

BOOK REVIEWS

Gas Chromatography/Mass Spectrometry: edited by H. F. LINSKENS and J. F. JACKSON, *Modern Methods of Plant Analysis, New Series, Volume 3*, Springer, Berlin, 1986. 304 pp. DM 169.

GC/MS has been with us for some time; indeed it is a technique that is as old as this journal. Its most dramatic application has been to plant volatiles and most of our present knowledge of the essential oils is based on its successful application to a wide range of plant tissues over the last two decades. Combined with derivatization, GC/MS can also be used for less volatile constituents and it has proved its worth, for example, in the analyses of phytosterols and other lipid constituents. It even has a place in the analysis of macromolecules, e.g. in the sequence analysis of the sugars of pectic polysaccharides. The most sophisticated applications of GC/MS techniques however have been in the plant hormone field and here it has proved of inestimable value because of its sensitivity and power of discrimination. Most of these applications of GC/MS have been written about elsewhere, so that there is little that is particularly new in this third volume in the *Modern Methods of Plant Analysis* series. Its principal virtue is the bringing together in one place of a representative collection of chapters, discussing

recent literature of GC/MS as it applies to plant products.

The dominant theme here is the GC/MS of plant growth substances and four of the eleven chapters are devoted to their analysis. There is a useful introductory chapter by P. Hedden and then there individual reports on auxins (L. Rivier), auxin esters (Bandurski and Ehmann) and on cytokinins (Palm, Tay and Macleod). Other chapters deal with cyclic nucleotides, methylated alditol acetates, fatty acids, sterols and terpenoids. There is also an interesting account of the GC/MS of food flavours, with a summary of the various volatile components detected in most common fruits and vegetables and finally there is a description of the GC/MS of tobacco constituents. Most, though not all the chapters contain listings of MS fragmentations, GC profiles and illustrations of mass spectra. A fair amount of practical detail is provided although not consistently in every chapter. In summary, then, this is a worthwhile addition to the literature of phytochemical analysis. While by no means comprehensive it does provide a broad survey of recent methods.

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Orchid Biology, Reviews and Perspectives, Volume 4: edited by JOSEPH ARDITTI, Cornell University Press, Ithaca. 1987. 344 pp. \$60.50.

Although the tuberous roots of orchids have been used as a source of a nutritive beverage, no one can claim the family to be of prime economic importance to Man. It is the fascinating, exotic inflorescences which are the attraction and there is no other group of plants which are so prized for the intrinsic beauty of form, shape and colour in the flowers. Scientifically, the family, one of the largest in the angiosperms, is of immense interest; for example, there are the fascinating series of symbioses between orchid flowers and their insect pollinators and between orchid roots and their mycorrhizal associations. Few families more deserve monographic treatment than this one, and it is much to the credit of Professor Arditti that we have available a series of review volumes devoted to orchid biology. This fourth volume provides a variety of interesting and authoritative review articles which are well worth the attention of every serious botanist.

Of the seven reviews in this book, that on the evolution of the family by D.H. Benzing is the most generally

important. This author considers in some detail the various character states that have been employed in tracing orchid evolution and he points out some of the dangers of drawing too many conclusions from present available data. Certainly we still have a long way to go before we can pretend to understand how this enormous family has developed. Pollination mechanisms are briefly considered in a review of *Orchis* entitled 'Evolution from Reward to Deception' by A. Dafni, which is so fascinating that it leaves one asking for more. There are two anatomical chapters on leaf stomata and root structure, one embryological chapter on pollen development and one physiological chapter on respiration. The work begins with historical accounts of the development of orchidology in South East Asia and describes the work of botanists at the Singapore Botanic Gardens such as Holttum, Corner, Ridley, Burkill and many others. Finally there is a useful appendix produced by the editor in collaboration, listing the major orchid diseases, their symptoms and their control.

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