

आर पी यूनीफाइड

राष्ट्रीय शिक्षा नीति के
पार्यक्रम अनुसार

महिला सशक्तिकरण

WOMEN EMPOWERMENT

द्वितीय वर्ष

डॉ. माधवीलता दुबे



राम प्रसाद एण्ड संस

Neither this book nor any part may be reproduced or transmitted in any form, electronic or mechanical, including photocopying, microfilming and recording, or by any information storage and retrieval system without permission in writing from the publisher. The publisher is liable for legal action.

Note : Due care and diligence has been taken while editing and printing. The publisher of the book hold any responsibility for any mistake that may occur. All disputes are subject to Bhopal jurisdiction only.

ISBN : 978-93-95447-10-6

© सुरक्षित

मूल्य : एक सौ पच्चीस रुपये मात्र (125.00)

मुद्रक : शब्द ऑफसेट प्रा. लि., भोपाल, मो. : 98934...

सामाजिक परिवर्तन एवं विकास

डॉ. माधवी लता दुबे



मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल

सामाजिक परिवर्तन एवं विकास : डॉ. दुबे
Samajik Parivartan Evam Vikas : Dr. Dubey

© मध्यप्रदेश हिन्दी ग्रन्थ अकादमी

ISBN — 978-93-94032-50-7

- प्रादेशिक भाषाओं में विश्वविद्यालय स्तरीय ग्रन्थों और साहित्य
भारत सरकार के मानव संसाधन विकास मंत्रालय (शिक्षा)
योजनान्तर्गत, मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल द्वारा

प्रकाशक : मध्यप्रदेश हिन्दी ग्रन्थ अकादमी
रवीन्द्रनाथ ठाकुर मार्ग, बानगंगा,
भोपाल - 462 003
दूरभाष - 0755-2553084
E-mail : mphga1970@gmail.com

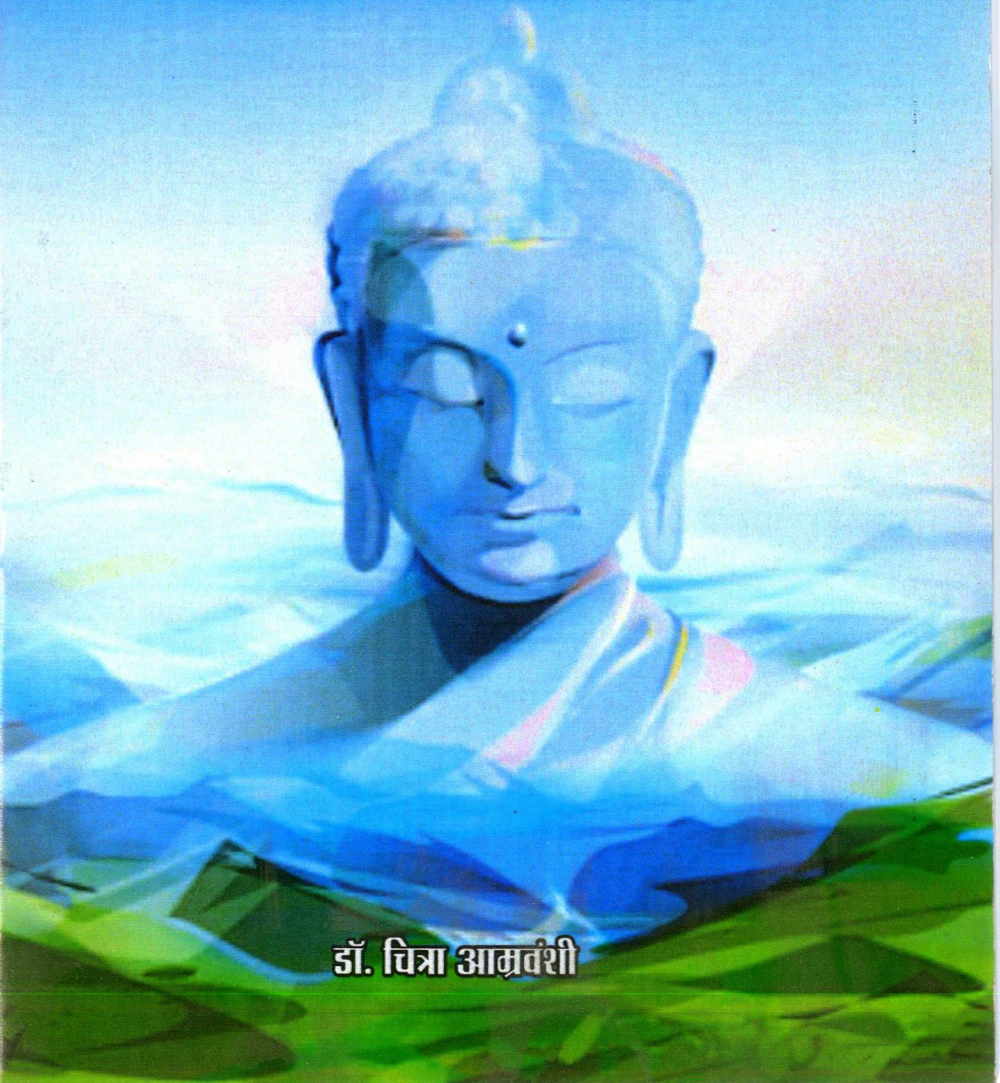
संस्करण : प्रथम - 2022

मूल्य : ₹ 150.00 (एक सौ पचास) मात्र

कम्पोजिंग : अक्षर ग्राफिक्स, न्यू मार्केट, भोपाल

बुद्धचरित

(संक्षिप्त खण्ड काव्य)



डॉ. चित्रा आम्रवंशी

ISBN : 978-93-92370-15-1

बुद्धचरित

डॉ. चित्रा आम्बवंशी

सर्वाधिकार

डॉ. चित्रा आम्बवंशी

प्रकाशक

संदर्भ प्रकाशन, भोपाल

मो. 9424469015

संस्करण

प्रथम 2022

मूल्य

रुपये 140/-

मुद्रण

जे.एम.डी. ग्राफिक्स

प्लॉट नं. 4, शॉप नं. 6, एच.डी.एफ.सी. बैंक के सामने
पॉल भवन, जोन-1, एम.पी. नगर, भोपाल

भाषा और संस्कृति

बी.ए./बी.कॉम./बी.एससी./बी.एच.एससी./बी.सी.ए.

के विद्यार्थियों हेतु

द्वितीय वर्ष

: लेखक :

डॉ. लक्ष्मीचन्द्र

प्राध्यापक, हिन्दी

शास. स्वशासी स्नातकोत्तर महाविद्यालय,

छिन्दवाड़ा

डॉ. संगीता सक्सेना

प्राध्यापक, हिन्दी,

शा.म.ल.बा. कन्या स्नातकोत्तर

(स्वशासी) महाविद्यालय, भोपाल.

डॉ. अर्पणा बादल

सहायक प्राध्यापक, हिन्दी

सरोजनी नायडू शास. कन्या स्नातकोत्तर महाविद्यालय

भोपाल



मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल

प्रादेशिक भाषाओं में विश्वविद्यालय स्तरीय ग्रन्थों और साहित्य के निर्माण के लिए भारत सरकार के मानव संसाधन विकास मंत्रालय (शिक्षा) की केन्द्र प्रवर्तित योजनान्तर्गत, मध्यप्रदेश हिन्दी ग्रन्थ अकादमी, भोपाल द्वारा प्रकाशित।

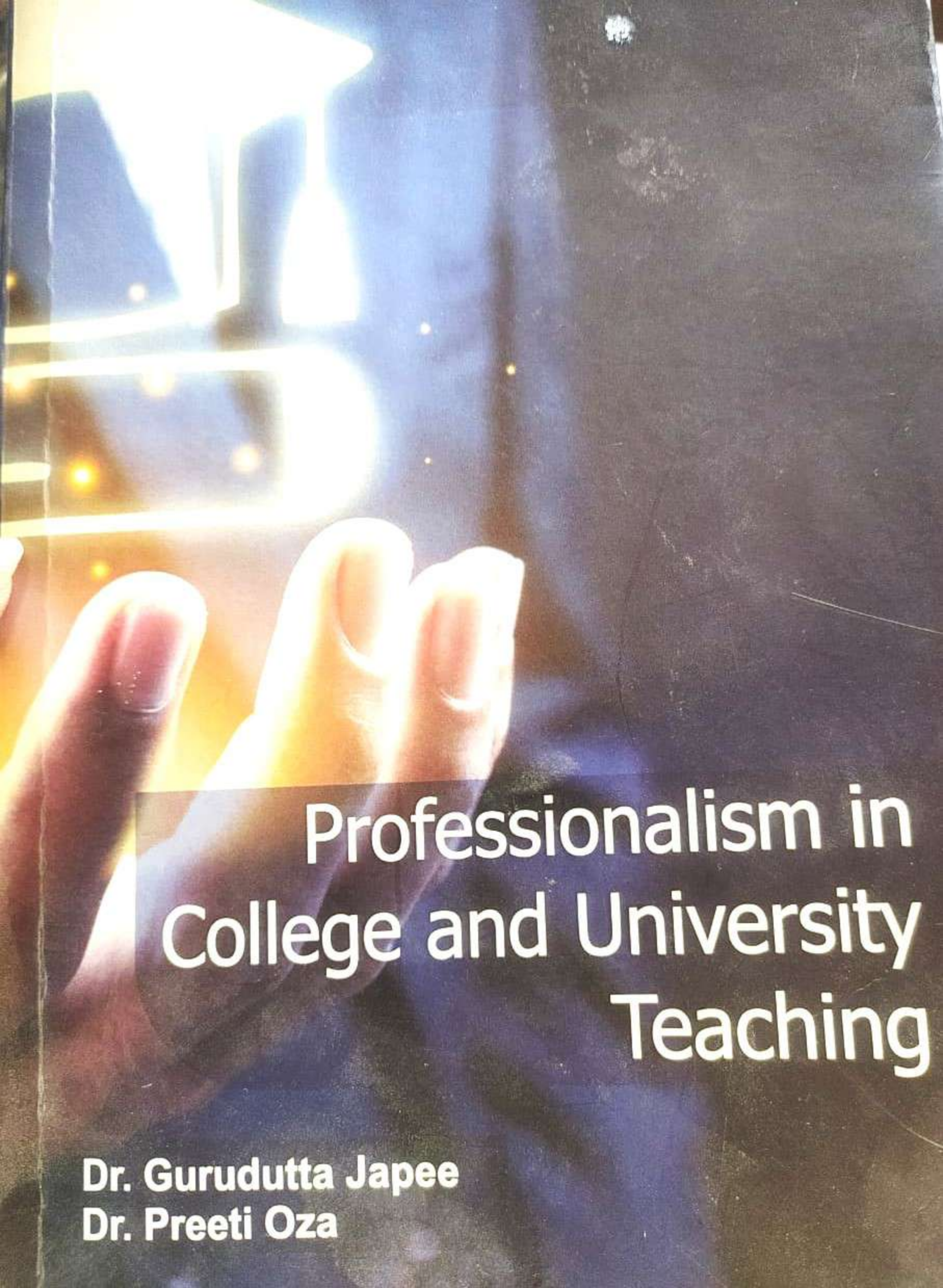
क : मध्यप्रदेश हिन्दी ग्रन्थ अकादमी
रवीन्द्रनाथ ठाकुर मार्ग, बानगंगा,
भोपाल - 462 003
दूरभाष - 0755-2553084
E-mail : mphga1970@gmail.com

: द्वितीय, (आवृत्ति) 2023

: ₹ 70.00 (सत्तर रूपये) मात्र

: अक्षर ग्राफिक्स, न्यू मार्केट, भोपाल

: शाईन आफसेट प्रिंटर्स

A hand is shown holding a glowing, spherical object that emits a bright light. The background is dark with several horizontal light trails, suggesting motion or a futuristic setting. The overall mood is one of discovery and innovation.

Professionalism in College and University Teaching

Dr. Gurudutta Japee
Dr. Preeti Oza

**PROFESSIONALISM IN
COLLEGE AND UNIVERSITY
TEACHING**

**DR. GURUDUTTA JAPEE
DR. PREETI OZA**

Pen Pencil Books

INDIA

© Contributors

First Edition 2022

No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording without the prior permission in writing of the publisher. Application for such permission should be addressed to the publisher.

Pen Pencil Books
India

Ph: +91 98240 26507

E-mail : penpencilbooks@gmail.com

ISBN: 978-81-953325-2-6

in association with Vista Publishers

Printed in India at Trident Enterprises, Noida
Printed on paper from sustainable resources.

CONTENTS

- Preface* v
1. Digital Etiquette in Online Teaching Learning
Dr. Preeti Oza 1
 2. Accountability in Higher Education Institutions
Dr. Gurudutta P. Japee 22
 3. Values and Ethics in Teaching *Dr. Asha Menon* 29
 4. Ethics and Values in Teaching Profession
Dr. C B Mishra 41
 5. Value Education in India - Need and Importance
Ms. Sunita Nandwani 51
 6. Self-Transformation: The Art of Learning, Unlearning
and Relearning with Mindfulness
Dr. Smita Ghosh 73
 7. How do Professional Frameworks Support
Professionalism in Higher Education? & Why are
Professional Networks and Research Networks Useful
for College and University Teachers?
Dr Sai Madhavi D 86
 8. 21st Century Professional Standards when Teaching
in the Field of Arts / Performing Arts Education at
College & University Levels
Dr. Sheilana Devi Ramdoo 99

9. How can College and University Teachers Improve Their Professionalism Online!! *Dr. Preeti Oza* 120
10. Professional Ethics and Values in Teaching *Neetu Sahu* 143
11. Values, Ethics and Human Dignity in the Profession of Teaching *Dr. Naina Singh & Ms. Soumya Nair* 148
12. Why do College and University Professors need to be High Standards of Professional Behavior? *Kirti Bala Bahekar & Dr. Pratima Gautam* 172
13. What are Professional Values and Why they are Important? *Kajal Arora* 183
14. What are the Professional Values and Why they are Important? *Mrs. Joeeta Mukherjee Ghosh* 191
15. Present Crisis in Teaching Profession *Dr. G.S. Patel* 202
16. Moral Values in Higher Education: Instilled, Inculcated, or Enforced *Dr. Parshottam Vishnudas Guranani* 214
17. Pre-Service Teacher Training Challenges and Issues in Context to Indian Education *Dr. Bhavesh M. Modi* 224
18. Service Learning Pedagogy: A Blended Approach in Teaching Professional Engineering Ethics and Social Responsibilities *Dr. Anuradha S.G.* 244
19. Why are Professional Networks and Research Networks useful for College and University Teachers? *Parulkumari Bhati* 254
20. Dance - As a Performing Art at Higher Education Level in India *Dr. Uma Rele* 266

अनकही मनकही

डॉ. लक्ष्मी श्रीवास्तव
मीरा श्रीवास्तव



डॉ. लक्ष्मी श्रीवास्तव
 पिता : स्व श्री लालजी लाल श्रीवास्तव
 माता : स्व श्रीमती कमलेश्वरी श्रीवास्तव
 जन्म : 1 अगस्त 1959 सिकंदराबाद,
 आंध्र प्रदेश
 शिक्षा : एम ए चित्रकला, पीएचडी

सेवा : 40 वर्षों से निरंतर महाविद्यालयीन शिक्षण कार्य, वर्तमान में प्राध्यापक चित्रकला : सरोजिनी नायडू शासकीय कन्या स्नातकोत्तर (स्वशास्त्री) महाविद्यालय भोपाल (म.प्र.)

पुस्तक प्रकाशन :

- "कला निनाद" 2010 विभु प्रकाशन, इलाहाबाद (उ.प्र.)
- 40 से अधिक शोधपत्र प्रकाशित।

चित्र प्रदर्शनी

- "संबद्ध" समूह चित्रकला प्रदर्शनी ललित कला अकादमी नई दिल्ली। 2011
- अखिल भारतीय कालिदास एवं मूर्तिकला प्रदर्शनी उज्जैन मध्य प्रदेश 1977, 1978 एवं 1979
- अखिल भारतीय चित्र एवं मूर्तिकला प्रदर्शनी, महाकोशल कला परिषद, रायपुर, मध्य प्रदेश 1978/79
- मध्य भारतीय हिंदी साहित्य सभा ग्वालियर, मध्य प्रदेश, "काव्य चित्र प्रदर्शनी" 1981।
- चित्रकार स्व डी. पी. शर्मा स्मृति कला प्रदर्शनी मध्यप्रदेश कला परिषद ग्वालियर, मध्यप्रदेश। 1982
- "राजा रवि वर्मा आदरांजलि" समूह चित्र प्रदर्शनी, भारत भवन भोपाल, मध्य प्रदेश 2010
- चित्रकार एल. एन. भावसार जी के सम्मान में चित्र प्रदर्शनी भारत भवन, भोपाल, मध्य प्रदेश
- राष्ट्रीय चित्रांकन कार्यशाला एवं प्रदर्शनी, संस्कृति विभाग, स्वराज भवन, भोपाल, मध्य प्रदेश। 2008
- जवाहर कला केन्द्र जयपुर राजस्थान "जश्र ऑफ कलर्स" समूह चित्र प्रदर्शनी जयपुर, राजस्थान। 2010
- भारतीय ललित कला संस्थान अमृतसर पंजाब "वाइब्रेशन साउण्ड ऑफ कलर्स एंड फॉर्म्स" समूह चित्र प्रदर्शनी 2010
- चित्रकार एम. मेरे गुरु स्व. राजाराम जी की स्मृति में समूह चित्र प्रदर्शनी "राजाराम रूप ध्वनि दीर्घा" भोपाल, मध्य प्रदेश। 2021
- डॉक्टर सुनीता सोनी प्राध्यापक समाजशास्त्र स. ना. शा. कन्या स्नातकोत्तर महाविद्यालय भोपाल के काव्य संग्रह "दिल ए दरमियान" के लिए "दृष्टांत चित्रांकन" भोपाल, मध्य प्रदेश। 2020

रुचियाँ : चित्रकला के साथ संगीत, नृत्य एवम लेखन कार्य में विशेष रुचि।



सुश्री पी. पी. श्रीवास्तव
 पिता : स्व श्री लालजी लाल श्रीवास्तव
 माता : स्व श्रीमती कमलेश्वरी श्रीवास्तव
 जन्म : 21 दिसंबर 1956 सिकंदराबाद
 (आंध्रप्रदेश)
 शिक्षा : एम ए
 अर्थशास्त्र एवं समाजशास्त्र
 बी एड

सेवा : के. जी. चिल्ड्रन हा. सेकेंडरी स्कूल भोपाल ग्वालियर में 42 वर्षों तक प्राचार्य पद पर तथा वर्तमान में के. जी. चिल्ड्रन महाराजपुर ग्वालियर में डायरेक्टर पद पर कार्यरत

पुस्तक प्रकाशन : सबसे बड़ी पूंजी, बाघम्बर प्रकाशन इलाहाबाद

- प्रयास सेवा एवं साहित्य मंच की संस्थापक अध्यक्ष
- लायनेस क्लब सौम्या ग्वालियर 2001 अध्यक्ष
- वरिष्ठ नागरिक सेवा संस्थान की वर्तमान संयुक्त अध्यक्ष
- सत्या विकास समिति ग्वालियर की वर्तमान सचिव
- कायस्थ किरण महिला समिति की वरिष्ठ सदस्य
- संस्कार मंजरी ग्वालियर की सदस्य
- शासकीय महारानी लक्ष्मीबाई मोरार ग्वालियर की पूर्व छात्रा परिषद की अध्यक्ष
- दिव्यज्योति जाग्रति संस्थान,
- विज्ञान एवं प्रौद्योगिकी विभाग भारत सरकार लोक शिक्षण संचलनालय (म.प्र.)
- रोटरी क्लब ग्वालियर
- ग्वालियर विकास समिति
- संस्कार मंजरी ग्वालियर एवं प्रजापिता ब्रह्मकुमारी ईश्वरीय विश्वविद्यालय लखर ग्वालियर द्वारा सम्मानित

रुचियाँ : गायन, वादन, लेखन एवं सवाद.

MRP ₹ 260/-

ISBN: 978-93-93594-02-6



9 789393 139402 6

अनकही-मनकही पुस्तक में चित्रों पर लिखीं कविताएं



रिपोर्टर • IamBhopal

Mobile no. 9827080406

डॉ. लक्ष्मी श्रीवास्तव और मीरा श्रीवास्तव द्वारा रचित 'अनकही मनकही' पुस्तक का होटल राजहंस अभिनंदन में हुआ। कार्यक्रम में साहित्यकार डॉ. विनय राजा राम, शायर मदन मोहन दानिश, अपेक्स बैंक भोपाल के एमडी पीएस तिवारी

उपस्थित थे। अनकही मनकही पुस्तक, चित्रों और कविताओं का संयोजन है। डॉ. लक्ष्मी श्रीवास्तव ने अपने बनाए चित्रों पर कविताएं और अपनी लिखी कविताओं पर चित्र सृजन किए हैं। शासकीय सरोजिनी नायडू कॉलेज में चित्रकला विभाग में प्रोफेसर हैं। पुस्तक का विमोचन महाविद्यालय की प्राचार्य डॉ. प्रतिभा सिंह द्वारा किया गया।

Sanjay Sahay *Editor*

Extremophilic Fungi

Ecology, Physiology and Applications

 Springer

Editor
Sanjay Sahay
Sarojini Naidu Government Postgraduate
Girl's (Autonomous) College
Bhopal, Madhya Pradesh, India

ISBN 978-981-16-4906-6

ISBN 978-981-16-4907-3 (eBook)

<https://doi.org/10.1007/978-981-16-4907-3>

© The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2022

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.


The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Singapore Pte Ltd.
The registered company address is: 152 Beach Road, #21-01/04 Gateway East, Singapore 189721, Singapore

Sanjay Sahay
Editor

Extremophilic Fungi

Ecology, Physiology and Applications

 Springer

Contents

Part I Basic Information

- 1 **Isolation, Culture, and Maintenance of Extremophilic Fungi** 3
Kalhoro Muhammad Talib, Jing Luhuai, Xiaoming Chen, Ali Akbar,
Ayesha Tahir, Irfana Iqbal, and Imran Ali
- 2 **Modern Tools for the Identification of Fungi, Including Yeasts** 33
Ayesha Tahir, Irfana Iqbal, Kalhoro Muhammad Talib, Jing Luhuai,
Xiaoming Chen, Ali Akbar, Anam Asghar, and Imran Ali

Part II Eco-physiology

- 3 **Major Habitats and Diversity of Thermophilic Fungi** 55
Swapnil Chaturvedi and Indira P. Sarethy
- 4 **Thermophilic Fungi: Habitats and Morpho-Molecular Adaptations** 77
Regina Sharmila Dass, Joy Elvin Dhinakar, Akriti Tirkey,
Mayukhmita Ghose, and Angeline Jessika Suresh
- 5 **Modulation of Physiological and Molecular Switches in Thermophilic Fungi: A Brief Outlook** 97
Tuyelee Das, Samapika Nandy, Abdel Rahman Al-Tawaha,
Potshangbam Nongdam, Ercan Bursal, Mahipal S. Shekhawat,
and Abhijit Dey
- 6 **Psychrotrophic Microfungi: Major Habitats, Diversity and Living Strategies** 111
Kanak Choudhary, Najeeb Hussain Wani, Farooq Ahmad Ahanger,
Suhaib Mohamad Malik, Vinod Chourse, Abdul Majid Khan,
and Sanjay Sahay

- 18 Extremophilic Fungal Lipases: Screening, Purification, Assay, and Applications** 395
J. Angelin and M. Kavitha
- 19 Extremophilic Fungal Proteases: Screening, Purification, Assay, and Applications** 439
Sourav Bhattacharya and Arijit Das
- 20 Extremophilic Fungal Amylases: Screening, Purification, Assay, and Applications** 465
Ragini Bodade and Krutika Lonkar
- 21 Extremophilic Fungi as a Source of Bioactive Molecules** 489
Annada Das, Kaushik Satyaprakash, and Arun Kumar Das
- 22 Piezophilic Fungi: Sources of Novel Natural Products with Preclinical and Clinical Significance** 523
Tuyelee Das, Puja Ray, Samapika Nandy, Abdel Rahman Al-Tawaha, Devendra Kumar Pandey, Vijay Kumar, and Abhijit Dey
- 23 Biotechnological Applications of Microaerophilic Species Including Endophytic Fungi** 547
Beenish Sarfaraz, Mehwish Iqtedar, Roheena Abdullah, and Afshan Kaleem
- 24 Whole Cell Application Potential of Extremophilic Fungi in Bioremediation** 557
Sunil Bhapkar, Rushikesh Pol, Deeksha Patil, Anupama Pable, and Umesh U. Jadhav
- 25 Extremophilic Fungi: Potential Applications in Sustainable Agriculture** 581
Sanjay Sahay
- 26 Extremophilic Fungi for the Synthesis of Nanomolecules** 615
Harshita Shukla and Shyamji Shukla
- 27 Fungal Extremozymes: A Potential Bioresource for Green Chemistry** 651
Imran Mohsin and Anastassios C. Papageorgiou
- 28 Fungal Extremozymes in Green Chemistry** 683
Ajay Nair, Archana S. Rao, K. Nivetha, Prakruthi Acharya, Aneesa Fasim, Veena S. More, K. S. Anantharaju, and Sunil S. More
- 29 Phylogenomics, Microbiome and Morphological Insights of Truffles: The Tale of a Sensory Stimulating Ectomycorrhizal Filamentous Fungus** 709
Mohan Das, Ananya Pal, Subhodeep Banerjee, Subhara Dey, and Rintu Banerjee

- 7 **Physiology and Molecular Biology of Psychrotrophic Fungi: An Insight** 129
Tuyelee Das, Samapika Nandy, Devendra Kumar Pandey, Abdel Rahman Al-Tawaha, Potshangbam Nongdam, Ercan Bursal, Mahipal S. Shekhawat, and Abhijit Dey
- 8 **Ecology, Physiology, and Diversity of Piezophilic Fungi** 141
Shyamji Shukla and Harshita Shukla
- 9 **Halophilic, Acidophilic, Alkaliphilic, Metallophilic, and Radioresistant Fungi: Habitats and Their Living Strategies** 171
Tuyelee Das, Abdel Rahman Al-Tawaha, Devendra Kumar Pandey, Potshangbam Nongdam, Mahipal S. Shekhawat, Abhijit Dey, Kanak Choudhary, and Sanjay Sahay
- 10 **Ecology and Diversity of Microaerophilic Fungi Including Endophytes** 195
Deeksha Patil, Vishal Dawkar, and Umesh Jadhav
- 11 **Fungi in Hypoxic Soils and Aquatic Sediments** 219
Irena Maček
- 12 **Chaotolerant Fungi: An Unexplored Group of Extremophile** 245
Sanjay Sahay
- 13 **Xerophilic Fungi: Physiology, Genetics and Biotechnology** 253
Sanhita Sarkar, Namita Ashish Singh, and Nitish Rai
- Part III Applications**
- 14 **Extremophilic Enzymes: Catalytic Features and Industrial Applications** 273
Kanak Choudhary, Mangesh Kumar Mankar, and Sanjay Sahay
- 15 **Biotechnological Application of Extremophilic Fungi** 315
Aneesa Fasim, H. K. Manjushree, A. Prakruti, S. Rashmi, V. Sindhuja, Veena S. More, K. S. Anantharaju, and Sunil S. More
- 16 **Extremophilic Fungal Cellulases: Screening, Purification, Catalysis, and Applications** 347
Sangita Chouhan, Rajkumar Ahirwar, Tejpal Singh Parmar, Ashiq Magrey, and Sanjay Sahay
- 17 **Extremophilic Fungal Xylanases: Screening, Purification, Assay, and Applications** 367
Aneesa Fasim, A. Prakruti, H. K. Manjushree, S. Akshay, K. Poornima, Veena S. More, and Sunil S. More



Gender and Feminism

UNDERSTANDING AND EMPOWERING WOMEN

Editors

Dr. Yogesh Kumar Sharma

Dr. Susheela B.

Dr. Anupama Rawat



Worldwide Circulation through Authorspress Global Network

First Published in 2022

by

Authorspress

Q-2A Hauz Khas Enclave, New Delhi-110 016 (India)

Phone: (0) 9818049852

E-mail: authorspressgroup@gmail.com

Website: www.authorspressbooks.com

Gender and Feminism: Understanding and Empowering Women

ISBN 978-93-5529-146-2

Copyright © 2022 Editors

Concerned authors are solely responsible for their views, opinions, policies, copyright infringement, legal action, penalty or loss of any kind regarding their articles. Neither the publisher nor the editors will be responsible for any penalty or loss of any kind if claimed in future. Contributing authors have no right to demand any royalty amount for their articles.

Printed in India at Thomson Press (India) Limited

Gender and Feminism

UNDERSTANDING AND EMPOWERING WOMEN

Editors

Dr. Yogesh Kumar Sharma

Dr. Susheela B.

Dr. Anupama Rawat



AUTHORS P R E S S

Contents

<i>Foreword</i>	7
Prof. M. Priyadarshini	
<i>Foreword</i>	9
G. Avanceeja Rajesh	
<i>Editor's Preface</i>	11
Prof. Yogesh Kumar Sharma	
<i>Editor's Preface</i>	15
Dr. B. Susheela	
<i>Editor's Preface</i>	17
Dr. Anupama Rawat	
<i>Introduction</i>	27
Prof. Yogesh Kumar Sharma	
1. Feminism that Transformed the Status of Women in India	37
Raja Kumar Tenali	
2. Distant Flew Indian Flamingo: Anandi Gopalrao Joshi	46
Sayce Abhay Patil	
3. An Analogical Representation of Women's Life with Respect to Biblios and their Present Status	50
Dr. Angel Ruth Shalom	
4. A Comparative Study on Cross Culture Aspects of Individualism and Collectivism in the Novels of Chandani Lokuge and Yasmin Gooneratne	61
Dr. P. Mattaiah Yadav	
5. A Modern Perspective of Ecofeminism through Disney Movies	69
Parvathy C.S.	
6. The Treatment of Women in Indian English Poetry	76
Dr. Indira Banerji	



Gender and Feminism

UNDERSTANDING AND EMPOWERING WOMEN

Prof. Yogesh Kumar Sharma is a poet, story writer, essayist, blogger and an author. Prof. Yogesh Kumar Sharma (M.A., MPhil, PhD) is presently working as Professor in Swami Shraddhanand College, (University of Delhi), Alipur, Delhi-110036. He was also Associate NCC Officer (ANO) in his college. His early education was held at Khurja and higher education, (M.A., M.Phil., Ph.D.) at Institute of Advanced Studies, Meerut University Meerut, U. P., INDIA. His research work "Influence of *The Bhagavad Gita*" on Matthew Arnold is considered as outstanding scholarly work in literary circles. He has published several articles and his poems on different topics have found place in a number of newspapers, magazines and journals. He has written many poems (more than 700), short stories (around 50), articles and essays (200) on different aspects of society concerning day to day life of the people. As a poet he has authored a book *Voices: Dharohar: The Glory of the North-East* is another book written by him, based on travelogue

About the Book

The definition of 'Feminism' is not about strengthening gender diversity by standing on the side of a woman; it is a common struggle for human freedom marred by gender inequality.

This book is a noble attempt by the academic scholars to unlearn and dismantle the normative structures and identify the difference. Multiple social, religious, caste and ethnic identities have tried to negotiate themselves through uprisings, protests, movements to fight against oppression espousing their cause as marginalised and the less privileged. To universalise but to contextualise the difference and to bring into forefront diverse grievances, needs and expectations and make each and every campaign more inclusive is the need of the hour. This book creates a bench mark by focusing on differences and not on similarities. It is a trail marked for inclusivity.



AUTHORS PRESS
Publishers of Creative & Scholarly Books

ISBN 978-93-5529-146-2



9 789355 291462

₹ 1500 | \$ 40

A TEXTBOOK OF ORGANIC FARMING

Under the New **National Education Policy**, academic session in various universities and colleges of Madhya Pradesh: From 2021-22 onwards, according to the syllabus issued by the Department of Higher education, Govt. of Madhya Pradesh as a vocational subject for the B.Sc. First year students



1 YR
B.Sc



DR. SHOBHA SHRIVASTAVA

DR. SAURABH PAGARE

Contents of the course

Unit	Topic	Page No.
1.	Introduction and Principles, Developing organic farm, Conversion of soil to Organic Soil Cultivation and Tillage, Creating good growing conditions, Soil Compaction, Types of Soil Cultivation.	1
2.	Crop Planning and Management, Crop Rotation, Intercropping, Cover Crops, Crop-Animal Association. Mulching: Definition, Uses, Selection of Mulch Material, Source of Mulching Material, Applications of mulch.	16
3.	Organically manage the field, Live Fencing, Water and Nutrient Management, Weed Management, Pest and Disease Management. Plant propagation, Criteria For Seed Evaluation, Characterization and Multiplication, Importance of Traditional Varieties, Seed Conservation.	40
4.	Other form of organic management, Biodynamic Agriculture, Rishi Krishi, Natural Farming, Panchgavya Krishi, Natueco Farming, Homa Farming.	98



Book is available on Amazon, Flipkart, & www.hsrpublications.com

RS. 225 /-



HSRA
Publications



सुर निनाद



डॉ. सुधा दीक्षित

सुर निनाद

डॉ. सुधा दीक्षित

✽ प्रकाशक :

कैलाश पुस्तक सदन

हमीदिया मार्ग, भोपाल-462 001

फोन : (0755) 2535366, 4256804

email : kailashpustak@gmail.com

website : www.kpsbhopal.com

✽ संस्करण : 2022

✽ ISBN : 978-93-93913-23-4

✽ © लेखक एवं प्रकाशक

✽ मूल्य : 750/- रुपये

✽ मुद्रक :

मेश प्रिंटर्स, 105-ए, सेक्टर-एफ,

गोविन्दपुरा इंडस्ट्रियल एरिया, भोपाल

Note:

- All Rights Reserved. No Part of this Publication may be reproduced or transmitted in any form or by any means without prior written permission of the author and publisher.
- All disputes are subject to Bhopal jurisdiction only.

DISCLAIMER

- Every effort has been made to avoid errors or omissions in this publication. In spite of this, some errors might have crept in. Any mistake, error or discrepancy noted may be brought to our notice which shall be taken care of in the next edition. It is notified that the publisher or the author or printer of this book does not take any responsibility for the absolute accuracy of any information published and for any damage or loss of action caused to any one, of any kind, in any manner arising therefrom.
- For binding mistakes, misprints or for missing pages, etc., the publisher's liability is limited to replacement within one month of purchase by similar edition.



डॉ. सुधा (त्रिपाठी) दीक्षित

- ✦ जन्म - 29 मई, 1962 वाराणसी
- ✦ पिता - स्व. डॉ. आदित्य नारायण त्रिपाठी
प्रसिद्ध वैज्ञानिक एवं प्रोफेसर माइनिंग इंजीनियरिंग आई.टी.विभाग, काशी हिन्दू विश्वविद्यालय, वाराणसी
- ✦ सितार की शिक्षा - विश्व विख्यात सितार वादक एवं पूर्व प्रोफेसर काशी हिन्दू विश्वविद्यालय स्व. डॉ. राजभान सिंह जी,

- ✦ प्रारम्भिक शिक्षा - सेंट्रल हिन्दू गर्ल्स स्कूल, वाराणसी
- ✦ बी.ए.बी.म्यूज (आनर्स सितार) - मंच कला संकाय एवं महिला महाविद्यालय काशी हिन्दू विश्वविद्यालय
- ✦ एम. म्यूज - 1984, काशी हिन्दू विश्वविद्यालय
- ✦ डी. म्यूज - (डॉक्टर ऑफ म्यूजिक) 1987, काशी हिन्दू विश्वविद्यालय
- ✦ उपलब्धियाँ - काशी हिन्दू विश्वविद्यालय में रिसर्च Scholarship, शोध परख लेख, उत्तर प्रदेश संगीत नाटक अकादमी की शोध पत्रिका, "छायानट" में प्रकाशित Research Hunt प्रकाशन, ओमनाद द्वारा अन्तरराष्ट्रीय संगोष्ठी में शोधवाचन एवं प्रकाशन, म.प्र. हिन्दी ग्रन्थ अकादमी की शोध पत्रिका "रचना" में अनेक प्रकाशन, अनेक अन्य पत्रिकाओं में वाचन एवं प्रकाशन
डॉ. भीमराव अम्बेडकर विश्वविद्यालय, देवी अहिल्या बाई विश्वविद्यालय में R.D.C. विषय विशेषज्ञ, वर्तमान में राजा मान सिंह तोमर संगीत एवं कला विश्वविद्यालय, ग्वालियर में महामहिम राज्यपाल द्वारा मनोनित कार्यपरिषद सदस्य, अखिल भारतीय महिला परिषद द्वारा शिक्षा के क्षेत्र में महत्वपूर्ण योगदान हेतु सम्मानित
- ✦ मंच प्रदर्शन - विगत 25 वर्षों से शास्त्रीय रागों पर आधारित वाद्य वृन्द की रचना तथा स्वयं एवं छात्राओं द्वारा मंच प्रदर्शन, भारत भवन, राज भवन, दूरदर्शन की 50वीं वर्षगांठ पर प्रदर्शन एवं प्रसारण, रविन्द्र भवन में म.प्र. उत्सव, माण्डू उत्सव, लगातार तीन वर्ष पंचमड़ी उत्सव में प्रदर्शन Indian council for cultural relation (Ministry of external affairs Govt. of India) Invited to perform vadya vrinda 2012, स्वयं एवं छात्राओं द्वारा फ्यूजन संगीत की सी.डी. जो विगत वर्षों से न्यूजीलैण्ड के रेडियो "तरना" द्वारा प्रसारित की जाती है। आर्ट ऑफ लिविंग द्वारा विश्व के 1200 सितार वादकों के सामूहिक वादन कार्यक्रम में भारत की एक मात्र संस्था से सर्वाधिक छात्राओं की भगागीदारी "गिनीज बुक" ऑफ वर्ल्ड रिकॉर्ड" में कार्यक्रम दर्ज किया गया, 2016 में World cultural festival में स्वयं एवं छात्राओं द्वारा दिल्ली में सामूहिक वादन।
- ✦ प्रकाशन
"राग रजन" (वाद्य संगीत की रचनाएँ)
"राग दर्शन" ब्रेल लिपि में (वाद्य संगीत की रचनाएँ)
वर्तमान में सरोजिनी नायडू शासकीय कन्या स्नातकोत्तर महाविद्यालय में प्राध्यापक एवं विभागाध्यक्ष संगीत के पद पर कार्यरत।



समाज कार्य की अवधारणा एवं तकनीकी

CONCEPT & TECHNIQUES OF SOCIAL WORK

डॉ. शैलजा दुबे

डॉ. आरती श्रीवास्तव

डॉ. शशांक शेखर ठाकुर

डॉ. शीबा जोसफ

आरती पब्लिशिंग हाऊस एण्ड डिस्ट्रिब्यूटर्स

समाज कार्य की अवधारणा एवं तकनीक

लेखक

डॉ. शैलजा दुबे

डॉ. आरती श्रीवास्तव

डॉ. शशांक शेखर ठाकुर

डॉ. शीबा जोसफ

आरती पब्लिशिंग हाउस एण्ड डिस्ट्रीब्यूटर्स

प्रकाशक द्वारा

आरती पब्लिशिंग हाउस एण्ड डिस्ट्रीब्यूटर्स

ISBN : 978-81-944685-0-9
सर्वाधिकार : आरती पब्लिशिंग हाउस एण्ड डिस्ट्रीब्यूटर्स
मूल्य : ₹700.00
प्रथम संस्कारण : 2022

प्रकाशक : आरती पब्लिशिंग हाउस एण्ड डिस्ट्रीब्यूटर्स

युगांतर अंतराष्ट्रीय शोध पत्रिका

ऑफिस : ए-5, क्रिश्चियन कालोनी, पटेल चेस्ट,

दिल्ली विश्वविद्यालय, दिल्ली-110007

E-mail: akhilesh_tiwari1979@yahoo.com

santoshtiwari05712@gmail.com; www.theyugantar.in

Mob.: 9818156392, 9455251733

इस पुस्तक का कोई भी भाग किसी भी रूप में या किसी भी अर्थ में प्रकाशक की अनुमति के बिना प्रकाशित नहीं किया जा सकता है। इस पुस्तक का सर्वाधिकार सुरक्षित है।



आरती पब्लिशिंग हाऊस एण्ड डिस्ट्रिब्यूटर्स

युगान्तर अंतरराष्ट्रीय शोध पत्रिका

हेड आफिस : ए-5, क्रिश्चियन कालोनी
दिल्ली विश्वविद्यालय, दिल्ली-110007

E-mail: akhilesh_tiwari1979@yahoo.com
santoshtiwari05712@gmail.com; www.theyougantar.in
Mob.: 9918156392, 9455251733

ISBN No. 978-81-944685-0-9



ISBN No. 978-81-944685-0-9

मूल्य : 700 /-



Handbook of
Biofuels

Edited by **Sanjay Sahay**



Handbook of Biofuels

Contents

Edited by

Sanjay Sahay

Sarojini Naidu Government Girl's Postgraduate College,
Bhopal, India



ACADEMIC PRESS

An imprint of Elsevier

Academic Press is an imprint of Elsevier
125 London Wall, London EC2Y 5AS, United Kingdom
525 B Street, Suite 1650, San Diego, CA 92101, United States
50 Hampshire Street, 5th Floor, Cambridge, MA 02139, United States
The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, United Kingdom

Copyright © 2022 Elsevier Inc. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or any information storage and retrieval system, without permission in writing from the publisher. Details on how to seek permission, further information about the Publisher's permissions policies and our arrangements with organizations such as the Copyright Clearance Center and the Copyright Licensing Agency, can be found at our website: www.elsevier.com/permissions.

This book and the individual contributions contained in it are protected under copyright by the Publisher (other than as may be noted herein).

Notices

Knowledge and best practice in this field are constantly changing. As new research and experience broaden our understanding, changes in research methods, professional practices, or medical treatment may become necessary.

Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds, or experiments described herein. In using such information or methods they should be mindful of their own safety and the safety of others, including parties for whom they have a professional responsibility.

To the fullest extent of the law, neither the Publisher nor the authors, contributors, or editors, assume any liability for any injury and/or damage to persons or property as a matter of products liability, negligence or otherwise, or from any use or operation of any methods, products, instructions, or ideas contained in the material herein.

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

A catalog record for this book is available from the Library of Congress

ISBN: 978-0-12-822810-4

For Information on all Academic Press publications
visit our website at <https://www.elsevier.com/books-and-journals>

Publisher: Joe Hayton

Acquisitions Editor: Lisa Reading

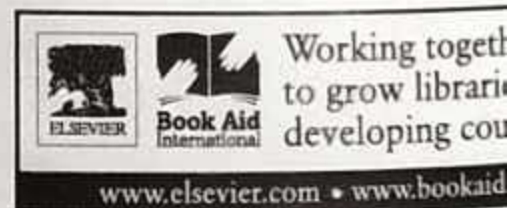
Editorial Project Manager: Chris Hockaday

Production Project Manager: Kamesh Ramajogi

Cover Designer: Greg Harris

Typeset by MPS Limited, Chennai, India

Printed in India



Contents

List of contributors

xi

Part A Introduction

1. An economic analysis of biofuels: policies, trade, and employment opportunities 3
Bipasa Datta
 - 1.1 Introduction and the current scenario 3
 - 1.2 Issues and limitations related to biofuel production: first- versus next-generation biofuels 7
 - 1.3 Biofuel policies in action 11
 - 1.4 International trade of biofuels 19
 - 1.5 Poverty, welfare, and employment aspects of biofuel production 24
 - 1.6 Concluding comments 26References 27
Further reading 29
2. Technoeconomic analysis of biofuel production with special reference to a downstream process 31
Ramesh Kumar, Rashmi Dhurandhar, Sankha Chakraborty, Bikram Basak and Alak Kumar Ghosh
 - 2.1 Introduction 31
 - 2.2 Necessity of biofuels 32
 - 2.3 Different tools for technoeconomic analysis 33
 - 2.4 Different process for downstream separation of bio-EtOH 36
 - 2.5 Case study: PI achieved using novel multistaged membrane scheme for biofuels production 38
 - 2.6 Conclusion 43References 43

Part B Bioenergy: potential feedstock

3. Plants: a sustainable platform for second-generation biofuels and biobased chemicals 4
Loredana Lopez, Fiammetta Alagna, Linda Bianco, Isabella De Bari, Carlo Fasano, Francesco Panara and Giorgio Perrella
 - 3.1 Introduction 4
 - 3.2 Biomass composition and primary platform chemicals 4
 - 3.3 Biotechnological approaches to improve plants for various applications 5References 6
4. Energy plants (crops): potential natural and future designer plants 7
Mario Motto and Sanjay Sahay
 - 4.1 Introduction 7
 - 4.2 Potential natural energy plants (crops) 7
 - 4.3 Biomass feedstocks for biorefinery use 7
 - 4.4 Genetic applications to improve productivity 10
 - 4.5 Concluding remarks 10Acknowledgments 11
References 11
5. Algal biorefinery: technoeconomic analysis 11
Susana Rodríguez-Couto
 - 5.1 Introduction 11
 - 5.2 Microalgae 11
 - 5.3 Microalgal biorefinery 11
 - 5.4 Technoeconomic analysis 11
 - 5.5 Analytical tools 11

29.3	Types of biofuel cells	552	32	Carbon dioxide capture for biofuel production	605
29.4	Characteristics of enzymatic and microbial fuel cells	556		<i>Prachi Nawkarkar, Ashok Ganesan and Shashi Kumar</i>	
29.5	Recent development and new approaches in enzymatic as well as microbial fuel cell	565	32.1	Introduction	
29.6	Application and challenges	567	32.2	Carbon capture and storage	605
29.7	Future aspect of biofuel cells	570	32.3	Microbial application for biofuels	605
References		570	32.4	Carbon dioxide capture using microalgae	608
30	Biomass-based electrification	577	32.5	Carbon concentrating mechanism	609
	<i>Geeta Kumari and Sanjib Kumar Karmee</i>		32.6	Biofuels	609
30.1	Introduction	577	32.7	Value-added products	610
30.2	Advantages of biomass-based electrification	578	32.8	Concluding remarks and future perspectives	613
30.3	Primary routes for biomass-based electrification	578	References		614
30.4	Economics of biomass-based electrification	585			615
30.5	Biomass-based electrification in India: prospects and challenges	585	33	Solar intervention in bioenergy	621
30.6	Conclusions	587		<i>Indra Neel Pulidindi and Aharon Gedanken</i>	
References		587	33.1	Introduction	621
			33.2	Solar intervention in biodiesel production	621
			33.3	Solar intervention in bioethanol production	630
			33.4	Conclusion	638
			Acknowledgments		640
			References		640
Part J					
New directions					
31	Nanotechnological interventions in biofuel production	593	34	The pursuits of solar application for biofuel generation	643
	<i>Enosh Phillips</i>			<i>Sanjay Sahay</i>	
31.1	Introduction	593	34.1	Introduction	643
31.2	Production around the globe	593	References		657
31.3	Biofuel production	595			
31.4	Challenges in biofuel production	595	Index		663
31.5	Nanotechnology in biofuel production	596			
31.6	Nanocellulose in biofuel production	600			
31.7	Conclusion	602			
Acknowledgment		602			
References		602			
Further reading		604			

Part G

Biogas: the decentralised fuel**24. Decentralized biogas plants: status, prospects, and challenges 473***T.E. Rasimphi, D. Tinarwo, C. Sambo, M.A. Mutheiwana and P. Mhlanga*

24.1 Introduction	473
24.2 The role of renewable energy	474
24.3 Biogas formation process	474
24.4 Factors controlling anaerobic digestion	475
24.5 Anaerobic digesters	475
24.6 Types of organic matter used as feedstock to biodigesters	476
24.7 Biogas technology overview and status	476
24.8 The history of biogas	478
24.9 Potential of small-scale biogas plants to improve livelihood	478
24.10 Challenges to biogas commercialization in developing countries (e.g., African countries) and possible measures	479
24.11 Challenges of small-scale digesters penetration	480
24.12 Conclusion	481
Acknowledgments	482
References	482

25. Biogas: microbiological research to enhance efficiency and regulation 485*Reckson Kamusoko, Raphael M. Jingura, Zedias Chikwambi and Wilson Parawira*

25.1 Introduction	485
25.2 Conceptual framework	485
25.3 Process parameters	487
25.4 Practices to enhance efficiency and regulation of anaerobic digestion	487
25.5 Research and development agenda for enhancing efficiency and regulation of AD	494
25.6 Conclusion	494
References	494

Part H

Syngas**26. Biogas technology implementation in rural areas: a case study of Vhembe District in Limpopo Province, South Africa 501***T.E. Rasimphi, D. Tinarwo, S. Ravhengani, C. Sambo and P. Mhlanga*

26.1 Introduction	501
-------------------	-----

26.2 Objectives	502
26.3 Study area	502
26.4 Methods	503
26.5 Findings	504
26.6 Challenges of biogas technology penetration in rural areas	507
26.7 Conclusion	508
Acknowledgments	508
References	508

27. A biotechnological overview of syngas fermentation 511*Spyridon Achinas, Jelmer Mulder and Gerrit Jan Willem Euverink*

27.1 Introduction	511
27.2 Syngas as feedstock	512
27.3 Syngas fermentation	514
27.4 Conclusion	523
References	523

Part I

Bioelectricity**28. Biofuel cell: existing formats, production level, constraints, and potential uses 531***Makarand M. Ghangrekar, Swati Das and Sovik Das*

28.1 Introduction	531
28.2 Production levels of bioelectricity through microbial fuel cells	532
28.3 Production levels of hydrogen and other fuels employing microbial electrolysis cells	535
28.4 Biofuel production level using microbial carbon-capture cells and microbial electrosynthesis cells	538
28.5 Potential uses of MET	544
28.6 Major constraints and future outlook	545
28.7 Conclusion	545
Acknowledgment	546
References	546

29. Enzymatic and microbial biofuel cells: current developments and future directions 551*Anwasha Mukherjee, Vishwata Patel, Manisha T. Shah and Nasreen S. Munshi*

29.1 Introduction	551
29.2 A brief history of biofuel cell development	552

17.5 Hurdles	345	20.5 Challenges associated with biohydrogen	
17.6 Future prospects	347	20.6 Approaches to overcome the challenges related to biohydrogen	410
References	348	20.7 Conclusion	413
		Acknowledgment	415
		References	416
			418
18. Microbial biodiesel: a comprehensive study toward sustainable biofuel production	353	21. Biological routes of hydrogen production: a critical assessment	419
<i>Sushobhan Pradhan, Ritesh S. Malani and Asmita Mishra</i>		<i>Neha Singh and Shyamali Sarma</i>	
18.1 Introduction	353	21.1 Introduction	
18.2 Fundamentals of biodiesel processing techniques	354	21.2 Mechanism of biological H ₂ production	419
18.3 Microbial lipid synthesis using various types of oleaginous microorganisms	360	21.3 Routes of biohydrogen production	420
18.4 Summary and future prospects	368	21.4 Substrates as feedstocks for biohydrogen	420
References	369	21.5 Technical challenges of biological routes	423
		21.6 Strategies to enhance microbial hydrogen production	424
		21.7 Future perspectives and conclusion	425
		References	429
			430
19. Assessment of farm-level biodiesel unit—a potential alternative for sustainable future	377	22. Thermochemical routes applying biomass: a critical assessment	435
<i>Sushobhan Pradhan and Ritesh S. Malani</i>		<i>Geeta Kumari and Sanjib Kumar Karmee</i>	
19.1 Introduction	377	22.1 Introduction	435
19.2 Biodiesel production methodology	378	22.2 Circular economy approach to sustainability	436
19.3 Commercial-level biodiesel units	381	22.3 Thermochemical valorization processes for biomass	436
19.4 Farm-level biodiesel units	384	22.4 Challenges and future prospects	447
19.5 Life cycle assessment of farm-level biodiesel unit	388	22.5 Conclusion	448
19.6 Case studies conducted across the globe for analysis of the feasibility of farm-level biodiesel production units	390	References	448
19.7 Future prospective and challenges	393		
References	393		
		23. Splitting of water: biological and non-biological approaches	453
		<i>Ashitha S and Soney C. George</i>	
Part F		23.1 Introduction	453
Biohydrogen: the cleanest fuel		23.2 Hydrogen production	453
20. Biohydrogen: potential applications, approaches, and hurdles to overcome	399	23.3 Application of nanotechnology in hydrogen production	454
<i>Kajol Gorla, Richa Kothari, Har Mohan Singh, Anita Singh and V.V. Tyagi</i>		23.4 Water-splitting approaches	455
20.1 Introduction	399	23.5 Biological approaches	455
20.2 Various feedstocks for biohydrogen	400	23.6 Non-biological approaches	461
20.3 Biohydrogen generation from biophotolysis	401	23.7 Conclusion and future aspects	468
20.4 Potential applications of biohydrogen	406	Acknowledgements	468
		Abbreviations	468
		References	469

12. Downstream process: toward cost/energy effectiveness	249		
<i>Ramesh Kumar, Rashmi Dhurandhar, Sankha Chakraborty and Alak Kumar Ghosh</i>			
12.1 Introduction	249		
12.2 Selection of economical feedstocks	250		
12.3 Novel approaches for biomass utilization for Bio-EtOH production	251		
12.4 Tradition routes used for the production of biofuels	253		
12.5 Different traditional routes of downstream processing of bio-EtOH and their limitations	253		
12.6 Potential of novel membrane-based separation technology	254		
12.7 Downstream processing using membrane-based separation technology	255		
12.8 A novel concept of a membrane-integrated hybrid system for downstream processing	257		
12.9 Conclusions and prospects	258		
References	258		
13. Process integration: hurdles and approaches to overcome	261		
<i>M. Picón-Núñez</i>			
13.1 Introduction	261		
13.2 Reaction improvements leading to reduced energy consumption	262		
13.3 Heat recovery in bioethanol processes	263		
13.4 Thermal integration of distillation columns	272		
13.5 Combined heat and power	276		
13.6 Process development challenges	279		
13.7 Conclusions	280		
References	280		
14. Community-level second-generation bioethanol plant: a case study focused on a safety issue	283		
<i>Roberto Lauri and Biancamaria Pietrangeli</i>			
14.1 Introduction	283		
14.2 The case study: the bioethanol production plant	283		
14.3 Hazards related to bioethanol: the flammability	284		
14.4 Pool fire: predictive models of thermal radiation	285		
14.5 The case study: pool fire deriving from pump leakage	289		
14.6 Bioethanol pool fire: results and discussion	289		
14.7 Conclusions	293		
List of abbreviations	293		
References	294		
15. Third-generation bioethanol: status, scope, and challenges	295		
<i>Deepthi Hebbale and T.V. Ramachandra</i>			
15.1 Introduction	295		
15.2 Bioethanol production from algal biomass	296		
15.3 Case study: bioethanol from <i>Enteromorpha intestinalis</i>	304		
15.4 Economic prospects of macroalgae biorefinery	306		
15.5 Scope for further research	307		
15.6 Conclusion	308		
Acknowledgment	309		
References	309		
Part D			
Biobutanol: renewed interest			
16. Biobutanol, the forgotten biofuel candidate: latest research and future directions	315		
<i>Dorota Kregiel</i>			
16.1 Advantages of biobutanol production	315		
16.2 Microbial producers	316		
16.3 Feedstocks for butanol production	318		
16.4 Strain improvement	320		
16.5 Process improvement	321		
16.6 Conclusions	324		
References	324		
Part E			
Biodiesel: potential sources and prospect			
17. Algal biodiesel: technology, hurdles, and future directions	331		
<i>Ashok Ganesan, Prachi Nawkarkar and Shashi Kumar</i>			
17.1 Introduction	331		
17.2 Biodiesel	331		
17.3 Technologies for biodiesel production	332		
17.4 Solvents used for oil extraction	337		

5.6 Case study	121	8.6 Conclusion	
5.7 Conclusions	122	References	182
References	122		183
6. Tapping wastewater resource: why and how?	125	9. Decongestion of lignocellulosics: a critical assessment of physicochemical approaches	189
<i>Emmanuel Kweinor Tetteh, Dennis Asante-Sackey, Edward Kwaku Armah and Sudesh Rathilal</i>		<i>Santosh Kumar, Rekha Kushwaha, Sudhir Kumar and Madan L. Verma</i>	
6.1 Introduction	125	9.1 Introduction	
6.2 Wastewater treatment and resource recovery	126	9.2 Lignocellulose structure	189
6.3 Wastewater–energy nexus	133	9.3 Physical and chemical pretreatment methods	190
6.4 Nutrients recovery from wastewater	138	9.4 Physicochemical methods	192
6.5 Emerging wastewater treatment and nutrient recovery technologies	140	9.5 Conclusion and future directions	193
6.6 Conclusions	142	Acknowledgment	199
Acknowledgments	142	References	199
References	143		199
7. Food wastes/residues: valuable source of energy in circular economy	147	10. Deconstruction of lignocelluloses: potential biological approaches	207
<i>R. Rajkumar and C. Kurinjimalar</i>		<i>Sanjay Sahay</i>	
7.1 Introduction	147	10.1 Introduction	207
7.2 Circular economy in bioenergy	147	10.2 Physicochemical features of LCB	207
7.3 Sources of food wastes, global status, and their energy values	148	10.3 Need for pretreatment	208
7.4 Food waste to bioenergy production	150	10.4 Available pretreatment methods	209
7.5 Techniques for the production of bioenergy	154	10.5 Nonbiological versus biological pretreatment methods	210
7.6 Value-added products from food wastes	156	10.6 Objectives of biological pretreatment	210
7.7 Future perspectives	157	10.7 Tools of biological pretreatment	211
7.8 Conclusion	157	10.8 Biological approaches to pretreat LCB	213
Acknowledgments	157	10.9 Importance of biological approaches	224
References	158	10.10 Factors affecting biological pretreatment	225
		10.11 Conclusion	225
		References	225
		Further reading	232
Part C		11. Lignin: value addition is key to profitable biomass biorefinery	233
Bioethanol: 2G and 3G		<i>Edward Kwaku Armah, Maggie Chetty, Sudesh Rathilal, Dennis Asante-Sackey and Emmanuel Kweinor Tetteh</i>	
8. Biorefinery involving terrestrial and marine lignocellulosics: concept, potential, and current status	167	11.1 Introduction	233
<i>Diptarka Dasgupta and Arushdeep Sidana</i>		11.2 Lignocellulose biomass compositions	234
8.1 Biorefinery: an emerging concept	167	11.3 Sources and types of lignin	236
8.2 Biomass for biorefineries: availability, cost, and supply logistics	168	11.4 Lignin fragmentation	237
8.3 Biorefinery technologies for energy security and renewable chemicals: concept, potential, and current status	171	11.5 Biological processing of lignin	240
8.4 Challenges in accomplishing the goal	179	11.6 Current application of lignin	240
8.5 Environmental impact of biorefineries	182	11.7 The economic perspective of lignin	242
		11.8 Conclusion	244
		Acknowledgments	245
		References	245

Handbook of Biofuels

Edited by **Sanjay Sahay**

Key Features

- Reviews all existing and emerging technologies for the production of advanced biofuels
- Includes biofuel applications with compatible global application case studies
- Offers new pathways for converting biomass

Handbook of Biofuels looks at the many new developments in various types of bioenergy as well as the significant constraints in their production and/or applications, and the hurdles to overcome. Beyond introducing current approaches and possible future directions of research, this book covers sources and processing of raw materials to downstream processing, constraints involved and research approaches to address and overcome these needs.

With chapters on the techno-economic analysis of biofuel production and concepts and step-by-step approaches in bioenergy processing, the objective of this book is to present a comprehensive and all-encompassing reference about bioenergy to students, teachers, researchers, and professionals.

About the Editor

Dr. Sanjay Sahay, Professor of Botany, Sarojini Naidu Government Girl's Postgraduate College, Bhopal, India, obtained his PhD degree in fungal genetics from Patna University, Patna, India, and received his postdoctoral research experience in yeast molecular biology from the Indian Institute of Science, Bangalore, India. His research interests are 2G bioethanol, cold-active enzymes, and psychrophilic fungi. He has taught for 27 years, guided 18 PhD students, published more than 30 papers in peer-reviewed journals, contributed 3 book chapters, and submitted 2 patent applications (one granted) in 2G bioethanol. He has been selected as the Biotechnology National Associate by the Department of Science and Technology, Government of India and as a Research Awardee by the University Grants Commission, India.

ISBN 978-0-12-822810-4



9 780128 228104



ACADEMIC PRESS

An Imprint of Elsevier
elsevier.com/books-and-journals

TEXT BOOK OF
**Cell Biology and
Biochemistry**
for undergraduates

1st Edition



Dr. Devika Dogra



A Text Book of Cell Biology and Biochemistry

•
First Edition

Author

Dr. Devika Dogra



Iterative International Publishers

Title of the Book: A Text Book of Cell Biology and Biochemistry

Edition: First - 2022

Copyright 2022 © Author

**Dr. Devika Dogra, Ph.D (Biotechnology) IMBIBE AWARD FELLOW
M.Sc. (Biotechnology), B.Ed, PGDCA, Faculty Biotechnology,
Department of Botany and Biotechnology, Sarojini Naidu Government
Girl's PG (Autonomous) College, Bhopal (M.P.)**

No part of this book may be reproduced or transmitted in any form by any means, electronic or mechanical, including photocopy, recording or any information storage and retrieval system, without permission in writing from the copyright owners.

Disclaimer

The author is solely responsible for the contents published in this book. The publisher or editors don't take any responsibility for the same in any manner. Errors, if any, are purely unintentional and readers are requested to communicate such errors to the editors or publishers to avoid discrepancies in future.

ISBN: 978-93-92591-66-2

MRP: 270/-

Printed at & Distribution by:

Selfypage Developers Pvt Ltd.,
Pushpagiri Complex,
Beside SBI Housing Board,
K.M. Road Chikkamagaluru, Karnataka.
Tel.: +91-8861518868
E-mail: info@iiponline.org

IMPRINT: I I P Iterative International Publishers

Contents

Unit 1 Cell as a Basic Unit:	1 - 8
Historical background of the Cell, Cell Structure, Cell Theory, Prokaryotic Cell and Cell Organelles, Difference between Prokaryotic and Eukaryotic cell	
Unit 2 Cell Organelles and Cell Cycle:	9 - 47
Eukaryotic Cell and Cell Organelles: Ultrastructure of Eukaryotic cell (Plant and Animal cells), Structure and function of cell organelles: Cell membrane, Mitochondria, Chloroplast, Endoplasmic reticulum, Golgi bodies, Lysosomes, Peroxisomes, Nucleus, Cell Cycles and Cell division, Apoptosis or Cell death	
Unit 3 Molecular Structure of Water:	48 - 57
Water structure and Buffer: Properties of Water, Interaction of Water, Role of Water in Bio molecular Structure, Acid and Bases, Buffer Structure Chemical Bonds: Chemical Bonds (Ionic Bond, Covalent Bond, Coordinate Bond, Non-Covalent Bonds, Hydrogen Bond)	
Unit 4 Biomolecules:	58 - 79
Sources, Nomenclature, Classification, Structures, Characteristics, and Functions: - 1- Carbohydrates, 2- Lipids, 3- Proteins 4- Nucleic Acids.	
Unit 5 Tools and Techniques:	80 - 95
Principle and Applications of Light Microscopy, Centrifugation, Chromatography (Paper, Thin layer and Column), Colorimeter and Spectrophotometer.	

About the Author



Dr. Devika Dogra is a faculty of Biotechnology of Sarojini Naidu Govt. Girls PG College, Bhopal. She did M.Sc. in Biotechnology from College Affiliated to University of Mysore and Ph.D. from Department of biotechnology, Barkatallah University, Bhopal under IMBIBE AWARD FELLOWSHIP Sponsored by M.P. Biotech Council. She is teaching Cell Biology, Bioinstrumentation, Molecular Biology and Genetic Engineering Since 2010.



ISBN: 978-93-92591-66-2



MRP: 270/-

DMI NOTE 5 PRO
DUAL CAMERA

2022/

VERSO

PALACIO



Dr. Anupama Rawat

Dr. Anita Evelyn

Miss. Riya Mary Peter

VERSO PALACCIO

Verso Palaccio

(An Anthology of Poems and Short Stories)

Compiled by

Dr. Anupama Rawat

Dr. S. Anita Evelyn

Miss. Riya Mary Peter

VERSO PALACCIO

SUBHARAMBH PUBLICATION HOUSE

Email: subharambhpublisher@gmail.com

Instagram: https://www.instagram.com/subharambh_publication_house/

COPYRIGHT © Dr. Anupama Rawat 2022

COPYRIGHT © Dr. S. Anita Evelyn 2022

COPYRIGHT © Riya Mary Peter 2022

All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form by any means, Electronic, Mechanical, Magnetic, Optical, Chemical, Manual, Photocopying, Recording or otherwise (Except for mention in reviews or edited excerpts in the media) without the prior written consent of its writer and publisher.

This is a work of fiction. Names, characters, places and incidents are either product of the author's imagination or are used fictitiously and any resemblance to any actual person, living or dead, events or locales is purely coincidental.

"VERSO PALACCIO"

ISBN: 978-93-5504007-7

FICTION 1st Edition

TYPESETTING BY: SUSMITA SWAIN

COVER DESIGN: SUBHAM DEV KUMAR

PRICE: 350/-

The opinions/ contents expressed in this book are solely of the author and do not represent the opinions/ standings/ thought of publisher



**About the Editor
Dr. Anupama Rawat**

Dr. Anupama Rawat is a Qualified professional with a doctorate, M.Phil and M.A degree in Economics. A Teaching professional with 31 plus years of teaching experience she has authored/co-authored multiple publications, and member of various professional bodies and contributor in participatory decision making and policy formulation exercises. She has also served as a Director/Professor, with Symbiosis Centre for Management Studies, *Symbiosis International university, Pune on Lien, granted and also as Dean / Professor & Head at Dr. B.R. Ambedkar University of Social Sciences, Mhow, Indore* on deputation from Higher Education Department, Govt of M.P. She has a Track record of delivering on academic (teaching & research) goals and management targets of institution/college growth and expansion. She is also the State level Coordinator for Cambridge Assessment English Training Programme of M.P. She is also a poet who writes in Hindi as well as English and can speak Kannada language.

Dr. Anupama Rawat



Let's try Gandhi once again

*They wrote Gandhi
in text in words in pages in books,
on black boards, on walls, on posters, on pamphlets, on
LED screens, on the back of the buses, motor vehicles,
even trucks at times,*

*But could they ever underline and bother to decipher
deep in his writings of his words and give meaning to
each.*

They looked for Gandhi in khadi, in topis, in kurtas, in
bandis** and even in their loin cloth dhotis.
But could they ever find him in the very touch of all these
objects and their objectives.*

*They discussed Gandhi in meetings, in seminars, in
conferences, in workshops, in symposia and even in their
determined marches.*

*But never could they implement even one of his single
ideas in any of the successful schemes. Did they pose*

आरपी यूनीफाइड

राष्ट्रीय शिक्षा नीति के
प्राथमिक अनुसंधान

प्रायोगिक जन्तु विज्ञान

डॉ. एस. एम. सक्सेना
डॉ. मुकेश दीक्षित

प्रथम वर्ष



राम प्रसाद एण्ड संस

आरपी यूनीफाइड

प्रायोगिक जन्तु विज्ञान

Practical Zoology

राष्ट्रीय शिक्षा नीति प्रथम वर्ष पाठ्यक्रमानुसार

लेखक

डॉ. एस. एम. सक्सेना

एम.एस-सी, पीएच.डी.

पूर्व विभागाध्यक्ष, जन्तु विज्ञान विभाग

शासकीय सरोजिनी नायडू कन्या (स्वशासी) स्नातकोत्तर महाविद्यालय, भोपाल

प्रोफेसर एवं पूर्व अध्यक्ष, जन्तु विज्ञान अध्ययन मण्डल

बरकतउल्लाह विश्वविद्यालय, भोपाल

एवं

डॉ. मुकेश दीक्षित

एम.एस-सी, पीएच.डी., एफ.एस.एल.एससी.

शासकीय सरोजिनी नायडू कन्या (स्वशासी) स्नातकोत्तर महाविद्यालय, भोपाल



राम प्रसाद एण्ड संस

राष्ट्रीय शिक्षा नीति के पाठ्यक्रमानुसार विज्ञान विषय के हमारे प्रकाशन प्रथम वर्ष हेतु

पर्यावरण अध्ययन

Environmental Studies

योग एवं ध्यान

Yoga & Meditation

जन्तु विज्ञान (प्रथम एवं द्वितीय प्रश्नपत्र)

Zoology (Ist & IInd Paper)

जन्तु विज्ञान (गौण एवं वैकल्पिक विषय)

Zoology (Minor / Optional Paper)

वनस्पति विज्ञान (प्रथम एवं द्वितीय प्रश्नपत्र)

Botany (Ist & IInd Paper)

वनस्पति विज्ञान (गौण एवं वैकल्पिक विषय)

Botany (Minor / Optional Paper)

रसायन (प्रथम एवं द्वितीय प्रश्नपत्र)

Chemistry (Ist & IInd Paper)

रसायन (गौण एवं वैकल्पिक विषय)

Chemistry (Minor / Optional Paper)

एस.एम. सक्सेना एवं मुकेश दीक्षित

S.M. Saxena & Mukesh Dixit

एस.एम. सक्सेना एवं मुकेश दीक्षित

S.M. Saxena & Mukesh Dixit

निरंजन श्रोत्रिय, अर्चना श्रोत्रिय
एवं अजय कुमार भारद्वाज

Niranjan Shrotriya, Archana Shortiya
& Ajay Kumar Bhardwaj

निरंजन श्रोत्रिय, अर्चना श्रोत्रिय
एवं अजय कुमार भारद्वाज

Niranjan Shrotriya, Archana Shortiya
& Ajay Kumar Bhardwaj

आर.सी. सारस्वत एवं डी.डी. मिश्रा

R.C. Saraswat & D.D. Mishra

आर.सी. सारस्वत एवं डी.डी. मिश्रा

R.C. Saraswat & D.D. Mishra



राम प्रसाद एण्ड संस
भोपाल-462 001



POSTHUMANISM AND POST PANDEMIC

Editors

Dr. Anupama Rawat
Dr. A. Thenmozhi
Dr. P. Mattaiah Yadav

POSTHUMANISM AND POST PANDEMIC

Editors

Dr. Anupama Rawat
Dr. A. Thenmozhi
Dr. P. Mattaiah Yadav



AUTHORS P R E S S

Worldwide Circulation through Authorspress Global Network
First Published in 2022

by

Authorspress

Q-2A Hauz Khas Enclave, New Delhi-110 016 (India)

Phone: (0) 9818049852

E-mail: authorspressgroup@gmail.com

Website: www.authorspressbooks.com

Posthumanism and Post Pandemic

ISBN 978-93-5529-402-9

Copyright © 2022 Editors

Concerned authors are solely responsible for their views, opinions, policies, copyright infringement, legal action, penalty or loss of any kind regarding their articles. Neither the publisher nor the editors will be responsible for any penalty or loss of any kind if claimed in future. Contributing authors have no right to demand any royalty amount for their articles.

Printed in India at Thomson Press (India) Limited

Contents

<i>Preface</i>	5
Dr. Anupama Rawat	
<i>Preface</i>	7
Dr. A. Thenmozhi	
<i>Preface</i>	9
Dr. P. Mattaiah Yadav	
<i>Foreword</i>	11
Dr. A. Saridha M.A. M.Phil. Ph.D.	
1. The Existential Choice in Philip Roth's <i>Sabbath's Theater</i>	17
Rabi Kanta Roy	
2. Humanity, Companionship, Suffering and Dignity: Analysing Covid-19 Situation with Reference to Samuel Beckett's <i>Waiting for Godot</i>	26
Tanbir Shahnawaz	
3. Contemplation of Philosophical Approach and Cognitive Science (Psychology) in Indian Knowledge System	34
Dr. Vedprakash Borkar	
4. In Love with an Operating System: The Posthuman Plot in the film ' <i>Her</i> '	62
Wilson K. D.	
5. Posthumanism and the Post-Pandemic Era based on Kazuo Ishiguro's <i>Never Let me Go</i>	70
Esther George	
6. Posthumanism: A Philosophical Approach to Recognise Our Past, Present and Future	78
Raja Kumar Tenali	
7. Online Classes: Challenges and Solutions	87
Dr. Maria Justina Grey	



Dr. Anupama Rawat is a Qualified professional with a doctorate, M.Phil and M.A degree in Economics. A Teaching professional with 31 plus years of teaching experience she has authored/co-authored multiple publications, and member of various professional bodies and contributor in participatory decision making and policy formulation exercises.

She has also served as a Director/Professor, with Symbiosis Centre for Management Studies, *Symbiosis International university, Pune on Lien, granted and also as Dean / Professor & Head at Dr. B.R. Ambedkar University of Social Sciences, Mhow, Indore on deputation from Higher Education Department, Govt of M.P.*

She has a Track record of delivering on academic (teaching & research) goals and management targets of institution/college growth and expansion. **She is also the State level Coordinator for Cambridge Assessment English Training Programme of M.P.** She is also a poet who writes in Hindi as well as English and can speak Kannada language.



Dr. A. Thenmozhi, Head & Assistant Professor of English, Government Arts College, Dharmapuri, Tamil Nadu. She has presented papers at various international seminars and conferences and also published articles in UGC care list journals and peer-reviewed journals. She has attended state, national, and international seminars, conferences, UGC webinars and workshops. She has served as a convenor for one-day state and national level workshops.

Her area of specialization is Indian Dalit literature and she has done her research on Tamil Dalit writings.



Dr. P. Mattaiah Yadav is working as a Lecturer in English at Government Degree College for Women, Nalgonda, Telangana state. He was awarded M.Phil in Pronunciation and Ph.D in Translation Studies from The English and Foreign Languages University, Hyderabad. His areas of teaching and writing are English language, literature, linguistics and Phonetics, translation studies, cultural studies, and film studies.

He is a member of many academic bodies, reviewer for a few international journals and presented papers at National and International conferences, published papers in Scopus, UGC CARE listed, Web of science journals. He was invited for many conferences of NAAC as a Resource Person.



AUTHORS PRESS

Publishers of Creative & Scholarly Books

ISBN 978-93-5529-402-9

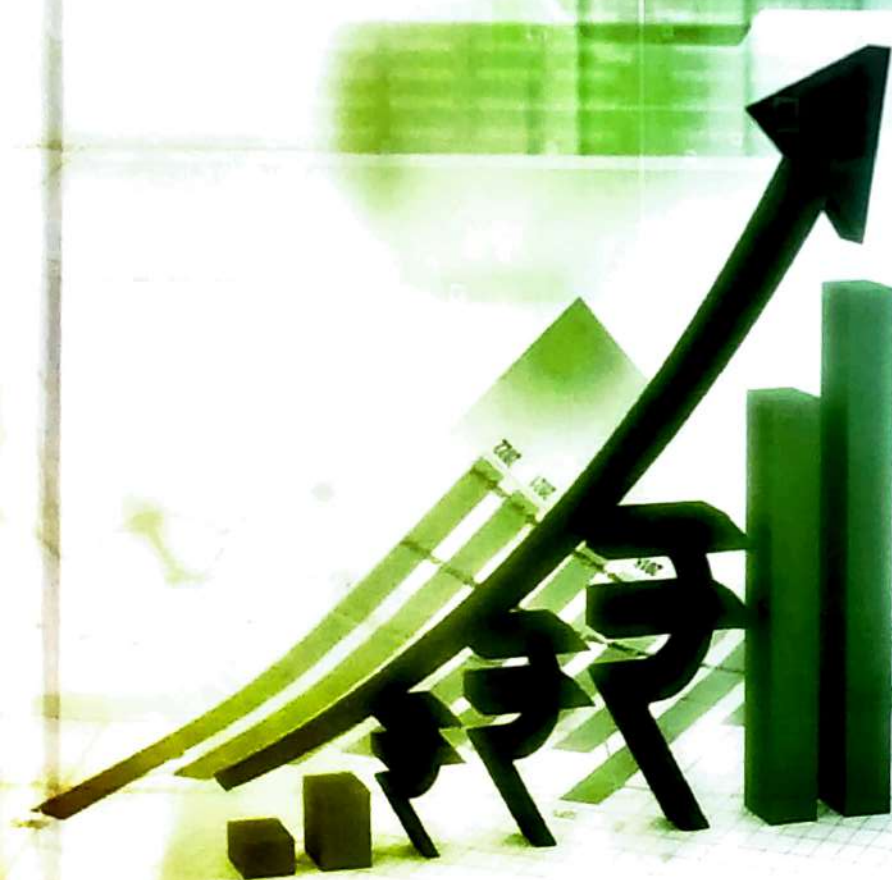


₹ 1500 | \$ 40

INDIAN ECONOMY

An Introduction

Dr. Preeti Pachori



INDIAN ECONOMY

An Introduction