

Contents

Part I State of the Art

Mycorrhizal Fungi: What We Know and What Should We Know?	3
E. Mohammadi Goltapeh, Y. Rezaee Danesh, R. Prasad, and A. Varma	
Diversity, Function and Potential Applications of the Root-Associated Endophytes	29
S. A. Kageyama, K. G. Mandyam, and A. Jumpponen	
Structure, Extent and Functional Significance of Belowground Arbuscular Mycorrhizal Networks	59
M. Giovannetti	
Foraging for Resources in Arbuscular Mycorrhizal Fungi: What is an Obligate Symbiont Searching for and How is it Done?	73
Mayra E. Gavito, Pål Axel Olsson	
Global Diversity Patterns of Arbuscular Mycorrhizal Fungi–Community Composition and Links with Functionality	89
Maarja Öpik, Ülle Saks, Jennifer Kennedy, and Tim Daniell	
Mycorrhiza Helper Bacteria	113
Mika T. Tarkka, Pascale Frey-Klett	

Part II Genetics and Molecular Biology

Genomic Organization and Mechanisms of Inheritance in Arbuscular Mycorrhizal Fungi: Contrasting the Evidence and Implications of Current Theories	135
James D. Bever, Hyun-Joo Kang, Wittaya Kaonongbua, and Mei Wang	

Ectomycorrhiza and Water Transport	149
Žaklina Marjanović, Uwe Nehls	
Hypogeous Pezizaceae: Physiology and Molecular Genetics	161
Varda Kagan-Zur, Marianna Zaretsky, Yaron Sitrit, and Nurit Roth-Bejerano	
Evaluation of the Possible Participation of Drought-induced Genes in the Enhanced Tolerance of Arbuscular Mycorrhizal Plants to Water Deficit	185
Juan Manuel Ruiz-Lozano, Rosa Porcel, and Ricardo Aroca	
Part III Eco-Function	
The Beneficial Effect of Mycorrhizae on N Utilization by the Host-Plant: Myth or Reality?	209
Anthony Gobert, Claude Plassard	
Ion Dynamics During the Polarized Growth of Arbuscular Mycorrhizal Fungi: From Presymbiosis to Symbiosis	241
Alessandro C. Ramos, Arnaldo R. Façanha, and José A. Feijó	
Arbuscular Mycorrhiza in Metal Hyperaccumulating Plants	261
Marjana Regvar, Katarina Vogel-Mikuš	
Mycorrhizal Fungi and Other Root Endophytes as Biocontrol Agents Against Root Pathogens	281
S. Tripathi, S. Kamal, I. Sheramati, R. Oelmuller, and A. Varma	
The Biocontrol Effect of Mycorrhization on Soilborne Fungal Pathogens and the Autoregulation of the AM Symbiosis: One Mechanism, Two Effects?	307
H. Vierheilig, S. Steinkellner, T. Khaosaad, and J.M. Garcia-Garrido	
Resource Partitioning Between Extraradical and Intraradical AM Fungal Mycelium	321
Ingrid M. van Aarle, Pål Axel Olsson	
Ozone Stress and Ectomycorrhizal Root–Shoot Signaling	337
Hojka Kraigher, Tine Grebenc, and David E. Hanke	
Part IV Biotechnology	
From Production to Application of Arbuscular Mycorrhizal Fungi in Agricultural Systems: Requirements and Needs	361
Jacqueline Baar	

Contents	xvii
Agronomic Management of Indigenous Mycorrhizas	375
Isabel Brito, Michael J. Goss, Mário de Carvalho, Diederik van Tuinen, and Pedro M. Antunes	
AM Inoculation in Tropical Agriculture: Field Results	403
Gisela Cuenca, Alicia Cáceres, and María Gabriela González	
The International Market Development for Mycorrhizal Technology	419
Miroslav Vosátka, Jana Albrechtová, and Robert Patten	
Why and How Using Micropropagated Trees rather than Germinations for Controlled Synthesis of Ectomycorrhizal Associations?	439
Sylvie Herrmann, François Buscot	
Biotechnology and Cultivation of Desert Truffles	467
A. Morte, M. Honrubia, and A. Gutiérrez	
The Fungal Transmitted Viruses	485
Dipika Singh, Neeraj Verma, and Ajit Varma	
Part V Eco-Physiology	
Intertwined Existence: The Life of Plant Symbiotic Fungi in Agricultural Soils	507
Walid Ellouze, Keith Hanson, Atul Nayyar, Juan Carlos Perez, and Chantal Hamel	
Macroecology of Microbes – Biogeography of the Glomeromycota	529
V. B. Chaudhary, M. K. Lau, and N. C. Johnson	
Arbuscular Mycorrhiza of Endangered Plant Species: Potential Impacts on Restoration Strategies	565
Birgit Fuchs, Kurt Haselwandter	
Community Developmental Patterns and Ecological Functions of Ectomycorrhizal Fungi: Implications from Primary Succession	581
Kazuhide Nara	
Colonization of Plant Roots by Pseudomonads and AM Fungi: A Dynamic Phenomenon, Affecting Plant Growth and Health	601
Guido Lingua, Elisa Gamalero, Anna Fusconi, Philippe Lemanceau, and Graziella Berta	

In vitro Cultures Open New Prospects for Basic Research in Arbuscular Mycorrhizas	627
Custodia Cano, Sandy Dickson, Manuel González-Guerrero and Alberto Bago	
Interactions of <i>Piriformospora indica</i> with Medicinal Plants	655
R. Prasad, M. Sharma, S. Chatterjee, G. Chauhan, S. Tripathi, A. Das, S. Kamal, A.K.S. Rawat, K.K. Bhutani, M.K. Rai, P. Pushpangdan, and A. Varma	
In Vivo Assessment of Stress Impact on Plant's Vitality: Applications in Detecting and Evaluating the Beneficial Role of Mycorrhization on Host Plants	679
Merope Tsimilli-Michael, Reto J. Strasser	
Part VI Structure and Systematics	
Edible Mycorrhizal Fungi: Identification, Life Cycle and Morphogenesis	707
C. Murat, A. Mello, S. Abbà, A. Vizzini, and P. Bonfante	
Arbuscular Mycorrhiza in Physiological and Morphological Adaptations of Mediterranean Plants	733
Cristina Cruz, Patricia Correia, Alessandro Ramos, Luís Carvalho, Alberto Bago, and Maria Amélia Martins Loução	
Novel Symbiotrophic Endophytes	753
Amit C. Kharkwal, Harsha Kharkwal, Irena Sherameti, Ralf Oelmuller, and Ajit Varma	
<i>Frankia</i> Nodulation, Mycorrhization and Interactions Between <i>Frankia</i> and Mycorrhizal Fungi in <i>Casuarina</i> Plants	767
X. H. He, C. Critchley	
Index	783