

**New Trends in Microbial Ecology.** Bharat Rai and M. S. Dkhar (eds). Department of Botany, N. Eastern Hill University, Shillong 793 022 and International Society for Conservation of Natural Resources, BHU, Varanasi 221 005. 1998. Price: Rs 750. 435 pp.

Microbial ecology is an important branch of microbiology, but has been receiving less attention in recent years when compared to molecular biology and genetic engineering. It is therefore heartening to come across a publication entitled 'New Trends in Microbial Ecology' compiled from the proceedings of a recent national symposium on this topic. The 36 chapters cover a wide range of subjects from biodiversity, biodegradation of organic materials and interaction of microbes with higher life forms to microbial symbionts, plant and animal pathogens and food microbiology. Effect of pollutants on specific microflora in the ecosystem has also been discussed in some of the chapters. The compilation of information in the various chapters is good and comprehensive and as stated by the editors, the information will be useful to researchers in microbiology, biotechnology and allied disciplines.

Broadly grouped, the major emphasis has been on the role of micro-organisms in biodegradation of a range of natural substrates including organic wastes, plant residues and agrochemicals in the natural environment. Das *et al.* (p. 66) have reviewed decomposition of sericultural wastes by mixed populations of bacteria and fungi with *Aspergillus fumigatus* as a dominant agent of decomposition. The chapters on microbial colonization of plant litter (Charaya and Mehrotra, p. 76), keratinophiles with reference to *Chryso-sporium* and related fungi (Kushwaha, p. 355), fungal damage to organic cultural heritage (Garg and Dhawan, p. 51) and decomposition of agrochemicals by

rhizosphere microflora (Gupta and Mukherji, p. 90) provide the reader with useful information related to these specific topics. Bharat Rai (p. 1) and Upadhyay (p. 26) provide valuable information in their chapters on biodiversity with special reference to fungi and in relation to environmental variations. Due emphasis has been given on fungal diversity having 'significance in evolution, ecosystem function and human progress' and the need stressed for *in situ* conservation in natural habitats and *ex situ* in culture collections. Greater attention required to screen little investigated habitats for novel microbial species has also been pointed out. Role of micro-organisms in sustaining global environment and also as sources of various valuable metabolites useful to plants, animals and humans has been documented.

The role of small animals like earthworms and isopods on the microbiology of the ecosystem has been discussed in three chapters by Behera *et al.* (p. 127), Kayang (p. 137) and Dkhar and Dkhar (p. 150). Important conclusions based on these studies include the role of earthworms as direct and indirect agents influencing the survival and dispersal of microfungi and also their feeding and burrowing action increasing the microbial activity and nutrient status of the soil. Isopod grazing of the litter has an influence on the rate of litter decomposition and the 'pretreatment' following grazing and egestion of the litter makes the litter more biodegradable.

Biocontrol of nematodes and eco-friendly biopesticide management for control of plant pathogens as well as weed hosts has been dealt with in the chapters by Mishra *et al.* (p. 253), Khare and Bhale (p. 261) and Sharma and Paul (p. 272). Use of fungal antagonists like *Trichoderma harzianum* for biocontrol of *Sclerotium rolfsii* wilt and collar rot, development of mycoherbicides for weed

control for which more than hundred fungal species have been recognized for their potential and the need for tactical approaches for integrated plant breeding involving antagonistic microbial genes to develop 'agriculture free from chemicals in any form' have been discussed in detail.

Chapters on mycorrhizal as well as nitrogen fixing symbionts deal with various aspects including mycorrhizal inoculation in plant nursery and forestry (Singh and Pandey, p. 315), (Tiwari and Singh, p. 326) and legume-*Rhizobium* interactions (Ghosh *et al.*, p. 335; Singh *et al.*, p. 341). Molecular aspects of *Frankia-Alnus* actinorhizal symbiosis and development of PCR-RFLP patterns for this interrelationship have also been discussed (Verghese *et al.*, p. 350). Other topics discussed in the book include dermatophytosis (Dubey and Tiwari, p. 368), food and fermentation microbiology (Chandra, p. 372) and aflatoxin contamination management in maize and groundnut (Roy and Chourasia, p. 425).

An overview of the contents of this publication provides a feel for the diversity of topics covered under microbial ecology and also valuable information which can be useful in microbiological and biotechnological studies. The editors deserve to be complimented for their efforts in successfully bringing out this treatise. I have felt that this topic needs further expansion to include the extremophiles (e.g. thermophiles, alkalophiles, etc.) which have been the focus of recent global attention forming a major component of the newer trends in microbial ecology.

M. C. SRINIVASAN

Biochemical Sciences Division,  
National Chemical Laboratory,  
Pune 411 008, India