

BOOK REVIEWS

Nutrition of the Angiosperm Embryo: by DAVID R. MURRAY, pp. viii + 246, Research Studies Press Ltd, 1989. Price: £32.60.

This volume describes a subject generally either neglected or considered only very briefly in other texts: how the embryo of the angiosperm grows and develops and in particular how it obtains its nutrients. The book contains nine chapters: 1. Introduction, 2. Identification and Classification of Nutrients, 3. Assimilation and Translocation of Nutrients, 4. Translocation Mechanisms, 5. Fruit Development, 6. The Nutritive Function of Seed Coats, 7. Phloem Unloading, 8. Construction of Media for Embryo Growth *in vitro* and 9. Embryogenesis and Prospects for Plant Improvement.

The heart of the presentation is in chapters 5–7. These contain a wealth of information dealing with all aspects of the developing embryo. The chapters draw quite heavily on the work of the author and present data never previously assembled. Many of the problems of the nutrition of the embryo, what function the seed coat fulfils and how translocation into the developing embryo and fruit takes place are described and analysed. This part of the book presents a very well balanced and critical review of present knowledge, with a quite welcome personal impact of the author's views.

The other chapters are somewhat less successful. Chapters 2 and 3 deal with problems of general plant nutrition and some peculiar slips have crept in. For example phytochrome is stated to contain copper, (no reference given), but cytochrome oxidase and ascorbic acid oxidase are not mentioned as copper enzymes. Nickel is dealt with at length but it is not clear why it is regarded as important in embryogenesis or nutrition. Chapter 3 has a useful

summary on assimilation and translocation and in part deals with the source of certain compounds which end up in the embryo or seed. The treatment of translocation mechanisms in chapter 4 seems a little sketchy. Chapter 8 contains information on media for embryo culture and spells out general principles. It has curious omissions, e.g. the work of Obendorf and co-workers on embryo growth and pod-cultures. The last short chapter does not really add very much and seems to be a bit of an afterthought.

Presentation and lay out of the book are generally clear and there seems to be very few misprints. However Evenari is consistently misspelled. The publisher has clearly used some modern computerised system for production. This has probably speeded up publication; references are up to 1986, but the addenda contains only one reference from 1987. However, visually the printing process used leaves something to be desired, e.g. by not straightening right margins and the rather pale printing of this reviewer's copy. There is no author index and a separate plant index would have been welcome.

I recommend this volume to anyone interested in the problem of seeds and seed development. It contains much information and undoubtedly focusses attention on many unsolved problems. Many readers of *Phytochemistry* will find something to interest them. However, the price of £32.60 means that only those directly concerned with germination or embryo growth will purchase it for their personal libraries. Most phytochemists will be content to browse through it in their libraries.

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Studies in Natural Products Chemistry: Volume 1: Stereoselective Synthesis (Part A): edited by ATTA-UR-RAHMAN, Elsevier, 1988, pp. ix + 739. Price £117.40.

My initial impression upon opening this book was that it contained yet another collection of plenary lectures from an obscure conference—another assault upon the overstretched budgets of scientific libraries. Such is not the case. The book contains seventeen specialist reviews of particular areas of natural products synthesis, some of them covered for the first time, and many of them of particular contemporary interest. Most of the accounts emphasize the particular achievements of the authors, and summarize work that has hitherto only been available as preliminary communications.

The first five chapters concentrate upon the indole alkaloids, including the relatively rare indole carbazoles (J. Bergman) and indolo[2,3-*a*]quinolizines (G. W.

Gribble), together with the indoloquinolizidines (M. Lounasmaa) and the complex *Strychnos* alkaloids (J. Bosch and J. Bonjoch). Pride of place must go to the chapter on the use of vinyl azides for the construction of indole and isoquinoline alkaloids (C. Moody). Though brief, it includes elegant approaches to a diverse array of structures. More isoquinoline synthesis appears in the next chapter (M. Hanaoka); and this is followed by a mammoth 80-page chapter (Y. Nishimura) on pyrrolizidine and indolizidine chemistry, which also includes a timely summary of routes to the glycosidase inhibitors like castanospermine and swainsonine. Another important contribution by A. Matsuda and S. Terashima provides details of several successful syntheses of sesbanamide together with some data on anti-tumour profiles for the natural product and certain analogues. Finally, the first half of the book concludes with two chapters on alkaloid synthesis via [3 + 2] cycloadditions (W. H. Pear-

son) and via cycloadditions of nitrones and nitroso species.

The next three chapters cover the synthesis of complex nucleoside antibiotics (P. P. Garner); milbemycins and avermectins (M. T. Crimmins *et al.*); and anthracyclones, rifamycin-S, sesbanamide (again!), and various polyunsaturated acids (A. V. Rama Rao). Much of this material has been amply reviewed elsewhere; but the final four chapters provide timely reports of new synthetic methodology. The accounts of the use of tropone for the construction of pseudoguaianolides and ophiobolanes (J. H. Rigby); and of the new reagents used for biomimetic olefine cyclisation (M. Nishizawa), make fascinating reading. A second mammoth chapter gives details of the strategic use of homochiral ketals and acetals in synthesis (E. A. Mash), and there are extensive tabular surveys of diastereoselective reductions, intramolecular cyclisations, alkylations and etc. This is probably the most useful chapter in the whole book. Finally, there is the usual tour

de force from K. Mori, who describes an impressive list of personal synthetic achievements using intermediates produced with the aid of enzymes. He even provides full experimental details for the enzyme-mediated preparations.

The book is well-produced from camera-ready copy, and there is a sister volume concerned with structure elucidation.

Both are entitled 'Part A', so we can expect further parts to appear in due course. The price seems a bit on the high side, especially as there were no typesetting costs. This will inevitably ensure that the book is only purchased by libraries and experts; and this is a pity because it contains a wealth of interesting synthetic chemistry, and deserves to be widely read.

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Plant Flavonoids in Biology and Medicine II: Biochemical, Cellular and Medicinal Properties; edited by VIVIAN CODY, ELLIOTT MIDDLETON, JR, JEFFREY B. HARBORNE and ALAIN BERETZ, Alan R. Liss, New York, 1988. 484 pp. \$80.00.

This book, which is volume 280 of the series, "Progress in Clinical and Biological Research", contains a collection of reports given at the meeting on Plant Flavonoids in Biology and Medicine held in Strasbourg, France in 1987. These reports represent authoritative reviews by experts on a series of topics relating to the significance of the role of flavonoids in plants and mammals. The book covers such areas as crystal and molecular structure of flavonoids, the use of HPLC/MS techniques for flavonoid isolation from crude extracts, biological activity in relation to molecular shape and bacterial metabolism of flavonoids. There are also reports on flavonoids in medicinal plants and plant cell cultures.

The major part of the book is concerned with the potential of flavonoids in the medicinal field. The antifungal and antiviral activities of flavonoids are well reviewed. However, most the book is concerned with reviews of flavonoids as antiinflammatory, antiallergenic, anticarcinogenic, antihepatotoxic, antithyroid compounds and as moderators of capillary fragility. In considering the importance of flavonoids in these areas there are reports on flavonoids and arachidonic acid metabolism, in particular the effects of flavonoids on lipoxygenases and cyclooxygenase, key enzymes of this pathway, are well reviewed along with the related effects of flavonoids on human platelet aggregation and protein kinase C.

Other reports cover the importance of recent work on solid tumours in relation to flavonoid antitumour activity with preclinical data on flavone acetic acid, data on the inhibition by flavonoids of basophil histamine release and on the inhibition by flavonoids of cell adhesion to and spread on laminin substrates, an important part of malignant tumour invasion. There are also reports on the effects of flavonoids on hepatic drug metabolising enzymes and the specific binding of the liver regenerating drug, silybinin, to the estradiol receptor. One of the more interesting areas considered with, perhaps, far reaching implications for the future is the role of flavonoids as oxygen free radical scavengers and the importance of flavonoids in modulation of the immune response. The book finishes with reports on the side effects of flavonoids used in medicine with a discussion of the importance of flavonoids in traditional medicine.

The book represents a useful companion to Volume I, published in 1986 by A. R. Liss, and can be recommended as a valuable source of information for enzymologists, biochemists, phytochemists, physiologists, immunologists and pharmacologists. It should also be of interest to clinical researchers in mutagenesis, allergy, inflammation, oncology and viral infections. At eighty dollars the book may be somewhat expensive for the individual but for the library with an interest in these areas it is an essential addition to the knowledge of the biological activities of the flavonoids in relation to their potential use in medicine.

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