Smith, S.E., Read, D.J.: **Mycorrhizal Symbiosis.** Second Edition. - Academic Press, San Diego - London - New York - Boston - Sydney - Tokyo - Toronto 1997. 605 pp., £ 65.00. ISBN 0-12-652840-3.

The second edition of the reviewed book brings three important changes of emphasis. These are: firstly, enormous amount of new work based on molecular phylogeny of the fungi, secondly, the increased emphasis on the extraradical mycelium which is of key significance in all types of mycorrhizas, and finally the increased knowledge about the diversity of the structure, organisation and function of the mycorrhizal fungi.

The structure of both editions of this book is the same, *i.e.* four sections provide information about the main types of mycorrhiza including the vesicular-arbuscular (VA) mycorrhizas, ectomycorrhizas, mycorrhizas in the Ericales and orchid mycorrhizas. These four sections deal with the identity of the symbionts, structure and development of the mycorrhizas formed by them, as well as their function and ecological significance. he fifth section is then devoted to general themes.

The first section consists of five chapters that describe the symbionts forming VA mycorrhizas, colonisation of roots and anatomy of VA mycorrhizas, the genetic, cellular and molecular interactions in the establishment of VA mycorrhizas, growth and carbon economy of VA mycorrhizal plants and mineral nutrition, heavy metal accumulation and water relations of VA mycorrhizal plants. Also the second section consists of five chapters dealing with the structure and development of ectomycorrhizal roots, the growth and carbon economy, nitrogen and phosphorus nutrition of ectomycorrhizal plants. The fifth chapter describes the ectomycorrhizas which exhibit in mycorrhizal roots some of the structural characteristics of both ectomycorrhizas and endomycorrhizas. Two chapters of the third section describe the structure and development of arbutoid and monotropoid mycorrhizas and the anatomy, the colonisation processes and functional aspects of ericoid mycorrhizas. The chapter "Orchid mycorrhizas" of the fourth section describes the isolation, nutritional characteristics, mycorrhizal colonisation, the mechanism of the transfer of nutrients from fungus to plants, plant-fungus interactions, and the specificity and ecology of orchid fungi. This chapter has shown how a combination of conventional and molecular methods has the potential to unravel some of the complexities of plant-fungus interactions at both physiological and taxonomic levels and provide data relevant to ecological situations. The last section with four chapters is devoted to general themes in which ideas and information essential for clear understanding had been integrated. Here the uptake, translocation and transfer of nutrients in mycorrhizal symbioses is described, as well as the roles of mycorrhizas in ecosystems, VA mycorrhizas in agriculture and horticulture and the problem of mycorrhizas in managed environments, *i.e.* forest production, interactions with other micro-organisms and pollutants.

The nutrient transfer between the symbionts in all mycorrhizal types, the role of mycorrhizas in ecosystems, the applications of mycorrhizas in agriculture, horticulture and in forestry are the topics of this book, supplemented with about 2 000 references. The figures and electron microscopy photographs are very illustrative. The book can be recommended to mycologists, physiologists, ecologists and researchers interested in plant and fungal biology.

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