Book Reviews

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BOOK REVIEWS

Dictionary of Drugs, Volumes 1 and 2. Edited by J. ELKS and C.R. GANELLIN. Chapman and Hall, 29 West 35th Street, New York, NY 10001. 1990. xii + 1303 pp. (Vol. 1), vii + 755 (Vol. 2). 21 × 28 cm. $1099. ISBN 0-412-27300-4 (set).

This two-volume reference set contains tabulated chemical and pharmacological data on over 6000 drugs in current use or in late development for clinical use. The first volume contains the chemical data, structures, pharmacological use, and bibliography for the drug entities. The drugs are arranged in alphabetical order, with entries listed by a generic name or, in simple cases, by a systematic name. Those drugs that are derivatives are listed under the entry name of the parent compound. Each entry has a Dictionary Number and contains the chemical name, synonyms, trade-names, CAS Registry Number, molecular formula, and molecular weight. Most entries contain the chemical structure, showing stereochemistry when appropriate. Chemical data include melting point, boiling point, and pK_a. The chemical data for a racemic mixture are provided and, if available, for each stereoisomer. This data has been extracted from both the primary literature and patent documentation. Therapeutic uses are provided, and many entries contain information on toxicity. Bibliographic information includes references on synthesis, spectroscopic data, and pharmacology.

The second volume contains several important indexes, with each index term referring to a Dictionary Number. The Name Index contains all names and synonyms, listed in alphabetical order, used throughout the *Dictionary of Drugs*. A Molecular Formula Index and a CAS Registry Number Index are provided for all drugs and drug derivatives. One index, referred to as the Type of Compound Index, categorizes all drugs under one or more headings based on pharmacological activity. The final index, the Structure Index, contains reduced size chemical structures that appeared in the Dictionary, arranged in order of the Dictionary number.

The Indexes volume is critical for effective utilization of the *Dictionary of Drugs*. Many drugs are derivatives and are not listed as a unique entry item. Rather, these drugs are listed under the entry name of the parent compound. Utilization of the Name Index or the Molecular Formula Index enables one to rapidly identify the Dictionary Number for the main entry. The Type of Compound Index, which classifies drugs by pharmacological activity, is also useful for identifying drugs having similar therapeutic effects. The Structure Index, containing reduced diagrams of chemical structures, is provided to facilitate "the rapid skimming of Dictionary contents when searching for structurally-related drugs." However, arrangement of this index alphabetically by Dictionary Number does not always permit searching for structurally-related drugs. A more effective approach might have been arrangement of the chemical structures based on pharmacological activity.

Overall, the *Dictionary of Drugs* is an excellent reference work for up-to-date and concise information of currently used drugs. The printed format for each entry item enables the user to find readily the chemical data, structures, pharmacological use, and bibliography for the drug. The *Dictionary of Drugs* is an important reference and recommended for all research libraries; unfortunately, the price for the two volume set limits its purchase by individuals. Nevertheless, this reference is another valuable source of concise chemical information for researchers and educators in pharmaceutical fields.

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Handbook of Terpenoids. Triterpenoids. Volumes I and II. S. DEV, B.A. NAGASAMPAGI (Vol I); S. DEV, A.S. GUPTO, S.A. PARWARDHAN (Vol II). CRC Press, Inc., 2000 Corporate Blvd., N.W., Boca Raton, FL 33431. 1989. 573 pp. (Vol I), 624 pp. (Vol II). 18.5 × 26 cm. $247.50 (Vol I), $247.50 (Vol II). ISBN 0-8493-3661-2 (Vol I), 0-8493-3662-0 (Vol II).

It was in 1982 that the CRC Press commenced publication of a series of handbooks of terpenoids. The first two handbooks covering monoterpenoids appeared in 1982 and four issues covering diterpenoids were published in 1985–1986.

The two volumes under review deal with acyclic, monocyclic, bicyclic, tricyclic, tetracyclic (Volume I), pentacyclic, and hexacyclic (Volume II) triterpenoids. A common preface to both volumes written in 1986 (surprisingly 3 years prior to publication) states "Every effort has been made to cover naturally occurring compounds which have appeared in accessible literature until the end of 1982." On the contrary, in certain cases, authors refer to literature published up to 1986.

Both volumes carry at the beginning a common 71-page general information and skeletal-type index which provides useful reference material covering early development, present status, absolute stereochemistry and structures, reactions, synthesis, biosynthesis, nomenclature, natural occurrence, and structural types. Each volume provides at the end a common 7-page general bibliography which lists some selected references to books, reviews, and key papers dealing with various aspects of triterpenoid chemistry. However, the indexes are not cumulative in two volumes; each volume has a compound and a species index.

Following the skeletal-type index, Volume I provides some 464 pages listing triterpenoids, giving for each the trivial name or semisystematic name (any less common trivial name in parentheses), classification code number (giving the number of carbon atoms and rings, skeletal type, and serial number), molecular formula (molecular weight in parentheses), structure (including stereochemistry where appropriate), mp (or bp) of the parent compound and/or derivatives, nD, $[\alpha]_D$, isolation, spectral data (uv, ir, 1H nmr, ms), and remarks [including information and references to derivatives prepared, structural correlations made, additional spectral data (^{13}C nmr, X-ray), synthesis (or partial synthesis), biosynthesis, biological activities, structural revision (if required), and any co-occurring artifacts]. Each compound (and derivatives) carries a separate list of references. Altogether 11 acyclic, 4 monocyclic, 3 bicyclic, 34 tricyclic, and 747 tetracyclic triterpenoid (parent) structures are listed; the actual number of compounds is greater, since information on some naturally occurring derivatives is also provided. Triterpenoid alkaloids are also included.

In volume II, 869 pentacyclic and 3 hexacyclic triterpenoids (514 pages) are similarly treated.

These two handbooks are certainly notable efforts covering about 1700 triterpenoids along with their naturally occurring derivatives and containing more useful and up-to-date information for each compound than in Glasby's *Encyclopedia of the Terpenoids*. The printing is excellent. Spotting errors in a work of this nature is a difficult task; however, the structure of (24*S*)-aglaitriol on p. 139 of Vol. I appears to be inverted. Inclusion of a formula index would have certainly enhanced the usefulness of this work.

This invaluable work is highly recommended for natural product chemists, especially those involved in triterpene research. Although the cost of the two volumes appears to be high ($495) the actual cost per triterpenoid is a mere 30 cents. These two handbooks should definitely find places on the library shelves of all departments concerned with natural product chemistry.

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Countercurrent Chromatography. Apparatus, Theory, and Application. W.D. CONWAY. VCH Publishers, 220 East 23rd Street, Suite 909, New York, NY 10010. 1990. xiv + 475 pp. 15.5 × 223.5 cm. $75.00. ISBN 0-89573-331-5.

This is a well written book on countercurrent chromatography, which is one of the most useful separation techniques for the isolation of rather polar natural products. Dr. Conway, an expert in this field, should be commended for his efforts in publishing this superb reference book, which will benefit many scientists working in the field of natural products. Although several books and special issues in journals under this topic have already been published, this is the first book written by one author presenting an overview of countercurrent chromatographic techniques.

The book consists of two parts which are well-balanced, namely the theory and the application. The author explains the theory in an easy style. Because each isolation of natural products is different, it is difficult to generalize every application. However, the rationale presented provides useful information for selecting an apparatus. The knowledge of the theory aids in a more efficient operation of the apparatus. Another successful aspect of this book lies in the illustrations of the apparatus and theory, which help the readers' understanding of their components. The book covers up-to-date application data and features a bibliography containing 422 references through 1989. It was clearly a time-consuming labor to compile this work. However, it would be more informative to cite references, not the review papers.

After reading this book, I wondered if all apparatuses are necessary, because only a few scientists can afford all of them. It would have been interesting to include data comparing all the apparatuses with several reference compounds.

Aside from several spelling errors which should be corrected in the future version, this book is certainly worth reading for anyone actively engaged in isolation of natural products and purification of rather polar synthetic compounds as well. The price is reasonable in comparison with the cost of similar books.

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Chromatographic Analysis of Alkaloids. MILAN POPL, JAN FÄHNRICH, and VLASTIMIL TATAR. Marcel Dekker, 270 Madison Avenue, New York, NY 10016. 1990. viii + 667 pp. 15 × 22.5 cm. $150.00. ISBN 0-8247-8140-6.

The alkaloids are one of the largest, most structurally diverse, and biologically interesting of all the classes of natural products. The majority of prescription products that contain natural products are derived from alkaloids, and the major drugs of abuse, cocaine and heroin, are also alkaloids. There is consequently a substantial need for analytical systems to both separate complex alkaloid mixtures for the purposes of isolation, as well as for standardization of crude drugs and prescription products and their detection for forensic purposes.

This book by Popl, Fähnrich, and Tatar has seven chapters: an introduction to the classification and physical properties of alkaloids that are pertinent to chromatography, a chapter introducing chromatographic terminology, theory, and instrumentation, chapters on gas, liquid, and thin-layer chromatographies, and a final chapter on examples of alkaloid determinations, mostly in tabular form.

This is a nicely constructed, well-prepared volume in the Chromatographic Science Series (Volume 53) edited by Jack Cazes. The monograph is clearly typed, with relatively few typographical errors, and the figures are clear, with well-detailed legends. The diagrams, in contrast, are rather poor; they do not reflect stereochemistry, and indeed there are very few structures considering all of the alkaloids mentioned. In fact, inspection reveals no structures beyond those presented as structure type examples in Chapter 1. There is a very useful index of compounds, methods that have been applied to their analysis, and the origin of the material (e.g., plant, biological fluid, etc.). Thus finding a technique for the analysis of ergotamine in plant samples becomes a straightforward process.

Being an expansionist rather than a purist, this reviewer was not thrilled with the "definition" of an alkaloid used in this monograph because it refers to alkaloids as being cyclic with nitrogen in a negative oxidation state. This tends to limit the coverage rather than embrace alkaloid chemistry as it exists today. For example, the latest alkaloid to be marketed in the United States is derived from a spider venom, where chromatographic separation issues abound. Similarly, the leading experimental anticancer drug, taxol, is also an alkaloid, but does not fit the definition and so the separation problems relating to taxol and its congeners are not addressed. Such omissions, due to the application of a narrow definition of an alkaloid, detract from an overview of current alkaloid chromatographic problems. On the other hand, the coverage of the traditional alkaloids and the separation problems, whether the source is the plant or a biological fluid, appears to be quite good, and the details provided would be very useful to an experimentalist.

One unfortunate aspect of the book, evident in Chapter 1, is the number of misstatements and hyperbole. Some examples include: Ephedrine and colchicine are classified in the same sub-groups because of N not in a ring; ricinine is referred to as a dihydropyridine (p. 4); "The esters of tropine occur in many plants" (p. 6); "Protopine is widespread in many plants" (p. 10); Hygrine is regarded as a pyrrole derivative (p. 12); "All of them (*Strychnos* bases) are toxic" (p. 10), "Harmine bases are the simplest indole alkaloids" (p. 15).

Another distressing aspect is evident in the opening sentence of Chapter 2 "Anybody who starts with the chromatography of alkaloids faces serious problems." A list of supposed "difficulties" then follows. Why not say "Opportunities exist for applying the full range of chromatographic techniques for the separation and identification of alkaloids"?

Overall though, in spite of some of the limitations alluded to above, this is a useful accumulation for anyone interested in the techniques available for the separation of alkaloids. It will be an important volume for every library with a natural product or analytical chemistry collection and will prove useful for teachers of chromatographic analysis.

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Studies in Natural Products Chemistry, Volume 7, Structure and Chemistry (Part A). ATTA-UR-RAHMAN. Elsevier Science Publishers, P.O. Box 882, Madison Square Station, New York, NY 10159. 1990. xx + 528 pp. 16.5 × 24 cm. $179.50. ISBN 0-444-88829-2.

This volume in the series contains 11 chapters, each devoted to a more or less specific area of natural product chemistry. As such, it will be of special interest to those involved with certain areas of research and somewhat less useful to the general audience. All of the chapters contain references through the 1988 literature and several clearly have stated this coverage as a goal. Because most of the chapters deal with some aspect of terpene or terpenoid chemistry, this provides a somewhat unifying aspect to the volume.

The two initial chapters ("Chirality as manifested in the biological activity of natural products," W. Gaffield, 25 pp., 112 references; "The use of synthetic substrate analogues in the study of enzyme-carbohydrate interactions," K. Bock and B.W. Sigurskjold, 57 pp., 297 references) are somewhat apart from the rest. Gaffield focusses on swainsonine, castanospermine, and their analogues as glycosidase inhibitors and the teratogenicity of steroidal amines. Bock and Sigurskjold limit their chapter to "in vitro studies of purified specific enzymes and pure neutral carbohydrate substrates . . . with emphasis on the structural aspects of the substrate analogs." This is a comprehensive and detailed treatment which would alone justify purchasing of the volume by those in this research area.

D.V. Banthorpe presents "Synthesis of lower terpenoids and related compounds by plant tissue cultures" (42 pp., 47 references), a chapter which "attempts to introduce organic chemists to this potent tool," mainly by summarizing work from the author's lab. "The stereochemistry of cartenoid biosynthesis" (G. Britton, 50 pp., 446 references) is an excellent review, with sections devoted to early stages, phytoene formation, desaturation, and cyclization. The major portion is devoted to the stereochemistry of cyclization. Triterpenes are the major focus of several chapters: "Recent advances in oleanane triterpenes" (G.R. Mallavarapu, 44 pp., 93 references), "Toxins of echinoderms" (G.G. Habermehl and H.C. Krebs, 51 pp., 221 references), and, in part, "Bioactive constituents of plants used in African traditional medicine" (K. Hostettmann and A. Marston, 32 pp., 70 references). The last-named chapter also describes a variety of phenolics and quinones with bioactivity.

Three chapters are devoted to taxonomically restricted groups of plants: "Chemical constituents and bioactive compounds from mangrove plants" (U. Kokpol, D.H. Miles, A.M. Payne, and V. Chittawong, 24 pp., 67 references), "Natural products from the genus *Artemisia* L." (J.A. Marco and O. Barbera, 64 pp., 437 references), and "Biologically active compounds from Simaroubaceous plants" (M. Okano, N. Fukamiya, and K.-H. Lee, 35 pp., 81 references). Of these, the Marco and Barbera chapter is certainly a tour de force, being comprehensively and beautifully presented. Flavonoids and sesquiterpene lactones are the major components, and 357 total structures are listed. In addition, a list is given of all *Artemisia* species which have been studied. The chapter on mangrove plants includes isolates from any plants of the mangrove area, not just the typical key species from Rhizophoraceae, Avicenniaceae, and Sonneratiaceae. The review on Simaroubaceae presents a survey of papers in the 1972–88 period but particularly centers on quassinoid bioactivity, especially from the Lee laboratory.

The final chapter, "The chemistry of iridoids" (A. Bianco, 58 pp., 238 references), is written in an engaging first person style by one of the pioneers in the field. Of particular interest is some focus on historical development and on iridoid chemistry, particularly acid-catalyzed rearrangements. It also reviews the use of iridoids as chiral synthons. This is a marvelously useful review which covers the field in general and will be an important starting point for anyone engaging in iridoid research.

Finally, it might be valuable to mention what is not covered in the book. There is very little on instrumental methods of structure determination, but the comprehensive bibliographies of some of the chapters can be used for direct entry into the primary literature. Secondly, there is no focus on, and often no mention of, synthetic methods. This is not a criticism and may even be a strong point. Authors were allowed to concentrate on the natural products themselves, not on organic synthesis. All libraries and individual researchers in the areas covered will certainly want copies of this volume.

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