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Nota di contenuto	Molecular Ecology of Rhizosphere Microorganisms; Preface; List of Contributors; Content; 1 Current Challenges in Introducing Beneficial Microorganisms into the Rhizosphere; 1.1 Introduction and Definitions; 1.2 Relationship of Root Colonization to Biocontrol and Growth Promotion; 1.3 The Process of Colonization; 1.4 Effect of Biotic and Abiotic Factors; 1.5 Bacterial Traits Contributing to Rhizosphere Competence; 1.6 Population Dynamics of PGPR in the Field; 1.7 Release of Genetically Engineered Rhizobacteria; 1.8 Mechanisms of Biological Control by PGPR; 1.9 Inconsistent Performance of PGPR 1.10 Improving Root Colonizing and Biological Control 1.11 Conclusion; 1.12 References; 2 Studies on Indigenous Endophytic Bacteria of Sweet Corn and Cotton; 2.1 Introduction; 2.2 Materials and Methods; 2.2.1 Media; 2.2.2 Field Experiments; 2.2.3 Sample Preparation and Surface Sterilization; 2.2.4 Growth Conditions, Bacterial Counts and Data Analysis; 2.2.5 Isolation and Preservation of Endophytes; 2.2.6 Strain Identification; 2.3 Results; 2.3.1 Population Dynamics; 2.3.2 Bacterial

Identification; 2.4 Discussion; 2.5 References

3 Detection of Introduced Bacteria in the Rhizosphere Using Marker Genes and DNA Probes

3.1 Introduction; 3.2 Methods; 3.2.1 Spontaneous Antibiotic Resistance; 3.2.2 Marker Genes; 3.2.2.1 New metabolic capability; 3.2.2.2 Heavy metal resistance; 3.2.2.3 Bioluminescence; 3.2.2.4 Herbicide resistance; 3.2.2.5 Transposons carrying antibiotic resistance; 3.2.3 DNA Probes; 3.2.4 Detection Limits, Amplification and Enrichment; 3.2.4.1 Increased Sensitivity by PCR Amplification; 3.2.4.2 Enrichment; 3.3 Case Study : "kicking LacZY-labelled *Pseudomonas cormgutu* in the Field; 3.3.1 Pre-release Testing 3.3.2 Field Release

3.4 The Ecological Fitness of Genetically-Engineered Bacteria; 3.4.1 Metabolic Load; 3.4.2 Reduced Fitness; 3.5 Conclusions; 3.6 References; 4 Impact of GEMMOs on Rhizosphere Population Dynamics; 4.1 Introduction; 4.2 A Most Probable Number (MPN) Recovery Technique; 4.3 The Need for an Eco-Physiological Index (EPI); 4.4 Conclusions; 4.5 References; 5 Developing Concepts in Biological Control: A Molecular Ecology Approach; 5.1 Introduction; 5.2 Siderophore-Mediated Competitive Exclusion of Phytopathogens; 5.3 Exploiting Antifungal Metabolites to Enhance Biological Control 5.4 Stability of Introduced Genes and Biological Containment Systems for GMO's

5.5 Conclusion; 5.6 References; 6 Biocontrol of Root Diseases by *Pseudomonas fluorescens* CHAO: Current Concepts and Experimental Approaches; 6.1 Introduction; 6.2 Mechanistic Studies on Biocontrol Traits of *Pseudomonas fluorescens* CHAO; 6.2.1 Chemical Identification of Extracellular Metabolites; 6.2.2 Genetic Manipulation of Strain CHAO; 6.2.3 Gnotobiotic System; 6.2.4 Mutations Affecting Biocontrol Efficacy, Regulation of Secondary Metabolism, and some Caveats; 6.2.5 Induced Systemic Resistance in Plants 6.2.6 Genetic Instability of Strain CHAO: Effects on Secondary Metabolism and Biological Control

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Sommario/riassunto

This book helps evaluate the state of the art of rhizosphere microbial ecology and biotechnology. Experts in the field review methods and strategies applied to the detection, identification and monitoring of microorganisms in the rhizosphere. Major topics treated include:- construction of genetically marked rhizosphere bacteria - detection of marked wildtype and genetically modified organisms (GMOs)- identification of wildtype and GMOs by DNA probes and PCR amplification- rapid typing of non-modified and GMOs by PCR-based techniques - assessment of the role of gene transfer

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