

## Book review

Y. Asada, W.R. Bushnell, S. Ouchi & C.P. Vance (Eds), 1982. Plant infection. The physiological and biochemical basis. Japan Sci. Soc. Press, Tokyo & Springer-Verlag, Berlin/Heidelberg/New York. XVIII + 362 pages. ISBN 3-540-11873-X. Cloth DM 126.

In 1966, a series of USA-Japan seminars was started on the morphology, physiology and biochemistry of plant-parasite interactions. This book is essentially the proceedings of the fourth seminar, held in 1981 in Minnesota, USA. Although this seminar covered broad areas of research on disease physiology, it emphasized the nature of specificity and biochemical communication between host and parasite. Most of the 22 chapters in this volume review published work in the area of the authors' speciality, but some mainly present as yet unpublished original work. Each chapter ends with a summary of the discussion of the paper.

The prefatory chapter reviews briefly recent advances in Japan on the physiology of infection and is followed by an essay on the sites of action of disease determinants in relation to symptom expression.

Reviews of the infection process stress the importance of formation of wall appositions as a barrier against penetration of leaves of Gramineae and specify the unique role of primary germ tubes of *Erysiphe graminis*. Attention is also paid to the initiation and specificity of the symbiotic association of soybean and *Rhizobium japonicum*.

Detailed studies describe the many factors and mechanisms involved in the hypersensitive response in incompatible interactions between potato and *Phytophthora infestans* and between other plants and powdery mildews and rusts. The underlying mechanisms are, however, still poorly understood, and this is also true for the phenomena of induced susceptibility and immunization against disease. Metabolic alterations and regulations in host-pathogen interactions are exemplified by the sweet potato-*Ceratocystis fimbriata* system and the interaction between olive and oleander and *Pseudomonas syringae* pv. *savastanoi*.

Five chapters deal with host-specific toxins. One describes the association of mitochondrial DNA with Texas male-sterile and toxin-sensitive cytoplasm in maize. Four others review clearly structures and modes of action of the host-specific toxins of *Alternaria alternata* pathotypes and *Helminthosporium* spp.

The role of phytoalexins in disease resistance is discussed in four reviews. Accumulation of the phytoalexin glyceollin may be the functional basis for restriction of growth of incompatible races of *Phytophthora megasperma* f. sp. *glycinea* in soybean hypocotyls. Evidence for the function of an elicitor-receptor model in the regulation of phytoalexin accumulation is presented. Phytoalexins and preformed antifungal substances may also have a role in the resistance of oat leaves to fungal infections. Pathogenicity may depend on the pathogen's ability to detoxify phytoalexins by monooxygenases.

The final chapters are two lectures, on hypersensitive cell death and on general principles in plants underlying plant disease phenomena, given by Professors K. Tomiyama and I. Uritani, respectively, who both retired from Nagoya University, Japan, recently, and to whom the book is dedicated.

This well-produced book maintains a high level throughout. It can be recommended to everyone interested in plant disease physiology and wishing to become informed about the rapid developments in certain areas of this field.

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