

Botany Of Mangroves

Focusing on Venezuela and Mexico, this edited volume from the International Society of Halophyte Utilisation (ISHU) explores the environmental issues facing South and Central America's coastal ecosystems, and discusses the uses of mangrove species and other halophytes in addressing issues of both coastal pollution and upland soil salinisation. The book presents a series of case studies and examines the economic potential of mangrove restoration and halophyte production.

Mangroves are typically tropical coastal ecosystems found in the inter-tidal zones of river deltas and back water areas. They represent highly dynamic and fragile ecosystems, yet they are the most productive and biologically diversified habitats of various life forms including plants, animals and microorganisms. Mangroves are a resource of many different products, including: microorganisms that harbor a diverse group of industrially important enzymes, antibiotics, therapeutic proteins and vaccines; timber resistant to rot and insects; and medicinal plants. Divided into three main parts, Biotechnological Utilization of Mangrove Resources first provides a broad introduction into mangrove ecology. Subsequent chapters discuss the biodiversity of mangroves, including the diverse nature of the organisms within the mangroves themselves. The final part pays special attention to biotechnological utilization of mangroves. Topics such as antimicrobial activity of mangrove-derived products, anti-oxidant activity of mangrove derived products and pharmaceutical applications, are covered in detail. Biotechnological Utilization of Mangrove Resources brings the latest research and technologies in mangrove biology into one platform, providing readers with an up-to-date view on the area. This would serve as an excellent reference book for researchers and students in the field of marine biology especially interested in mangrove ecosystems.

This book presents a comprehensive overview and analysis of mangrove ecological processes, structure, and function at the local, biogeographic, and global scales and how these properties interact to provide key ecosystem services to society. The analysis is based on an international collaborative effort that focuses on regions and countries holding the largest mangrove resources and encompasses the major biogeographic and socio-economic settings of mangrove distribution. Given the economic and ecological importance of mangrove wetlands at the global scale, the chapters aim to integrate ecological and socio-economic perspectives on mangrove function and management using a system-level hierarchical analysis framework. The book explores the nexus between mangrove ecology and the capacity for ecosystem services, with an emphasis on thresholds, multiple stressors, and local conditions that determine this capacity. The interdisciplinary approach and illustrative study cases included in the book will provide valuable resources in data, information, and knowledge about the current status of one of the most productive coastal ecosystem in the world.

The recent discovery of diverse-eoic flowers and floral organs in Cretaceous strata has revealed astonishing details about the structural and systematic diversity of early angiosperms. Exploring the rich fossil record that has accumulated over the last three decades, this is a unique study of the evolutionary history of flowering plants from their earliest phases in obscurity to their dominance in modern vegetation. The discussion provides comprehensive biological and geological background information, before moving on to summarise the fossil record in detail. Including previously unpublished results based on research into Early and Late Cretaceous fossil floras from Europe and North America, the authors draw on direct palaeontological evidence of the pattern of angiosperm evolution through time. Synthesising palaeobotanical data with information from living plants, this unique book explores the latest research in the field, highlighting connections with phylogenetic systematics, structure and the biology of extant angiosperms.

In Defense of Plants

Mangrove Ecosystems of Asia

Frontier Encounters

The Botany of Mangroves

Dynamic Sedimentary Environments of Mangrove Coasts

Field Guide to the Mangroves of Queensland

Challenges readers to reconsider the moral standing of plants.

The Australian Institute of Marine Science presents the index to the "Field Guide to the Mangroves of Queensland." The index offers access to information about the characteristics and location of mangrove types in Queensland. The mangroves are listed by common name and scientific name.

In the 2007 third edition of her successful textbook, Paula Rudall provides a comprehensive yet succinct introduction to the anatomy of flowering plants. Thoroughly revised and updated throughout, the book covers all aspects of comparative plant structure and development, arranged in a series of chapters on the stem, root, leaf, flower, seed and fruit. Internal structures are described using magnification aids from the simple hand-lens to the electron microscope. Numerous references to recent topical literature are included, and new illustrations reflect a wide range of flowering plant species. The phylogenetic context of plant names has also been updated as a result of improved understanding of the relationships among flowering plants. This clearly written text is ideal for students studying a wide range of courses in botany and plant science, and is also an excellent resource for professional and amateur horticulturists.

This book presents a global and interdisciplinary approach to plant ecology, guiding students through essential concepts with real-world examples.

An Exploration into the Wonder of Plants

Ecology, Biology and Taxonomy

Ecology of Mangroves

A Philosophical Botany

Early Flowers and Angiosperm Evolution

Plants as Persons

Ancient Plants and People is a timely discussion of the global perspectives on archaeobotany and the rich harvest of knowledge it yields. Contributors examine the importance of plants to human culture over time and geographic regions and what it teaches of humans, their culture, and their landscapes.

A broad introduction to the ecology of the unique environment of the saltmarsh.

Mangroves are a fascinating group of plants that occur on tropical and subtropical shorelines of all continents, where they are exposed to saltwater inundation, low oxygen levels around their roots, high light and temperature conditions, and periodic tropical storms. Despite these harsh conditions, mangroves may form luxuriant forests which are of significant economic and environmental value throughout the world - they provide coastal protection and underpin fisheries and forestry operations, as well as a range of other human activities. This book provides an up-to-date account of mangrove plants from around the world, together with silvicultural and restoration techniques, and the management requirements of these communities to ensure their sustainability and conservation. All aspects of mangroves and their conservation are critically re-examined. Those activities which threaten their ongoing survival are identified and suggestions are offered to minimise their effects on these significant plant communities.

Mangrove Ecosystem: An Overview
Mangroves: Definition and Types
'Mangrove' has been variously defined in literature. The Oxford dictionary mentioned the words 'mangrove' since 1613, indicating tropical trees or shrubs found in coastal swamps with tangled roots that grow above the ground. Later, the term 'mangrove' was referred to the individual plant or tidal forest or both, as 'Mangrove plants' and 'Mangrove ecosystem' (MacNae 1968). Chapman (1984) used the term 'mangrove' for inter tidal plants, and considered plant communities of inter tidal forest as mangrove ecosystem called 'mangal'. The term 'mangal' was also commonly used in French and in Portuguese to refer to both forest communities and to individual plants. Several workers have opined that plants growing in between the highest and the lowest tidal limits may be considered 'mangrove' (Aubreville, 1964; MacNae, 1968; Blasco, 1977; Tomlinson, 1986; Naskar & Guha Bakshi, 1987). The tidal limits of various habitats, however, can vary. Mangrove plants comprise a heterogeneous group of independently derived lineages that are defined ecologically by their occurrence in tidal zones along shorelines and in estuaries and physiologically by their ability to withstand high salt concentrations and low soil aeration. Based on their abundance, distribution, and habitat specificity, Tomlinson (1986) distinguished major and minor mangrove elements as well as mangrove associates. He recommended that mangrove species were basically of two types, viz., (1) Major element of mangals or true mangroves - with complete fidelity to the mangrove environment, and (2) Minor element of mangals - not conspicuous in mangrove habitats, rather might prefer the peripheral habitats of mangrove regions. The term 'Mangrove associate' was coined for the flora representing nonarboreal, herbaceous, sub-woody and climber species, found growing mostly in regions bordering the tidal periphery of mangrove habitats. Tomlinson (1986) used fairly rigid criteria to distinguish true mangroves from mangrove associates. In his criteria, true mangroves possess all or most of the following features: (i) occurring only in mangrove environment and not extending into terrestrial communities; (ii) morphological specialization (aerial roots, vivipary); (iii) physiological mechanism for salt exclusion and/or salt excretion; (iv) taxonomic isolation from terrestrial relatives.

Evolution of Plant-Pollinator Relationships

Mangrove Ecosystems: A Global Biogeographic Perspective

Status, Challenges and Management Strategies

The Biology of Mangroves and Seagrasses

Biotechnological Utilization of Mangrove Resources

Halophytes: An Integrative Anatomical Study

Coastal Vegetation, Second Edition is an expanded series designed to give a general account of types of ecology or habitat of British vegetation. This book is composed of 10 chapters, and begins with a brief survey of the basic ecological principles. The succeeding chapters deal with the marine algal vegetation of the littoral and sublittoral. These topics are followed descriptions of the phanerogamic and algal vegetation of salt and brackish marshes and the vegetation of sand dunes together with their lsacks. Other chapters examine the specialized vegetation associated with the drift-line and the vegetation of shingle beaches. The final chapters are concerned with the plants found on coastal cliffs and the mangrove. This book is of value to undergraduate students with subjects related to coastal vegetation.

Mangroves and seagrasses form extensive and highly productive ecosystems that are both biologically diverse and economically valuable. This book, now in its third edition and fully updated throughout, continues to provide a current and comprehensive introduction to all aspects of the biology and ecology of mangroves and seagrasses. Using a global range of examples and case studies, it describes the unique adaptations of these plants to their exacting environments; the rich and diverse communities of organisms that depend on mangrove forests and seagrass meadows (including tree-climbing shrimps, synchronously flashing fireflies, and 'gardening' sea-cucis); the links between mangrove, seagrass, and other habitats; and the evolution, biodiversity, and biogeography of mangroves and seagrasses. The economic value of mangroves and seagrasses is also discussed, including approaches to rational management of these vital resources and techniques for the restoration of degraded habitats. A final chapter, new to this edition, examines the potential effects of global climate change including sea level rise. As with other titles in the Biology of Habitats Series, particular emphasis is placed on the organisms that dominate these fascinating aquatic ecosystems although pollution, conservation, and experimental aspects are also considered. This accessible textbook assumes no previous knowledge of mangrove or seagrass ecology and is intended for senior undergraduate and graduate students, as well as professional ecologists, conservation practitioners, and resource managers.

This book uses five decades of map data, air photos, and medium to high-resolution satellite imagery to track the expansions of aquaculture and the loss of both estuarine and mangrove land covers in Ecuador. The results are staggering. In some regions, Ecuador has lost almost 50% of its estuarine space and approximately 80% of its mangrove forest. The current estuarine land cover bears no resemblance to the historic estuarine land cover. The analysis is complete from 1968 to 2014. The analysis covers all the major estuaries of mainland Ecuador. The research expands beyond purely land cover into the land use of the estuaries and the implications of the land cover transitions. The author lived in Ecuador's estuarine environments for almost two years studying this area. During this time he conducted mapping workshops with local residents, conducted 100 interviews with local actors, conducted six group discussions with fisherfolk syndicates, conducted eight presentations, worked on a shrimp farm. He was employed by the Ministry of the Environment on a Prometeo fellowship for one-year researching estuarine health and worked on mangrove replanting projects in the estuaries. In addition to the remote sensing data, the author provides a contextual framework to the analysis. It is not just hard numbers that are presented, but a remote sensing analysis tied to local actors that tell a coherent almost 50-year estuarine story at the national, provincial, and local scales. The book is intended for researchers, academics, graduate students, NGOs, and government actors including those who work in development, environment, and policy implementation. It is suitable supplemental reading for students in courses related to the coastal zone, land use change, and remote sensing. The electronically supplementary material includes all the related data to underpin the analysis as well as all the resulting GIS files.

This valuable book is a comprehensive volume on mangroves, with information accessible to both botany professionals and students. It provides an easy method of identifying mangroves and distinguishing one species from another. What is a mangrove and what are the criteria of mangroves are explained, along with descriptions of distinctions among major mangroves, mangrove associates, mangrove halophytes, and back mangals. Many photos and illustrations are provided, showing the visible features of mangroves. The volume also covers a range of other topics, including habitats and climatic conditions, morphological and reproductive features, how climate change is affecting mangroves and methods of mitigation and conservation. This book is about mangroves, the intertidal coastal forests that struggle every moment against hungry tides because mangroves flourish at the interface zone of land and sea. Like an evergreen forest in the tropical and subtropical regions of the world, mangroves form definite coastal vegetation, providing protection to people living in such fragile zones against the occurrence of frequent natural calamities. Key features: Introduces important factors about mangroves: definition, early records of mangroves, categorization, and more Looks at the distribution of mangroves worldwide along with features of mangrove habitats and climatic conditions Describes the ecology and environmental conditions, particularly the concept of intertidal zones along estuary positions where tidal flows inundate mangroves Discusses the distinct morphological attributes and reproductive phenology of major mangroves Details the attributes of mangroves, covering a total of 78 species of intertidal flora, including 32 true mangroves, along with their diagnostic features, salient attributes, and illustrations for easy identification Highlights the burning environmental issue of climate change and its impact on mangroves Provides a variety of methods of restoration, conservation, and protection of mangroves

Knowledge and Practice at the Russian, Chinese and Mongolian Border

Structure, Function, and Services

Field Identification Guide for Indian Mangroves

Tropical Ecosystems and Ecological Concepts

The Ecology of Mangrove and Related Ecosystems

A concise, descriptive overview of mangrove plants, with emphasis on individual species.

Mangrove Ecosystem Ecology and Function deals with several aspects of mangrove science, as well as conservation, management, and related policies. The book is divided into six sections and structured into 10 chapters. The first section discusses mangrove ecology, structure, and function; the second section explains mangrove physiology related to salt accumulation; the third section focuses on mangrove polychaetes; the fourth section talks about the biospect of mangrove microbes; the fifth section discusses soil geochemistry; and the sixth section elucidates mangrove management and conservation. Researchers from different countries and fields of mangrove ecosystem exploration have contributed their findings. This book would be an ideal source of scientific information to graduate students, advanced students, researchers, scientists, and stakeholders involved in mangrove ecosystem research.

The Botany of MangrovesCambridge University Press

The book provides an up-to-date account of mangrove forests from Asia, together with restoration techniques, and the management requirements of these ecosystems to ensure their sustainability and conservation. All aspects of mangroves and their conservation are critically re-examined. The book is divided into three sections presenting the distribution and status of mangrove ecosystems in Asia, the challenges they are facing, their issues and opportunities, and the management strategies for their conservation.

Mangrove Guidebook for Southeast Asia

Contemporary Trends in Archaeobotany

Mangroves: Ecology, Biodiversity and Management

Mangrove Forests in India

Proceedings of the International Symposium held at Mombasa, Kenya, 24–30 September 1990

Mangroves of Vietnam

Mangroves are one of the most productive and biologically important blue-carbon ecosystems across the coastal intertidal zone of earth. In the current scenario of serious environmental changes like global warming, climate change, extreme natural disasters, mangrove forests play a vital role in mitigating greenhouse gas emissions and maintaining ecosystem balance. Mangroves are unique ecosystems with rich biological diversity of different taxonomic groups exhibiting great ecological and commercial importance. The book consolidates existing and emerging information on ecology of mangroves, with a special reference to their biodiversity and management. It emphasizes on the role of mangroves in providing various ecological services. The book is a comprehensive compilation covering all aspects of mangrove ecology. It is useful for students and researchers in ecology, plants sciences and environmental sciences.

This book focuses on morphological and anatomical strategies developed by halophytes during evolution that allow them to survive in high-salt environments. These adaptive strategies refer to well integrated structural features, such as succulence, salt secretion (salt glands and vesicular hairs), aerenchyma, Kranz anatomy, bulliform cells, successive cambia, tracheoidioblasts and endodermis with pronounced Casparian strips. The authors present cross sections of the roots, stems and leaves of 62 halophyte species belonging to 18 families from different habitats and climates (temperate, Mediterranean). They also discuss the ecological, physiological and evolutionary aspects of the various adaptive structures in an integrative way. Beginning with the structural level, this book offers novel insights into the ecology of halophytes and opens new perspectives for the identification of salt-tolerant crop plants or halophytes that can be used for ecological purposes, such as bio-remediation and revegetation.

The book also discusses the ecological, physiological and evolutionary aspects of the various adaptive structures in an integrative way. Beginning with the structural level, this book offers novel insights into the ecology of halophytes and opens new perspectives for the identification of salt-tolerant crop plants or halophytes that can be used for ecological purposes, such as bio-remediation and revegetation. Published with ISME, ITTO and project partners FAO, UNESCO-MAB, UNEP-WCMC and UNU-INWEH This atlas provides the first truly global assessment of the state of the world's mangroves. Written by a leading expert on mangroves with support from the top international researchers and conservation organizations, this full colour atlas contains 60 full-page maps, hundreds of photographs and illustrations and a comprehensive country-by-country assessment of mangroves. Mangroves are considered both ecologically and from a human perspective. Initial chapters provide a global view, with information on distribution, biogeography, productivity and wider ecology, as well as on human uses, economic values, threats, and approaches for mangrove management. These themes are revisited throughout the regional chapters, where the maps provide a spatial context or starting point for further exploration. The book also presents a wealth of statistics on biodiversity, habitat area, loss and economic value which provide a unique record of mangroves against which future threats and changes can be evaluated. Case-studies, written by regional experts provide insights into regional mangrove issues, including primary and potential productivity, biodiversity, and information on present and traditional uses and values and sustainable management.

Mangrove ecosystems are tropical or subtropical communities of mainly tree species which can be found on low, muddy, usually intertidal coastal areas. They cover an area of approximately twenty million hectares throughout the world, with the largest expanses occurring in Malaysia, India, Brazil, Venezuela, Nigeria and Senegal. Mangrove communities are of great ecological importance due to the role they play as habitat builders and shoreline stabilisers. They typically grow in saline coastal soils, which develop through a combination of two processes: mineral sediment deposition and organic matter

accumulation. This book presents topical research from across the globe in the study of mangroves, including the eco-biology of mangroves; the mangrove ecosystem of Sundarbans, India; mangrove wetland ecosystem modelling in the Everglades; and the microbial diversity from mangrove sediments. This is the first comprehensive science-based primer to highlight the unique ecosystem services provided by mangrove forests, and discuss how these services preserve the livelihoods of coastal populations. The book presents three decades of real-time data on Sundarbans and Bhitarkanika mangroves in India measuring carbon and nitrogen sequestration, as well as case studies that demonstrate the utility provided by mangroves for reducing the impact of storms and erosion, providing nutrient retention for complex habitats, and housing a vast reservoir of plant, animal and microbial biodiversity. Also addressed is the function of mangroves as natural ecosystems of cultural convergence, offering the resources and products necessary for thriving coastal communities. The book will be of interest to students, academics and researchers in the fields of oceanography, marine biology, botany, climate science, ecology and environmental geography, as well as consultants and policy makers working in coastal zone management and coastal biodiversity conservation. Journey Amongst Mangroves

The Biology of Mangroves

Mangrove Ecosystem Ecology and Function

Mangroves and Aquaculture

Anatomy of Flowering Plants

An Introduction to the Flora and Fauna

Introductory textbook using the entire range of tropical ecosystems - terrestrial, freshwater and marine - to illustrate and explain major ecological concepts.

Dynamic Sedimentary Environments of Mangrove Coasts provides knowledge on the importance of sedimentary dynamics in managing mangrove forests. In the first part of the book, the editors seamlessly offer a general introduction of mangrove sedimentary dynamics. This leads into more in-depth information on soil surface elevation change, sea level rise, and the importance of sedimentary dynamics in the loss or gain of blue carbon. The book concludes the discussion of mangrove sedimentary dynamics by addressing the issues of climate change (e.g. sea level rise and blue carbon) on mangrove restoration and sediment. This book will assist coastal managers and academics in addressing the gaps in mangrove restoration and coastal management. As such, it will be a valuable reference for advanced undergraduate students, graduate students, researchers, academics in the field of coastal restoration, and coastal management practitioners. Provides a state-of-the-art summary of research into sedimentary dynamics in mangrove forests Includes updates on issues of climate change-relevant to mangroves, such as blue carbon and sea level rise Presents scientific background and successful case studies for mangrove restoration that can solve problems relating to mangrove management

The Study of Plants in a Whole New Light "Matt Candiasis succeeds in evoking the wonder of plants with wit and wisdom." —James T. Costa, PhD, executive director, Highlands Biological Station and author of Darwin's Backyard #1 New Release in Nature & Ecology, Plants, Botany, Horticulture, Trees, Biological Sciences, and Nature Writing & Essays In his debut book, internationally-recognized blogger and podcaster Matt Candiasis celebrates the nature of plants and the extraordinary world of plant organisms. A botanist's defense. Since his early days of plant restoration, this amateur plant scientist has been enchanted with flora and the greater environmental ecology of the planet. Now, he looks at the study of plants through the lens of his ever-growing houseplant collection. Using gardening, houseplants, and examples of plants around you, In Defense of Plants changes your relationship with the world from the comfort of your windowsill. The ruthless, bony, and wonderful nature of plants. Understand how plants evolve and live on Earth with a never-before-seen look into their daily drama. Inside, Candiasis explores the incredible ways plants live, fight, have sex, and conquer new territory. Whether a blossoming botanist or a professional plant scientist, In Defense of Plants is for anyone who sees plants as more than just static backdrops to more charismatic life forms. In this easily accessible introduction to the incredible world of plants, you'll find: • Fantastic botanical histories and plant symbolism • Passionate stories of flora diversity and scientific names of plant organisms • Personal tales of plantsman discovery through the study of plants If you enjoyed books like The Botany of Desire, What a Plant Knows, or The Soul of an Octopus, then you'll love In Defense of Plants.

China and Russia are rising economic and political powers that share thousands of miles of border. Despite their proximity, their interactions with each other - and with their third neighbour Mongolia - are rarely discussed. Although the three countries share a boundary, their traditions, languages and worldviews are remarkably different. Frontier Encounters presents a wide range of views on how the borders between these unique countries are enacted, produced, and crossed. It sheds light on global uncertainties: China's search for energy resources and the employment of its huge population, Russia's fear of Chinese migration, and the precarious independence of Mongolia as its neighbours negotiate to extract its plentiful resources. Bringing together anthropologists, sociologists and economists, this timely collection of essays offers new perspectives on an area that is currently of enormous economic, strategic and geo-political relevance.

Mangroves

Saltmarsh Ecology

Mus. Bot

Mangroves of Indian Sundarban: Ecological, Biochemical and Molecular Aspects

Mangroves and Halophytes

Mangrove Ecology, Silviculture and Conservation