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Aquatic Microbial Ecology and Biogeochemistry: A Dual Perspective Springer

Aquatic plants refer to a diverse group of aquatic photosynthetic organisms large enough to be seem with the naked eye, and the vegetative parts of which actively

grow either permanently or periodically (for at least several weeks each year) submerged below, floating on, or growing up through the water surface. These include aquatic vascular plants, aquatic mosses and some larger algae. Aquatic plants are grouped into life forms, each of which relates differently to limiting factors and has distinct ecological functions in aquatic ecosystems. Life form groups include emergent macrophytes (plants that are rooted in sediment or soils that are periodically inundated, with all other structures extending into the air), floating-leaved macrophytes (rooted plants with leaves that float on the water surface), submersed macrophytes (rooted plants growing completely submerged), free submerged macrophytes (which are not rooted but attached to other macrophytes or submerged structures) and free-floating macrophytes (plants that float on the water surface). Aquatic plants play an important role in the structure and function of aquatic ecosystems by altering water movement regimes, providing shelter and refuge and serving as a food source. In addition, aquatic plants produce large standing crops which can also stabilize sediments, accumulate large amounts of nutrients thus improving water healthy. Thus, because of their ecological role, aquatic plants are an important component of aquatic ecosystems. Aquatic plants are very vulnerable to human activities and global changes, and many species of the plants had become endangered in the past several decades due to habitat loss, flooding, damming, over foraging, biological invasion and eutrophication, which might not be halted but enforced in the future when more extreme weathers coincide with enhanced human activities.

Anthropogenic Impacts on the Microbial Ecology and Function of Aquatic Environments Academic Press

Freshwater Biodiversity is a much underestimated component of global

biodiversity, both in its diversity and in its potential to act as models for fundamental research in evolutionary biology and ecosystem studies. Freshwater organisms also reflect quality of water bodies and can thus be used to monitor changes in ecosystem health. The present book comprises a unique collection of primary research papers spanning a wide range of topics in aquatic biodiversity studies, and including a first global assessment of specific diversity of freshwater animals. The book also presents a section on the interaction between scientists and science policy managers. A target opinion paper lists priorities in aquatic biodiversity research for the next decade and several reactions from distinguished scientists discuss the relevance of these items from different points of view: fundamental ecology, taxonomy and systematics, needs of developing countries, present-day biodiversity policy at European andat global scales. It is believed that such a platform for the interaction between science and science policy is an absolute necessity for the efficient use of research budgets in the future.

Riverine Ecosystem Management Greenwood

Tropical Stream Ecology describes the main features of tropical streams and their ecology. It covers the major physico-chemical features, important processes such as primary production and organic-matter transformation, as well as the main groups of consumers: invertebrates, fishes and other vertebrates. Information on concepts and paradigms developed

in north-temperate latitudes and how they do not match the reality of ecosystems further south is expertly addressed. The pressing matter of conservation of tropical streams and their biodiversity is included in almost every chapter, with a final chapter providing a synthesis on conservation issues. For the first time, Tropical Stream Ecology places an important emphasis on viewing research carried out in contributions from international literature. - First synthetic account of the ecology of all types of tropical streams - Covers all of the major tropical regions - Detailed consideration of possible fundamental differences between tropical and temperate stream ecosystems - Threats faced by tropical stream ecosystems and possible conservation actions - Descriptions and synstheses life-histories and breeding patterns of major aquatic consumers (fishes, invertebrates)

Streams and Ground Waters

Oxford University Press

This unique textbook takes a broad look at the rapidly expanding field of freshwater microbiology. Concentrating on the interactions between viruses, bacteria, algae, fungi and micro-invertebrates, the

book gives a wide biological appeal. Alongside conventional aspects such as phytoplankton characterisation, seasonal changes and nutrient cycles, the title focuses on the dynamic and applied aspects that are not covered within the current textbooks in the field. Complete coverage of all fresh water biota from viruses to invertebrates Unique focus on microbial interactions including coverage of biofilms, important communities on all exposed rivers and lakes. New information on molecular and microscopical techniques including a study of gene exchange between bacteria in the freshwater environment. Unique emphasis on the applied aspects of freshwater microbiology with particular emphasis on biodegradation and the causes and remediation of eutrophication and algal blooms.

Semi-aquatic Mammals
Elsevier
The sounds produced by geophonic, biophonic and technophonic sources are relevant to the function of natural and human modified ecosystems. Passive recording is one of the most non-invasive technologies as its use avoids human intrusion during acoustic surveys and facilitates the accumulation of huge amounts of acoustical data. For the first time, this book collates and reviews the science behind ecoaucostics; illustrating the principles, methods and applications of this exciting new field. Topics covered in this comprehensive volume include; the assessment of biodiversity based on sounds emanating from a variety of environments the best technologies and methods necessary to

investigate environmental sounds implications for climate change and urban systems the relationship between landscape ecology and ecoacoustics the conservation of soundscapes and the social value of ecoacoustics areas of potential future research. An invaluable resource for scholars, researchers and students, Ecoacoustics: The Ecological Role of Sounds provides an unrivalled set of ideas, tools and references based on the current state of the field.

Diseases of Marine Animals

Elsevier

This condensed volume summarizes updated knowledge on the warm-monomictic subtropical Lake Kinneret, including its geophysical setting, the dynamics of physical, chemical and biological processes and the major natural and anthropogenic factors that affect this unique aquatic ecosystem. This work expands on a previous monograph on Lake Kinneret published in 1978 and capitalizes on the outcome of more than 40 years of research and monitoring activities. These were intensively integrated with lake management aimed at sustainable use for supply of drinking water, tourism, recreation and fishery. The book chapters are aimed at the limnological community, aquatic ecologists, managers of aquatic ecosystems and other professionals. It presents the geographic and geological setting, the meteorology and hydrology of the region, continues with various aspects of the pelagic and the littoral systems. Finally, the last section of the book addresses lake management, demonstrating how the accumulated knowledge was applied in

order to manage this important source of freshwater. The section on the pelagic system comprises the heart of the book, addressing the major physical processes, external and internal loading, the pelagic communities (from bacteria to fish), physiological processes and the major biogeochemical cycles in the lake.

Plankton Academic Press

This state-of-the-art, research level text considers the growing volume of research at the interface of hydrology and ecology and focuses on: the evolution of hydroecology / ecohydrology process understanding hydroecological interactions, dynamics and linkages methodological approaches detailed case studies future research needs The editors and contributors are internationally recognised experts in hydrology and ecology from institutions across North America, South America, Australia, and Europe. Chapters provide a broad geographical coverage and bridge the traditional subject divide between hydrology and ecology. The book considers a range of organisms (plants, invertebrates and fish), provides a long-term perspective on contemporary and palaeo-systems, and emphasises wider research implications with respect to environmental and water resource management. Hydroecology and Ecohydrology is an

indispensable resource for academics and postgraduate researchers in departments of physical geography, earth sciences, environmental science, environmental management, civil engineering, water resource management, biology, zoology, botany and ecology. It is also of interest to professionals working within environmental consultancies, organizations and national agencies.

Body Size: The Structure and Function of Aquatic Ecosystems Frontiers Media SA

Freshwater algae are among the most diverse and ubiquitous organisms on earth. They occupy an enormous range of ecological conditions from lakes and rivers to acidic peat swamps, inland saline lakes, snow and ice, damp soils, wetlands, desert soils, wastewater treatment plants, and are symbionts in and on many plants, fungi, and animals. In North America, the variety of freshwater habitats colonized by algae is very rich, and offers an enormous and fascinating range of environments for their study. They form the base of most aquatic food webs and are critical to studies of ecosystem health. Algal ecologists and taxonomists play an important role in the understanding of aquatic ecosystems: their biodiversity, productivity, interactions with other organisms, and water quality. This book provides in one volume a practical and comprehensive guide to the genera of freshwater algae known from North America. The format combines the necessary

ecological, taxonomic and methodological information for all scientists working in aquatic environments, whether their specialty is in environmental monitoring and water quality assessment, biological composition, ecology, evolution, or molecular biology.Key Features* The first complete accounting of North America's freshwater algal genera in more than 50 years* Includes a guide to the current literature on species identification in each group of algae* High-quality photographs and drawings of more than 770 genera* A clear, easy-to-use introductory key to the diagnostic chapters* Synthetic chapters on freshwater habitats, use of algae in environmental assessment, and control of nuisance algae* Contributions from 27 experts in all areas of freshwater algae* Extensive literature citations* Companion volume of Ecology and Classification of North American Freshwater Invertebrates 2nd edition, edited by Throp and Covich

Diversity and Eco-Physiological Responses of Aquatic Plants

Princeton University Press

There is a growing need for appropriate management of aquatic plants in rivers and canals, lakes and reservoirs, and drainage channels and urban waterways. This management must be based on a sound knowledge of the ecology of freshwater plants, their distribution and the different forms of control available including chemical and physical, and biological and biomanipulation. This

series of papers from over 20 different countries was generated from the tenth in the highly successful series of European Weed Research Society symposia on aquatic plant management, this being the tenth. It provides a valuable insight into the complexities involved in managing aquatic systems, discusses state-of-the-art control techniques and deals with patterns of regrowth and recovery post-management. Careful consideration is given to the use of chemicals, a practice which has come under scrutiny in recent years. Underpinning the development of such control techniques is a growing body of knowledge relating to the biology and ecology of water plants. The authorship of the papers represents the collective wisdom of leading scientists and experts from fisheries agencies, river authorities, nature conservation agencies, the agrochemical industry and both governmental and non-governmental organisations.

Global Citizen – Challenges and Responsibility in an Interconnected World

Springer Science & Business Media

Aquatic hyphomycetes were discovered 50 years ago by C.T. Ingold. They remained a relatively obscure group until their role as intermediaries between deciduous leaves and stream invertebrates

was established some 20 years ago. This book, for the first time, provides a comprehensive summary and critical evaluation of the biology and ecology of these organisms. Aspecial effort was made to evaluate the potential and actual insight that have been or will be derived from work in related disciplines such as the ecology of other fungal groups, stream ecology, or population ecology. The topics treated include the basic life history of the fungi and the potential role of wood, a discussion of how the fungi have adjusted to life in running water, their interactions with invertebrates, the attachment and germination of their spores, what is known about sexual reproduction, how water chemistry may influence their distribution and activity, how they react to human degradation of their environment, and a summary of the research done on the Indian subcontinent. The volume is of special interest to mycologists and stream ecologists and should facilitate the entry of new workers into this exciting area.

Aquatic Ecosystems: Interactivity of Dissolved Organic Matter John Wiley & Sons

Aquatic Functional

Biodiversity: An Ecological and Evolutionary Perspective provides a general conceptual framework by some of the most prominent investigators in the field for how to link eco-evolutionary approaches with functional diversity to understand and conserve the provisioning of ecosystem services in aquatic systems. Rather than producing another methodological book, the editors and authors primarily concentrate on defining common grounds, connecting conceptual frameworks and providing examples by a more detailed discussion of a few empirical studies and projects, which illustrate key ideas and an outline of potential future directions and challenges that are expected in this interdisciplinary research field. Recent years have seen an explosion of interest in using network approaches to disentangle the relationship between biodiversity, community structure and functioning. Novel methods for model construction are being developed constantly, and modern methods allow for the inclusion of almost any type of explanatory variable that can be correlated either with biodiversity or ecosystem functioning. As a result these models have been widely used in ecology, conservation and eco-evolutionary biology. Nevertheless, there remains a considerable gap on how well these approaches are feasible to understand the mechanisms on how biodiversity constrains the provisioning of ecosystem services. - Defines common theoretical grounds in terms of terminology and conceptual issues - Connects theory and practice in ecology and eco-

evolutionary sciences - Provides examples for successful biodiversity conservation and ecosystem service management

Australian Freshwater Ecology Springer Science & Business Media

Overviews of the source, supply and variability of DOM, surveys of the processes that mediate inputs to microbial food webs, and syntheses consolidating research findings provide a comprehensive review of what is known of DOM in freshwater. This book will be important to anyone interested in understanding the fundamental factors associated with DOM that control aquatic ecosystems."--BOOK JACKET.

Modern Trends in Applied Aquatic Ecology Elsevier

Aquatic microbial ecology, a growing interdisciplinary field, has become increasingly compartmentalized in recent years. The aim of this volume is to propose a framework for biochemical and molecular approaches, which are employed ever more widely in studies of aquatic microbial communities and ecosystem functioning. The book presents state of the art applications of modern molecular research techniques to a range of topics in ectoenzymes microbial carbon metabolism bacterial population dynamics RNA chemotaxonomy of microbial communities plasmids and adaptation to environmental conditions. Written for limnologists, marine biologists, and all

researchers interested in environmental microbiology and molecular aspects of ecology, this volume will provide a stimulating introduction to this emerging field.

Biology, Ecology and Management of Aquatic Plants Academic Press

A globalized world places new demands on us as citizens. Global Citizen – Challenges and Responsibility in an Interconnected World gives insight and perspectives on what it means to be a citizen in a global world from Norway's most distinguished scholars. It poses and answers important questions, such as which duties and rights do we have as citizens in a globalized world; which institutions are just and sustainable, and how can a global ethic and a global worldview be reconciled with the fact that the lives of the greater part of the Earth ' s population is still local? Global Citizen – Challenges and Responsibility in an Interconnected World draws on insights from philosophy, jurisprudence, theology, and the social sciences to shed light on this manifold and important topic, with relevance for policy makers, stakeholders, academics, but most important, for us as citizens who need to take both a political and personal decision on how to live as a citizen in a global world.

Climate Change and Light in Aquatic Ecosystems: Variability & Ecological Consequences Frontiers Media SA

Aquatic ecosystems are currently experiencing unprecedented levels of

impact from human activities including over-exploitation of resources, habitat destruction, pollution and the influence of climate change. The impacts of these activities on the microbial ecology of aquatic environments are only now beginning to be defined. One of the many implications of environmental degradation and climate change is the geographical expansion of disease- causing microbes such as those from the Vibrio genus. Elevating sea surface temperatures correlate with increasing Vibrio numbers and disease in marine animals (e.g. corals) and humans. Contamination of aquatic environments with heavy metals and other pollutants affects microbial ecology with downstream effects on biogeochemical cycles and nutrient turnover. Also of importance is the pollution of aquatic environments with antibiotics, resistance genes and the mobile genetic elements that house resistance genes from human and animal waste. Such contaminated environments act as a source of resistance genes long after an antibiotic has ceased being used in the community. Environments contaminated with mobile genetic elements

that are adapted to human commensals and pathogens function to capture new resistance genes for potential reintroduction back into clinical environments. This research topic encompasses these diverse topics and describes the affect(s) of human activity on the microbial ecology and function in aquatic environments and, describes methods of restoration and for modelling disturbances.

Ecoacoustics Springer Organisms and environment have evolved through modifying each other over millions of years. Humans appeared very late in this evolutionary time scale. With their superior brain attributes, humans emerged as the most dominating influence on the earth. Over the millennia, from simple hunter-food gatherers, humans developed the art of agriculture, domestication of animals, identification of medicinal plants, devising hunting and fishing techniques, house building, and making clothes. All these have been for better adjustment, growth, and survival in otherwise harsh and hostile surroundings and climate cycles of winter and summer, and dry and wet seasons. So humankind started experimenting and acting on ecological

lines much before the art of reading, writing, or arithmetic had developed. Application of ecological knowledge led to development of agriculture, animal husbandry, medicines, fisheries, and so on. Modem ecology is a relatively young science and, unfortunately, there are so few books on applied ecology. The purpose of ecology is to discover the principles that govern relationships among plants, animals, microbes, and their total living and nonliving environmental components. Ecology, however, had remained mainly rooted in botany and zoology. It did not permeate hard sciences, engineering, or industrial technologies leading to widespread environmental degradation, pollution, and frequent episodes leading to mass deaths and diseases.

Fresh-water Biology

Springer

Ecologists have long struggled to predict features of ecological systems, such as the numbers and diversity of organisms. The wide range of body sizes in ecological communities, from tiny microbes to large animals and plants, is emerging as the key to prediction. Based on the relationship between body size and features such as biological rates, the physics of water and the amount of habitat available, we may be able

to understand patterns of abundance and diversity, biogeography, interactions in food webs and the impact of fishing, adding up to a potential 'periodic table' for ecology. Remarkable progress on the unravelling, describing and modelling of aquatic food webs, revealing the fundamental role of body size, makes a book emphasising marine and freshwater ecosystems particularly apt. In this 2007 book, the importance of body size is examined at a range of scales that will be of interest to professional ecologists, from students to senior researchers.

Ecology and Classification of North American Freshwater Invertebrates

John Wiley & Sons

This concise, readable introduction to limnology (the science of investigating the structure and function of inland waters), places the subject in the context of modern ecology. Unlike most ecological textbooks, which use examples taken almost exclusively from terrestrial systems, this book integrates the fields of limnology and ecology by presenting empirical data drawn entirely from freshwater ecosystems in order to advance ecological theories (limnoecology). This second edition builds upon the strengths of the first with the structure of the book following the same hierarchical concept of ecology, from habitat properties, individuals, populations, coupled populations and communities to ecosystems. However, it has been thoroughly revised throughout to incorporate

findings from new technologies and methods (notably the rapid development of molecular genetic methods and stable isotope techniques) that have allowed a rapid and ongoing development of the field. There is a new emphasis on food webs, species diversity and ecosystem functioning, climate change, and conservation management. Key ecological questions are examined in the light of the latest experimental evidence. Throughout the text evolutionary theory is applied to an understanding of freshwater ecosystems, thereby filling a niche between traditional limnology and evolutionary ecology. This accessible text is suitable for both undergraduate and graduate students taking courses in limnology, freshwater ecology, and aquatic biology as well as the many professional limnologists, ecologists and conservation biologists requiring a concise but authoritative overview of the topic

RECREATIONAL FISHERIES Elsevier

The Third Edition of Ecology and Classification of North American Freshwater Invertebrates continues the tradition of in-depth coverage of the biology, ecology, phylogeny, and identification of freshwater invertebrates from the USA and Canada. This edition is in color for the first time and includes greatly expanded classification of many phyla. - Contains extensive and detailed classification keys for identification of diverse freshwater

invertebrates. - Many drawings and color photographs of freshwater invertebrates. - Single source for a broad coverage of the anatomy, physiology, ecology, and phylogeny of all major groups of invertebrates in inland waters of North America, north of Mexico.

Tropical Stream Ecology Academic Press

Aquatic Photosynthesis is a comprehensive guide to understanding the evolution and ecology of photosynthesis in aquatic environments. This second edition, thoroughly revised to bring it up to date, describes how one of the most fundamental metabolic processes evolved and transformed the surface chemistry of the Earth. The book focuses on recent biochemical and biophysical advances and the molecular biological techniques that have made them possible. In ten chapters that are self-contained but that build upon information presented earlier, the book starts with a reductionist, biophysical description of the photosynthetic reactions. It then moves through biochemical and molecular biological patterns in aquatic photoautotrophs, physiological and ecological principles, and global biogeochemical cycles. The book considers applications to ecology, and refers to historical developments.

It can be used as a primary text in a lecture course, or as a supplemental text in a survey course such as biological oceanography, limnology, or biogeochemistry.