

Preface

Soil provides an excellent and diverse ecological niche for the rhizospheric microorganisms and seems to be a hotspot for most of the microbial interactions taking place below ground level. Among the various rhizospheric microorganisms, mycorrhizal fungi, plant growth-promoting bacteria and root nodule bacteria are of prime importance, because they have the unique ability to interrelate with the soil and host plant and are also responsible for the assorted underground interactions. These microorganisms also play a vital role in nutrient uptake, water relation, ecosystem establishment, and plant diversity and also had an adverse effect on the pathogen in a diverse range of pathosystems. Besides these functions, microorganisms also influence the water use efficiency and biological function during plant–soil interactions, directly or indirectly by altering the microbial balance in the rhizosphere and suppressing the broad spectrum of plant pathogens.

Considering the importance of these ground rhizospheric microorganisms in the plant disease protection, it came into highlight from research that the combined application of these microorganisms is more beneficial than the use of a single agent and provides a better management against the soilborne plant pathogens. The interaction of these microorganisms also provides an overview about the biological functions of soil and its interaction with the plant–microbe system, nutrient management, biogeochemical cycling, various water environmental conditions in response to biotic and abiotic stresses, signaling of molecules during host–pathogen interaction, role of phytohormones against the environmental stresses, and the major challenges in the formulation of microorganisms for the biocontrol products. The molecular approach of these microorganisms is also the basis for understanding the mechanism involved in disease suppression by these hidden underground beneficial microbes.

This volume with 17 Chapters describes the basis of nutrient exchange between the microorganisms and the host plants, mechanism of disease protection, and recent molecular techniques involved in understanding these multi-tropic interactions. We hope that the book will be helpful to graduate students, teachers, researchers, and industry persons, who are interested in soil microbiology, plant pathology, ecology, environmental sciences, and agronomy.

We are highly grateful to all our contributors for readily accepting our invitation for not only sharing their knowledge and research but for venerably integrating their expertise in dispersed information from diverse fields in composing the chapters and enduring editorial suggestions to finally produce this venture. We greatly appreciate their commitment. We are also thankful to Prof. Munir Ozturk for his suggestions and writing the foreword for this volume.

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