Phytochemistry, 1980. Vol 19, p. 2237. Pergamon Press Ltd Printed in England.

BOOK REVIEWS

Biochemistry and Physiology of Plant Hormones: by T. C. MOORE. Springer-Verlag, Berlin, 1979. 274 pp. DM 49. $27.

The author's intention here is to provide a student text on naturally occurring growth regulators for use either in an advanced undergraduate course or as background reading for postgraduates specializing in plant physiology. I believe these objectives have been achieved in an admirably up-to-date and amply illustrated volume of under 300 pages. It is also a book which will be generally of value to those taught hormonology in earlier decades seeking to up-date their knowledge of this field, especially of the biochemistry.

For most of the way, the text follows conventional lines: there is an introductory chapter on terms and concepts and then individual treatments of auxins, gibberellins, cytokinins, abscisic acid and ethylene. More unexpectedly, however, the final chapter is headed phytochrome. However, this is only a brief account of this light receptor pigment; by including phytochrome here, the author has the opportunity to discuss hormonal control of flowering and to mention the present status regarding the still hypothetical flowering hormone 'florigen'. Expectedly, the chapter on the auxins is one of the longest; it includes a sensible background discussion of the estimated environmental hazards of 2,4,5-T and its contaminant, dioxin, a subject of continued public debate at the present time. The chapter on gibberellins I thought to be particularly interestingly presented; its authoritative nature no doubt stems from the author's own research contributions in this area.

There are excellent illustrations and well chosen references. Generally free of errors, nevertheless several of the structures of phenolic inhibitors on p. 183 (which were borrowed from another textbook!) are incorrect. The fact that the phenolic dihydrostilbene lunularic acid appears to replace abscisic acid in liverworts is mentioned but no judgement is reached as to whether phenolic inhibitors, as have been advocated by Kefeli and others, can be considered to be hormonal in effect or not. Perhaps in a student text, one can accept the omission of still hotly disputed areas of investigation. A more serious loss, to my mind, is the absence of a section dealing specifically with the practical problems associated with hormone characterization. However, in a book covering what has always been a controversial albeit fascinating research discipline, no one author can hope to completely satisfy every customer. In conclusion, I can only reiterate that Dr. Moore has produced a lively and up-to-date text which should be appreciated by a wide audience of phytochemical and other readers.

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Crassulacean Acid Metabolism: Analysis of an Ecological Adaptation: by M. KLUGE and I. P. TING. Springer, Berlin, 1978. 210 pp., 112 figs. DM74.

The curious behaviour of many succulent plants, particularly of members of the Crassulaceae, in accumulating large amounts of vacuolar organic acid at night time only to lose this acidity during the following day has been known for nearly two centuries. The phenomenon, described as Crassulacean Acid Metabolism, or CAM for short, has remained for most of the intervening period a puzzling idiosyncracy, the source of carbon for acid synthesis being particularly problematical. It was not until the discovery in the mid-1960s of the C_4 pathway of photosynthesis in sugar cane and other tropical grasses that the penny dropped and it was realised that the accumulation of malate in CAM plants was simply an ordered part of the photosynthetic process. Thus CAM plants could be considered a variant on C_4 photosynthesis, but, more important, a novel representation of biochemical adaptation to hostile xerophytic habitats; they are desert plants with a special protection from water loss.

The comparison between CAM and C_4 plants can be expressed quite simply: in CAM, the sequential carboxylations catalysed by PEP carboxylase and RUDP carboxylase respectively are separated temporally (and diurnally) whereas in C_4, they are separated spatially (and anatomically). Biochemically, there are, of course, differences between the two groups of plant; furthermore there are a variety of different CAM types. It is the purpose of the present book to summarize the biochemical and ecological experiments that have been carried out on CAM plants over the last 15 years which have led to our present advanced state of knowledge of this interesting natural adaptation.

In order to set the biochemistry in perspective, there are two opening chapters which provide a comprehensive survey of the taxonomic distribution and geography of

CAM plants and also an excellent well-illustrated account of their morphology and anatomy. The rest of the book then covers in detail the biochemistry and physiology, with descriptions in turn of metabolic pathways, metabolic control, the CAM enzymes and gas exchange. In a brief final chapter, the two authors consider the ecological advantage of CAM and discuss the economic value of such plants.

One minor criticism: I felt the authors might have recapped a little on the classical aspects of CAM plants. For example, more detail of the nature of the organic acid accumulated by these succulents would have helped to set the new data in perspective. Otherwise, however, it is excellent compilation. There is an extensive bibliography and a final appendix includes reference to the 1978 literature. This is a valuable monograph, written by two experts and it will undoubtedly serve as the main source of information on the subject for at least the present decade.

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