Book Reviews[*]

Artemisia. Edited by C. W. Wright (University of Bradford, UK). Taylor & Francis, London. 2002. xiii + 344 pp. 7 × 10 in. £72.99. ISBN 3-415-27212-2.

Artemisia, volume 18 of the book series entitled "Medicinal and Aromatic Plants−Industrial Profiles", gives an in-depth look at this genus. This book comprises 15 chapters.

Chapter 1 introduces the reader to general features of the Asteraceae family, a biological and systematic review of the tribe Anthemideae and the genus *Artemisia*, chemical overview and chemotaxonomy, in-vitro cell and tissue cultures, and biosynthesis and sites of synthesis of some artemisia secondary metabolites. Chapters 2−8 deal with the analysis and quality control of commercial *Artemisia* species and the botanical, phytochemical, and biological aspects of a number of important *Artemisia* species: *A. absinthium* (Wormwood), *A. dracunculus* (French Tarragon), *A. herba alba*, *A. ludoviciana* ssp. *mexicana* (Estafiate or iztauyat), *A. pallens* (Davana), and *A. vulgaris* (Mugwort).

Chapters 9−15 are dedicated to *A. annua*, the only species that produces the important antimalarial drug artemisinin. They cover various aspects of the plant, namely, its traditional use, cultivation, genetics, and phytochemistry, the development of artemisinin and its derivatives, their mode of action, and their clinical use in the treatment of malaria, as well as the regulation of the quality and use of artemisinin and its derivatives.

With the exception of some typos found throughout the book, the chapters are well written and extensively referenced. The book offers a unique perspective on the different aspects of artemisia and artemisinin research topics. This book is reasonably priced and would be a very useful reference to botanists, phytochemists, medicinal chemists, and health sciences professionals. It will also be a welcome addition to the reference section of scientific libraries.

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NP030745T

10.1021/np030745t

Pharmaceutical Biotechnology: Drug Discovery and Clinical Applications. Edited by O. Kayser and R. R. Müller (Free University of Berlin). Wiley-VCH, Weinheim. 2004. xxv + 311 pp. 7 × 10.5 in. $190.00. ISBN 3-527-30554-8.

Biotechnology has revolutionized the pharmaceutical sciences with the power of recombinant technology, leading to the development of new drugs and biomedical therapies. This book provides a balanced perspective of the field dealing with the discovery, processing, formulation, and regulation of biotech drugs, as well as promising new therapeutic strategies. A nice complement of industrial and academic experts contributes timely reviews on this rapidly growing field.

Part I of the book introduces basic concepts and technologies in pharmaceutical biotechnology. Of particular interest to the natural product community are two chapters on microbial and plant production of biopharmaceuticals, both small molecules and recombinant proteins. New and emerging biotech strategies on the development of new antimicrobial drugs in microorganisms and the use of plants to express recombinant proteins for humans are highlighted with up-to-date examples. Parts II and III describe the development of recombinant proteins and vaccines in a series of well-referenced chapters focusing on their production, bioprocessing, characterization, formulation, and regulation. The pharmaceutical industry is highly regulated, and additional chapters on biogenerics, patent law, and the drug approval process in the United States and Europe will provide the reader with a good overall impression of the approval process. The final section of the book takes a look "into the next decade" at prospective drugs and therapeutics strategies. Topics, including therapeutic antibodies, gene therapy, xenotransplantation, and tissue engineering, promise real therapy or prevention opportunities for a number of currently untreatable diseases.

Overall the book is well written and offers the reader broad insight into many aspects of the pharmaceutical biotechnology field. Other than the inconvenience of the color figures removed from their respective chapters and grouped in the forward, the book is well organized and referenced. While this field is quickly evolving, this book provides a fresh overview of this dynamic topic of research. Thus, I highly recommend this book, not just to individuals already involved in the pharmaceutical profession but also to those from related areas with an interest in biotech drugs.

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10.1021/np030759z

Medicinal Plants of the World, 2nd Edition, Vol 1. Edited by Ivan A. Ross (U.S. Food and Drug Administration). Humana Press, Totowa, NJ. 2003. xv + 491 pp. 7 × 11 in. $99.50. ISBN 1-58829-281-9.

Four years after its first publication, the 2nd edition of *Medicinal Plants of the World* reappears with a reference-updated version of the same selection of plants included in the 1st edition. The first of the book's 27 chapters covers the morphological terminology commonly encountered in describing medicinal plants. The remaining 26 chapters follow a systematic pattern for describing each of the 26 plants included in the book. These plants range from the very well known, such as curcuma and garlic, to the less known, such as jatropha and moringa. Each chapter includes the same sections: common regional names, botanical description, origin and global distribution, traditional medicinal uses, chemical constituents, pharmacological activities, clinical trials, and references. The book

[*]Unsigned book reviews are by the Book Review Editor.

ends with a glossary section that defines many of the encountered botanical, biochemical, and pharmacological terms. It also contains a set of color pictures for each of the covered plants. The paper and print are of high quality, and the hard cover adds to the value and durability of the book.

The opening chapter provides the reader with a set of plant organ figures and morphological definitions that is equally useful for the professional botanist as well as for the nonspecialized reader. The book then follows a monographic style that is strongest in the sections dealing with ethnobotany/traditional medicine and tends to be less specific in the chemistry sections, where primary metabolites are not separated from secondary metabolites, but rather are listed together alphabetically. No chemical structures are presented, which is not uncommon with this class of books. The pharmacological sections are probably the most confusing because activities are listed alphabetically, which leads to obvious redundancy and scattering of information. Also, clinical trials should have been listed separately to emphasize their significance, despite their overall scarcity. There are also some terminological inaccuracies that include truncated meanings, such as "adjuvant activity", and opposite meanings such as "antichemopreventive" instead of "chemopreventive", but these can be clearly resolved by examining the respective cited references. The inclusion of negative pharmacological effects adds to the value of these sections since it provides prospective researchers with the full spectrum not just the bright side of it. The massive effort spent in preparing the book is obvious in the total number of cited references, 3505, with an average of 134 references per chapter. With this wealth of extensive up-to-date referencing, it provides concrete ground for researchers planning to pursue further investigation on any of the covered plants.

However, the book lacks specific author input/analysis of all the listed activities/uses, and as such, it does not attempt to answer specific questions, but does provide the literature leads toward finding answers. It is not clear why the particular plants included in the book were selected. One could ask whether the title *Medicinal Plants of the World* is appropriate or instead ought to be *Representative Medicinal Plants of the World*? Nevertheless, and despite its relatively high price, the book is a valuable resource for professionals interested in one or more of the included plants and who have access to many of the references therein. For the general reader, however, other available books may prove to be more useful.

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NP030749Y

10.1021/np030749y

Molecular Cancer Therapeutics: Strategies for Drug Discovery and Development. Edited by George C. Prendergast (Lankenau Institute for Medical Research and Jefferson Medical College). John Wiley & Sons, Inc., Hoboken, NJ. 2004. xiv + 351 pp. 18 × 26 cm. $89.95. ISBN 0-471-43202-4.

For those interested in expanding their current basic research to the field of drug discovery as it relates to cancer chemotherapy, this volume will provide a primer to answer many basic questions. In fact, graduate students, too, will benefit from a thorough reading, as the topics are basically soup to nuts. In the Forward, the editor sets ambitious goals that are reached: to direct the text to a broad audience of students, postdoctoral and academic investigators, and scientific professionals in biotechnology/pharmacology industry. While the latter group probably has most of the general knowledge in this book, i.e., how drugs are discovered and moved along the development path, it certainly will enlighten those with such experience as well.

The contemporary topics covered range from an introduction to current paradigms of cancer as a disease, target selection, and an excellent discussion on high-throughput screening; critical technologies, such as microarrays and siRNA; in vivo models, including interesting chapters on xenografts and transgenic mice; preclinical pharmacology; and, finally, clinical development. An entrée into patent law is also presented and offers intriguing examples of invention development and the interactions with commercial entities.

However, there are a few quibbles worth mentioning. Although Chapters 4 and 5 provide good summaries of siRNA technology and the field of protein transduction and its attendant methods, examples in the field of drug discovery would have enhanced their utility. In contrast, the excessive detailed literature review in Chapter 8 (on microarray techniques) may be confusing to a novice. Missing from the volume is a chapter on bioinformatics and the plethora of computer algorithms available for drug development and design. Finally, this reviewer has concerns about emphasizing the need to select new agents that are highly specific for their respective targets. For some cancers, modest promiscuity (e.g., an inhibitor that attacks several kinases along different oncogenic signaling pathways) may be quite valuable as a trigger of apoptotic cell death.

In summary, *Molecular Cancer Therapeutics* covers vast territory encompassing cancer drug discovery and development in a highly dedicated and credible fashion. The references are up to the minute, the book is well edited, and it will be a welcome edition to someone's desktop (the old-fashioned kind). So why buy it if *Nature Reviews* cover most, if not, all topics? It should be read cover to cover by those who are interested, and, for only $90, an astute editor has efficiently placed 14 pdf files and their references in one place for the reader and of course, most importantly, supplied boundaries to the burgeoning field.

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10.1021/np0307587

Natural Products: the Secondary Metabolites. By James R. Hanson (University of Sussex). The Royal Society of Chemistry, Cambridge, UK. 2003. vi + 147 pp. 24.5 × 19 cm. $28.00. ISBN 0-85404-490-6.

Seventeenth in the series of The Royal Society of Chemistry tutorial chemistry texts, *Natural Products: the Secondary Metabolites* is an introductory text addressing the many aspects of natural products chemistry. This is a useful supplementary textbook for undergraduate and graduate students with a solid background in organic chemistry who want to gain a working knowledge of natural products chemistry. While it could by no means be considered comprehensive, the author does a fabulous

job summarizing and presenting the major concepts of the field of natural products to his target audience.

The book is logically organized into five chapters beginning with the definition of a natural product and outlining the different classes of natural products, followed by explanations of characterization and stereochemistry, and ending with a discussion of the biosynthetic pathways. Chapter 1 defines for the reader what compounds are considered to be secondary metabolites and introduces the common classes using several examples from each class. This chapter also introduces the biosynthetic origins of the metabolites, basic isolation techniques, and the chemical ecology of plant and insect metabolites. Chapters 2 and 3 reintroduce the methods of organic chemistry used in the structure elucidation of natural products. These valuable chapters provide the reader with the basic knowledge of physical and spectroscopic methods including MS, IR, UV, and NMR spectroscopy and the chemical methods used to identify the gross structure, functional groups, coupling constants, and absolute stereochemistry of a natural product. Chapter 4 reinforces the material presented in chapters 2 and 3 by providing detailed examples of structure elucidation of compounds from several different classes. Chapter 5 outlines the biosynthetic pathways. Each section includes detailed biosynthetic schemes that walk the students through the process.

Overall, the chapters are very well constructed and employ useful learning tools to help the student to organize and synthesize the material being presented. For example, at the beginning of each chapter the author provides the student with a set of specific aims outlining the material he or she should understand after reading the text. At the end of each chapter is a summary of the key points complementing those aims. Throughout most of the textbook the author provides examples of worked problems that include a question and the expected answer. Problems at the end of the chapters are thoughtful and inspire the students to apply the major concepts presented in the text. Answers are found at the end of the book. Perhaps the nicest and most reader friendly aspect of the textbook is the notes included in the margin of the text. These notes provide important definitions that allow the student to progress without having to refer continually to other books.

Natural Products: the Secondary Metabolites is an excellent tutorial text that can be used as a supplementary text in organic chemistry and introductory natural products courses. Students will appreciate the short, concise explanations, the worked problems, and the cost of the text.

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NP030747D

10.1021/np030747d

COX-2 Blockade in Cancer Prevention and Therapy. Edited by Randall E. Harris (The Ohio State University). Humana Press Inc., Totowa, NJ. 2003. x + 371 pp. 7 × 11 in. $145.00. ISBN 0-58829-010-7.

This book is the most recent publication in the series Cancer Drug Discovery and Development. The book is divided into five parts with 20 chapters, each of about 10−30 pages in length, contributed by 41 authors. The contributors cover a broad field of expertise from biochemistry, medicinal chemistry, and molecular biology to different disciplines in medicine, especially in the area of cancer, representing both university and pharmaceutical industry research.

Part I, Historical Perspectives, includes two chapters, which give an overwiew of the discovery and development of nonsteroidal anti-inflammatory drugs (NSAIDs) and selective cyclooxygenase-2 inhibition. The chapter entitled "Historical Aspects of COX-2: Cloning and Characterization of the cDNA, Protein and Gene" is an especially extensive, well-written chapter. Part II is focused on the epidemiology of NSAIDs, with a very informative and valuable emphasis on colon and breast cancer. The chapter "Epidemiology of Nonsteroidal Anti-Inflammatory Drugs and Colorectal Cancer" includes comprehensive tables on studies on NSAIDs and colorectal cancer and polyps; noteworthy is the table on "Ongoing Clinical Trials of NSAIDs and Colorectal Adenomatous Polyps". Part III, Animal Models of Carcinogenesis, addresses the efficacy of NSAIDs in malignant neoplasms in vivo and chemopreventive effect of COX-2 inhibitors in different types of cancers. In the chapter "Role of Synthetic and Naturally Occurring Cyclooxygenase Inhibitors in Colon Cancer Prevention", the concept of combinations of low doses of various chemopreventive agents is presented. This part ends with an excellent chapter describing genetic models and illustrating the complexity of selective cyclooxygenase inhibition. In Part IV, Molecular Biology of COX-2, six chapters present different aspects of cyclooxygenase and the effect on important processes in carcinogenesis. One chapter focuses on the exciting new area of association of COX-2 and PPARs in carcinogenesis and implications for chemoprevention and future development. Finally, in Part V, clinical applications of NSAIDs and selective COX-2 blockade are discussed in five chapters, showing both the potential and limitations of cyclooxygenase inhibition in cancer prevention and therapy and the future role of COX-2 and cancer.

While it is difficult to avoid because of the multiplicity of authors, in many cases the different chapters repeat the background of cyclooxygenases and prostaglandin biosynthesis and also some literature citations. The large number of subheadings combined with short paragraphs at times makes the text somewhat choppy and difficult to read. After reading the book, one gets the impression that further research on COX-2 will be important for future drug development in the area of cancer. However, the negative aspects of COX-2 blockade will be important to address and critically review; perhaps this topic could be another future publication in the series "Cancer Drug Discovery and Development". In summary, the book is of high quality and very interesting; it will be valuable for cancer researchers, especially those interested in chemoprevention.

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NP030755U

10.1021/np030755u

Plants That Fight Cancer. Edited by S. E. Kintzios and M. G. Barberaki (Agricultural University of Athens, Greece). CRC Press, Boca Raton. 2004. xi + 296 pp. 7 × 10 $^{1}/_{4}$ in. $149.95. ISBN 0-415-29853-9.

As a book that is meant to provide a guide to plants that demonstrate activity in bioassays for anticancer activity,

this volume is very limited. Only 78 terrestrial plants are individually discussed, although related or unrelated species are mentioned in the discussion of each plant. The editors do indicate in the Preface that the volume does not include all existing plant species with anticancer properties, and this might have been acceptable had not a significant number of errors and omissions taken away from the book's usefulness.

The book is arranged in four chapters plus an appendix. Chapter 1 is a brief discussion of cancer, cancer therapy, and drug development. Aside from typographical errors (errors that are pervasive throughout the book), this chapter is a good but brief introduction to the reasons for investigating plants for new cancer chemotherapeutic agents. Chapter 2 begins with a brief discussion of plant cells and metabolites and then attempts to classify all plant-derived natural products with anticancer activity into 14 broad or narrow groups. The groups selected seem arbitrarily limited and fail to capture compounds such as the maytansinoid ansa macrolides. Each grouping is briefly discussed, followed by a table of plants containing compounds falling into the particular group. Unfortunately, several errors and omissions detract from this chapter. For instance, Table 2.2, showing general structures of alkaloids, has missing bonds in several structures. After the text makes the point that distribution of acetogenins is exclusively in the Annonaceae family, Table 2.4, Plants Containing Annonaceous Acetogenins, lists 11 plants, seven of which are not in the Annonaceae family and do not contain Annonaceous acetogenins, while leaving out *Xylopia aromatica* (Annonaceae, described in Chapter 3). Other omissions are also strange. For example, all of the plants discussed in Chapter 3.2.1, those that have produced compounds used in cancer treatment (e.g., *Podophyllum*, *Vinca*, *Camptotheca*, *Taxus*), are omitted from the relevant table. Typographical errors abound, some amusing ("Anthraquinones represent the largest group of natural quinines"), some egregious (*Acronychia porteri* misspelled as *Acrougehia porteri*).

Chapter 3 provides short descriptions of the 78 plants selected with information on the compounds isolated or the active ingredients, target cancers, related plants, and leading references. The chapter is divided into sections on plants actually used clinically, promising candidates for further investigation, plants where the reputed activity is not realized, and other species with anticancer activity. This chapter again contains many typographical errors, e.g., a header about the status of mistletoe application in cancer chemotherapy in the discussion of camptothecin. For some plants, doses used for bioassays are cited without indicating whether they are for a pure compound or a plant extract. In some cases, active constituents are assumed to be present in the plant under discussion without any clear reference to having been isolated, or are attributed to the wrong plant in some cases, e.g., maytansinoid tumor inhibitors to *Mallotus philippinensis* (Euphorbiaceae) with chromenes and phloroglucinol derivatives given as examples of the maytansinoids. Presumably this latter example is a typographical error rather than deliberate, but it exemplifies the overall problems with this book. And, in the section on *Taxus* and taxol, there is the statement that "Despite the many attempts to synthesize taxol, the molecule still remains inaccessible by total synthesis". Several distinguished synthetic chemists would be surprised to learn that their taxol syntheses have not been noted, especially since the literature was evidently surveyed through 2002.

Chapter 4, however, is a relatively good review of cytotoxic metabolites from marine algae and is editorially the cleanest chapter in the book.

Finally, there is an appendix of "structures of the most important compounds derived from terrestrial higher plants", although it is, in fact, titled "Chemical Structures of Selected Compounds". The appendix title is more apt, since included are structures of dichloromethane, hexane, ammonium phosphate, and cisplatin, to name a few of the compounds illustrated that are not derived from plants. This is unfortunate since many additional structures of active plant-derived compounds could have been included in the space wasted showing simple solvents, salts, and non-plant-derived compounds. Most of the compounds cited in the plant discussions are not included, which necessitates accessing the primary literature to find the structures of these compounds. And again there are gross errors: several structures have pentavalent carbon atoms, others have missing bonds, and others have bonds that appear to join to the center of another bond.

One of the main reasons to purchase a book like this is to have a concise review of previous work reported by the time of publication on a list of plants selected either by geographical region or, as is the case here, by specific activity. However, due to the large number of typographical, textual, and graphical errors and omissions, this book cannot be recommended as filling that need.

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10.1021/np0307542

Herbal Drugs and Phytopharmaceuticals, 3rd Edition. Edited by Max Wichtl (Universität Marburg). CRC Press, Boca Raton. 2004. xliii + 704 pp. 10 × 11 in. $279.95. ISBN 0-8493-1961-7.

The "Wichtl", as this volume is often called, is one of the most successful textbooks in German-speaking Europe. While the first edition mainly covered herbal tea drugs, the book has since expanded to include the herbal drugs most widely used in phytomedicines. The book has been translated from the fourth German edition by Josef A. Brinckmann and Michael P. Lindenmaier, who also added the regulatory status of herbal drugs in the United Kingdom, Canada, the United States, and, in some cases, Australia. New in the fourth edition is a section on phytopharmaceuticals in the general part and 12 new full drug monographs, including, for example, green tea leaves, garlic powder, eleuthero root, and chaste tree fruit. In addition, there are seven short monographs on herbal drugs considered of minor importance for Central Europe, including centella, black cohosh rhizome, cola, loosestrife, saw palmetto, European sanicle, and feverfew.

The general part consists of an excellent introduction to the making of a tea, as well as the storage and quality control of raw material. The newly added section on phytopharmaceuticals tries to diminish the confusion about varying terminology used in different countries to describe plant-based medicinal products. I particularly liked the definitions of "standardization" and "normalization" of a phytopharmaceutical. Hopefully, these definitions will become more widely accepted outside the European continent as well.

The main part of the "Wichtl" now consists of 212 full monographs. Herbal drugs were included on the basis of popular use in Central Europe. The author has kept the usual format for the monographs by including Latin and English names, synonyms, origin of the plant, constituents, indications, side effects, the making of the tea, preparations on the market in German-speaking Europe, identification and adulteration, storage, and literature. Some of the outstanding features of the monographs are the wonderful color photographs of all the herbal drugs in their environment and of the dried and cut plant material. The monographs also contain helpful descriptions and pictures of plant material as viewed under the microscope, which is rather difficult to find in textbooks nowadays. The former editions have been renowned for how well the monographs were researched, and this edition is no exception. All the monographs have been completely updated, with the reference sections including all relevant recent publications on a given plant. Furthermore, the reader can find examples of monographs of herbal drugs from the German Commission E, the ESCOP, and the WHO in the general part of the book.

Overall, it is rather difficult to find places for improvement in this book. I missed the color pictures in the seven short monographs and wondered if the authors were running out of time to present them as full monographs. It was also surprising that there was no monograph on *Echinacea purpurea*, despite the fact that this is the leading *Echinacea* species on the European market. A minor error concerned the name of the main alkamide in *Echinaceae angustifoliae radix*, which should be dodeca-2*E*,4*E*,8*Z*,10*E*/*Z*-tetraenoic acid isobutylamide.

In general, the book is a detailed, scientifically up-to-date book on herbs, which not only is a must for pharmacists but can also be recommended for anybody interested in scientifically based phytotherapy, despite its rather high price. For those who suffer from "occasional displeasure associated with one's working environment", please read carefully the sweet monograph on chocolate (*Pasta Theobromae*).

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NP030752H

10.1021/np030752h

Course Notes on the Interpretation of Infrared and Raman Spectra. By D. W. Mayo, F. A. Miller, R. W. Hannah (Bowdoin College, University of Pittsburgh, Bowdoin College, respectively). Wiley-Interscience, Hoboken. 2004. xxvi + 567 pp. 16 × 24 cm. $125.00. ISBN 0-471-24823-1.

As the title implies, this book is a compilation of notes from the famous summer course on infrared and Raman spectroscopy that has been taught for over 50 years, first at MIT, then at Bowdoin College. The majority of the book, eight chapters, is taken up with detailed analyses of group frequencies, characteristic absorptions of particular functional groups or bonds, in organic molecules. There are then chapters on polymers, inorganic compounds, and mixtures, and, toward the end, a survey of infrared and Raman group frequencies (a sort of review and comparison). There is also a chapter on sample handling and an introductory chapter that provides some terminology and theoretical background.

There are three exercise sections placed at intervals in the book. These, along with numerous examples of spectra in each chapter, provide graphic reinforcement of the obvious and the subtle value of infrared spectra in structure elucidation. The book details more nuances of functional group analysis than most of us learned in undergraduate or graduate school. Today, many practicing natural products chemists may not remember, or may have never learned, that the substitution pattern of a benzene ring or the geometry of an isolated double bond can be assigned from the IR spectrum. The ring juncture geometry of frog alkaloids is still most frequently assigned by GLC-FTIR, and one IR spectrum can readily distinguish carboxylic acids from esters from amides, while it may take a couple of 2D NMR spectra to accomplish the same task.

This book is an excellent reference source on infrared/Raman spectral analysis and should, therefore, be available in academic and chemical and chemistry-related industry libraries. Unfortunately, the price will likely preclude its inclusion in many personal libraries, particularly those of students and postdocs.

NP030756M

10.1021/np030756m