

Book review

Mycorrhiza Manual. A. Varma (ed) Springer-Verlag, Berlin Heidelberg, 1998. XXXIV, 542 pp. ISBN: 3-540-62437-6.

This book is an excellently written laboratory manual, which perfectly meets the scientific demand caused by a recent explosion of interest in mycorrhiza and in the molecular and genetic tools to study this phenomenon. The 34 chapters were written by leading scientists well known for the high quality of their research. About 90 specialists were involved in preparation of this book and it is impossible to cite all of them.

The first chapter by A. Varma introduces us to the world of friendly mycorrhizal fungi, briefly characterizing the present state of knowledge, future perspectives and methods. The following chapters usually consist of a short introduction explaining aims and basic differences between the developed techniques, followed by a focus on modifications of the known methods, chemicals and equipment (including suppliers), procedures, troubleshooting and discussion of possible applications or limitations of the proposed techniques, including a wide range of references. The book gives a broad spectrum of methods useful in describing mycorrhizosphere microorganisms, offering procedures used for isolation of microbial strains, biochemical analyses, DNA isolation and immunogold localization techniques. Several chapters could be very useful for those working on detection, identification and biodiversity of mycorrhizal fungi and for studying interactions within the fungal community.

Procedures for RNA and DNA extraction, DNA or cDNA library preparation, PCR amplification, RFLP, RAPD, protein or isoenzyme analysis, as well as the use of monoclonal and polyclonal antibodies, are given, including important hints when studying AM, ecto- and orchid mycorrhizas (procedures mostly developed or modified for mycorrhizal fungi in the laboratories led by P. Bonfante, V. Gianinazzi-Pearson, B. Hock, F.

Martin and S. E. Smith). In the case of ectomycorrhizal fungi, useful information on database searching via the WWW is provided, including a list of molecular jump stations and URLs for network sequence-database searching on the Web (F. Martin and C. Voiblet). The evaluation of arbuscular mycorrhizal colonization by non-vital and vital staining is discussed by Dickson and Smith. Those who wish to study modifications of root system architecture and longevity will find useful advice on flow cytometry, nuclei preparation and DAPI staining (J. E. Hooker et al.). The methods describing PCR cloning of genes of mycorrhizal fungi (P. Franken et al.) could be employed to reveal phenomena involved in establishing the symbiosis.

A further step in understanding mycorrhiza might be made using techniques of macro- and micro-dissection of roots, which allow for a quantitative histochemistry observation, even of a single mycorrhiza (R. Hampp et al.). Methods used in studies on production and activity of fungal enzymes, including purification and characterization are given by S. Perotto et al. and Tibbet et al.

Those studying the impact of stress factors on mycorrhiza will find the chapter on glutathione and glutathione disulphide estimation useful (I. Kranner), as well as that on siderophore production (K. Haselwandter and G. Winkelmann). Finally, methods describing the isolation and regeneration of protoplasts of ectomycorrhizal fungi in order to study, for example, the uptake of metabolites provide a promising approach for a better understanding of mycorrhiza.

The book can be highly recommended for all laboratories working on mycorrhiza. It could also be useful for those working on plant physiology, microbiology, molecular biology as a source of up-to-date protocols, especially with the continuously increasing awareness of the widespread nature of mycorrhiza.

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