

BOOK REVIEWS

Alkaloids: Chemical and Biological Perspectives, Volume 2. Edited by S. WILLIAM PELLETIER. Wiley-Interscience, New York, NY 10158. 1984, xi + 490 pp. 17 × 24 cm. \$59.95.

The second volume in the series edited by S. W. Pelletier on alkaloids, *Alkaloids: Chemical and Biological Perspectives*, presents five chapters of valuable information for workers in the area. Each chapter is authored by respected researchers and experts on the particular family of alkaloids or technique covered.

The first chapter in this volume is devoted to the use of X-ray diffraction methods in the elucidation of alkaloid structures. A brief introduction describing the equipment and techniques used is followed by descriptions of the two most common methods, the heavy atom and direct methods, using actual examples from the literature. Methods used when the first two methods are not applicable are also discussed, and the chapter concludes with a discussion of the results obtained. This chapter should be valuable for students and chemists who often have only a limited knowledge of X-ray diffraction methods.

Chapter two is devoted to the imidazole alkaloids, a class of alkaloids that is rarely reviewed. In fact, the author makes the point that the last comprehensive review of this class was published in 1953. The chapter discusses the alkaloids initially by classifying them according to structure and then switches to classifying them by the plant from which they have been isolated. Each alkaloid is discussed briefly with remarks on the structure elucidation, spectral data, biosynthetic origin, and biological properties.

Chapter three discusses the quinolizidine alkaloids derived from the Leguminosae family. The structures of the quinolizidine alkaloids are presented in tabular form interspersed among brief comments about each structural type. The biogenetic relationships are also presented. Of particular interest is the discussion of the use of *gc/ms* for detection and identification of these alkaloids in plant extracts. The chapter concludes with brief discussions of the biological activities and functions of the quinolizidine alkaloids.

Chapter four presents a review of the maytansinoids. Although several other reviews of this class of compounds are available, this chapter does an admirable job of presenting a comprehensive look at the entire area. Both naturally-occurring and semi-synthetic derivatives are discussed, techniques for isolation and characterization are presented, and the synthetic approaches that have resulted in the total synthesis of several maytansinoids are reviewed. Finally, the biological activity and clinical trials of maytansine are briefly reviewed.

The final chapter and last half of the book are devoted to a spectral and physical constant catalog of the C₁₉-diterpenoid alkaloids. The data comes, in large part, from the author's laboratory and describes 159 naturally occurring alkaloids and 48 derivatives. The author notes that this is an area of much current interest, with the structures of more than 60 members of this class having been elucidated in the past six years.

This volume provides a wealth of information for the researcher interested in alkaloids in five extensively referenced chapters. The chapters are generally easy to read with numerous structures, and a great deal of attention has been paid to producing a book without typographical errors. The families of alkaloids covered may not be the most commonly encountered, but they are families in which there is much current interest. While the price of the book may seem high to some, the amount of information included provides a great deal of value to the purchaser.

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Natural Products Chemistry, Volume 3. Edited by K. NAKANISHI, T. GOTO, S. ITO, S. NATORI, and S. NOZOE. Kodansha Scientific Books, Tokyo 112, Japan, and University Science Books, Mill Valley, CA 94941. 1983, xii + 700 pp. 18.5 × 26.5 cm. \$90.00.

Natural products chemistry has long been a prominent branch of organic chemistry, providing a source of challenging target molecules for synthetic chemists and a rich array of structural types for the application and development of new physical techniques. The introduction and refinement of many new methods of separation and purification in recent years, together with dramatic progress in analytical instrumentation and its applications to structure determination, have made possible the isolation and structural elucidation of an increasing number of novel complex natural products, some occurring in only minute quantities. Many of these compounds possess potent biological activity and are finding important applications in medicine, pharmacology, and molecular biology. Their preparation has resulted in the development of ingenious new synthetic methodology involving the use of a host of novel reagents, many containing elements other than carbon (e.g., silicon, boron; organometallics) designed to achieve highly regiocontrolled and stereocontrolled reactions.

To illustrate these exciting developments in natural products chemistry, the editors and their many collaborators have selected a broad range of topics covering isolation, structural elucidation, synthesis, biosynthesis, and biological activity. As in earlier volumes, chapters are devoted to terpenoids, steroids, fatty acids and derivatives, sugars, carboaromatics and related compounds, alkaloids, and non-alkaloidal nitrogen-containing compounds. The range of compounds encompasses hormones, sex pheromones, toxins, antibiotics, and a variety of other chemotherapeutic agents isolated from animal, fermentation, marine, and plant sources. Liberal use is made of structural formulae in the clear and concise presentation of spectral and other physical data and in the elaboration of synthetic procedures. Each synthesis contains full details of the reagents employed, together with many useful comments as to the reasons for their choice, and the nature and mechanisms of the reactions involved. In many instances, such presentations are followed by summaries of the biological properties of the relevant compounds. More extensive discussions are presented on the chemistry of vision and rhodopsins, the biological activity of vitamin D₃, microbial enzyme inhibitors, and a number of other biologically important processes. Chapter 1 is devoted to a brief discussion of recent developments in the application of ¹³C-nmr spectroscopy to structure determination, and tables of ¹³C-nmr data are given for triterpenoids and flavonoids in the relevant chapters. It is a pity that the time of publication precluded detailed discussions of the many useful developments in 2D-nmr spectroscopy, although brief mention is made of one aspect in the structural elucidation of the triterpenes, trichilins A and B.

Considering the extent and detail of the coverage presented in this volume, relatively few trivial errors were noted. One such error was the incorrect assignment of the respective diagrams for ¹³C-nmr techniques discussed in Sections 1.6 and 1.9. More serious errors noted were the incorrect representation of the disaccharide moiety in the antitumor terpenoid, phyllanthoside, and the all-too-common confusion of cytotoxicity with anticancer activity, as in the case of palytoxin. These errors, however, do not detract from the splendid achievement of the authors in highlighting the tremendous developments occurring in natural products chemistry, and the many important contributions being made by this field to scientific and medical endeavor. The editors' hope of providing "a convenient guide to the important areas of the extremely broad field of natural products chemistry" is amply fulfilled. This volume will appeal to a wide spectrum of scientists and is strongly recommended to all those involved in bioorganic chemistry and the development of new drugs and methods of biological control. In addition, teachers of organic chemistry will find a wealth of material presented in a manner which should prove stimulating for students in advanced courses. Considering the scope of the work and the current cost of scientific books, this volume can be regarded as excellent value.

GORDON M. CRAGG, *National Cancer Institute*

The Ginseng Research Institute's Indexed Bibliography, A. W. RASHAP, B. A. BRALY, and J. T. STONE. Upstate Graphics, Woodstock, NY 12498. 1984, 120 pp. \$65.

I received this book over the Christmas holidays and hoped for a lot of help from it in uncovering missing documents and/or citations for a ginseng paper I was preparing.

As its title states, it is an indexed bibliography, nothing more, with 2320 entries under the ginseng section, 35 under patents, and 195 under *Eleutherococcus*, with the epithet consistently misspelled *senticosis*.

On about one-half the occasions when I needed to check my own entries, I found help in this bibliography. My first check, coincidentally, was a *Journal of Natural Products* article, entry no. 1274 in the bibliography. Unfortunately, the bibliographers had added things to the title that were not in the journal title. My second random check was to see how they treated a book by Kisaki, translated from Japanese to English by Joo and Bae, but I could not find that entry under the name of the author or the translator.

While my random checks and first impressions were unfortunate, I believe the document would be useful to those looking for recent literature on ginseng. The price is higher than I like to pay for an unannotated bibliography.

JAMES F. DUKE, *United States Department of Agriculture*

The Alkaloids, Chemistry and Pharmacology. Volume 23. Edited by ARNOLD BROSSI. Academic Press, Inc., New York, NY 10003. 1984, 399 pp. 15.5 × 23.5 cm. \$85.

The latest volume in this classic series contains six chapters. Two chapters update previous chapters on the colchicine and cephalotaxus alkaloids, and the remaining four chapters deal with maytansinoids, muscarine alkaloids, alkaloids from red peppers, and azafuoranthene and tropolisoquinoline alkaloids.

Chromatography of Alkaloids. Part B: Gas-liquid Chromatography and High Performance Liquid Chromatography, R. VERPOORTE and A. BAERHEIM SVENDSEN. Elsevier Scientific Publishing Co., New York, NY 10163. 1984, 457 pp. 17 × 25 cm. \$94.25.

This book is a companion to *Chromatography of Alkaloids. Part A: Thin-layer Chromatography* by the same two authors, which was reviewed recently in this journal [*J. Nat. Prod.*, **47**, 1069 (1984)]. The two volumes have little overlapping information and both are necessary for a full understanding of the chromatographic possibilities for alkaloids.

This is a thorough review of the subject with about 1400 references. It is in easy-to-read English but would have benefitted by having an English editor correct the large number of minor grammatical mistakes and punctuation errors which detract from the esthetics but not necessarily the usefulness of the information.

The book has two sections: (1) Gas-liquid Chromatography and (2) High Performance Liquid Chromatography. Under each section there is general information and then special chapters devoted to specific classes of alkaloids. Chromatographic data for many compounds in addition to alkaloids are included in this book because of the need to assay alkaloid-containing pharmaceutical mixtures (e.g. aspirin in APC) and compounds with similar structures (e.g., local anesthetics similar to cocaine).

This is a thorough review of the literature with extensive tables of chromatographic data and is not duplicated in any other single volume. It should be on the bookshelf of every library with holdings in alkaloidal chemistry.

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Natural Products and Drug Development, Alfred Benzon Symposium 20, 1984. Edited by P. KROGSGAARD-LARSEN, S.B. CHRISTENSEN, and H. KOFOD. Munksgaard International Publishers, Ltd., Copenhagen, Denmark. 1984, 599 pp. DKr. 375.

This is an outstanding publication that brings together information not only from Europe and North America but also from important research centers of Asia (China, India, Japan, Pakistan, and Thailand) and Australia. Norman Farnsworth, in the lead article, defined the topic more broadly than simply products of therapeutic value, but only two authors discuss products unrelated to health, Nakanishi on insect antifeedants and Blunden *et al.* on plant growth regulators.

The symposium volume is divided into five sections: (1) Terrestrial sources for active constituents and lead structures, (2) marine sources for active constituents and lead structures, (3) antimicrobial and antitumor compounds, (4) natural products as experimental tools and leads in drug design, and (5) CNS-active natural products in drug development. No attempt has been made to catalog all natural products being investigated, but there are many examples to illustrate the richness of natural products in novel chemicals for therapeutics and research. The volume contains a great deal more on the isolation and proof of structure of natural chemicals and synthetic analogs than it contains on the pharmacology or mechanisms of action of those products developed. The book illustrates that there are relatively few new pharmacological agents of clinical significance in the developed nations (outside of the antibiotics) but that there are a great number of research tools to help in the understanding of mechanisms of action of drugs and diseases.

The book should be on the want list for every teacher dealing with natural products, pharmacognosy, or economic botany and in every library with holdings in natural products chemistry.

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