

BOOK REVIEWS

Berg, Bjorn, and McClaugherty, Charles. 2014. *Plant Litter: Decomposition, Humus Formation, Carbon Sequestration*. Third edition. xvii + 315 pages. Springer, Dordrecht. ISBN 978-3-642-38820-0. € 149.99

Plant litter (dead organic matter) is a major component of ecosystems and plays a major role in determining their structure and function by virtue of being the source of energy for a large diversity of heterotrophic organisms. Decomposition of plant litter is a complex and prolonged process governed by the characteristics of both the litter and the environment. Besides being a source of plant nutrients, decomposition is a major driver of carbon flux to the atmosphere, and contributes to carbon sequestration in soils.

The book 'Plant Litter' by Berg and McClaugherty provides a comprehensive account of the subject based on the extensive studies in boreal forest ecosystems. An introductory chapter is followed by eleven chapters which discuss in detail the major processes in decomposition, diversity of decomposer organisms, variable chemical composition of fresh litter, its change during decomposition as well as its role in regulating the decomposition process, analytical techniques, the role of climate, models describing decomposition, and factors influencing the decomposition patterns. Decomposition of fine roots and woody litter is described in another chapter whereas the accumulation of recalcitrant humus and carbon sequestration are discussed in two separate chapters. The book concludes with four appendices, an exhaustive list of references and an index. Two of the appendices provide very useful material on the design of litter bag experiments and on the analytical methods for organic compounds, particularly lignin.

The volume, now in its third edition, was first published in 2005. It has already gained wide popularity for the scope and depth of its coverage of the subject. The authors have kept the scientific community regularly updated on the latest developments. The third edition brings into focus the effects of manganese on decomposition and on carbon sequestration, recent studies on decomposition dynamics and new analytical technique using ¹³C-NMR.

Despite the fact acknowledged by the authors that the book is based primarily on field studies of undisturbed forests of boreal regions, the basic mechanisms for the decomposition and transformation processes are supported by the studies from temperate systems. The fundamentals are applicable to a great extent also to the process in other climatic regions where the researchers would surely find the book useful in many ways.

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Pal, Ruma, and Choudhury, Avik Kumar. 2014. *An Introduction to Phytoplanktons: Diversity and Ecology*. xii+167 pages. Springer India, New Delhi. ISBN 978-81-322-1837-1 €139.99

As a researcher in limnology, I picked up this new book on *Phytoplankton: Diversity and Ecology* with great expectations that it may provide some new insights for research or serve as an introductory text for young researchers in India and neighbouring countries. However, I am highly disappointed with the volume which is not only poor in substance but also in language, presentation and organisation. The book was not planned with any specific objective or audience in mind but incorporates some random notes and an assortment of studies undertaken by the students of the senior author in two of her research projects.

The bulk of the book (more than 50%) comprises of two reports (combined 16 pages) on the phytoplankton taxa (mostly at generic level) recorded from East Kolkata wetland and a part of Sundanban and a detailed (64 pages) study of nutrients and phytoplankton in a coastal marine area near Kolkata (West Bengal). The remaining text, divided into four chapters, is a preliminary heterogeneous account of some aspects of phytoplankton from both freshwater and marine environments. No effort has been made to distinguish between the two environments and the text often switches abruptly between them. Among these is a 3-page chapter entitled 'Phytoplankton and Primary Productivity' that briefly describes the light-and-dark-bottle method and mentions nutrients as factors affecting the production. The Introductory chapter refers to systems of algal taxonomy, algal pigments, algal blooms, algal toxins, algae in wetlands and identification of common taxa. The chapter on Physico-chemical Environment of Aquatic Ecosystems describes briefly light and temperature regimes, turbulence and major nutrients (carbon, nitrogen, phosphorus, silica) besides a note on Redfield ratio. A few methods for sampling, estimation of numbers, biovolume and biomass, and diversity indices of phytoplankton, together with the method of data analysis (multivariate analysis) constitute the chapter on Community Pattern Analysis.

The book has no clear focus on any particular aspect of phytoplankton ecology or diversity, neither in fresh waters nor in marine habitats. The poor organisation, style and language will only leave the readers more confused. In fact, there is no scarcity of books on phytoplankton ecology as claimed by the senior author in her Preface. Unfortunately, such poorly planned and edited books can also tarnish the image of the publisher.

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SHORT NOTICES

Sota, T.; Kagata, H.; Ando, Y.; Utsumi, S. and Osono, T. 2014. *Species Diversity and Community Structure: Novel Patterns and Processes in Plants, Insects, and Fungi*. x+62 pages. Springer, Tokyo. ISBN 978-4-431-54260-5 (Soft cover). € 49.99

Species diversity and community organisation are recurrent themes in ecological research. However, there is relatively little understanding of the evolutionary and ecological processes that create and maintain the Earth's huge biodiversity. Kyoto University launched a decade long programme called "Global COE program for Evolution and Biodiversity Research" to promote novel integrative studies in this unexplored area. The book, *Species Diversity and Community Structure*, brings together three contributions from this programme. The three studies deal with three different approaches combining genomics to ecosystems and three major components of biodiversity – plants, insects and fungi.

The first contribution reviews the present status of the diversity of fungi and their functioning, summarises various methodologies and discuss the metagenomic approaches that were used in the assessment of the previously unexplored hyperdiversity of fungi in Asian tropical rainforests with 30-50 m high canopies. The second contribution presents results from experimental studies on the complex interactions between herbivorous insects and plants in the community context focusing on genetic variation and phenotypic plasticity in plant defenses against herbivores. The third contribution describes studies on the speciation processes related to the evolution of life history. Sota and colleagues present two hypotheses: first relates to the allopatric speciation in beetles promoted by the evolution of flightlessness in winged insects, and second relates to allochronic speciation in a winter moth group promoted by climatic disruption of reproductive period. They suggest that temporal isolation caused by periodically harsh climate in a seasonal environment may have promoted diversification of insects.

This small volume will be useful to all those interested in biodiversity and will stimulate further multidisciplinary research through collaboration between biologists working at molecular and macro levels.

Sharma, Sanjay K. and Sanghi, Rashmi (Editors). 2012. *Advances in Water Treatment and Pollution Prevention*. xx+457 pages. Springer, Dordrecht. ISBN 978-94-007-4203-1 (Hardcover) € 149,99

Globally, water pollution is a serious problem as it affects the entire biosphere and all human uses of water. The causes of water pollution and its affects are well known and yet little effort is made to prevent it. Treatment of wastewaters - both domestic and industrial -has for many decades been a subject of common interest. Newer treatment technologies are being developed regularly to meet the needs to remove new categories of pollutants as well as to improve treatment efficiencies. The bulk of the published literature is also growing rapidly but without any consequent impact on the magnitude and diversity of pollution.

The volume edited by Sharma and Sanghi brings together 34 researchers, mostly from the field of chemistry and chemical engineering, and representing 12 countries, to contribute 14 articles related to wastewater treatment. The first two articles provide an overview of the current issues and approaches to protection of water resources and a historical perspective on their management. Other contributions present studies on the removal of various pollutants from wastewater effluents, such as Drugs and Metabolites, various kinds of Dyes and Pigments, Heavy Metals and Organic Pollutants. Some contributions focus on the processes and technologies. These include: Nanocrystal Photocatalysts for degradation of Azo dyes, use of microwaves for degrading organic pollutants, direct flocculation process, combination of macromolecular adsorption and coagulation, and polysaccharide-based macromolecular materials for decolorization of textile effluents. A hybrid method that combines sono-photochemical and sonoelectrochemical approaches using ultrasound for the degradation of organic pollutants is discussed in detail in two articles. Another interesting contribution describes the use of microbial fuel cells for producing energy during wastewater treatment.

Though there is little new that is reported first time in this volume, and the articles cover only a small part of the very wide spectrum of pollution control technologies, the volume will be of interest to the students, researchers and those engaged in the treatment of industrial effluents and other wastewaters.

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