

# Book Reviews

**Alkaloids: Chemical & Biological Perspectives. Volume 12.** Edited by S. W. Pelletier (University of Georgia). Elsevier Science, Amsterdam, The Netherlands. 1999. xvii + 388 pp. 15 × 23 cm. \$224.00. ISBN 0-08-042805-3.

Alkaloids continue to be one of the most important classes of secondary metabolites due to their interesting physiological activities. The volume under review is the 12th in a series dealing with chemical and biological perspectives of this class of compounds. Like its predecessors in the series, this volume contains in-depth reviews of relevant topics by a number of experts active in the field. The book contains six chapters of varying lengths, the majority of which are extensively referenced. The volume begins with a chapter on chemistry and biology of acronycine-type alkaloids (authored by F. Tillequin, S. Michel, and A.-L. Skaltsounis). This is the longest chapter (102 pages) in the book, covering isolation, chemical properties, structure elucidation, spectral data, synthesis, and biological properties of acronycine and its naturally occurring analogues including the dimeric types. Studies on some synthetic analogues are also included. This chapter contains 210 references. The second chapter (82 pages) is an update of isolation procedures, structures, structure elucidation, occurrence, biochemistry, and bioactivities of *Solanum* steroid alkaloids (H. Ripperger). It contains two comprehensive tables, one listing the occurrence of glycoalkaloids and alkalamines in various plant species of the genus *Solanum* and the other listing physical constants (molecular formulas, melting points, and  $[\alpha]_D^{25}$ ) of alkalamines and glycoalkaloids of this subclass. This chapter cites 233 references. Chapter 3 by P. Wipf entitled "Synthesis and Structure-Activity Studies of Lissoclinum Peptide Alkaloids" deals with sources, total synthesis, secondary structures, and biological activities of peptide alkaloids of the marine ascidian genus *Lissoclinum* (106 references). Cytotoxicity data for 18-, 21-, and 24-membered lissoclinum peptides are presented in three separate tables with  $IC_{50}$  values given in mg/mL (this should be  $\mu\text{g/mL}$ ?). Chapter 4 describes the use of pyroglutamate as a chiral template for the synthesis of alkaloids (M. B. Smith). This review focuses on the preparation and the use of an important derivative of glutamic acid, 5-oxoproline (also known as pyroglutamic acid), and its analogues in the synthesis of amino acids (which are precursors for alkaloid synthesis), alkaloids (e.g., pyrrolizidine, indolizidine, menzamine, cephalotaxus types), antibiotics, and other pharmaceuticals (183 references). Chapter 5 presents a review on the on-line coupling of capillary electrophoresis (CE) and mass spectrometry (MS) for the analysis of complex mixtures of alkaloids (J. Stöckigt, M. Unger, D. Stöckigt, and D. Belder). It discusses the principles of CE with UV and MS detection, development of a generally applicable CE-MS system for the analysis of alkaloids, and the application of CE-UV and CE-MS in the analysis of mixtures of indole, protoberberine/benzophenanthridine,  $\beta$ -carboline, opium, isoquinoline, and *Rauwolfia* alkaloids (97 references). The sixth and last chapter, entitled "Oxidation of Anthelmintic Marcfortine A, an Indole Alkaloid" by B. H. Lee, M. F. Clothier, and G. I. Kornis, provides a brief review (41 pages) on oxygenated analogues of marcfortine A, an alkaloid with potent antiparasitic activity against helm-

inths (25 references). This chapter is more of a personalized research account, which even has rather extensive experimental and spectral data. In addition to these six chapters the book contains a subject and an organism index.

The chapters are uneven in quality and style of presentation. A few typographical errors were noted. Despite these drawbacks, the book is well-produced, with written material free of any serious errors. The volume is probably too expensive for most individual collections, but it is a valuable acquisition for a library maintaining a collection of the series.

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**Mistletoe, The Genus *Viscum*.** Edited by Arndt Büssing (University Witten Herdecke, Germany). Harwood Academic Publishers, The Netherlands. 2000. xv + 266 pp. 17 × 24.5 cm. \$105.00. ISBN 90-5823-092-9.

As with many natural products and medicinal plants, there is still much to be learned about mistletoe. This book provides an excellent step in organizing what is known and providing a basis for further development. The book is organized into 15 chapters. In these chapters botanical and medicinal properties of both mistletoe families (Loranthaceae and Viscaceae) are covered, with the greatest attention being given to the Viscaceae family. Particular emphasis is given to *Viscum album* L. because of its medicinal history and current use in commercial products.

Chapters 1 through 7 cover the past use and outwardly observable properties of the plants. The first chapter gives a general history of mistletoe in folklore and in treating human ailments. The next four chapters go into detail on the speciation and its growth habits in Africa, Europe, Korea, and Argentina. Biological properties and chemical components are also discussed, but later chapters go into more detail on these subjects. Chapter 6 studies problems encountered in trying to cultivate mistletoe. Choice of host trees, propagation, and growth requirements are examined as well as an excellent description of its stages of growth. Chapter 7 gives an insight into what can be done to use tissue cultures in producing mistletoe, the ultimate goal being the in vitro production of useful products. This chapter is very short, as little has been done in this area, but it is a good overview of the problems encountered and conditions found necessary to eliminate some undesirable growth patterns.

Chapters 8–11, 14, and 15 give information on chemical and medicinal properties. Material covered includes the isolation of various chemical and medicinal fractions, medical conditions treated, mechanisms by which the extracts appear to act in the body, and the clinical effects of their use. Toxicology and undesirable side effects are

covered with case reports. The chapter on adverse effects was particularly well written with good tables, conclusions from case studies, and summaries highlighting factors that can be used to assess the onset of adverse reactions. Chapters 14 and 15 address the use of mistletoe lectin and purified vs whole plant extracts in terms of the physiological responses obtained in cancer therapy.

Chapters 12 and 13 are overviews of different types of therapeutic products available, their preparation, and approaches that can be used to monitor quality. Quality control issues related to production, use of chemical and biological assays, cleanliness, stability, and storage are discussed in terms of meeting legal requirements and producing effective products.

In summary, the book is well written and organized. Pictures and tables throughout the book help illustrate and explain the material being covered. Each chapter has an introduction and a well-written conclusion outlining main points and their implications and consequences as they apply to future studies and mistletoe use.

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**America's Botanic-Medical Movements: *Vox Populi*.** By Alex Berman (University of Cincinnati) and Michael A. Flannery (University of Alabama at Birmingham). The Haworth Press, Inc., Binghamton, NY. 2001. xxiii + 289 pp. 15 × 21 cm. \$24.95. ISBN 0-7890-1235-9.

In this work, two experts on the history of pharmacy review the development and practice of three American botanic-medical doctrines that represented popular alternatives to regular medicine in the nineteenth century. The motivations behind these movements are reminiscent of those that support modern alternative medicine: regular physicians offering expensive Latin diagnoses and brutal if not lethal treatments were challenged by a democratic ideology that upheld the right and ability of ordinary people to determine their own fate. Yet the earliest botanic physicians did not shrink from heroic treatment: the Thomsonians' fondness for lobelia-induced emesis earned them the sobriquet "puke doctors". And, far from rejecting botanical medicines as a matter of doctrine, regular physicians performed more scientific research on their properties than the botanics did.

From that beginning, the unparalleled rejection of botanicals by American medicine was hardly inevitable. The often colorful histories and personalities of the Thomsonians, neo-Thomsonians, and eclectics, summarized in this work, suggest that the botanics were indeed partly responsible. Repeated stories of schism, lawsuit, and accusations of fraud are amusing if sometimes pathetic. These groups' constant infighting, vitriolic attacks on regular medicine, and inability to adapt to new demands for science led to their downfall and to the virtual extinction of their methods, even as American phytochemicals were embraced by foreign researchers.

Despite all this, the botanics may have done much of value. Among the best of the numerous appendices is a list of the Thomsonian materia medica (one presumes that the

numerous errors in the spelling of Latin binomials were present in the original). Many of the plants listed were Native American remedies that prejudiced regular physicians refused to explore, and most are still used today, often with considerable justification.

Unfortunately, this book is poorly organized. It begins with a general discussion of medical practice, in which groups such as the eclectic school are mentioned repeatedly before they are defined or described. A chapter on Thomson and his followers opens with a summary of later groups, then proceeds to the story of Thomson's disciple, Coffin, who practiced in England, before returning to a biographical note on Thomson himself, and so forth; thus, much skipping about is required.

The reader is also expected to possess some obsolete or specialist knowledge. In the chapter on regular medicine, he will be left to deduce, over half a dozen pages, that calomel is equivalent to mercurous chloride, that tartar emetic contains antimony, and that both are toxic; the authors simply leap into a discussion of excessive doses of calomel. One sentence providing its chemical identity, origin, uses, and effects would have greatly improved the whole section. In short, while the book is an invaluable collection of information, it is unlikely to be read for enjoyment.

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**Principles and Applications of Asymmetric Synthesis.**

By Guo-Qiang Lin, Yue-Ming Li, and Albert S. C. Chan (Hong Kong Polytechnic University). Wiley-Interscience, John Wiley and Sons, Inc., New York, NY. 2001. xvii + 515 pp. 15 × 22.5 cm. \$89.95. ISBN 0-471-40027-0.

It is an enormous task to try to summarize in one volume the basic concepts and most successful accomplishments of asymmetric synthesis. The authors have chosen to review progress over the last 20 years in all major areas of stoichiometric and catalytic asymmetric synthesis, including oxidation, hydrogenation, cycloadditions,  $\alpha$ -alkylation of carbonyl compounds, and nucleophilic addition to carbonyls.

Chapter 1 provides an introduction to the principles underlying asymmetric synthesis. Several interesting examples of the different biological properties of enantiomers are given, which would be useful to anyone emphasizing the importance of chirality in an organic chemistry course. The discussion of different types of chirality (central, axial, planar, helical) would likewise be helpful for undergraduates, but is not of sufficient depth for would-be practitioners of asymmetric synthesis. The latter half of the chapter is much better executed; in particular, the sections on determining enantiomer composition and absolute configuration are clearly written and referenced and will be very useful to those learning the field.

Chapters 2–6 discuss progress on individual asymmetric reactions. Given the broad scope of the review and the page limitation a one-volume treatment imposes, the coverage of recent work is necessarily quite limited. Chapters 4–6 (asymmetric oxidation, cycloadditions, and reduction, re-

spectively) contain the most recent work, but overall these chapters suffer in comparison with their counterparts in *Catalytic Asymmetric Synthesis* (2nd ed). Chapter 7 describes the use of asymmetric reactions in natural product synthesis, ranging from Woodward's erythronolide A and Masamune's 6-deoxyerythronolide syntheses, to a discussion of more recent work on Taxol and baccatin III. Chapter 8 briefly describes the use of enzymatic catalysts, some miscellaneous asymmetric synthetic methods, and important new concepts in asymmetric synthesis including nonlinear effects, chiral poisoning, enantioselective activation, and chiral amplification.

In summary, this book is worthy of purchase for library collections and for chemists who would like to have a one-volume summary of the last 20 years of asymmetric synthesis. Those actively involved in asymmetric synthesis research will find this book most useful for quick review of subfields in which they are less conversant. For critical and timely analysis of catalytic methods most practitioners will likely turn to more specialized volumes.

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**Sage: The Genus *Salvia*.** Edited by Spiridon E. Kintzios (Agricultural University of Athens, Greece). Harwood Academic Publishers, The Netherlands. 2000. xix + 296 pp. 17 × 24.5 cm. \$110.00. ISBN 90-5823-005-8.

This book is Volume 14 in the series *Medicinal and Aromatic Plants—Industrial Profiles*. This series has chosen to focus on plants of global economic importance, presenting detailed information on the various aspects of botany, distribution, chemistry, and pharmacology that contribute to the use and value of the genus. This format offers a relatively complete picture of a particular plant genus, but the specialist (i.e., in pharmacognosy or medicinal chemistry) may find some chapters of little immediate relevance. That being said, the volumes in this series are generally reliable reference books due to the depth of the information contained in the chapters that are most relevant to the reader, and Sage is no exception.

The book begins with an introduction to the history and traditional uses of some of the hundreds of species of *Salvia*. The botany section comprises a thorough treatise on botanical variation and distribution of *Salvia* in Greece, along with a short review of the use of sage in southern Africa. Four chapters cover horticultural and genetic aspects of sage. Three chapters review the distribution, extraction, isolation, and characterization of compounds from *Salvia* species. Specifically, essential oils, other terpenoids, and the polyphenolic salvianolic acids are discussed in detail, since these classes represent most of the known biologically active compounds. Several additional chapters cover tissue culture of the Labiatae in general and sage in particular for the purposes of recovering these compounds or micropropagation of species.

The four chapters concerning the pharmacology of sage constitute the largest section in the book. A comprehensive review of the biological and pharmacological activity that has been reported for the genus is provided, followed by

chapters that delve further into antioxidant, antihypertensive, and neurological effects of *Salvia*.

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**Medicinal Plants of Brazil.** By Walter B. Mors, Carlos Toledo Rizzini, and Nuno Alvares Pereira (Federal University of Rio de Janeiro [Mors, Pereira], Rio de Janeiro Botanical Garden [Rizzini]). Reference Publications, Inc., Algonac, MI. 2000. 15 × 22.5 cm. \$60.00. ISBN 0-917256-42-5.

Recent years have seen publication of many catalogs of the medicinal plants known from a given geographic region. *Medicinal Plants of Brazil* is the sixth in a series that has previously covered West Africa, the West Indies, North Africa, China, and India. The book is a welcome encyclopedia: an alphabetical listing by family, genus, and species of approximately 1500 species of Brazilian plants with a history of indigenous medical use or published report of pharmacological activity. For each plant species, the authors provide a scientific name, information on the distribution of the species within Brazil, and notes on the medicinal use of the species. Thankfully the full author citation is provided with each species name, which will be a great help to those interested in the complex nomenclature of Brazilian plants. Unfortunately no synonyms are provided in the main text, although they are listed in a separate section, where they likely will go unnoticed by most readers. The distribution information unfortunately is restricted to Brazil and contains no notes on occurrence outside of the country. Another disappointment is that the use information is not referenced, making it impossible to associate particular remedies with specific Brazilian indigenous groups. For a small subset of species, additional notes on chemistry and pharmacology are provided, and when this information is available, it is well referenced.

The encyclopedia is not comprehensive; certainly more than 1500 of the perhaps 50 000 species of plants in Brazil have a history of medicinal use. But 1500 species is a large contribution, and this volume is a modern compilation of what has been published about medicinal plants of Brazil. The botanical names accepted for species are uneven, with only some of the family treatments having been carefully reviewed by specialists (one suspects that Robert DeFilipps of the Smithsonian greatly helped facilitate this). However, many others have not been reviewed, and much information is indexed under plant names no longer accepted by the botanists who study those groups. For the information on chemistry and pharmacology, it is particularly nice to see the full references include journal article titles, enabling readers to decide if references are worth consultation. The three comprehensive indices to medicinal use, common name, and scientific name are tremendously useful and account for nearly a third of the book. The first two greatly facilitate retrieval of information from the text, but I am not sure of the value of an index by scientific name to a book organized alphabetically by scientific name, since it still does not include the synonyms.

An interesting forward by Robert DeFilipps provides a very readable account of several subjects germane to the

subject of medicinal plants in Brazil: the derivation of the country name Brazil from indigenous names for Brazilwood, notes on the history of medicinal plant use in Brazil, the discovery of curare, and notes on the ethnic diversity of native Brazilian populations. This section is wonderfully illustrated by Anna DiCarlo with examples of various indigenous groups, with their various traditional head adornments.

*Medicinal Plants of Brazil* is organized with a format that provides easy access to information about a large number of species, and it will be an indispensable reference for any student of ethnobotany or pharmacognosy of Brazilian plants. The affordable price will make it a welcome addition to the libraries of anyone interested in the medicinal use of plants or their chemistry and pharmacology worldwide. It will be nice when all of the information on medicinal plants of the world is compiled in a single place, preferably a publicly accessible database, but the first step will be assembling all of the distributed information for the published literature and this book is a marvelous step in that direction.

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**Medicinal and Aromatic Plants—Industrial Profiles, Vol. 10: Basil, the Genus *Ocimum*.** Edited by Raimo Hiltunen and Yvonne Holm (University of Helsinki, Finland). Harwood Academic Publishers, Amsterdam, The Netherlands. 1999. xi + 169 pp. 17 × 24.5 cm. \$80.00. ISBN 80-5702-432-2.

Dried basil imports into the United States increased from 0.10 g per capita in 1964 to 11.77 g per capita in 2000! These figures ignore domestic basil production, which has also soared as both a fresh and processed herb in pesto and salad dressings, so probably the current per capita consumption of basil might be estimated at 22 g per capita per year! With an increasing consumption of culinary basil, there has also arisen a great interest in the other species of *Ocimum*, a genus that has enough morphological and chemical variation to satisfy everyone, from classy chefs to chemists, who may be easily bored with the mundane. Unfortunately, with this much variation, this genus also presents a problem to both the taxonomist and medical researcher.

*Basil, the Genus Ocimum* begins with a cladistic study of the genus by Alan Paton, M. R. Harley, and M. M. Harley; this redefines the genus to incorporate previously recognized taxa in *Becium*, *Erythrochlamys*, and *Orthosiphon* subgenus *Nautochilius*. Eli Putievsky and Bertalan Galambosi follow with production systems in Israel and Finland. Raimo Hiltunen presents a discussion of the chemistry of *Ocimum*, including the fixed oils and fatty acids, flavonoids, phenolic acids, triterpenes, steroids, and, with Yvonne Holm, a thorough discussion of the essential oils. Yvonne Holm also authors a chapter on the bioactivity of basil, including the antimicrobial, antifungal, insecticidal, and antiinflammatory activities with the effects on immunomodulation, anticarcinogenicity, hypoglycemia, etc. This book concludes with Seija Marjata Mäkinen and Kirsti

Kaarina Pääkonen discussing the processing and use of basil in foodstuffs and beverages.

As the editors admit, the enantiomeric composition of basil oils could be explored further, but this is also an area of active current research, so we must await a future, comprehensive review of that aspect. Beyond summarizing my two-foot stack of reprints on *Ocimum*, I found new information in all the chapters. The original taxonomic work by Paton, Harley, and Harley is alone worth the purchase of this book, as it presents a comprehensive new survey of the genus not published anywhere else.

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**Medicinal and Aromatic Plants—Industrial Profiles, Vol. 8: Saffron, *Crocus sativus* L.** Edited by Moshe Negbi (The Hebrew University of Jerusalem, Rehovot, Israel). Harwood Academic Publishers, Amsterdam, The Netherlands. 1999. xii + 155 pp. 17 × 24.5 cm. \$80.00. ISBN 90-5702-394-6.

Saffron, derived from the stigmas of the flowers of *Crocus sativus*, is probably not only the most adulterated spice but also the most confused. Everything from petals of poet's marigold (*Calendula officinalis* L.) to false-saffron (*Carthamus tinctorius* L.) to turmeric-dyed corn silk has been pawned off as saffron, while I am constantly reading popular articles about Buddhist monks dyeing their robes with saffron (they are indeed "saffron-colored", and different sources of dyes are used, but in Thailand, for example, it is often the heartwood of the jack-fruit tree, *Artocarpus integrifolius* L., not saffron).

In *Medicinal and Aromatic Plants—Industrial Profiles, Vol. 8: Saffron, Crocus sativus* the editor, Moshe Negbi, presents an introductory chapter on "Saffron Cultivation, Past, Present and Future Prospects" and then divides this book into three sections: "The Saffron Plant (*Crocus sativus* L.) and its Allies", "The Present State of Saffron Cultivation and Technology", and "Futuristic Aspects of Saffron Cultivation, Usage and Industry". The botany, taxonomy, and cytology of saffron and its allies are thoroughly and lucidly presented by the doyen of the genus *Crocus*, Brian Mathew, with some new revelations about the origin of saffron. Maria Grilli Caiola discusses the reproductive biology with abundant illustrations, while Dov Basker presents the chemistry of saffron with a comprehensive survey of the literature in a compact fashion. Regional cultivation of saffron is presented in Italy (Fernando Tammaro), Azerbaijan (N. Sh. Azizbekova and E. L. Milyaeva), Greece (Apostolos H. Goliaris), and Morocco (Ahmed Ait-Oubahou and Mohamed El-Otmani). Saffron technology is presented by Dov Basker. Under the futuristic icon, Fikrat I. Agdul-ae and Gerald D. Frenkel discuss biological and medical research, while Pier Francesco Galigani and Francesco Garbati Pegna discuss cultivation and harvesting in Florence (the center of saffron engineering), Giuseppe Chichiricò discusses genetic improvement, and Ora Plessner and Meira Ziv discuss in vitro work and the possibility of commercial propagation and secondary metabolite production.

The strength of this book is the editorial labor of pulling together so many different authors on so many different topics from so many different geographical regions. Saffron cultivation in Azerbaijan has never before been published in the western literature, for example. While the references in each chapter are not exhaustive, they do include the primary, important ones. Weaknesses, as the editor admits, include the absence of authors from Spain (the leading area of production) and India.

For the true saffronologist or just the general reader in herbs and spices, this book is a compact source of informa-

tion on saffron, a veritable *vade mecum*, and highly recommended.

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