1. Record Nr. UNINA9910743342903321

Titolo	Natural products from actinomycetes : diversity, ecology and drug discovery / / Ravishankar V. Rai and Jamuna A. Bai, editors
Pubbl/distr/stampa	Singapore : , : Springer, , [2022] ©2022
ISBN	981-16-6131-6 981-16-6132-4
Descrizione fisica	1 online resource (512 pages)
Disciplina	589.23
Soggetti	Microbiological chemistry Natural products - Analysis
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- Contents -- Editors and Contributors -- About the Editors -- Contributors -- 1: Actinobacteria from Marine Environments: A Unique Source of Natural Products -- 1.1 Introduction -- 1.2 Marine Actinobacteria: Where Can We Find Them? -- 1.2.1 Sediments and Seawater -- 1.2.2 Marine Fauna -- 1.2.2.1 Corals -- 1.2.2.2 Sponges -- 1.2.2.3 Tunicates, Mollusks, Marine Fishes, and Other Organisms -- 1.2.3 Marine Flora: Macroalgae, Seagrass, and Mangrove -- 1.3 Bioactive Metabolites Produced by Marine Actinobacteria -- 1.3.1 Pharmaceuticals -- 1.3.2 Other Bioactive Compounds -- 1.4 From the Field to the Laboratory: Best Approaches to Isolate Marine Actinobacteria -- 1.5 New Tools for Bioprospecting Actinobacteria -- 1.6 Conclusions and Future Perspectives -- References -- 2: Exploration of Insects and Mollusks for New Secondary Metabolites from Actinobacteria -- 2.1 Introduction -- 2.2 Secondary Metabolites from Actinobacteria -- 2.3 Insect-Microbe Interactions -- 2.4 Actinobacteria Isolated from Ants -- 2.5 Actinobacteria Isolated from Termites -- 2.6 Actinobacteria Isolated from Bees -- 2.7 Actinobacteria Isolated from Wasps -- 2.8 Actinobacteria Isolated from Beetles -- 2.9 Actinobacteria Isolated from Bugs -- 2.10 Mollusca-Microbe Interactions -- 2.11 Actinobacteria Isolated from Nudibranch -- 2.12 Actinobacteria Isolated from Snails -- 2.13 Actinobacteria Isolated from

Clams -- 2.14 Conclusion and Future Perspectives -- References -- 3: Polar Actinobacteria: A Source of Biosynthetic Diversity -- 3.1 Introduction -- 3.1.1 Actinobacteria from the Poles -- 3.1.2 Compounds Isolated from Polar Actinobacteria -- 3.2 Diversity of Biosynthetic Gene Clusters in Polar Actinobacteria -- 3.2.1 PCR-Based Approach -- 3.2.2 Genomic and Metagenomic Approaches -- 3.3 Conclusions and Future Perspectives -- References.
4: Actinobacteria from Arid Environments and Their Biotechnological Applications -- 4.1 Introduction -- 4.1.1 Desert Environment -- 4.1.2 Actinobacteria from Desert -- 4.2 Isolation Strategies for Desert Actinobacteria -- 4.2.1 Pre-treatment of Environmental Samples -- 4.2.2 Selective Media and Antibiotics -- 4.2.3 Growth Conditions of Desert Actinobacteria -- 4.2.4 Selection of Actinobacterial Colonies -- 4.3 Biotechnological Applications -- 4.3.1 Environmental and Industrial Applications -- 4.3.2 Agricultural Applications -- 4.3.3 Health Science Applications -- 4.4 Conclusion and Future Perspectives -- References -- 5: Endophytic Actinobacteria in Biosynthesis of Bioactive Metabolites and Their Application in Improving Crop Yield and Sustai... -- 5.1 Introduction -- 5.2 Endophytic Microbes -- 5.3 Endophytic Actinobacteria for Sustainable Agriculture Improvement -- 5.4 Biological Control -- 5.5 Abiotic Stress: Reduction, Alleviation and Control -- 5.6 Plant Growth Promotion -- 5.6.1 Siderophore Production -- 5.6.2 Nitrogen Fixation -- 5.6.2.1 Interaction with Rhizobium -- 5.6.3 Phosphate Solubilization -- 5.6.4 ACC Deaminase Activation -- 5.6.5 Phytohormone Production -- 5.7 Crop Yields -- 5.8 Conclusion and Future Perspectives -- References -- 6: An Overview on Natural Product from Endophytic Actinomycetes -- 6.1 Introduction -- 6.2 Endophytic Actinomycetes -- 6.3 Endophytic Actinomycetes from Various Sources -- 6.4 Marine Endophytic Actinomycetes -- 6.5 Biomedical Applications of Marine Endophytic Actinomycetes -- 6.6 Industrially Important Actinomycetes and Their Application -- 6.7 Secondary Metabolites of Endophytic Actinomycetes -- 6.8 Conclusion and Future Prospectives -- References -- 7: Regulation of Secondary Metabolites Through Signaling Molecules in Streptomyces -- 7.1 Introduction.
7.2 Structural Diversity of the Streptomyces Signaling Molecules -- 7.3 The Signaling Molecule-Dependent Regulatory Pathway for Secondary Metabolite Production -- 7.4 The Receptors of Regulatory Signaling Molecules -- 7.5 The Pseudo-receptor Proteins: Their Function and Interactive Ligands -- 7.6 Signaling Molecules/Antibiotics Act as Intra-/Interspecies Signals -- 7.7 The Streptomyces Antibiotic Regulatory Proteins (SARP): One of the Main Targets of Signaling Molecule/Receptor System -- 7.8 Natural Product Discovery Through Manipulation of Regulatory System -- 7.9 Conclusion and Future Perspective -- References -- 8: New Strategies to Activate Secondary Metabolism in Streptomyces -- 8.1 Streptomycetes Are Complex Mycelial Sporulating Bacteria and the Main Source of Bioactive Compounds -- 8.1.1 Streptomyces Development -- 8.1.2 Streptomyces Differentiation and Industrial Fermentations -- 8.1.3 Novel Drug Discovery Approaches -- 8.1.4 Screening for New Bioactive Compounds from Natural Microorganisms -- 8.2 New Strategies for High-Throughput Screening from Natural Microorganisms -- 8.2.1 New Strategies for Actinomycete Strain Isolation -- 8.2.1.1 Exploring New Niches -- 8.2.1.2 Symbiotic Relationships -- 8.2.1.3 Non-culturable Microorganisms -- 8.2.2 Old and New Strategies to Activate and Explore Secondary Metabolism in Actinomycetes -- 8.2.2.1 Selective Methods to Improve the Production of Known Compound -- 8.2.2.1.1 Engineering Precursor Biosynthesis and Specific Regulators -- 8.2.2.1.2

Heterologous Expression, Omics-Guided Secondary Metabolite Synthesis -- 8.2.2.1.3 Combinatorial Biosynthesis -- 8.2.2.2 Unselective Methods -- 8.2.2.2.1 Modifying the Culture Medium -- 8.2.2.2.2 Inducing Stress -- 8.2.2.2.3 Random Mutagenesis -- 8.2.2.2.4 Ribosomal Engineering -- 8.2.2.2.5 Genome Mining -- 8.2.2.2.6 Co-cultures and Elicitors.
8.2.2.2.7 Strategies to Modulate Secondary Metabolism Based on Macroscopic Morphology (Pellet and Clump Formation) -- 8.2.2.2.8 Strategies to Modulate Secondary Metabolism Based on Mycelium Differentiation and Programmed Cell Death -- 8.2.2.2.9 Strategies to Modulate Secondary Metabolism Based on the Use of Non-pathogenic Targets to Test the Biological Activi... -- 8.3 Conclusions -- References -- 9: Novel Agroactive Secondary Metabolites from Actinomycetes in the Past Two Decades with Focus on Screening Strategies and Di... -- 9.1 Introduction -- 9.2 Exploring Actinomycetes Producing Agroactive Secondary Metabolites from New Habitats -- 9.2.1 Actinomycetes from Marine Environment -- 9.2.2 Actinomycetes from Extreme Terrestrial Environment -- 9.2.3 Terrestrial Plant- or Animal-Associated Actinomycetes -- 9.3 Phylogenetic Analysis of the Agroactive Secondary Metabolites-Producing Actinomycetes Strains -- 9.4 New Techniques for Accelerating the Process of Discovery of Novel Agroactive Secondary Metabolites -- 9.4.1 Chemical Screening -- 9.4.2 Gene Screening -- 9.4.3 Genome Mining -- 9.5 Traditional Methods for Discovering New Agroactive Secondary Metabolites from Actinomycetes -- 9.5.1 Mutagenesis -- 9.5.2 Bioconversion -- 9.6 The Designed Biosynthesis of New Agroactive Secondary Metabolites in Post-omics Era -- 9.6.1 Gene Replacement -- 9.6.2 Gene Overexpression -- 9.6.3 Gene Deletion or Disruption -- 9.6.4 Expression of Introduced Heterogeneous Genes -- 9.7 Novel Agroactive Secondary Metabolites from Actinomycetes in the Past Two Decades -- 9.7.1 Novel Insecticidal and Acaricidal Metabolites -- 9.7.2 Novel Antifungal or Bactericidal Metabolites -- 9.7.3 Novel Herbicidal, Phytotoxic, or Plant Growth Regulating Metabolites -- 9.7.4 Novel Nematicidal Metabolites -- 9.7.5 Novel Antiphytoviral Metabolites.
9.8 The Development of Agrochemicals with Leads from Actinomycete and Their Application in Crop Protection -- 9.9 Conclusion -- References -- 10: Quorum Sensing and Quorum Quenching Metabolites in Actinomycetes -- 10.1 Introduction -- 10.2 QS Signals in Actinomycetes -- 10.3 QS in Streptomyces Species -- 10.3.1 Streptomyces griseus -- 10.3.2 Streptomyces virginiae -- 10.3.3 Streptomyces coelicolor -- 10.3.4 Streptomyces avermitilis -- 10.3.5 Streptomyces rochei -- 10.3.6 Streptomyces natalensis -- 10.3.7 Streptomyces globisporus -- 10.3.8 Streptomyces albidoflavus -- 10.3.9 Streptomyces lavendulae -- 10.3.10 Streptomyces filipinensis -- 10.3.11 Streptomyces chattanoogensis -- 10.3.12 Streptomyces tsukubaensis -- 10.3.13 Antibiotics as Signaling Molecules -- 10.4 QS in Non-Streptomyces Species -- 10.5 Detection of QS Signals and Receptors in Actinomycetes -- 10.6 Interspecies Signaling in Actinomycetes -- 10.7 QS-Regulated Phenotypes in Actinomycetes -- 10.8 Quorum Sensing Inhibition in Actinomycetes -- 10.8.1 Quorum Quenching Enzymes in Actinomycetes -- 10.8.1.1 Quorum Quenching Enzymes in Streptomyces sp. -- 10.8.1.2 Quorum Quenching Enzymes in Rhodococcus sp. -- 10.8.1.3 Quorum Quenching Enzymes in Nocardioides sp. -- 10.8.2 Quorum Sensing Inhibitory Compounds in Actinomycetes -- 10.8.2.1 Anti-virulence Compounds Against Oral Pathogens -- 10.8.2.2 QS and Biofilm Inhibitory Compounds Against Vibrio sp. -- 10.8.2.3 Anti-infective Compounds Against ESKAPE Pathogens -- 10.8.2.4 Quorum Sensing Inhibitory Compounds Against

Other Bacterial Pathogens -- 10.8.2.5 Quorum Sensing Inhibitory Compounds Against Plant Pathogens -- 10.8.2.6 Quorum Sensing Inhibitory Compounds Against Fungal Pathogens -- 10.9 Conclusion and Future Prospectives -- References -- 11: Metabolic Engineering of Actinomycetes for Natural Product Discovery -- 11.1 Overview. 11.2 Identification and Capture of Biosynthetic Gene Clusters (BGCs).