

BOOK REVIEWS

Ecology of Insect-Plant Interactions: by P. J. EDWARDS and S. D. WRATTEN. Institute of Biology Studies No. 121. Edward Arnold, London, 1980. 60 pp. Paperback £2.50.

While the biochemistry of insect-plant interactions has received a great deal of attention in the literature in recent years, the more biological aspects of these interactions involving secondary plant substances have not been so extensively reviewed. This little introductory text therefore has much to commend it, especially since it provides an excellent entry into a difficult and complex subject. It is particularly nicely organized in the way that the topics of the eight chapters follow on logically in sequence. Thus, we start with plants and herbivores and then move on to the problems of plants as food and the toxic effects of secondary compounds. Then follow host-plant finding and recognition, communication and defense, host-plant resistance, coevolution of plants and herbivores and finally the biogeographical implications.

Emphasis is rightly given to the experimental evidence from which conclusions about plant-insect interactions have been drawn and there are ample illustrations in the form of graphs, diagrams and tables of representative experiments. In general, the book is accurate and remarkably up-to-date. The only section I would fault is that on *pheromones*, since it gives the false impressions that these chemical messengers in insects are often of plant (dietary) origin, which is not the case. The authors, for example, quote the 1976 paper of Hendry and coworkers on the dietary origin of the female pheromone of the oak leaf roller moth, which is now regarded as incorrect [see later article in *Science* **195**, 86-89 (1977)]. Only about sixty references have been included because of space restrictions but these are well chosen and representative. Certainly, phytochemists working in the area of plant-insect interactions will find something of interest and value in these pages.

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Plant Tissue Culture as a Source of Biochemicals: edited by E. JOHN STABA. CRC Press, Florida, 1980. 285 pp. illus. \$69.95.

Interest in the use of plant cell and tissue cultures to produce designated secondary compounds of interest to industry is currently in a resurgent state so that the appearance of a text on this subject is particularly well timed. This multi-author volume is edited by Dr. John Staba, an established authority in this particular area of research. The ten chapters have been written by twelve experts in the field of plant tissue culture, of which all but one are North American. It is particularly interesting to note that six of the authors are from industrial laboratories and six from universities and research institutes, which creates a balance between academic and industrial viewpoints.

The first two chapters, 'Laboratory Culture' by Seabrook, and 'Nutrition and Metabolism' by Dougall, are of a fairly general nature and would have been more appropriate in a general text on plant tissue culture; indeed the reader does not meet the designated subject of the book until p. 59. Chapter 3, 'Secondary Metabolism and Biotransformation' by Staba, examines the metabolism of organic compounds by cell cultures and provides an excellent source of references; such an approach, although extremely useful, is inevitably fragmentary. The importance of selecting the appropriate culture is expertly dealt with in chapter 4, 'Selection of Plant Cell Lines which Accumulate Compounds' by

Widholm. It is a concise, and very readable account in which all of the major approaches are examined, an essential part of the book. In chapter 5, 'Storage of Plant Cell Lines' by Dougall, there is a return to more general topics. This is a very brief treatment, just over four pages, including two tables and does not give the author space to do more than introduce the subject. Chapter 6 on 'Environmental Factors' is surprisingly divided into two parts: the first part on 'Light' by Seibert and Kaokade is a fairly concise treatment and contains much very useful information; the second part by Martin is much too brief and I feel it would have been better to have combined the two parts into one integrated contribution. Chapter 7, 'Mass Culture Systems for Plant Cell Suspensions', is a readable and useful account of the application of microbiological procedures to the culture of plant cells. 'Industrial and Government Research' is the title of chapter 8 by Misawa. This presents much interesting information, again in a somewhat fragmentary form, emphasizing which compounds are, and will, be of interest to those working in this area of research. It is important to note that the author believes that the production of useful plant metabolites will soon be industrially successful. A most useful chapter (chapter 9) by Goldstein, Ingle and Lasure deals with 'Product Cost Analysis' and makes most stimulating reading. A considerable amount of data is provided which will provide vital assistance to those contemplating scaling up from the laboratory level. The final chapter (10) by Nickell, 'Products', presents, largely in tabular form, the products that have been detected in

plant tissue and cell cultures. It is a mine of information and provides a valuable data base for all those interested in producing designated compounds from plant cell cultures.

There is inevitably in a multi-author volume overlap of subject matter, some of which should have been reduced by the Editor. On a number of occasions the same research results are described in several places. This can be avoided. Also the balance of subjects treated in this volume is not completely satisfactory. Indeed some of the subject areas are not especially appropriate to the overall aim of the book. There is also a tendency to include very

short chapters for what appears to be the sake of completeness. It would perhaps have been better to have left out or incorporated these topics into the other chapters.

Undoubtedly the value of this book is as a source of information and this has been achieved. The book is produced to a high standard, is well laid out and easy to read. It deserves a place in the library of the plant tissue culturist.

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