

Iqbal Ahmad · Farah Ahmad
John Pichtel *Editors*

Microbes and Microbial Technology

Agricultural
and Environmental
Applications



Springer

Contents

1 Microbial Applications in Agriculture and the Environment: A Broad Perspective.....	1
Iqbal Ahmad, Mohd Sajjad Ahmad Khan, Farrukh Aqil, and Mahipal Singh	
2 Molecular Techniques to Assess Microbial Community Structure, Function, and Dynamics in the Environment.....	29
Gurdeep Rastogi and Rajesh K. Sani	
3 The Biofilm Returns: Microbial Life at the Interface	59
Anand Jain, Enrico Marsili, and Narayan B. Bhosle	
4 Future Application of Probiotics: A Boon from Dairy Biology	87
Vinod Singh, Sarika Amdekar, Hariom Yadav, Nagendra Nath Mishra, and Shailini Jain	
5 Microbially Synthesized Nanoparticles: Scope and Applications.....	101
Javed Musarrat, Sourabh Dwivedi, Braj Raj Singh, Quaiser Saquib, and Abdulaziz A. Al-Khedhairy	
6 Bacterial Quorum Sensing and Its Interference: Methods and Significance.....	127
Iqbal Ahmad, Mohd Sajjad Ahmad Khan, Fohad Mabood Husain, Maryam Zahin, and Mahipal Singh	
7 Horizontal Gene Transfer Between Bacteria Under Natural Conditions.....	163
Elisabeth Grohmann	
8 Molecular Strategies: Detection of Foodborne Bacterial Pathogens	189
Javed Ahamad Khan, R.S. Rathore, Iqbal Ahmad, and Shaheen Khan	

9	Recent Advances in Bioremediation of Contaminated Soil and Water Using Microbial Surfactants	207
	Achlesh Daverey and Kannan Pakshirajan	
10	Bioaugmentation-Assisted Phytoextraction Applied to Metal-Contaminated Soils: State of the Art and Future Prospects.....	229
	Thierry Lebeau, Karine Jézéquel, and Armelle Braud	
11	Biosorption of Uranium for Environmental Applications Using Bacteria Isolated from the Uranium Deposits	267
	Takehiko Tsuruta	
12	Bacterial Biosorption: A Technique for Remediation of Heavy Metals	283
	Mohd Ikram Ansari, Farhana Masood, and Abdul Malik	
13	Metal Tolerance and Biosorption Potential of Soil Fungi: Applications for a Green and Clean Water Treatment Technology	321
	Iqbal Ahmad, Mohd Imran, Mohd Ikram Ansari, Abdul Malik, and John Pichtel	
14	Rhizosphere and Root Colonization by Bacterial Inoculants and Their Monitoring Methods: A Critical Area in PGPR Research.....	363
	Farah Ahmad, Fohad Mabood Husain, and Iqbal Ahmad	
15	Pesticide Interactions with Soil Microflora: Importance in Bioremediation	393
	Munees Ahemad and Mohammad Saghir Khan	
16	Baculovirus Pesticides: Present State and Future Perspectives.....	415
	Flavio Moscardi, Marlinda Lobo de Souza, Maria Elita Batista de Castro, Mauricio Lara Moscardi, and Boguslaw Szewczyk	
17	Fungal Bioinoculants for Plant Disease Management	447
	Mujeebur Rahman Khan and M. Arshad Anwer	
18	Mycorrhizal Inoculants: Progress in Inoculant Production Technology	489
	Zaki A. Siddiqui and Ryota Kataoka	
	Index.....	507