

BOOK REVIEWS

Plant Infection, the Physiological and Biochemical Basis: edited by Y. ASADA, W. R. BUSHNELL, S. OUCHI and C. P. VANCE. Springer, Berlin, 1982. 362 pp. DM 126 (\$50.40).

This book contains 22 essays in which leading U.S. and Japanese plant scientists discuss their recent researches towards improving our knowledge of the scientific basis of resistance and susceptibility of plants to microbial disease. These essays arose from a joint U.S.–Japanese seminar held in May 1981 in a closed session in Minnesota, U.S.A. and in spite of the absence of any European contribution, together they provide a representative picture of recent research efforts. Much of the work described here has appeared in the primary literature but most authors have been provided with more space than is usually available in a research paper to expand and speculate about the significance of their findings.

In a brief book review, one can only pick out a few salient points among the many interesting papers that are collected here. The possibility that physical factors at the leaf surface may provide resistance to fungal pathogens has often been dismissed in the past because of lack of experimental data; new evidence, discussed here by R. T. Sherwood and C. P. Vance, indicate that papilla formation in grass leaf epidermal cells is actually induced by mildews and may prevent infection in favourable circumstances. The protection of plants from infection by immunisation is another idea from the past—a method that works with animals—which is now undergoing revival through the studies of J. Kuc; here, he describes his

latest results which indicate that such protection can work in the case of members of the Cucurbitaceae. Controlled infection with *Colletotrichum lagenarium* or tobacco necrosis virus protects cucumber from a broad range of potential pathogens.

Important probes for improving our experimental understanding of the subcellular site of microbial infection in the higher plant are the host-specific toxins manufactured by pathogens. These toxins are discussed in several chapters, but notably in one by J. M. Daly on the polyketols and terpenoids of *Helminthosporium* and in another by T. Ueno and his colleagues on the cyclic peptides of *Alternaria*. Elicitation of the phytoalexin response is another area of active research at the molecular level and N. T. Keen provides a useful and thoughtful review of the present position on elicitors, with some emphasis on his own studies of the *Phytophthora megasperma*–soya bean symbiosis. The final paper on hypersensitive cell death, its significance and physiology by K. Tomiyama covers a complementary area of study, this time with reference to the *Phytophthora infestans*–potato interaction.

In summary then, this is a useful, timely and well produced collection of essays, which can be warmly recommended to anyone working on this subject. To the general reader, it provides a useful account of developments since the Springer Encyclopedia volume 'Physiological Plant Pathology' appeared, back in 1976.

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Micromolecular Evolution, Systematics and Ecology: An Essay Into a Novel Botanical Discipline: by OTTO R. GOTTLIEB. Springer, Berlin, 1982. 170 pages. Soft cover DM 79, approx. US \$33.00.

After agreeing to review Professor Gottlieb's slim volume "Micromolecular Evolution, Systematics and Ecology", I waited in eager anticipation for its arrival on my desk. Thankfully, I was not disappointed although make no mistake about it, this is not an easy book to read and on numerous occasions over the past few months I have, after struggling for some time with its complicated sentences, been forced to put it aside in favour of rather lighter reading. Basically, Professor Gottlieb has set out to show how information obtained from the study of secondary products (flavonoids, alkaloids, polyacetylenes and the like) or 'micromolecules' can be successfully used to support the evolutionary development and taxonomic classification of certain groups of higher plants. Of course, there is nothing particularly new about such an approach to plant taxonomy, but where this book differs fundamentally is in the careful integration of data relating to different types of secondary products and their possible allelochemic functions, and the novel but entirely logical

numerical arrangement of these substances according to skeletal type and oxygenation pattern. The result is a rather mathematical view of chemosystematics which I feel could discourage some casual readers from delving deeper into the book. The importance of micromolecules to systematics in a wide range of plant taxa is described in detail (Chapters 4–16), and it could be said that there is something here for almost everyone. As a result the compounds considered include flavonoids, alkaloids (benzylisoquinolines, indoles, quinolines and quinolizidines), iridoids, polyacetylenes and xanthonenes, and in some chapters, notably that dealing with the Papilionoideae, data for various natural products (flavonoids, isoflavonoids, quinolizidine alkaloids and non-protein amino acids) are combined to give a more coherent systematic picture.

Although Professor Gottlieb's book seems remarkably free of typographic errors, it does have some shortcomings not least of which is the fact that it is written in a curiously wordy fashion, and often I found it necessary to read sentences or paragraphs several times before their meaning became even partially clear. The lack of a really comprehensive reference section is also disappointing. Take Table 12.2 for example in the chapter covering the