

Preface

The microbial world is the largest unexplored reservoir of biodiversity and acts as a major source for agriculture, industrial, and medicinal applications. Bacteria are the most dominant group of this diversity, which exist in different ecological niches. The growing interest in microorganisms promoting plant growth provides a fascinating biological system for the enhancement of their growth and development. Efforts have been made in this scenario for the selection of organisms and their selective genera suitable for sustainable plant growth.

With limited arable land coupled with rising demand of a steadily increasing human population, food supply is a global challenge and, therefore, production of high-quality food void of unacceptable chemicals is a pressing need. Knowledge of different mechanisms involved in support of plant growth promotion and disease suppression is essential from both societal and scientific point of view.

This volume comprises 15 chapters that cover application of symbiotic, free-living, rhizospheric, endophytic, methylotrophic, diazotrophic, and filamentous bacteria in plant growth promotion and protection and other related genera associated with orchids and coniferous tree. The effects of ecological consequences of the plasmid plasticity influence the adaptation of azospirilla to the complex plant-soil ecosystem, which have proved to be a great success in improving plant growth. A due account is provided with respect to *Lysobacter* spp., which uniquely is displayed in traits distinguishing them from other similar microbes in the practical field of agriculture. Complex knowledge relating to biology and biotechnology of methylotrophy has remained under infancy. A brief picture on the diversity of methylotrophs and their interactions that imply at both plant and ecosystem level is also provided, and the selection of suitable microbial partner to host orchids proved beneficial for the establishment of a stable community.

Substantial information is provided on the knowledge of different groups of bacteria and other related microbes such as *Actinobacteria*, *Actinomycetes*, and insect gut bacteria, which also have an added advantage due to their unexplored niche.

Spectacular progress has been made in phytobacteriology particularly in the area of agrobiolgy. The subject has evidently grown enormously, but the role of different group of bacteria and related organisms on plant growth responses also needs to be studied.

This book will benefit the students, teachers, and researchers and those interested to strengthen their learning of the subject of Agriculture, Plant physiology, Plant protection, Agronomy, Microbiology, Biotechnology, and Environmental science.

I am grateful to all the leading experts who have contributed their chapters in the preparation of the aforesaid volume. This pragmatic approach for investment in research from seed to soil and then raising plants will boost sustainability.

Appreciations are due to my research students, Abhinav, Rajat, Pankaj, Narendra, and Dr. Sandeep for their sincere efforts. I am also thankful to C.S.I. R., U.G.C., and UCOST for their financial support in the execution of the research projects on the subject that emerged as a prelude in compilation of this volume. I owe my special thanks to Dr. Jutta Lindenborn, Springer, for the excellent support in bringing out the volume in its current shape.

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<http://www.springer.com/978-3-642-20331-2>

Bacteria in Agrobiolgy: Plant Growth Responses

Maheshwari, D.K. (Ed.)

2011, XI, 370 p., Hardcover

ISBN: 978-3-642-20331-2