Preface

This book was conceptualized during finalizing the Soil Biology volume "Root engineering: Basic concepts and Applications" edited by Asuncion Morte and Ajit Varma (2014). Soon it was realized that the basic functions of roots are heavily regulated by the microorganisms around them and thus a new volume "PGPR and Medicinal Plants" was depicted. The prime aim and objective of this volume is to highlight various aspects of action, effect, and application of PGPRs in medicinal plants to lend a hand to scientists throughout the world working in this field.

The rhizosphere concept was first introduced by Hiltner (1904) to describe the narrow zone of soil surrounding the roots where microbial populations are stimulated by root activities. The term "plant growth-promoting rhizobacteria (PGPR)" was first used by Joseph W. Kloepper in the late 1970s and has become commonly used in scientific literature. A large number of microorganisms such as bacteria, fungi, protozoa, and algae coexist in the rhizosphere; however, the most abundant organism is bacteria. Plants select those bacteria contributing most to their fitness by releasing organic compounds through exudates creating a very selective environment where diversity is low. Since bacteria are the most abundant microorganisms in the rhizosphere, it is highly probable that they influence the plants' physiology to a greater extent, especially considering their competitiveness in root colonization, hence, referred as plant growth-promoting rhizobacteria (PGPR). PGPRs are the group of microorganisms which colonize and have symbiotic relationship with the plant roots and promote plant growth via various plant growth-promoting substances and also act as biofertilizers.

The world today comes up with a new ailment after every short span of time and thus our requirement of medicines and drugs continues to amplify. Natural compounds are most preferred over synthetic drugs for curing diseases and these natural compounds are variedly obtained from medicinal plants. All we need is to enhance quality and quantity of plant secondary metabolites, which can be skillfully used for drug production. Numerous plant growth-promoting rhizobacteria are well known to exhibit beneficial effects on plenty of medicinal plants.