

Preface

The late Dr. Stephen Thomas Moss of Portsmouth Polytechnic, UK, edited the book “Biology of Marine Fungi” in the year 1986. The present book, appearing nearly 25 years later, is dedicated to the memory of Dr. Moss, the eminent mycologist who left us prematurely. His expertise covered marine, as well as the trichomycetous fungi and electron microscopy of fungi. None of the authors who have contributed in the present book were authors in the 1986 book, indicating that a new crop of marine mycologists have appeared on the scene, bringing new ideas, techniques and approaches, and having been groomed and guided by the earlier generation in their quest to understand the biology of marine fungi.

There have been quite a few books on marine fungi. Johnson and Sparrow’s pioneering monograph in 1961, the book on higher marine fungi by Kohlmeyer and Kohlmeyer in 1979 and in recent times, reviews on diverse topics in marine mycology published as “Fungi in marine environment” by Kevin Hyde in 2002 as a special issue of the journal *Fungal Diversity* are examples. Several books published as proceedings of the marine mycology symposia containing original research papers have appeared regularly. The present book is aimed to present marine fungal biology in its broad perspective, with several reviews and extensive literature coverage that will help the students and teachers working in this field.

With increasing realization of the importance of oceans in our daily lives, the diversity of marine microbes, flora and fauna has attracted the attention of the scientific community. Several exciting papers on marine fungi have appeared in the last two decades. Thus, fungi have been reported from extreme marine environments, such as hydrothermal vents, deep-sea trenches, cold methane seeps, deep-sea subsurface, hypersaline, anoxic and suboxic waters. Culture-dependent as well as culture-independent approaches are helping in assessing marine fungal diversity. Several new phylotypes have been reported based on these techniques, which may contribute to the hidden diversity of fungi on this planet. This should pave way for developing methods to culture the uncultured fungi.

Unraveling the functional diversity of fungi using metagenomics approach is slowly gathering momentum, the first report being that of fungi in coral holobiont.

This approach emphasizes the ecological role of fungi present in any niche. With increasing availability of molecular tools, the metagenomics of fungi in various marine environments will become a popular approach in future.

In this book, I have tried to include reviews on some of the recent advances made in different topics. The role of unicellular thraustochytrids, although not strictly fungi, but eukaryotic osmotrophs, in marine food web is discussed by Bongiorno in the first chapter. The oomycetous pathogens of marine fisheries and shell fisheries with their descriptions and symptoms are illustrated by Hattai. The chapter on fungal endosymbionts of algae highlights their diversity and metabolites. The diversity and ecology of planktonic fungi in the world's oceans and their significance in ocean carbon and nutrient cycling is reviewed by Wang. Fungi associated with sponges and corals and their secondary metabolites have enthused interest of pharma companies. In light of this, one chapter discusses the ecology of fungi in corals and their role in coral ecosystem. Dead Sea with its extremely high salt content is an extremophilic environment. A chapter is devoted to fungi in this environment. Another chapter discusses diversity and adaptation of fungi growing in hypersaline environment of salterns. Sumathi et al. have reviewed molecular diversity of fungi in oxygen-deficient environment from world oceans. Nagano and Nagahama discuss the cultured and uncultured fungal diversity in deep-sea sediments. This chapter highlights the presence of novel fungal lineages, their adaptations and ecological role in extreme environments. Pang et al. discuss fine tuning of identification of marine ascomycetes by classical morphological taxonomy using several new criteria. Sridhar et al. provide new data on diversity of marine fungi from beaches of Portugal. A chapter is devoted to describe marine genera of Xylariaceae of the phylum Ascomycota. Sarma has compiled information on diversity of marine fungi occurring on the mangrove plant *Rhizophora* in 18 different sites world over. Finally, two chapters describe biotechnological potentials of marine fungi in various fields of industrial enzymes, secondary metabolites and bioremediation.

The untapped potential of oceanic resources is being increasingly realized. These resources are in the field of bioactive molecules, enzymes, nutraceuticals, antibiotics, energy, aquaculture, source of gene pool and biodiversity. Most papers contributed in this book have tried to address the current global understanding of the biology, role and biotechnological potential of fungi in the oceans.

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