Book Reviews

Chemical Dictionary of Economic Plants. J. B. Harborne and H. Baxter (University of Reading, UK). John Wiley & Sons, New York, NY. 2001. xvii + 217 pp. 14 × 29.5 cm. $355.00. ISBN 047-149226-4.

A more accurate title for this book might be "*The Chemical Constituents and Uses of Selected Economic Botanical Products*". The authors provide chemical and economic information on 753 botanical products indexed by common and Latin names and referenced by their entry number (1−753) rather than their page numbers. The botanical products are largely vascular plants (ferns, horsetails, lycopods, gymnosperms, angiosperms), occasionally mushrooms (*Amanita*), lichens (*Lobaria, Ramalina, Roccella*), and marine algae (*Chondrus*, *Fucus*, *Furcellaria, Gelidium, Laminaria*). Chemical constituents are not defined or indexed, nor are chemical structures or formulas presented.

The common names and their entry numbers are classified under the following categories: "Medicinal Plants" (1−184), "Food Plants" (185−322), "Essential Oils" (323−442), "Oils and Fats" (443−483), "Dyestuffs" (484−563), "Tannins" (564−594), "Plant Biocides" (595−632), "Hallucinogenics" (633−663), "Gums and Rubbers" (664−695), "Waxes and Resins" (696−725), and "Plant Fibers" (726−753). Each entry includes species name, family name, its classification restated (e.g., "medicinal plant"), and brief descriptions of the chemical constituents and uses. An entry for the Alder Buckthorn is illustrative of the type of information provided:

> **Alder Buckthorn** **3**
>
> *Rhamnus frangula* (=*Frangula alnus*) (Rhamnaceae)
>
> Medicinal plant. Contains several anthraquinone glucosides, frangulin, frangula-emodin, chrysophanic acid and frangularoside
>
> Almost exclusively used for treating constipation. Small doses may be used to stimulate bile secretion.

Within each category, entries are presented alphabetically by common name. Five to eight entries appear on each page, often with additional information on alternative common names, specific parts of the plant used, geographical origin or distribution of the species, and related species, but the format is not always consistent or entirely accurate; for example, candelilla (*Euphorbia antisyphilitica*)—stated to be "a shrub of northern Mexico"—is a perennial herb occurring also in the Big Bend region of Texas.

References are presented only as a bibliography, and most of the entries in this are for dictionaries, encyclopedias, and handbooks (e.g., J. B. Harborne, H. Baxter, and G. P. Moss, *Phytochemical Dictionary*, 2nd edition, Taylor & Francis, London, 1999); a total of 25 are listed. The color photographs of 15 species, which appear on four pages in the mid part of the book, add little value due to their limited representation of the products presented and their poor quality. An exception is the photograph of "Woad", *Isatis tinctoria* (Brassicaceae or Cruciferae as recognized by Harborne & Baxter), which also appears on the cover.

The authors indicate in the preface that they were arbitrary in deciding what information to include in their content. For instance, products of the yew genus (*Taxus*) are indicated only for *T. baccata* heartwood, which is reported to contain anthocyanidins used in dyes. One might also have expected to find information on taxanes such as Taxol (paclitaxel, taxotere), used to treat cancer and atherosclerosis, which is found in the bark, leaves, and seeds of *Taxus* spp. This is especially so since they mention that other less significant medicinal plants such as *Menyanthes trifoliata* (Menyanthaceae) contain iridoid glycosides, alkaloids, and flavonoids and that "no pharmacological data are available to justify its use as a herbal medicine".

The classification and alphabetical arrangement of the entries by common names will not likely appeal to scientists who routinely conduct research. The value of scientific names is especially evident where seaweeds *Chondrus crispus* and *Gigartina mamillosa* may both be referred to as Irish moss and where the epiphytic *Tillandsia* (Bromeliaceae) is commonly known as Spanish moss, while no mosses (Musci) are represented, and where the authors themselves obviously failed to recognize that they repeated information under different common names for the same species, such as seen in the medicinal plants section for *Rhamnus frangula* and *Fucus* spp. Latin names, unfortunately, do not include their authors, and this further lessens the book's scientific value, although this information can be obtained from other sources such as *A Checklist of Names for 3,000 Vascular Plants of Economic Importance* by E. Terrell, S. R. Hill, J. Wiersema, and W. E. Rice (USDA 1986), or its expanded and more expensive version of ∼*10,000 World Economic Plants* (CRC Press 1999, $125), and the classic *Dictionary of Economic Plants* (2nd edition) by J. C. T. Uphof (1968), reprinted (J. Kramer 2001, $80.)

In summary, the book by Harborne and Baxter provides useful information on the chemical contents of many economic plants; however, its high price tag and limited content will probably limit its market to herbalists, homeopathic practitioners, and food technologists.

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Botanical Dietary Supplements: Quality, Safety and Efficacy. By Gail B. Mahady, Harry H. S. Fong, and Norman R. Farnsworth (University of Illinois at Chicago). Swets & Zeitlinger Publishers, The Netherlands. 2001. v + 271 pp. 17 × 24 cm. $79.50. ISBN 90-265-1855-2.

With the recent boom in herbal product use, many medical professionals are struggling to find accurate scientific information on the appropriate use, safety, efficacy, and toxicity of these products. In an attempt to fill this need, many individuals, companies, and industrial associations have published monographs on various herbs. Each of these undertakings has produced a slightly different publication, each with a different intended audience and usage. *Botanical Dietary Supplements: Quality, Safety and Efficacy* is another addition to this growing collection

of herbal monographs for medical professionals. This book is directed toward "a busy health care professional" and it "will enable one to quickly ascertain which clinical uses are supported by clinical data, without having to read through all the pharmacology".

The book begins with a brief introduction to the botanical market with current marketing data and raises some of the troublesome issues within the industry and their possible solutions. Chapter two progresses to a discussion of government regulation. This is an area of much confusion both within and without the herbal industry. The authors do an admirable job of explaining where regulations are in place and their effectiveness. This chapter, of course, focuses on the Dietary Supplement Health and Education Act (DSHEA) of 1994. The chapter goes into great detail on the impact of DSHEA on both FDA regulation of the industry and the regulation's impact on the health care industry. The third chapter covers the issue of standardization, both in potency and quality. This is a significant issue for most medical professionals who are used to working with single entity, easily quantifiable medications. This chapter describes the complexities of standardized herbal preparations and what steps the industry is taking to address them.

The remaining chapters are devoted to 22 specific herbs. The rationale for choosing these herbs is oddly missing. Most of the herbs chosen are the more commonly used ones and have a justifiable presence in the book. However, a few (e.g., chaparral, comfrey, germander, and German chamomile) are little known herbs or are herbs that the majority of the herbal industry has voluntarily ceased to sell due to toxicity concerns.

Each herbal monograph consists of the following sections: synopsis, introduction, quality information, medical uses, summary of clinical evidence, mechanism of action, pharmacokinetics (in some monographs), and safety information. The synopsis section briefly summarizes all the other sections in one short paragraph. The introduction provides traditional uses and a description of the plant's regulatory history. Plant identification, active ingredients, and typical standardization details are presented in the quality information section. Traditional uses and scientifically supported medicinal uses, if available, are quickly mentioned in the medical uses section. A major part of each monograph is the summary of clinical evidence available for the herb. Those monographs that contain a pharmacokinetics section have additional details about absorption, distribution, and elimination for the actives in the herbs. The mechanism of action section uses animal and *in vitro* studies to deduce potential explanations for the medicinal properties of the herb. In some cases this section is quite detailed; in others there is insufficient information or the information only allows for speculation. Finally, the safety information section covers adverse events, contraindications, drug interactions, toxicology, and dosing.

The information presented in this book is well referenced, thoughtfully arranged, and concise. The science is as up-to-date as can be expected. Everything a medical professional needs in terms of the current understanding for these herbs is contained in these monographs. The synopsis, safety, and pharmacokinetics are the only sections in these monographs that are short enough to provide answers for "busy health care professionals". The other sections are best read outside of a busy work environment. That said, this book is a good reference to have in just about any medical professional's office, but may not be the one you pull off the shelf to answer a question quickly.

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The Phytochemistry of the Macro and Blue-Green Algae of the Arabian Gulf. By A. M. Rizk, H. S. Al-Easa, and J. M. Korprobst (University of Qatar and University of Nantes). University of Qatar, Doha, Qatar. 1999. xviii + 746 pp. 16.5 × 24 cm. $75.00. ISBN 99921-46-64-8.

This is an impressive volume in its encyclopedic coverage of the natural products chemistry of marine algae and cyanobacteria. Although the title indicates that it only covers algae from the Arabian Gulf, this is misleading. The reported natural products chemistry is in fact for algae and cyanobacteria collected and studied from many parts of the world; the relevance of this volume to marine phytochemists is thus very broad. Following an extensive contents section (10 pp) as well as a brief introduction and acknowledgements, the arrangement of material is in three main parts.

Part One (121 pp) gives a general introduction to the chemistry of marine algae and cyanobacteria, as well as an interesting, albeit brief, section on human utilization and application of these organisms. This broad overview nicely encapsulates the essence of marine algal systematics, ecology, and biochemistry and would be useful to a reader new to this topic. The bulk of the chapter is broken into a review of the typical primary metabolites and secondary metabolites of the major groups of algae and the cyanobacteria. This is a useful section of the volume in that major metabolic trends are identified and interesting natural product examples are discussed.

Part Two is a taxonomic listing of algae from the Arabian Gulf (15 pp). In tabular format, the occurrence of 59 species of green algae, 14 species of cyanobacteria, 67 species of brown algae, and 111 species of red algae is noted for five locations (Bahrain, Iran, Kuwait, Qatar, and Saudi Arabia). This section concludes with 25 quite attractive color plates showing photographs of green, brown, and red algae.

Part Three constitutes the bulk of the volume and describes the reported natural products chemistry species by species (414 pp). This comprehensive review is impressive in its level of detail, referencing (144 pages of references with an estimated 2500 entries!), and breadth of coverage. A number of insightful charts delineate the proposed biosynthetic relationships of related and oftentimes co-occurring metabolites. In this regard, this is an invaluable work for virtually any scientist studying features of the chemistry, biochemistry, or ecology of marine algae. Again, the reported chemistry is for species of these algae occurring from many parts of the world, and the prospective user of this volume should not be mislead by the title that suggests only an Arabian Gulf perspective.

The book is nicely rounded out with an adequate glossary (7 pp), the extensive reference list described above, a taxonomic index (21 pp), and subject index (26 pp). Overall, this provides a comprehensive and worldwide review of the natural products chemistry of marine algae and cyanobacteria. Purchase of this volume will be attractive to special-

ists studying the chemistry or biology of marine algae and cyanobacteria and research intensive university libraries. Although the book is printed on high-quality heavyweight paper, the binding seems rather flimsy, and this reviewer's copy cracked in several locations during preparation of this review. However, given its rather modest cost, high level of scholarship, and obvious care and attention to detail, this is a real bargain for the algal specialist!

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Herb-CD, 4th Edition. By T. Brendler, J. Gruenwald, and C. Jaenicke (PhytoPharm Consulting). Medpharm Scientific Publishers, Stuttgart, Germany. 2001. DM 150.60, Euro 77.00. ISBN 3-88763-092-0.

The latest version of this reference on herbal remedies contains information on over 900 plants and more than 1000 herbal drugs obtained from these plants. Use of the program is less than intuitive, so the "Help" section is required reading. "Help" contains useful supplemental information, but its organization is rudimentary in that the active links we have come to expect in recent computer programs are lacking. This often necessitates scrolling through the whole thing to find the explanations needed.

One can search plants by scientific or common name, bringing up information on general history of use, synonyms, etymology, botany, and plant habitat. These latter sections provided some interesting and useful details that other herbal references lack. From the plant screen, it is easy to access the corresponding section on the herbal drug(s) obtained from the plant in question. Information on usage, dosage, modes of action, indications, contraindications, and side effects is provided, and, if the herbal drug was evaluated by the German Commission E, the monograph is available. There is also information as to the chemical compounds found in the drug.

The database can also be searched by drug name, but these names will be less familiar to the American audience than the plant names. This search mode, however, allows the user to search for specific chemical classes and compounds. Although this is a useful feature, it was a bit inconsistent in practice. I could display all alkaloid-containing plants, but not all steroid-containing plants. Restricting my search to flavolignans, the compounds displayed were all specific to *Silybum marianum*; however, selecting flavolignans in an unrestricted search of all the compounds in the database produced *Hydnocarpus* as the only species. A more productive search was obtained by selecting "indications". Here choosing "acne" or "pharyngitis" brought up lists of plants that were reported to be useful in a specific medical system.

An unusual feature of this database is that one can restrict a search to one of 80 official pharmacopoeias; however, monographs are only provided for herbal drugs that have been evaluated by Commission E.

References are provided (first author et al. only), but they are listed alphabetically without citation numbers. Together with the fact that titles are generally not provided in the bibliography, it is difficult to locate a specific reference for any given information. References can be searched by keyword, but this is usually not sufficient to determine the primary source for the information being presented.

The authors' attempt to qualify the information available on plants and plant drugs as to the extent of efficacy and safety is welcome but not completely successful. An herbal drug with clinical evidence of efficacy is designated ++, with pharmacological evidence is +, and traditional use is ±. Addition of an "!" indicates "potential risks due to the plant's characteristics". These designations are somewhat subjective and inconsistently applied. It is often unclear which indications have been pharmacologically or clinically verified due to the lack of specific citations. Conversely, *Schisandra* is designated ±, yet its mode of action is stated to include demonstrated liver protection and regeneration in addition to antioxidant, antiinflammatory, and tumor-inhibiting activities. There are numerous examples where a plant deemed to warrant an "!" has no identified contraindications or safety warnings. In contrast, *Sassafras* has no "!" despite the warning that a major component, safrole, is carcinogenic. This rating system as applied is not very useful in helping the user discern the level of evidence for safety or efficacy. A skull and crossbones is used to denote plants with poisonous parts, but again, this affords little discrimination when the suspect plant parts are not mentioned, and *Acer rubrum* is labeled a poison along with *Digitalis*!

In sum, this CD is a logical companion to the Commission E monographs and a good general reference (as opposed to a research tool) for people interested in herbal remedies.

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Fortschritte Der Chemie Organischer Naturstoffe: Progress in the Chemistry of Organic Natural Products, Volume 82. Edited by W. Herz (Florida State University), H. Falk (Johannes-Kepler Universität), G. W. Kirby (University of Glasgow), and R. E. Moore (University of Hawaii at Manao). Springer Verlag, Wien and New York. 2001. vii + 293 pp. 15 × 23 cm. EUR 142 ISBN 3-211-83653-5.

The "Fortschritte" series is one on which natural product chemists and biologists rely; one simply has to have access to these volumes. The very high production values and the excellence of the reviews from the leaders in their respective fields are now almost legendary. As such, this contribution is a very fitting addition to the series and in some ways exceeds the established standards, raising the proverbial bar for others to emulate.

Bringmann and his colleagues at Würzburg have assembled a single-chapter volume on numerous classes of natural products from a variety of sources that contain a biaryl group. The chapter is divided into three sections, namely, general and stereochemical aspects, nonbridged biaryls, and bridged biaryls. It deals with the difficult aspects of precise structure elucidation and the techniques required, the approaches to selective synthesis, and the biology associated with this large and diverse group of natural products. Some of the classes of compound discussed were familiar; others, such as the glycopeptides, less so. All are treated generously and in critical detail. For many years Bringmann's group has investigated the naphthalene-isoquinoline alkaloids and pioneered their full structure determination and atropisomeric synthesis, as well as aspects of their biology. These compounds form only a part of the diverse discussion presented here. As appropriate, the authors raise significant issues regarding the thorough characterization of many biaryl systems in nature. As a result, numerous challenges are offered for chemists and biologists to contribute in the future to the chemical and biological study of biaryl natural products. The broad-ranging content is augmented with over 1360 references, an author index, and a subject index. Also included, and enhancing the chapter, are some very attractive photographs of the plants that have yielded these interesting metabolites.

Like other members of the series, this volume should be considered an essential component of chemical and biochemical libraries.

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Medicinal Natural Products: A Biosynthetic Approach, Second Edition. By P. M. Dewick (University of Nottingham). John Wiley and Sons, Ltd., UK. 2002. x1i + 507 pp. 18.5 × 24.5 cm. $115.00 ($72.95 paperback). ISBN 0-471-49640-5.

This is the second edition of *Medicinal Natural Products* by Paul Dewick of the University of Nottingham. The first edition was published in 1997, but much has changed in the field of natural products even in that short time period, with the most notable change from a biosynthetic perspective being the discovery of a completely different pathway to the terpenoids in some organisms. This edition therefore builds on the solid foundation of style and format of the first, expands certain critical areas, and updates the references. The result in doing this is a superb treatise of substantial intellectual value. Grateful thanks must go to the author for this wonderful gift to the natural product community.

As indicated in Chapter 1, "This book has been written primarily for pharmacy undergraduates...". This may be true in the U.K., but given the level of natural products impact in the curriculum, it is not true for pharmacy students here in the U.S. We use this volume in our Advanced Pharmacognosy sequence for graduate students, which surveys secondary metabolites and their origins, structures, and biological activities. Even there, the content of this volume is beyond the scope of the time available. So the good news then is that there is always something of interest in the book to go back to. As the author indicates on page 2, that is indeed the intention. This should not be regarded as a textbook therefore, and yet it is also not a research treatise. For me though, there is a very strong message that underpins this volume: that natural products chemistry and biology are evolving rapidly at the cutting edge of several areas of science and are an essential aspect of the human experience.

There are eight chapters in the book. An introductory chapter is followed by an overview of secondary metabolism, including the mechanistic aspects (a wonderful strong point throughout the book). This is followed by chapters on the acetate pathway, the shikimate pathway, the mevalonate and the deoxyxylulose phosphate pathways, alkaloids, peptides and proteins, and finally carbohydrates. Overall, the emphasis is on products derived from higher plants, and there are also well-written sections on peptide hormones and various antibiotics. The use of "boxes" in the text to focus on more detailed aspects of selected topics continues to work well and allows the author to expand on selected areas of interest without distracting the reader from the overall theme of the chapter or the natural flow of the information as it is being presented. At the end of each chapter there is a list of pertinent, recent review articles, which is organized by the sequence of the subtopics in the chapter. There is a very fine subject index at the end of the book.

This is a really excellent book, from both a content and a production perspective. It is beautifully produced, the various typefaces used are clear, and the structures are well-proportioned and extremely error-free. I have already bought several copies for academic colleagues around the world as gifts and would strongly encourage others to do the same. Buy one for yourself and one for a less fortunate colleague in another country. Anyone interested in natural products should have ready access to a copy of this book, and the paperback version makes it accessible to students. For all chemistry libraries it is a "must buy".

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