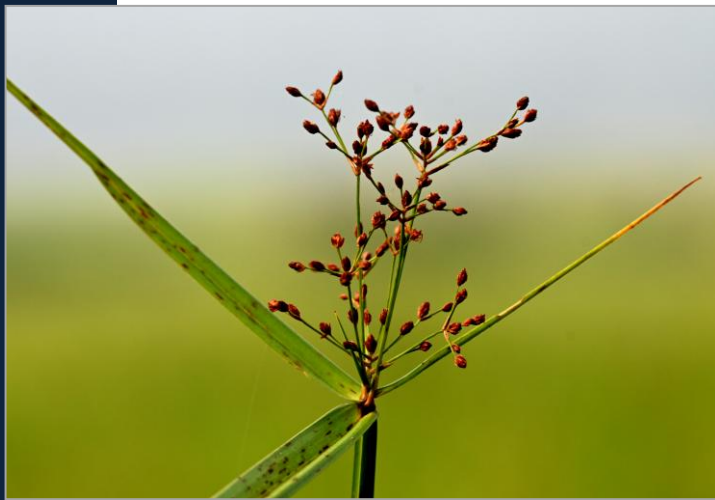


PHARMACOLOGICALLY IMPORTANT

Cyperaceae

OF INDIA



**Amaryllis Langbang
Emdad Hossain
Rajkumari Supriya Devi**



Pharmacologically Important CYPERACEAE of India



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Dedicated to elucidating the medicinal potential of the Cyperaceae family, with research focused on advancing antimicrobial discovery, generating new scientific insights and contributing to global natural drug development. This plant, of particular importance in India, represents a promising species with significant therapeutic value worthy of wider recognition.

Amaryllis Langbang

The Cyperaceae family, particularly the genus *Cyperus* in India, holds significant pharmacological value due to its strong medicinal properties and wide spread use in traditional healthcare systems.

Emdad Hossain

Cyperaceae are the quiet architects of wetlands: sustaining biodiversity, stabilizing ecosystems and preserving cultural and medicinal heritage.

Rajkumari Supriya Devi





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PREFACE

Plants have served as vital sources of medicine since early human civilization. Among medicinal plants, members of the family Cyperaceae remain comparatively underexplored despite their wide distribution, ecological significance and long history in traditional healing systems. India, with its rich floristic diversity and varied ecosystems, hosts numerous species of Cyperaceae with notable pharmacological potential. This edited volume *Pharmacologically Important Cyperaceae of India* brings together current scientific knowledge on selected sedge species with established or emerging medicinal value. Once viewed mainly as weeds or dominant wetland plants, many Cyperaceae members are now recognized for their phytochemical richness and diverse biological activities, including antioxidant, antimicrobial, cytotoxic and therapeutic properties. The aim of this book is to bridge traditional knowledge with ecological perspectives and modern pharmacological research. The chapters present detailed accounts of the phytochemical composition and bioactivity of species such as *Actinoscirpus grossus*, *Cyperus compressus*, *C. rotundus*, *C. cuspidatus*, *C. haspan*, *C. polystachyos*, *Bulbostylis barbata*, *Abildgaardia ovata* and others, with emphasis on pharmacological and nutraceutical potential influenced by ecological adaptations. The contributions also highlight the relevance of these plants in addressing challenges such as antibiotic resistance, livestock health and sustainable natural therapeutics. Adopting an interdisciplinary approach integrating pharmacology, phytochemistry, ecology and applied biological sciences, this volume offers experimentally supported insights in a clear and systematic manner. Editors hope that, it will serve as a valuable reference for students, researchers, academicians and professionals in medicinal plant research and natural product chemistry, while encouraging further exploration, conservation and sustainable use of lesser-known sedges.

Editors

BACKGROUND

In the present era of rapid environmental change, emerging diseases and declining effectiveness of synthetic drugs, there is an urgent need to rediscover and scientifically validate plant-based resources that are both effective and sustainable. Medicinal plants offer a vital link between human health and ecosystem health, yet many botanically and pharmacologically important groups remain inadequately studied. Cyperaceae family, despite its wide distribution and ecological dominance in wetlands, grasslands and disturbed habitats, has received limited attention in mainstream research and education. *Pharmacologically Important Cyperaceae of India* responds to this gap by documenting the medicinal relevance of selected sedge species that are often overlooked, misidentified or dismissed as weeds. At a time when antibiotic resistance, biodiversity loss and climate-driven habitat degradation pose serious global challenges, this book highlights how ecologically resilient plants can serve as sources of novel bioactive compounds and natural therapeutic solutions. By integrating phytochemical and pharmacological evidence with ecological context, this book highlights the importance of conserving functional plant diversity alongside exploring its applied value. For educationists, this book provides an updated, research-oriented resource that can support teaching in botany, pharmacognosy, environmental science and life science curricula. The species-based chapters with experimental insights make it particularly useful for undergraduate and postgraduate learning, project work and research training. It encourages students to look beyond conventional medicinal plants and appreciate the scientific potential of the lesser-known taxa. For conservationists and environmental planners, this volume offers a compelling argument for the protection of sedge dominated habitats such as wetlands and marginal ecosystems. By demonstrating the pharmacological and nutraceutical significance of Cyperaceae species, this book strengthens the need for habitat conservation, sustainable utilization and inclusion of sedges in biodiversity management strategies. It promotes a shift in perception from weeds to valuable biological resources, thereby supporting informed conservation policies and community awareness. The very purpose of this book is to serve as a timely and relevant contribution to sustainable healthcare, biodiversity education and conservation science. It looks forward to inspire informed research, responsible resource use and long-term conservation of India's underappreciated yet pharmacologically important sedge flora.

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Amaryllis Langbang

She holds a Master of Science (M.Sc.) degree in Microbiology and has dedicated nine years of professional experience as a Drug Analyst in the Microbiology Section of the Regional Drug Testing Laboratory, Guwahati, Assam, India. Through extensive laboratory work, she has developed strong expertise in microbial analysis, quality evaluation and the rigorous standards required for drug safety and compliance. Currently, she is a research scholar at Assam Don Bosco University, India awaiting her final thesis presentation. Her research focuses on the medicinal potential of plants, with a special emphasis on *Syzygium diospyrifolium* (Wall. ex Duthie) S.N. Mitra. Through a multidisciplinary approach involving molecular docking, phytochemical analysis, antimicrobial assessment and antibiofilm studies, her work aims to explore and validate the therapeutic value of this traditionally important species. In addition to her primary research plant, she has deep interest in the Cyperaceae family, known for their fascinating ecological adaptability and rich ethnomedicinal importance. Many members of this family, such as species of *Cyperus*, possess notable therapeutic properties including antimicrobial, anti-inflammatory, diuretic and antioxidant activities. Their diverse phytochemical composition and longstanding use in traditional healing systems make them an inspiring subject for scientific exploration, especially in the field of natural product research. Driven by curiosity and a passion for medicinal plant research, she continue to work towards bridging traditional knowledge with modern scientific validation, contributing meaningfully to the fields of microbiology, pharmacognosy and natural product discovery.



Dr. Emdad Hossain

He is currently serving as an Associate Professor in the Department of Pharmaceutical Technology at Jadavpur University, Kolkata. Prior to joining Jadavpur University, he held the positions of Principal and Professor at Pharmacy College, Azamgarh, Uttar Pradesh, India. He earned both his M.Pharm and Ph.D. degrees from Jadavpur University, Kolkata and has devoted the past twenty-four years to teaching and research in the field of Natural Products Studies. Over the course of his academic career, Dr. Hossain has authored twenty-three research and review papers published in reputed, high-impact, peer-reviewed international journals, along with one conference proceeding, one editorial, twenty-six book chapters, and six edited books. He has presented more than 83 research papers at various national and international conferences, demonstrating his active engagement with the scientific community. Dr. Hossain is a life member of several distinguished professional associations. He serves as the Editor-in-Chief of the Global Academic Journal of Pharmacy and Drug Research. Additionally, he is the Associate Editor of the Indian Journal of Research in Pharmacy & Biotechnology and he contributes as an editorial board member to twelve other national and international journals. He is also an active reviewer for several journals published by Elsevier, Springer-Nature, Wiley, and Taylor & Francis. A sought-after academic speaker, he has delivered numerous lectures at refresher courses, as well as at national and international conferences in India and abroad. His contributions to academia and research have earned him numerous honors, including the Best Teacher Award (2002), Jewel of India Award (2014), Young Performer Award (2015), Best Faculty Award (2018), Shikshak Shri Award (2018), Bharat Ratna Dr. Abdul Kalam Gold Medal Award (2018), Nirali's Pharma Recognition Award (2019), Best Researcher Award (2019), Best Educationist Award (2019), Rastriya Vidya Gaurav Gold Medal Award (2019), SAS Best Principal Award (2020) and the Prof. M. L. Schroff Pharma Recognition Award (2025), among several other accolades.



Dr. Rajkumari Supriya Devi

She is currently serving as Project Director at Ambika Prasad Research Foundation, Odisha, with nearly 10 years of research experience in the field of botany, medicinal plants, ethnobotany, microbiology, wetland and riverine ecosystems, forest fire studies and taxonomy. She has authored over 135 publications, including 75 research papers, 55 book chapters and 7 books in reputed national and international platforms. She played a key role in formulating the Management Plan for the State Botanical Garden, Nandankanan Zoological Park, Odisha and has delivered numerous presentations on wetlands, ethnobotany, riverine ecology and biodiversity conservation at national and international seminars and workshops. Her current research interest focuses on the wetland flora wildlife fodder plants from Cyperaceae and with an emphasis on wetland conservation.

“With every blade, sedges stitch together the fragile fabric of
wetland ecosystem”



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