Phytochemistry, 1977, Vol. 16, p. 1623. Pergamon Press. Printed in England.

BOOK REVIEW

Biochemical Aspects of Plant–Parasite Relationships: edited by J. FRIEND and D. R. THRELFALL. Phytochemical Society Symposia No. 13, 354 pp. Academic Press, London and New York, 1976. £10.80.

This volume of essays, which were first presented at a Symposium held in Hull in April 1975, provide the reader with an up-to-date account of recent developments in a research area often referred to as physiological plant pathology. The book begins with an important introductory description by T. F. Preece of the various events that occur when microbial spores first descend on the leaves of plants, observations which are essential to an understanding of plant infection and modes of resistance. The second chapter by J. R. Coley-Smith reviews recent work on the host-stimulated germination of fungal sclerotia in the soil, for example of those of the fungus *Sclerotium cepivorum* through the release from roots of *Allium* species of aliphatic sulphur compounds into the surrounding soil. This is a neglected area of biochemical ecology of secondary plant substances and deserves to be more widely known. The following two chapters by R. Johnson and D. S. Ingram provide more essential background information to the biochemical understanding of host–parasite interactions in terms of genetical and structural aspects. The latter chapter contains many fine illustrations showing in detail the effect that penetration of the fungal haustorium has on the organization of the host plant cells.

One of the most damaging effects of microbial invasion on the host plant is cell wall maceration and recent developments are here covered in two excellent complementary chapters written by two masters of the subject, D. F. Bateman and R. K. S. Wood. The involvement of plant hormones in pathogenesis is known to be complex and highly controversial; the subject is sympathetically reviewed here by Daly and Knoche, with particular reference to their own work on cereal rusts. There follows what, to me at least, is the outstanding contribution in a book of excellent essays, that by G. A. Strobel on toxins of plant pathogenic bacteria and fungi. This author described *inter alia* his own recent, fascinating results on the mode of action of helminthosporoside, a low molecular weight toxin which is able to produce disease symptoms in sugar cane leaf by binding with a specific protein on the plant cell membrane.

With the many recent discoveries of chemical barriers to microbial invasion in terms of preformed compounds and of phytoalexins, structural features of the leaf surface are often passed over. D. J. Royle rightly corrects the imbalance by reviewing this subject, pointing out that physical barriers are of significance in at least a few plant infections and that they become valuable in augmenting other resistance characters when breeding crop plants for disease resistance. Chemical barriers are then considered in no less than five chapters, the first of these being a brief account by J. C. Overeem of preformed antifungal agents in tulips, broad bean, apple trees and grasses. B. J. Deverall then provides a general overall view of phytoalexins and their relevance to plant pathology, with J. Kúc and H. D. VanEtten, with co-workers, writing more detailed reports on terpenoids and isoisoflavonoids respectively. Van Etten's review is particularly impressive for its wide scope and extensive coverage and is the best general account of these legume phytoalexins yet to have appeared. The final chapter in the set, written by the senior editor, points to the role of lignification in diseased tissue and puts forward a novel hypothesis, applying at least to blight infection on potato tuber, that esterification of the cell walls by phenolic acids occurring after invasion provides a type of phytoalexin response which is effectively antifungal in its nature. The last chapter in the book by J. A. Callow discusses changes that occur in nucleic acid metabolism as a result of infection in plant cells.

In summary the editors are to be congratulated in providing such a fine collection of inter-related review articles, which together provide a most valuable perspective into a research topic which is undergoing rapid development and expansion at the present time. The volume maintains the high standard set by previous members of this Symposia series. It is excellently produced, illustrated and indexed; and, in these inflated times, the price seems very reasonable.

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