

Preface

Plants provide an excellent ecosystem for microorganisms that interact with plant cells and tissues with differing degrees of dependence. Investigation on the relationship between roots and microbiota are essential to achieve innovations in agriculture and biotechnology. Similar to other industries, one such system is adoption of biological agents in the form of Plant Growth Promoting Bacteria (PGPB). These groups of bacteria are as effective as pure chemical on plant growth enhancement and disease control besides managing abiotic and other stresses in plants. Such organisms are now alternative paradigms for commercialization. Seeing the importance of these bacteria in the protection of plant health, new biotechnological approaches are employed regulating to develop newer and much better microbial agents for management of the phytopathogens.

This volume of the Microbiology Monograph series has 18 chapters that cover various facets of current scientific knowledge on PGPB that colonize the root and rhizosphere. *Bacillus*- and *Paenibacillus*-based bioinoculant formulations have met with great success in improving plant growth. A large number of PGPB genera on one hand and rhizobia and few endophytes on the other promise benefit to crop ecosystem for sustainable agriculture. A due account is provided with respect to basic concept on plant–bacteria interaction, mineral–nutrient exchange, biofilm formation, and bacteria inhabiting in harsh and cold tropical environment and their role in ethylene regulation via ACC deaminase, as well as the mechanisms of action of PGPB-mediated antifungals. In relation to plant health, the exploitation of such beneficial bacteria may improve agriculture system with economically sound production of human food and animal feed.

This book will be useful not only for students, teachers, and researchers but also for those interested in agriculture microbiology, plant pathology, ecology, environmental science, and agronomy.

I would like to express my sincere thanks to all the contributors for their much needed cooperation, authoritative and up to date information organized in a befitting manner. I acknowledge with thanks the assistance rendered by my research students Abhinav, Rajat, Pankaj, and Dr. Sandeep. I am also thankful to Council of

Scientific and Industrial Research (CSIR), New Delhi, and Director, Uttarakhand Council of Science and Technology (UCOST), Dehradun, India, for their support in execution of my research projects on PGPB that served as a prelude to lay foundation for compilation of the volume like this. I owe my special thanks to Prof. Alexander Steinbüchel, series editor, 'Microbiology Monographs,' University of Münster, Germany, for his professional advice from time to time in multifarious manner. I extend my sincere thanks to Drs. Christina Eckey and Jutta Lindenborn from the publisher Springer for their valuable support to facilitate completion of this volume.

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Plant Growth and Health Promoting Bacteria

Maheshwari, D.K. (Ed.)

2011, XVI, 448 p. 99 illus., 13 illus. in color., Hardcover

ISBN: 978-3-642-13611-5