

Book Reviews

Natural Products from Plants. Edited by P. B. Kaufman, L. J. Cseke, and S. Warber (University of Michigan), J. A. Duke (USDA), and H. L. Brielmann (no affiliation given). CRC Press, Boca Raton, FL. 1998. xiii + 343 pp. 15.5 × 23 cm. \$124.95. ISBN 0-84933134-X.

The title, preface, and chapter headings of this book held out great promise of working to fill an important reference and educational need, but reading the book was most disappointing.

Chapter 1, a summary of major classes of plant natural products, was so rife with structure drawing errors that the review nearly ended there! Examples include faltarinol (p 5), taxol (p 13), azadirachtin (different renditions on pp 15 and 244), squalene (p 15), genistein (different renditions on pp 25 and 160), serotonin (p 28), morphine (pp 30 and 32), chelidone (p 31), berberine (p 32), ellipticine (p 32), psilocybin (p 32), and quinine (p 33). The drawings are also of poor quality. Font changes abound between and within (Figure 1.8) figures. Why draw a hydrocarbon with no substituents in modern stick form (Figure 1.1), but then draw polyunsaturated fatty acids in the old letters/no bonds style (Figure 1.4)? Bond angles should certainly be drawn better, particularly with modern software, and delocalized π bonds in benzene rings should be drawn inside the ring (Figure 1.3). The text on p 22 mentions flavone (emboldened), but the structure is not presented in Figure 1.21.

Chapter 2 provides a good overview of the general biosynthetic pathways to plant metabolites and some explanation of why certain natural products may be synthesized by plants. Some of the figures are difficult to read, appearing to be copies of copies. It is odd that alkaloid biosynthesis and biogenic silica and silicification are each accorded the same amount of text coverage!

Chapter 3 focuses on regulation of plant metabolite biosynthesis. The latter half of the chapter summarizes some very valuable information from the literature, but the “essay” on camptothecin production is a detriment to the chapter. The handling of the data is questionable. The y axis in Figure 3.6 is not extended to include two of the concentrations used (out of four), and thus, the “linear” plot displayed is inaccurate. (It is highly unlikely that one would obtain a linear plot of concentration vs integration value over 3 orders of magnitude in concentration.) No standard deviations were provided; how accurate could integration of a highly tailed peak with impurity shoulders be? All this brings the results (Figure 3.7) into question. Finally, the reader first gets the impression that the student researchers were “scooped” by the authors of ref 3, but then the HPLC analysis of that reference is cited in this work.

Chapter 4, on the uses of plant compounds by humans, is, at best, an eclectic selection of topics for a general reference. The capsule summary of the history of herbal medicine is really a summary of one reference book. The student research project (pp 125–8) is a wandering narrative with no real objectives or results. Trichosanthin is not a “drug”, a term that should be reserved for compounds in clinical use. While podophyllotoxin is a phenolic, it should also be identified as a lignan. Artemisinin gets more coverage than quinine in a section on the latter, but is described as having a β -membered lactone ring called an α -methyl- γ -lactone! The only chemical structures provided

in the entire chapter are those of garlic constituents, rendered in a long outmoded style.

Chapter 5, on modes of action and target sites, covers the cell life cycle (using antitumor agents as probes), transmembrane signaling, immunomodulation, and toxic effects. Structure drawings are of poor quality and varying style.

Chapter 6 is a brief but strongly worded discourse on the concept of synergy, illustrated by numerous examples.

Chapter 7, on bioseparation of compounds, is more confusing than informative, starting with the title. The title is more about extraction than separation, although both topics are treated to some extent; the “bio” in bioseparation is never really explained. In the taxol discussion, the authors mention the use of C_{18} cartridges to remove chlorophyll, but the comparative chromatograms (“chart recordings”) in Figure 7.6 indicate that much more than chlorophyll was removed. Other taxol problems: taxol is now primarily available from baccatin III by semisynthesis, and the structure of taxol (p 235) is incorrectly drawn. In the section on chromatography methods, the use of silica gel is not mentioned under adsorption chromatography but is noted under partition chromatography. A brief mention of high-throughput screening and combinatorial chemistry is made at the end of the chapter.

Chapter 8 offers a rather unusual assortment of “case studies” of plant natural products—neem, balsam fir, white cedar, lavender, and various plants used in dyeing. On page 250, the structure of fenchone is drawn in an old and awkward style. On the same page, the authors discuss synthesis as a source of most cures for disease in this century, but indicate that “...these compounds are present in nature as well...” and the natural compounds are “...healthier, more readily available, and cheaper...” If that were the case, the pharmaceutical industry would surely opt for such safer and more economical products. It is surprising that, in the essay/research project on lavender, the author did not use pentane to extract or partition the essential oils from the steam distillate.

The book ends on a solid note. Chapter 9, on conservation needs and efforts, is a very good summary of problems in conservation and various efforts to address them.

In summary, while there are a few useful contributions in this book, there is so much misinformation that it cannot be recommended as a general reference or text book, particularly at its exorbitant price.

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Medicinal Plants of the World: Chemical Constituents, Traditional and Modern Medicinal Uses. By Ivan A. Ross (U.S. Food and Drug Administration). Humana Press, Inc., Totowa, NJ. 1988. xiii + 415 pp. 17.5 × 25 cm. \$99.50. ISBN 0-89603-542-5.

This book is a wonderful contribution to the knowledge of medicinal plants of the world. It is especially interesting to note that many of these plants are, in fact, foods and spices as well as medicines. Nine of the 26 plants presented are actually food plants. Much of the data and information presented on these plants focuses on the nonedible plant parts. As an example, mangoes, *Mangifera indica*, are discussed at length. Many of the medicinal uses for this species are for plant parts other than the edible fruit. The bark and leaves are used for a variety of medicinal purposes. I was especially pleased to see that medicinal preparations created with other plant species are presented. For each species there are numerous chemical constituents listed and an extensive number of references associated with all the pharmacological and clinical activity known for the species. The author also provides an extensive list of common names from many countries.

I was especially pleased that this book was written by a biologist with the U.S. Food and Drug Administration involved in toxicological research. As Mr. Ross states in his preface, there is a great need for cross-referenced information on very widely known and widely distributed medicinal plants. As the author points out, there is no text that describes in one place the common name, traditional, medicinal use, chemical constituents, pharmacological activity, and clinical trials of these plants.

There are very few shortcomings with this book. One minor error in the otherwise wonderful photographic colored plates of the plants is a mislabeled plant species. Plate number 8 is supposed to illustrate the plant *Cymbopogon citratus*, or lemon grass. The actual photograph is of *Manihot esculenta*, a completely different plant.

The choice of plants that are presented in this book was clearly driven by their broad and international use and distribution. I would compliment the author for selecting the plants presented as they are some of the most widely used medicinal plants on the planet. One would say in response to this wonderful book "bravo, twenty-six down and fifty thousand to go".

One of the greatest applications of this book would be in the area of public health. This book can assist nurses, doctors, and all health care practitioners in biodiversity-rich countries to integrate the use of these plants into local traditional medicine clinics. There is a great deal of

information on the biology and toxicology of these plants, which can help complementary medicine health care facilities to integrate them into treatment programs. For example, the plant *Mormordica charantia* is utilized to treat diabetes all over the world. There are a number of integrated traditional medicine public health programs in countries such as the Philippines that promote and teach local people about plants that can help manage chronic diseases. *M. charantia* has been documented to effectively manage elevated blood glucose levels in a variety of patients. This book ideally would be purchased and distributed widely throughout biodiversity-rich countries in Asia, Africa, and Latin America. This would facilitate a greater integration of traditional medicine into rural and urban health clinics. In fact, this writer would suggest that scientists from biodiversity-poor countries purchase two copies of this book, one for themselves and a second one to send to a colleague in a biodiversity-rich country who might otherwise not have access to this important information.

This book allows the reader to further appreciate the importance of the conservation of biological and cultural diversity. The uses of these plants were discovered and have been further refined by cultures throughout the world. The incredible diversity of medical applications of the plants described in this book helps us all understand why we should continue to put as much effort as possible into the global conservation of biocultural diversity. Imagine what extraordinary and important medical and food applications exist for many of the poorly investigated plant species of the planet.

Mr. Ross is to be congratulated and complimented for such a well-done book. It is an invaluable resource that will become a critical reference to a great diversity of specialists in the fields of public health, chemistry, phytochemistry, ethnobotany, toxicology, and botany. Thank you, Mr. Ross, for such a wonderful book.

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