

CONTENTS

Contributors

vii

1. Plant-Microbiota Interactions as a Driver of the Mineral Turnover in the Rhizosphere	1
R. Alegria Terrazas, C. Giles, E. Paterson, S. Robertson-Albertyn, S. Cesco, T. Mimmo, Y. Pii and D. Bulgarelli	
1. Introduction	2
2. Methodological Approaches to Study Plant-Microbiota Interactions and Their Contribution to Plant Mineral Uptake	5
3. Defining the Microbiota Thriving at the Root-Soil Interface	13
4. Plant-Microbiota Interactions Interfere with the Mineral Turnover at the Root-Soil Interface	22
5. From the Laboratory to the Field	45
Acknowledgments	48
References	48
 2. Familiar Stranger: Ecological Genomics of the Model Saprotroph and Industrial Enzyme Producer <i>Trichoderma reesei</i> Breaks the Stereotypes	 69
I.S. Druzhinina and C.P. Kubicek	
1. Introduction	70
2. History of <i>Trichoderma reesei</i> : The Straight Way to the Model	71
3. Evolution and Biogeography and Ecology of <i>Trichoderma reesei</i>	73
4. Reproductive Biology of <i>Trichoderma reesei</i>	76
5. Mycoparasitism of <i>Trichoderma reesei</i>	79
6. The <i>Trichoderma reesei</i> Genome	82
7. <i>Trichoderma reesei</i> Nutrition	83
8. Regulation of the Plant Cell Wall Degradation Machinery in <i>Trichoderma reesei</i>	91
9. Epigenetic Aspects of Cellulase and Hemicellulose Regulation	103
10. Cellulase Signaling	106
11. The <i>Trichoderma reesei</i> Secretory Pathway	107
12. Secondary Metabolites	110
13. Applications of <i>Trichoderma reesei</i>	120
14. Conclusion	126
Acknowledgments	127
References	127

3. Analysis of Low-Biomass Microbial Communities in the Deep Biosphere	149
Y. Morono and F. Inagaki	
1. Introduction	150
2. Obtaining High-Quality Samples and Tracing Contaminants	151
3. Detecting Deep Microbial Cells in Geological Samples	157
4. Molecular Ecological Analyses of Microbial Communities	163
5. Metabolic Activity Measurements Using Chemical Profiles and Radioisotope/Stable Isotope Tracers	167
References	173
4. The Impact of Oxygen on Bacterial Enteric Pathogens	179
N. Wallace, A. Zani, E. Abrams and Y. Sun	
1. Enteric Pathogens Exposed to Varying Oxygen Levels	180
2. Enteric Pathogens Responding to Varying Oxygen Levels	182
3. Conclusion	192
References	193
Index	205
Contents of Previous Volumes	215