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शहीद उधम सिंह की आत्मकथा

और चुनिंदा दस्तावेज

अध्यक्ष
हिन्दी - विभाग
कु० वि० कुरुक्षेत्र

डा. सुभाष चन्द्र

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देस हरियाणा

अनुक्रम

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Alochnatmik Sanvad
(Critical Essays)

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Dr. B.R. Ambedkar is taken as leader of depressed classes but in real sense he was the leader of the nation, worked for emancipation of women, betterment of labourers, prepared good Irrigational schemes and so on. We should search and write on bright aspects of Baba Saheb.

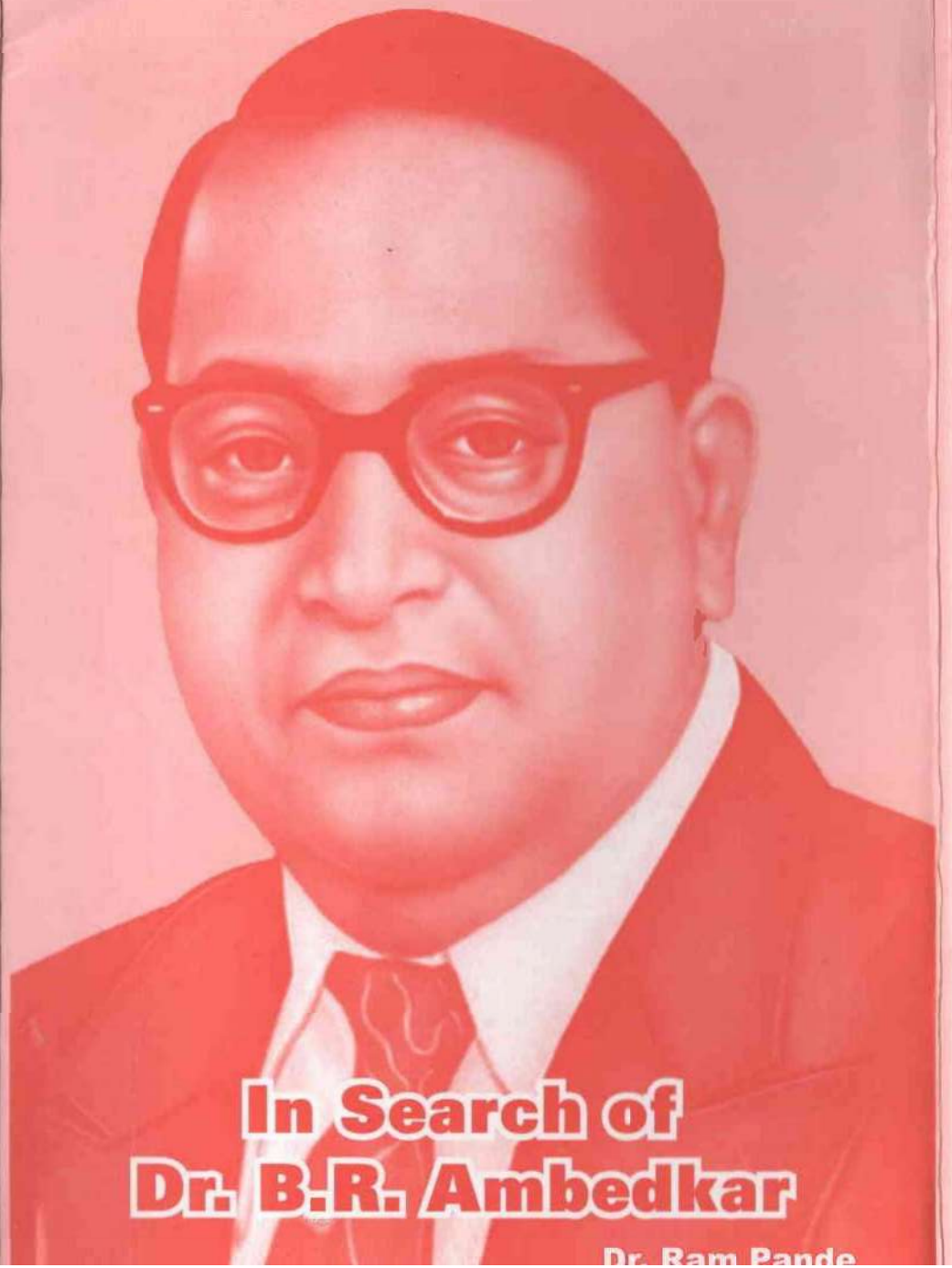
The present compendium is as outcome of the three days national seminar cum workshop on 8, 9, 10 September, 2016 organised under the auspices of Shodhak. The seminar was participated by the scholars from Rajasthan, Uttarpradesh, Gujarat, Haryana, Madhya Pradesh, Chhattisgarh. We are thankful to Indian Council of Historical Research, New Delhi for grant in-aid for organising the seminar.

It is hoped that the present book shall be useful for further researches on Dr. B.R. Ambedkar.

– Ram Pande

In Search of Dr. B.R. Ambedkar

Dr. Ram Pande



In Search of Dr. B.R. Ambedkar

Dr. Ram Pande

About the Editor

Dr. Ram Pande, Hony. Secretary and Editor of Shodhak, has authored 11 books, edited 30 books, Published 107 articles in National and International Journals like Proceedings of Indian Historical Records Commission, Indian History Congress, Shodhak Cambridge Bulletin etc. Has edited two District Gazetteers of Rajasthan, Collected, edited original record's on Peoples Movement in Rajasthan Selection from originals in Six Vols. Has organised 41 National Seminars on behalf of Shodhak.

Dr. S K Chahal was born on 6 September 1968 in Rohtak city of Haryana State, India. Having an experience of about 24 years in teaching and research at different universities, he is presently working as Professor & Chairman, Department of History, Kurukshetra University, Kurukshetra. Additionally, he is holding the charge of the prestigious Mahatma Jyotiba Phule Chair in his university which is the only Chair founded after the name of Mahatma Phule in any university of north India. He has also worked as Deputy Director of the Centre for Dr. B R Ambedkar Studies in his University. An expert of Dalit Studies, Dr. Chahal has published another full-fledged research work entitled '*Dalits Patronised: Indian National Congress and the Untouchables of India 1921-1947*' as well as about two dozen papers in the reputed research journals of India.

A self-made person coming from a very humble background and an Ambedkarite to the core, Dr. Chahal has been among the pioneers of Dalit Studies in India.

Dr. B.R. Ambedkar

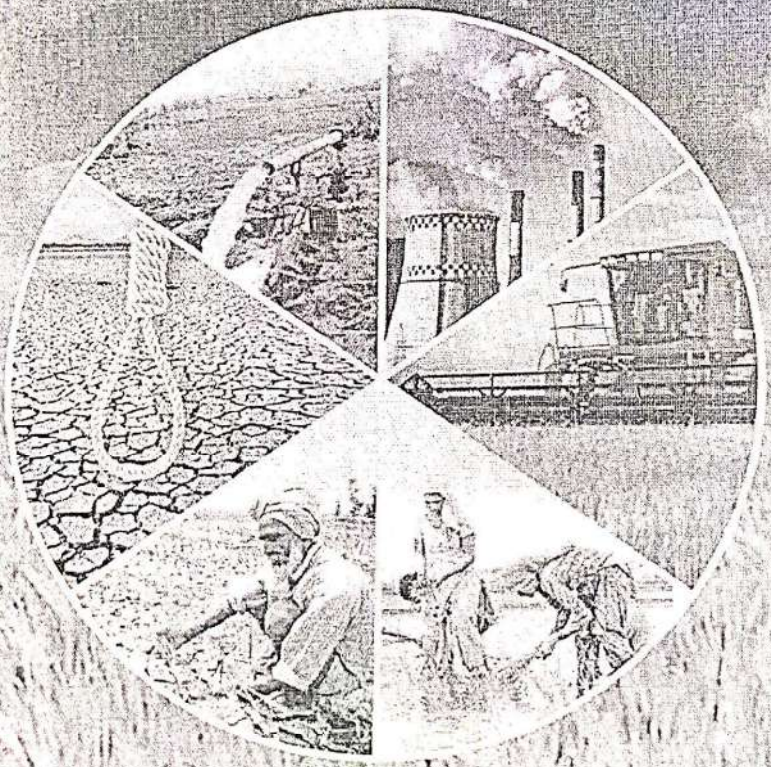
The Maker of Modern India

Dr. S.K. Chahal

Before the commencement of the e
Dr. Babasaheb Bhimrao Ramji Amb
(1891-1956), there were the 'untouch
Hindus in India. Ambedkar emerged
amongst such down-trodden class
revolt against the age-old social order.
however, equally noted that his loya
India was as great as was his hatred f
traditional values of the orthodox
society. He repeatedly emphasize
paramount need of 'nation building' for
Hence, the study of Dr. Ambedkar
maker of modern India and the political,
and intellectual deliveries made there
by him may be of utmost significance
present work is a serious attempt to
on this hitherto relatively ignored dimens
his life and works.

The author has consulted for writin
book numerous sources, mostly primary
writings and speeches of Dr. Amb
collected/selected works of his contem
leaders like Mahatma Gandhi etc.;
Papers/Government Records and perio
etc. In the present study, the autho
studied the contributions of Dr. Amb
as a maker of modern India in the
lengthy and well-researched chapter
learned young historian has come ou
the hypothesis that Dr. Ambedkar, to
the revolutionary Italian thinker A
Gramsci, was an organic thinker and
of India. His role in respect of the
building of India seems to be based
social realities of the country as w
concrete political thoughts, havi
principle aim of social justice. Throu
different political, social and intel
deliveries, which were 'organic
revolutionary in nature, he made a sig
contribution in the making of modern

Development and Change in Agrarian Society



Dr. Geet Lamba

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Development and Change in Agrarian Society: Emerging Issues

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5

E-GOVERNANCE AND RURAL DEVELOPMENT IN INDIA: A STUDY

Rajesh Kumar Bhatt

Introduction

The innovations of new technologies in 21st century have enhanced the speed of transformation marvelously. Among these technologies, the Information Technology emerges as a powerful tool for delivery of services in the public sector, private sector, education, training and numerous fields of the transport, communication, trade, banking, education and governance. But its effects in the field of governance for improving transparency, efficiency and effectiveness has been ushering a new era. So, it becomes pertinent to understand the meaning and definition of IT.

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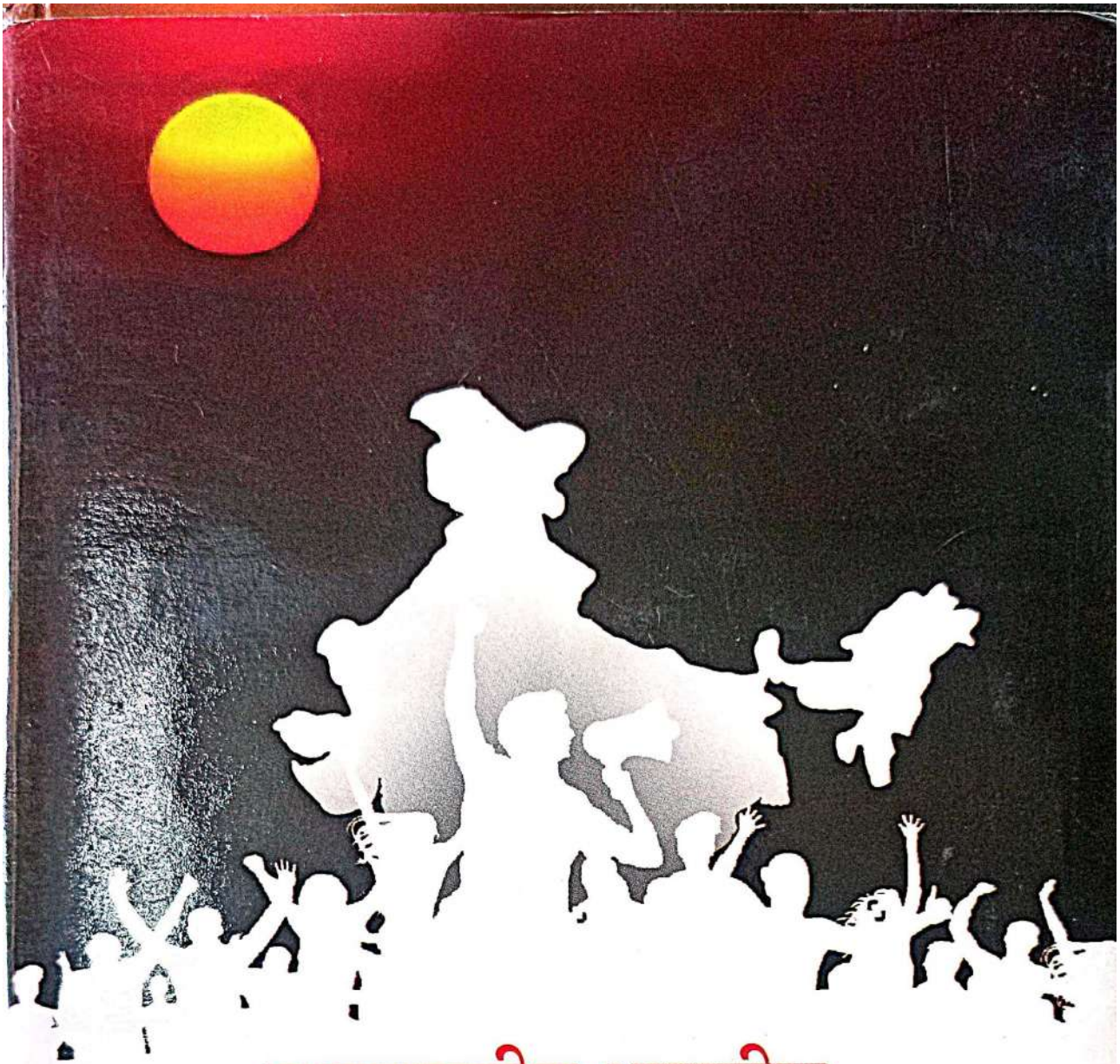
Initiatives and Objectives of Information Technology in India

In India, for keeping in view far reaching benefits of Information technologies many initiatives were taken at the governmental level. Though globally we are lagging far behind as the status of India is ranked 43rd out of 60 (EIU 2002), 54th (IDC 2001), and 34th (Global Technology Index, 2002).

The Prime Minister while reiterating the importance of IT on



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C.M. Govil
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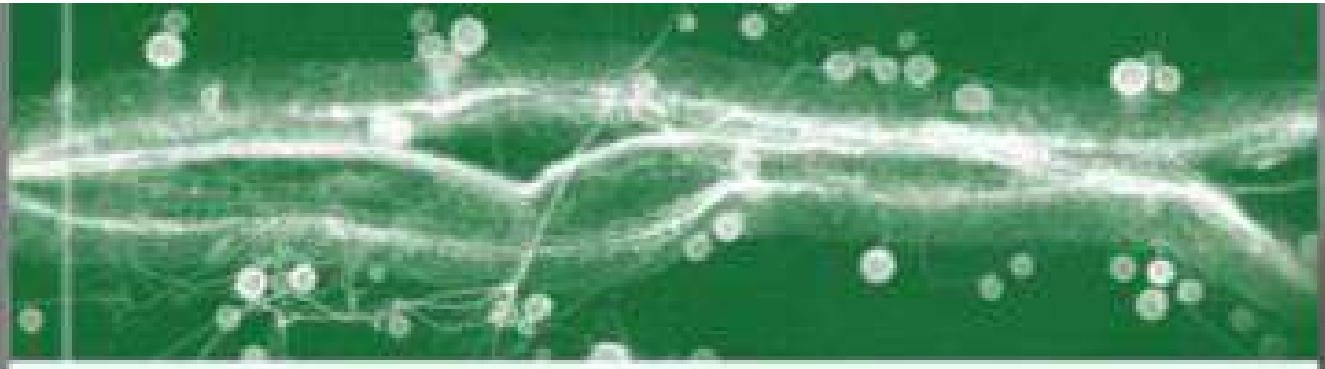
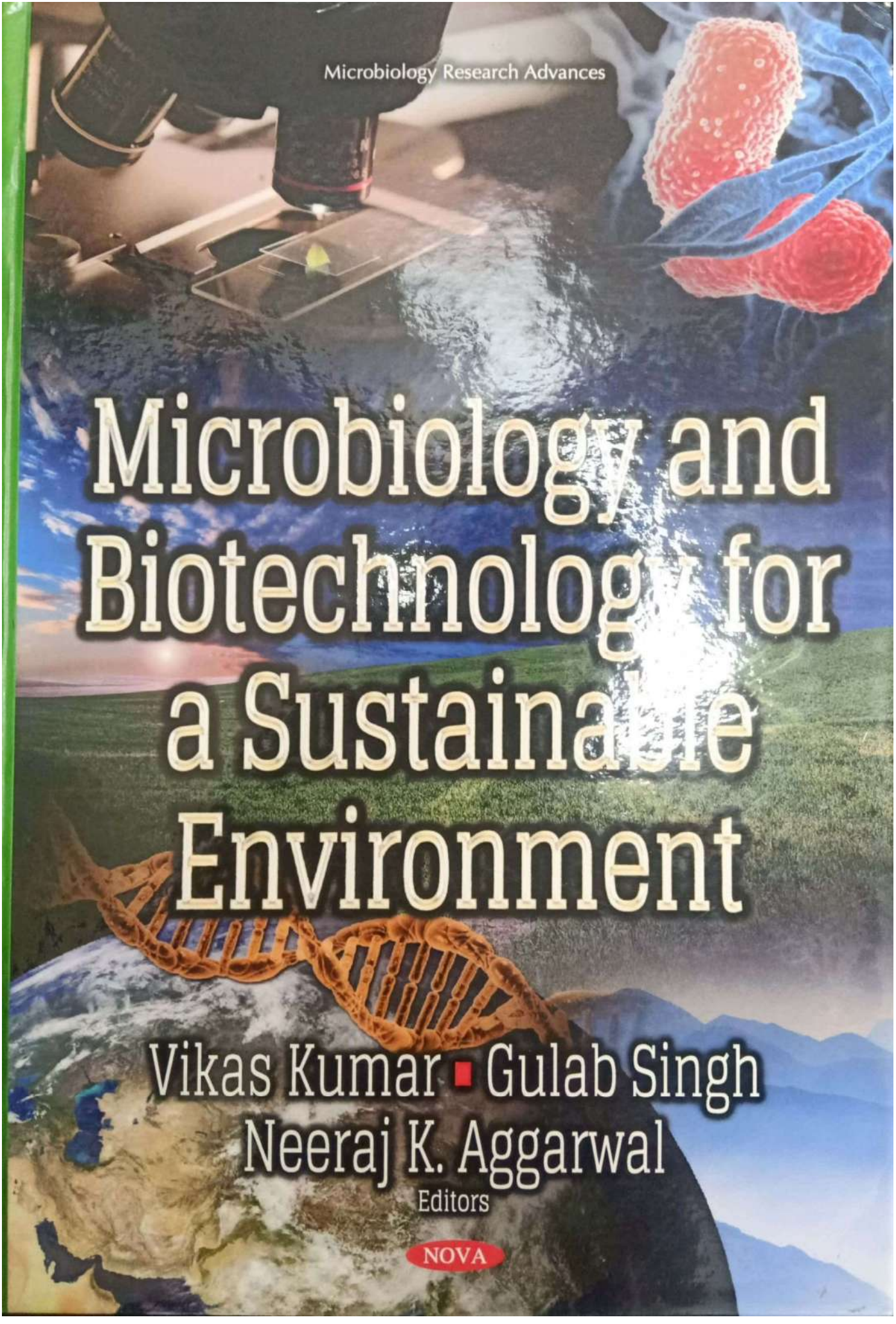


Mycorrhizal Fungi

Ashok Aggarwal
Kuldeep Yadav

BAYA

ASTRAL



MICROBIOLOGY RESEARCH ADVANCES

MICROBIOLOGY AND BIOTECHNOLOGY FOR A SUSTAINABLE ENVIRONMENT

VIKAS KUMAR,
GULAB SINGH
AND
NEERAJ K. AGGARWAL
EDITORS

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In: Microbiology and Biotechnology ...
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Chapter 8

THE APPLICATION OF MICROORGANISMS IN CONSOLIDATED BIOPROCESSING OF BIOMASS FOR BIOETHANOL PRODUCTION

Anita Saini[1], Neeraj K. Aggarwal[1,*] and Anita Yadav[2]
[1]Department of Microbiology, Kurukshetra University, Kurukshetra, India
[2]Department of Biotechnology, Kurukshetra University, Kurukshetra, India

ABSTRACT

Biomass is a huge source of energy for meeting energy demands of the increasing world population. The renewability of the biomass ensures uninterrupted supply of energy. In nature, every year very large quantities of lignocellulosic biomass are generated from various sources including forest vegetation and litter, agricultural residues, agro-industrial, municipal and food processing wastes. These wastes can be utilized for the production of biofuels such as bioethanol. This approach also solves the problem of disposal of lignocelluloses in the environment. Traditional bioethanol production processes involve distinct steps of pretreatment, saccharification of pentoses or hexoses polymers, and fermentation of C6 or C5 sugars. But due to certain limitations and economic infeasibility of this technology, recent research studies have shifted their interest towards consolidated bioprocessing (CBP). CBP integrates the events of saccharification of both C6 and C5 sugar-containing polymers and fermentation of resulting pentoses and hexoses into ethanol, in one step in a single bioreactor. The microorganisms play a crucial role in consolidated bioprocessing. Consolidated bioprocessing can be commenced using different strategies. Either a consortium of microorganisms can be used having different abilities such as hydrolysis of celluloses or hemicelluloses, and conversion of resulting pentoses and hexoses into ethanol. On the other hand, the microorganisms with high hydrolytic or ethanologenic potential can be

*Corresponding author: Neeraj K. Aggarwal. E-mail: neerajkuk26@gmail.com.

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Chapter 1

THE ROLE OF BIOTECHNOLOGY IN ENVIRONMENTAL SUSTAINABILITY

Vikas Kumar[1,*], Gulab Singh[2], Neeraj K. Aggarwal[3], Parveen Surain[3], Romika Dhiman[4] and Monika Sharma[5]

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[2]Department of Biotechnology, Central University of Haryana, Jant-Pali, India
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[5]Department of Microbiology, Medical Lab Technology,
Aditya Institute of Technology, New Delhi, India

ABSTRACT

Establishing an environmental friendly co-existing mechanism on earth is of vital importance. Biotechnology is being considered as an emerging science for environmental protection and to support the sustainable development in different aspects. In agricultural sectors, increasing attention has been paid to the sustainable development in which the high productivities of plants and animals are ensured using their natural adaptive potentials, with a minimal disturbance of the environment. Rapid industrialization and urbanization over the past many decades has resulted in contamination of all the components of the environment. Bioremediation is an attractive and potential alternative for treatment of these contaminated sites. Recent developments in molecular biology have been applied to develop novel strains of microorganism with desirable properties that would be applicable in bioremediation. This chapter also outlines the current and emerging applications of biotechnology in the production and processing of chemicals, for sustainable development.

* Corresponding author email: vmeashi@gmail.com.

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Chapter 10

ENVIRONMENTAL MANAGEMENT BY MICROBES THROUGH POLY β-HYDROXYBUTYRATE PRODUCTION

Gulab Singh[1,*], Vikas Kumar[2] and Neeraj K. Aggarwal[3]
[1]Department of Biotechnology, Central University of Haryana, Jant-Pali, India
[2]Department of Biotechnology, Maharishi Markandeshwar University, Mullana, India
[3]Department of Microbiology, Kurukshetra University, Kurukshetra, India

ABSTRACT

Microbes can utilize a wide range of organic waste materials as nutrient source. The waste materials generated from different sources like agricultural waste, agricultural industry waste like sugar industry, potato processing industry and dairy industry etc, house hold waste are utilized by wide range of bacteria and they store the Poly β-hydroxybutyrate (PHB) granules as reserve food materials when high carbon and nitrogen ratio is present. The PHB producer microbes degrade the organic waste materials by utilizing them as nutrient source and also produce PHB- A biodegradable bio-plastic. The biotechnological process of industrial production can be made economically viable by on site utilization of surplus organic waste materials for industrial production. Facilities for production of biochemical, biopolymer and bio-fuel should be integrated with the existing facility where the organic waste materials produced. In India, surplus amount of dairy industries and other agricultural based industries waste such as rice, corn, sugarcane etc, is available. The utilization of waste materials for production of value added products not only improve the production cost of such products but also protect the environment by efficient management of waste.

5

ROLE OF MICROBES IN HUMAN HEALTH

Vijay Kumar* and Shiwani Guleria
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Kurukshetra University, Kurukshetra, Haryana, India -136119
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ABSTRACT

In the recent years, bacterial diseases have evolved and re-emerged in many areas of the world. These diseases have caused the significant damage to the health of the humans and moreover raised the concern towards the economy related to health. There are many factors which have led to the increased number of diseases, for instance antimicrobial resistance, poor eating habits, etc. As the bacterial diseases are transmitted by various ways, researchers have also developed many diagnostic techniques to identify or trace the pathogen and diagnosis of the diseases in the recent years. In order to control the bacterial diseases, a synchronised approach should be implemented by health workers in collaboration with research institutions and governmental agencies.

***Key words**: Health; Bacteria; Disease; Transmission; Human.*

HIGHLIGHTS

- Bacterial diseases have caused the significant damage to the economy and health of the humans.
- Pathogens can be traced and identified through diagnostic techniques.
- A synchronised approach of research institutions and governmental agencies is needed.

1. INTRODUCTION

Microbes are very small organisms which cannot be seen by naked eyes. But still they are ubiquitous in nature; they are found everywhere in air, water, soil, etc.

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Chapter 15
Bioremediation of Agricultural, Municipal, and Industrial Wastes

Shivani Garg
Kurukshetra University, India

ABSTRACT

Growth of agriculture and manufacturing industries has resulted in increased a wide range of complex and hazardous compounds to the environment. Excess growth of hazardous waste has led to reduce availability of clean water and disturbances of soil thus limiting crop production. Waste generated from different sources like Industrial, domestic and agricultural etc. having different kinds of chemical compound i.e. organic or inorganic. Traditional methods are not able to deal with some of these chemical compounds. Bioremediation process is good option in such environmental problems. Bioremediation provides a technique for cleaning up pollution by enhancing the natural biodegradation processes. It treats such waste with the help of microorganism. Number of microbes including aerobes, anaerobic and fungi are involved in bioremediation process. Specific types of microbes are used to treat specific type of chemical contaminant. The chapter include all the techniques of bioremediation used to treat different kinds of contaminant.

INTRODUCTION

Ecosystems are threatened with natural environmental changes and disturbances that remove biomass from a community, such as fire, flood, drought, or predation over time and geographic space. (Levin, 1992) These disturbances needs new techniques emerge out of the patchwork of natural experimentation and opportunity implying a good measure of ecological resilience are a cornerstone theory in an ecosystem (Folke et al., 2004). The most common types of waste can be categorized into four types: agricultural, industrial, municipal and nuclear (Alloway, 1995). Agricultural waste, have both natural and non-natural wastes, is a general term used to describe waste produced from the fields through various activities. Agricultural wastes are the by-products of various agricultural activities such as crop production, harvesting of crops, saw milling, agro-industrial processing, and others. In India sugar industry alone produces about 90 MT of bagasse per year and being used in the manufacturing of insulation boards, wall panels, printing paper and corrugating medium (Sengupta, 2002). Generally, agricultural waste is produced in two forms- solid and liquid waste. The food harvesting and production industry generate crop residuals,

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Environmental Issues Surrounding Human Overpopulation

Rajeev Pratap Singh
Banaras Hindu University, India

Anita Singh
University of Allahabad, India

Vaibhav Srivastava
Banaras Hindu University, India

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Chapter 8
Impact of Overpopulation on Land Use Pattern

Shivani Garg
Kurukshetra University, India

ABSTRACT

Overpopulation does not depend only on the size or density of the population, but on the ratio of population to available sustainable resources. It also depends on how resources are managed and distributed throughout the population. Overpopulation is one of the hazards and serious problem, which creates a great obstacle in the way of national development. It is estimated that growth in human population affect the global land use pattern available for agriculture, forest land cover, nearby area of different type of water bodies. The rapid increase of human population is putting extraordinary pressure on our natural resources available e.g. land, water, ecosystem services etc. The purpose of this chapter is to highlight the various environmental implications of overpopulation and rural-urban migration which in turns affect the land use pattern of world. Deforestation and loss of ecosystems that sustain global atmospheric oxygen and carbon dioxide balance is also another implication.

INTRODUCTION

In past few years, cities grow due to the rapid increase in world population and the migration of people from villages to cities. In the developing countries, the population growth has been more unstable& some cities are facing unplanned and uncontrolled settlements (e.g. slums) at the densely populated areas. Human beings have maximum population on earth although it decreases with high death rate due to illnesses, infections, famines; accidents and war but comparatively fertility rates should be high for species survival. Many factors affect the rate of change of population. As number of individual increases, the problems related to it are also increased. The main reasons that affect growth of population are the natality, mortality, immigration and migration. The natality is the ratio between births and individuals in given population and time. The mortality is the ratio of number of deaths to individuals present in given area and time. Migration is the number of people enters in or out of an area. The rate of change of population size is affected by these factors in a particular region. Overpopulation has been initiated

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Obesity and Blood Sugar among Indian Marginal and Working Women: A Geographical Analysis

Suman Chauhan[1] & Virender[2]*

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**Email: chauhansuman132@gmail.com*

Abstract

In this article, an attempt has been made to analyze the spatial variations in overweight and blood sugar among Indian main female workers and marginal female workers. The study revealed that obesity was negatively associated with blood sugar among women (main female workers and marginal female workers). While the percentage of women who suffered from blood sugar was negatively associated with main female workers and positively associated with marginal female workers. The highest percentage of overweight females was found to be 33.5 per cent in Goa, followed by Andhra Pradesh (33.2%), Punjab (31.3 %), Tamil Nadu (30 %) and Jammu Kashmir (with 29.1%). While, the lowest percentage of overweight female population was found to be 10.3 per cent in Jharkhand, followed by Bihar (11.7%), Chhattisgarh (11.9%) and Meghalaya (12.7%). In case of union territories,

Health Care Services among Indian Marginal and Work Seeking Women: A Spatial Analysis

Suman Chauhan[1] & Suman Devi[2]*

[1]Assistant Professor, [2]Research Scholar

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[*]Email: virenderchhachhiya@gmail.com

Abstract

The present research work attempts to analyze the spatial variations in antenatal checkups and institutional births among Indian Marginal and Work Seeking Women. Kerala had the highest percentage of antenatal checkup i.e. 95.1 per cent, followed by Goa (84.4 %), Andhra Pradesh (82.4 %), Telangana (79.2 %) and Manipur (77.0%). While, Bihar had the lowest percentage of antenatal check-up i.e. 18.7 per cent, followed by Arunachal Pradesh (24.2%), Nagaland (24.9%) and Assam (40.0%). In case of union territories, Lakshadweep had highest percentage of antenatal check-up i.e. 91.9 per cent, followed by Pondicherry (80.6%) and Daman and Diu (75.1%). However, national average of the percentage of antenatal check-up was 74.2 per cent. The state Kerala had the highest percentage of institutional births i.e. 99.9 per cent, followed by Tamil Nadu (99.0 %), Goa (96.9%) and Sikkim (94.7%). The state Chhattisgarh had lowest

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Plasmons in a semiconductor electron quantum wire at finite temperature in the random phase approximation

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Akariti Sharma[*,#], Vinayak Garg[*], *and* R. K. Moudgil[$]

View Affiliations

View Contributors

Entrance channel effects in the fission of ^{192,202,206,210}Po compound nuclei.

Ruchi Mahajan[1],* B.R. Behera[1], Meenu Thakur[1], N. Saneesh[2], Gurpreet Kaur[1], Priya Sharma[1], Kushal Kapoor[1], R. Dubey[2], A. Yadav[2], Neeraj Kumar[3], P. Sugathan[2], A. Jhingan[2], Hardev Singh[4], A. Kumar[1], A. Saxena[5], A. Chatterjee[2], and Santanu Pal[6]

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Introduction

Studies on the nature and magnitude of nuclear dissipation have emerged as a topic of considerable interest in recent years. It is now well established that dissipation causes delay of the fission process with respect to the statistical picture of compound nucleus (CN) decay. Apart from nuclear dissipation, the fission time scale is also sensitive to the shell effects in fission barrier height and the density of nuclear levels [1]. The feasibility of synthesis of super heavy elements is based on the expectation of their stability against fission due to shell effects [2]. Recently, Singh et al. [3] and Sandal et al. [4] studied the effect of shell closure by neutron multiplicity measurements for the CN ^{213,215,217}Fr and ^{210,212,214,216}Rn. In the present work, experimental measurement of pre-scission multiplicity (M_{pre}) is extended over a wider range of N/Z and fissility for CN of Po isotopes. Here, we have measured the M_{pre} for two systems: (i)^{48}Ti+^{144}Sm and, (ii)^{48}Ti+^{154}Sm at 72 MeV of excitation energy. This experiment was performed using the National Array of Neutron Detectors (NAND) at Inter University Accelerator Centre (IUAC). New Delhi. For more details on the experimental set up reader is refered to ref [5]. In the present study, we also include the systems ^{12}C+^{194}Pt and ^{18}O+^{192}Os populating ^{206}Po and ^{210}Po respectively for which experimental data for M_{pre} are already available [6, 7]. The chosen systems span the neutron deficient ^{192}Po (N_{CN}=108) to neutron rich ^{210}Po (N_{CN}=126) CN. We also perform a detailed statistical model analysis for the four systems.

Statistical Model Caculations

In the framework of statistical model the CN can either undergo fission or reduce to a evaporation residue along with the emission of light particles like neutrons, protons, and α particles and γ rays. The fission width Γ_{BW} is obtained from the transition-state model of fission due to Bohr and Wheeler[8]. The particle and γ emission widths are obtained from the Weisskopf formula[9].

We obtain the fission barrier in the present calculation by including shell correction in the liquid-drop nuclear mass. The shell correction term δM is defined as the difference between the experimental and the liquid-drop model (LDM) masses (δM= $M_{experimental}$ - M_{LDM}). The fission barrier of a compound nucleus carrying angular momentum then given as:

$$B_f(l) = B_f^{LDM} - (\delta_g - \delta_s) \qquad (1)$$

where $B_f{}^{LDM}$ is the liquid drop model fission barrier [10] and δ_g and δ_s are the shell correction energies for the ground state and saddle configurations respectively. The level

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Fabrication of ^{178}Hf using ultra-high vacuum evaporation technique

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Introduction

For the synthesis of super heavy elements, a complete understanding of the reaction mechanism of heavy ion induced fusion-fission reactions is the necessary requirement in the context of nuclear physics experiments. The very first step is the preparation of target(s) as per the experimental requirements. During fabrication, one needs to be careful about the uniformity of the thickness distribution across the deposition area of the target material as well as the chemical purity of the deposited films [1]. For one of our experiment, we needed isotopically enriched ^{178}Hf as target in the thickness range of 150-200 μg/cm^2. To the best of our knowledge, a few reports are available on HfO_2 deposition by atomic layer method [2] and chemical vapor deposition [3]. Maier et al. [4], applied bomb reduction technique to prepare self-supporting Hf targets in the thickness range of 100-300 μg/cm^2 from HfF_4 by high vacuum sputter deposition.

In the present work, the isotopic Hf targets were successfully fabricated in the target development laboratory of Inter University Accelerator Centre (IUAC), New Delhi, using the turbo pump based coating unit with a vacuum of the order of 10^{-7} Torr. In this paper, we describe the various steps followed to fabricate good quality ^{178}Hf targets on carbon backing.

Fabrication details

It is very difficult to prepare the thin self-supporting targets and most often backing material is needed to support such thin targets. Here in the beginning, we used thin foil of carbon (~20 μg/cm^2) as backing and $BaCl_2$ as the parting reagent. Carbon foils were made by electron beam deposition using diffusion pump based coating unit [5]. Glass slides used as a substrate were kept at 19.5 cm and 18.5 cm away from the resistive heating arrangement and the electron gun assembly, respectively. Carbon was deposited on the glass slides after the successful deposition of releasing agent. These carbon coated glass slides were annealed in a tubular furnace at 325°C for 1 hour in nitrogen atmosphere to remove any internal stress on the deposited films.

Keeping in mind the high cost and limited availability of enriched isotopic materials, several trials were first made with natural hafnium to optimize different parameters of the deposition process. Initial attempt of Hf fabrication was done by 2 KW electron gun deposition arrangement using diffusion pump based coating unit. A Tungsten crucible was used for the deposition of the source material. After the deposition & floating of the target films, in order to check the purity of the deposited films, X-ray fluorescence (XRF) measurements were carried out at Department of Physics, Panjab University, Chandigarh. The XRF data showed the presence of high percentage of Tungsten contamination in the deposited films. Thereafter, we switched to the turbo pump based coating unit having 6 KW electron gun arrangement. This system is also equipped with a quartz crystal thickness monitor for controlling the thickness as well as the rate of deposition. Fig. 1 shows the inside view of turbo based evaporation assembly. The overall schematic of turbo based coating unit is shown in Fig. 2. A few trials were first carried out using natural Hf for the reasons discussed earlier. After the first attempt of Hf deposition, the films got damaged during floating probably due to the low thickness of carbon backing.

Measurement of α-particle yield in ^{212}Rn nucleus to understand the fission dynamics

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Introduction

Exploring the dynamics of fusion-fission reaction mechanism has always been of interest in heavy-ion-induced nuclear reaction. The extraction of fission time scales using different probes is of central importance for understanding fusion-fission process. In the past, extensive theoretical and experimental efforts have been made to understand the various aspects of the heavy ion induced fusion-fission reactions [1]. Compelling evidences have been obtained from the earlier studies that the fission decay of hot nuclei is protracted process i.e. slowed down relative to the expectations of the standard statistical model and more light particles are expected to be emitted during the fission process [2]. These particles are emitted from various stages of the reaction process i.e. from compound nucleus (CN) (prescission) and from fully accelerated fission fragments (postscission). The multiplicities of various particles (neutrons, protons, alphas etc.) emitted during the decay of excited nucleus provide the information about these time scales and hence, help in understanding the fusion-fission dynamics. Charge particles provides more information about the emitter in comparison to neutrons as charged particles faces coulomb barrier and are more sensitive probe for understanding the dynamics of fusion-fission reactions [3]. In the present work, we are reporting some of the preliminary results of charged particle multiplicity measurements.

Experimental Details

The experiment was performed at the 15 UD Pelletron facility at Inter University Accelerator Centre (IUAC), New Delhi, using General Purpose Scattering Chamber (GPSC). Enriched and self-supporting target of ^{196}Pt having thickness 1.8 mg/cm^2 was used in the experiment. Beam of ^{16}O with incident energy 98.4 MeV, was used to form ^{212}Rn. The charged particles (protons and alphas) were detected in coincidence with fission fragments, so as to extract the particle multiplicities for the reaction under study. In total, four detectors (16 crystals) of CsI(Tl) were used for the detection of protons and alpha particles. Two Multi-Wire Proportional Counters (MWPCs) were used for the detection of fission fragments. The MWPCs were kept at the folding angles to detect complimentary fission fragments. One MWPC detector was kept at an angle of 30^0 w.r.t beam whereas, the second was kept at an angle of 135^0 at a distance of 20.5 cm from the centre of target. Four CsI(Tl) detectors were kept at angles of 70^0, 90^0, 110^0 and 130^0 w.r.t the beam direction. All charged particle detectors, having four crystal each, were kept at a distance of 15.5 cm from the centre of the target covering a solid angle of 16.6 msr for each CsI(Tl) detector.

In order to obtain the energies of the detected charged particles, CsI(Tl) detectors were calibrated using both offline and online techniques. The offline calibration was done using ^{241}Am and ^{229}Th sources. The online calibration was done using two reactions ^{12}C + ^{12}C at 30 MeV and ^{7}Li + ^{12}C at 20 MeV. From ^{12}C + ^{12}C reaction, α energies are in the range of 1.63 MeV to 18.5 MeV. Similarly, from ^{7}Li + ^{12}C reaction, α energies are in the range of 5.27

Comparative study of Properties of stable(^{4}He) and weakly bound(^{6}He) Helium isotopes using Skyrme Pairing Force-SKP Functional

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In past, several attempts have been made to understand the relationship between effective nucleon-nucleon interactions and observed static and dynamic properties of nuclei such as binding energies, root mean square (r.m.s.) radii, saturation properties of nuclear forces, densities of nucleons, symmetry energy and incompressibility of nuclear matter at given density. For instance, authors in Refs.[1-3] have used Tabakin's potential to solve the Hartree-Fock problems up to second and third order correction terms to estimate some of nuclear properties. But such calculations were unable to explain the observed densities and radii of nuclei in a consistent way. The serious difficulty with these calculations was the improper saturation properties of Tabakin's potential. Davies and his group [4] have made calculations within the framework of Brueckner Hartree-Fock method by adopting Reid's soft core potential but still unable to reproduce the nuclear radii and binding energies of nuclei. Such discrepancies can be correlated with the higher order terms in the expansion of Reid's soft core form of potential which was not suitable for description of nucleon-nucleon interactions.

A more realistic approach to overcome aforementioned difficulties is the use of Hartree-Fock method with effective skyrme interactions wherein one can circumvent completely the problem of addition of higher order terms. The skyrme interactions are density dependent interactions and provide satisfactory description of the radii, binding energies and single particle energies of doubly closed shell nuclei. The Hartree-Fock method with Skyrme interaction thus becomes the most widely utilized approach to analyse the nuclear structure and related properties.

In its original form Skyrme's interaction can be written as a potential [5].

$$V = \sum_{i<j} v_{ij}^{(2)} + \sum_{i<j<k} v_{ijk}^{(3)}$$

with, $v_{ij}^{(2)}$ is a two body terms and $v_{ijk}^{(3)}$ is a three body term. The two body terms and three body terms were modified by different authors by fitting the large set of experimental data available in literature [6-7]. In configuration space, the two body interaction terms is defined as

$$v_{ij}^{(2)} = t_0(1+x_0P^\sigma)\delta(\vec{r}_1-\vec{r}_2)$$
$$+\frac{1}{2}t_1(1+x_1P^\sigma)\left[\delta(\vec{r}_1-\vec{r}_2)\vec{k}^2+\vec{k}'^2\delta(\vec{r}_1-\vec{r}_2)\right]$$
$$+t_2(1+x_2P^\sigma)\vec{k}'\delta(\vec{r}_1-\vec{r}_2)\vec{k}$$
$$+iW_0(\vec{\sigma}_1+\vec{\sigma}_2)\bullet\vec{k}'\times\delta(\vec{r}_1-\vec{r}_2)\vec{k}$$

with, $\vec{k}$ and $\vec{k}'$ as relative wave vectors of two nucleons respectively. P^σ is the spin-exchange operator and $\vec{\sigma}$ are Pauli spin matrices. W_0 is spin-orbit term. The three body term assumes a zero range force which is equivalent to a two body density dependent interactions [1] and is defined as

$$v_{ijk}^{(3)} = \frac{1}{6}t_3(1+x_3P^\sigma)\left[\delta(\vec{r}_1-\vec{r}_2)\right]\rho^\alpha$$

Such term provides a simple phenomenological representation of many body effects. The simple structure of Skyrme force allows one to express Hamiltonian density for a system described by a Slater determinant as an algebraic sum function

Analysis of complete fusion excitation functions for $^{7}Li+^{152}Sm$, ^{197}Au and ^{209}Bi reactions at around barrier energies

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The study of nuclear reactions involving weakly bound nuclei at near barrier energies is a subject of contemporary interest. In particular because of the small binding energy of projectiles investigation of the role of breakup process on fusion excitation functions has attracted significant interest. The coupling with the breakup channel initiates new complete fusion (CF), incomplete fusion (ICF) and sequential complete fusion (SCF) processes which cause irregular enhancement in fusion excitation functions in sub barrier energy region and needs further investigation [1]. One of the major endeavors is to study the relative contribution of CF and ICF in total fusion cross section. In the present work we have analyzed the fusion excitation function for CF process using the simple Wong's formula in conjunction with the energy dependent Woods-Saxon potential (EDWSP) [2-4] in near barrier energy region for $^{7}Li+$ ^{152}Sm, ^{197}Au and ^{209}Bi reactions. For detailed description of calculation methodology please see Ref. [2]. In order to extract CF from TF, we have used a recently proposed selection function [2] which represents the fact that at barrier energy, there is a strong competition between the CF and ICF processes as both are equally probable. While at energies much higher than the barrier energy, CF predominates over ICF and vice versa at very low energies.

Since the fusion cross section is highly sensitive to barrier radius, a very small change in its value may results appreciable change in fusion cross section. For the reactions considered here, barrier radius must depend on the deformation of target nucleus only because the quadrupole moment of the projectile ^{7}Li is negligibly small in comparison to that of target.

Phenomenologically, we have found that the parameter r_0 used to determine barrier radius varies from 1.38 to 1.39fm for reactions involving targets having quadrupole moment smaller than 0.5b, from 1.40 to 1.41fm for reactions involving targets with quadrupole moment 0.5 to1.5b and 1.42 to1.44fm for reactions involving targets with quadrupole moment greater than 1.5b.

In Figs. 1 through 3 we have compared the fusion excitation function for CF process for $^{7}Li+$ ^{152}Sm, ^{197}Au, ^{209}Bi reactions respectively with the corresponding experimental data. The values of barrier radius parameter used in the calculation along with the quadrupole moment of targets are listed in Table 1. The quadrupole moment values are taken from Ref. [5] observed via Muonic X-ray hyperfine structure method. It is important to note that barrier radius parameter increase with the increase in absolute value of quadrupole moment of target and does not depend upon its sign. It may be attributed to the fact that the deformed target may have different orientations with equally likely.

Table 1 Values of quadruple moment and barrier radius parameter r_0 for targets considered in present study.

Nucleus	Quadrupole moment (barn)	Barrier radius parameter (fm)
^{152}Sm	-1.7	1.43
^{197}Au	0.6	1.40
^{209}Bi	-0.4	1.38

Study of Decay properties of $^{269-271}$Hs* nucleus formed via Different incoming Channels by using GSkI Skyrme Force

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Introduction

The occurrence of superheavy nuclei is due to the quantum shell effect that overcomes the strong Coulomb repulsion between the large numbers of protons and stabilized them against spontaneous fission. In the present work, we extend our earlier [1] study of the excitation functions (EFs) of ^{274}Hs*, formed in fusion reactions ^{26}Mg+^{248}Cm, ^{48}Ca+^{226}Ra and ^{36}S+^{238}U, based on Dynamical Cluster-decay Model (DCM) [2], to the use of other nuclear interaction potential derived from Skyrme energy density formalism (SEDF) based on semiclassical extended Thomas Fermi (ETF) approach. The Skyrme force used is the new GSkI force [3] for our calculation for cross section and comparison with the experimental data taken from [4–7]. Here, only the EFs for the production of $^{269-271}$Hs isotope via 3n-5n decay channel from the ^{274}Hs* compound nucleus are studied at $E^* = 40$ to 51 MeV for three incoming channel, including quadrupole deformations β_{2i} and "hot-optimum" orientations θ_i. The calculations are made within the DCM where the neck-length ΔR is the only parameter representing the relative separation distance between two fragments and/or clusters A_i(i=1,2) which assimilates the neck formation effects.

Methodology

The nucleus-nucleus interaction potential in SEDF, based on ETF method, is defined as

$$V_N(R) = E(R) - E(\infty) = \int H(\vec{r})d\vec{r} - \left[\int H_1(\vec{r})d\vec{r} + \int H_2(\vec{r})d\vec{r}\right] \quad (1)$$

where H is the Skyrme Hamiltonian density, a function of nucler, kinetic-energy, and spin-orbit densities, the later two themselves being the functions of the nucleon/ nuclear density, written in terms of, so-called, the Skyrme force parameters, obtained by fitting to ground-state properties of various nuclei. There are many such forces, both old and new, and we have chosen new GSkI Skyrme [3] force for our calculation. The radius vectors for axially symmetric deformed nuclei are

$$R_i(\alpha_i, T) = R_{0i}(T)\left[1 + \sum_\lambda \beta_{\lambda i} Y_\lambda^{(0)}(\alpha_i)\right], \quad (2)$$

with T-dependent equivalent spherical nuclear radii $R_{0i}(T) = R_{0i}(T=0)(1+0.0007T^2)$ [8] for the nuclear proximity pocket formula, and $R_{0i}(T) = R_{0i}(T=0)(1+0.0005T^2)$ [9] for SEDF, where $R_{0i}(T=0) = [1.28A_i^{1/3} - 0.76 + 0.8A_i^{-1/3}]$.

Finally, the compound nucleus temperature T (in MeV) is given by

$$E^* = E_{c.m.} + Q_{in} = (A/10)\,T^2 - T. \quad (3)$$

Adding to V_N, the Coulomb and angular momentum ℓ-dependent potentials V_C and V_ℓ, we get the total interaction potential $V(R, \ell)$, characterized by barrier height V_B^ℓ, position R_B^ℓ and curvatur $\hbar\omega_\ell$, each being ℓ-dependent.

The compound nucleus decay/ fragment formation cross sections are calculated within the DCM, given as

$$\sigma = \frac{\pi}{k^2}\sum_{\ell=0}^{\ell_{max}}(2\ell+1)P_0P; \qquad k = \sqrt{\frac{2\mu E_{c.m.}}{\hbar^2}} \quad (4)$$

where P_0 is preformation probability referring to mass asymmetry η [$= (A_1 - A_2)/(A_1 + A_2)$]

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Study of the neutron transfer effect in ^{11}Be + ^{238}U fusion reaction at near barrier energies

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The fusion reaction involving weakly bound nuclei, both stable and radioactive, has received a great attention during last two decades [1-3]. The early experiments carried out using Radioactive Ion Beams have confirmed the existence of an extended halo structure among some of these weakly bound nuclei. Owing to their exceptionally large size and very small binding energy of last nucleon(s) the fusion involving these nuclei differs fundamentally from those involving tightly bound nuclei. The nucleus ^{11}Be being a representative of well-established halo system has attracted a significant attention since from the beginning of the era of Radioactive Ion Beam facilities. Fekou-Youmbi et al [4] have studied the effect of halo structure on fusion cross section for ^{11}Be + ^{238}U system at near barrier energies and have found an enhancement in fusion cross section with respect to its stable isotope ^{9}Be. Subsequently Signorini [5] has studied the effect of low breakup threshold on fusion cross section for ^{11}Be + ^{238}U system and found an enhancement in fusion cross section at sub barrier energies. In the present work, we have studied the same system to understand the peculiar behavior of fusion cross section within the framework of quantum diffusion approach [6]. In this approach, various channel coupling effects are simulated through the dissipation and fluctuation effects. However, along with the channel coupling effects, the nuclear deformation and neutron transfer processes have also been identified as playing a key role in the analysis of fusion reactions. The partial wave capture cross-section, the cross-section for the formation of dinuclear system, is given by

$$\sigma_c(E_{c.m.}) = \pi\lambda^2 \sum_L (2L+1) P_{cap}(E_{c.m}, L) \quad (1)$$

Within the framework of quantum diffusion model, the partial capture probability, P_{cap}, is obtained by integrating an appropriate propagator from initial state at t = 0 to the final state at time t and is given by

$$P_{cap} = \lim_{t\to\infty} \frac{1}{2} erfc\left[\frac{-r_{in} + \overline{R(t)}}{\sqrt{\Sigma_{RR}(t)}}\right] \quad (2)$$

The first moment, $\overline{R(t)}$, and the variance, $\Sigma_{RR}(t)$, are given by

$$\overline{R(t)} = A_t R_0 + B_t P_0 \quad (3)$$

$$\sum_{RR}(t) = \frac{2\hbar^2\lambda\gamma^2}{\pi}\int_0^t d\tau' B_{\tau'} \int_0^t d\tau'' B_{\tau''} \times \int_0^\infty d\Omega \frac{\Omega}{\Omega^2+\gamma^2} \times coth\left[\frac{\hbar\Omega}{2T}\right] cos[\Omega(\tau'-\tau'')] \quad (4)$$

with

$$B_t = \frac{1}{\mu}\sum_{i=1}^{3} \beta_i (s_i+\gamma) e^{s_i t}$$

$$A_t = \sum_{i=1}^{3} \beta_i [s_i(s_i+\gamma) + \hbar\lambda\gamma/\mu] e^{s_i t}$$

Above $\beta_i = \left[(s_i - s_j)(s_i - s_k)\right]^{-1}$, $i,j,k = 1,2,3$ and $i \neq j \neq k$ and s_i are the real roots of

$$(s+\gamma)(s^2 - \omega_0^2) + \hbar\tilde{\lambda}\gamma s/\mu = 0 \quad (5)$$

where γ, ω_0 and $\tilde{\lambda}$ are the internal excitation width, renormalized frequency and parameter related to the strength of linear coupling.

Combining Eqs. (3) and (4) one obtains

$$P_{cap} = \frac{1}{2} erfc\left[\left(\frac{s_1(\gamma - s_1)}{2\hbar\tilde{\lambda}\gamma}\right)^{1/2} \times \frac{\mu\omega_0^2 R_0/s_1 + P_0}{\left[\frac{s_1\gamma}{\pi(s_1+\gamma)}\left(\psi\left(1+\frac{\gamma}{2\pi T}\right) - \psi\left(\frac{s_1}{2\pi T}\right)\right) - T\right]^{1/2}}\right] \quad (6)$$

Where $\psi(z)$ is the digamma function. By using Euler-Maclaurin integration formula, we get the simple expression for digamma function that is

Role of static and energy dependent interaction potential in sub-barrier fusion dynamics of $^{6}Li+^{152}Sm$ reaction

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In past few decades, the extensive investigations on theoretical as well as on experimental grounds clearly pointed out the effects of nuclear structure degrees of freedom such as inelastic surface excitations, permanent shape deformation and/or particle transfer channel on fusion process. For well bound nuclei, the coupling of relative motion of participant nuclei to their internal degrees of freedom leads to the substantially large fusion enhancements at below barrier energies over the expectations of the one dimensional barrier penetration model. However in case of weakly bound/halo nuclei, the breakup channel strongly influences the fusion process around the Coulomb barrier and subsequently leads to the suppression of the fusion cross-sections at above barrier energies with reference to the coupled channel calculations. This suppression effect is directly related with the low binding energy of the breakup channel associated with loosely bound system [1].

Recently, Rath *et al.*[2] performed the experimental measurement of $^{6}Li+^{152}Sm$ reaction at near and above barrier energies. The interesting aspect of the this reaction is that the projectile is weakly bound nucleus while the target isotope is a well deformed nucleus and role of projectile breakup channel is directly inferred from the fusion mechanism of this reaction. In this regard, we have analyzed the fusion dynamics of $^{6}Li+^{152}Sm$ reaction within the framework of the static nuclear potential and the energy dependent interaction potential [3-5]. In this work, we have tested standard Woods-Saxon potential, which is static in nature and the energy dependent Woods-Saxon potential (EDWSP) model [3-5] along with one dimensional Wong formula [6] for exploring the fusion dynamics of the chosen reaction. In the EDWSP model [3-5], the depth (V_0) of the real part of the Woods-Saxon potential is defined as

$$V_0 = \left[A_P^{\frac{2}{3}} + A_T^{\frac{2}{3}} - (A_P + A_T)^{\frac{2}{3}} \right] \left[2.38 + 6.8(1 + I_P + I_T) \frac{A_P^{\frac{1}{3}} A_T^{\frac{1}{3}}}{\left(A_P^{\frac{1}{3}} + A_T^{\frac{1}{3}} \right)} \right] \; MeV$$

where, $I_P = \left(\frac{N_P - Z_P}{A_P} \right)$ and $I_T = \left(\frac{N_T - Z_T}{A_T} \right)$ are the isospin asymmetry of the colliding systems. The energy dependent diffuseness parameter is defined as

$$a(E) = 0.85 \left[1 + \frac{r_0}{13.75 \left(A_P^{\frac{1}{3}} + A_T^{\frac{1}{3}} \right) \left(1 + \exp\left(\frac{\frac{E}{V_{B0}} - 0.96}{0.03} \right) \right)} \right] fm$$

with, $a(E)$ is the energy dependent diffuseness parameter, E is the incident energy in center of mass frame, V_{B0} is the Coulomb barrier and r_0 is the range parameter, which geometrically defines the radii of colliding pairs.

The static Woods-Saxon potential produces a single Coulomb barrier between the collision partners and one has to include the channel coupling effects in order to recover sub-barrier fusion data of chosen reaction. However in EDWSP model, due to energy dependence in the nucleus-nucleus potential instead of single fusion barrier a spectrum of the energy dependent fusion barriers of variable height is produced. The distribution of energy dependent fusion barriers of different heights is shown in Fig.1. In this spectrum, some of the energy dependent fusion barriers are lower than that of the Coulomb barrier (25.10 *MeV*), which in turn, shift the flux from incoming channel to fusion channel. Such kinds of barrier modification result in the barrier lowering effects and lower the effective fusion barrier between the colliding systems. As a result, the EDWSP model predicts larger fusion cross-sections at sub-barrier energies over the expectations of the one dimensional barrier penetration model which will be discussed in detail in Fig.2.

The theoretical results obtained by using the static Woods-Saxon potential along with the one dimensional Wong formula substantially underestimate the experimental data particularly at below barrier energies while at above barrier

Analysis of (^{3}He, t) charge exchange reaction on ^{58}Ni at intermediate energy

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The (^{3}He, t) charge exchange reaction wherein a proton transforms into a neutron which eventually changes the isospin of the reaction participants indentified as a reliable tool to analyze the spin-isospin excitation in nuclei [1, 8]. Variety of charge-exchange reactions have been also used, to extract the Gamow –Teller strengths with the use of a proportionality relation, between differential cross section at vanishing momentum transfer and the corresponding GT transition strength. The strengths deduced through charge exchange reactions provide stringent tests for nuclear structure calculations and serve as inputs to the modeling of the explosion dynamics of a massive star [3, 4].

In present contribution we analyze the results of (^{3}He,t) charge-exchange reaction at 140 MeV/u on ^{58}Ni within the theoretical framework of distorted wave impulse approximation(DWIA). In this approach the differential cross section for inelastic charge exchange reaction A(a, b)B may be expressed as

$$\frac{d\sigma}{d\Omega} = \frac{\mu_a \mu_b}{(2\pi\hbar^2)^2} \frac{k_b}{k_a} \left| \sum_{i=D,E} \sum_{kJ_t} \alpha^{t_i s_i l_i k J_t}_{j_i s_i \nu_i} T^{t_i s_i l_i k J_t m_{t_i}}_i \right|^2 \quad (1)$$

Here μ_a, μ_b and k_a, k_b are the reduced masses and wave numbers in the incident and exit channels, respectively. The coefficient, $\alpha^{t_i s_i l_i k J_t}_{j_i s_i \nu_i}$, contains the Racah coefficients describing the recoupling of various angular momenta. The subscript i appeared in eq. (1) is i =D for direct transitions and i = E for exchange transitions. The transition amplitude may be written in terms of direct and exchange overlap integrals as

$$T^i_{t_i s_i l_i k l_t m_{t_i}} = \frac{(4\pi)^{3/2}}{k_a k_b} \sum_{l_a l_b} i^{l_a - l_b + \pi} \hat{l}_a (l_a 0 l_t m_{l_t} | l_b m_{l_t}) O^i_{t_i s_i l_i k l_t, l_a l_b} Y_{l_b m_{l_t}} (\hat{k}_b)$$

Here O^i represents the direct (i = D) and exchange (i = E) overlap integrals respectively [5,6].

Through the use of eq. (1) we have calculated the differential cross section for the ^{58}Ni(^{3}He, t)^{58}Cu(1^+,g.s) and ^{58}Ni(^{3}He, t)^{58}Cu(0^+,0.203) charge exchange reactions at 140 A MeV energy and the results so obtained are presented in Figs. (1) and (2) respectively. Our calculation contains exactly calculated exchange contribution which approximated in almost earlier work.

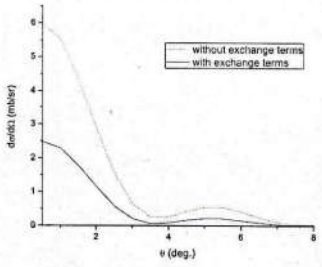
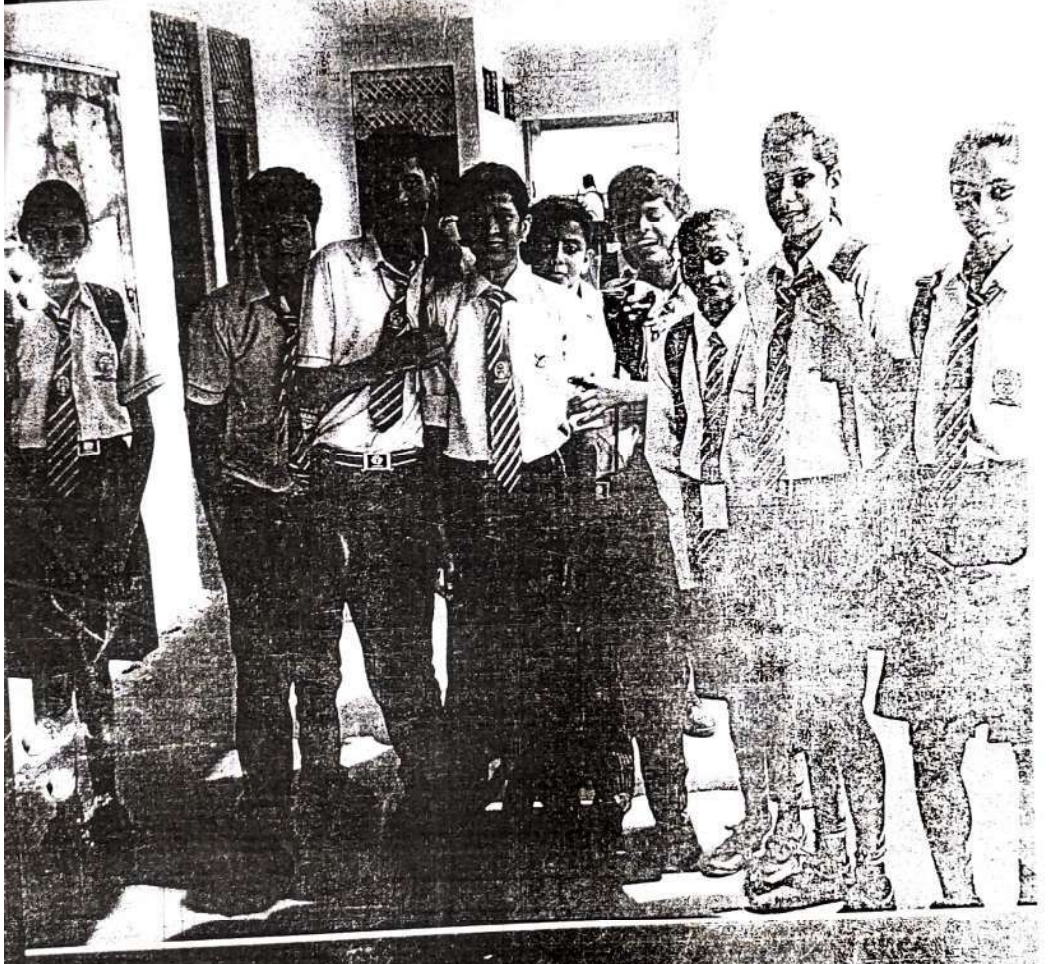


Fig.1 (color online) The calculated angular distribution for the reaction (^{3}He, t) on ^{58}Ni target at 140 A MeV energy. The solid (blue line) line has been obtained with the inclusion of exchange contribution while dashed (black) line represents the result corresponding to direct contributions alone.

In fig. 1 the dashed lines represent the results without exchange terms while the solid line gives the contribution corresponds to direct and exchange terms both.

Revamping o[illegible] System Through New Education Policy (NEP)



Editors :
Mala Tandon, Sushanta K. Paul
Ritu T. Chakravarty & Dipita Bhattacharya

Contents

Affirmative Career Choice: Equity, Access and Quality in Teacher Education

—*Dr. Taruna, C. Dhall*

Education Today

Over the years, India as a nation has put up in place a well thought out systems that provide for education of its masses. These established systems overlook the provision for education at different levels ranging from early childhood education (ECE) to higher education (HE). This responsibility is shared by state government and central government in a coordinated manner. Besides providing for education, time and effort is also invested in monitoring the execution of policies to assess its impact and plan further course correction. Guiding principle, behind this being, the need to enhance the access of qualitative education in an equitable manner across the entire populace of the country.

Equity

World Education Forum 2015 describes equity in education as "means to achieving equality. It intends *to provide the best opportunities for all students* to achieve their full potential and act *to address instances of disadvantage* which restrict educational achievement. It involves special treatment/action taken to reverse the historical and social disadvantages that prevent learners from accessing and benefiting from education on equal grounds". In India, one of the focus area envisaged by the first National Policy on Education (NPE-1968), as suggested by Kothari Commission was "equalization of educational opportunity for all sections of society, including girls, minorities, disadvantaged classes, tribal people and in rural areas". The NPE of 1986-1992, while reiterating 'education' for all' as a national goal, endorsed the concept of a "National System of Education" that caters to all students, irrespective of "caste, creed, location or sex". Central and state governments have rolled out various schemes towards realization of this goal. Noteworthy effort in this direction has been the rolling out of the financial schemes like scholarships, reimbursement of fees, easy student loans to name a few. To a great extent such schemes have enabled the students to overcome social, economic and geographic barriers to equitable opportunities to access education.

Access

Over the recent decades, advances in information and communication technology, improved infrastructure have appreciably narrowed the geographical divide by

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Innovative HR Practices in IT Sectors

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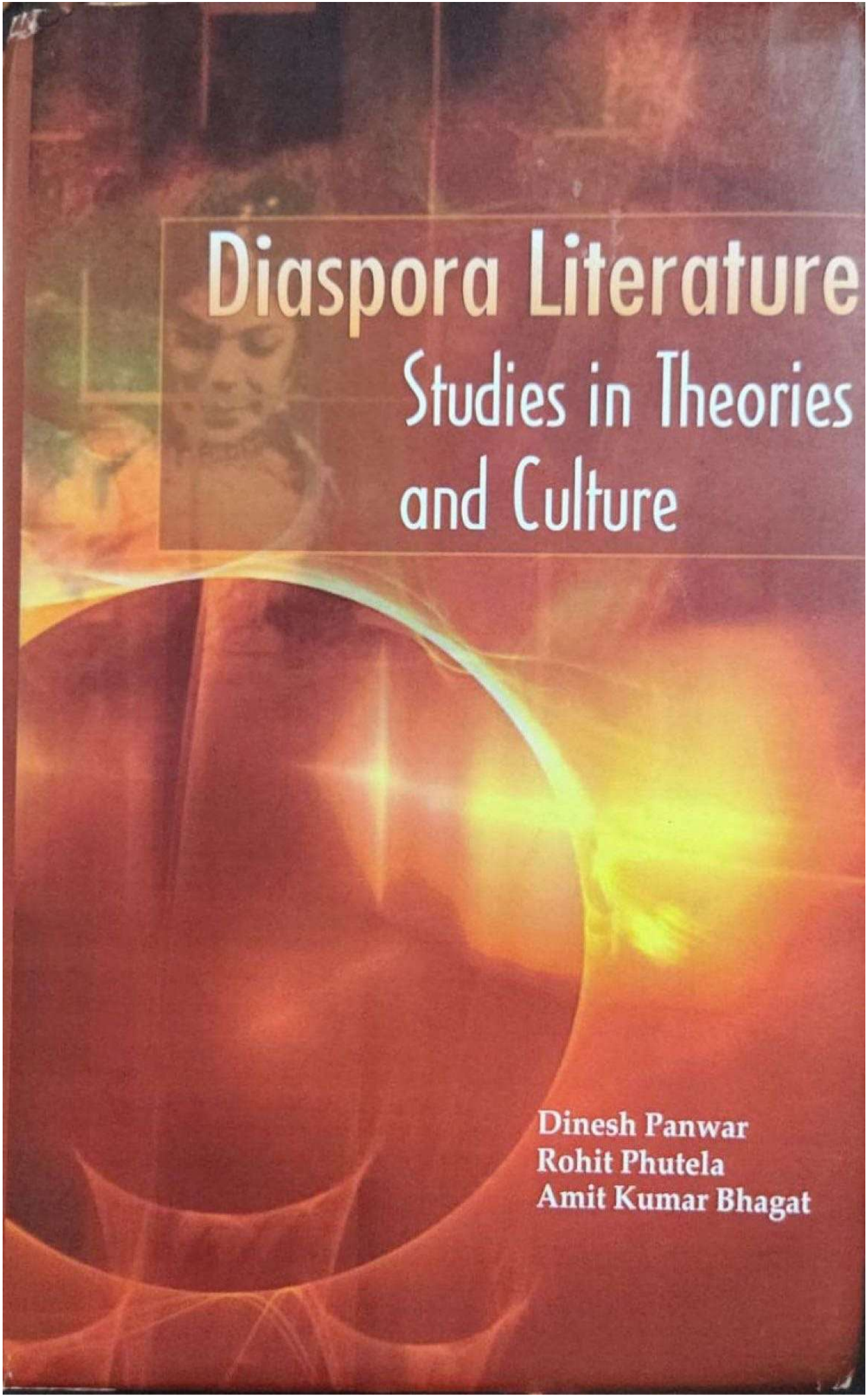
Abstract

An important element of human resource management is the 'human approach' while managing people. Training and Development, Performance appraisal, Potential Appraisal, Career Planning and Development, Compensation and Reward are the major HR practices in any business organization. Human Resource has been considered as one of the most important factors today in managing all material facts of an organization. The present market conditions and scenario need to innovative HR practices in competitive environment. For achieving these objectives IT sectors needs to adopt innovative HR practices. The aim of this paper is to examine the innovative HR practices in IT sector. For better functioning of IT sector and for a suitable growth of this sector there, HR plays a vital role in managing manpower with the consistence to the goal of the corporation. For this reason, IT sector need to carefully evaluate their existing HR practices and modify them with innovation. In this research paper efforts are made for developing innovative HR practices. The present study attempts to explore the innovative HR practices in various information technology organizations. The employees of information technology organizations covered in this study are – Tata Consultancy Services (TCS), Wipro Technologies, Infosys Technologies Ltd., and Motorola, Hindustan Computer Ltd. (HCL) etc.

Key-Words : Human Resource, Information Technology Sector.

Introduction

The quality of products and services both depend upon the quality of human resource, which needs continuous and multiple-skill training. Thus, to attain such human resource, there must be emphasis on developing and nurturing a strategy-based on human resource development practices in the information technology organizations. Human resource development comprises of many components like – selection procedures, training policy, performance and promotion policy, transfer policy, wages, compensation, social-security policy, worker's welfare policy, recreational policy, employee- employee/employer/management relations, trade union, health policy, etc. All these components help to develop highly skilled, efficient, effective and dynamic human resource in these organizations. For the success of information technology organizations, it is necessary that right person must be placed at right job and his potential must be enhanced through multiple and continuous training. Thus, this sector must give more emphasis on the development of human resources by prevailing upon different aspects of human resource development practices in their organizations. All the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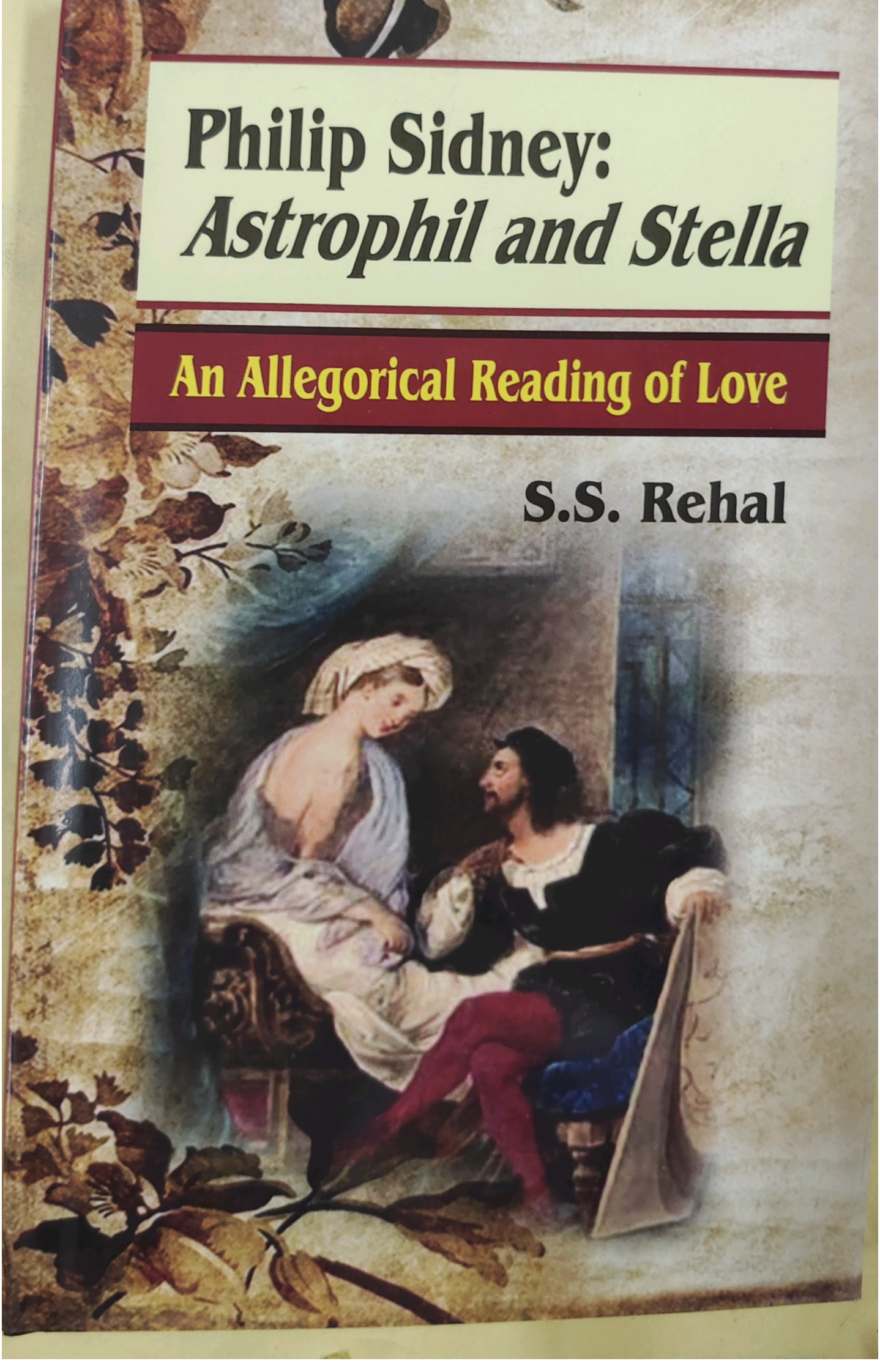

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