*Book Reviews**

PhytoChem Australia: A Database on Australian Plant Chemistry 1940−2000. By David J. Collins and Claude C. J. Culvenor. CSIRO Publishing, Collingwood, Victoria, Australia. 2003. CD-ROM. $295.00 (Australian). ISBN 0-643-06632-2.

The authors, distinguished Australian phytochemists, have indexed over 2700 references to the chemistry of Australian plants published over the last 60 years in a CD-ROM format. The references are accessible through searches for authors, compound types, and plant names. This last capability is perhaps the most useful aspect of the database, which is constructed using Filemaker Pro.

As with many such CD-ROM products (the Chapman Hall Database of Natural Products being one example), a frustration in using it is that it is constructed on a "stand-alone" basis: it is neither capable of exporting or importing information. In this case, the only output permitted is to the printer. It is understandable that the authors wish to protect their copyrighted work from piracy; however, this limits the usefulness of the product.

No chemical structures are included at any point; this is essentially only a bibliography. Coverage includes work done outside of Australia on Australian plants and appears to be quite comprehensive. The software developers have not made the product as useful as it might be; for instance, there appears to be no way to search for papers using two author names, nor is there any obvious way to employ other types of Boolean logic in a search, such as combining an author search with a plant name search. Results of searches can, however, be sorted on selected fields before printing.

Those investigating the phytochemistry of Australian plants may find this to be a useful index, but it is far less useful than it might have been, and quite expensive.

John A. Beutler

National Cancer Institute
Frederick, Maryland

NP030735S

10.1021/np030735s

Sponges (Porifera) (part of the Progress in Molecular and Subcellular Biology Series). Edited by Werner E. G. Müller (Johannes Gutenberg-Universität). Springer-Verlag, Berlin. 2003. xviii + 258 pp. 16 × 24 cm. $159.00. ISBN 3-540-00968-X.

A first glance at the title suggests a broad review of the state of knowledge regarding the molecular biotechnology of sponges. Instead, this book is actually a series of reports from the Center of Excellence "BIOTECHmarin", a consortium of research groups in Germany. That said, the book does provide a valuable overview of the molecular biology and natural products chemistry of sponges, highlighted mostly by specific examples from the authors' laboratories.

The opening chapter briefly reviews the history and morphology of sponges as a basis for a deeper discussion of the gene repertoire of sponges and impact on the evolution of the organisms. Following are two chapters on the microorganisms associated with sponges and their diversity, using a few sponge species as examples.

There are three chapters focused on natural products studies of sponges, one highlighting the application of on-line hyphenated techniques (like HPLC-MS, HPLC-NMR, and HPLC-CD) to the rapid identification of constituent molecules without preparative isolation and purification, and two on natural products from marine sponges and associated fungi. There is some repetition or overlap in the three chapters, but perhaps more reinforcing than uselessly redundant.

The remaining three chapters focus on the development of sustainable sources of useful or interesting marine compounds: one on cultivating sponges, one on sponge tissue (primmorphs) culture, and the third on genetic expression approaches.

Overall, the book is well written, with excellent use of graphics and color plates. The book will be of interest and value to anyone conducting research on sponges, and it should be in the library of any institution with programs in marine science or invertebrate zoology.

NP030737C

10.1021/np030737c

A History of Nonprescription Drug Regulation. By W. Stephen Pray (Southwestern Oklahoma State University). Pharmaceutical Products Press (Haworth), Binghamton, NY. 2003. xviii + 279 pp. 15 × 21 cm. $39.95 (soft). ISBN 0-7890-1538-2 (soft).

This book traces the fascinating evolution of food and drug laws governing nonprescription products in the United States, focusing primarily on Federal legislation enacted from 1903 to 1997. The author recounts the battle against quackery in the form of patent medicine in the early part of the 20th century and equates it intriguingly to the furor over dietary supplements in the current era. Dr. Pray chronicles the remarkable career of Dr. Harvey Wiley and his "poison squad" in the early 1900s, when Wiley was in charge of the USDA Bureau of Chemistry, forerunner of the FDA. The book delves into the origins of the 1906 Pure Food and Drugs Act in considerable detail. Its successor, the current 1938 Food, Drug & Cosmetic Act (FD&C Act), was an initiative conceived by Rexford Tugwell, once a member of President Franklin Roosevelt's "brain trust", and championed by Senator Royal Copeland, a homeopathic physician turned politician who chaired the Senate Commerce Subcommittee at the time. Dr. Pray provides us with perhaps more detail than necessary about the various versions the legislation went through during years of debate before the sulfanilamide tragedy brought about its final passage in 1938, and puts a similarly fine focus on the Durham-Humprey amendment of 1951 that distinguished nonprescription from prescription drugs and

*Unsigned book reviews are by the Book Review Editor.

the Kefauver-Harris amendments of 1962 that required drugs to be shown to be effective.

The final three chapters bring the story up to date by chronicling the drug efficacy reviews that followed the 1962 amendments, current issues regarding Rx-to-OTC switches, and the regulation of homeopathic drugs. The last chapter of the book is devoted to dietary supplements and to the Dietary Supplement Health and Education Act of 1994 (DSHEA), which Dr. Pray believes "was a radical defeat for nonprescription product regulation, removing a vast array of dietary supplements from FDA authority". This statement appears to presume that dietary supplements had previously been regulated by FDA as drugs, which was not the case. In fact, dietary supplements were covered in the 1938 FD&C Act as a subcategory of foods known as "foods for special dietary use" and were so regulated until 1994, when DSHEA provided a more specific definition—still within the overall category of foods. There are other errors of fact or chronology regarding the evolution of various laws and regulations affecting dietary supplements, which, strictly speaking, lie outside of Dr. Pray's primary area of focus. The chapter complains about this reviewer's appointment to the Commission on Dietary Supplement Labels, on the grounds that I have a pro-industry bias. DSHEA required that the members of the Commission be people who had expertise about the industry but who were "without bias" with respect to dietary supplements. The Department of Health and Human Services determined that the best way to meet these requirements would be to include experts from a broad variety of disciplines. Three of the seven members of the Commission were people with direct or indirect ties to the industry. Four, including the Chairman, were highly respected academicians, including two professors of nutrition, the nation's leading professor of pharmacognosy, and a professor of law who had previously served as an FDA counsel.

Despite some strong reservations and caveats about the dietary supplement chapter, Dr. Pray's history of nonprescription drug regulation is an interesting and valuable reference for scholars with an interest in the origins of current food and drug law.

Annette Dickinson

Council for Responsible Nutrition
Washington, DC

NP030731N

10.1021/np030731n

Synthetic Applications of 1,3-Dipolar Cycloaddition Chemistry Toward Heterocycles and Natural Products. Edited by A. Padwa (Emory University) and W. H. Pearson (University of Michigan). Wiley-Interscience, Hoboken, NJ. 2003. xii + 940 pp. 6 × 9 $^1/_2$ in. $105 (paperback), $445 (hardcover). ISBN 0-471-28061-5.

Synthetic Applications of 1,3-Dipolar Cycloaddition Chemistry Toward Heterocycles and Natural Products is a timely supplement to the widely cited and popular 1984 two-volume treatise on the same subject, and the high standards of thoroughness and readability established by the initial work have been satisfyingly achieved again. All academic and corporate chemistry libraries should certainly acquire this volume, and those with precariously small book budgets may confidently consider the sturdy paperback ($105) in place of the hardcover ($445). The clarity of the writing ensures that the book will appeal to chemists with different backgrounds ranging from those unfamiliar with the area seeking a broad overview to experts demanding a comprehensive reference source.

The first 10 chapters are organized by structure or functional group (i.e., nitrones, nitronates, azomethine ylides, carbonyl ylides, thiocarbonyl ylides, nitrile oxides, nitrile ylides and nitrile imines, diazoalkanes, azides, mesoionic ring systems), and the final two chapters address the effect of external reagents and asymmetric reactions. Each chapter is prefaced by a contents outline that generally includes subsections on background, structure/reactivity, preparation, synthetic applications (intra- and intermolecular), mechanisms, and stereochemistry. The contributions primarily focus on developments since 1984, and literature citations are complete through 2000 and much of 2001. Expert editing, the authors' attention to scientific detail, and consistent document formatting have resulted in a well-organized text that reads seamlessly as a unified entity. An exceptionally detailed 40-page index completes this important and highly recommended contribution to 1,3-dipolar cycloaddition chemistry literature.

Brian L. Pagenkopf

The University of Texas at Austin
Austin, Texas

NP0307340

10.1021/np0307340

The ABC Clinical Guide to Herbs. Edited by Mark Blumenthal (American Botanical Council). American Botanical Council, Austin, TX. 2003. xxx + 480 pp. 8 $^1/_2$ x 11 $^1/_4$ in. $69.95. ISBN 1-58890-157-2.

The ABC Clinical Guide to Herbs is a comprehensive, highly referenced, and science-based resource describing over 40 of the most widely used single herb and proprietary multiherb products on the U.S. market. While its stated purpose is to serve as an accredited continuing education course on medical botanicals for health care professionals, the potential uses for the *Guide* extend far beyond this application. This excellent reference book is a practical source of up-to-date, credible, research-supported information that should empower health care professionals as they advise their patients about herbal remedies.

The senior editor, Mark Blumenthal, is Founder and Executive Director of the American Botanical Council (ABC), a nonprofit herbal research and education organization. The authors (most of whom are presently or formerly associated with the ABC) consulted with 83 external reviewers, each of whom reviewed at least one of the monographs. The reviewers were selected from a cross-section of fields, including pharmacology, pharmacognosy, medicine, naturopathy, and pharmacy, and most hold doctoral degrees. They represent academia, the herbal products industry, trade organizations, consulting firms, and research and governmental institutions (including NIH and NCI). The expertise of this panel lends considerable authority and credibility to the work.

The introduction to the *Guide* is an interesting essay that provides a background on the status of herbal medicine, followed by a thorough description of the book. Part I of the introduction includes an important section on herb safety, helpful discussions of standardization and regulatory issues, a useful guide to interpreting product labels, and a treatment of the issues and challenges associated with integrating botanical medicine into modern clinical

practice. Part II provides a detailed explanation of each section of the herbal monographs, including those describing uses, dosage, duration of administration, chemistry and pharmacological descriptions, mechanisms of action, contraindications and adverse effects, potential drug interactions, safety ratings, regulatory status, and clinical studies.

The chapters covering 29 popular single herbs are presented in alphabetical order, and each consists of three sections: a two-page clinical overview intended for use as a quick reference to uses, dosages, contraindications, and administration guidelines; a one-page patient information sheet for photocopying and distributing to patients; and a detailed and referenced monograph for the healthcare professional. Herbal product monographs for 13 proprietary (mainly multiherb) preparations are presented in a separate section.

The ABC Clinical Guide to Herbs is well organized, and the clinical overview and patient information sheets are particularly user-friendly. The overviews allow practitioners to quickly zero in on dosage and administration information and offer clear guidelines for different herbal preparations (dried herb, tincture, etc.). Information regarding administration during pregnancy and lactation is also provided; this is a very positive feature that is often not included in other herbal reference books. The patient information sheets cover the salient issues without being overwhelming and are sufficiently detailed to be of help to the average patient. The monographs are thorough and convincingly referenced to the primary literature. The sections on adverse effects and drug interactions are particularly well written and comprehensive. For example, the monograph on kava presents a detailed and balanced treatment of the current controversy surrounding the possible adverse effects of this herb. The monographs also report chemical profiles of the herbs, with particular emphasis on the primary constituents and/or compounds considered to be the active components. Herbs from different indigenous sources are discussed individually within the monographs, and in the case of ginseng, the American and Asian varieties are allowed separate chapters altogether. The pharmacological activities sections are wisely divided into separate subsections describing human, animal, and in vitro studies. This differentiation of the nature of the studies gives the reader a clear perspective from which to make judgments concerning activity and is a definite advantage of the *Guide*.

Each monograph concludes with an extremely helpful and informative table summarizing the design, duration, dosage, preparation, and results/conclusions of relevant clinical trials for each medical application of the herb. Of special interest to the advising clinician and those concerned with the equivalence of different preparations, the tables specify the names of commercial brands used in the trials (supplementary information on the brands is also provided in the appendix). The inclusion of these tables is undoubtedly one of the most appealing features of the book.

There are only a few minor weaknesses in the monographs. Some of the contraindications sections appear to rely more heavily on information gleaned from the German Commission E Monographs (authoritative, but lacking in detail) and from secondary sources (such as reviews or texts), even when more current primary literature may have been published. The authors acknowledge their use of secondary sources for safety information and anticipate that updates of the monographs may become available on the ABC website (www.herbalgram.org) as additional research results become available.

While the authors state that the mechanism of action (MOA) sections are not intended to be exhaustive, some contain inconsistencies in the types of information presented. Although most of the statements effectively describe the proposed MOA, some are simply reports of pharmacological activity or a biochemical process (glycyrrhizin is metabolized to its aglycone 18-β-glycyrrhetinic acid in the intestine), and others are too vague to be useful ([licorice] protects the liver through 18-β-glycyrrhetinic and glycyrrhizin). This type of information could certainly provide clues to the MOA and may be of interest to a pharmacologist, but would be relatively meaningless to most clinicians. These instances are relatively infrequent, however, and most of the MOA statements do provide a meaningful link between the observed physiological action of an herbal product (licorice relieves gastric inflammation) and the proposed mechanism of action (possibly by inhibiting prostaglandin synthsesis and lipoxygenase). The most useful MOA sections are interpretive summaries written in paragraph form (such as the sections for black cohosh and evening primrose oil), rather than a bulleted format that lists more studies, but provides relatively little detail or interpretation.

The price of the *Guide* is incredibly reasonable considering the wealth of information that it provides. Given its potentially frequent use, several enhancements are suggested for future editions. The book is printed in black and white ink on relatively lightweight paper, presumably in an effort to minimize cost. An investment in some color print and heavier weight paper would probably be well received. The appendix includes a perforated section containing a post-test and separate CEU application forms for various health care disciplines. Perforation of the patient information sheets (or their inclusion in an accompanying packet) would facilitate photocopying for distribution to patients. Alternatively, a CD containing files for the sheets, test, and forms could be added to the book for relatively little cost.

Ideal for clinical use, *The ABC Clinical Guide to Herbs* would be a very appropriate and timely addition to the curricula and libraries of medical, pharmacy, nursing, and dietitian schools. This admirable work is highly recommended for health care professionals and would also be a valuable addition to the bookshelves of herbal products researchers or interested enthusiasts.

Katherine B. Gloer

Department of Chemistry
University of Iowa
Iowa City, Iowa

Karyn M. Shanks

Kylemore Center for Health and Healing, LLC
Iowa City, Iowa

NP030732F

10.1021/np030732f

Drug Design: Cutting Edge Approaches. Edited by Darren R. Flower (Edward Jenner Institute for Vaccine Research). Special Publication 279. Royal Society of Chemistry, Cambridge (UK). 2002. x + 192 pp. 6 × 9.5 in. $59.50. ISBN 0-85404-816-2.

This book represents the proceedings of the RSC meeting on Cutting Edge Approaches to Drug Design, which was

held on March 13, 2001, at the Scientific Societies Lecture Theatre in London, UK. It is comprised of an introduction followed by seven chapters covering a variety of topics that cluster around the theme of drug design.

The lengthy introduction, which alone occupies over a quarter of the book, was written by the editor. It is not an easy read, but well worth the effort. Like any really good introduction, this chapter provides the reader with enough background information to fully appreciate that which follows. Flower starts with the origins of the term *drug* and proceeds through the development of current medical practice over 7 centuries. This is followed by a discussion of how drug targets are elucidated, highlighting the roles of bioinformatics and chemoinformatics in this process, and continues with a brief discussion of lead discovery. My fears of a lengthy discussion of rational drug design met first an interesting discussion of the importance of natural products as a source of leads. The progression from lead to product development candidate proceeds through homology modeling based on physical parameters such as NMR or crystallography, to library design and screening, to structure−activity relationships. Along the way, the author interjects bits of perspective that are consistently on target. For example, on page 29 he states, "The view that 'mindlessly' constructing a large enough number of molecules and out will pop not just a lead but a development candidate has proved both naïve and shortsighted. In many ways it was replacing thought with action." Dr. Flower then introduces the concept of *drugness*, the balance between intrinsic activity and ADME or DPMK properties, and explains why the most active compound in a series in vitro is often not the one that gets developed. The chapter concludes with a discussion of the interrelationships between these disciplines. Throughout the chapter, the perspective remains consistently that of an industrial laboratory program. A dozen well-conceived figures are used to illustrate points made in the text, and the author uses six "boxes" to digress on a variety of points from serendipity to computational resources. One might easily be left with an impression of the author as a university professor bubbling over with information on a variety of topics at the same time.

As is often the case in compilations such as this, the next seven chapters provide a real mixed bag in terms of scope, coverage, and approach to information. The chapter on the mutagenesis and modeling of the TM2-loop-TM3 region of biogenic amine GPCRS by Hunt et al. (Merck), for example, has the look and feel of a short research communication, while the short chapter on high-throughput X-ray crystallography by Blundell et al. (Cambridge), while giving some experimental details, is clearly a summary of a group of experiments published elsewhere. The other chapters were primarily review in nature. Teresa Atwood and Darren Flower discuss the importance of bioinformatics to the search for new GPCRs in the genome. Darren Green describes an approach to lead generation by virtual screening of virtual libraries, and Ian McLay extends this discussion to virtual techniques for lead optimization. In a particularly well-illustrated chapter, Andrew Davis and Robert Riley describe the use of parameters derived from physical organic chemistry to predict and control drug-like properties in development programs. Examples used in this chapter, drawn from research at a number of companies on HIV protease inhibitors, renin inhibitors, NMDA antagoniosts, and CYP-3A4 inhibitors, clearly illustrate concepts such as Lipinski's rules for drug-like molecules. The final chapter, by Flower et al., describes computational vaccine design, a potential alternative or complementary approach to the discovery and development of new antibiotics for the chemotherapy of infection caused by resistant microorganisms.

Overall the book is well written and well edited. Typographical errors are scarce, and the subject index appears to be accurate. An ample number of references are included to lead the interested reader into the specialist literature. The target readership is described as "all drug discovery scientists, including medicinal and combinatorial chemists, molecular modelers, bio- and cheminformaticians, and pharmacologists, amongst others". While this book gives an excellent snapshot of the state of the art in drug design, as it was in 2001, it will be evident to readers active in the field that the cutting edge is a moving target in this dynamic field of research. Nonetheless, I highly recommend this book to all students and practitioners even marginally involved in drug discovery.

Robert P. Borris

Merck Research Laboratories
Rahway, New Jersey

NP030736K

10.1021/np030736k

Analysis and Purification Methods in Combinatorial Chemistry. Edited by Bing Yang (Discover Partners International, Inc.). Wiley Interscience, New York, NY. 2004. xii + 466 pp. 6 × 9 in. $99.95. ISBN 0-471-26929-8.

In some influential circles combinatorial chemistry was considered in its early days as an attractive alternative to the more laborious natural products chemistry as a source of exploitable leads. Consequently a number of firms downgraded or even eliminated their natural products programs. Experience has often demonstrated that this choice was unwise, since these techniques need not be mutually exclusive. Recent years have seen a growing movement to mate these methods in attempts to extract the utility of both for mutual benefit. To those interested in these efforts but not actively engaged, the challenge of keeping informed of important developments is almost overwhelming, because of the voluminous and scattered literature. Works such as this are especially valuable in this regard. In particular, one notes that most reviews and books deal with the more glamorous aspects of design and construction of libraries and comparatively neglect the key technologies required for analysis and purification. Clearly, there is little to be gained through speed of construction if one has to spend inordinate periods in purification. Although mainly anticipated to be of value to synthetic chemists, there is much of value in this easily readable book that natural products chemists will recognize as addressing familiar challenges but in novel ways. In this spirit I recommend that the readership of this journal either purchase a copy or recommend it to their libraries.

This multiauthored work is divided into 17 chapters. Six deal with the complexity and special challenges associated with analysis of compounds on beads, even on single beads, and on monitoring of the progress and optimization of conditions for syntheses carried out in this way. Emphasis is on NMR, FT-IR, MS, and colorimetric methods. Three

deal with high-throughput methods of analysis of library contents to ensure quality. This section does not neglect the ever-growing field of gel polymer chemistry. Three treat high-throughput purification methods using a variety of integrated, hyphenated methodologies. Finally, five deal with postsynthesis and postpurification analytical methods with an emphasis on the stability of the products and the likelihood that they will consist of drug-like molecules. Much practical information that can only be gained through experience is found in this last section.

All of the chapters are well written and comparatively free of typos and challengeable assertions. This reviewer found the chapters by Jill Hochlowski (of Abbott Laboratories) on attended and unattended high-throughput purification, Ralf God and Holger Gumm (of SEPIAtech GmbH) on parallel HPLC analyses and purification, Kenneth Morand and Xueheng Cheng (of Procter and Gamble) on stability of archived library contents, Bernard Faller (of Novartis) on physicochemical profiling, and Christopher Lipinski (Emeritus of Pfizer) on solubility considerations to be particularly relevant, useful, and interesting.

In sum, this work is not directed specifically toward natural products chemists but contains very useful information on an important contemporary field that is increasingly impinging on ours. I recommend that natural products chemists become familiar with it.

Lester A. Mitscher

Kansas University
Lawrence, Kansas

NP0307338

10.1021/np0307338

Methods in Polyphenol Analysis. Edited by C. Santos-Buelga (University of Salamanca) and G. Williamson (Nestlé Research Center). Royal Society of Chemistry, Cambridge. 2003. xiv + 348 pp. 16 × 24 cm. £ 99.50. ISBN 0-85404-580-5.

The volume *Methods in Polyphenol Analysis* is particularly timely because of the rapidly expanding medical and health interest in polyphenols, especially those with high antioxidant properties. The book contains contributions from over 30 scientists from European and American research centers and includes 16 well-referenced and up-to-date chapters devoted to extraction procedures for polyphenols (i.e., different groups of flavonoids, derivatives of flavan-3-ols and hydroxycinnamates) from plant materials, foods, and biological fluids and tissues, as well as modern techniques for the identification of polyphenols and their quantitative determination in various samples. Moreover, the enzymatic and chemical syntheses of some flavonoids are described because some assays and experiments require larger samples.

The procedures for the extraction of the different classes of polyphenols from plant sources are covered in detail in Chapter 1. In addition to the well-known classical solvent extraction procedures, the authors cover solid-phase extraction (SPE), microwave-assisted extraction (MAE), pressurized liquid extraction (PLE), and supercritical fluid extraction (SFE). Some aspects of the extraction procedures are also revisited and explored in more depth in later chapters. Information is also presented for different techniques for the purification and separation of polyphenols including the use of column chromatography with different adsorbents, countercurrent chromatography (CCC, Chapters 11, 13), high-speed countercurrent chromatography (HPCCC, Chapters 11, 12, 13), droplet countercurrent chromatography (DCCC, Chapter 13), centrifugal partition chromatography (CPC, Chapters 12, 13), and normal- and reverse-phase HPLC (many chapters).

A few chapters are devoted to the application of HPLC coupled to MS (Chapter 3), DAD (Chapter 5), fluorescence (Chapter 10), and coulometric detectors (mainly Chapter 4, but also Chapter 10). It is worthwhile to comment on the last mentioned technique, namely, HPLC with a coulometric array detector; this technique has high sensitivity (higher than UV or fluorescence detection), high selectivity, and the ability to detect coeluting compounds with the same retention times, but different oxidation potentials, and is thus particularly useful in the detection of flavonoids (many of which have low oxidation potentials) in biological materials, including animal tissue samples.

Some aspects of NMR analysis of different polyphenols are discussed throughout the book. Details for HPLC-NMR, in either the 1D or various 2D NMR modes, which represent complementary methods to LC-UV-MS, are described in Chapter 6.

The analysis of polyphenols in biological fluids and tissues is covered in Chapter 2; included are extraction methods for different polyphenols with emphasis on various extraction problems (especially for sulfate determinations), together with the details of acid and enzymatic hydrolysis of the conjugates and storage of the samples. In addition, a comparison of procedures for the recovery of quercetin and its 3-glucoside from human plasma is presented. Some aspects of the analysis of polyphenols in tissue and biological fluids are also discussed in Chapters 10, 13, and 14.

Chapters 8 and 9 are devoted to methods for the enzymatic synthesis of quercetin glycosides, including radiolabeled compounds, and the hemisynthesis of methylated, sulfated, and glucuronidated conjugates of different flavonoids and methylated catechins.

Derivatives of flavan-3-ols are common ingredients of foodstuff, such as wines and teas. The extraction, purification, identification, and quantitative analysis of cathechins and the products of their oxidative transformations such as theaflavins and thearubigins, as well as proanthocyanidin oligomers, are widely covered throughout the book, especially in Chapters 11, 12, and 13. Moreover, there are lists detailing the physical properties of green tea catechins and black tea dimeric flavonoid oxidation products, as well as tables providing spectroscopic characteristics of the discussed compounds. The formation of phenoxyl radicals of simple phenols and flavan-3-ols, their acid−base properties, and determination of redox potentials are discussed in Chapter 7. This information will be valuable for understanding the antioxidant properties of flavan-3-ols.

Separate chapters are devoted to the analysis of hydroxycinnamates (Chapter 14), anthocyanins (chapter 15), and flavanones, chalcones, and dihydrochalcones (Chapter 16).

This volume brings together in one place many lab procedures for the analysis of polyphenols that have been previously reported but are scattered throughout the scientific literature, sometimes in difficult to access publications. Significantly, the book presents extensive "hands-

on" experiences by the authors, many of whom have a long list of publications in the field of polyphenol analysis. All aspects of the isolation, identification, and quantification of polyphenols are clearly described in a format suitable for beginners as well as experienced workers. The advantages and disadvantages of the different methods are noted, including how to handle analysis steps that are difficult to execute correctly.

Methods in Polyphenol Analysis will be an important guide for many phytochemists and nutritionists as well as for workers in the pharmaceutical, herbal medicine, and food fields in universities, medical schools, and industry.

Małgorzata Wojcińska

Department of Pharmacognosy
Poznań University of Medical Sciences
Poznań, Poland

NP030739X

10.1021/np030739x