

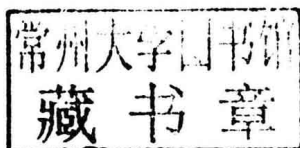
João Lucio de Azevedo  
Maria Carolina Quecine *Editors*

# Diversity and Benefits of Microorganisms from the Tropics

 Springer

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Editors

# Diversity and Benefits of Microorganisms from the Tropics



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# Diversity and Benefits of Microorganisms from the Tropics

# Foreword

Animal life is, on the whole, far more abundant and more varied within the tropics than in any other part of the globe, and a great number of peculiar groups are found there which never extend into temperate regions — A.R. Wallace, 1876

Tropical ecosystems are major reservoirs of biological diversity on our planet, as observed by the great naturalist A.R. Wallace more than a century ago. Does the tropical abundance of biological diversity extend to microorganisms? With the recent availability of rigorous methods for characterizing microbial communities, the tremendous diversity of microorganisms in tropical environments is now also evident. Microorganisms compose a large proportion of biological diversity on Earth, and have fundamental roles in the structure and function of ecosystems around the globe. This book provides new insights into the roles of microorganisms in a range of tropical environments, including rainforests, mangroves, savannahs, agricultural fields, and fresh and ocean waters.

The striking influence of latitude on species diversity, which was first noted by Wallace in the 1800s, has now been substantiated by many ecological studies. These studies, overwhelmingly, have focused on animals, plants, and other macroorganisms. Is microbial life also more diverse at the equator than in temperate regions of the globe? That question is still open for debate. Many scientists think that the concept “everything is everywhere” applies to the distribution of microorganisms on Earth. Proponents of “everything is everywhere” cite the enormous sizes of microbial population in virtually all environments and the capacities of atmospheric and ocean currents, as well as the movement of plant and animal hosts and environmental substrates to disperse microorganisms worldwide. Nevertheless, recent studies describe microbial biogeographical patterns that are far from uniform across the planet. Some conclude that microbial communities, like many plants and animals, are more diverse at the equator than at higher latitudes. Understanding the diversity and function of microorganisms in the tropics is key to resolving these fundamental concepts of global biogeography.

Biological diversity is perhaps our greatest resource on this planet. Nowhere is this more evident than in the tropics, where the abundant life forms interact in ecosystems of stunning beauty and tremendous complexity. Around the globe,

microorganisms are integral components of ecosystems, but knowledge of the identities and functions of microorganisms in the tropics has lagged behind those from temperate climates. This book provides a glimpse into the microbial communities present in a range of tropical environments, highlights current knowledge of the functional roles of these communities, and identifies challenges and questions that remain unanswered. The authors collectively explore the many potential applications of tropical microorganisms to agricultural productivity, fermentation products, and a variety of industrial applications. Altogether, this book lays out a compelling case for the importance of microbial communities to the function of tropical ecosystems.

Oregon State University

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