

virulent and non-virulent species produce the same toxins and in the same amounts? As indicated by Marré there is a great deal left to be done.

This volume as its predecessors is well produced, diagrams and structures are clearly presented and there are few mistakes. As in previous volumes, the index is rather inadequate and many compounds are missing. I have pleaded before and plead again with editors and publishers

to go over to an alphabetical listing of references. This is much easier both for the writer and especially for the reader. The price is high but not unusually so, as book prices tend to go. A volume well worth having.

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Phytochemistry, 1980, Vol. 19, p. 2516. Pergamon Press Ltd. Printed in England.

Biochemical Systematics and Evolution: by ANDREW FERGUSON. Halsted Press, John Wiley and Sons, New York, 1980. 194 pp., illus., \$42.95.

The text reviewed here would have been more appropriately entitled, *Introduction to Electrophoretic Approaches to Animal Systematics and Evolution*; or some such title. In his preface the author acknowledges that 'the greater part of this book is devoted to the application of gel electrophoresis' and 'that most examples concern animals'. Indeed, nearly all of the text pages are preoccupied with that approach and that Kingdom. There are 14 pages of bibliographic citations, only a few of which contain botanical references. With 6 pages devoted to a topic index we have a text of 194 pages which contain about 70 illustrations. Most of the latter are histograms, electrophoregrams, dendrograms, or yet other line drawings designed to portray the presentation of electrophoretic data.

Practically all of the published work discussed or reported upon are from the zoological literature. Only 4 of the 170 pages of text and 12 references (from among *ca* 286 citations) are devoted to the botanical literature, most of this relating to polyploidy and its detection by electrophoresis. One searches in vain among the references for such well-established botanical chemosystematic workers as Alston, Fairbrothers, Harborne, Hegnauer, Mabry, McNair, Mirov, Swain, to name but a few. Surprisingly, Boulter's extensive comparative work on cytochrome *c* is omitted (although this is portrayed in diagram from yet some other reference). Even the section entitled 'History of the Biochemical Approach' neglects the botanical side, ignoring completely the historical roots which clearly began, at least in principle, with De Candolle in the early 1800s and, at least in practice, by lichenologists (using secondary compounds) during that same century. Ferguson erroneously states (p. 13) that 'The term *chemosystematics* is sometimes used synonymously with *biochemical systematics*, although the former tends to be

favoured by botanists and the latter by zoologists. In part this stems from the use by botanists, in the past, of low-molecular-weight chemicals—the study of which is the realm of the chemist—while zoologists have concentrated on proteins and nucleic acids—the concern of the biochemist.' In fact, the present reviewer fancies that he coined the term chemosystematics (perhaps along with several others in the 1950s; it was loosely interchanged with chemo-taxonomy and biochemical taxonomy) simply because it was a shorter, quicker, way to refer to the discipline of biochemical systematics. In short, chemosystematics was intended as an abbreviation of biochemical systematics. After all, micromolecules, both plant and animal, are biochemicals, much as are macromolecules.

According to its author, the book is designed primarily for 'the advanced undergraduate student but the postgraduate and research worker should find parts of interest and benefit.' In my opinion, this is so because the author has organized his material well and communicates this clearly and concisely. He does not attempt to overload the reader with 'such and such have found this and that, however...'. Rather the text is a simple telling of the contribution, both real and potential, of electrophoretic methods for systematic purposes, albeit animal. He covers that field admirably, weaving in, when appropriate, peripheral but germane accounts of polymorphism, selectionism vs neutralism, Hardy-Weinberg expectations, parthenogenesis, hybridization, genetic distance and identity, DNA hybridization, amino-acid sequence studies and molecular clocks. All that. But as a botanical worker I can't help but believe that the text could have lived up to its title had the author taken the time to digest the rich field of literature in botanical chemosystematics, both micromolecular and macromolecular.

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