Book Reviews

Plant Resources of South-East Asia No. 12: Medicinal and Poisonous Plants 1. By L. S. de Padua (University of the Philippines), N. Bunyapraphatsara (Mahidol University, Bangkok), and R. H. M. J. Lemmons (Wageningen Agricultural University). Backhuys Publishers, Leiden, The Netherlands. 1999. 713 pp. 18.5 × 25 cm. $180.00. ISBN 90-5782-042-0.

The 12th volume of Plant Resources of South-East Asia (PROSEA) continues a strong series of volumes cataloging the plants used for timber, other construction materials, dyes, food, forage, and medicine from Thailand, Laos, Cambodia, Vietnam, Malaysia, the Philippines, Indonesia, and Papua New Guinea. Volume 12 of PROSEA will be published in three parts, and the first catalogs the most important species of medicinal and poisonous plants. Parts 2 and 3 presumably will continue with minor and lesser-known medicinal plants analogous to the way the three parts of Volume 5 treated timber species. In one sense, the title is misleading, as this is really a catalog solely of medicinal plants. The authors point out in the first paragraph that poisonous plants are included only when they also have a history of medicinal use and that at lower doses toxic constituents are often beneficial and therapeutic.

The volume is organized into three sections, with an introduction, an alphabetical catalog of medicinally important plant genera, and supporting information including literature cited, indices, and appendices. The first section is an introduction that covers the use, chemistry, pharmaceutical development, botany, and agronomy of medicinal plants. These 70 pages provide a concise background for the reader new to the subject matter, but more thorough treatments are available in other publications and most of the subjects are discussed only superficially here.

The second section is a survey of 92 genera of plants used medicinally in Southeast Asia. The entries for each of the genera vary according to the number of species included. Those genera with multiple species have a generic entry including information on nomenclature, taxonomy and geographic distribution, traditional use, chemistry and pharmacology, and husbandry, all of which is followed by an extensive list of references. Generic entries are followed by brief sections for each of the constituent species, covering their vernacular names, distribution, uses, description, and references. Similar topics are treated directly under individual species entries, without general generic information, when only a single species from a given genus is included.

Southeast Asia has a long history of human use for thousands of medicinal plants, and a comprehensive catalog for the region would include treatments for more than the 92 genera covered. However, the strength of this volume lies in the depth of individual treatments, which draw from the diverse experience of the authors, rather than the breadth of species coverage. The 106 authors who contributed material to the 432 pages that catalog medicinal genera and species have interests and experience that range from plant taxonomy and biology through chemistry, pharmacognosy, and pharmaceutical development to agronomy, horticulture, and conservation. Seldom is high-quality botanical, chemical, pharmacological, and horticultural information assembled in the same volume, and for this reason, most readers will find this a tremendously useful reference. While one might hope that Parts 2 and 3 will cover many more species, the treatment of these most important genera is both comprehensive and detailed.

The third part of the volume is reference material comprising literature cited, an extensive glossary, indices to compounds, parmaceutical terms, scientific and vernacular plant names, and a number of other support sections. It provides the reader with information relevant to the catalog of medicinal plants and a window to other relevant literature. Unfortunately, the relatively high price may make the book unavailable to some of those who could best use this material. Nevertheless Volume 12 of PROSEA is a valuable compilation of information on Southeast Asian medicinal plants that will be appreciated by students of the flora of Southeast Asia, medicinal plants, or economic botany in general.

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Comprehensive Organic Transformations: A Guide to Functional Group Preparations, 2nd Edition. By Richard C. Larock (Iowa State University). John Wiley & Sons, New York, NY. 1999. xlvi + 2583 pp. 17.5 × 25 cm. $125.00. ISBN 0-471-19031-4.

This is the second edition of the well-known compilation of organic chemical transformations, Larock, first published in 1989. When this tome arrived, I assumed that it was a continuation of the first edition, since it appeared to be only slightly thicker than the latter. Not so! Happily, this volume stands alone and completely replaces the earlier edition. This new edition, which has the information density of a neutron star, contains all of the chemical riches of the 1989 book and much more. Indeed, due to lighter-weight paper, the new edition is 120% larger (2583 vs 1160 pages) but only about 1 inch thicker with the same page dimensions as the first edition. Most of this increase is in the Transformation Index (586 vs 163 pages).

This new edition covers the literature through 1995, using the same organization as the first edition. Some 200 primary journals are covered (an increase of 39). The book is again divided into the synthesis of Alkanes and Arenes, Alkenes, Alkynes, Halides, Amines, Ethers, Alcohols and Phenols, Aldehydes and Ketones, Nitriles, and Carboxylic Acids and Derivatives. The Table of Contents is very forthright and user friendly. Each chapter is preceded by a list of General References and is divided into the reaction type used to prepare the subject functional group and then further categorized into specific methods or precursor substrates. For example, Alkenes prepared by Elimination reactions is divided into 64 categories. Although the same nine functional groups are embraced as in the first edition, some new entries appear within these chapters. Reductive Dimerization (of Alkenes) is new to Alkanes and Arenes, and Acetals and Isonitriles are new substrates for the

preparation of Alkanes by Reduction. Most categories have obviously expanded in the intervening years since the first edition. Thus, Coupling Reactions as a preparation of Alkanes and Arenes has been enlarged from 17 to 27 groups, oxidation methods to give Aldehydes and Ketones has grown from 21 to 34 classifications, and new organometallic entries are widespread. Some chapters contain bonus information. For example, Diels−Alder Reactions (under the preparations of Alkenes) contains sections on Mechanisms, Use of High Pressure, Microwave Irradiation, Use of Ultrasound, Catalysis, Radical-Cation, Ionic, etc. Bare-bones literature citations are on the same page as the applicable chemical transformations.

The Transformation Index is less friendly than the Table of Contents because it uses more or less specific chemical names. A typical entry: "To (prepare) '2-alkylidene-3-nitro-4-alkanelactam' from '2-alkynamide *N*-(2-nitroalkyl)', see page ..." or "'1,3-dioxo-1,4,7,7a-tetrahydroisobenzofuran-3a-carboxylate ester' from '2-alkoxycarbonyl-2-alkene-1,4-dioic acid anhydride'". Not all entries are this intimidating, but readers will usually take a shortcut plunge into the Table of Contents.

In summary, like the first edition, Larock-II is indispensable for the practicing synthetic organic chemist. For a book this size, it's a steal at $125.

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Natural Products from Plants. By Peter B. Kaufman, Leland J. Cseke, Sara Warber (University of Michigan); James A. Duke (Retired USDA); and Harry L. Brielmann (Industrial Researcher). CRC Press, Boca Raton, FL. 1998. xiii + 343 pp. 15.5 × 23 cm. $129.95. ISBN 0-8493-3134-X.

This book consists of nine chapters that deal with various aspects of natural products and plants. Chapter one is a survey of the general classes of natural products that are commonly found in plants (terpenes, carbohydrates, alkaloids, amines, etc.). Chapter two is primarily a chapter on biosynthesis, discussing how and why these compounds are made by plants. Chapter three addresses how the synthesis of these natural products is regulated by various environmental, biochemical, and genetic factors. Chapter four describes the uses (good and bad) of plants with some discussion of pure natural products, but does not cover many of the important medicinal natural product plants. Chapter five discusses the mode of action and molecular targets of a few selected natural products. Chapter six describes the synergy principle at work in plants, pathogens, insects, herbivores, and humans. Chapter seven describes methods of collection, grinding, and extraction, as well as analytical methods and the use of bioassays. Chapter eight describes case studies that show some of the traditional (medicinal, dyes, plant fragrances) uses of plants. Finally, chapter nine discusses all aspects of plant conservation.

The book is well written with many photographs, free of errors, and well indexed and has good supplemental information and references at the end of each chapter. The authors of the book primarily have biology/botany backgrounds. The authors indicate that the primary reason for writing this book was the general lack of knowledge and misinformation about natural products from plants. While the book does provide some useful information about natural products from plants, the amount of specific information on natural products (pure compounds) is somewhat limited. This book would thus primarily appeal to the plant sciences and anyone else interested in a more biological/biochemical, molecular biology approach to natural products. It would not be recommended for those individuals interested in a more chemical approach to natural products and/or herbs, for graduate programs in natural product chemistry/pharmacognosy/medicinal chemistry, or for anyone else generally interested in medicinal uses of natural products. There are a number of much better texts available for these purposes.

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Pharmacological Research on Tradition Herbal Medicines. By Hiroshi Watanabe (Toyama Medical and Pharmaceutical University, Toyama, Japan) and Takeshi Shibuya (Tokyo Medical University, Tokyo, Japan). Harwood Academic Publishers, Amsterdam, The Netherlands. 1999. x + 247 pp. 17 × 24.5 cm. $90.00. ISBN 90-5702-054-8.

This book provides an introduction to some of the current research on traditional herbal medicines, with a particular focus on Kampo medicine, and, in doing so, provides a bridge for the gap between traditional herbal medicine and the modern (so-called western) approach to medicine.

Eleven of the fourteen chapters provide detailed overviews of the various authors' research on the pharmacology and mechanism of action of particular herbals. The breadth of coverage is exceptional: asthma, neuropsychiatric disorders, dementia, aging, stress, neurodegeneration, chronic inflammatory airway disease, blood rheology, Ca^{2+} antagonists, immune system, and viral infections. These chapters clearly require some understanding of pharmacology and human physiology for the maximum benefit. It is this kind of research, coupled with modern clinical trials, that willlend increasing credibility to herbal medicine in the conventional health care community.

One chapter provides a brief history of medicinal plant use in Thailand and efforts to revitalize and unify the practice in that country. The remaining two chapters are overviews of the search for anti-HIV agents in medicinal plants and the development of cancer treatments from traditional Chinese medicine. A shortcoming of the latter two chapters is a failure to cite other relevant work in the field.

Overall, there is a wealth of information on physiological function and bioassay design in this book and new insights into some well-known (ginseng) and less well known oriental medicinal plants. It should be of particular inte-

rest to pharmacologists and other natural products researchers interested in mechanism of action and bioassay design.

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Chromatographic Science Series, Vol. 81: Thin-Layer Chromatography, 4th Edition. By Bernard Fried and Joseph Sherma (Lafayette College, Easton, PA). Marcel Dekker, Inc., New York, NY. 1999. viii + 499 pp. 15 × 23 cm. $195.00. ISBN: 0-8247-0222-0.

Thin-layer chromatography (TLC) is one of the most widely used chromatography techniques in natural products laboratories, and this volume fills an important niche in updating the reader on the latest developments concerning this separatory and preparative method. The book is divided into Parts I and II (representing chapters on theory and practice and on applications, respectively), and the authors point out that new information has been added to Part I, such as sample preparation by supercritical fluid chromatography, the use of robotics and automation, and video documentation and computer imaging. It is certainly eye-opening to consider how far TLC has come since first being developed by Egon Stahl in Germany about 40 years ago.

Part I of the book contains chapters dealing, in turn, with the history of TLC; basic theory; TLC sorbents; sample preparation; the application of samples; solvents; development techniques; detection and visualization; quantitative evaluation and documentation; quantification; reproducibility and validation of results; preparative TLC; and radiochemical techniques. In the opinion of this reviewer, the book is most informative here, with these introductory chapters being written very clearly, so as to be of use even to the novice practitioner. Many manufactured devices to facilitate TLC are featured, and helpful photographs of almost all of these are provided. The authors offer a mine of useful practical tips and have really made a fine effort to supply the reader with updated information.

The second part of the volume contains chapters on TLC applications in relation to the separation of organic dyes; lipids; amino acids; carbohydrates; natural pigments; vitamins; nucleic acids; steroids and terpenoids; pharmaceuticals; and miscellaneous aspects. The stated intent is to update the voluminous literature on TLC applications of these compound classes. Unfortunately, most of these chapters contain rather turgid descriptions of specific approaches to separations by particular authors; such information could have been provided far more effectively using well-designed tables. If the chapter on "Steroid and Terpenoids" is taken as being representative, only 21 out of 87 references cited are from 1990 onward. The vast majority of the chapter is devoted to steroids (sex hormones, bile acids, and ecdysteroids), with plant mono-, sesqui-, di-, and triterpenoids rating only a page between them. Regrettably, the word "terpenoid" is misspelled consistently as "terpinoid" throughout this chapter. Indeed the book could have used an additional proofreading stage, since there are at present a large number of typographical errors, especially in the bibliographical section of each chapter in this part of the volume. However, a strong point of the applications chapters in Part II of the book is each set of "Detailed Experiments", which for a given compound class provide stepwise instructions suitable for undergraduate students on how to carry out specific TLC separations.

From the point of view of natural products scientists, this will be a useful, although somewhat flawed, book to have available in the laboratory. The applications part could have been improved with the inclusion of chemical structures, since, at present, there are only two structures in the entire volume. At the end of the book a useful list of manufacturers of TLC equipment and supplies is provided, and there is a glossary of chromatographic terms. A separate section on the composition and specific uses of TLC visualization reagents would have been useful also, but some information of this type is interspersed within the applications chapters. Overall, however, the positive aspects of *Thin-Layer Chromatography, 4th Edition* far outweigh any shortcomings, and this volume is highly recommended for institutional purchase.

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Handbook of Reagents for Organic Synthesis. Reagents, Auxiliaries and Catalysts for C−C Bonds. Edited by Robert M. Coates and Scott E. Denmark (University of Illinois at Urbana−Champaign). John Wiley & Sons, New York, NY. 1999. xvi + 746 pp. 21.5 × 28 cm. $115.00. ISBN 0-471-97924-4.

The eight-volume *Encyclopedia of Reagents for Organic Synthesis* is recognized as an authoritative source of information on reagents employed in organic synthesis. However, the cost of the set has limited it to purchase predominantly by libraries. Accordingly, it is not often found in labs where synthetic chemistry is performed. The editors of the Encyclopedia have recognized the need to provide a less comprehensive source of information concerning reagents and have authorized the publication of a condensed four-volume set of the Encyclopedia titled the *Handbook of Reagents for Organic Synthesis*. The editors of each volume were charged with choosing reagents from the Encyclopedia for inclusion in the Handbooks that have the highest probability of regular utilization. The book reviewed here is one of the series of four volumes; the other volumes are titled Oxidizing and Reducing Agents (edited by Steven D. Burke and Rick L. Danheiser), Acidic and Basic Reagents (edited by Hans J. Reich and James H. Rigby), and Activating Agents and Protecting Groups (edited by Anthony J. Pearson and William R. Roush).

Bob Coates and Scott Denmark have performed a notable service on behalf of the synthetic community. This volume of the Handbook is well organized and covers the gamut of reactions and reagents employed for preparation of C−C bonds. The volume begins with a summary (45 pages) of the 22 categories of reaction types (that are discussed subsequently in the text). Each category section includes a listing of specific reagents, literature references to current reviews (1992−1998), and references to *Organic Syntheses* preparations (including graphics) taken from volumes 70−75 that provide an example of either the specific reagents

or general reaction type. This reviewer thought that this approach was particularly useful.

The short summary section is followed by an alphabetical listing of the reagents. Each reagent listing begins with the structure of the reagent, CAS registry number, molecular formula, molecular weight, and pertinent information about the reagent such as physical properties and solubility. Even special handling precautions are provided where appropriate. The next section of each listing includes examples of how the reagent has been employed in organic synthesis and typically includes extensive references to the recent literature. Unfortunately, the literature references to the individual reagents extend only through 1993.

This volume also has an excellent set of indices, including a list of contributors, reagent formula index, and subject index.

The quality of the binding and the paper is typical of modern textbooks and is expected to withstand the daily rigors of the laboratory for many years with minimal precautions. The price of the volume is also particularly attractive at $115 and means that the set of Handbooks should find a place in the laboratory (where it belongs!).

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Handbook of Reagents for Organic Synthesis; Acidic and Basic Reagents. Edited by H. J. Reich (University of Wisconsin, Madison) and J. A. Rigby (Wayne State University). John Wiley and Sons, New York, NY. 1999. xii + 494 pp. 21.5 × 28 cm. $115.00. ISBN 0-471-979252-2.

The editors of the highly successful series *Encyclopedia of Reagents for Organic Synthesis* (EROS) have selected a series of excerpts from the eight volume series of over 6000 pages and organized them into a four volume set of handbooks on different reagent types. These include *Reagents, Auxiliaries and Catalysts for C-C Bond Formation*; *Oxidizing and Reducing Agents*; and *Activating Agents and Protecting Groups*; and the title volume: *Acidic and Basic Reagents*. The major advantage of these smaller volumes of more limited scope is their affordability compared to the complete encyclopedia and their focused treatment of a specific type of reagents. The volume that concerns acidic and basic reagents includes entries on a variety of Lewis and protic acid reagents as well as alkyl lithium alkoxide and amine and weak Lewis bases such as crown ethers. While the included entries are lifted directly from the complete encyclopedia, additional updated references to recent reviews and *Organic Syntheses* entries are also included. For those who already have the complete encyclopedia, these new, smaller handbooks will be of little value. They will, however, provide more affordable access to the more useful and valuable parts of the encyclopedia to those for whom the complete encyclopedia is cost prohibitive.

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