PERGAMON

Phytochemistry 54 (2000) 729

PHYTOCHEMISTRY

www.elsevier.com/locate/phytochem

Book Review

Current Advances in Mycorrhizae Research
G.W. Podila, D.D. Douds (Eds). American Phytopathological Society, St Paul, Minnesota, USA, 1999, 193 pp., $38, ISBN 0-89054-245-71.

Mycorrhizae are widespread symbiotic associations established between the roots of 90% of land plants and at least 6000 fungal species from Zygo-, Asco- to Basidiomycotina. In spite of their importance to plant survival, providing ready access to vital nutrients in the soil, research on these key symbioses has been slow to develop. It is only recently that molecular, genetic, biochemical and physiological techniques have been applied to them. The present edited volume, published under the imprimatur of the American Phytopathological Society, is intended to review the advances in mycorrhizal research of the last decade.

There are 14 chapters, most of which are multi-authored, and they are divided into six sections. The first section is on signalling mechanisms and includes a chapter on 'external sugar concentrations as a signal controlling ectomycorrhizal fungal gene expression'. The second section moves on to the subject of mycorrhizal fungi and plant defence and is essentially concerned with defence responses in plants towards arbuscular mycorrhizae. The third section deals with the application of molecular genetics to mycorrhizal symbiosis and includes a paper on the life cycle of the truffles. These are ascomycetous fungi in the genus *Tuber* which are able to establish ectomycorrhizae with roots of trees such as poplar, oak, willow and hazel. Truffles are, of course, better known as culinary delicacies, which are detected in the soil by pigs or dogs.

The fourth section, a biochemical one, is entitled 'carbon metabolism and the cost of arbuscular mycorrhizae' and contains a chapter on tracing the carbon pathway in fungi by NMR spectroscopy and a chapter on assessing the costs of mycorrhizal infection in Agroecosystems. The final two sections, which are quite short, are concerned with ultrastructural changes in the infected plant roots and with the genetic engineering of mycorrhizae.

As a source of information on plant-mycorrhizal associations, I found this volume to be of limited use. One handicap is the lack of abstracts at the beginning of each chapter. It is only possible to divine the gist of a particular contribution from the illustrations or the concluding remarks. I was interested in the possible role of flavonoids present in root exudates as signalling molecules to these fungi. Although there are nine references in the index to flavonoids, I was not able to obtain a balanced view of whether they are important or not. I have a feeling that this book is primarily for mycorrhizal buffs. However, plant biochemists interested in these symbioses and wishing to draw comparisons with the much better studied plant-bacterial associations of nitrogen fixation, could do well to dip into these pages.

Jeffrey B. Harborne*
University of Reading, School of Plant Sciences, Department of Botany, Whiteknights, Reading RG6 6AS, UK

* Tel.: +44-118-931-8162; fax: +44-118-975-3676.

PII: S0031-9422(00)00207-7