

Book review

N.J. Fokkema & J. van den Heuvel (Eds), 1986. Microbiology of the phyllosphere. Cambridge University Press, Cambridge. 392 pp. with figures and tables, hardback cover. ISBN 0 521 32344 4. Price £ 30.

The still growing interest in the ecology of the microflora of the phyllosphere has led to the organization of the Fourth International Symposium on the Microbiology of the Phyllosphere since 1970. This symposium was held at Wageningen, the Netherlands, 2-6 September 1985. The review papers presented by specialists at this conference were compiled into a book to update the overview over the traditionally important fields and several new topics in phyllosphere research.

The book is divided into five sections. Section I on 'New Techniques' comprises four papers. One paper on theoretical aspects of sampling for quantification of micro-organisms is followed by two papers on detection of micro-organisms by various techniques, including autoradiography for detection in situ. Although the title of the last paper suggests a review of various serological techniques for the quantitative estimation of fungal colonization, it describes only ELISA.

Section II and III are concerned with fungi. The six papers on 'Ecology of Epiphytic Fungi' deal with items such as colonization dynamics, yield reduction by saprophytic fungi on leaves, microbial adaptation to climatic conditions, and a listing of sooty moulds and black mildews in extra-tropical rain forests. Furthermore, one paper discusses and demonstrates the potential of yeasts to indicate levels of air pollution with sulphur dioxide. The comparison between phyllosphere and rhizosphere as environments for saprophytic colonization contributes to a better understanding of these complex ecological habitats.

'Endophytic Leaf Fungi' (Section III) forms a rather new area of phyllosphere research and is represented by four papers. One of the papers describes the taxonomy of endophytes, two papers review the biology and toxin production of endophytes (mainly dealing with woody perennials), and the last paper has specialized on grass endophytes.

Section IV deals with leaf colonization by 'Plant-pathogenic and Saprophytic Prokaryotes'. Bacteria are represented with three papers on epiphytic survival, variability of populations, and colonization of host and non-host plants by phytopathogenic bacteria. The final paper in this section describes the many mycoplasma species isolated from plant surfaces since isolation was first reported by Davis in 1978, and their relationship with insects.

Section V comprises five papers on the present status and prospects of 'Biological Control on Aerial Plant Surfaces'. In this challenging area of research, the tactics and feasibility of the use of biocontrol agents are discussed in one paper in regard to genetic engineering in general and in another paper specifically on control of ice-nucleation-active bacteria on plants. Furthermore, papers are presented on the use of *Trichoderma* species, on hyperparasites in general, and on resistance to plant pathogens induced by microbial metabolites.

The book has been edited very conscientiously and great care has been taken to produce it with a uniform layout, good illustrations and an extensive index. The attractive front cover of the book depicts the wonderful microcosmos of the leaf surface seen through the artistic eyes of one of the 'first' phyllosphere pioneers M.C. Escher. Because of the many good reviews covering various important areas of research and because of its reasonable price, the book will be of interest for libraries of agronomy and general biology and deserve the attention of teachers, students and scientists in phytopathology, microbiology and ecology.

J.W.L. van Vuurde