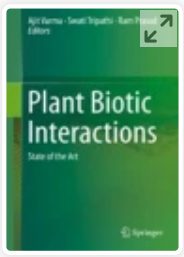


Book | © 2019

# Plant Biotic Interactions

State of the Art



**Editors:** Ajit Varma, Swati Tripathi, Ram Prasad

Presents the latest findings on and trends in plant-biotic interactions and their applications in plant productivity and agricultural sustainability

Covers a range of disciplines, e.g. microbial technology, environmental microbiology, agricultural science, the health sciences, biological sciences and other related disciplines

A valuable asset for undergraduate and graduate students, researchers and scholars, scientists in academia, industry, planners and policymakers from diverse fields



## Sections

Table of contents

About this book

Keywords

Editors and Affiliations
About the editors
Bibliographic Information



# Table of contents (17 chapters)

Search within book

Front Matter PDF
Pages i-vi

Endophytic Microorganisms as Biological Control Agents for Plant Pathogens: A Panacea for Sustainable Agriculture
Charles Oluwaseun Adetunji, Deepak Kumar, Meenakshi Raina, Olawale Arogundade, Neera Bhalla Sarin
Pages 1-20

Plant–Phytophthora Interaction Proteomics
M. Anandaraj, P. Umadevi
Pages 21-29

Impact of Climate Change on Soil Microbial Community
Srikanth Mekala, Srilatha Polepongu
Pages 31-41

Industrial Effluents: Impact on Agricultural Soils and Microbial Diversity
Sujata Mani, Pankaj Chowdhary, Vishvas Hare
Pages 43-60

Plant Metabolites Involved in Plant–Pathogen Interactions

Daraksha Parween, Binod Bihari Sahu, Maya Kumari, Ramesh N. Pudake
Pages 61-84

Management of Root-Knot Nematode in Different Crops Using Microorganisms

Aastha Singh, Pankaj Sharma, Anju Kumari, Rakesh Kumar, D. V. Pathak
Pages 85-99

Plant Growth-Promoting Bacterial Life at High Salt Concentrations: Genetic Variability

Ritika Kapoor, S. S. Kanwar
Pages 101-111

Rhizosphere: A Home for Human Pathogens

Richa Sharma, V. S. Bisaria, Shilpi Sharma
Pages 113-127

Effect of Organic Farming on Structural and Functional Diversity of Soil Microbiome: Benefits and Risks

Vijay Laxmi Shrivas, Upma Singh, L. Weisskopf, P. Hariprasad, Shilpi Sharma
Pages 129-146

Plants for Biocontrol and Biological Control of Plant Pathogens

Prachi Saxena, Jyoti Srivastava, Shrishti Pandey, Shreya Srivastava, Neha Maurya, Niharika Chand Kaushik et al.
Pages 147-179

Entomopathogenic Nematodes in the Biological Control of Insect Pests with Reference to Insect Immunity

Istkhar, Ashok Kumar Chaubey, Amar Prakash Garg

Pages 181-209

Interaction Between Aromatic Oil Components and Bacterial Targets

Smaranika Pattnaik, Niranjan Behera
Pages 211-226

Enhancement of Active Constituents of Medicinal Plants Through the Use of Microbes

Charu Gupta, Dhan Prakash
Pages 227-241

Effect of Agnihotra Ash on Drug-Resistant Escherichia coli in Water

Reshma Tuladhar, Bijaya Laxmi Maharjan, Supriya Sharma, Anjana Singh, Ulrich Berk
Pages 243-251

Plant Microbe Interface: The Plant Antimicrobial Peptides

S. Manivannan, P. Umadevi
Pages 253-261

Microbe-Mediated Abiotic Stress Alleviation: Molecular and Biochemical Basis

Pandiyan Kuppusamy, Samadhan Yuvraj Bagul, Sudipta Das, Hillol Chakdar
Pages 263-281

Microbial Diversity in Soil: Biological Tools for Abiotic Stress Management in Plants

Neera Garg, Kiran Saroy, Amandeep Cheema, Aditi Bisht
Pages 283-321

Back to top ↑

## About this book

This book highlights recent advances in the field of plant-biotic interactions and explores current serious issues in the crop production industry. It is intended to attract more attention to these important, but often overlooked areas, and to stimulate new ideas for future research.

Plants are constantly under attack by pathogens, pests, and parasites, which can significantly impact worldwide food production and human health. While pathogens and pests attack and interconnect with their hosts in a variety of ways, plants have developed sophisticated immune systems to fight infections. In the field of plant-biotic interactions, most of the studies to date have focused on the function and signaling pathways of plant disease resistance proteins and pattern recognition receptors, as well as pathogen effector proteins.

In contrast, this book presents new and emerging research areas, and introduces students, researchers, academics, and policy advisors to the latest trends in e.g. microbial technology, environmental microbiology, agricultural science, the health sciences, biological sciences and other related disciplines.

Back to top ↑

## Keywords

**Microbial Ecology** **PBI**

**Plant Biotic Interactions**

**Plant Fungal Interaction**

**Plant Microbe Interaction**

**Plant Productivity**

**Plant Pathogen Interaction**

**Plant Surface Microbiology** **Symbiosis**

Back to top ↑

## Editors and Affiliations

**Amity Institute of Microbial Technology, Amity University, Noida, India**

Ajit Varma, Swati Tripathi

**Department of Botany, Mahatma Gandhi Central University, Motihari, India**

Ram Prasad

Back to top ↑

## About the editors

**Prof Dr Ajit Varma**: Professor Varma has completed his PhD at the age of 25 years from Allahabad University and Former Professor, School of Life Sciences, Jawaharlal Nehru University, India. Presently, he is the Distinguished Scientist & Professor of Eminence of Amity Institute of Microbial Technology; Pro-Vice Chancellor, Ritnand Balved Education Foundation, and Vice Chairman, Amity Science, Technology & Innovation Foundation Amity University Uttar Pradesh, India. He has published more than 314 papers in reputed journals and has

been serving as an editor in Chief of Soil Biology Series, Springer Verlag Germany. Dr Varma is the Fellow of Alexander-von-Humboldt Society, Germany, elected Fellow of National Academy Agricultural Sciences and Fellow of Microbiology Society of India.

**Dr Swati Tripathi:** Assistant Professor at Amity Institute of Microbial Technology, Amity University, Noida, India. She is working on plant microbe interaction, and microbial biotechnology. Dr Tripathi has a number of research papers and review articles to her credit in the journals of international repute. She has her post doctoral experience from South Korea and has been awarded Early Career Research Award recently.

**Dr Ram Prasad**: Assistant Professor at Amity Institute of Microbial Technology, Amity University, Noida, India. He is working on plant microbe interaction, nanobiotechnology, and microbial biotechnology. Dr Prasad has edited several books and has a number of research papers and review articles to his credit in the journals of international repute. During 2014, Dr Prasad has been awarded American Cancer Society UICC International Fellowship for Beginning Investigator, USA. Presently, he is working as Research Associate Professor at School of Environmental Sciences and Engineering, Sun Yat-Sen University, China.

Back to top ↑

## Bibliographic Information


| Book Title | Book Subtitle | Editors |
|---|---|---|
| Plant Biotic Interactions | State of the Art | Ajit Varma, Swati Tripathi, Ram Prasad |
| **DOI** | **Publisher** | **eBook Packages** |
| https://doi.org/10.1007/978-3-030-26657-8 | Springer Cham | Biomedical and Life Sciences, |

Biomedical and Life Sciences (R0)

**Copyright Information**
Springer Nature Switzerland AG 2019

**Hardcover ISBN**
978-3-030-26656-1
Published: 11 December 2019

**Softcover ISBN**
978-3-030-26659-2
Published: 18 December 2020

**eBook ISBN**
978-3-030-26657-8
Published: 28 November 2019

**Edition Number**
1

**Number of Pages**
VI, 321

**Number of Illustrations**
2 b/w illustrations, 30 illustrations in colour

**Topics**
Microbiology, Biotechnology, Plant Science

Back to top ↑