

cal biogenicity. It definitely helps in the identification of putative fossils.

The Phanerozoic stromatolites are covered under Part 2. It includes five papers covering mostly Mesozoic stromatolites. Part 2 is important as good papers dealing with Phanerozoic stromatolites rare and invariably attract little attention.

Part 3 deals with different aspects of modern stromatolites which are growing in different environmental settings like marine, lacustrine and hot springs. Among the seven papers, here, two deal with unusual environmental settings, one deals with an unusual ecosystem of the modern stromatolites of alkaline and hypersaline high-altitude lakes of Argentina and another is on the terrestrial siliceous stromatolites. The paper by Farías *et al.* on Argentina's lake environment compares the high-altitude lake environment with the envisaged environment of early Earth. This paper can open up new windows for understanding early evolution of life. Another paper by Handley and Campbell discusses the importance of terrestrial siliceous stromatolites from geothermal setting.

Part 4 has three papers on the techniques used in the study of stromatolites and microbiota. These include the latest available techniques like micro-FTIR spectroscopic imaging, nano SIMS and laser Raman spectroscopy. Thus, a much expanded overview is available for the study of stromatolites and microbiota. Tewari has used some of these techni-

ques for the study of Buxa Formation of the Sikkim Himalaya.

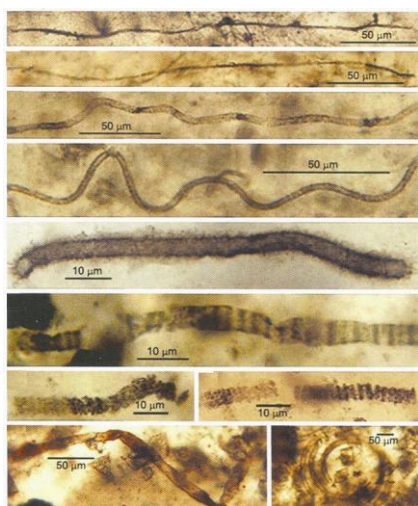
The maximum number of papers (nine) are included in Part 5, dealing with geochemistry and geomicrobiology. Out of these, two papers deal with the material from India. Baskar *et al.* have worked on the cave geomicrobiology of Indian caves and present a status report. Lokho and Tewari describe the biostratigraphy, sedimentation and chemostratigraphy of the Tertiary Neotethys sediments from the NE Himalaya, India. This work does not fit into the theme of the book and should not have been included.

Part 6 has only two papers; one gives some points for the search of life on Mars and the second deals with sulphur isotope analysis for understanding the early history of our Earth. Part 7 summarizes the work given in the book, with remarks for future prospects.

The book is a commendable effort by the editors in spite of some editorial negligence. Some papers have abstracts, but many do not have any. There should have been a uniformity in formatting. It is a useful book for research scholars dealing with sedimentology, early life, microbial mats and biogeochemistry. The price of the book has not been mentioned. I trust it is not too high to discourage students from owning the book.

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Optical photomicrographs showing filamentous chert-permineralized microfossils in petrographic thin section of the Proterozoic Buxa Formation of the Ranjit Window, Sikkim, northeastern India.

Towards Conservation and Management of Mangrove Ecosystems in India. J. R. Bhatt, D. J. Macintosh, T. S. Nayar, C. N. Pandey and B. P. Nilaratna (eds). International Union for Conservation of Nature and Natural Resources, New Delhi. 2011. ISBN 978-2-8317-1263-5.

Mangroves are remarkable ecosystems that thrive in the transitional zones between the land and the oceans. The importance of mangroves is rarely recognized. In India, its importance was realized for the first time during the super cyclone in Odisha and the 2004 tsunami. Mangroves act as a bio-shield to protect

the human settlements, agriculture, livestock and coastal infrastructure from the impacts of cyclones, hurricanes, sea-water intrusions, etc. Climate change will further enhance the importance of mangroves as an adaptation strategy to cope with its adverse impacts such as sea-level rise, salt-water intrusion, cyclones and hurricanes.

In India, there is little research on mangrove ecosystems. Till recently, the extent and spread of mangroves was not known. The mangroves are subjected to degradation and loss threatening the coastal ecosystems. In India, the focus of mangrove research and conservation is largely on the Sundarbans. The monograph edited by Bhatt *et al.* and published by IUCN is an excellent compilation of several articles by well known experts, conservationists and administrators managing the mangroves. The monograph covers all aspects of mangrove ecosystems in India. It presents an excellent analysis of the extent of mangroves, the trends, and biodiversity status of mangroves, review of the research on them, threats contributing to loss of mangroves, conservation and restoration efforts, the government policies, programmes and regulations on coastal zone management and impact of climate change.

Some of the chapters (Biodiversity of mangrove ecosystems in India, Review of mangrove species in India) are well written and some merely report the conservation and restoration programmes implemented in different states of India. In fact, the state-level conservation and restoration programmes could have all been combined into a single chapter highlighting the achievements made so far, the threats and the barriers to conservation and restoration of mangroves. There is adequate coverage of mangroves of the Sundarbans with two chapters dedicated to description of the Sunderbans ecosystem and biodiversity, and conservation and management of Sundarbans Biosphere Reserve.

The chapter on impact of climate change on marine ecosystems of India is a bit outdated. It provides information on climate-change projections and impacts based on outdated literature. A lot of new literature is available on projections of climate change and its impact on marine ecosystems and mangroves. This chapter could have covered various aspects of climate change and mangroves in the context of mitigation and adaptation to

climate change, based on the literature for the period 2007–2011.

I wish there was a concluding chapter highlighting the current threats to mangroves, including climate change, how the current efforts of conservation and restoration are inadequate and also making recommendations on policies, institutions, technical interventions and capacity-building requirements to promote conservation and restoration of mangroves. The monograph finally presents the recommendations from a workshop proceedings; instead, it should have been the result of the analysis in its various chapters. The monograph should have had a couple of chapters from neighbouring countries such as Bangladesh, where serious efforts are being made to conserve and restore mangroves, to learn lessons on best practices for consideration by Indian authorities.

To conclude, despite a few limitations, this monograph will be a valuable addition to the literature and information on mangroves, so badly needed to promote conservation and restoration. It may contribute to the generation of scientific knowledge on various aspects of mangroves. The monograph is professionally produced with high-quality photographs and charts to keep the interest of the readers. In India, most people think of the Sunderbans as the only mangrove forest of importance, whereas mangroves spread across the coast and also those which have been degraded or lost should receive adequate attention of researchers and policy-makers. We should not remember mangroves only in times of adversities such as cyclones and hurricanes. Instead we must have a comprehensive programme to monitor, conserve and restore mangroves by involving all the stakeholders, particularly the local communities.

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Soil Enzymology in the Recycling of Organic Wastes and Environmental Restoration. Carmen Trasar-Cepeda *et al.* (eds). Springer Verlag, Berlin, Heidelberg. 2012. 354 pp. Price: € 149.95. ISBN 97836421-211614.

In recent years soil enzyme activities have been discussed as indicators of soil quality, soil fertility and soil microbial activity under degraded, agriculture and forest ecosystems and to determine the success of restoration process. While soil enzymology has been practised in various polluted, degraded and natural ecosystems for centuries, the scientific understanding is still in its infancy. Therefore, soil scientists, ecologists and environmentalists are embarking on the understanding of ecological functions of extracellular and intracellular soil enzymes using advanced molecular tools. Honestly, I am a beginner in understanding the complexities of degraded lands and the role of microbial activity in their restoration. In this context, I have been looking for new books that provide up-to-date wider information synthesis and review of soil enzymology.

This book is a compilation of a number of specific case studies on soil enzymology, presented in an international meeting organized by the Spanish Group of Soil Enzymology held in December 2008 in Burgos, Spain. It has been edited by five eminent Spanish scientists. Eighty-six authors – 71 (Spain), 8 (Italy), 6 (Austria) and 1 (Mexico) have contributed to this book. The aim of the book, as described in the Preface, is to disseminate the Spanish research on soil enzymology to the global scientific communities. In my opinion, publication of specific case studies/research papers in a book form is rather unenthusiastic. Journals, dealing with soil fertility, biology, biochemistry and ecology, can provide maximum readership and on-line as well as off-line exposition.

The book opens with an introductory chapter by Paolo Nannipieri *et al.* which provides an up-to-date revision of the history of soil enzymology, the future research prospects and challenges and usefulness of the emerging tools in molecular microbial ecology. They have suggested that 'the present enzyme assays determine potential rather than real enzyme activities and the existing soil enzyme assays are simple, accurate and

inexpensive. But they do not discriminate the contribution of extracellular stabilised enzymes from that of intracellular enzyme activities (associated to active microbial cells). Enzyme assays distinguishing the contribution of extracellular stabilized enzymes from that of intracellular enzyme activities are needed.'

The synopsis of the book (sections, chapters and content) is described in the Preface. In brief, the content is arranged in three parts. Part I includes nine research papers, which assess soil carbon, nitrogen, phosphorus, soil microbial biomass, soil enzymes and other biochemical properties in organic and mineral amended soils, volcanic tuffs (Mexican *Tepetates*), Canary Islands, disturbed lands, *Eucalyptus* stands and agriculture ecosystems. Part II includes ten research papers, which assess changes in soil microbial community structure and activities in heavy metal-polluted landscape, gypsiferous soils, degraded agricultural soils, fungicide (2,4,5-trichlorophenol) and herbicide-amended soils. Part III includes five papers, which assess humus-enzyme complexes in vermicompost, L-glutaminase in compost of urban refuse and microbial interactions in lettuce-rhizosphere soil.

The strength of the book is that it contains excellent individual research papers which have novel findings of microbial and enzyme activities in a range of soil environments. Possible effects of heavy metals (Cd, Ni, Zn and Cu) on microbial community structure and activity in the soil are reviewed in chapter 1 of part II. The importance of soil organic matter in modulating the effects of heavy metals on microbial activities is also reviewed in this chapter. Moreover, few research papers in this book include physiological, biochemical and molecular (nucleic acid profiling using PCR-based denaturing gradient gel electrophoresis) fingerprinting methods to assess soil microbial diversity and functions in a range of created and natural soil environments. Chapter 1 of part III suggests a new approach for fingerprinting of 16S rRNA genes of prokaryotes involved both in aerobic (oligonucleotide microarray COMPOCHIP) and anaerobic (ANAEPOCHIP) processes in the biological treatment of organic waste.

However, the book suffers from several shortcomings, which limit its usefulness. Most of the contributors are from Spain, few are from the same institute