

Book review

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Endophytic fungi in grasses and woody plants. Systematics, ecology and evolution.

- 223 pp., APS Press, St. Paul, Minnesota, USA, 1996. — 49 US\$ (the book is in the library of the Society).

This book is the result of papers presented at a discussion session organized by the APS mycology committee in St. Louis, Missouri on August 21, 1991. Interest in endophytic fungi has surged in recent years. Although these fungi are not fully understood, evidence suggests that they can offer significant benefits to their host plants including an increased resistance to disease and herbivory, and the stimulation of seed growth.

To create a framework for future research the book presents the most extensive set of information on endophytic fungi available from a single source. Covering endophytes occurring in the grasses and woody plants of North America, South America and Europe, these articles combine descriptions of endophytic relationships, definitions of major concepts and reports on recent studies. The authors examine a range of topics including differences between endophytic colonization and latent infection, manipulating endophytes to control disease, effects of pollution and other human activities on endophytic communities, evolutionary adaptations, host specificity; host-endophyte interactions, biochemistry, physiology, morphology, occurrence. A floristic and ecological treatment of fungal endophytes is added in some chapters. The book starts with the relatively non-specialized group of fungi associated with woody plants and moves to discussions on the more specialized group of clavicipitaceous and *Acremonium* — like endophytes associated with grasses. The final two chapters address the area of human intervention and endophytic communities: what are the effects of human activities on endophytes and conversely, can endophytes be manipulated to man's benefit? Two general groups of endophytic fungi are distinguished: those that are usually present in grasses, seed transmitted and classified in the order Clavicipitales or in the genus *Acremonium*, the other group consisting of a diverse assemblage of organisms that inhabit woody plants.

In grass hosts endophytic fungi may have beneficial effects such as the modification of growth patterns or the amelioration of the plant's response to drought. Most often they do not cause injury to their hosts and some confer the plants resistance to injurious fungi, insects or nematodes. Several are of economic importance as they cause disease in plants. Identification of these fungi in grasses, ericaceous plants, conifers, broadleaved trees as well as tropical plants such as palms, orchids, aroids and bromeliads continues.

This book helps to answer at least some so far open questions and provide guidance for future research by listing fungal taxa common in various hosts and describing techniques used to isolate and identify endophytes in grasses and woody plants. Surveys of groups of fungi most frequently encountered, morphological and physiological aspects, co-evolution with hosts and adaptive strategies are included. Their adaptation to various hosts means a challenge to study them because they may grow slowly in pure culture or sporulate with difficulty or both, resulting in problems with their identification.

For scientists, biotechnology companies, farmers, plant breeders and foresters, studying the relationship between endophytic fungi and their hosts may lead to new methods of fighting crop disease, the discovery of novel chemical compounds and clues to the impact of these fungi on biodiversity. There is considerable interest in the use of endophytes for biocontrol. This coincides with demands by the environmentally conscious public for sustainable agricultural systems.

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