस प्रकार के मानक एवं वैज्ञानिक प्रविधि युक्त प्रशिक्षण आदर्श एवं आधुनिक मानव संसाधन के संवर्द्धन में काफी मददगार सिद्ध होगा।

भाषा शिक्षक के शिक्षण एवं प्रशिक्षण का महत्त्व -भारतीय परिवेश में

* सहायक प्रोफेसर, व्यवहारिक मनोविज्ञान विभाग, वीर बहादुर सिंह पूर्वांचल विश्वविद्यालय, जौनपुर

13

Biogenic and Non-Biogenic Waste for the Synthesis of Nanoparticles and Their Applications

Abhishek Kumar Bhardwaj
Amity University

Shanthy Sundaram and Rupali Kaur
University of Allahabad

Ram Naraian
Veer Bahadur Singh Purvanchal University

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CONTENTS

13.1 Introduction

The exponential development and industrialization of the world, basically cities, generate various kinds of municipal and industrial wastes having a tremendous amount of construction and demolition debris, plastic waste, e-waste, biomedical waste and other industrial hazardous and non-hazardous wastes. On the contrary, villages generate bio-wastes containing crop residue, food waste and other agro-wastes. For waste management, the world is looking forward to developing and deploying various technologies to reduce, reuse and recycle materials, generate energy and extract valuable resources (Naraian and Bhardwaj, 2020). The international market for recycling and extraction of valuable materials is growing steadily.

The modern scientific community of nanotechnology is focusing on the sustainable environment; therefore, they are developing innovative and groundbreaking methods for the synthesis of nanomaterials (Bhardwaj et al., 2021). However, several green methods of NPs synthesis were suggested by

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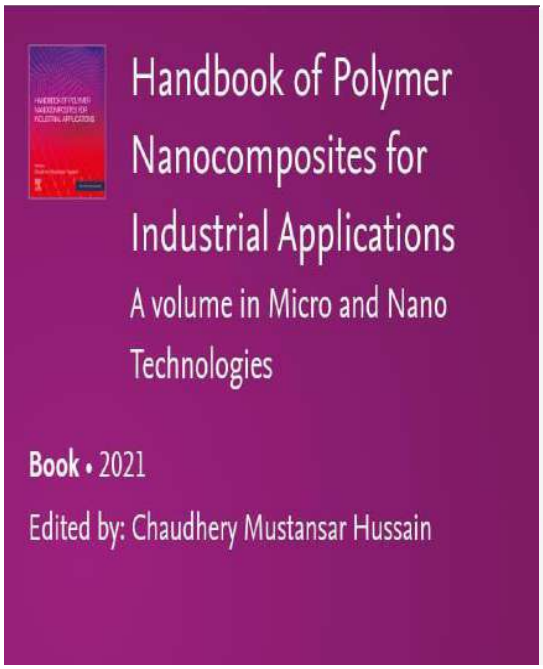

About the book

Description

Handbook of Polymer Nanocomposites for Industrial Applications summarizes the properties of polymer nanocomposites, discusses their industrial scale fabrication methods, and presents their applications for various industrial sectors at both experimental and theoretical models scales. The book also addresses existing challenges for the use of polymer nanocomposites in major industrial sectors. Overall, the aim of this book is to summarize the recent advancements in the use of PNCs in a variety of industry sectors. Particular attention is paid to these approaches that enable green and sustainable industrial developments. The legal, economical and toxicity aspects of polymer nanocomposite are also presented in detail.

Key Features

- Comprehensively explores how polymer nanocomposites are being used to create more efficient products and devices in a variety of industry sectors
- Explores the environmental, legal, health and safety issues of using polymer nanocomposites in an industrial context
- Develops a roadmap to the wider commercial utilization of polymer nanocomposites
- Emphasizes the use of polymer nanocomposites in green and sustainable technologies

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Chaudhery Mustansar Hussain

Department of Chemistry and Environmental Science, New Jersey Institute of Technology, Newark, NJ, United States

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Abstract

Bioprocessing is a natural, safe, and effective way for food manufacturers to create products such as cheese, yogurt, bread, wine, and beer. Bioprocessing uses living organisms and their components in the creation of new products. They used microbes and enzymes in bioprocessing technology provided best results under mild conditions such as neutral pH, normal atmospheric pressure, and temperatures close to room temperature. Therefore, bioprocessing can save a lot of energy in food industry—especially when they act as an alternative to heating products to high temperatures. Bioprocessing can also enhance taste and texture. Also, the microbes used in bioprocessing are biodegradable—reducing the carbon footprint of food production even further. The conventional food bioprocessing methods such as drying, fermentation, salting, and various forms of cooking, including roasting, frying, smoking, steaming, and oven baking developed the quality and flavor of the foods but they are unable to protect from microorganisms that leads to food spoilage. So, nowadays food industries focused on nanotechnology which increases the spoilage time of food. Moreover, nanotechnology showed potential applications in all aspects of food chain including storage, quality monitoring, food processing, and food packaging.

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Handbook of Polymer Nanocomposites for Industrial Applications

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Chapter 12 - Antimicrobial polymer nanocomposite films and coatings

Younes Ahmadi, Niloofar Moeini, Mithilesh Yadav, Sharif Ahmad

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Abstract

The growth and proliferation of pathogenic microbes and bacteria on various surfaces have caused an ever-increasing awareness, necessitating scientists of diverse realm to develop potential antimicrobial materials. Among various methods of prevention, the application of biocidal polymer films and coatings has played a vital role. Generally such polymers are developed by the incorporation of antimicrobial moieties within their matrices. The design and formulation of polymer nanocomposite (PNC) films and coatings with biocidal property, have gained higher interest due to the exceptional reinforcing abilities of nanomaterials compared to other biocides. From this perspective, the aim of the present chapter is to discuss the approaches used for the fabrication and processing of surface-active, selective, leaching and nonleaching antimicrobial PNCs along with their mechanism of action. The chapter also covers the importance of naturally derived precursors for the construction of eco-friendly and cost-effective antimicrobial PNCs. Further the advantages, limitations, and the future scope of such functional PNCs have been discussed.

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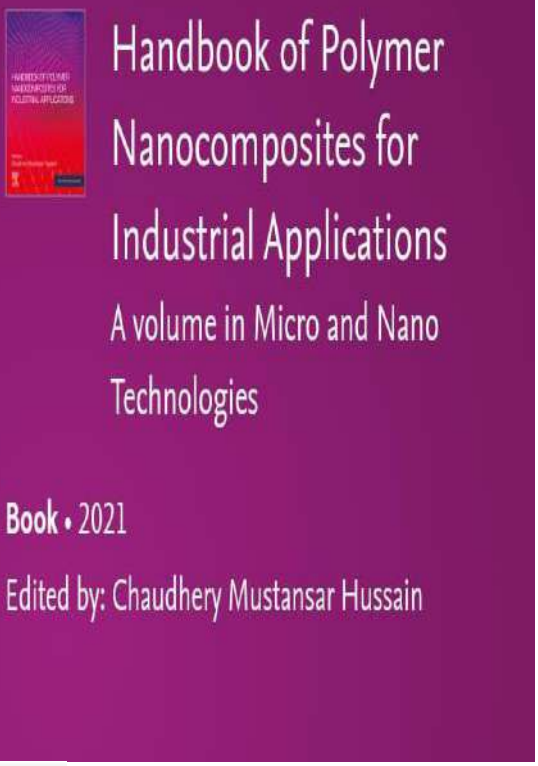

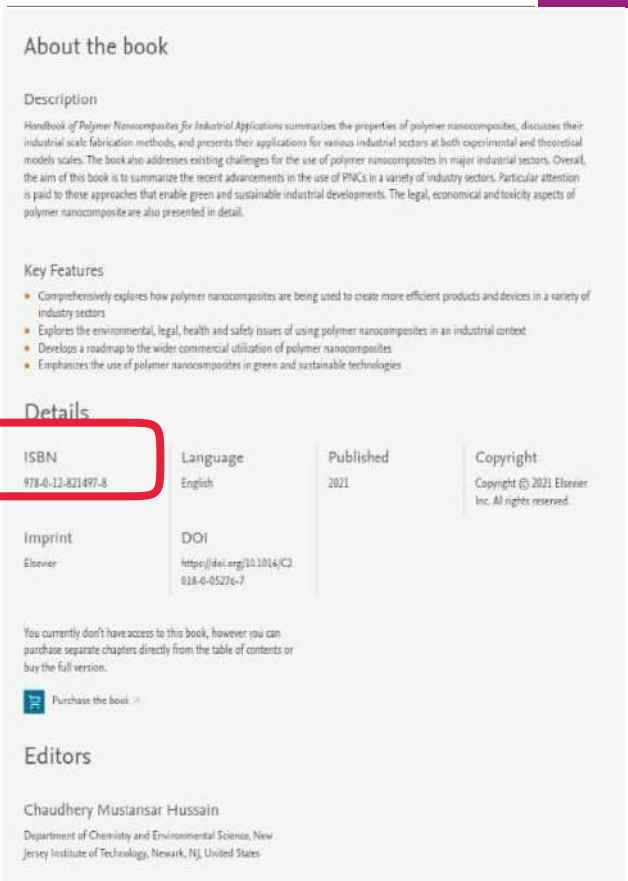

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High Performance Computing for Intelligent Medical Systems

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Indian Institute of Information Technology Design and Manufacturing, Jabalpur, India

IOP Publishing, Bristol, UK

Contents

Chapter 9

A comparison of Parkinson's disease prediction using ensemble data mining techniques with features selection methods

Dhyan Chandra Yadav and Saurabh Pal

Nerve cells or neurons are very important parts of the human body. The brain manages the control system and blood circulation by nerve cells. So it is necessary to know about symptoms of initial stage neuron disturbance in the body system. The 'main objective of this chapter is to protect the human body by initial knowledge about Parkinson's disease. We used machine learning algorithms and analyzed Parkinson's symptoms.

Machine learning algorithms provide help in prediction of attributes and give maximum accurate results. In this paper, we used Naïve Bayes, Decision Tree, Extra Tree, Random Forest and Bagging ensemble method for better prediction compared with all other performed work in this field or in the medical field. All the selective algorithms are tree based algorithms and they have different and important properties for better prediction on a large dataset. We use Bagging ensemble method with all selective algorithms and provide a unique result of prediction.

After all experiments, we find a better result with Bagging algorithms compared to all other selective algorithms, Naïve Bayes, Decision Tree, Extra Tree and Random Forest. Bagging algorithms evaluated with Kappa (0.958), Overall Fraction Correct (0.98), Mis-classification Rate (0.02), Sensitivity (0.979) and Specificity (0.983).

9.1 Introduction

Parkinson's disease is a very dangerous disease in the human body in which nerve cells become dead in a particular area. The nerve system runs by dopamine chemical in the human brain so dead neurons do not produce dopamine. Parkinson's disease is not observed at random in any human body because it is directly related with dopamine. Dopamine does not finish suddenly in the body.

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Contents

Chapter 6

Forecasting confirmed cases of Corona patients in India using regression and Gaussian analysis

Dhyan Chandra Yadav and Saurabh Pal

Corona virus is a major threat for human life leading to a very deadly life-threatening disease. The infection of this disease is so fast that in a very short span of time it took the whole world under its infection. In this chapter, we analyze the growing dataset of COVID-19 from 30 Jan 2020 to 9 July 2020 and estimate confirmed Covid positive cases and patient deaths.

The cases of this disease originated from Wuhan of China and the exact reason for the origin of this disease has not been explained to date. Experts are constantly experimenting to control this disease in the medical field, but to date no effective medicine to cure the disease immediately has been available. Four different functional models have been utilized for Covid data analysis of Indian Covid patients accessed from Kaggle. In this chapter, we have used linear, logarithmic, polynomial and Gaussian functional models for a COVID-19 dataset.

According to these models, we forecast the number of patients and death for Corona disease for the subsequent 120 days from the actual position of Covid cases at the end of Oct 2020 in India. After the analysis we find the polynomial function model is a very impressive model for forecasting. In this study, we find Covid infection grew in the next 120 days in India.

With the help of the prediction obtained from this research, the Indian Government can take preventive measures for controlling Corona disease such as lockdown and implementing social distancing. Another benefit is to develop medical facilities for providing for such a huge number of patients.

6.1 Introduction

Corona viruses are a complex chain of viruses that generate illness in the human body such as respiratory diseases. The respiratory diseases are mainly two of types:

- Middle East Respiratory Syndrome (MERS-CoV);
- Severe Acute Respiratory Syndrome (SARS-CoV).

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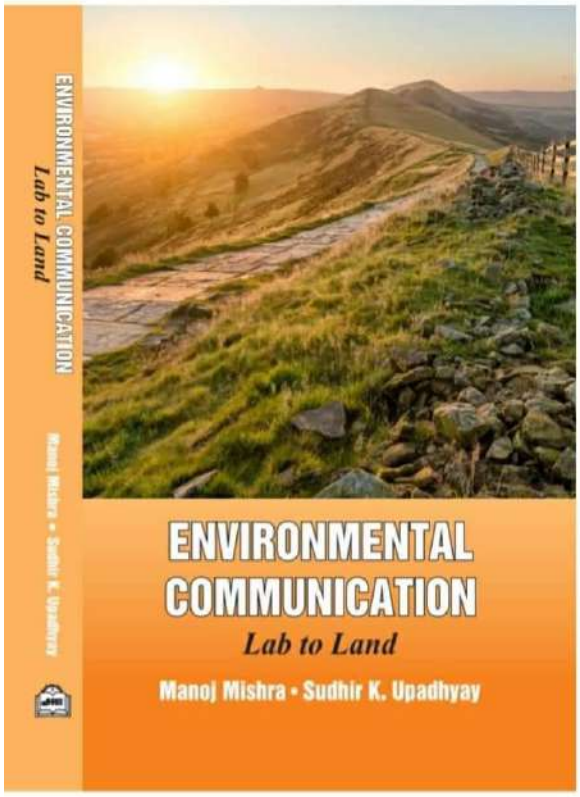

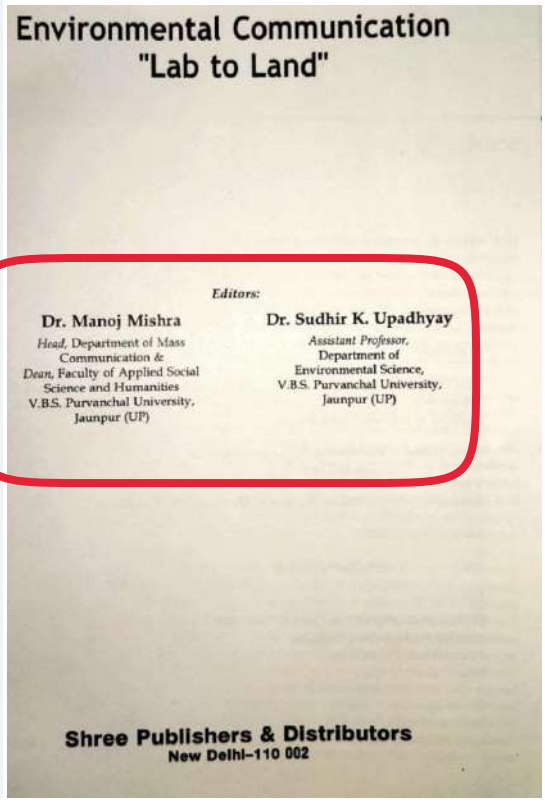

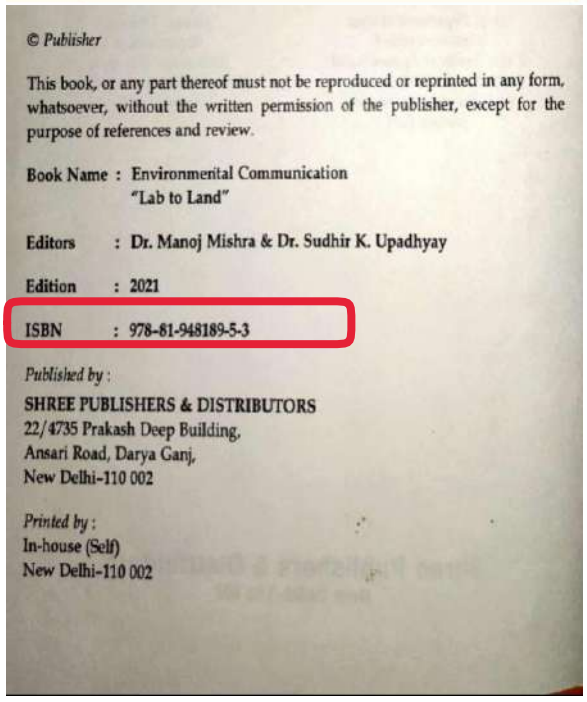

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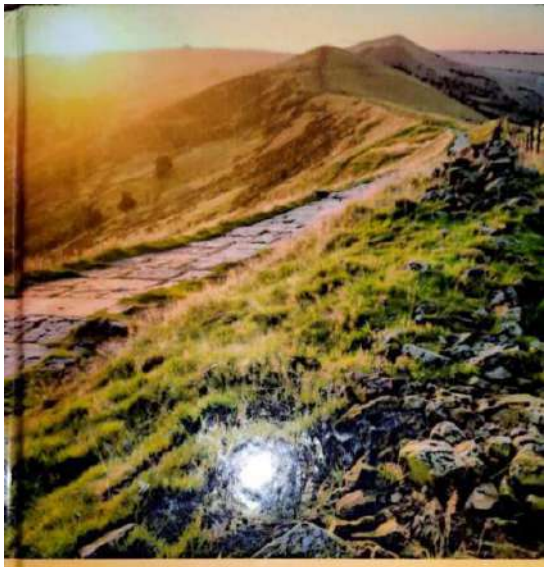

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Contents

7

BIOMEDICAL WASTES AND ITS MANAGEMENT: AN APPROACH OF SCIENTIFIC COMMUNICATION

Sunderam Shukla, Astha Maurya, Satakshi Shahi and Sudhir K. Upadhyay*

Abstract

In the modern era, health issues and the health care attention are directly depended on the development of health care units. Health care units include hospitals, pharmaceutical centres etc, and undoubtedly health care unit plays an important role to improve health and strengthen life. The by-products of HCUs are becoming a burden on the environment as biomedical waste. A load of biomedical waste significantly increases across the globe, especially under indiscriminate disposal. Thus, deep attention is an urgent requirement for mitigation and management of Biomedical Waste. In this connection, the government have prepared Bio- Medical Waste (Management and Handling) rules in this chapter. Characterisation, separation, identification of biomedical waste sources which is important parameters for point source reduction of biomedical waste. Hazardous impacts are reported by several workers due to biomedical waste due to its indiscriminate disposal, which leads to severe environmental problems. Systematic and scientific mode of mitigation should be required for the management of biomedical waste. Simultaneously, communication and awareness among the people also played a significant role to manage biomedical waste and its consequential hazardous effects. Health care units (HCUs) have great importance in human life but the waste generated from these units and clinics have a negative impact on human health and the environment.

Keywords: *Bio-Medical Waste, Health Care Units, Bio-Medical Waste Management, Infectious and Non-Infectious waste.*

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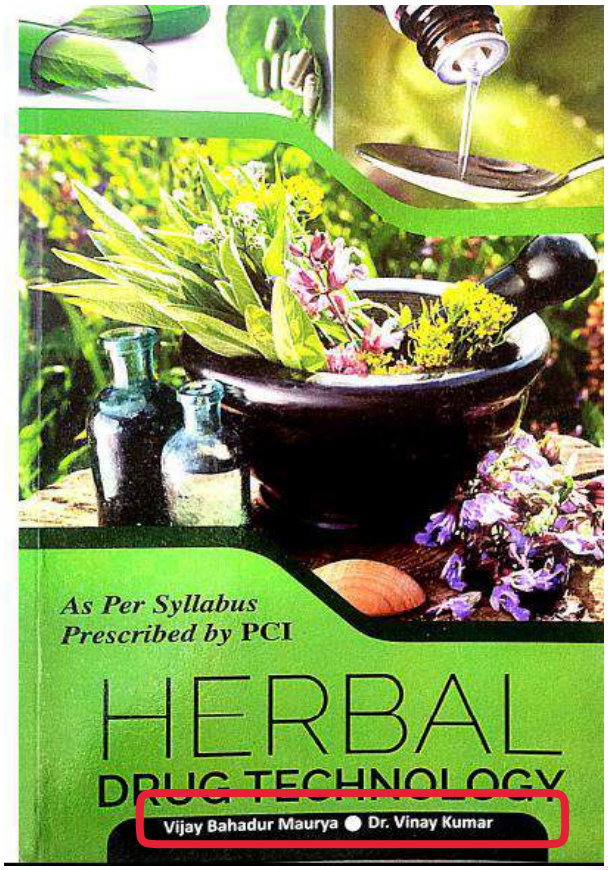
*Corresponding Author: Assistant Professor.



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HERBAL DRUG TECHNOLOGY

Vijay Bahadur Maurya ● Dr. Vinay Kumar

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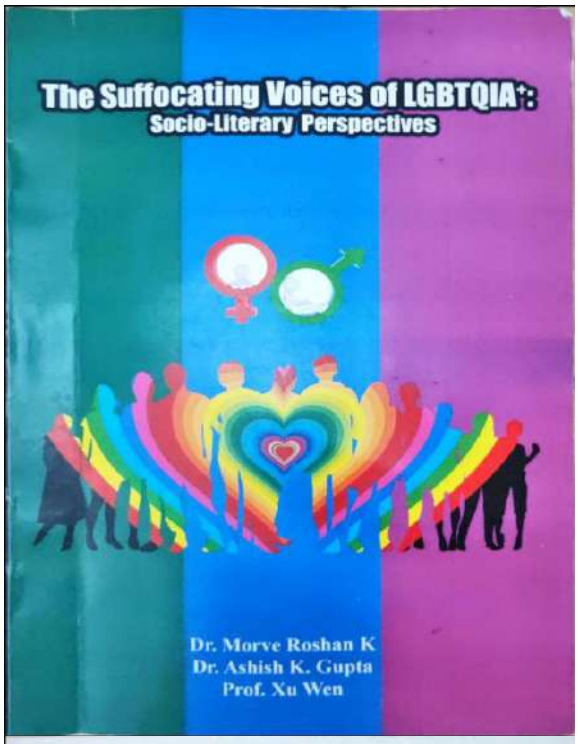
PREFACE

Herbs are part of world we live in. It plays a vital role in maintenance of human health. It has helped to enhance and improve the quality of human life. The presented book is according to new syllabus as per Pharmacy Council of India for undergraduate students. By the means of this book, we the authors want to provide descriptive knowledge of various chapters according the syllabus. This book gives the students, the knowledge of understanding of the quality of raw material, guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceutical, herbal drug industry, etc. The subject also emphasizes on Good Manufacturing Practices (GMP), patenting and regulatory issues of herbal drugs. The subject matter is presented in such a manner that it makes it easier to understand the role of herbs in daily life. It not only emphasizes the need of protection of environment and judicious use of the traditional resources of the earth but also helps in meeting the challenges of rapidly progressing technology.

We the authors have tried to present interesting, knowledgeable and accurate information that will be useful to both students and teachers.

We are thankful to **MS Aman Publishing House**, Meerut, UP who really helped us in all possible ways and took great pains to get this in its proper shape. We are thankful to all those who gave their valuable suggestions which have been incorporated in this publication. We wish to get your feedback and suggestion in future also. Last but not least, we acknowledge the support of our family members and friends who always helped us to do our best.

—Authors



TITLE : *The Suffocating Voices of LGBTQIA+: Socio-Literary Perspectives*

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Content

Chapter 8

Emerging Themes Related to the Discrimination at the Workplace with People Belongs to LGBT Community

Deepti Mishra*, Dr. Manoj Kumar Pandey** & Shivani Mishra***
*Ph.D. Scholar, Department of Applied Psychology, VBS Purvanchal University, Jaunpur, Uttar Pradesh.
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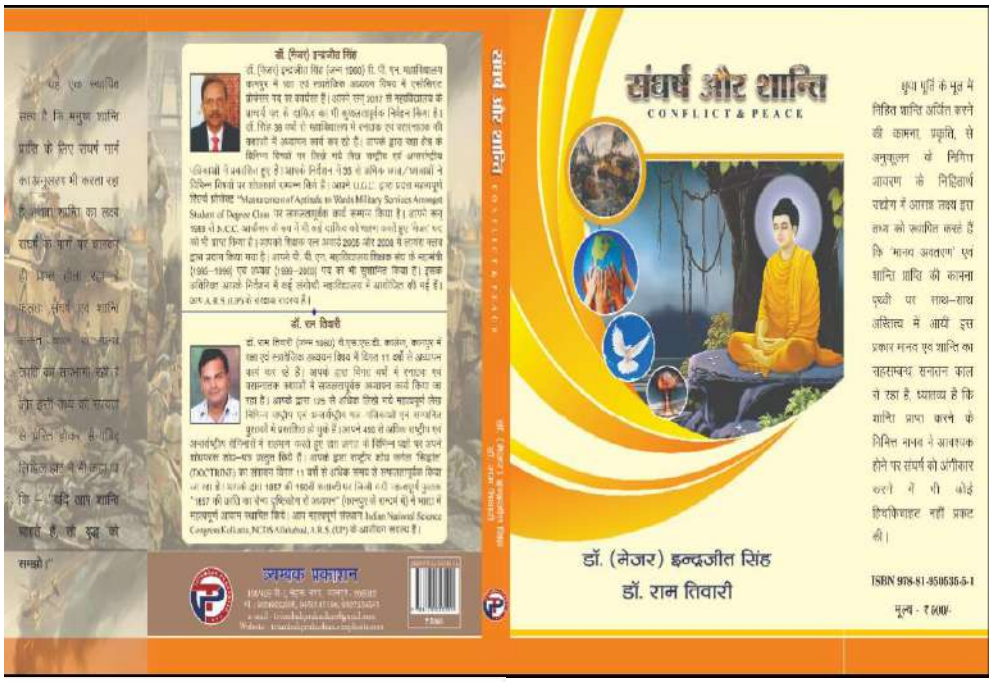
With the passage of time in the 21st century, people who belong to the lesbian, gay, bisexual and transgender (LGBT) community, start working in different organizations. But now LGBT workers encounter a high level of discrimination and harassment at the workplace that negatively affect their job satisfaction, job commitment, performance and organization overall productivity too. But very little research has been done focusing on discrimination on the basis of sexual orientation in the workplace. So, the purpose of this chapter is to explore the emerging themes due to sexual discrimination in the workplace in India. Further, this study attempts to give some recommendations for managers and all to prevent discrimination on the basis of sexual orientation. A systematic review of literature has been done to focus on the emerging themes related to perceived discrimination due to sexual orientation at the workplace. And in this study, it has been found that wage inequality, coming out among LGBT worker group are some of the major themes that are emerged in the workplace due to the sexual discrimination of LGBT workers and



Understanding the Role of Civil Society in Maintaining Peace and Harmony in Society

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Summary

The inter group conflict has become a universal existential reality of human life on earth. It disturbs peace and harmony of society. In this way, it presents one of the biggest challenges in maintaining peace and harmony among the members of the society. It has been observed that civil society has a good potential to control the intensity of intergroup conflict and maintain peace. But it has been often seen that besides existence of civil society, intergroup conflict escalates very much and it leads to loss of life and property. The purpose of this present research paper is to understand the role of civil society during intergroup conflict. An effort would be made to critically analyze the factors that affect efficiency of civil society during intergroup conflict. Researches have shown that various factors such as contextual factors, policies of government regarding civil society, pattern of intergroup interaction in society, proximity of civil society to local population, trust in civil society, decisive actions of civil society during conflictare some of the important factors that affect efficiency of civil society to handle the intergroup conflict and maintain peace and harmony in the society.

Keywords : Civil Society, Peace, Harmony, Intergroup Conflict.

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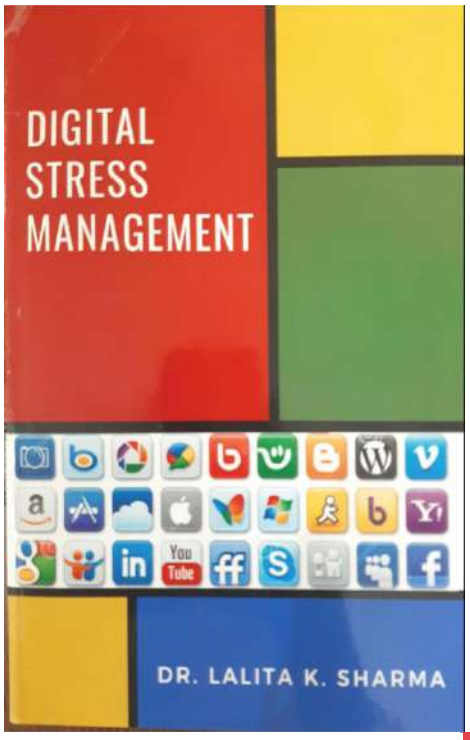
INTRODUCTION

Intergroup conflict and violence have emerged as one of themost researched and debatable issue in the past as well in the current scenario. There



CHAPTER 23

ROLE OF POSITIVE ATTITUDE, ASSERTIVENESS, RELAXATION TECHNIQUES, YOGA, MEDITAION, BALANCED DIET AND HOBBIES IN COPING WITH DIGITAL STRESS

Annu Tyagi
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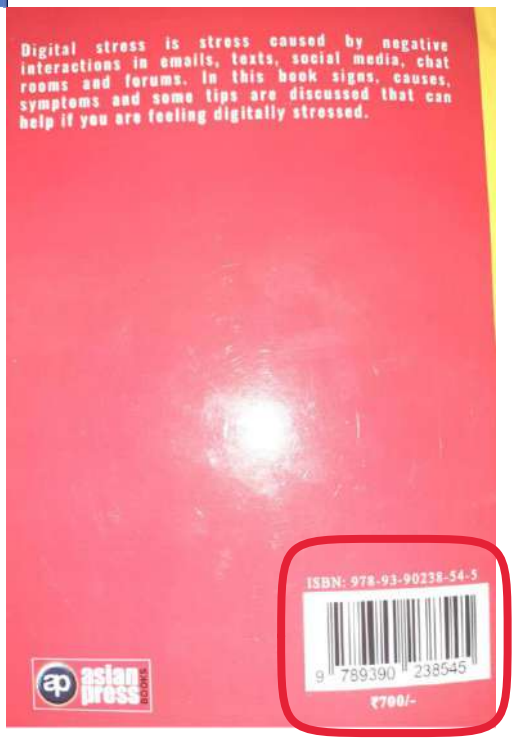
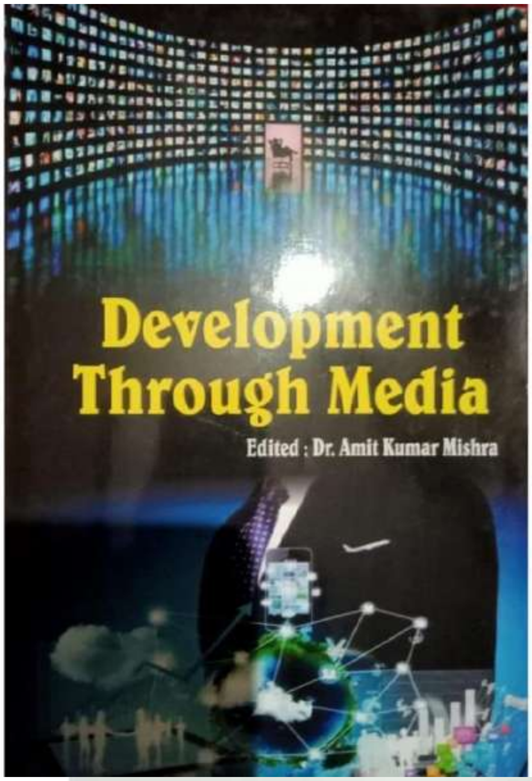
Jaunpur, Uttar Pradesh

ABSTRACT

Digital stress is the term for the overwhelming and exhausting challenges that are created by digital technology .COVID-19 outbreak has enhanced attachment with the digital gadgets and detachment people from the physical world as nationwide lockdown was imposed by the government from 24 March 2020. Incidents of cyber bullying, shaming on social networking sites have increased across the nation which resulted in stress. Coronavirus disease turned up to be a situation of socio-economic crisis and profound psychological distress. The use of technology increased drastically, making it tough for some to adjust and handle the digital stress, which have remarkable consequences on individual cognitive, emotional and behavioral aspect. Persistent feeling of uncertainty during COVID-19 outbreak has further increased the burden of psychological problems across the globe. Mental health issues like stress, anxiety, depression, insomnia etc. have increased during this period of pandemic. Sustainable use of technology and techniques like relaxation, meditation, yoga, time management and positive attitudes have been found to be effective in dealing with the digital stress and enhance psychological well-being.

Keywords: Digital stress, coronavirus, relaxation, positive attitude



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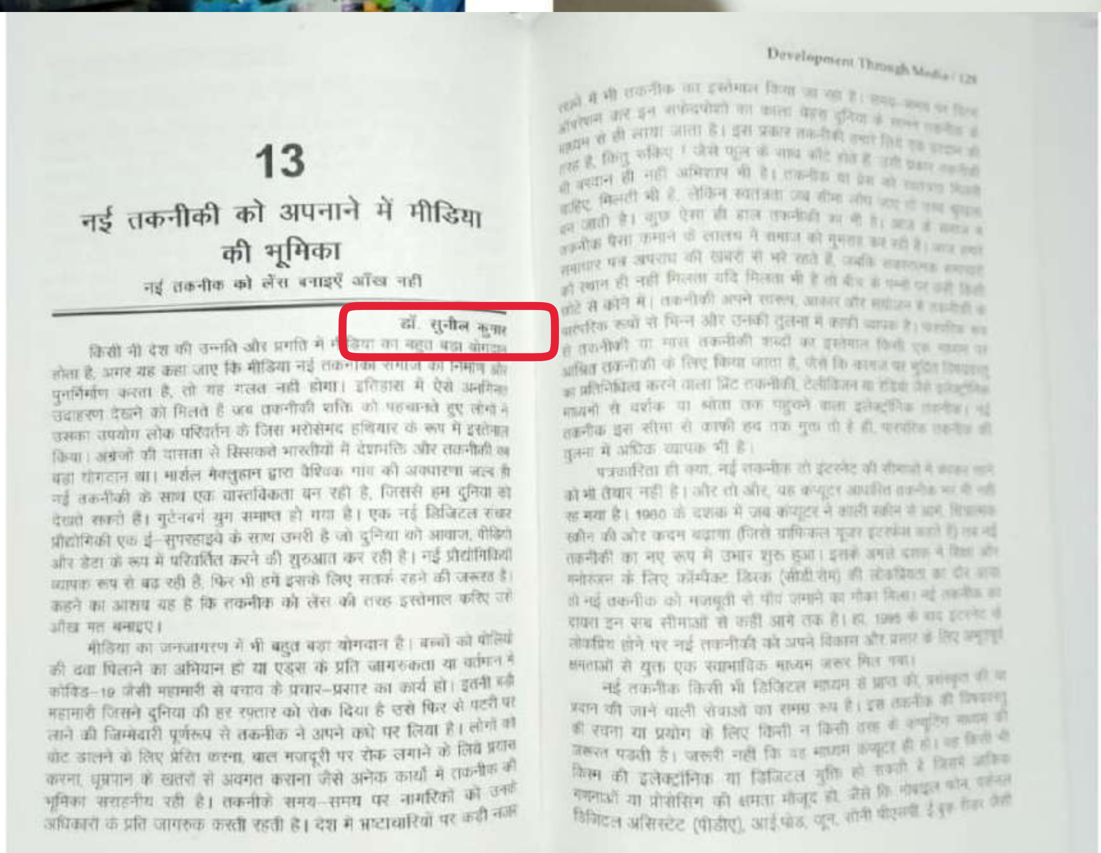

13

नई तकनीकी को अपनाने में मीडिया की भूमिका

नई तकनीक को लेंस बनाइएँ आँख नही

डॉ. सुनील कुमार

किसी भी देश की उन्नति और प्रगति में मीडिया का बहुत बड़ा योगदान होता है, अगर यह कहा जाए कि मीडिया नई तकनीकि समाज का निर्माण और पुनर्निर्माण करता है, तो यह गलत नही होगा। इतिहास में ऐसे अनगिनत उदाहरण देखने को मिलते है जब तकनीकी शक्ति को पहचानते हुए लोगो ने उसका उपयोग लोक परिवर्तन के जिस भरोसेमंद हथियार के रूप में इस्तेमाल किया। अंग्रेजो की दासता से सिसकते भारतीयों में देशभक्ति और तकनीकी का बड़ा योगदान था। मार्शल मैक्लुहान द्वारा वैश्विक गांव की अवधारणा जल्द ही नई तकनीकी के साथ एक वास्तविकता बन रही है, जिससे हम दुनिया को देखते सकते हैं। गुटेनबर्ग युग समाप्त हो गया है। एक नई डिजिटल संचार प्रौद्योगिकी एक ई–सुपरहाइवे के साथ उभरी है जो दुनिया को आवाज, वीडियो और डेटा के रूप में परिवर्तित करने की शुरुआत कर रही है। नई प्रौद्योगिकियाँ व्यापक रूप से बढ़ रही है, फिर भी हमें इसके लिए सतर्क रहने की जरूरत है। कहने का आशय यह है कि तकनीक को लेंस की तरह इस्तेमाल करिए उसे आँख मत बनाइए।

मीडिया का जनजागरण में भी बहुत बड़ा योगदान है। बच्चों को पोलियो की दवा पिलाने का अभियान हो या एड्स के प्रति जागरुकता या वर्तमान में कोविड–19 जैसी महामारी से बचाव के प्रचार–प्रसार का कार्य हो। इतनी बड़ी महामारी जिसने दुनिया की हर रफ्तार को रोक दिया है उसे फिर से पटरी पर लाने की जिम्मेदारी पूर्णरूप से तकनीक ने अपने कंधे पर लिया है। लोगों को वोट डालने के लिए प्रेरित करना, बाल मजदूरी पर रोक लगाने के लिये प्रयास करना, धूम्रपान के खतरों से अवगत कराना जैसे अनेक कार्यों में तकनीक की भूमिका सराहनीय रही है। तकनीके समय–समय पर नागरिकों को उनके अधिकारों के प्रति जागरुक करती रहती है। देश में भ्रष्टाचारियों पर कड़ी नजर

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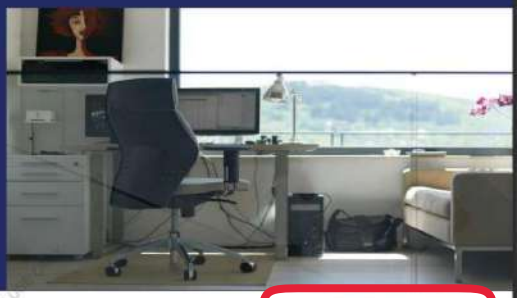

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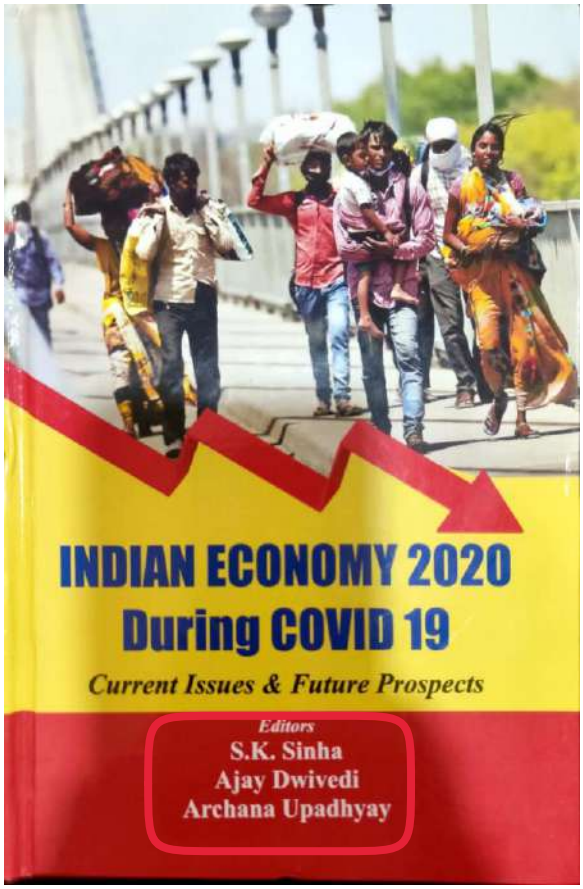

INDIAN ECONOMY 2020
During COVID 19

Current Issues & Future Prospects

Editors

S.K. Sinha
Ajay Dwivedi
Archana Upadhyay

Prof. SK Sinha is one of the gems of the line of academics. He serves 23 years to the society by his knowledgeable impressive commended subject teaching as well as important contribution to make the youth skillful with value system. He is working as a Dean, Chairperson Department of Management, Faculty of Commerce and Management at Chaudhary Ranbir Singh University, Jind, Haryana. He is also a strong pillar of the University by having the post of Dean Academic Affairs. He published many International and National Papers in reputed Journals.

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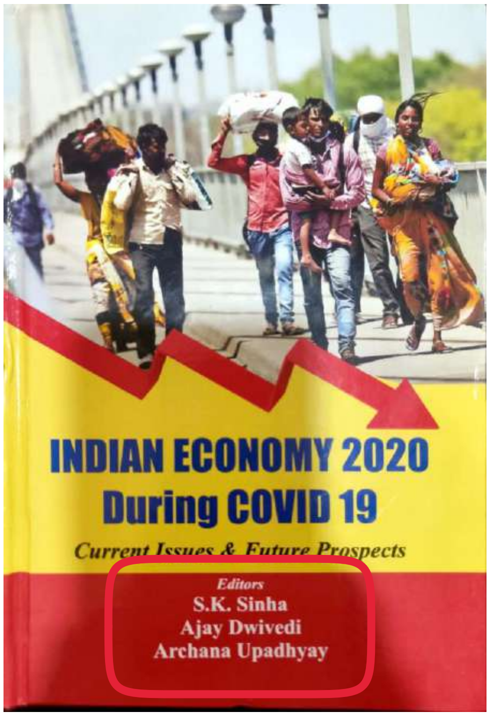

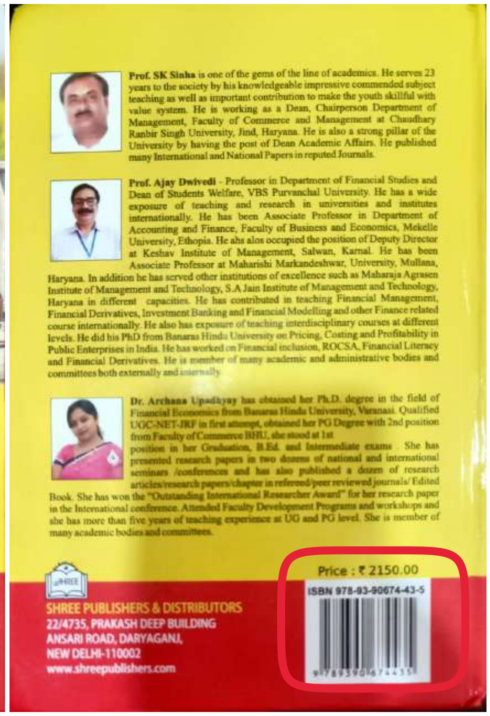

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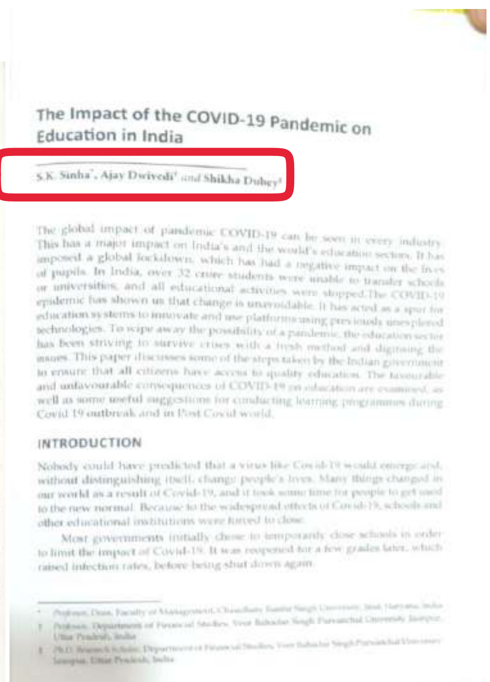

The Impact of the COVID-19 Pandemic on Education in India

S.K. Sinha[*], Ajay Dwivedi[†] and Shikha Dubey[‡]

The global impact of pandemic COVID-19 can be seen in every industry. This has a major impact on India's and the world's education sectors. It has imposed a global lockdown, which has had a negative impact on the lives of pupils. In India, over 32 crore students were unable to transfer schools or universities, and all educational activities were stopped.The COVID-19 epidemic has shown us that change is unavoidable. It has acted as a spur for education systems to innovate and use platforms using previously unexplored technologies. To wipe away the possibility of a pandemic, the education sector has been striving to survive crises with a fresh method and digitising the issues. This paper discusses some of the steps taken by the Indian government to ensure that all citizens have access to quality education. The favourable and unfavourable consequences of COVID-19 on education are examined, as well as some useful suggestions for conducting learning programmes during Covid 19 outbreak and in Post Covid world.

INTRODUCTION

Nobody could have predicted that a virus like Covid-19 would emerge and, without distinguishing itself, change people's lives. Many things changed in our world as a result of Covid-19, and it took some time for people to get used to the new normal. Because to the widespread effects of Covid-19, schools and other educational institutions were forced to close.

Most governments initially chose to temporarily close schools in order to limit the impact of Covid-19. It was reopened for a few grades later, which raised infection rates, before being shut down again.

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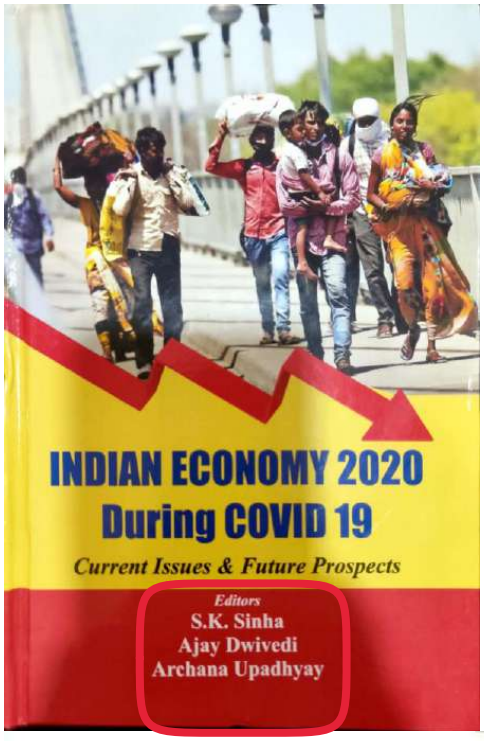

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IMPACT OF COVID-19 ON INDIAN ECONOMY

Ajay Dwivedi* *and* Om Dutt†

The present chapter focuses on how the present epidemic has exaggerated the entire economy severely. The author has reviewed many researches in this regard during previous outbreaks. In the present scenario world witness the most intricate era because of COVID 19 pandemic where every economy of the world suffering from the consequences of the COVID19. The author has made an attempt to study the serious implications faced by the world economy into various forms like economically and non-economically. Indian economy is also not free from the COVID19 impact. Although majority of businesses of India strongly hit by the pandemic and supply chains also witness the sharp down fall due to the pandemic, but still there is hope in the difficult time. In India businesses and enterprises have seen a huge dip in the economic activities during the COVID 19 and India is not alone who face this situation. In world all economies face same situation.

INTRODUCTION

Indian economy face the extraordinary time after many years of colonization because of Covid-19. Indian economy already experiencing tough time before Covid-19 pandemic hit the economic activities in the country. In extended lock down almost every sector of the economy face crisis specially manufacturing sector which is major contributor to the employment in the economy has witness the tough time. Severity of economic impact of COVID 19 will be determine by the, to extent which health emergency will be persistent in the economy and clinical management of the disease, also time period of lockdown in economy which further leads to mismatch between demand and supply conditions in the economy and importantly how lockdown is lifted by the government. In this paper our attempt to evaluate the health Indian economy before Covid -19 situation and also interested to see the impact of Covid- 19 on the wellbeing of different sectors of the economy. How macro variables of the economy react after the hit of pandemic. As we know that majority of economy in the world is standing at the central of pandemic and witnessing the two major crisis one

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MEDIA & COVID-19

Issues, Implications, Inferences

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26

Impact of COVID-19 Communication on Rural Population: A Case Study

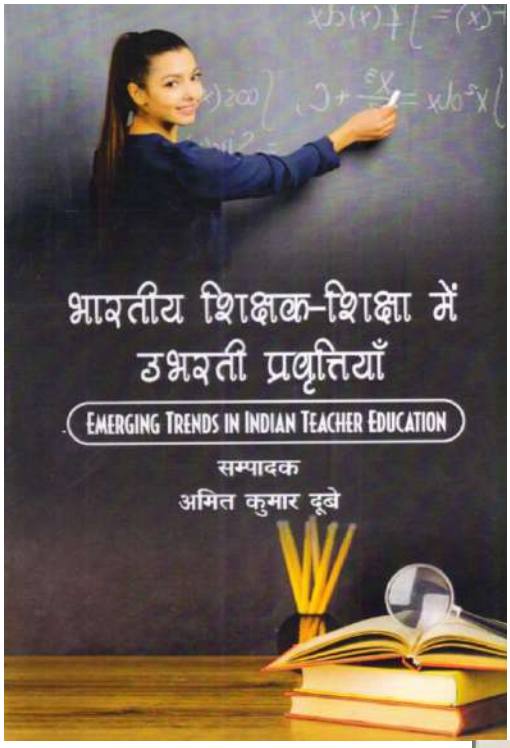
Dr. Manoj Mishra

Abstract

Media has disseminated all the relevant information like the places infected and mitigation measures about the deadly coronavirus which has rapidly infected the human population across the globe. Corona warriors of the media are present throughout the nation. The present study found that elderly people (>50 year) of Baksha Block were almost unaware of the impact of the disaster brought about by COVID-19 as compared to the younger (<50 year) people. A proper source of information is required for the rural people to induce awareness among them and to communicate the strategies to fight the COVID-19 pandemic. In rural areas most people do not have the electronic gadgets and financial ability. That is why they are not using Aarogya Setu app or proper sanitizers and masks during this crucial situation, nor are they aware that physical distancing has become an important weapon to fight the COVID-19 pandemic.

Introduction

COVID-19 has reached the whole world. It emerged from Wuhan in China (Phelan et al., 2020, Wu et al., 2020). Although, its exact origin and ability to spread among human beings are still not very clear, the large number of cases reported worldwide shows the human to human transmission of the disease. According to the WHO, the symptoms of COVID-19 appear to be relatively mild as compared with SARS-CoV (Severe Acute Respiratory Syndrome Coronavirus) and MERS-CoV (Middle East Respiratory Syndrome Coronavirus). Coronavirus relates with its large family and can infect mammals, birds and humans (WHO). On January 7, 2020, a novel coronavirus was isolated and the International Committee on Taxonomy of Virus (ICTV) referred this virus as Severe Acute Respiratory Syndrome Coronavirus-2 (Legido-Quigley et al., 2020, Wang et al., 2020, Khot et al., 2020). Symptoms of coronavirus in infected people could appear between two to 14 days of exposure--fever, cough, running nose, sore throat, headache, chest pain, tiredness, shortness of breath, rash, vomiting and diarrhea etc. The severity of novel coronavirus symptoms can range from very mild to severe; some people may have symptoms and some may have no sign or symptoms of the novel coronavirus. Older people and those



14

योग एवं व्यक्तित्व विकास

डॉ. जाह्नवी श्रीवास्तव

मन ऐसा तत्व है जो संसार के सभी [illegible] पाया जाता है यहाँ तक कि कीट और पतंगे भी इससे रहित नहीं हैं। मनुष्यों में मन की स्थिति को लेकर मनोवैज्ञानिकों, समाजशास्त्रियों एवं वेदज्ञों आदि व्याख्याकारों ने मन को दूरदर्शिता, तर्क प्रखरता एवं विवेकशीलता के रूप में विस्तार पूर्वक समझाया है। मन के सम्बन्ध में मतैक्य होते हुए कहा है कि मन किसी सीमा में नहीं रहता यह स्वेच्छाचारी जंगल में विचरण करने वाले पशु की तरह स्वच्छन्द उछलता-कूदता रहता है, पक्षियों की भाँति बिना पंख के ही किसी भी दशा में उड़ने के लिए आतुर रहता है, जिस प्रकार मदमस्त हाथी जंगल में पेड़ों को उखाड़ते, फसलें बर्बाद करते सिर्फ नुकसान करते हैं साथ ही साथ स्वयं भी भूखे प्यासे दिशा विहीन होकर भटकते हैं ठीक वही स्थिति हमारे मन की भी होती है। परन्तु मनुष्य एक ऐसा प्राणी है जिसके पास मन को नियंत्रित कर सकने की योग्यता एवं क्षमता ईश्वर ने प्रदान की है। मन को कैसे नियंत्रित किया जाए इसके लिए अनेकानेक साधन हमारे ऋषि - मुनि द्वारा बताए गए हैं जिसमें साधना एवं योग बहुत ही उपयोगी साधन माना गया है। योग के द्वारा मन के अनुचित प्रभाव को रोका जा सकता है उचित-अनुचित के मंथन से उलट पलट कर नवनीत निकाला जाता है, जिसके परिणामस्वरूप ही व्यक्ति सार्थक एवं निरर्थक विचारों के मध्य भेद कर सकने में सफल हो पाता है। मन पर अंकुश लगाना एवं दिशा प्रदान करना योग द्वारा सम्भव है अन्यथा की स्थिति में मन हवा के साथ उड़ने फिरने वाले तिनके की तरह अपनी मानसिक चेतना को निरर्थक या

* असि. प्रोफेसर, व्यावहारिक मनोविज्ञान विभाग, बी.बी.एस.पी.यू. जोधपुर

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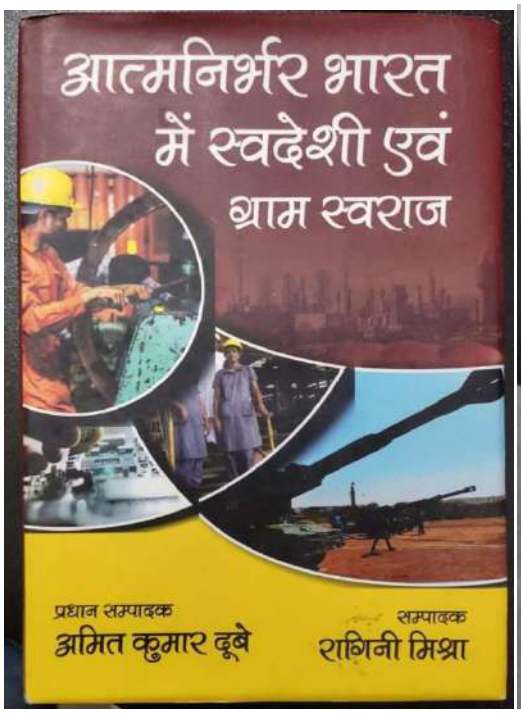

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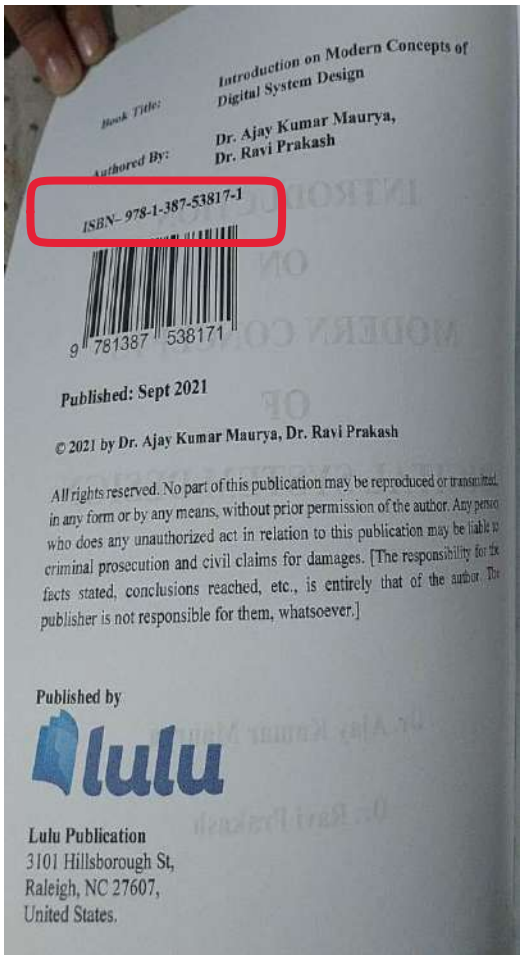

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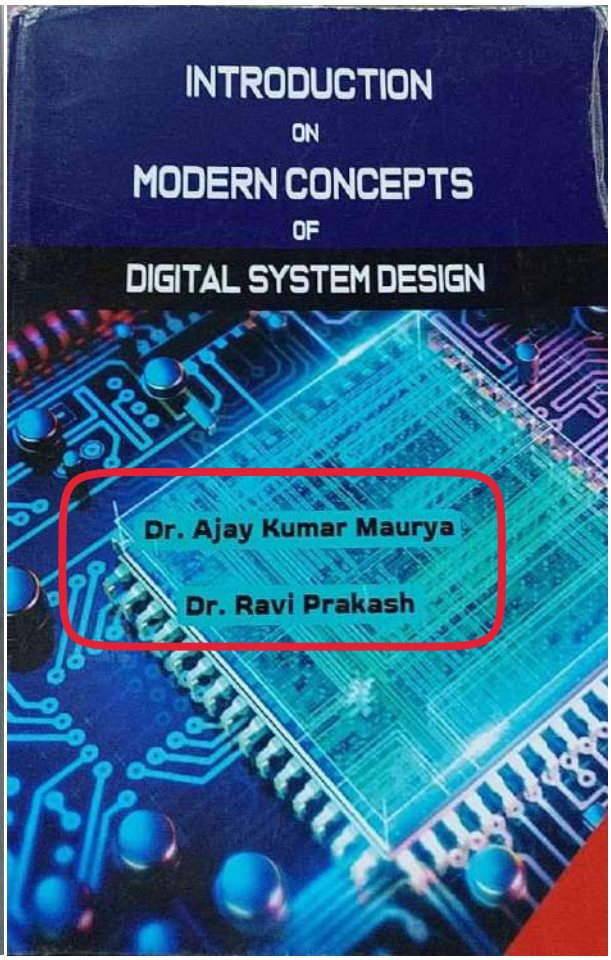

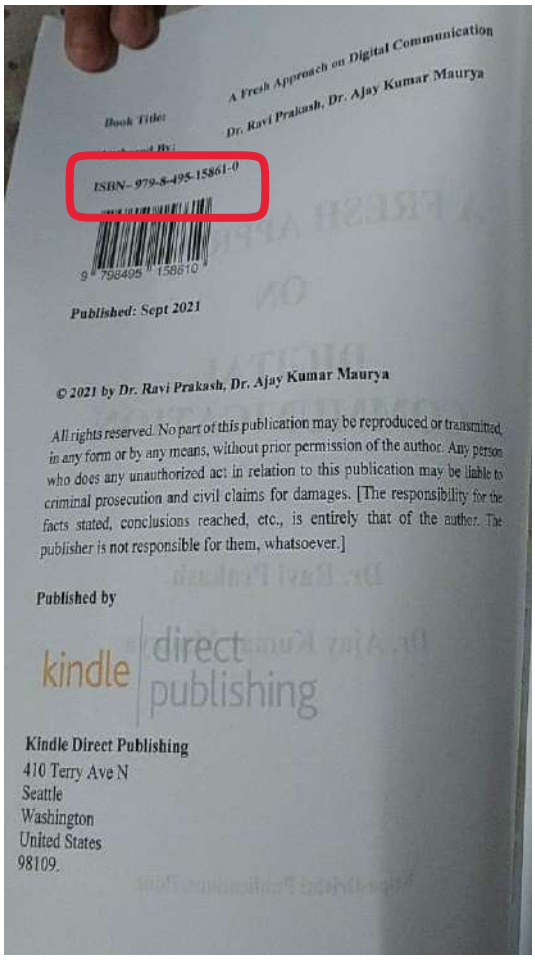

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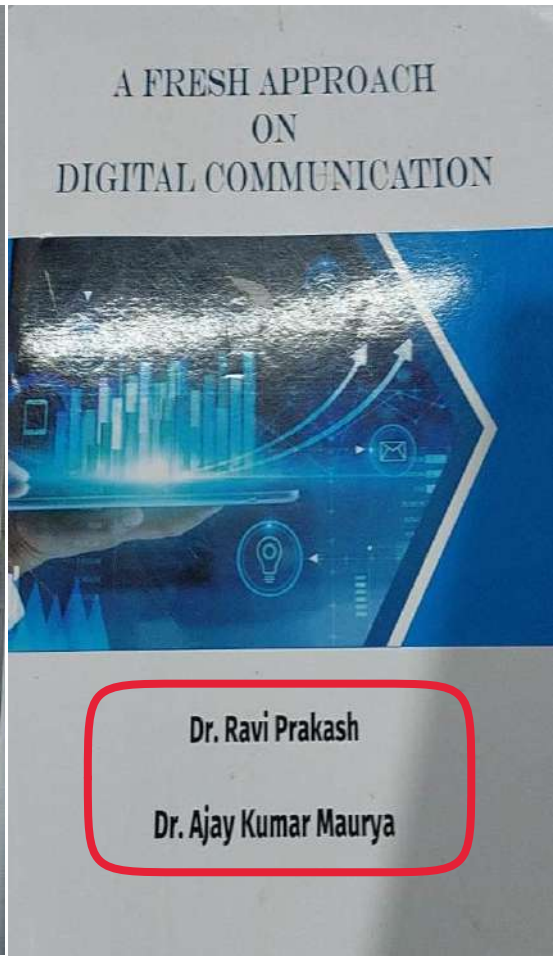

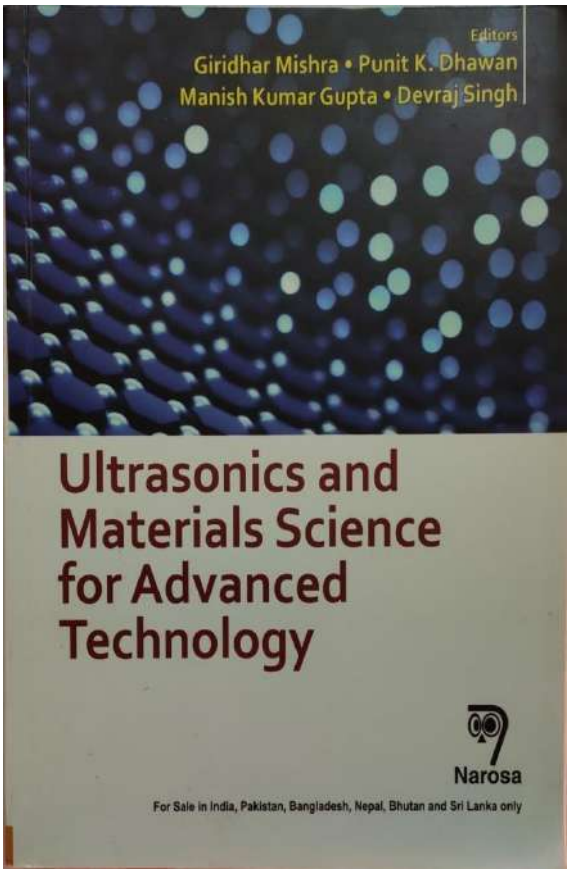

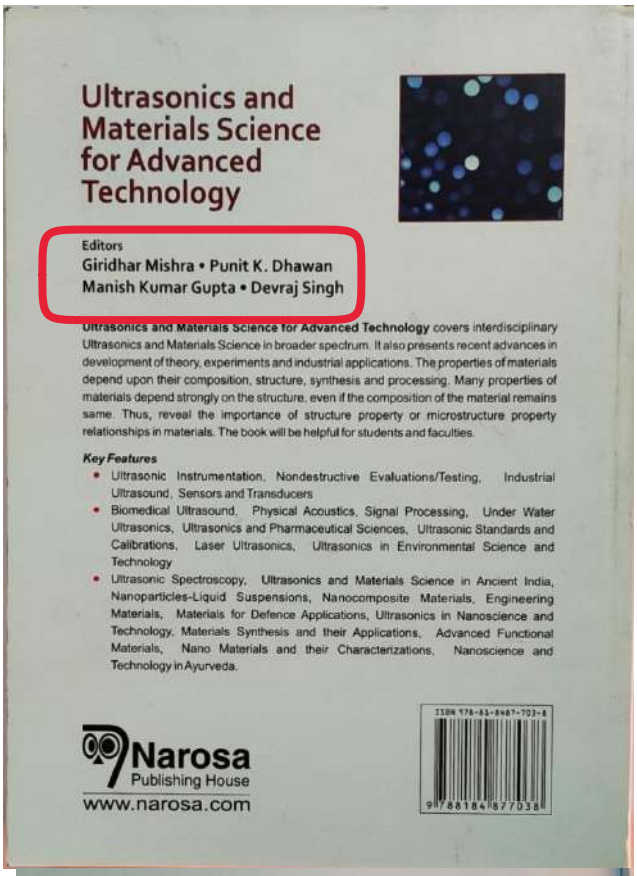

Contents

MTHFR Gene A1298C Polymorphism and Alzheimer's Disease Susceptibility

Vandana Rai

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ABSTRACT

Methylenetetrahydrofolate reductase (MTHFR) is a crucial enzyme involved in homocysteine/methionone metabolism. It catalyzes the conversion of 5,10methlenetetrahydrofolate in to 5methyltetrahydrofolate. A number of studies have examined the association of MTHFR A1298C polymorphism as risk factor for Alzheimer's disease (AD), but the results were contradictory. To clarify the influence of MTHFR A1298C polymorphism on Alzheimer's disease (AD), a meta-analysis of ten case-control studies was carried out. Four electronic databases were searched up to August, 2019 for suitable articles. The pooled odds ratios (ORs) with 95% confidence intervals (95% CIs) were used to evaluate the association. All statistical analyses were performed by MetaAnalyst program.

The results of meta-analysis suggested that except allele contrast model, A1298C polymorphism is not risk for Alzheimer's disease using overall comparisons in three genetic models (C vs. A: OR= 1.26, 95%CI= 0.912-1.76, p= 0.04; CC+AC vs. AA: OR= 1.43; 95%CI= 0.85-2.44, p=0.05; CC vs. AA: OR= 1.16, 95%CI = .88-1.55, p= 0.51; AC vs. AA: 1.55; 95%CI= 0.81-2.93,p=0.07). Publication bias was absent in all five genetic models. In conclusion, results of present meta-analysis showed no significant association between MTHFR A1298C polymorphism and AD risk.

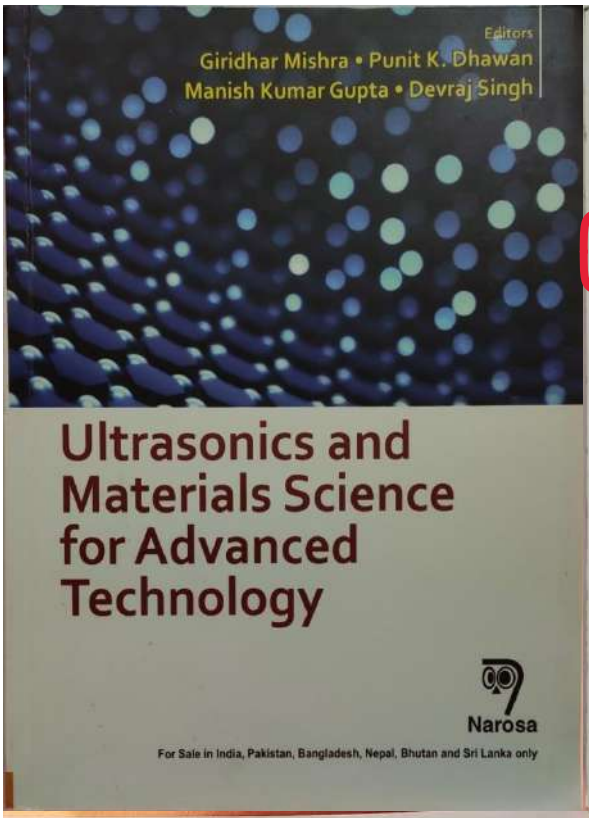
Keywords:Alzheimer's disease, MTHFR, A1298C, Polymorphism

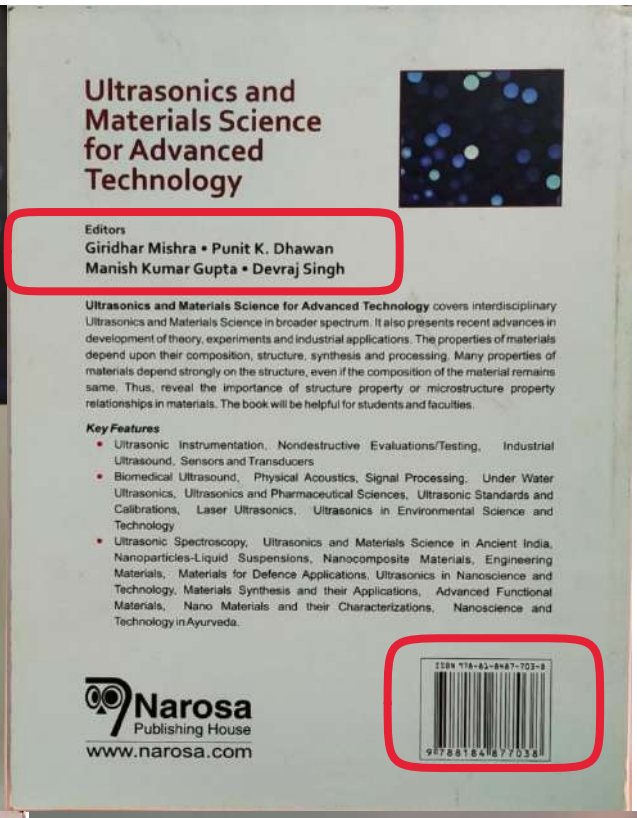
1. Introduction

Alzheimer's disease (AD) is one of the major neurodegenerative diseases in elderly population. It is the most common form of dementia, affecting 1 in 8 individuals older than 60 years of age. Most AD cases are late in onset and are probably influenced by both genetic and environmental factors. Epidemiological studies have demonstrated that elevated levels of plasma homocysteine (Hcy) may play an important role in the pathogenesis of AD [1-3].

Folic acid/folate is essential for cellular methylation, DNA synthesis, and homocysteine metabolism. MTHFR and methionine synthase reductase (MTRR) are two important enzymes of folate pathway and dysfunction of these genes increases plasma homocysteine concentration [4,55]. Both genes show polymorphism as MTHFR C677T, A1298C [6-9] and MTRR A66G [10-12] and frequency of these polymorphisms varies greatly word wide. MTHFR enzyme required for the conversion of 5,10-methylene-tetrahydrofolate to 5-methyltetrahydrofolate (5THF), 5THF is the methyl donor for synthesis of methionine from homocysteinine [13]. The MTHFR gene is present on short arm of chromosome 1 at position p36.3. MTHFR A1298C polymorphism is associated with reduced MTHFR enzyme activity and hyperhomocysteinemia [5].

In A1298C polymorphism, A is substituted with C nucleotide at position 1298 [5], leading to substitution of glutamate by alanine s (Glu429Ala) in the MTHFR enzyme. Glu429Ala in MTHFR enzyme, reduces 40% enzyme activity. Frequency of 1298C allele differs greatly in various ethnic groups of the world. The prevalence of the mutant CC homozygote variant genotype ranges from 7 to 12% in Europe, 4 to 5% in Hispanics and 1 to 4% in Asian populations (1 to 4%) [14]. Several studies have reported A1298Cpolymorphism as risk factor for several diseases like- cleft lip and palate, Down syndrome, neural tube defects, and psychiatric disorders etc [14]. MTHFR polymorphisms were studied as risk for AD by several researcher but their





Therapeutic siRNA Delivery for Cancer Therapy Using Nanoparticles

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*E-mail: pradipk14@yahoo.co.in

ABSTRACT

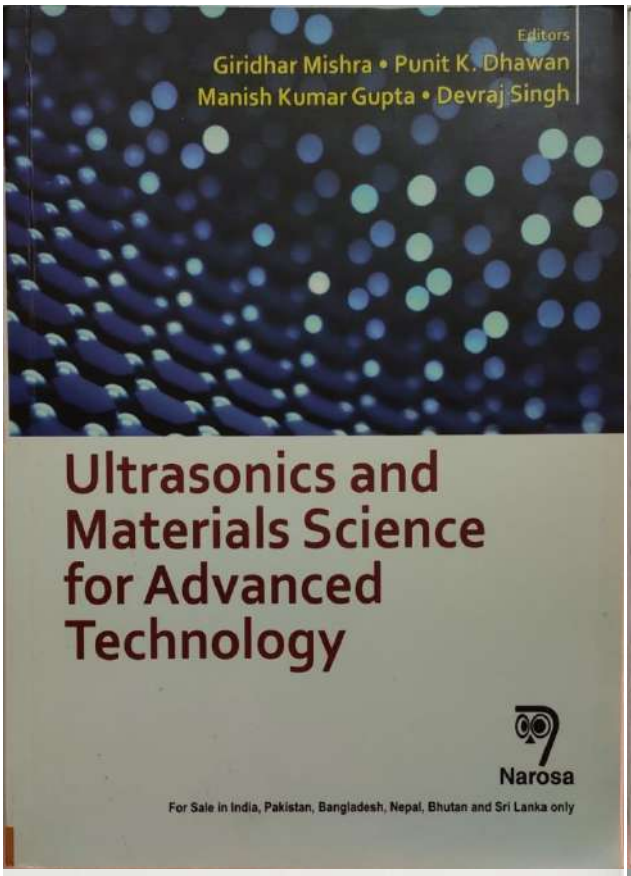
According to World Health Organization diseases Cancer, among non-communicable diseases, is one of the leading causes of global death in many countries. Mortality due to cancer increases due to delayed diagnosis and treatment. Early and accurate detection and successful treatment of cancer can save millions of lives. Last two decades has witnessed improved treatment of cancer due technological advancement and a better understanding of molecular biology of the cancer. Treatment of cancer involves surgery, radiotherapy, anticancer drug chemotherapy and targeted therapy. siRNA via the phenomenon of RNA interference can inhibit specific cancer promoting gene (i. e post transcriptional silencing) and has proved to be successful as a result many siRNA based anticancer drugs are in clinical trials and many are under preclinical research. Despite many advantages over chemotherapeutic drugs for cancer treatment like safety, high efficacy, and high specificity, siRNA therapeutics for cancer treatment faces many limitations especially their poor delivery. Clinical translation of naked siRNA for cancer treatment is affected by several barriers like intravascular enzymatic degradation, recognition by immune system renal filtration and short half life reduced uptake by cells unstable under physiological conditions. In addition large size, hydrophilic nature and negative charge on naked siRNA molecules prevent them to diffuse across biological membranes. A chemical modification of the siRNA molecule or a delivery vehicle or carrier is required for efficient uptake of siRNA by target cells. Nanomaterials can be used as drug delivery vehicles targeting cancer. Currently nanocarriers like liposomes dendrimers polymeric nanoparticles polymeric micelles inorganic nanoparticles containing anticancer agents such as drug or siRNA molecule have proven to have many advantages compared to other drug delivery system. Many lipid nanoparticles RNAi drugs and cyclodextrin polymer based nanoparticle delivery systems for siRNA are under clinical trials. In recent times scientists have attempted microbubble and ultrasound mediated delivery of miRNA and siRNA for cancer therapy. Ultrasound mediated nanoparticle delivery will be a promising option for targeted delivery of therapeutics like si RNA into target cells with reduced toxicity and systemic dose.

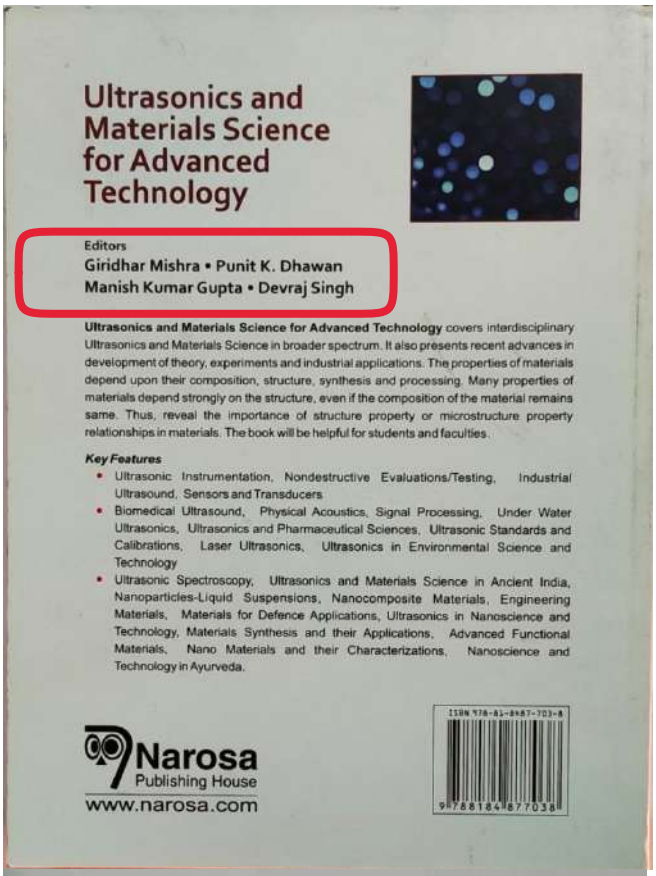
Key words: siRNA, nanoparticles, cancer, therapy

1. Introduction

Cancer is generic term used for a group of diseases caused by abnormal proliferation of cells. Cancer cells are different from normal (finite) cells as they grow and divide in an uncontrolled and unregulated manner and invade normal tissues and organs and destroy normal body tissue (1,2). Major risk factors that may increase the chances of cancer include age, tobacco use, alcohol use, radiation, infectious agents (like HPV), exposure to chemicals(cacinogens), hormones, unhealthy diet, lack of physical activity and high body mass index(3).

Common types of cancer are lung cancer, breast cancer, colorectal cancer, prostate cancer, skin stomach etc.(1) Cancer survival rate is increasing for many types of cancer, due technological advancement and improvement in the understanding and screening of the disease and its treatment. Different types of treatment available for cancer include surgery, chemotherapy, radiation therapy, targeted and hormonal therapy, and stem cell transplants (4, 5). siRNA drugs for cancer treatment can offer many advantages over





DRD2 TaqI A Polymorphism in Eastern Uttar Pradesh Population

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ABSTRACT

Dopamine receptor D2 (DRD2) encoded by DRD2 gene, is located on chromosome 11q22-23. Dopamine plays the central role in motivation, cognition, and reward seeking behaviour. Its dysfunction is implicated in numerous neurological and psychiatric disorders including drug abuse, schizophrenia, ADHD etc. The TaqI A polymorphism is localized 9.8 kb downstream from DRD2 gene in exon 8 of protein kinase gene (ANKK1). It is a SNP demonstrated to cause Glutamate to Lysine substitution at 713 amino acid residue in putative binding domain of ANKK1. Due to the central role of dopamine in reward seeking behavior, DRD2 TaqI A loci is a suitable candidate for investigation of molecular basis of addiction. The aim of the present study is to evaluate the frequency of DRD2 TaqI A polymorphism in Eastern Uttar Pradesh population. 3ml blood samples were collected from 50 individuals randomly selected from Eastern UP. Written informed consent along with profile detail was taken from each subject prior to blood sample collection. DRD2 TaqI A polymorphism analysis was done by PCR-RFLP method.

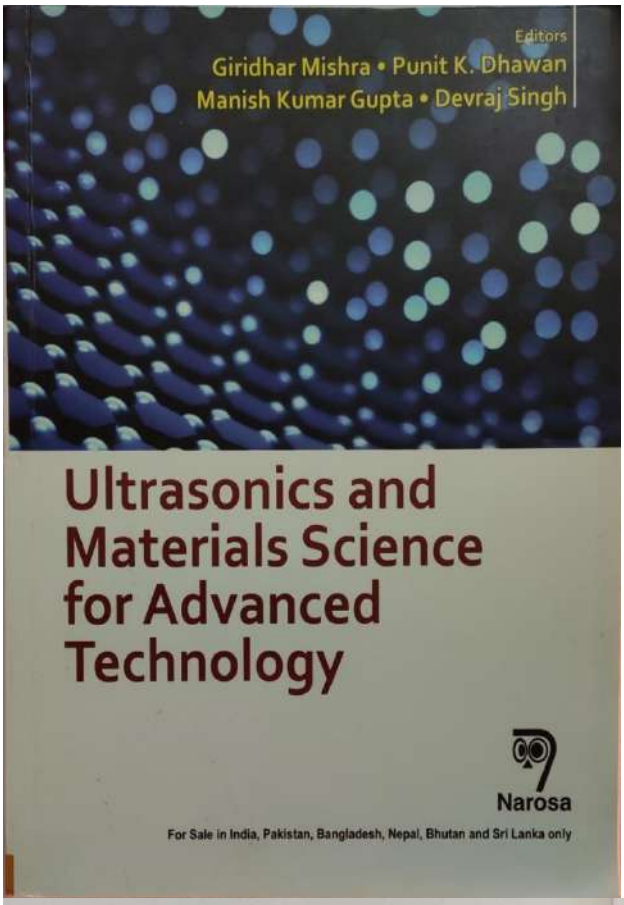
Genomic DNA was extracted from each collected blood samples and amplified using DRD2 TaqI region specific primers. PCR amplification produced 310bp long amplicon which was digested with Taq I enzyme for polymorphism analysis. In case of A2 allele, TaqI enzyme cleaved 310bp long fragment into two fragments of 180bp and 130bp. In case of A1 allele, a C to T substitution demolished the restriction site of TaqI, so amplicon of A1 allele remained uncut. In total 50 sample analyzed in present study, A2/A2, A2/A1 and A1/A1 genotype were found in 12, 32 and 06 samples respectively. The genotypic frequencies of mutant homozygous (A1/A1) is 0.12, heterozygous (A2/A1) is 0.64 and normal homozygous (A2/A2) is 0.24. The allelic frequency of A1 is 0.44 and of A2 is 0.56. In conclusion, the results of present study suggests that in TaqI A polymorphism of DRD2 gene, the frequency of allele A2 is higher than that of A1 allele in population of Eastern Uttar Pradesh.

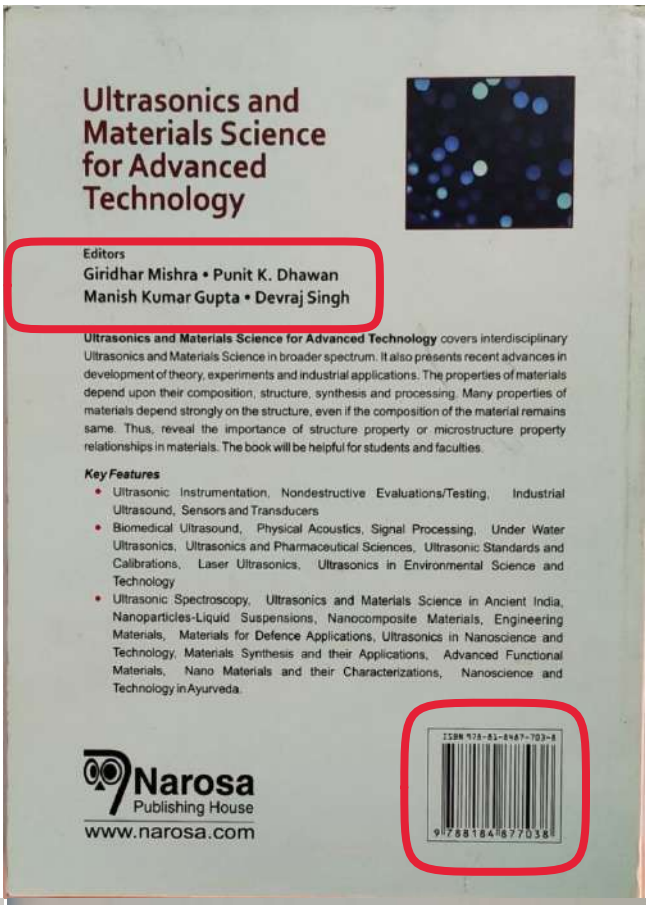
Keywords: Dopamine D2 receptor, gene polymorphism, dopamine, PCR-RFLP, psychiatric disorders.

1. Introduction

One of the most important system intervening reward mechanisms is considered to be dopaminergic pathways. Dopaminergic neurons are present in VTA of midbrain, projected into nucleus accumbens and ventral striatum [1] All the genes, involved in regulating the assembly of this system in brain is of great interest and can be a suitable candidate for investigation of molecular basis of addiction and several other psychiatric disorders [2]. Among these, the gene of interest that effect the dopaminergic neurotransmission is the Dopamine D2 receptor (DRD2) gene that is located at chromosome 11q22-23 encoding a G- Protein coupled receptor (Gi -inhibitory G protein) in post synaptic neurons [3] performing dual function of inhibitory auto receptor and a post synaptic receptors [4].

Several polymorphisms are reported in DRD2 gene (Taq1 B, Taq1D, -141 Ins/Del, Ser-Cys(S311C) but Taq1 A polymorphism is well studied in different psychiatric disorders including schizophrenia [5], depression [6], bipolar disorder [7], ADHD [8], and PTSD [9] and drug abuse [3]. TaqI A is SNP (rs1800497) located 9.8 kb downstream of DRD2 gene within exon 8 of functionally unrelated neighbouring gene, Ankyrin repeat and kinase domain containing-1(ANNK1). It causes Glutamate to Lysine substitution at 713 amino acid residue in putative binding domain of ANNK1 [10] with two alleles attributed as A1 and A2. This polymorphism leads





Ultrasonics and Materials Science for Advanced Technology

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Ultrasonics and Materials Science for Advanced Technology covers interdisciplinary Ultrasonics and Materials Science in broader spectrum. It also presents recent advances in development of theory, experiments and industrial applications. The properties of materials depend upon their composition, structure, synthesis and processing. Many properties of materials depend strongly on the structure, even if the composition of the material remains same. Thus, reveal the importance of structure property or microstructure property relationships in materials. The book will be helpful for students and faculties.

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A Study of Association of ABO Blood Group types with Cancer Risk

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ABSTRACT

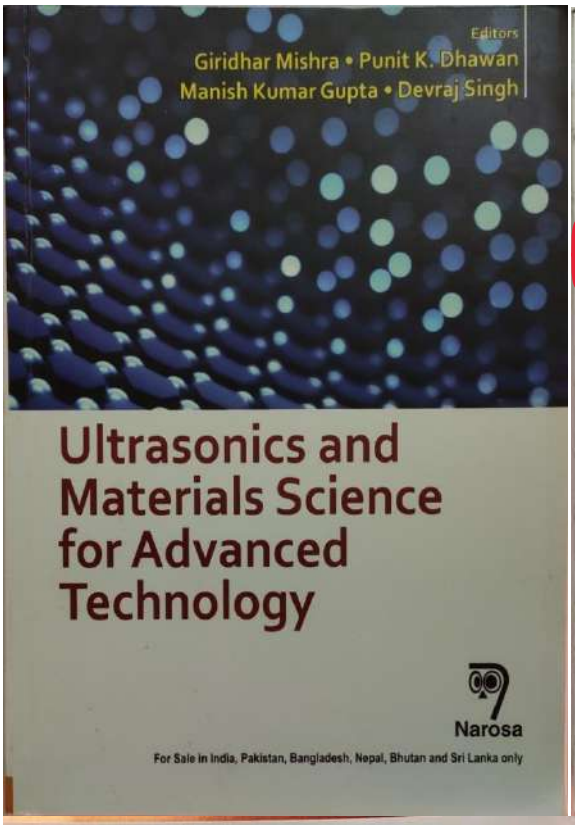
More than 30 blood group systems have been recognized by International Society of Blood Transfusion (ISBT). ABO blood group is one of the most studied blood group system. ABO blood group system consist of three alleles A, B and O, out which A and B are co- dominant and O is recessive. Many researchers and investigators have found association between ABO blood group and cancer risk. It was found from the recent data that blood group A and AB is associated with increased pancreatic and gastric cancer risk. In the present study data of ABO blood group of 243 patients, both males and females, with confirmed cases of cancer was obtained from Sir Sunderlal hospital, Institute of Medical Science (IMS), Banaras Hindu University (BHU) and Apex hospital, DLW Road, Varanasi. 250 Samples of both males and females were taken as control. Out of 243 cancer patients 117 were males and 126 were females. In 243 cases enrolled in present study, highest number of cases were of breast cancer among women and lowest were rectal cancer. It was found that A blood group was associated with breast cancer, oral cancer, liver cancer and ovarian cancer as compared to other blood group and blood group O was associated with lung cancer, gastric cancer, colon cancer, skin cancer and endometrial cancer.

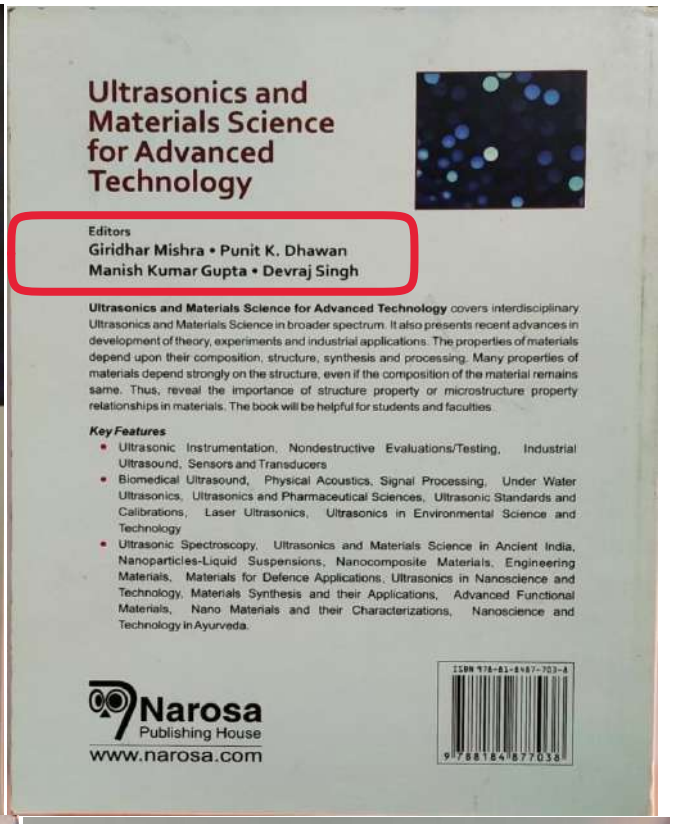
1. Introduction

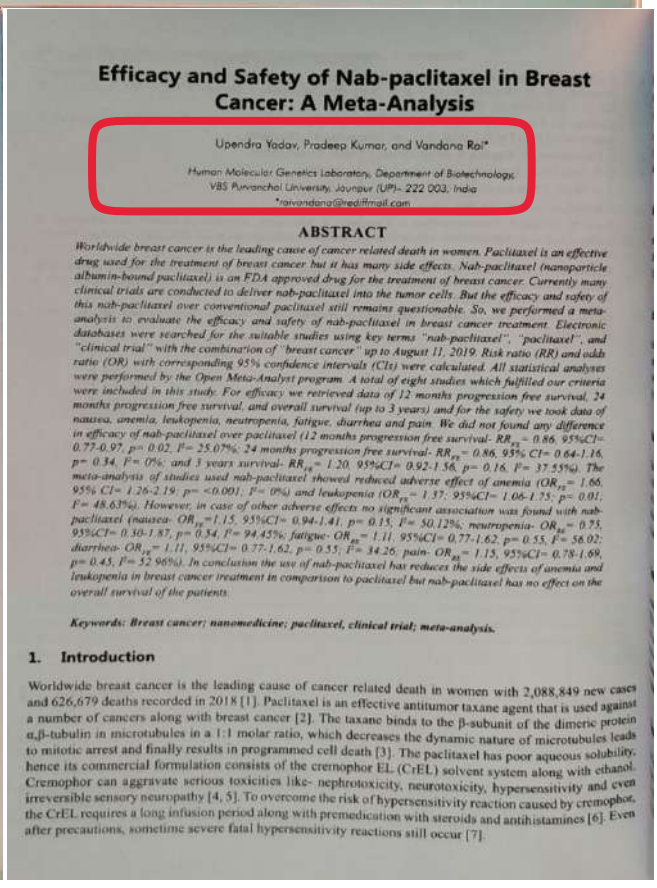
ABO blood group system contains three antigens (i.e. A, B and H) and is clinically most important blood group system among 33 blood group systems (1). Blood groups classification refers to the antigens present or absent on the red blood cells (RBCs) surface. The gene for ABO is located on chromosome 9 at 9p34.1-q34.2. ABO gene has 7 exons. ABO locus has three main allelic forms A, B and O. The frequency of A and B blood groups differs among the population of the world (2, 3, 4). Several studies have been carried out to find the frequency and association of ABO blood groups with different types of diseases in different population of the world (5-34)

Table 1 Association of ABO Blood Group with Different Type of Cancer

S.N.	Cancer	Sample Size	Blood Group Association	Country and State	References/ study
1	Breast Cancer	1713	A	Korea	Park et. al., 2017
2	Breast Cancer	206	A	Rajasthan	Saxena et. al., 2015
3	Breast Cancer	166	A	Greece	Meo et. al., 2017
4	Breast Cancer	197	A	Iran	Shiryazadi et. al., 2015
5	Pancreatic Cancer	166	A	Germany	Pelzer et. al., 2013
6	Pancreatic Cancer	633	A	Turkey	Engin et. al., 2012
7	Pancreatic Cancer	627	A	Germany	Rabbani et. al., 2012
8	Pancreatic Cancer	274	A	U.S	Greer et. al., 2010
9	Liver Cancer	88	A	Bangladesh	*Hosen et. al, 2018*
10	Gastric Cancer	1412	A	China	Xu et. al., 2016
11	Gastric Cancer	1045	A	China	Wang et. al., 2012







Efficacy and Safety of Nab-paclitaxel in Breast Cancer: A Meta-Analysis

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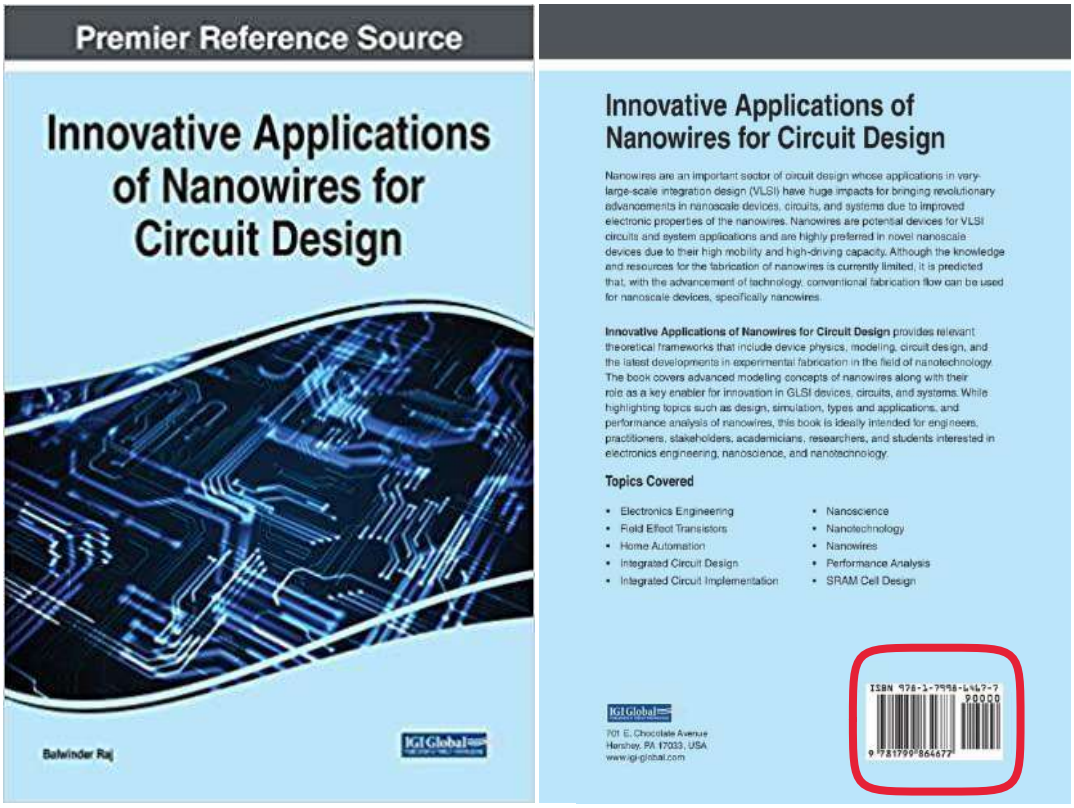
ABSTRACT

Worldwide breast cancer is the leading cause of cancer related death in women. Paclitaxel is an effective drug used for the treatment of breast cancer but it has many side effects. Nab-paclitaxel (nanoparticle albumin-bound paclitaxel) is an FDA approved drug for the treatment of breast cancer. Currently many clinical trials are conducted to deliver nab-paclitaxel into the tumor cells. But the efficacy and safety of this nab-paclitaxel over conventional paclitaxel still remains questionable. So, we performed a meta-analysis to evaluate the efficacy and safety of nab-paclitaxel in breast cancer treatment. Electronic databases were searched for the suitable studies using key terms "nab-paclitaxel", "paclitaxel", and "clinical trial" with the combination of "breast cancer" up to August 11, 2019. Risk ratio (RR) and odds ratio (OR) with corresponding 95% confidence intervals (CIs) were calculated. All statistical analyses were performed by the Open Meta-Analyst program. A total of eight studies which fulfilled our criteria were included in this study. For efficacy we retrieved data of 12 months progression free survival, 24 months progression free survival, and overall survival (up to 3 years) and for the safety we took data of nausea, anemia, leukopenia, neutropenia, fatigue, diarrhea and pain. We did not found any difference in efficacy of nab-paclitaxel over paclitaxel (12 months progression free survival- RR_{FS}= 0.86, 95%CI= 0.77-0.97, p= 0.02, I^2= 25.07%; 24 months progression free survival- RR_{FS}= 0.86, 95% CI= 0.64-1.16, p= 0.34, I^2= 0%; and 3 years survival- RR_{FS}= 1.20, 95%CI= 0.92-1.56, p= 0.16, I^2= 37.55%). The meta-analysis of studies used nab-paclitaxel showed reduced adverse effect of anemia (OR_{FS}= 1.66, 95% CI= 1.26-2.19; p= <0.001; I^2= 0%) and leukopenia (OR_{FS}= 1.37; 95%CI= 1.06-1.75; p= 0.01; I^2= 48.63%). However, in case of other adverse effects no significant association was found with nab-paclitaxel (nausea- OR_{FS}=1.15, 95%CI= 0.94-1.41, p= 0.15, I^2= 50.12%; neutropenia- OR_{FS}= 0.75, 95%CI= 0.30-1.87, p= 0.54, I^2= 94.45%; fatigue- OR_{FS}= 1.11, 95%CI= 0.77-1.62, p= 0.55, I^2= 58.02; diarrhea- OR_{FS}= 1.11, 95%CI= 0.77-1.62, p= 0.55, I^2= 34.26; pain- OR_{FS}= 1.15, 95%CI= 0.78-1.69, p= 0.45, I^2= 52.96%). In conclusion the use of nab-paclitaxel has reduces the side effects of anemia and leukopenia in breast cancer treatment in comparison to paclitaxel but nab-paclitaxel has no effect on the overall survival of the patients.

Keywords: Breast cancer; nanomedicine; paclitaxel, clinical trial; meta-analysis.

1. Introduction

Worldwide breast cancer is the leading cause of cancer related death in women with 2,088,849 new cases and 626,679 deaths recorded in 2018 [1]. Paclitaxel is an effective antitumor taxane agent that is used against a number of cancers along with breast cancer [2]. The taxane binds to the β-subunit of the dimeric protein α,β-tubulin in microtubules in a 1:1 molar ratio, which decreases the dynamic nature of microtubules leads to mitotic arrest and finally results in programmed cell death [3]. The paclitaxel has poor aqueous solubility; hence its commercial formulation consists of the cremophor EL (CrEL) solvent system along with ethanol. Cremophor can aggravate serious toxicities like- nephrotoxicity, neurotoxicity, hypersensitivity and even irreversible sensory neuropathy [4, 5]. To overcome the risk of hypersensitivity reaction caused by cremophor, the CrEL requires a long infusion period along with premedication with steroids and antihistamines [6]. Even after precautions, sometime severe fatal hypersensitivity reactions still occur [7].



Chapter 4

Diameter Dependent Ultrasonic Investigation of SiC Nanowires

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ABSTRACT

Despite various methods available theoretically and experimentally for material characterization, the ultrasonic characterization method has proven as one of important method because of its non-destructive evaluation (NDE) technique. This chapter explores the ultrasonic characterization of wide band gap semiconducting material SiC at nanoscale. In the present chapter, diameter dependent nonlinear elastic properties (second and third order elastic constants), thermophysical properties, and ultrasonic properties of single crystalline SiC-nanowires have been computed using Lennard-Jones potentials in the high temperature regime. The size dependent mechanical and ultrasonic properties of the SiC-nanowires and their mechanical stability has also been estimated using the higher order elastic constants

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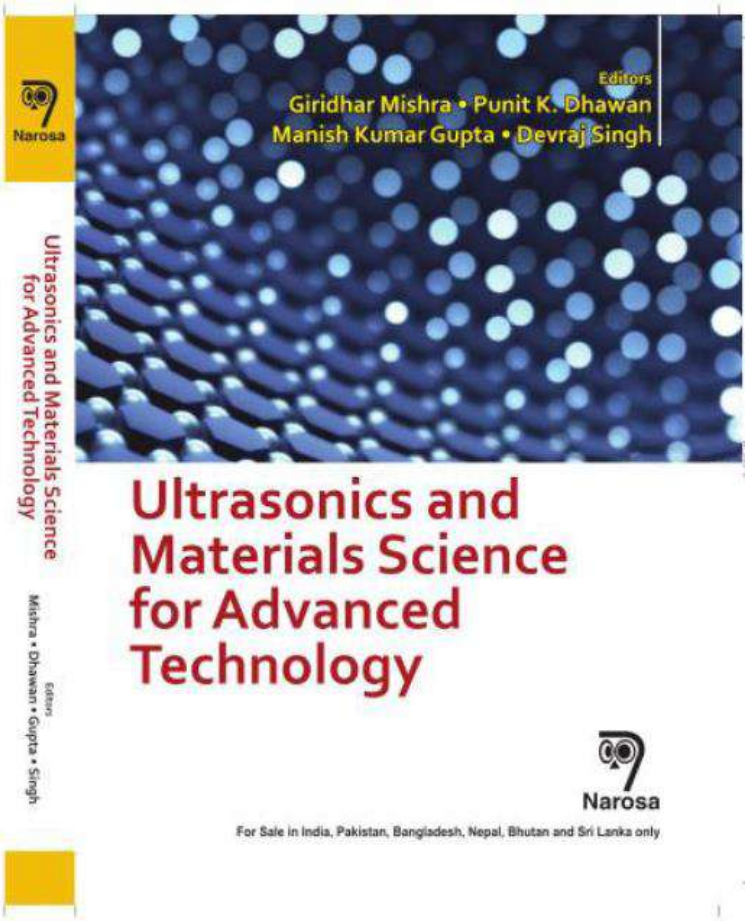

Elastic and Ultrasonic Properties of B1 and B2 Phase Boron Monopnictides

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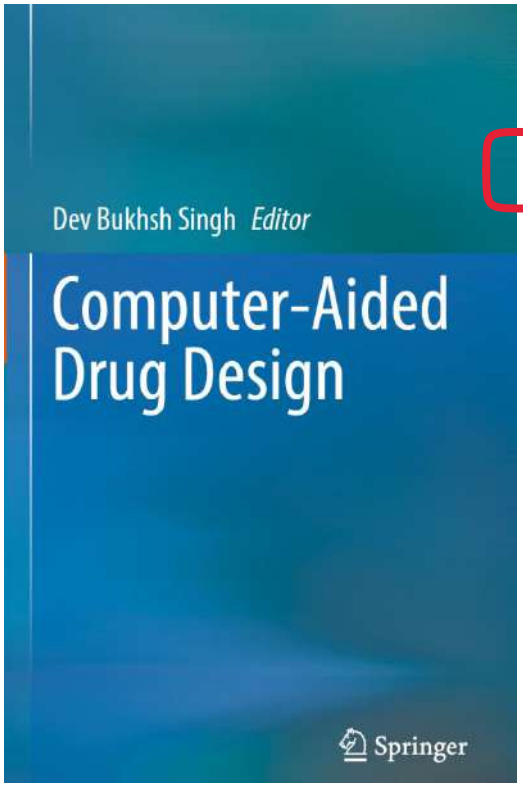
ABSTRACT

We have investigated and evaluated the elastic, ultrasonic and thermo-physical properties of NaCl and CsCl Boron based compounds BX(X=N, P and As) along <100> orientations. In the present study, we evaluate and compared the higher order elastic constants values at room temperature using theoretical approach of Mori and Hiki. The second order elastic constants have been applied to calculate the mechanical properties which confirmed that CsCl is not closely packed structure because of large volumeless density. Also, CsCl based boron compounds are stronger than NaCl based compounds. Further elastic constant have been applied to compute ultrasonic velocities for longitudinal and shear modes, thermal conductivity, Debye velocity and thermal relaxation time at room temperature. Finally ultrasonic attenuation has been estimated using phonon-phonon interaction and thermoelastic relaxation mechanism. We have found that the value of ultrasonic and Debye velocity is highest for CsCl boron based compounds at room temperature. From the result, we conclude that BN is strongest and most fit material for crystallographic study along <100> direction among other boron based compounds in both type of structure. We also found that the chosen materials are semi metallic in nature. The result was obtained and the correlation with available results was discussed on the chosen materials for their future prospects.

Keywords: *Elastic property, thermal property, ultrasonic property.*

1. Introduction

Boron-based compounds are widely used in electronic field due to the small core size of boron atom and the absence of p electrons. Many theoretical study have been carried out on boron based compounds specially on BP, BAs and BSb which explained their structural and electronic properties in the NaCl phase structure [1-2]. Although very few experimental data on these compounds [3-4] for both phase B1 and B2 are available in literature. Some other properties of these compounds at high pressure were studied by Wentzeovitch et al. [5-7], which also discussed its electronic properties. In the available literature, we did not find temperature dependent theoretical work on these compounds for both structure i.e. B1 and B2 phase. Due to limited theoretical studies on these compounds on both cubic structure (NaCl and CsCl) we got motivated to make new analysis on these materials. In present work we evaluate temperature dependent elastic, ultrasonic and thermal properties of Boron based compounds BX(X=N, P and As) at room temperature for both NaCl and CsCl phase structure. Also, we investigated the mechanical and thermophysical properties of these compounds. Finally the ultrasonic attenuation for boron based compounds was computed at 27°C temperature by using the computed parameters.



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Role of ADMET Tools in Current Scenario: Application and Limitations

4

Rajesh Kumar Kesharwani, Virendra Kumar Vishwakarma, Raj K. Keservani, Prabhakar Singh, Nidhi Katiyar, and Sandeep Tripathi

Abstract

High rates of drug failure cases are a challenge for the pharmaceutical industry to improve preclinical testing. For the ADMET prediction, selection of suitable experimental data and its use in the form of physiological parameters is a challenging task. Nowadays, ADMET prediction is performed at an early stage of drug designing to remove the pharmacokinetic (PK) property of poor compounds. Various ADMET prediction models have been developed using computational algorithms. Experimentally validated ADMET datasets have been analyzed, and related classification features and descriptors were used for the development of in silico models. The current chapter describes the role of ADMET analysis in drug designing, approaches used for model development, existing tools for ADMET prediction, and limitation of predictive models.

Keywords

ADMET · Toxicity database · Structure · Drug design · Pharmacokinetics

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71

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Description

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Reflects on techniques for a broad range of compounds and materials
Highlights sustainable and green chemistry pathways for molecular synthesis

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Green Approaches in Medicinal Chemistry for Sustainable Drug Design
Advances in Green and Sustainable Chemistry
2020, Pages 427-448

11 - Organocatalytic cycloaddition reaction: A gateway for molecular complexity

Ram Naresh Yadav [a], Gildardo Rivera [b], Ashok Kumar Srivastava [a], Bimal Krishna Banik [c]

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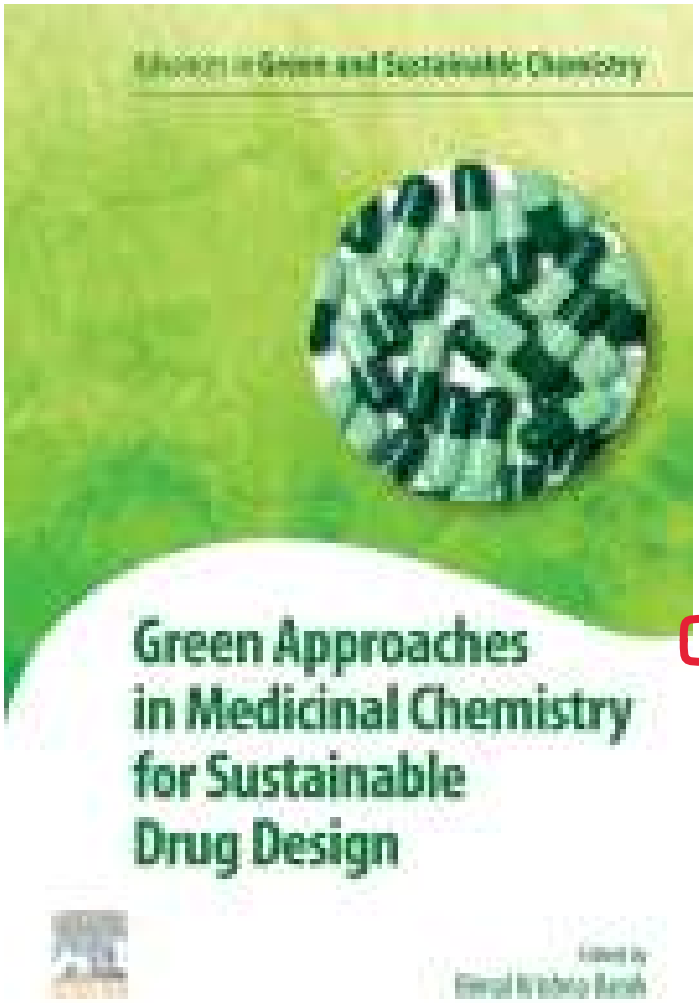
Abstract

The organocatalysis is the process of using small organic molecules to accelerate the reaction course without affecting the equilibrium position. The small organic compounds that have these catalytic effects are commonly referred to as organocatalysts. In recent years, the use of small organic molecules as catalysts has gained tremendous attention in the synthesis of complex organic molecules. The organocatalyzed reactions have several advantages over other existing transition metal or organometallic-mediated methodology for the asymmetric synthesis. This includes the use of less toxic, environmental benign and highly economical procedures.



Pages 989-1021

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About the book

Description

Extensive experimentation and high failure rates are a well-recognised downside to the drug discovery process, with the resultant high levels of inefficiency and waste producing a negative environmental impact. *Sustainable and Green Approaches in Medicinal Chemistry* reveals how medicinal and green chemistry can work together to directly address this

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About the book

Search in this book

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Table of contents

Full text access

Front Matter, Copyright, Contributors, Editor's biography, Preface

Part One: Green chemistry

Part Two: Methods and synthesis

Book chapter Abstract only

9 - Use of sustainable organic transformations in the construction of heterocyclic scaffolds

Sarita Khandelwal, Yogesh Kumar Tailor, ... Mahendra Kumar

Pages 245-352

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10 - One-pot strategy: A highly economical tool in organic synthesis and medicinal chemistry

Ram Naresh Yadav, Ashok Kumar Srivastava and Bimal Krishna Banik

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10 - One-pot strategy: A highly economical tool in organic synthesis and medicinal chemistry

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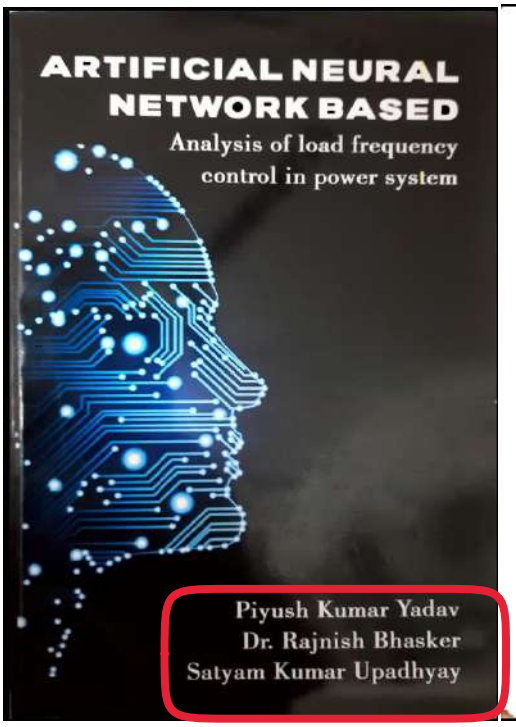
Abstract

In chemistry one-pot synthesis is a technique that allows multiple chemical transformations of substrates to target molecules in single reaction flask. This strategy is considered to be an attractive approach and widely accepted reaction strategy in synthetic organic chemistry. This protocol has several significant advantages over the conventional multistep reaction processes. The most important advantages of this protocol include high atom economy, less reaction time, minimum workup, and less separation of the products after each reaction. In this chapter, we wish to focus on various one-pot syntheses toward biologically relevant molecules and



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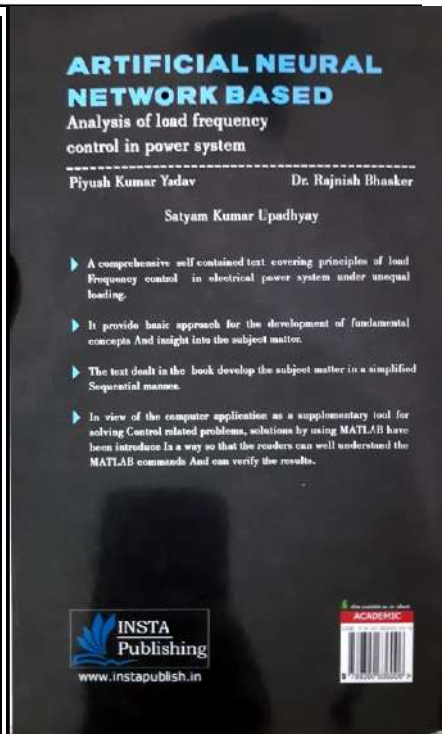

पंचायतीराज का गोंड जनजाति पर प्रभाव

कमलेश पाल

पंचायतीराज का गोंड जनजाति पर प्रभाव

प्रस्तुत पुस्तक पंचायती राज का गोंड जनजाति पर प्रभाव को अध्ययन की दृष्टि से पाँच भागों में बांटा गया है। प्रथम अध्याय में जनजाति को परिभाषित करते हुए भारत की संवैधानिक व्यवस्था में जनजातियों के स्वरूप पर प्रकाश डाला गया है। दूसरे अध्याय में गोंड जनजाति की उत्पत्ति के सम्बन्ध में समाजशास्त्रियों तथा शिक्षाविदों के विचारों को प्रस्तुत करते हुए गोंड जनजाति के बारे में विस्तार से बताया गया है। तृतीय अध्याय में पंचायती राज के स्वरूप का निर्धारण किया गया है। चतुर्थ और पंचम अध्याय में गोंड जनजाति पर पंचायती राज के सामाजिक, सांस्कृतिक, आर्थिक एवं राजनीतिक प्रभावों पर विस्तार से प्रकाश डाला गया है। प्रस्तुत पुस्तक समाज वैज्ञानिकों, शोधार्थियों एवं जनजातीय जीवन से जुड़े सभी पहलुओं पर अध्ययन हेतु अति उपयोगी है।

पुस्तक के लेखक वीर बहादुर सिंह पूर्वांचल विश्वविद्यालय जौनपुर में मानविकी एवं समाजविज्ञान विभाग के विभागाध्यक्ष हैं। आप भारतीय सामाजिक विज्ञान अनुसंधान परिषद नई दिल्ली द्वारा समाजशास्त्र विभाग, काशी हिन्दू विश्वविद्यालय वाराणसी में पोस्ट डाक्टोरल फैलो रहे हैं। आपकी विशेष रूचि जनजातीय अध्ययन, ग्रामीण विकास, अपराध शास्त्र, नगरीय समाजशास्त्र आदि है। इन्होंने अनेक राष्ट्रीय एवं अंतराष्ट्रीय संगोष्ठियों में शोध पत्र प्रस्तुत किए हैं साथ ही अनेक शोध पत्र पत्रिकाओं में लेख भी प्रकाशित हुये हैं।

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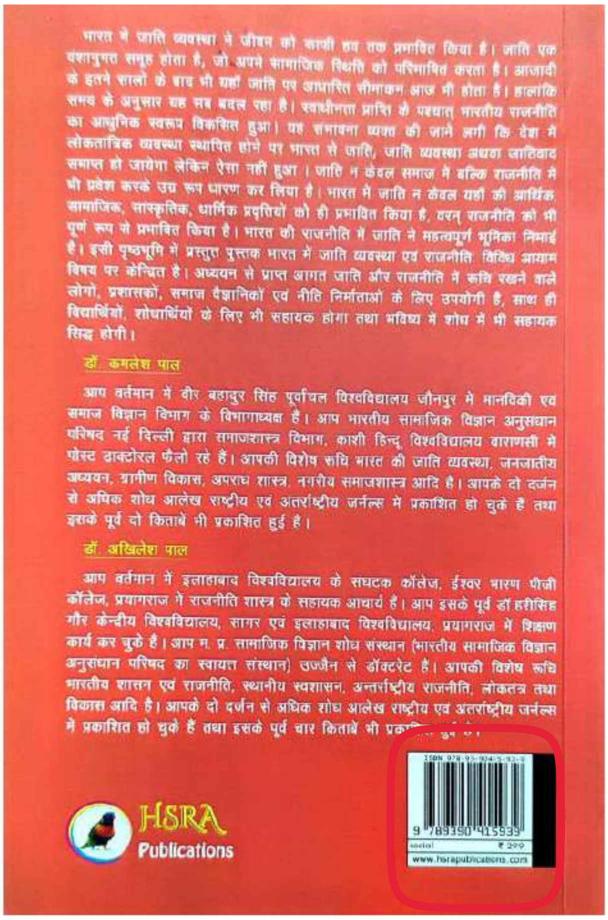

भारत में जाति व्यवस्था ने जीवन को काफी हद तक प्रभावित किया है। जाति एक वंशानुगत समूह होता है, जो अपने सामाजिक स्थिति को परिभाषित करता है। आजादी के इतने सालों के बाद भी यहाँ जाति पर आधारित सीमांकन आज भी होता है। हालांकि समय के अनुसार यह सब बदल रहा है। स्वाधीनता प्राप्ति के पश्चात् भारतीय राजनीति का आधुनिक स्वरूप विकसित हुआ। यह संभावना व्यक्त की जाने लगी कि देश में लोकतांत्रिक व्यवस्था स्थापित होने पर भारत से जाति, जाति व्यवस्था अथवा जातिवाद समाप्त हो जायेगा लेकिन ऐसा नहीं हुआ। जाति न केवल समाज में बल्कि राजनीति में भी प्रवेश करके उग्र रूप धारण कर लिया है। भारत में जाति न केवल यहाँ की आर्थिक, सामाजिक, सांस्कृतिक, धार्मिक प्रवृतियों को ही प्रभावित किया है, वरन् राजनीति को भी पूर्ण रूप से प्रभावित किया है। भारत की राजनीति में जाति ने महत्वपूर्ण भूमिका निभाई है। इसी पृष्ठभूमि में प्रस्तुत पुस्तक भारत में जाति व्यवस्था एवं राजनीति: विविध आयाम विषय पर केन्द्रित है। अध्ययन से प्राप्त आगत जाति और राजनीति में रुचि रखने वाले लोगों, प्रशासकों, समाज वैज्ञानिकों एवं नीति निर्माताओं के लिए उपयोगी है, साथ ही विद्यार्थियों, शोधार्थियों के लिए भी सहायक होगा तथा भविष्य में शोध में भी सहायक सिद्ध होगी।

डॉ. कमलेश पाल

आप वर्तमान में वीर बहादुर सिंह पूर्वांचल विश्वविद्यालय जौनपुर में मानविकी एवं समाज विज्ञान विभाग के विभागाध्यक्ष हैं। आप भारतीय सामाजिक विज्ञान अनुसंधान परिषद नई दिल्ली द्वारा समाजशास्त्र विभाग, काशी हिन्दू विश्वविद्यालय वाराणसी में पोस्ट डाक्टोरल फैलो रहे हैं। आपकी विशेष रुचि भारत की जाति व्यवस्था, जनजातीय अध्ययन, ग्रामीण विकास, अपराध शास्त्र, नगरीय समाजशास्त्र आदि है। आपके दो दर्जन से अधिक शोध आलेख राष्ट्रीय एवं अंतर्राष्ट्रीय जर्नल्स में प्रकाशित हो चुके हैं तथा इसके पूर्व दो किताबें भी प्रकाशित हुई हैं।

डॉ. अखिलेश पाल

आप वर्तमान में इलाहाबाद विश्वविद्यालय के संघटक कॉलेज, ईश्वर शरण पीजी कॉलेज, प्रयागराज में राजनीति शास्त्र के सहायक आचार्य हैं। आप इसके पूर्व डॉ हरीसिंह गौर केन्द्रीय विश्वविद्यालय, सागर एवं इलाहाबाद विश्वविद्यालय, प्रयागराज में शिक्षण कार्य कर चुके हैं। आप म. प्र. सामाजिक विज्ञान शोध संस्थान (भारतीय सामाजिक विज्ञान अनुसंधान परिषद का स्वायत्त संस्थान) उज्जैन से डॉक्टरेट हैं। आपकी विशेष रुचि भारतीय शासन एवं राजनीति, स्थानीय स्वशासन, अन्तर्राष्ट्रीय राजनीति, लोकतंत्र तथा विकास आदि है। आपके दो दर्जन से अधिक शोध आलेख राष्ट्रीय एवं अंतर्राष्ट्रीय जर्नल्स में प्रकाशित हो चुके हैं तथा इसके पूर्व चार किताबें भी प्रकाशित हुई हैं।

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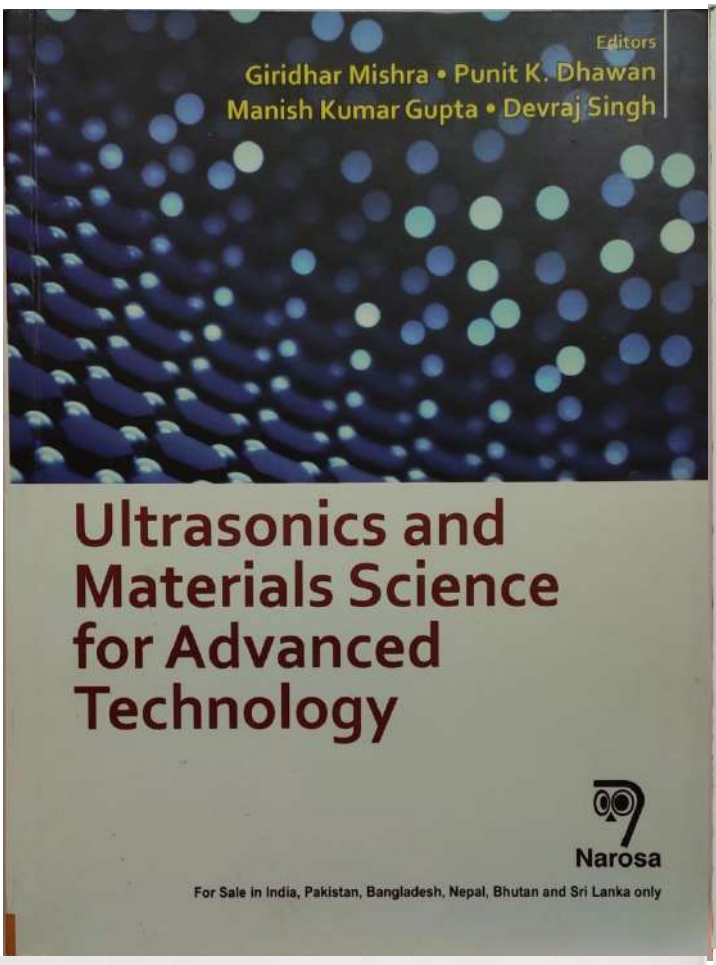

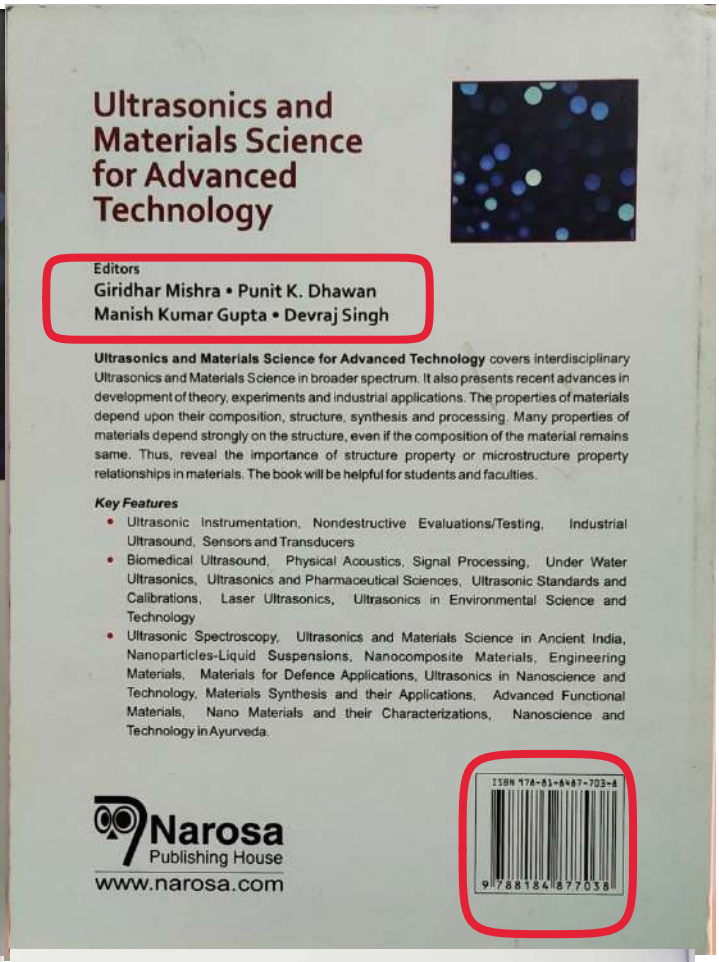

Cyclic Time Reduction in Precision Component Manufacturing

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ABSTRACT

These days the need for short setups is bigger than before. The SMED method, developed by Shingo, for reducing setup times is already known in industry for about 20 years. This project report will present a study of setup time reduction in a leading Aircraft component manufacturer involved in the machining of Precision components in small batches with large variety. Single Minute Exchange of Dies mainly concerned with the recognition of internal and external activities. It is mainly concerned with transferring internal activities into external ones particularly in as many numbers as possible, by also minimizing the internal ones. The validity of the method and procedures are verified by an application of components manufacturing on DMU 100T and DMU 60T, five axis CNC milling machine where setup times are critical for time reduction. Significant time savings have been achieved with minimum take.

It is observed that setup time significantly changes when parallel operations are implied. The change over process becomes more controlled when fixtures are enabled the setup time improves significantly. The investment on fixtures causes high production capacity even without increasing the number of machines, and without compromising the quality. The payback periods also very small. On the basics of these results some recommendations are suggested for continuous improvement.

1. Introduction

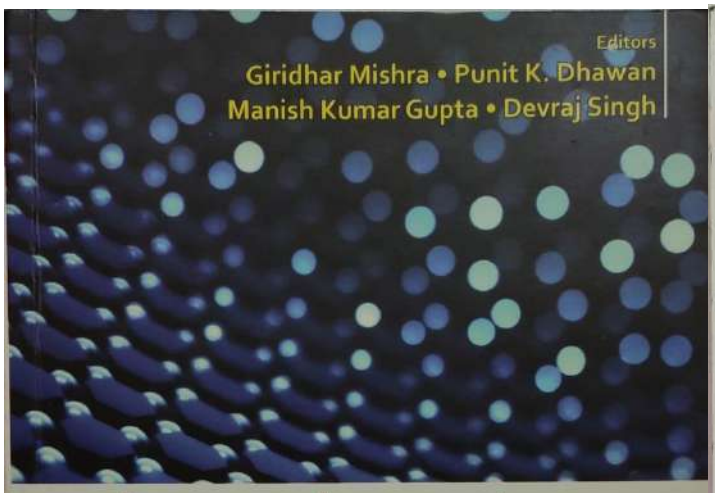
Market competitiveness, customer's responsiveness and market demand are the key factors responsible for the implementation and adoption of lean manufacturing techniques in industry. Survival of any industry depends on response time, production costs and flexibility in manufacturing. Due to customer's complexity and demand behaviour, better changeover or setup time reduction enables better response and small batch manufacturing. Reducing setup time leads to increased manufacturing flexibility and capability, shorter lead time, reduced inventory levels and production costs. Short setup time reduces wastes and defects, and thereby improved product quality. Reducing setup time will boost, company's capacity, increases manufacturing flexibility, and help increase overall output. Setup time can be reduced by using Single Minute Exchange of Die (SMED) concepts, which can be achieved through better planning, process redesign and product. The ultimate goal of SMED is to perform machine setup and changeover operations in less than ten minutes.

2. Methodology

A complete study of recorded setup changeover data process and implementation of SMED principles and Quick Die Change (QDC)technology to reduce setup time. A design of plan has been developed to reduce setup time.

2.1 Data Collection, Designing of Fixture's and Supporting Component

Statistical data is collected and analyzed to measure the machine setup time. First, data check sheet is prepared or developed prior to data collection and measured by using a stop watch. The production flow and standard operation procedure is briefly reviewed before developing the data collection check sheet. Based on



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Ultrasonics and Materials Science for Advanced Technology covers interdisciplinary Ultrasonics and Materials Science in broader spectrum. It also presents recent advances in development of theory, experiments and industrial applications. The properties of materials depend upon their composition, structure, synthesis and processing. Many properties of materials depend strongly on the structure, even if the composition of the material remains same. Thus, reveal the importance of structure property or microstructure property relationships in materials. The book will be helpful for students and faculties.

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A Survey on Machine Learning Methods for Phishing Detection

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ABSTRACT

Phishing is an electronically connected criminal activity in which the attacker steals the user's personal information like username, countersign, credit/debit card number, password, pin, legitimacy, confidential patient record, CVV number, etc. to benefit financially. Email-based phishing is the most common and traditional way of phishing scams, in which the phisher will send a suspicious email with an embedded URL and ask the user to click the URL. When the user clicks on the link, the link will be redirected to a spoofed site that looks the same to the original site to steal their credentials and displays some error message. Later the phishers use those credentials for malicious purposes. To overcome these scams, many anti-phishing tools have developed. Among that the machine learning-based approaches can give better results. This paper is an extensive survey of the various machine learning-based anti-phishing approaches that detect the phishing URL's from the URLs with URLs features.

Keywords: Phishing, anti-phishing, machine learning, phishtank, legitimate, suspicious.

1. Introduction

Phishing is one kind of deceitful activity through which the attacker steals user personal information. Phishing is popular with cybercriminals, as it is so far easier to trick someone into clicking a malicious link in a seemingly legitimate email than trying to break through a computer's defenses. Although some phishing emails are poorly written and fake, sophisticated cybercriminals employ the technique of professional marketers to identify the most effective types of message [1].

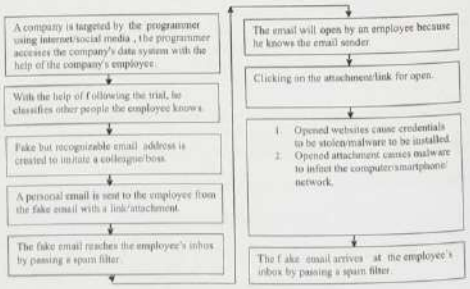
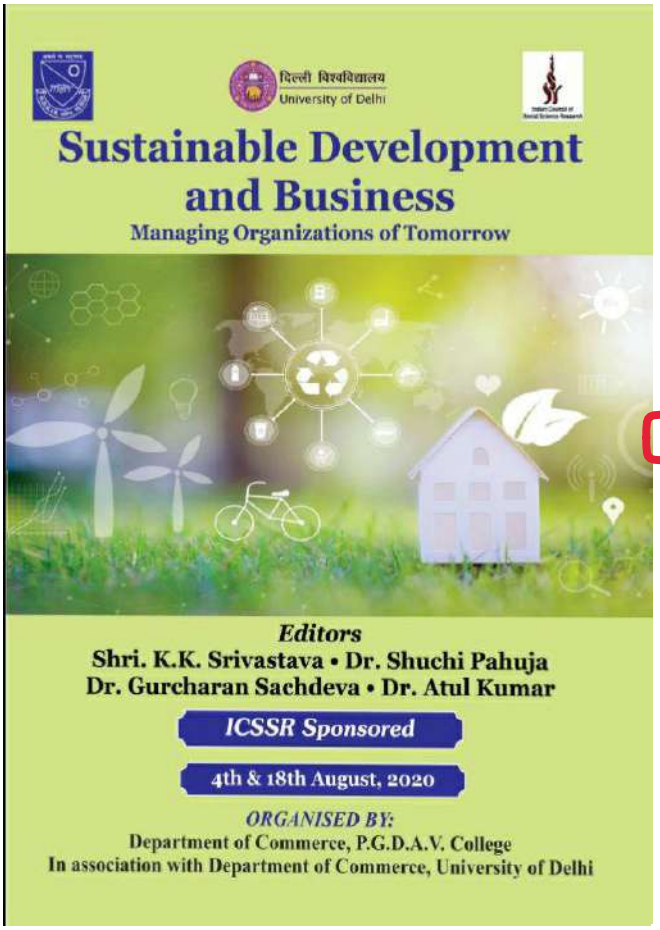


Figure 1 Phishing working procedure



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Sustainable Development and Business: Managing Organizations of Tomorrow

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CONTENTS

7

Solid Waste Management in India: A SWOT Analysis

Shikha Dubey, Akhileshwaro Nath** & Ajay Dwivedi****

ABSTRACT

Rising income, uncontrolled, unplanned urbanization, and changing lifestyles have resulted in increased volumes and changing composition of solid waste in India. It is proceeding towards waste management in an unscientific and unsystematic manner and unsound waste management in-country affects the public health of inhabitants to a great extent. Even in the present scenario of India towards waste management, a large portion of solid waste is dumped immethodically on outlying districts without any prior treatment. This leads to an increase in air pollution, water pollution, and land pollution as well and the current system of the municipal solid waste management system (MSW) in India focuses on the collection and transportation of largely mixed unsegregated waste for sustainable solid waste management. Furthermore, the fixed available quantity of natural resources and the increase in demand is making the problem more complex and challenging. The solid waste management system is a matter of concern for public health and has become a major challenge in India. Sustainable consumption and strategic waste management system would be required to prevent more depletion of Indian resources with help of this target of zero waste city (100% recycling) of municipal wastage and (100% recovery) of all resources from wastage can be achieved in future. Due to rampant urbanization and industrialization the rate at which waste generation is increasing, it's expected to reach 230 million tons per year by 2041. The objective of this research paper is to conduct a SWOT/SWOC (strength,

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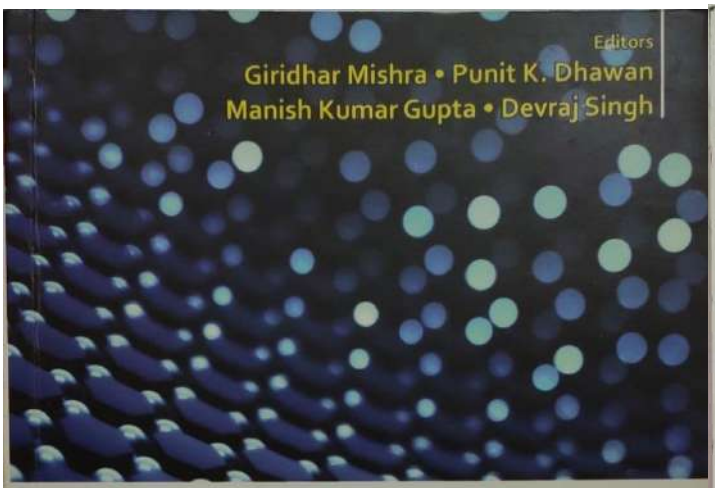

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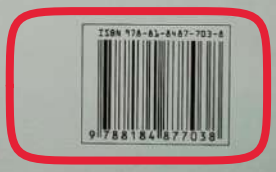

Role of Science Communication in Application of Earthworm on Agricultural Soil Restoration

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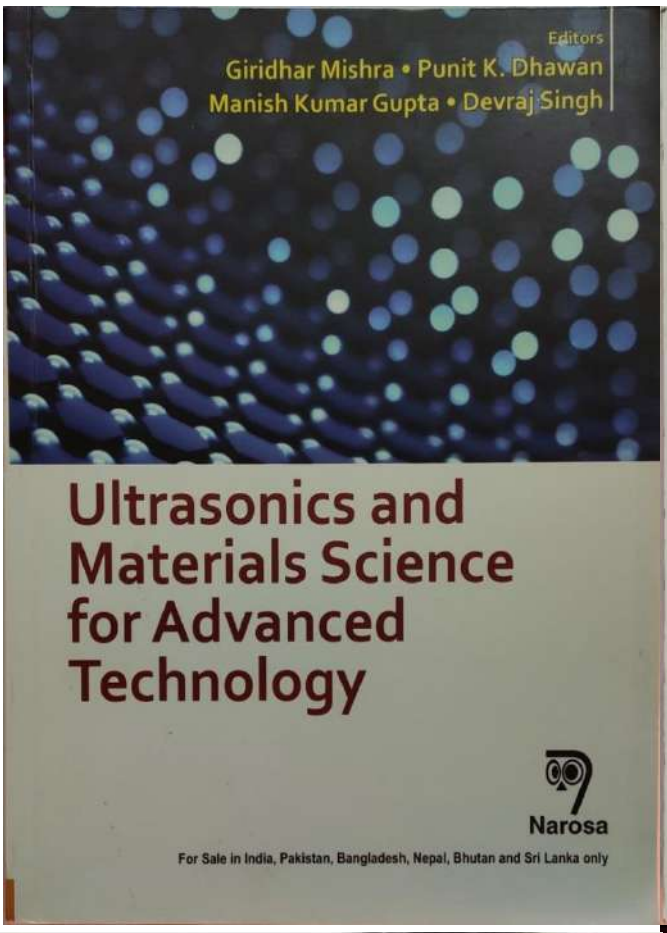
ABSTRACT

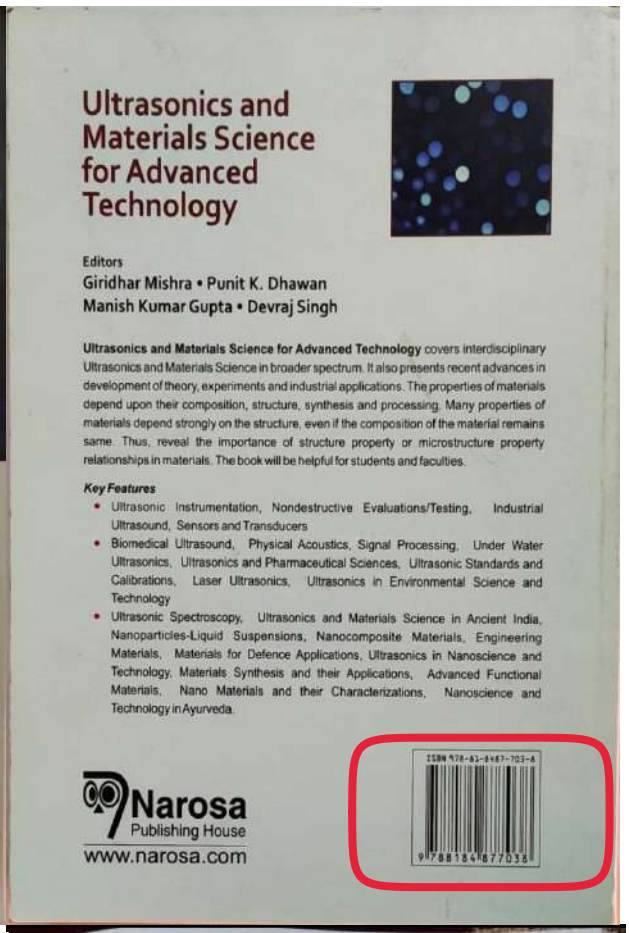
Earthworm is essential living ingredients for agricultural soil system; it has eco-friendly capability to enhance the soil health. In the present study, OC, N, P and yield of vegetable crops were observed at five different sites of district Jaunpur in year 2016, and all the farmers were applied uncontrolled pesticides dose. In vitro experiments of different concentration of soil and varied population of earthworms revelted that OC, N, P of the soil increased while concentration of pesticides were reduced after 20DAS followed by 10DAS as compared with control. Keeping the views of indiscriminate uses of pesticides; we initiated a campaign to educate the farmers to utilize only vermicompost and interesting results were observed in the year 2017 and 2018. Organic carbon, total nitrogen, total phosphorous of the treated soil and yield of vegetables crop were increase 26, 25, 13, and 30% respectively, in the year of 2018 followed by 2017.

Keywords: Earthworm, soil health, nutrient, communication and pesticide.

1. Introduction

About 3500 species of earthworms are reported worldwide with diverse habitat, earthworms are the member of order haplotaxida and phylum is annelid (Paoletti, 1999). Toe role of earthworms are increasing aeration and draining in soil, they utilize energy, nutrients and habitat from soil (Lavelle, 1988; Pechnik, 2010). Most of the organic matters from soil are ingested by earthworms; they also feed living organisms like nematodes, microfloracte (Curry and Schmidt, 2007). Earthworms prefer to ingest plant tissues/ residues but selective for most of the organic compounds/matter (Bonkowski *et al.*, 2000). Earthworms able to mix soil horizons, digest organic matter, dig burrows they deposit cast etc. these activities increase soil porosity, structural stability of soil and nutrition (Lavelle, 1988). Due to the worms selecting the nutrients that they consume, it results in their casts having higher soil organic matter, nutrient contents (Lavelle *et al.*, 1998) and even protecting the soil from erosion (Bernier, 1998). They also have an influence on the processes of aggregation, residue decomposition, nutrient mineralization, aeration, and water infiltration (Fonte *et al.*, 2009).The presence of earthworms may alter the structure of plant communities as well. Since earthworms manage the distribution of organic matter, plant root foraging is affected (Scheu, 2003). However, because earthworms release casts that have nutrients, plants grown better when earthworms are present (Scheu, 2003). Due to the heavy machinery in use today, there have been controls on earthworm growth and survival. These new techniques such as tillage and fertilization have been impacting the earthworm population in a negative way (Fonte *et al.*, 2009).Earthworms play a large role in soil structure and diversity. They have been called ecosystem engineers because they are an integral part of the soil ecosystem. This makes them a very important species that will continue to dominate soil ecosystems. Modern agricultural is based on proper irrigation, seed quality, synthetic fertilizers along with augmentation of pesticides and insecticides, massive use of pesticides uses are started since 1960 through green revolution. Most of the developing countries including India, peoples engaged in agricultural practices and maximum number of formers have less cultivated land area and they dependent on agriculture for their social and economical development





Assessment of Plant Growth Promoting activity of Bacteria Isolated from the Rhizospheric region of Carrot (Daucus carota)

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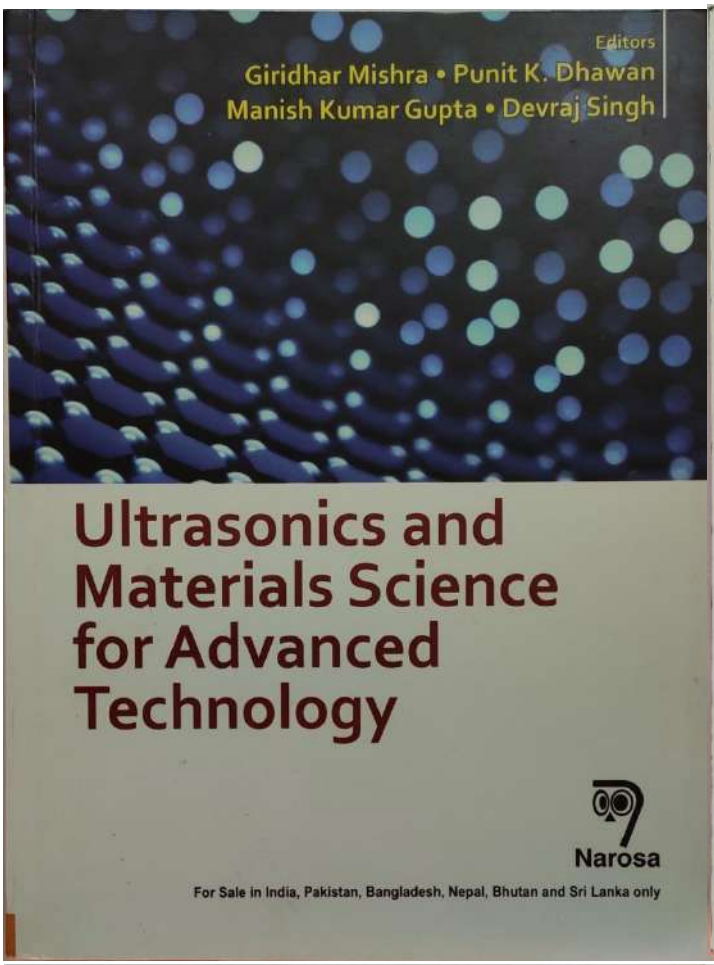
ABSTRACT

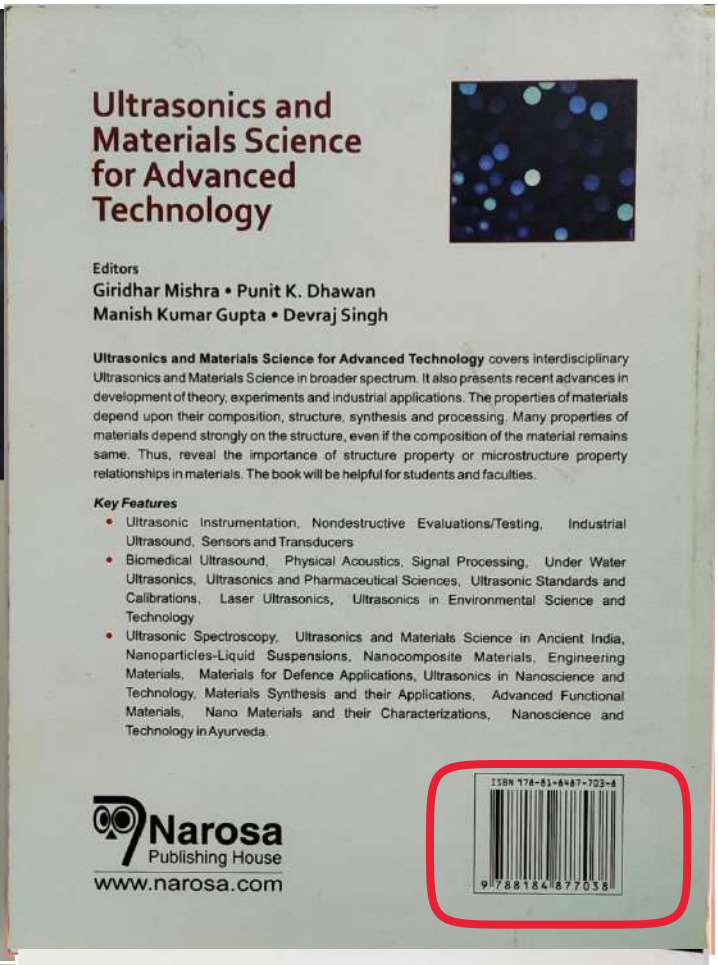
Plant Growth Promoting Rhizobacteria (PGPR) is group of bacteria that can increase the plant growth by using various mechanisms. This can be include direct (Nitrogen fixation, Phosphate solubilization, Siderophore production and Phytohormones production) or indirect (bio control agents, HCN production, Antibiotic production, production of lytic enzymes and induced systemic resistance) mechanisms of plant growth promotion. These bacteria can act as efficient biofertilizers for increasing the productivity of several crops. PGPR as biofertilizers are well recognized as efficient soil bacteria for sustainable agriculture. The current work aimed to study the plant growth promoting attributes of the bacteria isolated from the rhizospheric soil of carrot. Soil samples were taken from different carrot grown fields. Among all the 28 bacterial isolates, 10 bacteria were isolated from the orange carrot, 9 bacteria were isolated from the red carrot and 9 bacteria were isolated from the black carrot. Isolated bacterial cultures were showing the multiple plant growth promoting attributes.

Keywords: Rhizosphere, PGPR, biofertilizers, Daucus carota.

1. Introduction

Beneficial bacteria residing in rhizospheric region of plants and promote the growth and productivity of plants are referred as Plant Growth Promoting Rhizobacteria (Kloepper et al., 1980). These microbes can be grouped under two categories on the basis of their relationship with host plant such as extracellular (ePGPR) and intracellular (iPGPR) (Bhattacharyya et al., 2012). Growth promotion and enhancement of productivity is due to two different mechanisms of these microbes. In direct mechanisms microbes supply nutrients, produce growth promoters while in indirect mechanisms it suppresses the pathogenic microbial forms, capable to establish infection in host plants. Application of PGPR is a modern and ecofriendly approach in agriculture as a alternative of chemical fertilizer and pestisides. Carrot (Daucus carota L., 2n = 18) is a annual plant of the Umbelliferae (or Apiaceae) family. The most important characteristics of carrot is the massive accumulation of carotenoids that in the root, which is responsible for its characteristic color in most cultivars. β-carotene is a deoxygenated carotenoid and it is a parent molecule for synthesis of a group of oxygenated carotenoids called 'ketocarotenoids', which impart a distinct pink to red colour to tissues in which they are accumulated, such as the flesh of salmon, shells of shrimp and other crustaceans, and feathers of birds such as flamingoes and quails (Guerin et al., 2003). An important ketocarotenoids is astaxanthin which is of particular interest because of its many fold applications in various industries (food and pharmaceutical) (Guerin et al., 2003). Astaxanthin used as colorant mainly obtained through chemical synthesis procedure (Hussein et al., 2006) but various other biological sources such as algal and microbes has been investigated for its production (Tsukuyama et al., 1994, Dufossé, 2006). The present investigation has been carried out for isolation of PGPR from carrot rhizosphere and evaluation of their PGPR traits.





Influence of Copper and Zinc Nanoparticles on the Production of Lignolytic Enzme by White Rot Fungi

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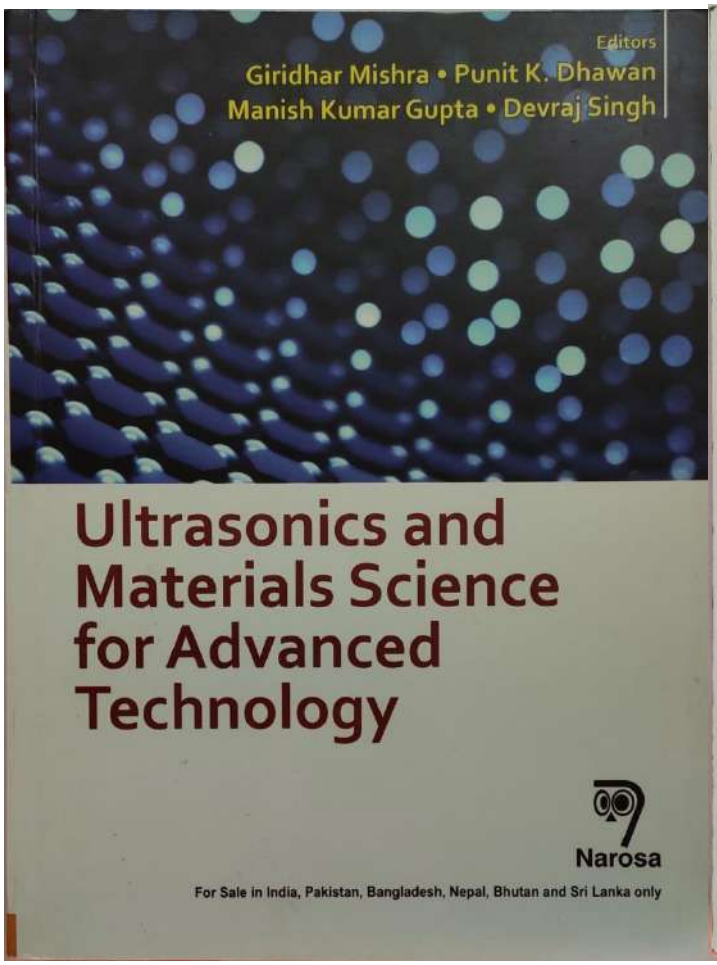
ABSTRACT

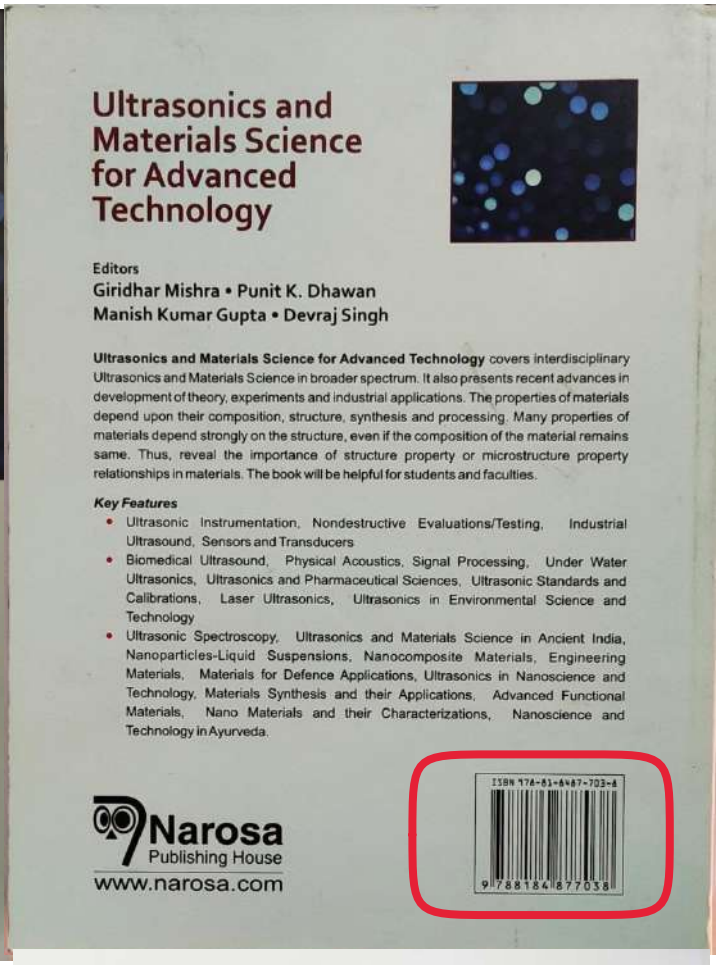
Nanoparticle is a small object that behaves as a whole unit in term of its transport and properties. Nanotechonology involves the tailoring of materials at atomic level to attain unique properties, which can be suitably manipulated for the desired applications. Recently, biosynthetic methods employing microorganisms such as bacteria and fungus and plant extract have emerged as a simple and viable alternative to more complex chemical synthetic procedures. In the present work, role of Nanoparticles in term of radial growth rate of Pleurotus species on petri plate media which have Cu, and Zn is observe. Pleurotus ostreatus and P. eryngii shows no inhibitory effect on Cu nanoparticles containing media, however, in the case of Zn nanoparticles containing media shows less inhibitory effect for the P. Ostreatus but in the case P. Eryngii, Zn containing media shows inhibitory effect. In the case of broth culture both nanoparticles increases the activity of laccase enzyme in comparison with control. The maximum laccase activity was found in Cu nanoparticles followed by Zinc supplemented media. In whole work it was found that the Cu and Zn nanoparticles enhanced the enzymatic activity and radial growth of both species. Low concentration of Cu and Zn nanoparticles increase the growth and enzyme production of the fungus positively because, that nanoparticles working as metal co-factors for enzymes (metaloenzyme) activity enhancement. Besides enzymes, other metalloproteins are involved in non-enzyme electron transfer reactions (cytochromes), may act as storage or transport proteins.

Keywords: *Pleurotus, nanoparticles, enzymes*

1. Introduction

A nanoparticle is a small object that behaves as a whole unit in term of its transport and properties. Nanoparticles have very unique physico-chemical properties. Fine particles of nanoparicles cover a range between 100 and 2500 nanometers (nm), while ultrafine particles are sized between 1 and 100 nm. Application of nanoparticle in science and technology for the purpose of manufacturing, widely use of nanoparticles in different sectors like industry, fabrics, personal care products and for environmental remediation. The increase in the production and use of engineered nanoparticles makes exposure to the natural environment. Microorganisms play an important role in proper functioning of most ecosystems, one aspects of evaluation of the toxicity of nanoparticles on the physiology of the microorganisms. *Pleurotus* species of oyster mushroom play an important role in conversion of organic material in to humus, carbon and nitrogen, complex organic compounds converted into humus is carried out by the secretion of extracellular lignin degrading enzymes, as well as cellulose degrading enzymes. Metal nanoparticles have anti-microbial property. Iron and copper nanoparticles could be presumed to react with peroxidase present in the environment to generate free radicals which is highly toxic to microorganisms. However the radicals influence the production of enzymes significantly to *Pleurotus* species.Heavy metal nanoparticle releases to the environment increasing continuously as a result of industrial activities and technological developments, which effect environment and public health because of their toxicity, accumulation in the food chain and persistence cause of carcinogenic and mutagenic in nature [1]. According to the WHO (World Health) Organization), the metals like cadmium, chromium, cobalt,





Anti-inflammatory and Antinociceptive Activity of Moringa Oleifera

Vinay Kumar Verma, Vijay Bahadur Maurya, Rajeev Kumar
Institute of Pharmacy, V. B. S. Purvanchal University, Jaunpur-222001, India

ABSTRACT

Moringa oleifera is commonly known as drumstick. It is found widely in the sub Himalayan range and commonly cultivated in all places of India. The powdered plant materials (1000g) was macerated with petroleum ether to remove fatty substances and the marc was further exhaustively extracted with 50% ethanol. The extracts obtained was further subjected to toxicological and pharmacological investigations. The antiinflammatory and antinociceptive activity of the 50% ethanolic extract of the Moringa oleifera leaf in animals is studied. The results obtained in the present study illustrate that correlations exist between the popular ancestral perception and genuine anti-inflammatory and antinociceptive activities of the whole plant of Moringa oleifera.

Key Words: Moringa oleifera, anti-inflammatory, antinociceptive

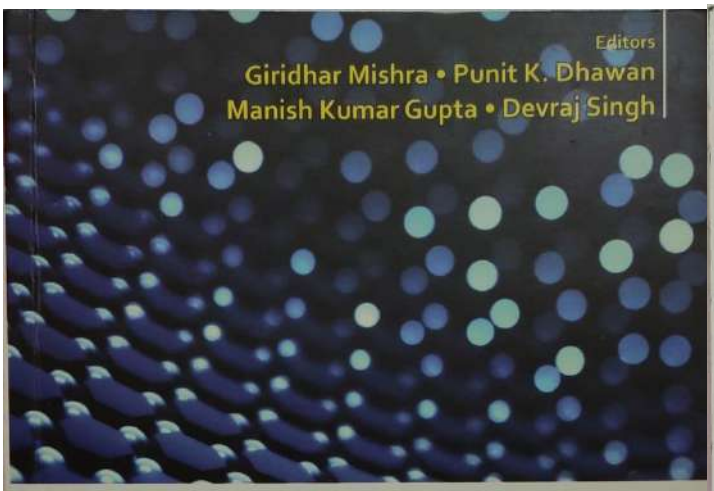
1. Introduction

There are about thirteen species of Moringa trees in the family Moringaceae. Moringa oleifera Lam. (synonym: Moringa pterygosperma Gaertn.) is the most widely known species but other species deserve further research as to their uses (M. L., 2000). Moringa oleifera is commonly known as drumstick. It is found widely in the sub Himalayan range and commonly cultivated in all places of India .It is a very popular backyard tree that grows to over 9 m height .It has soft, white corky trunk and branches bearing a gummy bark. Each tripinnately compound leaf bears several small leaflets. The flowers are white and the three winged seeds are scattered by the wind. The flowers, tender leaves and pods are eaten as vegetable. The leaves are rich in iron and therefore highly recommended for expectant mothers. Since all essential amino acids are present Moringa may be rightly called a complete food for total nutrition. The whole *Moringa oleifera* plant is used in the treatment of psychosis, eye diseases, fever and as an aphrodisiac, (Nadakami et al, 1973).

The aqueous extracts of roots and barks of it were found to be effective in preventing implantation, (Shukla et al, 1988) whereas the aqueous extracts of its fruits have shown significant anti-inflammatory activity. Methanolic extracts of its leaves have shown anti-ulcer activity while ethanolic extracts of seeds exhibited anti-tumour activity (Guevara et al, 1999). Different parts of this plant contain a profile of important minerals, and are a good source of protein, vitamins, β – carotene, amino and various phenolics acids (Farooq et al, 2007).

The *Moringa plant*, found in tropical and subtropical countries, provides a rich and rare combination of zeatin, quercetin, kaempferom and many other phytochemicals. It is very important for its medicinal value. Various parts of the plant such as the leaves, roots, seed, bark, fruit, flowers and immature pods act as cardiac and circulatory stimulants, possess antitumour (Makonnen et al, 1997), antipyretic, antiepileptic, anti-inflammatory and antiulcer (Pal et al, 1995).

In this study, the antiinflammatory and antinociceptive activity of the 50% ethanolic extract of the *Moringa oleifera* leaf in animals is described.



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Optimization of Surface Sterilization Process for Isolation and Cultivation of Bacterial Endophytes from Allium Sativum

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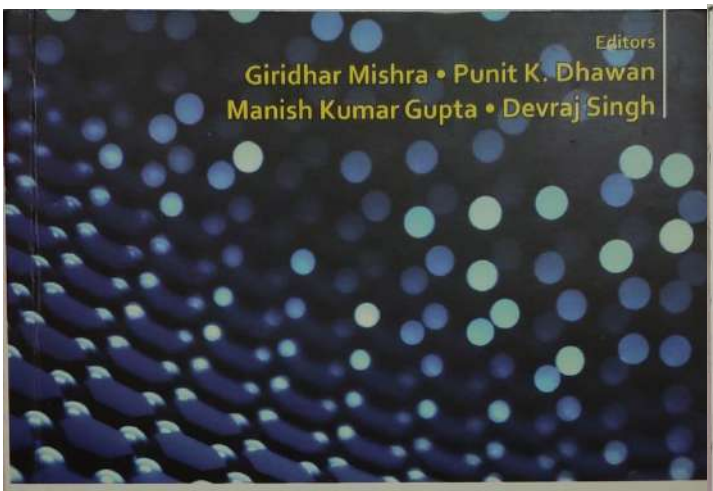
ABSTRACT

In recent year, bacterial endophytes gained attention as they have beneficial effect on plant and have ability to produce bioactive metabolites that have various biomedical applications. Study hypothesize that only 0.001-1% of all plant associated bacteria are cultivable. The isolation procedure is critical step when working with endophytic microorganism. Endophytes isolation protocol initiated with combined surface sterilization process followed by crushing or thin slice cutting plant tissue then plating on specific media. In the present investigation surface sterilization protocol for isolation of endophytes from leaf and bulb of Allium sativum were optimized by using ethanol and sodium hypochlorite. The procedure of the surface sterilizations vary for each plant part, species, age and surface properties of the plant. The present investigation aimed to optimize surface sterilization process as well as culturing of there bacteria on differtent specific media because after successful isolation many endophytic bacteria exhibited reduced re-growth capacity. In our laboratory total 37 bacteria were isolated out of which 9 bacteria were isolated from leaf and 28 bacteria were isolated from bulb of Allium sativum.

Keywords- Endophytes, Surface sterilization, Allium sativum

1. Introduction

Endophytic bacteria can be defined as those bacteria that colonize the internal tissue of the plant showing no sign of infection or negative effect on their host (Holliday, 1989; Schulz and Boyle, 2006). The term "endophyte" is derived from the Greek words "endon" meaning within and "phyton" meaning plant (De Bary 1866). These endophytes residing inside the plants are commonly known to improve plant growth and act as source of novel bioactive compounds (Ryan et al., 2008). In contrast to pathogens which invade the plant and impart harmful effect, the endophytes play beneficial role in the growth promotion of plant either by direct or indirect methods (Lodewyckx et al., 2002). Endophytes may reside in almost every internal part of plant tissues like of the roots, stem, leaf, fruit and seed (Hallmann et al., 1997 a & b). The endophyte population varies depending upon the tissue; plant developmental stage and the surrounding environment such as season (Kuklinsky-Sobral et al., 2004). Recent researches are mainly focused on plant microbes association and their role in production of valuable metabolites. One of the major problems facing by medical and pharmaceutical sciences is increasing drug resistance among the pathogens hence, researcher across the globe focus on an alternative to drug resistance and plant may play an important role in this context. Microorganism associated with medicinal plant act as reservoir of bioactive metabolites (Yu et al., 2010). Therefore, in the present investigation endophytic bacteria associated with Allium sativum were isolated because of its well known medicinal properties. It has antidiabetic, hypocholesterolemic, antilipidemic, fibrinolytic and anticancer activity (Bayan et al., 2014). In comparison to rhizospheric bacteria, endophytic bacteria are difficult to isolate and cultivate because they are more closely associated and dependent on the plant, therefore different procedures have been adopted for proper surface sterilization of plant parts for isolation of endophytic bacteria. The most commonly used isolation procedure is combination of ethanol and



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Bearing Fault Detection by Support Vector Classifier

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ABSTRACT

The bearing is an essential part of all rotating machinery. The early detection of faults in bearing by using vibration signals saves a significant amount of financial loss. Many approaches have been used to overcome this problem in past, but they succeeded to only some extent to identify the faults occurring on outer race, inner race, and rollers/balls. None of them is capable of diagnosing these faults accurately. Machine Learning-based Data-driven methods have shown better results as compared to signal processing-based techniques. In this paper we are presenting a Support Vector Classifier (SVC) which is capable of detecting faults with an accuracy of 99.47%. The results are shown in terms of Area Under Curve (AUC) of the precision-recall curve. A comparison with Multinomial Logistic Regression (MLR) is also shown.

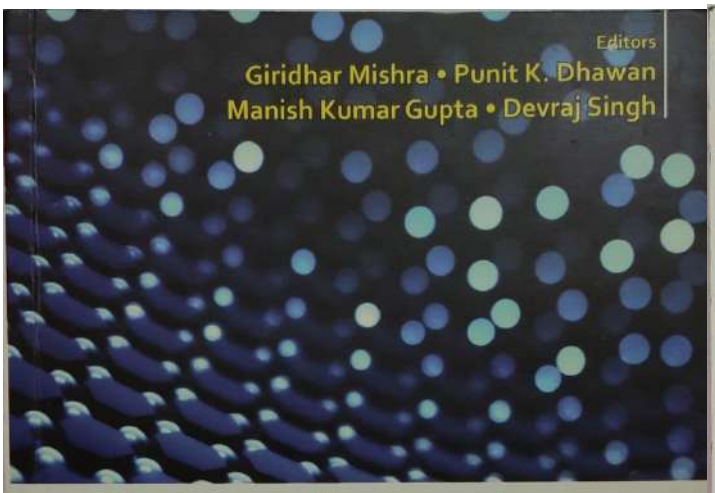
Keywords: Support Vector Classifier (SVC), Multinomial Logistic Regression (MLR), Area Under Curve (AUC)

1. Introduction

Bearing fault detection, using vibration data has gained the focus of mechanical engineers. Samanta and Al-Balushi [1] and Samanta *et al.* [1] analyzed the third and fourth central moments, i.e., skewness and kurtosis. The authors employed ANN and SVM for the diagnosis of bearing faults and summarized that both the even and odd moments are equally capable of representing bearing health effectively. Abbasion *et al.* [2] classified the single level fault severities in rolling element bearings. The authors' employed wavelet transform (WT) for the denoising of vibration signals. The classification has been performed using SVM and faults in various components have been classified. Liu *et al.* [5] and Bordoloi and Tiwari [3] employed SVM for the fault classification in rolling contact elements. Various statistical features viz. kurtosis, standard deviation, range, mean value are also utilized for the diagnosis of rolling element bearings by Kankar *et al.* [7]; Gangsar *et al.* [4] and Yaqub *et al.* [6]. These investigations utilized SVM and ANN (Artificial Neural Networks) and proposed that the selected features are sensitive to provide considerable fault identification accuracy. Here, we propose a new method based on augmented data processing before the SVC. The sequential augmentation of data improves the performance of SVC significantly.

2. The Proposed Method

Classifying data is a prime task of machine learning. Support vector machines (SVM) are used as binary classifiers. They are used both as supervised learning methods and unsupervised learning methods. When the data is labelled, classification by SVM is called SVC that is support vector classifier. In case of unsupervised learning where data is unlabelled, it is clustered in two distinct groups with the help of SVM.



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A Novel Decision Tree-based Method for Phishing Detection

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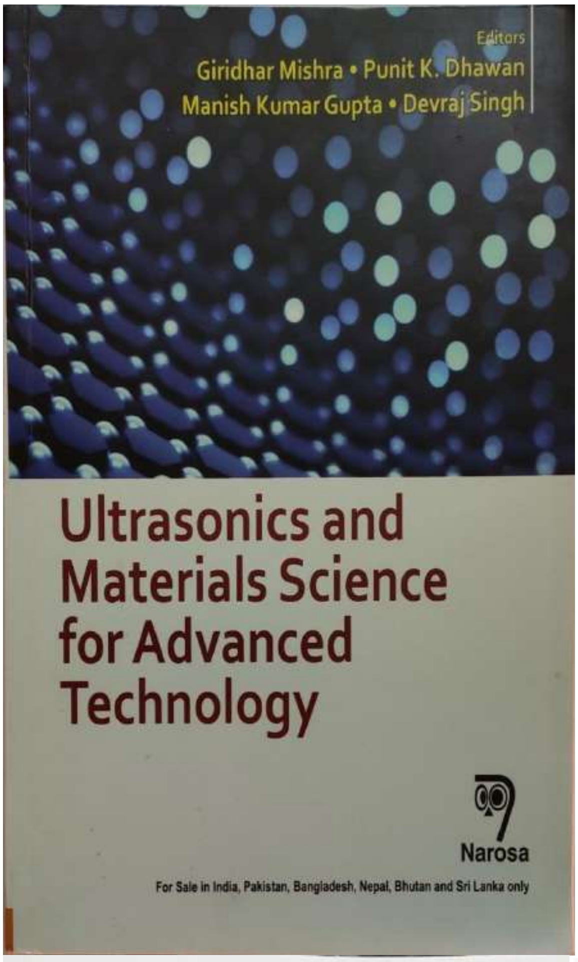
ABSTRACT

Phishing is an electronically connected criminal activity in which the attacker steals the user's personal information like username, countersign, internet banking account, credit/debit card number with the expiration date, password, pin, legitimacy, confidential patient record, CVV number, etc. to boon financially. Email-based phishing is the most common and traditional way of phishing scams, in which the phisher will send a suspicious email with an embedded URL and ask the user to click the URL. When the user clicks on the link, the link will be redirected to a spoofed site that looks the same to the original site to steal their credentials and displays some error message. Later the phishing uses those credentials for malicious purposes. To overcome these scams, many anti-phishing tools have developed. Among that the machine learning-based approaches can give a better result. This paper is an extensive study of the various machine learning-based anti-phishing approaches and their results that detect the phishing URL's from the URLs with URLs features. Six most important models of machine learning have been examined for the phishing detection problem. The Decision Tree-based method outperforms other methods.

Keywords: Phishing, anti-phishing, machine learning, phishtank, legitimate, suspicious, decision tree.

1. Introduction

Phishing is a wide term used to describe a group of scam people with their personal information shared such as consumer name, password, credit/debit card number, etc., that manipulate information for disseminating reasons. Earliest contact is sent to a bulky group of people at once, so anyone can be a victim. They will contact their victims with the help of URLs, social media, emails, and phones. The only target through this attack of these people is to send a fake correspondence, which appears to have originated from the actual organization, hoping that a large group will follow the links provided to them from these contacts and disclose their personal information to the phishers. Phishing is an automated detection method used to cheat billions of dollars to outsiders and phishing technology uses human nature as well as the power of the internet to deceive millions of people in the world [1]. The social media platforms are used for deceitful, cultivated and perceptive information from internet users by covering through a legitimate entity. The basic goal of phishing technology is to illegally commit deceitful financial transactions on behalf of internet users [2]. An anti-phishing working group (APWG), which is an NGO community (a non-profitable group) has reported on the 1st quarter of 2019 (January, February, March) that there was 180,768 phishing incident detected [3]. Various methodologies are being adopted at present to identify phishing web sites and emails. Sajid Yousuf Bhat *et al.* proposes an approach for "Spammer classification using ensemble methods over structural social network features" [4]. In [4] finds out whether the URL is spam/legitimate on the social network with community-based features. Mouad Zouina *et al.* proposes an approach for "A novel lightweight URL phishing detection using SVM and similarities index" [5]. In [5] phishing detection from the URL with the help of 6 features. SVM and similarity index is targeted to improve overall recognition of the phishing detection system. Alejandro Correa *et al.* explore "Classifying phishing URLs using recurrent neural networks" [6]. In [6]



Decoloration of Synthetic Textile Swiss Pink Dye Using a Potent Bacterial Isolate

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Department of Biotechnology, ... Mushroom Training & Research Centre (MTRC), Veer Bahadur Singh Purvanchal University, Jaunpur-222003, India
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ABSTRACT

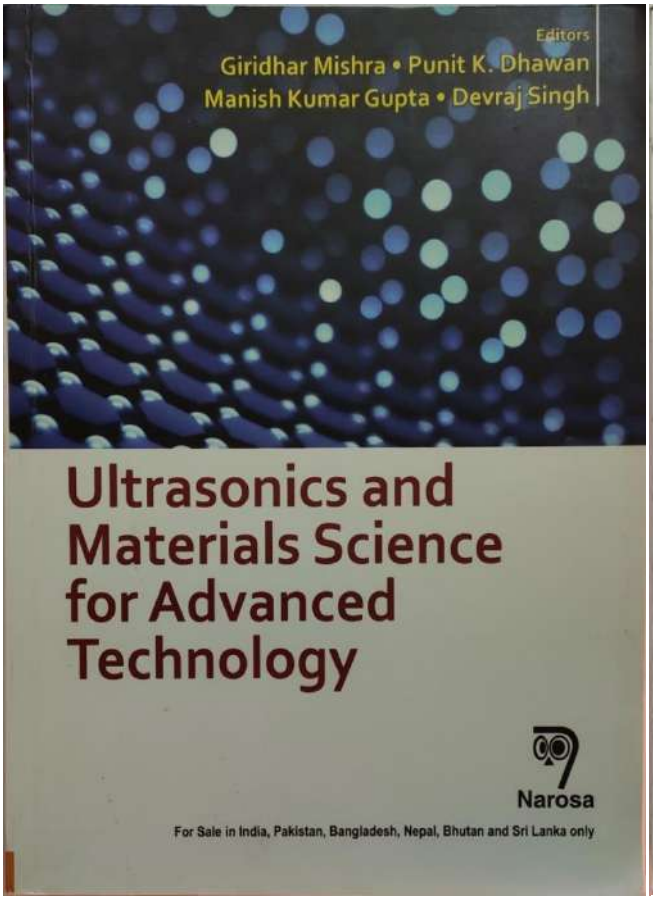
As nature is known to be rich with diversified biodiversity of microorganisms, we have isolated a novel bacterium bearing strong and efficient potency of dye decoloration. The dye decoloration efficiency of bacterial isolate was tested under submerged liquid media containing synthetic textile swiss pink dye. The bacterium very efficiently decolourized as well as degraded the textile dye in liquid media. The highest and completedye decoloration was achieved within 360 minutes of incubation under submerged conditions. Decoloration of synthetic textile swiss pink dye was also efficiently conducted using culture extract of bacterial isolate. The decoloration of swiss pink from culture extract was achieved within only 260 minutes, which was faster in comparison to bacterial decoloration. However, other bacterium tested in this study found not capable to degrade swiss-pink dye under both solid and liquid conditions. Based on the result obtained in the present study it can be concluded that bacterial degradation of swiss pink dye is very cost-effective and environment-friendly, which can be recommended for the degradation and decoloration of textile industry effluentscontaining carcinogenic dyes in large amountsthrough industrial effluent treatment plant (ETP).

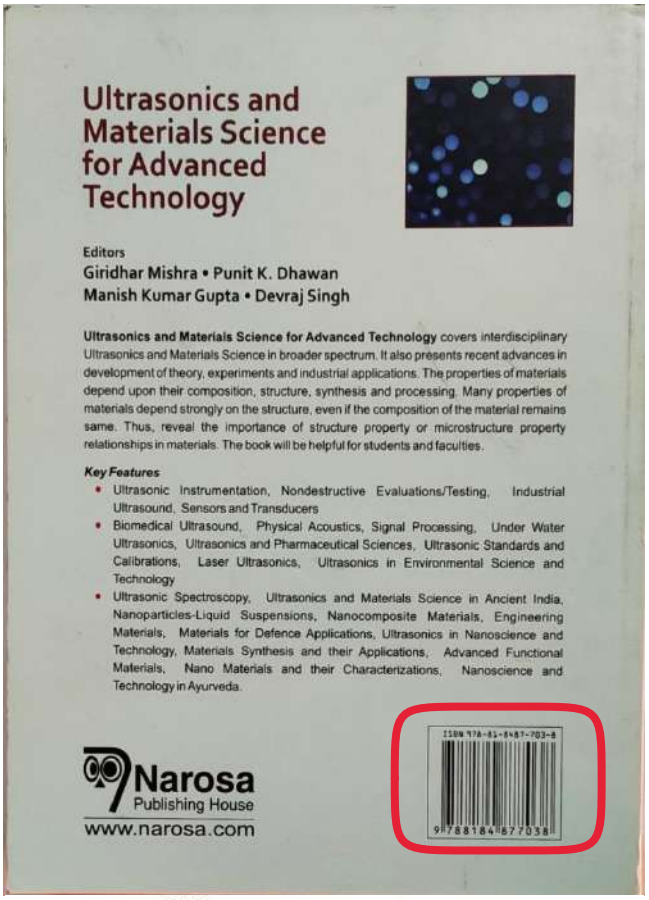
Keywords: Decoloration, textile effluent, swiss pink dye, dye degradation, bioremediation

1. Introduction

Textile industries are the crown of India's economy but they areconsistently becoming problematic day by day becauseof their threating discharges of untreated densely colored industrial effluents,which contains huge amount of dyestuffs.Such,synthetic dyestuffs of high coloring pigmentare extremely carcinogenic for living organisms of natural ecosystem especially water bodies.In addition, discharge of untreated textile dyes effluent in aqueous ecosystems also leads to reduction in sunlight penetration and negatively influences the level of dissolved oxygen,photosynthetic activity and several vital qualities of water. Discharge of textile industries contains a mixture of a large amount of coloring dyes and a very dark color, which creates serious environmental threats by damaging natural ecosystem. Therefore, direct discharge of textile industry effluents cannot be recommended, though the government has declared a standard governing policy regarding the discharge of effluents after their complete biological and non-biological treatments. Persistenceof untreated textile dyecontaining wastewater causes severe environmental dangerand the overall integrity of biome becomes disturbed, having an unpredictable health troubles globally[1,2]. The presence of −N=N− bond synthetic azo dyes makes them recalcitrant and carcinogenic in nature [3]. Several studies have been indicated that the involvement of various microorganisms produced extracellular reductive and oxidative enzymes such asazoreductase, laccase, tyrosinase, lignin, and manganese peroxidases degraded azo dyes [4,5].

Primarily degradation and decoloration of textile dye effluents are achieved by physical and chemical procedures, those are indeed not ecofriendly. In the recent past, many bioremediation techniques based on microbial members have been employed for the ecofriendly and cost-effective treatment of textile dyes and effluents. A few decades beforeseveral bioremediation techniques based on microbial cells,microorganisms (bacteria, fungi, and yeast) as well as their enzymes also have vast capabilities of dye degradation for successful





Effect of Four Different Oil Seed Cakes on Yield and Lignocellulolytic Enzymes During Cultivation of Oyster Mushroom Pleurotus Florida

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ABSTRACT

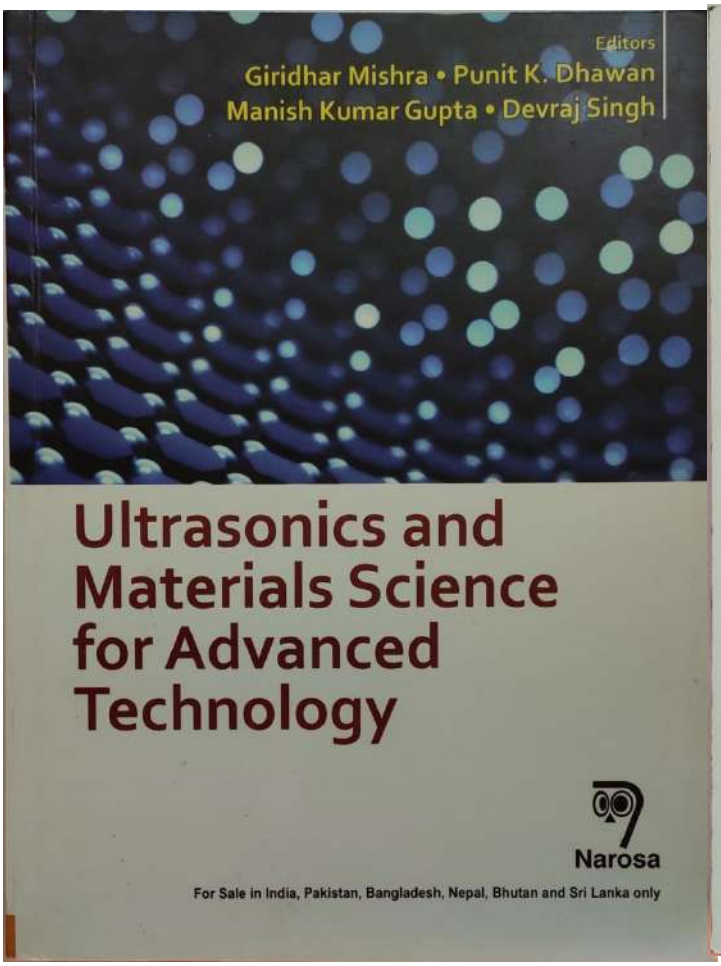
Oyster mushroom Pleurotus florida was cultivated on wheat straw (WS) as basal substrate supplemented with four different oil seed cakes such as groundnut seed cake (GSC), mahuaa seed cake (MSC), neem seed cake (NSC) and mustard cake (MC). The highest fruit body yield (2.514 g) was recorded in the sets of 2% (w/w) GSC supplemented substrate followed by 1,343, 1,243 and 1,062 g in the sets of 2% (w/w) MSC, NSC and MC respectively. The biological efficiency (BE) was also remarkably influenced of oil seed cakes. The order of BE achieved in response to oil seed cake supplementation in descending order as; 251.4 % > 134.3 % > 124.3 % > 106.2 % in GSC > MSC > NSC > MC. The mustard cake supplementation resulted the lowest yield and BE in comparison to other cakes. The enzyme profiling of cellulase, xylanase, laccase and manganese peroxidase (MnP) in all cultivation phases viz., complete mycelial run (CMR), pin head initiation (PHI), flush I, flush II and flush III were variably influenced. The supplementation of oil seed cakes also remarkably influenced to the duration of different cultivation phase. The GSC was found to be most superior to other tested cakes. Therefore, based on the results of present study the use of oil seed cake at 2 % (w/w) is recommended for oyster mushroom cultivation.

Keywords: Pleurotus florida, substrate, supplements, cultivation, yield, biological efficiency.

1. Introduction

Pleurotus florida is an edible fleshy mushroom, commonly called as oyster mushroom, which is a second most cultivated mushroom, constituting approximately 19% of the world's mushroom output [1]. The increasing population of the world's and its decrease in per capita arable land, along with rapid urbanization and industrialization, climate change, and a demand for quality and functional foods, such as mushrooms, these as secondary agriculture and novel crops [2]. It is a diverse genus belonging to white-rot basidiomycete fungi and well known for their complexity of the enzymatic system and prominent lignocellulolytic property [3]. The white-rot fungi *P. florida* have potential to produces extracellular enzymes such as cellulase, xylanase, laccase and manganese peroxidase (MnP). The genus *Pleurotus* well-known for conversion of substrate into edible and fleshy mushrooms [4]. Mushrooms not only convert lignocellulosic waste materials into human food, but also can produce notable nutriceutical products, which have many health benefits [5]. Various oil seed cakes including ground nut, mustard, neem seed, mahuaa seed, cotton seed, and sunflower seed are used as supplements in mushroom cultivation. These supplement cakes boost up for mushroom growth and development.

Bioconversion of lignocellulosic wastes is performed by *Pleurotus* spp. cultivation which produces enzymes such as hemicellulases, cellulases and ligninases [6]. The enzymes secreted by *Pleurotus florida*, degrade complex material into simple unit. So, these enzymes have a potential role in mushroom growth and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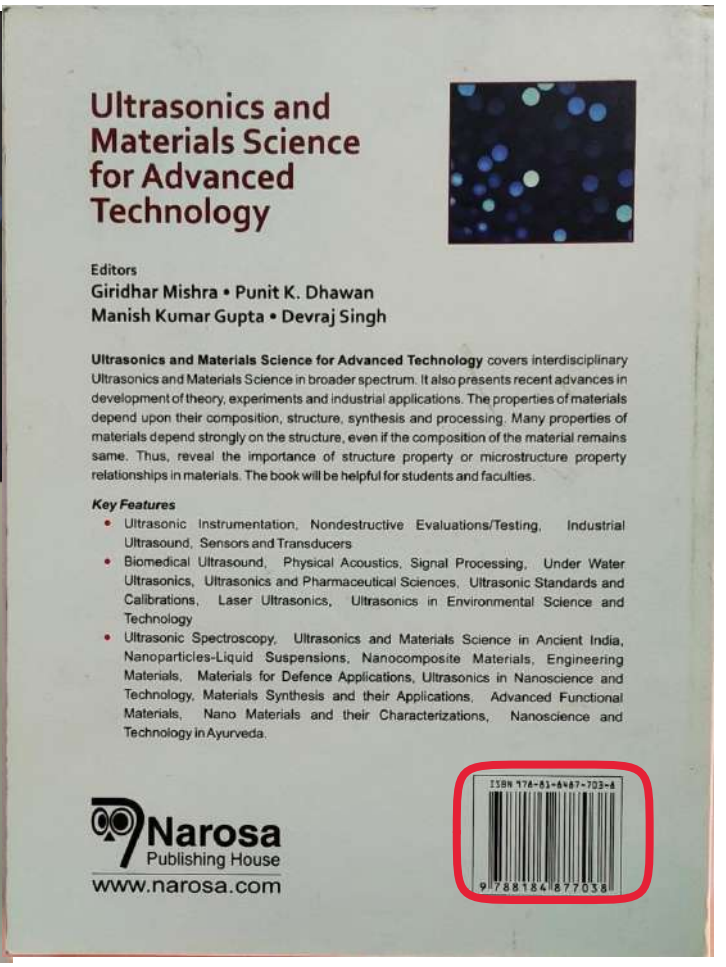
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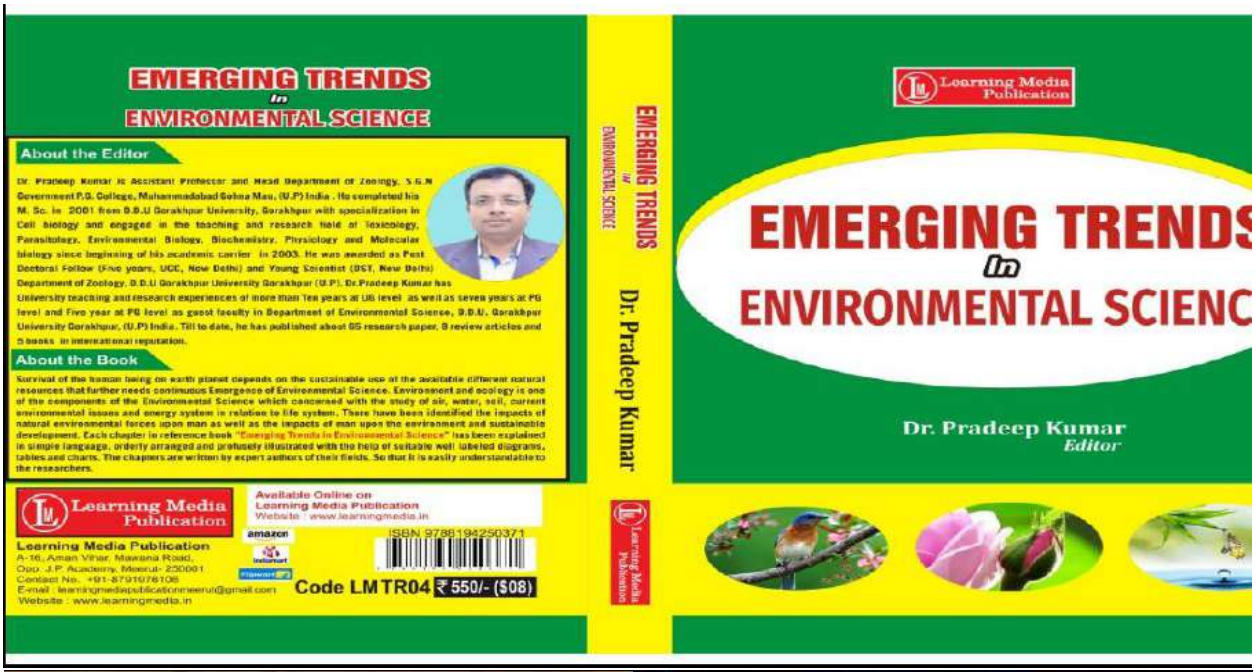

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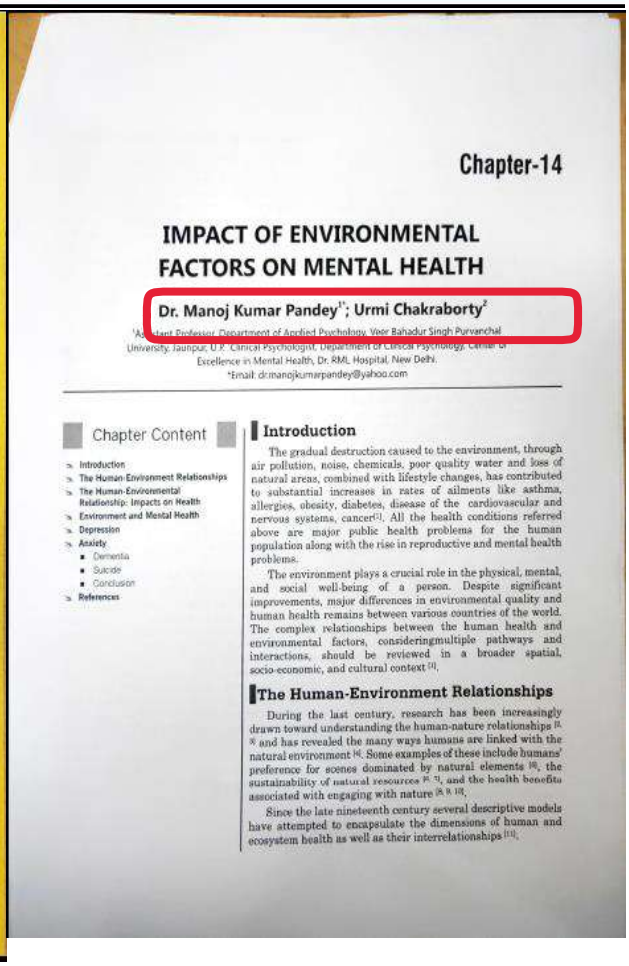

Chapter-14

IMPACT OF ENVIRONMENTAL FACTORS ON MENTAL HEALTH

Dr. Manoj Kumar Pandey[1*]; Urmi Chakraborty[2]

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Chapter Content

Introduction

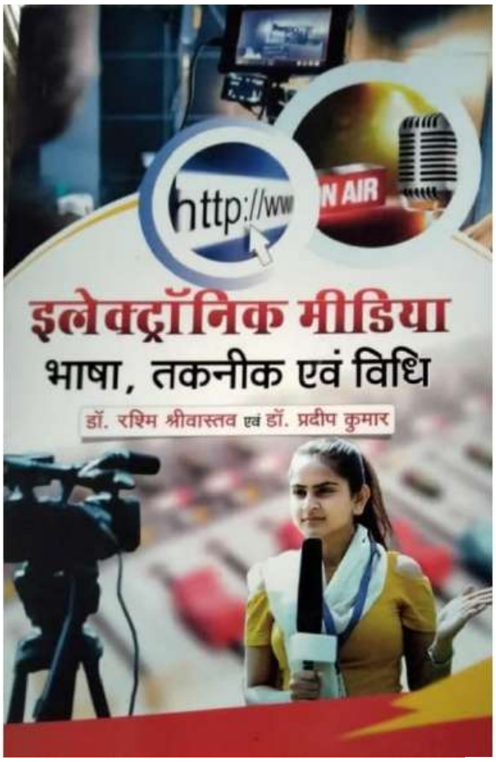
The gradual destruction caused to the environment, through air pollution, noise, chemicals, poor quality water and loss of natural areas, combined with lifestyle changes, has contributed to substantial increases in rates of ailments like asthma, allergies, obesity, diabetes, disease of the cardiovascular and nervous systems, cancer[1]. All the health conditions referred above are major public health problems for the human population along with the rise in reproductive and mental health problems.

The environment plays a crucial role in the physical, mental, and social well-being of a person. Despite significant improvements, major differences in environmental quality and human health remains between various countries of the world. The complex relationships between the human health and environmental factors, consideringmultiple pathways and interactions, should be reviewed in a broader spatial, socio-economic, and cultural context [1].

The Human-Environment Relationships

During the last century, research has been increasingly drawn toward understanding the human-nature relationships [2, 3] and has revealed the many ways humans are linked with the natural environment [4]. Some examples of these include humans' preference for scenes dominated by natural elements [5], the sustainability of natural resources [6, 7], and the health benefits associated with engaging with nature [8, 9, 10].

Since the late nineteenth century several descriptive models have attempted to encapsulate the dimensions of human and ecosystem health as well as their interrelationships [11].



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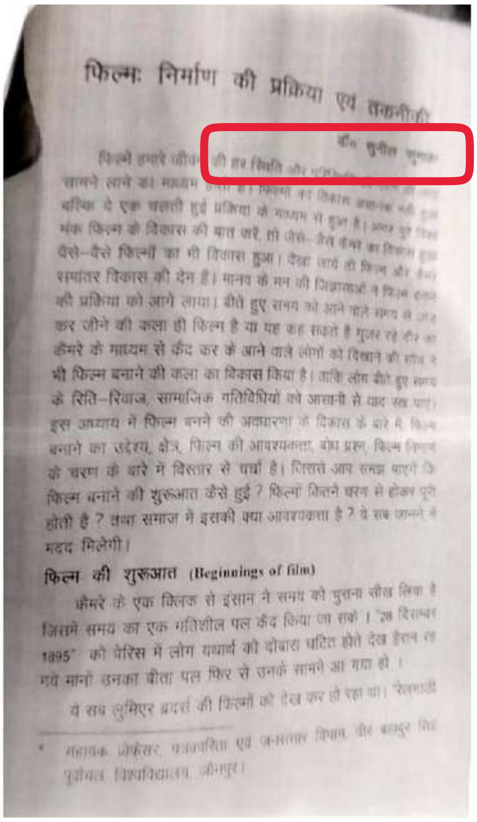

फिल्मः निर्माण की प्रक्रिया एवं तकनीकी

डॉ० सुनील कुमार*

[illegible] से–वैसे फिल्मों का भी विकास हुआ। [illegible] समांतर विकास की देन है। मानव के मन की जिज्ञासाओं ने फिल्म [illegible] की प्रक्रिया को आगे लाया। बीते हुए समय को आने वाले समय में [illegible] कर जीने की कला ही फिल्म है या यह कह सकते है गुजर रहे दौर को कैमरे के माध्यम से कैद कर के आने वाले लोगों को दिखाने की सोच ने भी फिल्म बनाने की कला का विकास किया है। ताकि लोग बीते हुए समय के रिति–रिवाज, सामाजिक गतिविधियों को आसानी से याद रख पाएं। इस अध्याय में फिल्म बनाने की अवधारणा के विकास के बारे में, फिल्म बनाने का उद्देश्य, क्षेत्र, फिल्म की आवश्यकता, बोध प्रश्न, फिल्म निर्माण के चरण के बारे में विस्तार से चर्चा है। जिससे आप समझ पाएंगे कि फिल्म बनाने की शुरूआत कैसे हुई ? फिल्में कितने चरण से होकर पूरी होती है ? तथा समाज में इसकी क्या आवश्यकता है ? ये सब जानने में मदद मिलेगी।

फिल्म की शुरूआत (Beginnings of film)

कैमरे के एक क्लिक से इंसान ने समय को पुराना सीख लिया है जिसमें समय का एक गतिशील पल कैद किया जा सके। "28 दिसम्बर 1895" को पेरिस में लोग यथार्थ को दोबारा घटित होते देख हैरान रह गये मानों उनका बीता पल फिर से उनके सामने आ गया हो। [illegible]

ये सब लुमिएर ब्रदर्स की फिल्मों को देख कर ही रहा था। [illegible]

* सहायक प्रोफेसर, पत्रकारिता एवं जनसंचार विभाग, वीर बहादुर सिंह पूर्वांचल विश्वविद्यालय, जौनपुर।

Major Issues and Challenges of Online Classes during Covid-19 Pandemic

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Abstract

Internet has changed the things that how we communicate nowadays, Online teaching during this pandemic Covid-19 has proved to be another perk of technology. Teachers are efficiently taking online classes but the questions arises the consideration and challenges that students and teachers are facing. Study is to throw light on some of the major concerns regarding it.

In the last two decades, online education has been considered to be highly important in the field of higher education (Allen&Araman,2014). In a developed country like America, making online learning an integral part of higher education due to many courses being made online (Li&Irby,2008;Luyt,2013;Lyons,2004). In this time of epidemic, UGC has given the guidelines of online education, it is mandatory that it is due to technology that teachers and students are able to do the work of teaching studies smoothly in this period, yes it is sure that there are many issues in it. There are many challenges too, which affects its quality However, empirical studies have been conducted to check the quality of online education such as communication, technology, time management, pedagogy and assessment etc (Bassoppo, Moto, 2006; Canaway, Elston & Schmit 2005;Ko & Rossen 2010; Limperos,et al, 2015).

For the past several years, we have been taught by the teachers of M.A final year psychology students how to make dissertation. In which students face a long and complicated process because a lot of information that is completely new to them is given such as data collection, using SPSS, statistics analysis, etc. because of long data collection Students take more time. They are informed in a phased manner for how to prepare the dissertation, in this task the teacher has to introduce extreme skill and caution, which also requires the necessary oral and verbal communication skills.

But after Covid-19 outbreak, all types of teaching were made online. There are many challenges that teachers and students have to face because preparing a scale in Google form for online survey is a big issue for students because of poor internet connection and lack of knowledge of computer technology, properly not able to connect online or not. In understanding, this kind of problem has become a challenge before the teachers but many students also

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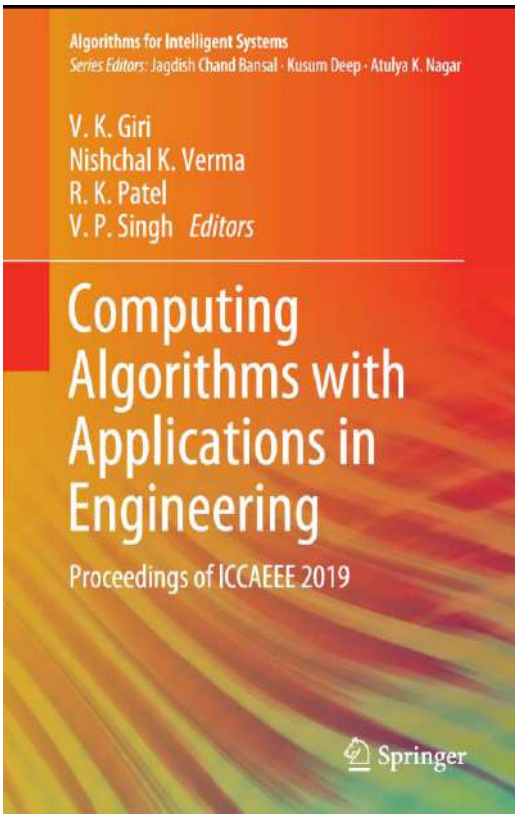

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Chapter 32
System Reduced by Using Residue of Pole in Pole Clustering Technique and Differential Method

Maneesh Kumar Gupta and Rajnish Bhasker

1 Introduction

Higher order models are complicated to use in real-time system. The higher order model is complex and difficult to handle because of computational problems. The reduced order model makes simpler for controlling the system, reduces the complexity and gives the best result. The authors reduces the higher order of transfer fuction with several different techniques [1–7]. Here, we have taken input–output relationship of the system in the form of transfer function.

The proposed method is a mixed method of the residue of poles in modified pole clustering and differential method. In literature [8], differential method used with the residue of pole in pole clustering method [9] in six orders. Now, we are checking in higher order system's example. We are also used to reduce the denominator by residue of pole in pole clustering method and numerator reduced by differential method for checking performance with original system with preserving stability.

2 Problem Formulation

Let the single-input single-output (SISO) higher order transfer function of the system is:

$$G(s) = \frac{N(s)}{D(s)} = \frac{a_0 + a_1 s + a_2 s^2 + \cdots + a_n s^{n-1}}{b_0 + b_1 s + b_2 s^2 + \cdots + b_n s^n}$$

where a and b are scalar constants.

Let the corresponding reduce rth order model is

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CHAPTER

16

Producers of Bioactive Compounds

Arvind Kumar[1] *and Ram Naraian*[2]

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OUTLINE

16.1 INTRODUCTION

Bioactive compounds are the chemical substances that are active in living cells, tissues, and organisms. These compounds are also known as secondary metabolites because they are not directly associated with the growth and development of the producer organism. Specific categories of bioactive compounds are produced either by a specific organism or by a related group of organisms. Bioactive substances also work as potential antioxidants and encounter free radicals very efficiently. The removal of reactive oxygen species prevents the development of many human disorders, including cancer and microbial infectious disease, which employ oxygen free radicals for their pathogenesis [1].

From the very ancient times concoctions of medicinal plants have been used for the treatment of various ailments in humans and animals. The mechanistic principle behind it is the integral presence of various biologically active compounds. Isolation, purification, and characterization studies established the specific role of bioactive compounds. The high demand rate, structure elucidation, and the availability of natural lead compounds have propounded the basis for the chemical synthesis of more potent and diverse bioactive molecules. Egyptians in 500 BCE preferred the use of white willow, wintergreen, and meadowsweet plants, which contain salicylic acids

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Mycodegradation of Lignocelluloses

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Chapter 1
Basic Mechanism of Lignocellulose Mycodegradation

Roshan Lal Gautam, Shweta Singh, Simpal Kumari, Archana Gupta, and R. Naraian

1 Introduction

Lignocellulose refers to a dry plant biomass abundantly available on earth in huge amount, which is annually synthesized and microbially degraded in nature. Tremendous amount of lignocellulosic wastes is also additionally produced by different industries including forestry, pulp and paper, agriculture, food from municipal solid waste, and animal wastes (Champagne 2007; Wen et al. 2004). The woody plant cell wall consists of major structural polymer components, namely, cellulose, hemicellulose, and lignin (Scheller and Ulvskov 2010; Gibson 2012). The lignocellulosic complex in plant cell wall contains approximately 40–60% cellulose, 20–40% hemicellulose, and 10–25% lignin (Kubicek 2012a, b), which can vary from one plant species to another. Sometimes huge biomass of lignocelluloses remains unused, which is either dumped or burned negligently creating big environmental issues. However, lignocellulosic biomass stores tremendous amount of energy that can be converted into another form and be employed for different valuable purposes. The microorganisms are the only predominantly responsible factors for lignocellulose degradation including fungi, and the most rapid degraders in fungi are the members of basidiomycetes (Sanchez 2009). White-rot fungi (WRF) have a versatile potential to secrete a wide range of wood-degrading enzymes involved in the breakdown of carbohydrate components (cellulose and hemicellulose) and aromatic constituent (lignin) (Kameshwar and Qin 2016). There are reports of approximately 10,000 species of WRF having different aptitude for depolymerization of lignocellulosic materials and further mineralization to carbon and water (Kirk 1984; Hatti et al. 2012). WRF such

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Chapter 12
Myco-Nanotechnological Approach for Improved Degradation of Lignocellulosic Waste: Its Future Aspect

Abhishek K. Bhardwaj, Manish Kumar Gupta, and R. Naraian

1 Introduction

Huge biomass of naturally produced lignocellulosic waste during agricultural practices is a big problem during its disposal in developing country. Lignocellulose is a complex carbohydrate polymer that is bonded to strong bonds to give it a highly stable structure and other hand intricate nature of lignin like polysaccharide of plant cell wall is slow or resistant to enzymatic degradation in normal environmental condition (Bilandzija et al. 2018). The farmers most often dispose huge amount of wastes through the process of negligent burning in open, which release huge amount of air pollutants like dense white or black smoke and ash (Perlack 2005; Alfirén and Hobley 2014). However, the lignocellulosic biomass has enormous potential to contribute global renewable energy, chemical, and materials in a sustainable manner (Kumar et al. 2008; Limayem and Ricke 2012; Saratale and Oh 2012; Papyane and Feraportova 2017). The technologies need to develop the value-added product such as (sugar, organic acids, surfactants, glues, solvents or beverage sweeteners, etc.) from huge amount of agriculture and forests, which are prominent sources of carbohydrates (Mamilla et al. 2019).

Many researchers reported that cellulolytic enzymes are found in insect, bacteria, fungi, and plant which can be utilized into various industrial sectors for conversion of cellulose into free glucose (Goyal et al. 1991; Jahangeer et al. 2005; Sharma et al. 2007). Due to wide demand for hydrolyzed cellulose products; various industrial sectors employing cellulolytic enzymes has attracted greater attention since past decades (Tischer and Wedekind 1999). Cellulases are the combination of

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Chapter 8
Rhizoremediation of Polyaromatic Hydrocarbons (PAHs): A Task Force of Plants and Microbes

Ram Naraian, Roshan Lal Gautam, Siya Ram, and Manish Kumar Gupta

Abstract Polyaromatic hydrocarbons (PAHs) are a group of more than hundred highly toxic, recalcitrant, and carcinogenic organic compounds, generated after incomplete combustion of organics, and persist in the environment as very noxious pollutants. Generally, several anthropogenic activities often pollute the upper fertile and rhizosphere soil of earth that exerts multiple harmful influences on the ecosystems. The severe contaminations from PAHs cause ill health of soil by the damage of plant, animals, and microorganisms, which may result in imbalance in the ecosystem. Though various physical and chemical methods have been attempted, they were found inappropriate, non-economical, and non-ecofriendly. The rhizoremediation presents itself as a potential approach for the remediation of soil from the PAHs using plant and rhizosphere microbes. The synergistic interaction of plant and existing rhizosphere bacteria has a wonderful role in bioremediation of PAHs, which constitutes rhizoremediation as an excellent and very attractive green technology. Under the integrated rhizoremediation approach of PAHs, plant roots on one side secrete organic exudates, while on the other side, bacteria contribute various enzymes to degrade recalcitrant PAHs into non-toxic forms. Thus, this eco-friendly technology establishes an approach, which not only limits to PAHs but also has a broad spectrum of bioremediation for various other recalcitrant organic pollutants such as chlorinated phenyls, explosives, insecticides, fungicides, etc. In consequence, practical implementation of rhizoremediation at ground level for decontamination of highly polluted sites needs to be promoted. The present chapter emphasizes detailed account on rhizoremediation of PAHs using an integrated approach of plant and microorganisms.

Keywords Rhizosphere · Rhizoremediation · PAHs · Plant exudates · Soil microbes · Organic pollutants

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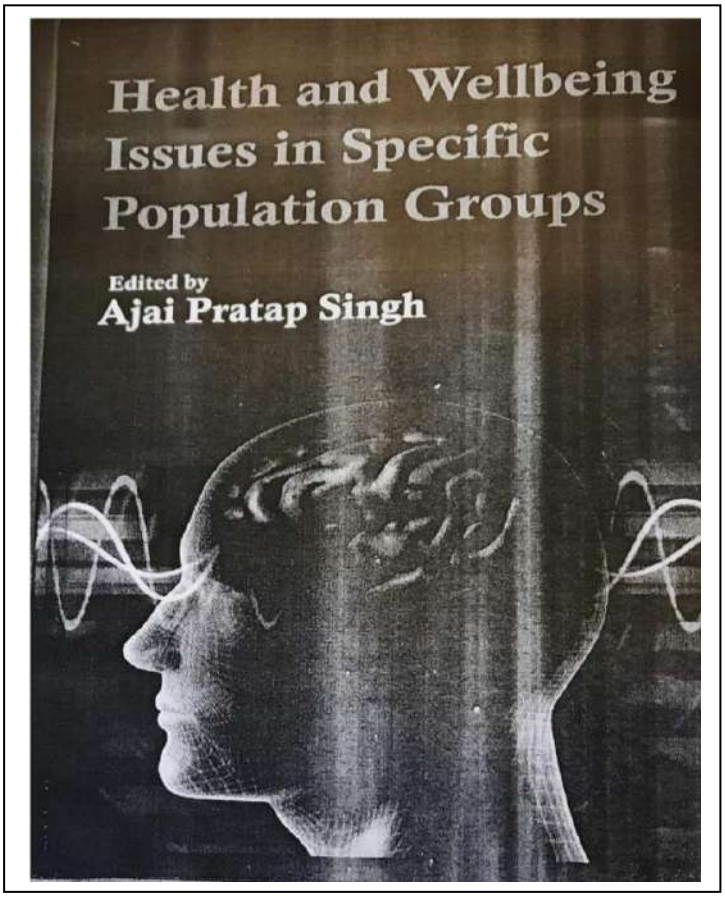
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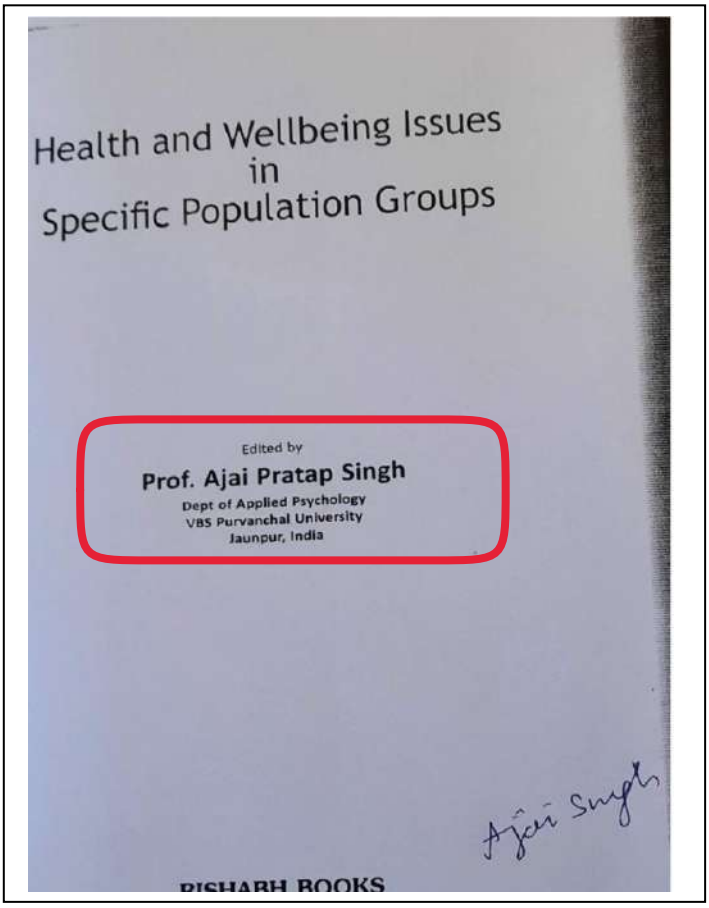
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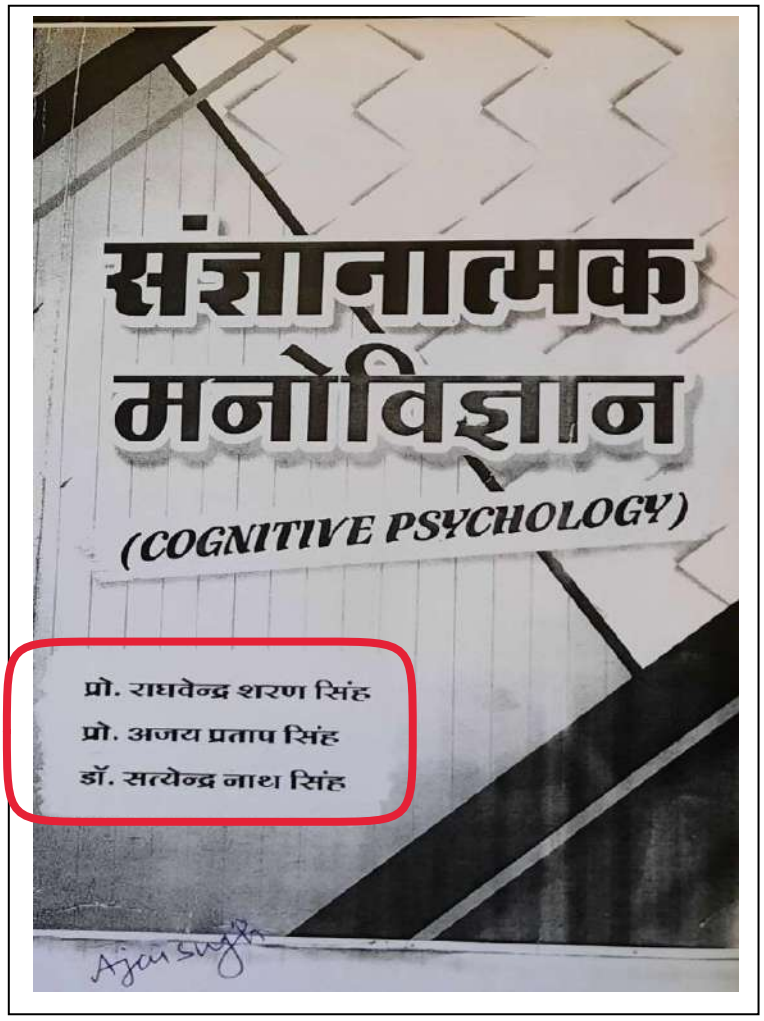

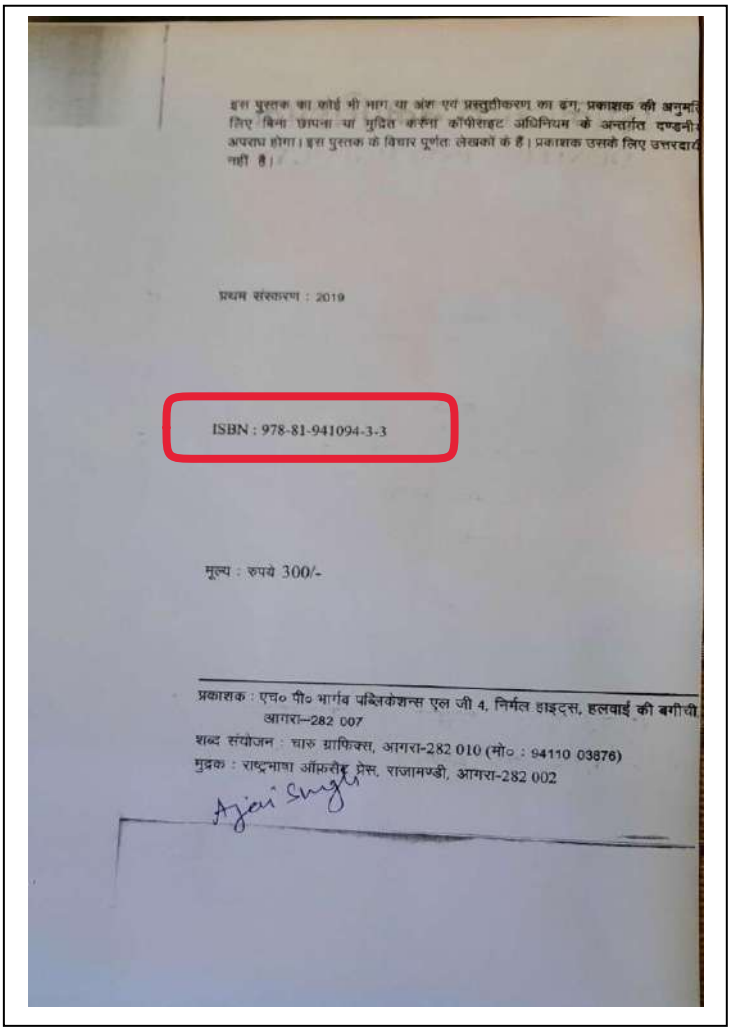
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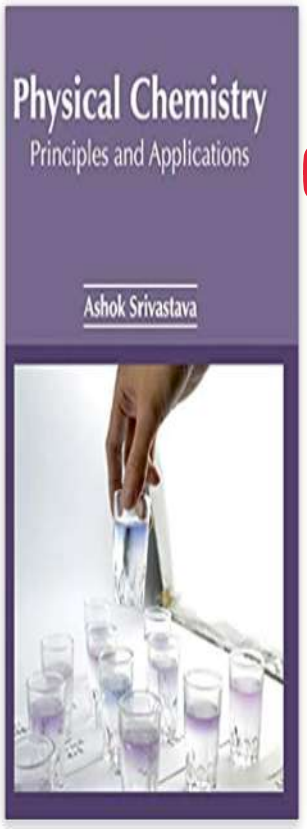

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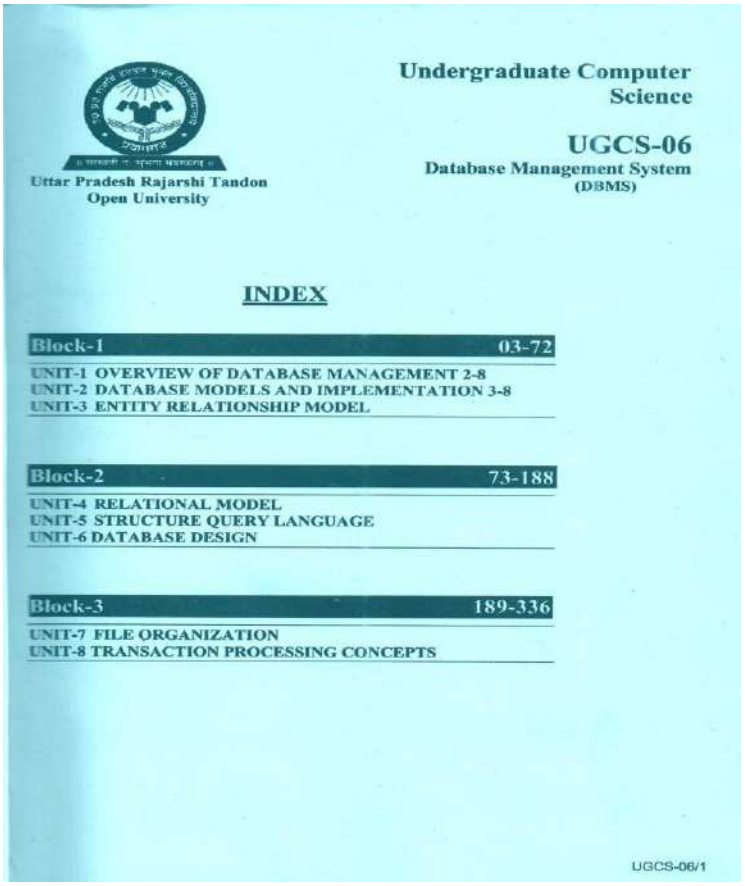

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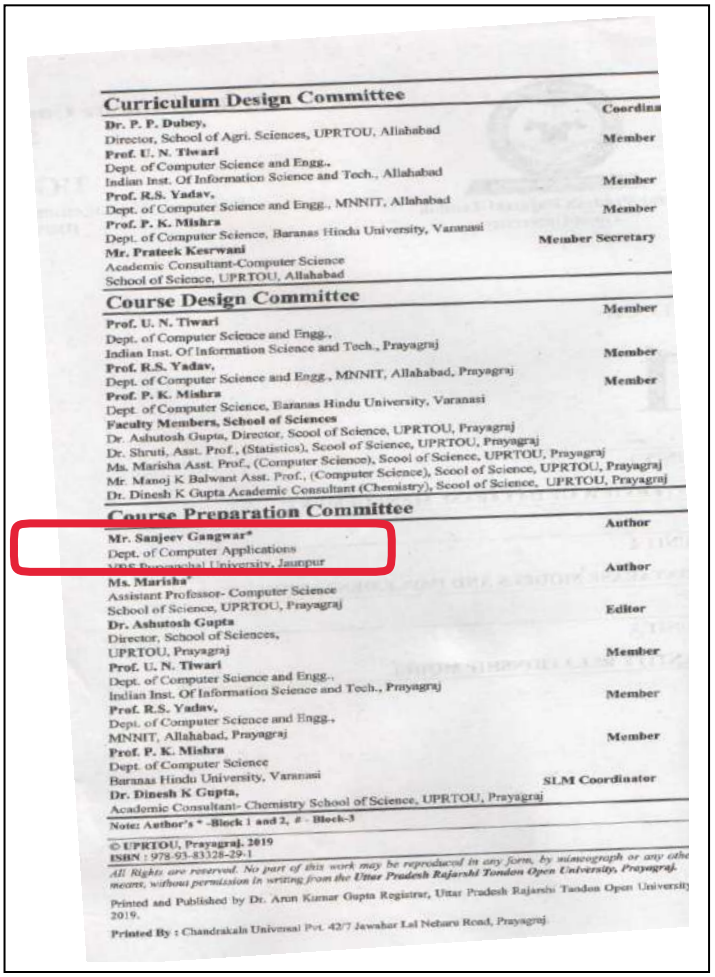

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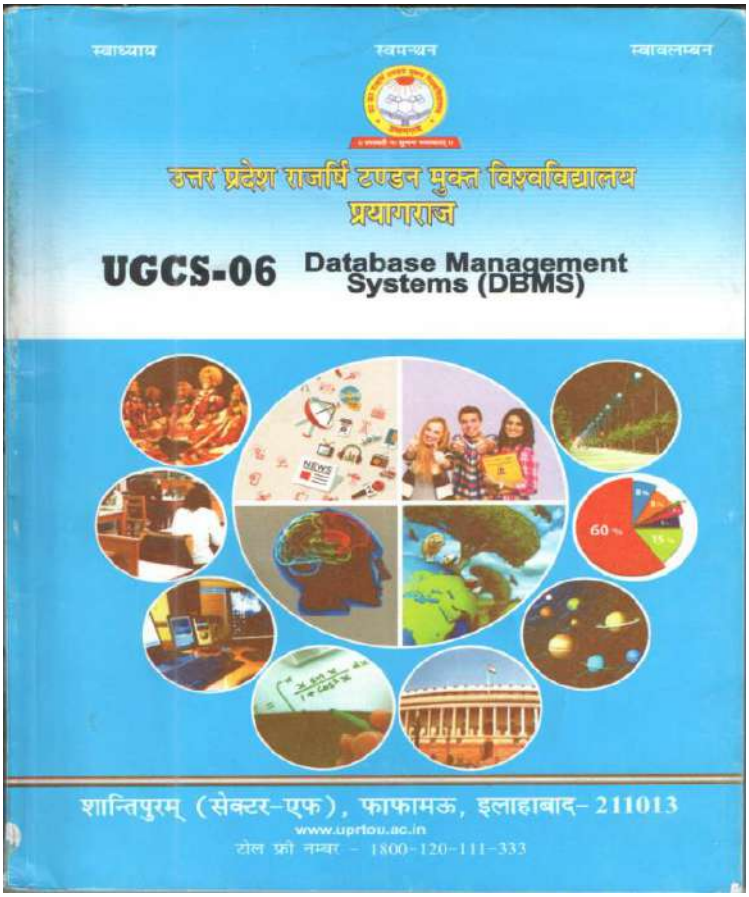

NEW AND FUTURE DEVELOPMENTS IN MICROBIAL BIOTECHNOLOGY AND BIOENGINEERING

Microbial Genes Biochemistry and Applications

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Contents

CHAPTER

6

Differential Expression of the Microbial β-1,4-Xylanase, and β-1,4-Endoglucanase Genes

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6.1 INTRODUCTION

Biocatalytic depolymerization of cellulose and hemicellulose compounds into their simpler sugars requires a synergistic action of multiple enzymes, among them, endoxylanases and β-xylosidases play an important role in xylan depolymerization, the major component of hemicelluloses (Juturu and Wu, 2012). The endoxylanases and β-1,4-endoglucanases are produced by bacteria, fungi, algae, and arthropods. However, bacteria and fungi are the major producers of these enzymes and the enzymes of their origin have been well-characterized at molecular, biochemical, and physiological level by different researchers (Deeta et al., 1999; Adrad et al., 2004). The expression of β-1,4-xylanase and β-1,4-endoglucanase is dynamic in response to the type and concentration of available carbohydrate (Ding et al., 2013). However, the proportion of different types of glycosidase secreted also varies from one organism to another. For instance, *Aspergillus* spp. secretes high levels of β-glucosidase while *Trichoderma reesei* is a potential secretor of endoglucanase. Therefore, mixed culture of *Aspergillus* and *Trichoderma* has been suggested with great success to achieve efficient cellulolytic process. However, the production of enzymes at large scale by mixed cultivation is a tedious process because different organisms require differential medium formulation and environmental parameters. The production of enzyme cocktails from separate hosts is also a costly affair. Therefore, viable commercialization of biofuel production by the cellulolytic process at the industrial scale requires constitutive synthesis of these enzymes in a single host. Cellulolytic and xylanolytic enzymes are rarely expressed at the constitutive level. They can be constitutively expressed under the control of a strong promoter in a single host by taking advantage of recombinant DNA technology (Rose and van Zyl, 2002; Polizeli et al., 2005; Hu et al., 2015).

Xylan is the major component of hemicellulose and the second-most abundant polysaccharide after cellulose. It is a complex and highly branched heterogeneous polysaccharide which consists of β-1,4-linked D-xylopyranosyl backbone substituted with glucuronopyranosyl, 4-O-methyl-D-glucuronopyranosyl, L-arabinosyl, D-galactosyl, acetyl, feruloyl, and p-coumaroyl side groups (Beg et al., 2001; Collins et al., 2005; Knob et al., 2010; Gong et al., 2013). Among a variety of xylanases, β-1,4-endoxylanase is a most important hydrolytic enzyme which cleaves internal β-1,4-glycosidic linkage in the xylan polymer, and releases short xylooligosaccharides of varying length (Gong et al., 2013; Kim et al., 2014). These oligosaccharides are degraded from the nonreducing end by the action of β-xylosidases (Zhang et al., 2007; Knob et al., 2010). Due to the highly heterogeneous nature, other accessory enzymes such as α-L-arabinofuranosidase, β-glucuronidase, acetylxylan esterase, ferulic acid esterase, and p-coumaric acid esterase are also required for complete hydrolysis of the xylan (Knob et al., 2010; Gong et al., 2013).

On the other hand, cellulose is the most easily available, renewable, and cheap substrate on this planet as a by-product of agro-industry, forestry, and from the solid waste of municipalities (Adrad et al., 2004). It is the

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Tribal Communication : Myths Metaphors and Reality

Nagendra Kumar Singh

18

The Role of Ashram Schools in Empowering Tribal Children: Challenges and Prospects

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Abstract

In ancient India community schooling concept was very popular and it was playing crucial role in ensuring quality education of community children.Community schools are known with various names e.g. Ashram, Gurukula, Pathasala, Vidyapeeth, Vihara etc. These schools were providing and promoting tradition of community schooling. Such schools were offering education to ensure overall development of tribal children. In India Ministry of tribal affairs and the state have made provisions to establish Ashram schools in tribal-dominated regions to provide quality education to tribal children. At present ashram schools are facing various problems in functioning. Ashram school was established to empower tribal students through residential educational facilities. Irregularities and lack of transparency are becoming major concerns and

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ALGINATES

Versatile Polymers in Biomedical Applications and Therapeutics

Md Saquib Hasnain | Amit Kumar Nayak
Editors

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CONTENTS

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Alginates

Versatile Polymers in Biomedical Applications and Therapeutics

This new volume explores the latest research on the use of alginate as a biopolymer in various biomedical applications and therapeutics. The uses of alginates and modified alginates discussed in this book include tissue regeneration, encapsulation and delivery of drugs, nucleic acid materials, proteins and peptides, genes, herbal therapeutic agents, nutraceuticals, and more. This book also describes the synthesis and characterizations of various alginate and modified alginate systems, such as hydrogels, gels, composites, nanoparticles, scaffolds, etc., used for biomedical applications and therapeutics.

Alginate, a biopolymer of natural origin, is of immense interest for its variety of applications in pharmaceuticals (as medical diagnostic aids) and in materials science. It is the one of the most abundant natural biopolymers and is considered an excellent excipient because of its non-toxic, stable, and biodegradable properties. Several research innovations have been made on applications of alginate in drug delivery and biomedicines. There needs to be a thorough understanding of the synthesis, purification, and characterization of alginates and its derivatives for their utility in healthcare fields, and this volume offers an abundance of information toward that end.

ABOUT THE EDITORS

Md Saquib Hasnain, PhD, has over six years of research experience in the field of drug delivery and pharmaceutical formulation analyses, especially in systematic development and characterization of diverse nanostructured drug delivery systems, controlled release drug delivery systems, bioenhanced drug delivery systems, nanomaterials and nanocomposites employing Quality by Design approaches as well as development and characterization of polymeric composites, formulation characterization using FTIR, DSC, PXRD, SEM, TEM, HPLC, LC-MS, and many more. He has authored over many publications in various journals and book chapters, and has one Indian patent application to his credit. He has also participated and presented his research work at conferences in India and abroad. He is a member of several scientific societies, including the Royal Society of Chemistry, International Association of Environmental and Analytical Chemistry, and Swiss Chemical Society.

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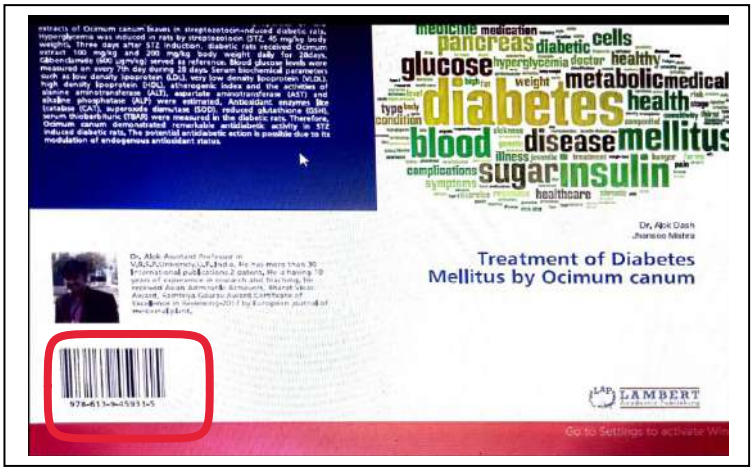
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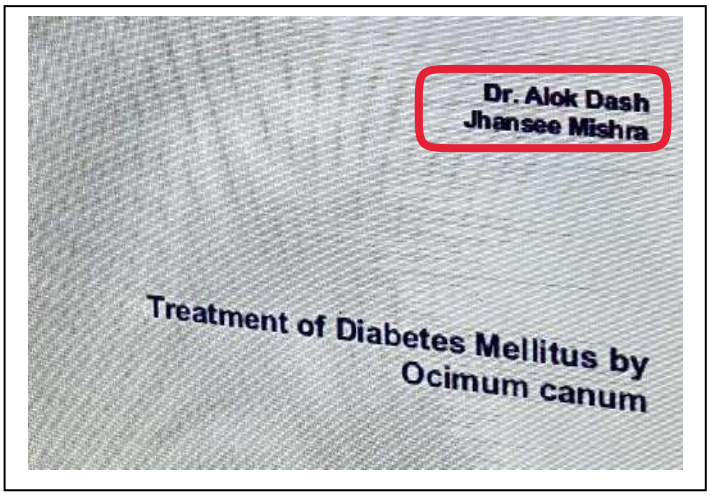
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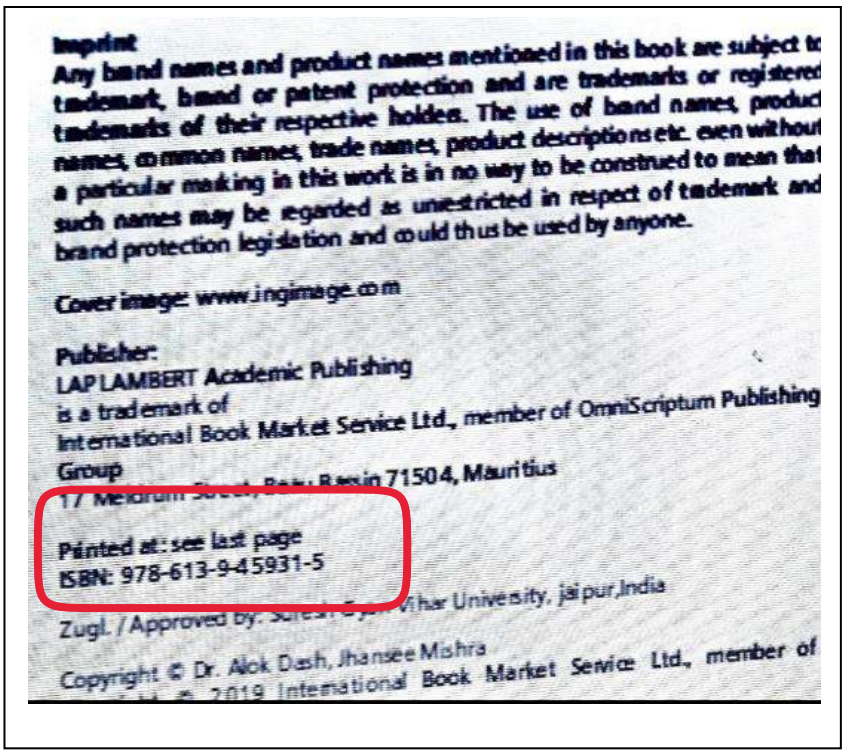
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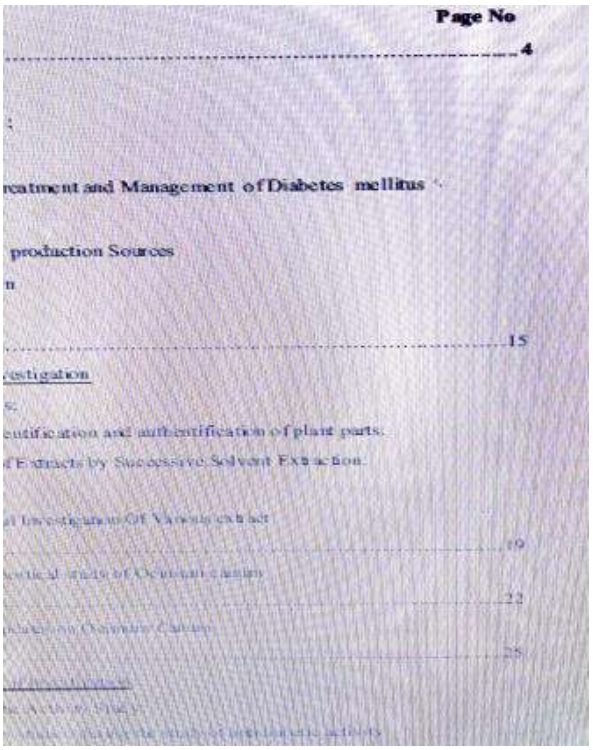
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4
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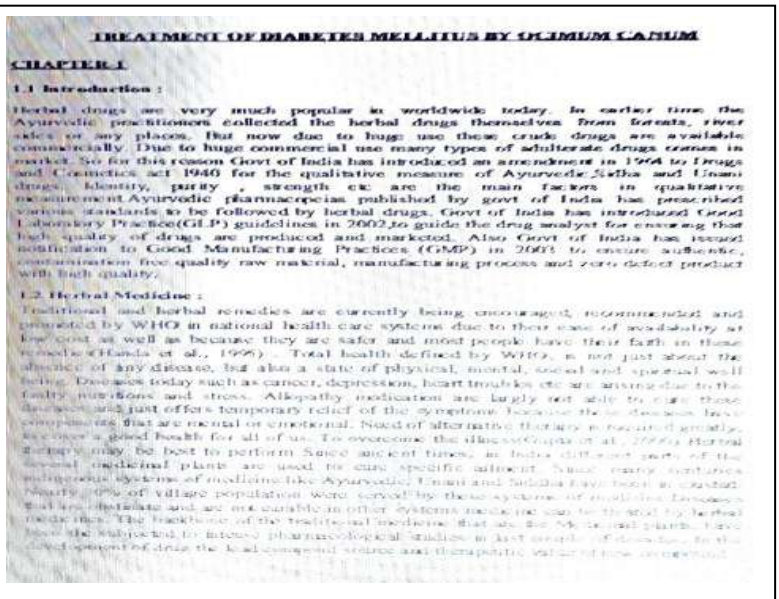
15


TREATMENT OF DIABETES MELLITUS BY OCIMUM CANUM
CHAPTER 1
1.1 Introduction :
1.2 Herbal Medicine :

to absolute or relative deficiency of insulin, This can arise in many different ways, but is most commonly due to autoimmune type 1 diabetes or to adult-onset type 2 diabetes. Dyslipidemia in diabetics can cause significant cardiac conditions, The main aim of this study was to detect the antidabetic and antioxidant activity of aqueous and petroleum ether extract of Platycladus orientalis in Streptozotocin-induced diabetic rats,Diabetes was induced in rats through an intraperitonial injection of streptozotocine (STZ) (55 mg/kg). In order to detect the antidiabetic activity, the extracts of Platycladus orientalis was given orally at doses of 100 and 200 mg/kg daily for 28 days, On day 28 the serum lipid profile that is total cholesterol (TC), triglycerides (TG), low-density lipoprotein(LDL), high-density lipoprotein (HDL), very-low-density lipoprotein (VLDL), etc. were estimated.The antioxidant parameters such as superoxide dismutase (SOD), glutathione (GSH), TBRA and coronary artery disease (CAD) were also evaluated.The extracts at doses of 200 mg/kg significantly decreased the blood glucose on 28th day.

Dr. Alok Dash
Dr.Jhansee Mishra

Diabetes Solution

Antidiabetic activity and modulation of antioxidant status by Platycladus orientalis

Dr. Alok Assistant Professor V.B.S.P.University India, He has more than 30 International publications and 2 patents having 10 years of experience in research and teaching viz. He received Asian Admirable Achievers, "Rashtriya Gaurav Award"-2017, Bharat Vikas Award, Certificate of Excellence in Reviewing-2017 by European journal of medicinal plant.

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Diabetes Solution

Antidiabetic activity and modulation of antioxidant status by Platycladus orientalis

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...LUTION BY PLATYCLADUS ORIENTALIS

...drugs are very much popular in worldwide today. In earlier time ...oners collected the herbal drugs themselves from forests, river ... But now due to huge use these crude drugs are available ... huge commercial use many types of adulterate drugs comes in ...son Govt of India has introduced an amendment in 1964 to Drugs ...40 for the qualitative measure of Ayurvedic,Sidha and Unani ...ty , strength etc are the main factors in qualitative ...c pharmacopeias published by govt of India has prescribed ... followed by herbal drugs. Govt of India has introduced Good ...P) guidelines in 2002,to guide the drug analyst for ensuring that ... are produced and marketed. Also Govt of India has issued ...Manufacturing Practices (GMP) in 2003 to ensure authentic, ...ity raw material, manufacturing process and zero defect product

...remedies are currently being encouraged, recommended and ...national health care systems due to their ease of availability at ...ause they are safer and most people have their faith in these ...

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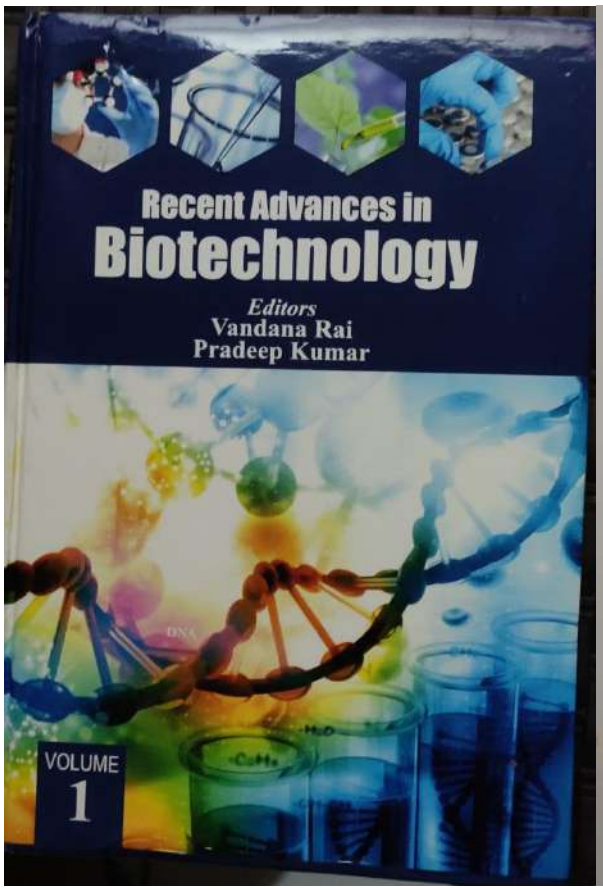

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13

Stem Cell and Their Applications

Vandana Rai*, Pradeep Kumar

A stem cell is unspecialized cell with a capacity to renew itself and differentiation to give rise the specialized cell. Stem cells are not committed to any function whereas specialized cells are committed to a specific function like retinal, skin, kidney, lung and muscle cells.

Cells may be classified on the basis of their potency of differentiation.

(i) Totipotent cells

Totipotent cell may differentiate in to all types of cells and has ability to form a complete organism eg, zygote.

(ii) Pleuripotent cell

Pleuripotent cells have capacity to differentiate in to almost all type of cells derived from all three germ layers- endoderm, mesoderm and ectoderm, eg, embryonic stem cells and embryonic germ cells.

(iii) Multipotent Cell

Multipotent cells have capacity to differentiate closely related family of the cells eg, hematopoietic stem cell that may differentiate in to red, white blood cells. These stem cells are known as adult stem cells.

(iv) Oligopotent Cell

Oligopotent cells have ability to differentiate in to few types of cells eg, lymphoid stem cell and myeloid stem cells.

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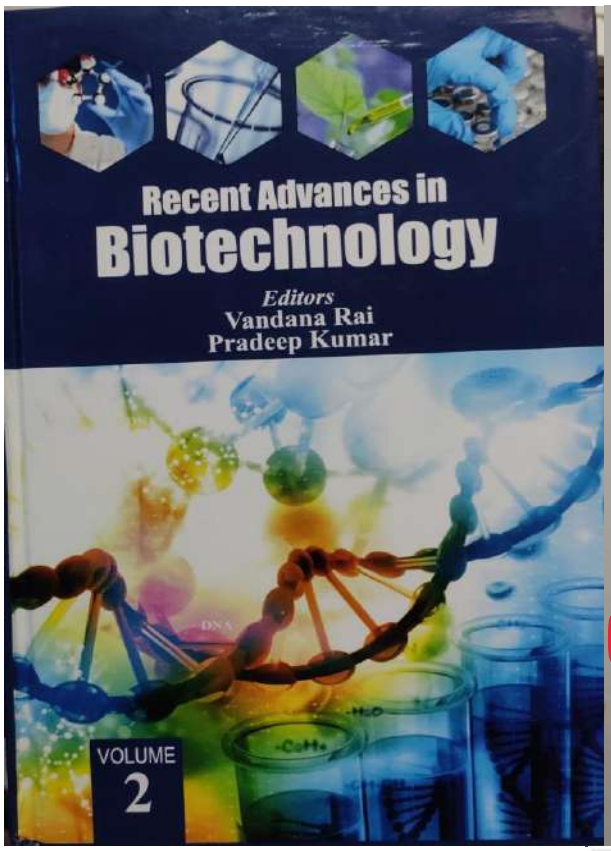

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Contents

1

Biotechnology and Its Different Disciplines

Vandana Rai*, Pradeep Kumar

INTRODUCTION

Biotechnology is the manipulation of living organisms for purposes other than their original intent. It may be simply defined as "using organisms or their products for commercial purposes." The technology encompasses a wide range of fields including the life sciences, chemistry, agriculture, environmental science, medicine, veterinary medicine, engineering and computer sciences to develop tools and products that hold great promise and concern. Biotechnology has applications in different major fields like medicine/human health, plant sciences, animal sciences, agriculture, industrial areas and environmental uses. Scientists divide the fields into red, green, white and blue biotechnology. Red biotechnology relates to medicine and green biotechnology relates to food. White biotechnology, also called industrial biotechnology, uses natural processes such as fermentation and enzymes to create products formerly made with chemicals and blue biotechnology encompasses all aspects of marine biology and genomics. The first recombinant DNA substance approved by the FDA was synthetic human insulin (Humulin), which was created to treat diabetes. One of the main goals of biotechnology is to feed the world's 6 billion people.

One major tool of modern biotechnology is recombinant DNA technology (rtDNA) or genetic engineering. The genetic makeup of plants and animals can be modified by either insertion of new useful genes or removal of unwanted ones. By changing the genetic information, genetic engineering changes the type or amount of proteins an organism is capable of producing. Through genetic engineering, genetically modified crops or organisms are formed. These GM crops or GMOs are used to produce biotech-derived foods. Virus, insect, pest resistant crop plants and animals have been developed and advances in insect resistance have been made. Genetic modifications have produced fruits and vegetables that have longer shelf lives: through delayed pectin degradation

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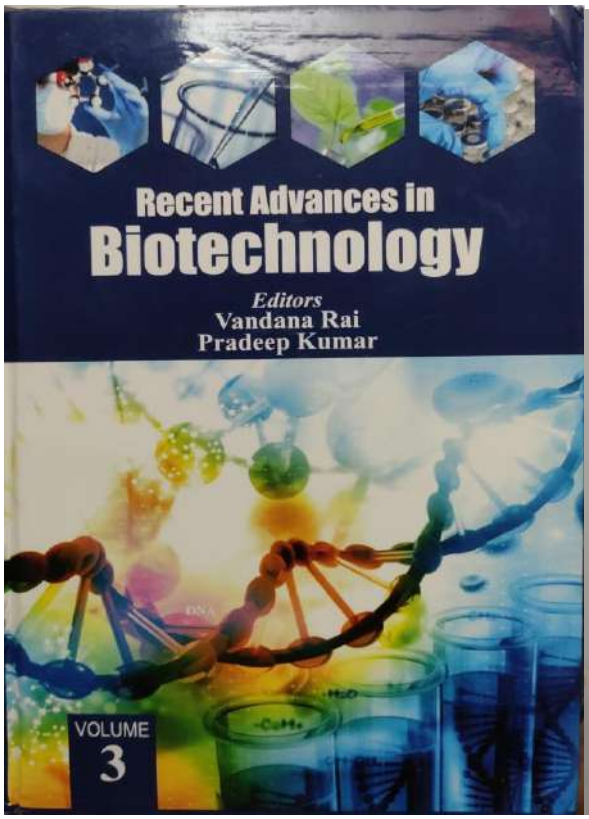

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1

RNA Interference : Mechanism and Applications

Vandana Rai*, Pradeep Kumar*

One of the most unexpected findings in past decade has been the discovery of RNA interference (RNAi). In 2006, American scientists Andrew Fire and Craig C Mello shared the Nobel Prize in medicine for their work on RNA interference in the nematode worm *Caenorhabditis elegans*. RNA interference (RNAi) is mechanisms where dsRNA interferes with the expression of the genes in order to silence it and control protein translation. This phenomenon was first reported in transgenic petunia flowers by Napoli and coworkers (1990), where "Co-suppression" was observed in the introduced transgene and chalcone synthase (CHS) gene resulting in white petunias instead of the expected deep blue coloration. A similar phenomenon known as "quelling" was observed in *Neurospora crassa* in 1992, while attempting to enhance orange pigmentation (Romano and Macino, 1992; Agrawal et al.,2003). However, RNAi gained popularity when in 1998 Fire and colleagues discovered the mechanism in *Caenorhabditis elegans* (Guo and Kemphues,1995). The natural role of RNA interference is thought to be the protection of the plant/nematode from invasion by viral pathogens (Zamore, 2002). On infection, RNA viruses generate double-stranded (ds) RNA molecules either in activation or replication, and it is these molecules that are capable of activating the host RNAi defense mechanism. This results in the specific degradation of the viral RNA so preventing viral multiplication (Voinnet, 2005; Martineau and Pyrah, 2007).

MECHANISM OF RNA INTERFERENCE

RNA interference takes place predominantly within the cytoplasm of the cell and is triggered by the introduction of a double-stranded oligonucleotide into the cell cytoplasm. The mechanism is mediated by the activation of 2 major molecules; the initial activity of the endonuclease Dicer (an RNAse III family

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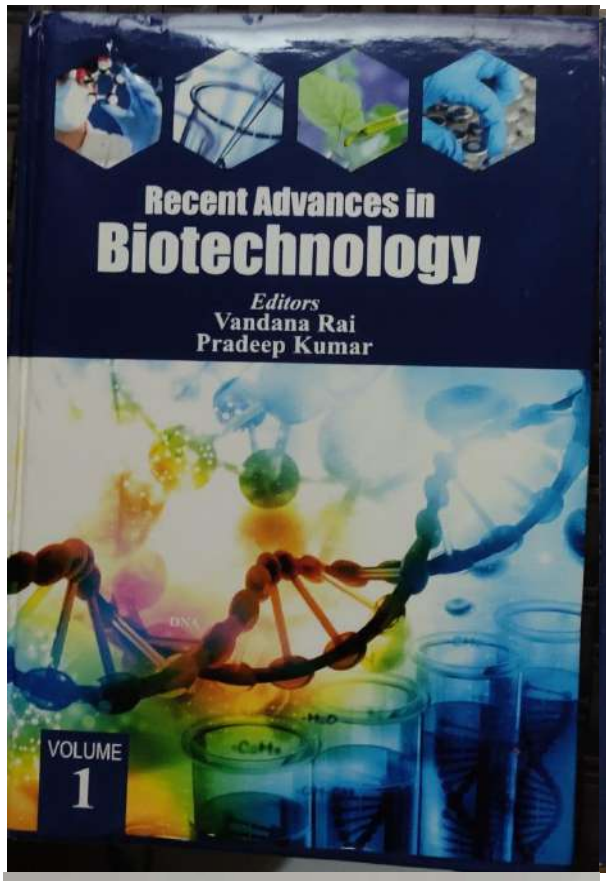

About the Editors

Dr Vandana Rai received her education at the universities in Lucknow (B. Sc) and Allahabad (M.Sc and D. Phil.) excelling in all the courses of study. Her research interest ranges from Cell Biology, Genetics, Molecular Biology and Human Molecular Genetics; Her contributions on Human Molecular Genetics are well recognized. She joined Veer Bahadur Singh Purvanchal University in 2000, and has involved in teaching and research since then. She is having over seventeen years of teaching experience at post graduate level. She has been guiding post graduate (M Sc) and doctoral (Ph D.) students since 2005. She has published over 6 dozen research articles, more than 12 chapters and edited 1 book. She has successfully completed five research projects funded by UGC, DST, DBT and CSIR. Dr Rai has been actively engaged in curriculum development of Biotechnology courses for postgraduate students and pharmacy courses for under graduate students. She has attended more than 30 International and national conferences, seminars and presented her research. She has also organized more than 10 various seminars, workshops, training programes and genetic awareness programes. She is member of Editorial Board and reviewers of several Journals like- International Journal of Life Science and Pharma Review, Asian journal of Medical Sciences , American Journal of Biomedical Research, Molecular Biology Reports, Genetic Testing and Molecular Biomarkers, Indian Journal of Medical Research, Meta Gene, Neuroscience Letter, PLoS One, Journal of Assisted Reproduction and Genetics and The Journal of Obstetrics and Gynecology etc. Dr Vandana Rai is life member of Indian Academy of Neurosciences (IAN), Biotech Research Society of India (BRSI) and Indian Society of Human Genetics (ISHG) etc.

Dr Pradeep Kumar has done his M Sc (Biotehnology) from University of Roorkee, Roorkee and Ph.D. in Biotechnology from VBS Purvanchal University, Jaunpur. His research interest ranges from Bioinformatics to Human Molecular Genetics. He joined Veer Bahadur Singh Purvanchal University in 2000 and has involved in Teaching and Research since then. He has published over 3 dozen research articles and several book chapters. He has presented his research work in several International and national conferences. He has successfully completed two UGC funded research projects. He is member of Editorial Board and reviewers of several Journals. Dr Pradeep Kumar is life member of Biotech Research Society of India (BRSI), Indian National Science Congress, Indian Society for Technical Education and Indian Society of Human Genetics (ISHG).

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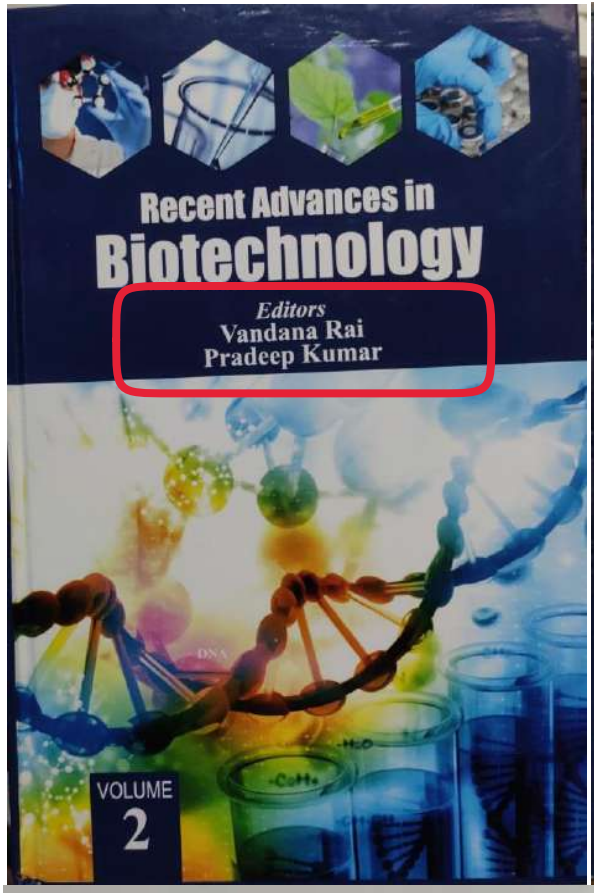

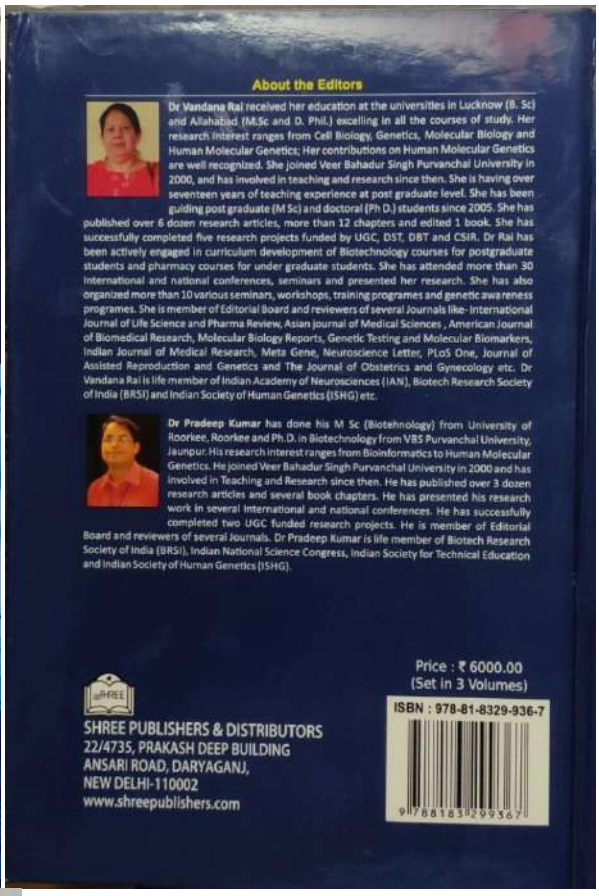

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Dr Vandana Rai received her education at the universities in Lucknow (B. Sc) and Allahabad (M.Sc and D. Phil.) excelling in all the courses of study. Her research interest ranges from Cell Biology, Genetics, Molecular Biology and Human Molecular Genetics; Her contributions on Human Molecular Genetics are well recognized. She joined Veer Bahadur Singh Purvanchal University in 2000, and has involved in teaching and research since then. She is having over seventeen years of teaching experience at post graduate level. She has been guiding post graduate (M Sc) and doctoral (Ph D.) students since 2005. She has published over 6 dozen research articles, more than 12 chapters and edited 1 book. She has successfully completed five research projects funded by UGC, DST, DBT and CSIR. Dr Rai has been actively engaged in curriculum development of Biotechnology courses for postgraduate students and pharmacy courses for under graduate students. She has attended more than 30 International and national conferences, seminars and presented her research. She has also organized more than 10 various seminars, workshops, training programes and genetic awareness programes. She is member of Editorial Board and reviewers of several Journals like- International Journal of Life Science and Pharma Review, Asian Journal of Medical Sciences , American Journal of Biomedical Research, Molecular Biology Reports, Genetic Testing and Molecular Biomarkers, Indian Journal of Medical Research, Meta Gene, Neuroscience Letter, PLoS One, Journal of Assisted Reproduction and Genetics and The Journal of Obstetrics and Gynecology etc. Dr Vandana Rai is life member of Indian Academy of Neurosciences (IAN), Biotech Research Society of India (BRSI) and Indian Society of Human Genetics (ISHG) etc.

Dr Pradeep Kumar has done his M Sc (Biotehnology) from University of Roorkee, Roorkee and Ph.D. in Biotechnology from VBS Purvanchal University, Jaunpur. His research interest ranges from Bioinformatics to Human Molecular Genetics. He joined Veer Bahadur Singh Purvanchal University in 2000 and has involved in Teaching and Research since then. He has published over 3 dozen research articles and several book chapters. He has presented his research work in several International and national conferences. He has successfully completed two UGC funded research projects. He is member of Editorial Board and reviewers of several Journals. Dr Pradeep Kumar is life member of Biotech Research Society of India (BRSI), Indian National Science Congress, Indian Society for Technical Education and Indian Society of Human Genetics (ISHG).

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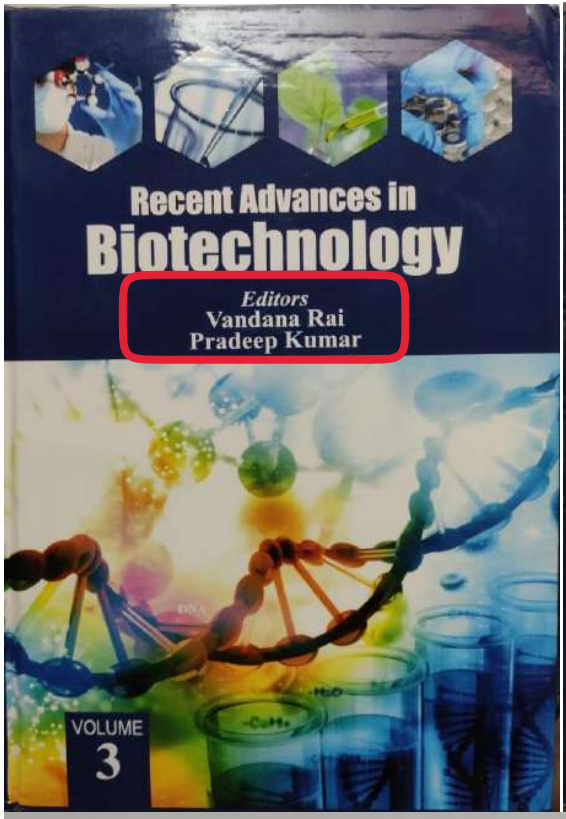

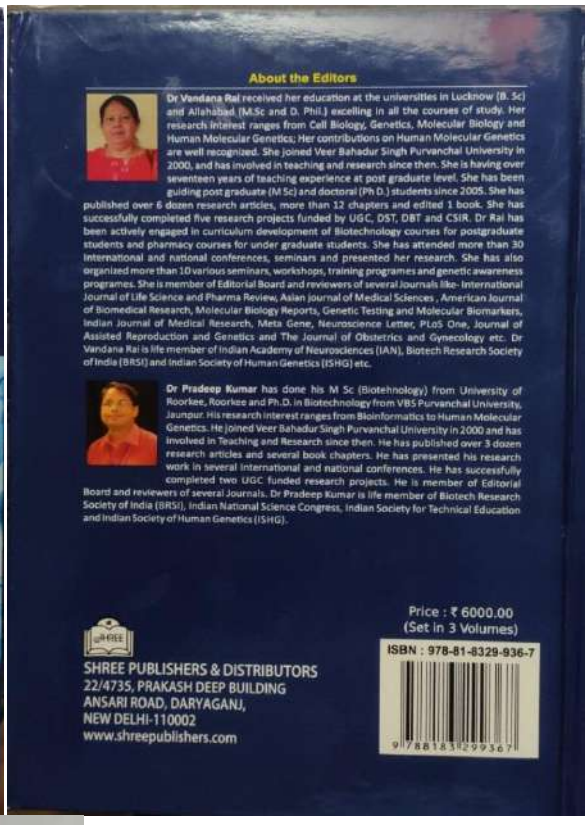

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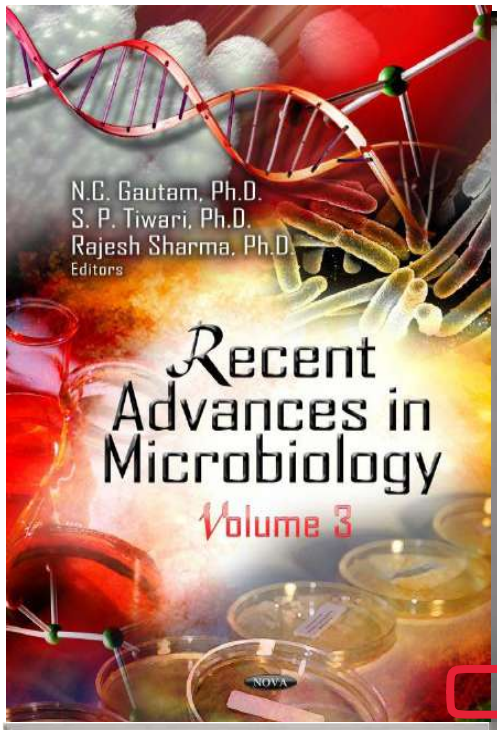

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Chapter 10

NANOTECHNOLOGY IN THE DETECTION OF PATHOGENIC MICROORGANISMS

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VBS Purvanchal University, Jaunpur, India

INTRODUCTION

One of the major health care problems of human beings is infectious diseases. The majority of these diseases are caused by contaminated food, water and air (Taubes, 2008; Kaittanis et al., 2010). They are responsible for significant human pathogenesis, morbidity and mortality around the world (Taubes, 2008; Hauck et al., 2010). Infectious diseases initiated in a particular region of the world can rapidly spread around the globe. The most effective strategy to prevent the spread of an infectious disease is rapid and accurate identification of the pathogen. Early diagnosis helps in control and eradication of the infectious disease. It also gives sufficient time to government and clinicians to take necessary preventive measures for disease-zoning (Tallury et al. 2010). On the other hand, misdiagnosis and delay in diagnosis of potentially dangerous pathogens is a limiting factor in early control of the disease. During the last century, significant advancement has been made in disease diagnostic techniques, with the most common methods used for identification or detection of infectious agents being microbial culture and colony counting, immunological assays (immunoassays) and molecular methods (Yang et al., 2008; Bissonnette and Bergeron, 2010; Kaittanis et al., 2010; Tallury et al. 2010).

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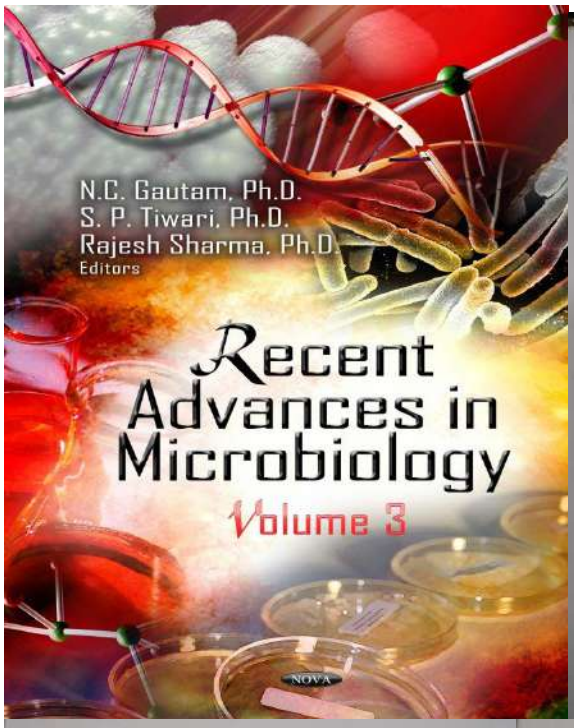

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Chapter 1

FROM LEEUWENHOEK TO CRAIG VENTER

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INTRODUCTION

Microbiology, a branch of biological science, came into existence at a time when several branches of science like Physics, Chemistry, Zoology and Botany were well established. This was due to a lack of facility to observe this form of life. In fact, they were like the ghosts of the scientific world, not visible to the unaided eyes. Although several microbial processes such as curd, vinegar and alcohol production were known from the ancient times, the role of microbes in these processes was not established. These tiny creatures have been playing an important role in every nook and corner of life, ranging from extremely beneficial to severely harmful, from being the source of food and medicines to the ability to cause diseases in plants, animals and human beings. However, here, too, their role was unknown. The society was mainly influenced by the religious-minded and the philosophically-inclined, who believed in the theory of Abiogenesis. According to this theory, life originated from non-living objects. It was widely believed that rotten meat begot flies, frogs came from mud, squirrels were born of trunks of trees, and mice originated from decaying grains.

Civilization and wars were directly affected by microbes; different civilizations were destroyed by a multitude of infectious diseases like typhus, plague, smallpox, syphilis,

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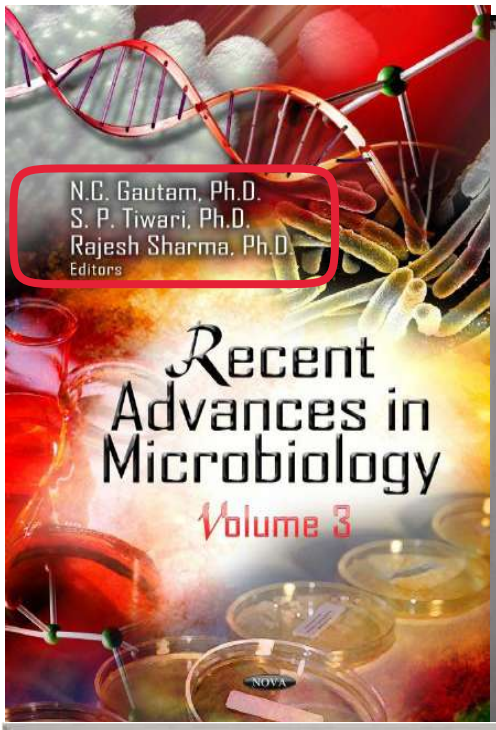

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CONTENTS

NEW AND FUTURE DEVELOPMENTS IN MICROBIAL BIOTECHNOLOGY AND BIOENGINEERING

Penicillium System Properties and Applications

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Contents

C H A P T E R

6

Penicillium Enzymes for the Saccharification of Lignocellulosic Feedstocks

Ram Naraian and Roshan L. Gautam
Veer Bahadur Singh Purvanchal University, Jaunpur, Uttar Pradesh, India

6.1 INTRODUCTION

Lignocelluloses are the most abundant natural feedstocks present on earth and are mainly comprised of lignin and three polysaccharides: cellulose, hemicellulose, and pectin (Class et al., 2013; Popper et al., 2011). Lignocellulosic materials including wood, grass, and forest and agricultural residues are chemically comprised of varying ratios of these components according to the plant species from which they originate (Iloselin et al., 2016; Rennie and Scheller, 2014). These components are strongly interlinked by noncovalent forces and covalent cross-linkages, forming an intricately linked network that provides strength to the plant cell wall (Pérez et al., 2002).

The world's produces million tons of agroindustrial residues annually, and these are largely disposed of in the open environment unchecked, generating an excessive accumulation of organic material (Iloselin et al., 2016). These agroindustrial wastes are among the leading sources of biomass in the world. These residues create post-disposal problems associated with pollution and generate considerable harm to the environment and the economic activities of the agroindustrial sector (Pandey, 1998; Iloselin et al., 2016). Therefore various microbial transformations have been proposed for the utilization of wastes for converting them into valuable products such as biogas, ethanol, chemicals, citric acid, various enzymes, flavoring compounds, fatty acids, and microbial biomass (Kundu and Ray, 2013).

Lignocellulosic residues have enormous potential as a renewable source of energy and a number of microorganisms use them as a carbon and energy source. Lignocelluloses can be decomposed to simpler sugars by the microbial lignocellulolytic enzyme system. The lignocellulolytic enzymes used in bioconversion mainly include cellulases and hemicellulases, which convert lignocellulosic biomass into fermentable sugars (Lian et al., 2010). These enzymes have been used in industries for many years and are considered to play a critical role (Bayer et al., 2007; Hu et al., 2015) in the saccharification of feedstocks. The enzymatic saccharification of lignocellulose using hydrolytic enzymes is the most popular method used to break down cellulose and hemicellulose into simpler monosaccharides. The enzymatic saccharification itself is inexpensive and less hazardous because of the use of microbial resources. Major constraints in enzymatic hydrolysis of cellulosic materials for the production of fermentation sugar are low productivity and the high cost of enzymes.

The genus *Penicillium* is known worldwide for production of value-added secondary metabolites and extracellular enzymes of commercial value (Banu et al., 2010). *Penicillium* sp. is a very fast-growing fungus whose mutants are largely used for the production of industrial cellulase (Liu et al., 2010; Hu et al., 2015), although it also has the potential to synthesize enzymes including cellulase, xylanase, β-glucosidase, β-xylosidase, peroxidase, and laccase under both either solid or submerged conditions.

The aim of the present chapter is to discuss the enzyme system of the most popular filamentous fungus *Penicillium* with reference to saccharification of lignocellulosic feedstocks.

NEW AND FUTURE DEVELOPMENTS IN MICROBIAL BIOTECHNOLOGY AND BIOENGINEERING

Penicillium System Properties and Applications

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CHAPTER

13

Biosynthesis of Nanoparticles by *Penicillium* and Their Medical Applications

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13.1 INTRODUCTION

Exploitation of microbial resources for nanoparticle synthesis is an emerging practice at the juncture of nanotechnology and microbial technology. Recently, nanotechnology has emerged as one of the major and fastest-growing fields of science and technology used for the production and utilization of nano-size materials. This area is of great appeal to academic and development researchers and has renewed interest in nanoparticles (Du et al., 2011). In the last two decades, this field has drawn the interest of researchers because of its potential applications in various fields. Nanotechnology exploits unique chemical, physical, electrical, and mechanical methods for the construction of nanomaterials (Buzea et al., 2007).

Nanoparticles are the collections of atoms, ranging from 1 to 100 nm in size. Within this size range, materials often develop valuable characteristics that are different from bulk materials (Fu et al., 2013). Taniguchi first introduced the term nanotechnology in 1974, which refers to the study of nanoparticles. In recent years, nanotechnology has proven to be a promising breakthrough in the area of medicine, engineering, manufacturing, and information technology and is now widely accepted. Nanoparticles bridge the gap between bulk materials and atoms and exhibit the properties of both ions and bulk materials (Thakkar et al., 2010; Sharma et al., 2015). Nanoparticles possess unique electrical, chemical, physical, and optical properties and thus are applied as catalyst, used in bioimaging, drug delivery, and fabrication of nanosensors, etc. (Alivisatos, 1996).

The natural systems of organisms provide exciting possibilities for the development of nanomaterials (Mandal et al., 2006; Mohanpuria et al., 2008). Filamentous fungi possess great advantages in nanoparticle synthesis, as most fungi are easy to handle, require simple nutrients, possess high wall-binding capacity, and have metal uptake capabilities (Dias et al., 2002; Singh and Vera, 2009). The *Penicillium* sp. with its characteristics of fast growth and antimicrobial significance used for the biosynthesis of nanoparticles (Saldiqi and Husen 2016) synthesis. There are several reports on nanoparticle synthesis by extracellular and intracellular means from *Penicillium* sp. (Zhang et al., 2009; Sheikhloo and Salouti, 2011).

This chapter includes a detailed account of nanoparticles and discusses the literature regarding the biosynthesis of nanoparticles employing *Penicillium* as bioresource using intracellular and extracellular protocols of nanoparticle synthesis along with their different medical applications.

13.2 NANOPARTICLES

Nanoparticles are entities smaller than 1 micron (μ) and originally as small as atomic and molecular length scales (~0.2 nm). These ultra minute particles can exist in the form of amorphous or crystalline state and can act as aerosols (Buzea et al., 2007). It is difficult to distinguish nanoparticles from the different stages of matter due

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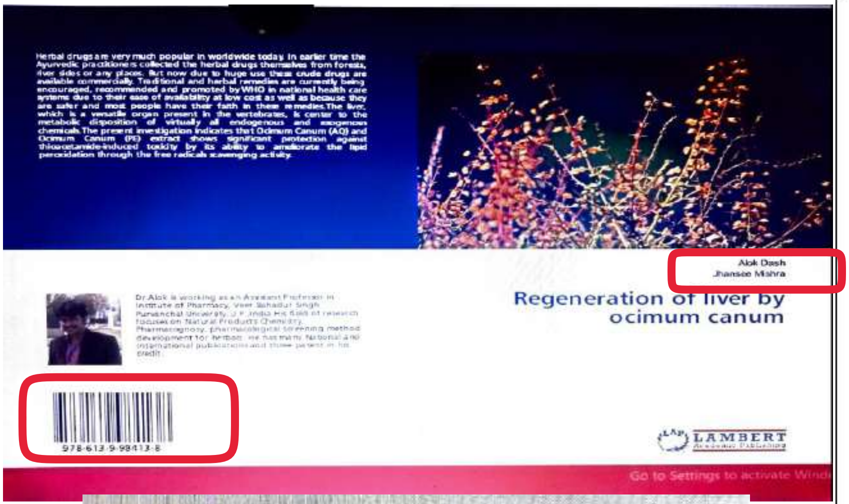


CONTAIN

Page No

REGENERATION OF LIVER BY *OCIMUM CANUM*

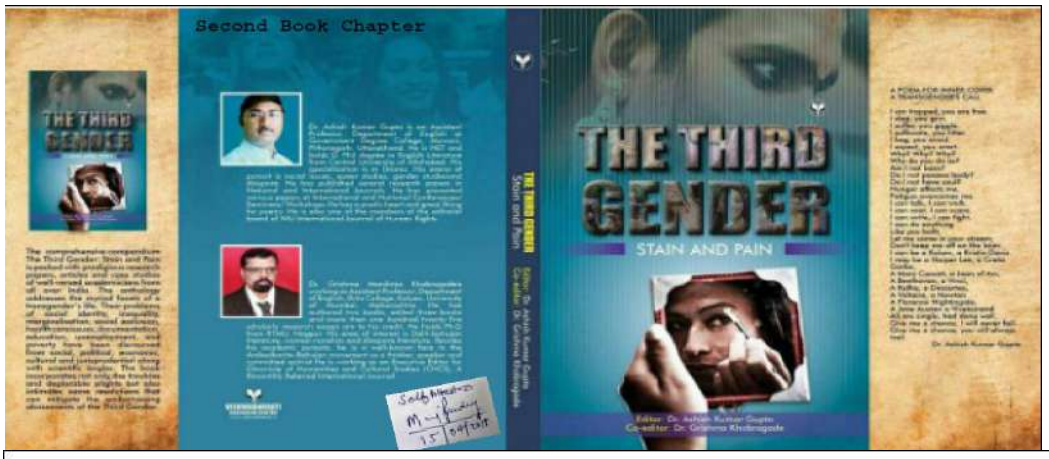
CHAPTER 1

1.1 Introduction :

Herbal drugs are very much popular in worldwide today. In earlier time the Ayurvedic practitioners collected the herbal drugs themselves from forests, river sides or any places. But now due to huge use these crude drugs are available commercially. Due to huge commercial use many types of adulterate drugs comes in market. So for this reason Govt of India has introduced an amendment in 1964 to Drugs and Cosmetics act 1940 for the qualitative measure of Ayurvedic,Sidha and Unani drugs. Identity, purity , strength etc are the main factors in qualitative measurement Ayurvedic pharmacopeias published by govt of India has prescribed various standards to be followed by herbal drugs. Govt of India has introduced Good Laboratory Practice(GLP) guidelines in 2002,to guide the drug analyst for ensuring that high quality of drugs are produced and marketed. Also Govt of India has issued notification to Good Manufacturing Practices (GMP) in 2003 to ensure authentic, contamination free quality raw material, manufacturing process and zero defect product with high quality.

1.2 Herbal Medicine :

Traditional and herbal remedies are currently being encouraged, recommended and promoted by WHO in national health care systems due to their ease of availability at low cost as well as because they are safer and most people have their faith in these remedies(Handa et al., 1995). Total health defined by WHO is not just about the absence of any disease, but also a state of physical, mental, social and spiritual well being. Diseases today such as cancer, depression, heart troubles etc are arising due to the faulty nutritions and stress. Allopathy medication are largly not able to cure these diseases and just offers temporary relief of the symptoms because these diseases have components that are mental or emotional. Need of alternative therapy is required greatly to ensure a good health for all of us. To overcome the illness(Gupta et al., 2000) Herbal therapy may be best to perform. Since ancient times, in India different parts of the several medicinal plants are used to cure specific ailment. Since many centuries indigenous systems of medicine like Ayurvedic, Unani and Siddha have been in existed. [illegible]



THE THIRD GENDER: STAIN AND PAIN

Editor
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Co-editor
Dr. Grishma Khobragade

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24

From Social Exclusion to Inclusion of Transgender (Third Gender) to the Mainstream Society: The Psycho-Social Perspective

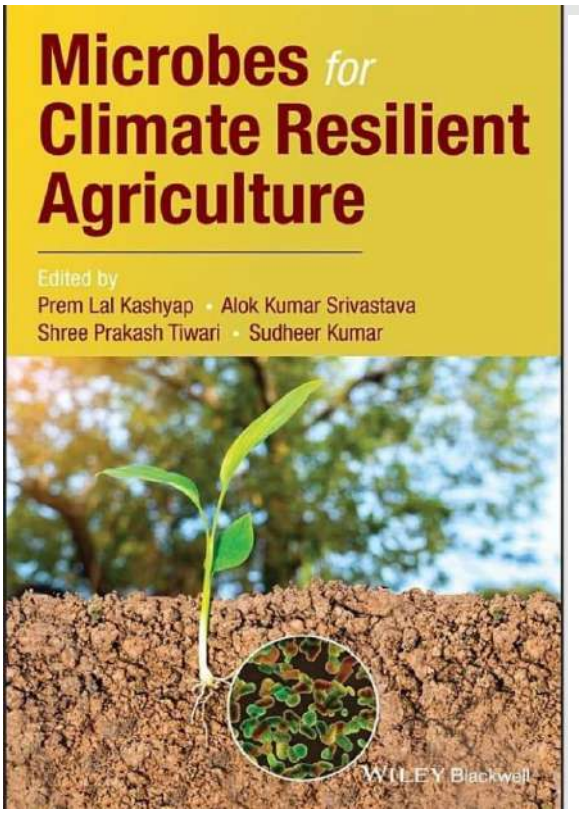
Dr. Manoj Kumar Pandey

Background of the Study:

Transgender or in Indian notion 'Hijras' have a recorded history of more than 4,000 years and they appear in ancient text as bearers of luck and fertility. Ancient myths bestow them with special powers to bring luck and fertility. Yet despite this supposedly sanctioned place in Indian culture, Hijras face severe harassment and discrimination from every direction. For instance:

> *Deepa is a 72 year old Hijra living in Mumbai: "Nobody says, "I'd love to be a Hijra!" Not if they know what happens to us. But what else can we do? A hijra has a man's body, but the soul is a woman." (13May, 2008, NewStatesman, U.K.)*

The uphill struggle for the hijras first begins with finding acceptance within the family.



MICROBES FOR CLIMATE RESILIENT AGRICULTURE

Edited by

Prem Lal Kashyap
Alok Kumar Srivastava
Shree Prakash Tiwari
Sudheer Kumar

WILEY Blackwell

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Debasis Bagchi

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2

Roles of AMP, ADP, ATP, and AMPK in Healthy Energy Boosting and Prolonged Life Span

Durgavati Yadav[1], Yamini B. Tripathi[1], Prabhakar Singh[1], Rajesh K. Kesharwani[2], Raj K. Keservani[3]

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Introduction

Different genetic and dietary manipulations known to prolong the life span have been shown to both decrease and increase the production of adenosine triphosphate (ATP) in cells (Bratic and Trifunovic, 2010). The molecular mechanism behind this dualism is not known; undoubtedly more experiments are needed to clarify the role of mitochondrial biogenesis, the mitochondrial respiration rate, and reactive oxygen species (ROS) production in different aspects of aging. Increased mitochondrial respiration would induce low levels of ROS production that in turn would act to stimulate antioxidant defense systems of the cell (Schulz et al., 2007).

Adenosine Monophosphate/5′-Adenylic Acid

Adenosine monophosphate/5′-adenylic acid (AMP) is a nucleotide used as a monomer in RNA. It is an ester of phosphoric acid and adenosine. It consists of a phosphate group, ribose sugar, and adenine (Nelson and Cox, 2008). AMP is produced in normal cells during various metabolic processes. It can be produced during ATP synthesis by the enzyme adenylate kinase by combining two adenosine diphosphate (ADP) molecules or by the hydrolysis of ADP and ATP. It is also formed in the living system when RNA is broken down. It is metabolically active in cellular signaling when converted into other forms. It can be converted into inosine monophosphate by the enzyme myoadenylate deaminase and is widely used as a flavor enhancer. Inosinate takes part in regulating purine nucleotide biosynthesis. It is first nucleotide formed during purine metabolism. In the catabolic pathway it is converted into uric acid and is excreted from the body. In

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24 Antioxidants and Vitamins: Roles in Cellular Function and Metabolism

Prabhakar Singh[1], Rajesh K. Kesharwani[2], Raj K. Keservani[3]

[1]VEER BAHADUR SINGH PURVANCHAL UNIVERSITY, JAUNPUR, INDIA; [2]RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL, INDIA

Antioxidants

Free radicals are constantly generated in biological systems as a result of internal and external stressors. Antioxidants, which are small molecules that inhibit or quench free radical reactions, limit inappropriate exposure to these stressors. Molecules whose reactions reduce free radicals or reactive oxygen species (ROS), scavenge them, suppress their formation, or oppose their actions are called antioxidants. Antioxidants reduce highly active oxidant molecules into a neutral molecule and themselves oxidize into recyclable nontoxic oxidized molecules.

Ascorbic acid, the major antioxidant in extracellular fluids, efficiently scavenges $O_2^{\cdot-}$, H_2O_2, $-OCl$, $^{\cdot}OH$, $ROO^{\cdot}$ radicals, and reactive nitrogen species (RNS) (Sies et al., 1992). β-Carotene, lutein, lycopene, β-cryptoxanthin, and α-carotene are present in human blood samples (Cantilena et al., 1992) and the antioxidant nature of these has been attributed to their unique structure, an extended system of conjugated double bonds (Stahl and Sies, 1996). Vitamin A contributes to the antioxidant system by limiting the decompartmentalization of highly catalytic iron (Morrissey and O'Brien, 1998). In addition to this defense system, the presence of a metal ion storage and transport protein serves to maintain cellular integrity. Examples are transferrin, lactoferrin, haptoglobin, ceruloplasm, metallothionein (Thurnham, 1990), and carnosine (Chan and Decker, 1994). A repair mechanism exists in biological systems, depending on the nature of the oxidized targets (Pacifici and Davies, 1991). These either regenerate the slightly oxidized macromolecules, keeping critical chemical groups in their reduced forms, or degrade defective, highly oxidized macromolecules into low molecular mass compounds. Many of the repair systems become deficient in the senescent cells; thus a high amount of biological garbage is accumulated (Terman et al., 2006; Brunk et al., 1992).

Antioxidants are broadly categorized as endogenous and exogenous. Endogenous antioxidants are developed by biological systems themselves and include antioxidant enzymes and molecules such as GSH peroxidase (GPX), catalase (CAT), superoxide

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6

Protein, Carbohydrates, and Fats: Energy Metabolism

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Introduction

The major sources of energy in the diet for many people are carbohydrates and fats. Carbohydrates and fats were found to contribute nearly equally, as much as 46% and 42%, respectively, to the energy in the content of diets in the United States. Increasing Westernization, urbanization, and mechanization around the world are associated with changes in the dietary pattern toward one of high-fat, high energy-dense foods and a sedentary lifestyle (Popkin, 2001; W.H.O., 2000).

Rather than being based on weight, equal energy must follow a comparison of carbohydrates and fat as energy sources in the diet. Carbohydrates, protein, and fat, the major micronutrients, are required to provide energy for maintenance, growth, and repair to the body. Energy driven by micronutrients is used in both physiological and psychological ways. Life expectancy around the world has increased as a result of advancements in diet and because of nutrition, hygiene, and control of infectious diseases.

Various infectious and nutrient deficiency disease are being replaced in developing countries by new alarming threats to the health of populations, including obesity, cardiovascular disease, and diabetes (W.H.O., 2000). Traditional food habits are being replaced by fast foods, soft drinks, and increased meat consumption (Popkin, 2001). In the modern era the global diet has increased in energy density (Popkin, 2001), which is a major problem for countries that are at risk of micronutrient deficiencies and associated disorders (Pena and Bacallao, 2000). Metabolism of biomolecules involves the biochemical changes of that molecules to provide energy for work and growth. Nutrition is concerned with food contained in the form of carbohydrates, lipids, and proteins, and how the body is going to use it. All carbohydrates, lipids, and proteins must be ingested and digested before they are assimilated and used by the body. Carbohydrates, lipids, and proteins are major nutrients; however other micronutrients, such as vitamins, minerals, and trace elements, are also necessary to carbohydrate, lipid and protein metabolism and digestion but are required in much smaller quantities.

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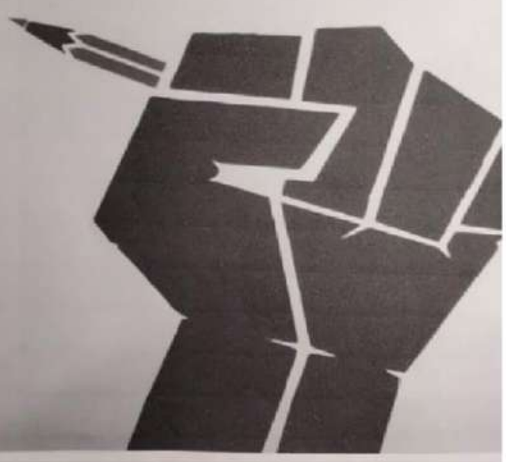

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इस पुस्तक के किसी भी अंश का किसी भी रूप में चाहे इलेक्ट्रानिक अथवा मैकेनिक तकनीक में, फोटोकापी द्वारा अन्य किसी प्रकार से पुनः प्रकाशन अथवा पुनर्मुद्रण, प्रकाशक की पूर्व अनुमति के बिना नहीं किया जा सकता है।

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18 समाचार लेखन

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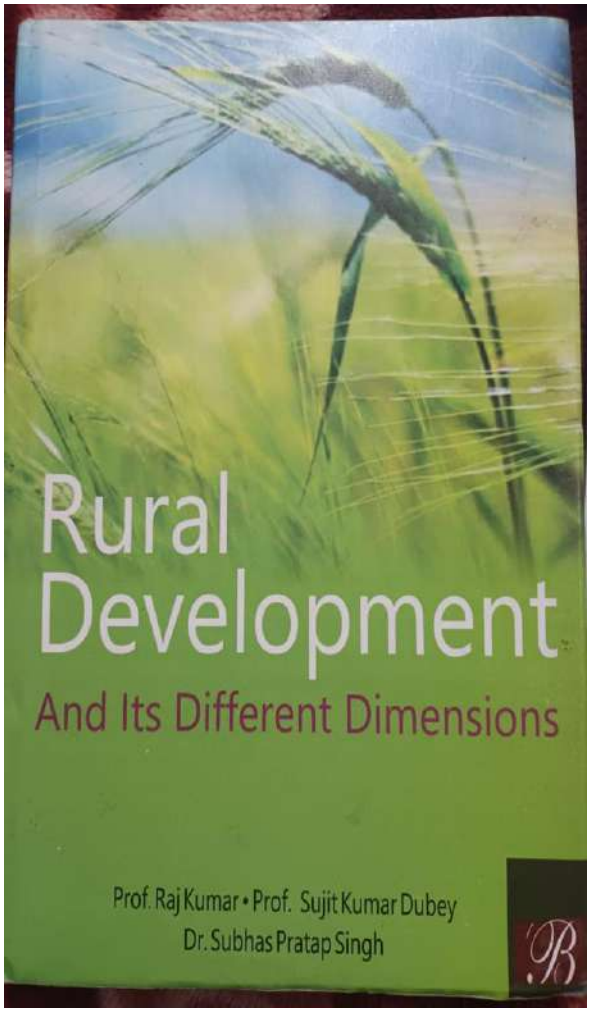
समाचार लेखन

समाचार लेखन एक कला है । इसे हम विज्ञान और गणित की तरह किसी सूत्र में नहीं पिरो सकते है। यह व्यक्ति के अभ्यास, ज्ञान और स्वप्रेरणा से आता है आप के अंदर जितना अधिक ज्ञान का भंडार होगा आपके लेखन की धार उतनी ही तेज और प्रवाह के साथ निकलेगी। वैसे तो समाचार हमारे दैनिक जीवन का अंग है, उसी तरह पत्रकारिता का भी बहुत बड़ा क्षेत्र है। इसमें प्रमुख रूप से संवाददाता को आर्थिक, राजनीतिक, अपराध जगत, सांस्कृतिक, सामाजिक आदि क्षेत्रों में जाकर समाचार संकलन करना पड़ता है बड़े समूह के समाचार-पत्रों कई संवाददाता होते है। हर बीट (क्षेत्र) में अलग-अलग संवाददाता होते है। मगर कई छोटे अखबारों में संवाददाताओं का काम मिश्रित लिए होता है, क्योंकि एक ही संवाददाता को कई क्षेत्रों में काम करना पड़ता है। उन्हें अनेक प्रकार के समाचारों को संकलन करना पड़ता है । साथ ही समाचार कैसे लिखा जाए। इस पर हमें विचार करना पड़ेगा। हालांकि समाचार माध्यमों में काम करने वाले पाठकों तथा श्रोताओं तक सूचनाएँ पहुँचाने के लिए लेखन के विभिन्न रूपों का इस्तेमाल करते हैं। इसे ही पत्रकारीय लेखन कहते है। पत्रकारिता या पत्रकारीय लेखन के अन्तर्गत सम्पादकीय, समाचार, आलेख, रिपोर्ट, फीचर स्तम्भ तथा कार्टून आदि है। पत्रकारीय लेखन का प्रमुख उद्देश्य है- सूचना देना, शिक्षित करना तथा मनोरंजन आदि करना। इसके कई प्रकार है यथा-'खोजपरक पत्रकारिता', वॉचडॉग, विचारों और घटनाओं से है। पत्रकारिता आदि। पत्रकारीय लेखन का सम्बन्ध समसामयिक विषयों, विचारों और घटनाओं से है पत्रकार को लिखते समय यह ध्यान रखना चाहिए वह सामान्य जनता के लिए लिख रहा है, इसलिए उसकी भाषा सरल और रोचक होनी चाहिए। वाक्य छोटे और सहज हो। कठीन भाषा का प्रयोग नहीं किया जाना चाहिए भाषा को प्रभावी बनाने के लिए अनावश्यक विशेषणों, जार्गन्स अप्रचलित शब्दावली और क्लीशे पिष्टोक्ति, कठिन, दोहराव का प्रयो नहीं होना चाहिए।

111



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17

Impact of Sustainable HR Practices on Organizational Commitment and Job Involvement Among Marketing Executives in Rural Areas

Abhinav Srivastava*

ABSTRACT

Sustainability has gained much attention from scholars and practitioners in recent years. There is lack of consensus on the link between HR practices and Sustainability which renders this issue to be viewed in many ways. This paper aims to highlight the possible impact of Quality of work life and work life balance (sustainable HR practices) on organizational commitment and job involvement among marketing executives in rural areas. A theoretical model has been proposed to establish the link between all the four variables.

Introduction

Even though sustainability, in general, is an important topic in research and management practices, "Sustainable HRM" has received comparatively little attention from scholars, as what it entails is still unclear. Prior literature reveals a lack of the consideration of systema links between sustainability and HRM and the studies that do, are still widely dispers across different HRM subfields, use diverse interpretation of sustainability and are bar inter-related with each other or with mainstream HRM literature (Ehnert, 2006)

In this paper concept of sustainability is linked with marketing executives working in ru areas. Further, his study will focus on the impact of sustainable HR practices on the organizatio outcome and individual outcome of marketing executives. This is really challenging to ensu organizational commitment and job involvement among marketing executives.

Rationale of the Topic

- Marketing executives are among those employees who are mostly away fro their workplace and office premises. They are the one who is expected to netwo and socialize with arange of stakeholders and customer to build and maintai relationships. Travel within a working day can be frequent and sometime

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