

# Modern Trends in Medicinal and Aromatic Plants

Dr. Geeta Tewari  
Dr. Penny Joshi  
Dr. Lalit M. Tewari



## Modern Trends in Medicinal and Aromatic Plants

Dr. Geeta Tewari  
Dr. Penny Joshi  
Dr. Lalit M. Tewari



Indu Book Services Pvt. Ltd.

## ABOUT THE BOOK

The book "Modern Trends in Medicinal and Aromatic Plants" presents recent advances and research in the field of medicinal and aromatic plant. These plants synthesize different classes of secondary metabolites such as alkaloids, carbohydrates, lipids, phenols, saponins, and terpenes which are commercially important in pharmaceutical, cosmetic and food and flavouring industries. The book includes 16 chapters highlighting different aspects of commercially important plant-based flavor compounds and their therapeutic potential. The phytochemical screening and antioxidant and antimicrobial potential of *Hedychium spicatum*, *Rhododendron arboreum*, *Urtica dioica*, *Ageratum conyzoides*, *Rubia cordifolia*, *Pogostemon benghalensis*, *Aloe* strains, *Phyllanthus amarus*, *Salvia* species, *Crassocephalum crepidioides* and *Rhodiola wallichiana* were explored in detail. Other chapters consider the usefulness of medicinal plants as spices and anthelmintic agents. Book also includes the study on phytochemical, pharmacological overview of Fabaceae trees, phytochemical, morphological, biological properties of *Cynoglossum* and anti-polycystic ovarian syndrome potential of some medicinal plants. The book is an effective reference for undergraduate and postgraduate students along with chemists working in the field of natural product, environmental, pharmaceutical, cosmetic, medicinal and nutrition chemistry.



**Dr. Geeta Tewari**, M. Sc., NET, GATE, Ph. D. is working as Professor in the Department of Chemistry, Assistant Dean Student Welfare, D. S. B. Campus and Deputy Director, IQAC, Kumaun University, Nainital. She has authored 04 edited books (03 National and 01 International) and two text books. Her publications include 85 research papers in reputed national and international journals, 20 book chapters and more than 20 popular articles in different magazines. She has completed eight research projects of UGC, UCOST, USERC, MOEn and IERP. She is member of various professional societies. She got Teacher of the Year Award 2021, Prof D N Agrawal Award 2022 and Prof Y P S Pangtey Research Award 2022. She is also a recipient of Young Scientist and Women Scientist Awards. Sixteen students completed their M. Sc. Dissertation and eight students completed Ph. D. under her supervision. Her Ph. D. scholar received Governor's Award for best research in 2015.



**Dr. Penny Joshi**, M.Sc., Ph.D. from University of Delhi, India, Post-doctoral Scientist, Department of Cell Stress Biology at the Roswell Park Cancer institute (RPCI), Buffalo, United States is presently working as an Assistant Professor, in the Department of Chemistry, D. S. B. Campus, Kumaun University, Nainital. Her area of interests includes synthetic chemistry, medicinal chemistry and cancer chemoprevention. She has published 30 research papers in reputed National and International Journals and 07 book chapters. Two US patents also go to her publication credit. One student has been awarded Ph. D. degree under her supervision and currently eight students are pursuing Ph. D. under her guidance. She has completed three research projects funded by UGC, DRDO and MoEF&CC and currently there is one ongoing DST-SERB project. She is a recipient of Prof. K. S. Valdiya Research Award in the year 2022.



**Dr. Lalit M. Tewari**, M. Sc., Ph. D. is working as Professor in the Department of Botany, Coordinator, IGNOU, D. S. B. Campus, and Director, Research and Development Cell, Kumaun University, Nainital. He has authored fourteen books and ten edited magazines on Uttarakhand culture. He has published 171 research papers in reputed national and international journals, 14 floras and 24 book chapters and more than 100 popular articles in different magazines. He has completed eleven research projects of UGC, UCOST, MOEn, DBT, NMPB and IERP. He got Uttarakhand Ratna Award 2016, Appreciation Certificate from Hon'ble Governor, Uttarakhand for NSS in the year 2017 & 2018, Teacher of the year Award 2020, Director of the year Award 2021, Asia Top 50 Scientists by EETCRS, Mumbai in 2021 and Prof Y P S Pangtey Research Award 2022. He is also a Fellow of Botanical Society (FBS). Forty one students completed Ph. D. and two students completed M. Phil. under his supervision. Administratively, he served as OSD, Deputy Controller, Exam, Programme Coordinator, NSS, Kumaun University, Nainital.



**INDU BOOK SERVICES PVT. LTD.**

(Publishers & Distributors)

4638 1st Floor, 21 Ansari Road, Daryaganj, New Delhi - 110002

Phone : 011-43584152, Mobile : +91-9873655211, 8851457915

E-mail : [indubook@gmail.com](mailto:indubook@gmail.com), [indubook@ymail.com](mailto:indubook@ymail.com)

Website : [www.indubookservices.com](http://www.indubookservices.com)

₹ 4995

ISBN: 978-93-91377-78-6



# **Modern Trends in Medicinal and Aromatic Plants**

# **Modern Trends in Medicinal and Aromatic Plants**

**Dr. Geeta Tewari  
Dr. Penny Joshi  
Dr. Lalit M. Tewari**



**Indu Book Services Pvt. Ltd.**

(Publishers & Distributors)

New Delhi

Modern Trends in Medicinal and Aromatic Plants

Dr. Geeta Tewari, Dr. Penny Joshi and Dr. Lalit M. Tewari

© Publisher and Authors

First Published: 2023

ISBN : 978-93-91377-78-6

**Disclaimer:** The views expressed in the book are that of the Author/s and not necessarily of the publisher and the organizations they are associated with.

**All rights reserved.** No part of this publication may be reproduced stored in a retrieval system or transmitted, by any means, electronic mechanical, photocopying, recording, without permission. Any person who does any unauthorised act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

*Printed in India:*

**INDU BOOK SERVICES PVT. LTD.**

(ISO 9001:2015 Certified - IAF Certified)

(Publishers & Distributors)

4638 1st Floor, 21 Ansari Road,

Daryaganj, New Delhi - 110002

**Phone** : 011-43584152,

**Mobile** : +91-9873655211, 8851457915

**E-mail** : indubook@gmail.com  
indubook@ymail.com

**Website** : www.indubookservices.com

*Typeset by*

SHAGUN GRAPHICS, Delhi-110086

# Contents

|                                                                                                                                                                                                       |                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| Foreword                                                                                                                                                                                              | vii                                                                       |
| Preface                                                                                                                                                                                               | ix                                                                        |
| 1. <b>Chemical Composition and Therapeutic Potential of <i>Hedychium spicatum</i> Buch. Ham. Rhizomes</b>                                                                                             | 1                                                                         |
| Aabha, Bhawana Kanyal, Krishna Rana, Neeta Negi, Geeta Tewari, Chitra Pande, Lata Rana, Kshitindra Kumar Singh, Shalini Singh, Girish C. Kharkwal and Kamaksha Mishra                                 |                                                                           |
| 2. <b>Medicinally Important Local Spices of the Indian Himalayan Region</b>                                                                                                                           | 15                                                                        |
| Tripti Mishra, Pushpa Joshi, Mahesh Pal and Lalita Joshi                                                                                                                                              |                                                                           |
| 3. <b>Phytochemistry and Pharmacology of <i>Rhododendron arboreum</i> and <i>Urtica dioica</i> L.: A Review</b>                                                                                       | 28                                                                        |
| Anuradha Bisht and Garima Matela                                                                                                                                                                      |                                                                           |
| 4. <b><i>In-vitro</i> and <i>in-vivo</i> Anti-Polycystic Ovarian Syndrome Activity of Medicinal Plants</b>                                                                                            | 46                                                                        |
| Chandrakanta, Tanuj Joshi, and Archana Negi Sah, Sweta Bawari and Abha Tripathi                                                                                                                       |                                                                           |
| 5. <b><i>Ageratum conyzoides</i> L. from Uttarakhand; Terpenoid Profile, Its Variation with Altitude and Antimicrobial Activity</b>                                                                   | 67                                                                        |
| 253                                                                                                                                                                                                   | Chandra M. S. Bisht, Anand B. Melkani, Manisha Palni and Leelawati Nitwal |
| 6. <b>Potential Therapeutic Activities Derived from Manjistha (<i>Rubia cordifolia</i> Linn.)</b>                                                                                                     | 89                                                                        |
| Deepti Tiwari, I. D. Bhatt, L. M. Tiwari, R.C. Sundriyal, Veena Pande and Deepika Pant                                                                                                                |                                                                           |
| 7. <b>Assessment of Antioxidant and Antimicrobial Potential of Leaf Extracts of <i>Pogostemon benghalensis</i> (Burm.f.) Kuntze from Kumaun Western Himalaya</b>                                      | 113                                                                       |
| Disha Upreti, L. M. Tewari, Medha Durgapal, Geeta Tewari, Santosh Kumar Upadhyay, Amrita kumari, Naveen Chandra Pandey, Geetanjali Upadhyay, Vasundhara Lodhiyal, Girish C. Kharkwal and Deepika Pant |                                                                           |

|     |                                                                                                                                                                                                     |     |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 8.  | <b>Antihelmintic Activity of Different Medicinal Plants</b>                                                                                                                                         | 134 |
|     | Divya Mahar, Manjunath Chatti, Nitish Semwal and Mahesh Chandra Arya                                                                                                                                |     |
| 9.  | <b>Variation in Antioxidant Activity and Antioxidant Constituents in Different Growth Stages of Leaves of Four <i>Aloe</i> Strains Grown at Middle Hill Climatic Condition of Western Himalayas</b> | 161 |
|     | H. K. Pandey, Anchala Guglani, Swati Arya, V. Kumar, S.S. Upadhyay and Nilofar Akhtar                                                                                                               |     |
| 10. | <b>Phytochemical, Pharmacological and Ethnomedicinal Aspects of <i>Phyllanthus amarus</i></b>                                                                                                       | 173 |
|     | Mamta Bisht, Amit Semwal, Ajay Verma and Deepika Pant                                                                                                                                               |     |
| 11. | <b>Chemical Composition and Antimicrobial Activity of Essential Oils of <i>Salvia</i> Species from Uttarakhand</b>                                                                                  | 185 |
|     | Lalit Mohan, Anand B. Melkani and Deepshikha Joshi                                                                                                                                                  |     |
| 12. | <b>Bioactive and Pharmacological Properties of <i>Crassocephalum crepidioides</i> (Benth) S. Moore: A Brief Review</b>                                                                              | 208 |
|     | Manoj Karakoti, Pankaj Ayra and Prasoon K. Joshi                                                                                                                                                    |     |
| 13. | <b>Chemical Composition, Antimicrobial and Antioxidant Activity of Essential Oil from Rhizomes of <i>Rhodiola wallichiana</i> (Hook.f.) S.H.FU</b>                                                  | 216 |
|     | Mohammad S. Javed, Sanjay Kumar, Pawan Kumar, Iram, Sachin Gupta and Rishendra Kumar                                                                                                                |     |
| 14. | <b>Phytochemistry, Morphology and Biological Properties of Some Medicinal Plants of Genus <i>cynoglossum</i>: A Review</b>                                                                          | 233 |
|     | Neelam Rawat, Sapna, Pushpa Joshi and Nilofar Akhtar                                                                                                                                                |     |
| 15. | <b>Biopesticidal Effects of Leaf Extracts Of <i>Urtica parviflora</i> (Roxb.) on the Larvae of, <i>Helicoverpa armigera</i> (Hübner)</b>                                                            | 251 |
|     | Niharika Bisht, Himanshu Pande, Divya Pangtey, Kanchan Bhandari, Raveesh Tripathi, Shankar Kumar, and Bodh R. Kaushal                                                                               |     |
| 16. | <b>Phytochemical and Pharmacological Overview of Some Trees from <i>Fabaceae</i> Family</b>                                                                                                         | 265 |
|     | Sushma Kholiya, Ameeta Tiwari, Nirmala Pargaian, Himanshu Pandey and Kavita Pant                                                                                                                    |     |
|     | <b>Index</b>                                                                                                                                                                                        | 285 |

---

## Chapter 8

---

# Antihelmintic Activity of Different Medicinal Plants

---

Divya Mahar<sup>1</sup>, Manjunath Chatti<sup>2</sup>, Nitish Semwal<sup>1</sup> and Mahesh Chandra Arya<sup>1\*</sup>

<sup>1</sup>Department of Chemistry, DSB Campus, Nainital, Kumaun University, Uttarakhand 263002 India

<sup>2</sup>Australian Centre for Electromaterials Science, School of Chemistry, Monash University, Clayton, Victoria 3800, Australia

\*Corresponding author email: mcary181@gmail.com

---

### Abstract

Medicinal plants have been used by tribal communities since ancient times for the treatment of several diseases. Tribal people are known to have rich tradition of using a number of plants for their anthelmintic, antioxidant, antibacterial, antifungal activities. The medicinal plants have lesser side effects in comparison to the synthetic drugs. Worldwide helminthiasis is one of the major health problems of organisms, they cause diseases in humans, terrestrial and aquatic animals and sometimes it can cause serious health hazards. Though pharmaceutical drugs are used to cure these diseases due to their effectiveness and fast relief but these drugs are not only expensive but may also have many side effects. There are so many plants, on the other hand which show anthelmintic activities with little or no side effects. This chapter sum-up the anthelmintic activity of traditional medicinal plants. The crude extract of leaves, stem, bark, rhizome, fruit, root, and shoot of medicinal plants are used to cure different diseases caused by different species of Platyhelminthes. The specific bioactive molecules isolated from medicinal plants can be used for further analysis of herbal drugs.

**Keywords:** anthelmintic activities, medicinal plants, tapeworm, trematodes, monogeneans, turbellarians

---

## 8.1 INTRODUCTION

The term 'Platyhelminthes' comprises of two Greek terms; platy and helminths; which means "flatworms". They belong to the kingdom Animalia and are commonly known