

Symbiotic Fungi

Principles and Practice

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Preface

It has been a pleasure to edit this manual. The final outcome is the result of our painstaking efforts involving a passionate discussion with eminent scientists from across the globe working on symbiosis, students and fellow colleagues. The first edition of Mycorrhiza Manual edited by Ajit Varma was published in 1998 by Springer. This new edition is published as a volume under the banner of the Soil Biology series as *Symbiotic Fungi: Principles and Practice*. The timing of the present edition has coincided with tremendous technical progress that has been made in the area of fungal symbiosis. The third edition of Mycorrhiza — Genetics and Molecular Biology, Eco-Function, Biotechnology, Eco-Physiology, Structure and Systematics, edited by Ajit Varma, appeared in July 2008. This leads to enormous demand for the protocol book to carry out the laboratory exercises and field trials.

Growing on mineral particles and decaying organic matter, and living in the vicinity of or within plant roots, are a diverse array of fungal species, many of which form diverse symbiotic associations with plant roots. These symbiotic associations that form between the roots of most plant species and fungi are very well-known. They are characterized by bi-directional movement of nutrients where carbon flows to the fungus and inorganic nutrients move to the plant, thereby providing a critical linkage between the plant root and soil. In infertile soils, nutrients taken up by the fungi can lead to improved plant growth and reproduction. As a result, these associations are often more competitive and better able to tolerate environmental stresses than other plants. The book contains the current state of practice on many aspects of symbiotic fungi and associated microbes. It deals with organismic interactions, diversity of microbial communities, mycorrhizal bioassays, nutrient transfer techniques, restoration ecology, AM inoculum procedures, biotechnological application, microbial communication and mushroom technology. It will be of interest to a diverse audience of researchers and instructors, especially biologists, biochemists, agronomist, foresters, horticulturists, mycologists, soil scientists, plant physiologists, microbiologists and molecular biologists.

It is hoped that the protocols proposed by the authors will stimulate further research, as the information presented tends to highlight both the need for further

work in this challenging field and the lack of agreement on some fundamental issues.

In planning this volume, invitations for contributions were extended to leading international authorities working with symbiotic fungi. We would like to express our sincere appreciation to each contributor for his/her work, and for their patience and attention to detail during the entire production process. We sincerely hope these eminent contributors will encourage us in the future as well, in the greatest interest of academia.

The encouragement and inspiration received from Dr. Ashok K Chauhan (Founder President, Ritnand Balved Education Foundation), Sri Atul Chauhan (Chancellor, Amity University Uttar Pradesh), and Sri Aseem Chauhan (Chancellor, Amity University Rajasthan) need special mention. We are extremely grateful to the staff members of Springer Heidelberg, especially Dieter Czeschlik and Jutta Lindenborn, for their continued interest, critical evaluation, constructive criticism and support. We wish to acknowledge the help and support given to us by our students, faculty colleagues, family members and friends for their constant encouragement.

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