

## Book Reviews

**Wine: Nutritional and Therapeutic Benefits.** Edited by Tom R. Watkins (Kenneth L. Jordan Heart Foundation, Montclair, NJ). American Chemical Society, Washington, DC. 1997. xi + 284 pp. 15 × 22.5 cm. \$89.95. ISBN 0-8412-3497-3.

Largely due to the study of Renaud and de Lorgeril in which the concept of the “French paradox” was elaborated, the notion of health benefits resulting from moderate wine consumption has become popular. Beyond improvements in cardiovascular status, interest has been further heightened by recent studies suggesting certain constituents of wine may be of some benefit in preventing cancer or Alzheimer’s disease. These reports strongly influence human consumption patterns; for example, this year, for the first time in the U.S., consumption of red wine has approximated consumption of white wine. Thus, publication of *Wine: Nutrition and Therapeutic Benefits*, is particularly appropriate at this time.

This book resulted from a symposium sponsored by the American Chemical Society Division of Agricultural and Food Chemistry (21st National ACS Meeting, Aug 20–24, 1995, Chicago). It comprises 20 chapters that are divided into two sections: wine composition and health benefits. The first section is extraordinarily comprehensive. The authors present quantitative analyses of hundreds of wines, describe composition changes that can result from variations in production processes, document interbottle variations that may be found in the same vintage, discuss adulterations and methods for adulterant analysis, etc. Although some of the methods used, described, and developed will be supplanted by more contemporary methodology, the comprehensive nature of these datasets is overwhelming.

The second section of the book, describing studies conducted to establish the potential health benefits of wine consumption, is also comprehensive. Chapters are presented describing epidemiological data, antioxidant effects, alteration of metabolic syndromes, effects on carcinogenesis, thrombogenic effects, etc. Nearly all studies show positive results, which are sometimes attributed to alcohol content, sometimes attributed to nonnutritive antioxidant components, and sometimes attributed to both. Most authors conclude the results are promising and additional studies are required.

A major strength of the volume is its completeness. It is obvious the symposium leading to this book was well-represented, and publishing these chapters is an important contribution. Tom Watkins did a fine job in organizing the text, ensuring a fairly consistent style throughout, indexing, etc. His enthusiasm for the subject virtually “bursts” out of the preface. A certain level of redundancy is noted throughout the text, but this is not excessive and practically impossible to eliminate in this type of work. My aging eyes would prefer a larger typeset, but perhaps this is the current-day standard. The book will not be of much interest to the lay public since its orientation is technical, but it

can be highly recommended for anyone interested in the chemistry and biological activity of wine. This information could generally be extrapolated to the grape, although this practice was not common in the text. Bearing this correlation in mind, however, the book should be of broader interest for natural product chemists and biologists.

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NP970099W

S0163-3864(97)00099-2

**Advances in Experimental Medicine and Biology. Vol. 404 (Saponins Used in Traditional and Modern Medicine); Vol. 405 (Saponins Used in Food and Agriculture).** Edited by George R. Waller (Oklahoma State University) and Kazuo Yamasaki (Hiroshima University). Plenum Press, New York, NY. 1996. xiii + 606 pp (Vol. 404). xii + 441 pp (Vol. 405). 16.5 × 24.5 cm. \$145.00 (each). ISBN 0-306-45393-2 (Vol. 404); 0-306-45394-0 (Vol. 405).

Saponins, by the original definition, constitute a class of compounds that foam when shaken with water. Plants or plant parts containing these compounds are often used by traditional societies as soaps, from which the term “saponin” was derived. Saponins are structurally composed of aglycon or sapogenin (steroidal or triterpenoid) and sugars [pentose(s), hexose(s), and/or uronic acid(s)]. Due to their useful applications in agriculture, food, and medicine, saponins are becoming increasingly important to mankind. Thus, the two volumes (404 and 405) in the series “Advances in Experimental Medicine and Biology”, which contain proceedings of a 5-day symposium organized by the American Chemical Society, Division of Agricultural and Food Chemistry, is timely. Both volumes contain short chapters of about 10–20 pages in length authored by chemists, biochemists, and biologists from over 25 countries. Some chapters are in the form of reviews, whereas others are research updates from authors’ laboratories.

The volume on “Saponins used in traditional and modern medicine” is presented in three sections: (1) commercial utilization and biosynthesis (eight chapters); (2) inhibition of diseases of mankind (33 chapters); and (3) antifungal and hemolytic activities (six chapters). Chapters covered in section 1 include commercial applications, production by suspension cultures, glycosidases, and enzymatic glycosylation. Sections 2 and 3 contain chapters dealing with saponins exhibiting antifungal, anti-tumor-promoting, antifilarial, antimalarial, antiviral, blood anticoagulant, antimycotic, and hemolytic activities. Saponins encountered in marine organisms, plants of different families (Compositae,

Leguminosae, Liliaceae, Rubiaceae, and Solanaceae) and localities (China, Southwest China, Moldavia, and Turkey) are also presented. Some noteworthy chapters include "Commercial utilization of plant-derived saponins: an overview of medicinal, pharmaceutical, and industrial applications" (M. F. Balandrin), "Anti-tumor-promoting activities of triterpenoid glycosides; cancer chemoprevention by saponins" (T. Konoshima), "Search for molluscicidal and antifungal saponins from tropical plants" (K. Hostettmann *et al.*), "Saponins with antifilarial activity from *Acacia auriculiformis* (S. B. Mahato), "Search for an endogenous mammalian cardiogenic factor" (K. Nakanishi *et al.*), "Bioactive triterpenoid and steroid saponins from medicinal plants in Southwest China" (C.-R. Yang and X.-C. Li), "Bioactive saponins from Solanaceous and Leguminous plants" (T. Nohara, S. Yahara, and J. Kinjo), "Steroidal glycoalkaloids: nature and consequences of bioactivity" (J. G. Roddick), "Chemistry and biological activity of steroid saponins from Moldavian plants" (P. K. Kintia), "Steroid and triterpenoid oligoglycosides of marine origin" (L. Minale *et al.*), "New cardioactive steroid saponins and other glycosides from Mexican *Tribulus cistoides*" (H. Achenbach, H. Hubner, and M. Reiter), "Triterpene saponins from plants of the flora of Turkey" (L. Calis and O. Sticher), and "19 New Steroidal saponins from *Allium* plants: isolation, structural elucidation and effect on blood coagulability" (J.-P. Peng and X.-S. Yao).

The second volume entitled "Saponins used in food and agriculture" has four major sections: (1) cosmetics, sweeteners, herbs, and nonalcoholic beverages (five chapters); (2) regulatory effects on crops, viruses, microorganisms, weeds, and insects (19 chapters); (3) chemical identification using NMR and MS (six chapters); and (4) nutritional aspects (5 chapters). Section 1 deals with saponins from Mohave Yucca, *Sapindus mukurossi*, fenugreek and *Ilex paraguariensis*, and sweet-tasting saponins. Section 2 covers saponins with phytotoxic, insecticidal, and oxygen-radical-scavenging activities as well as those with regulatory effects in the pathogenesis of root rots in cereal crops, growth and activity in rhizosphere bacteria, and growth enhancer effects on certain crops. It also discusses saponins of alfalfa (*Medicago sativa*), *Thalictrum* species, *Melilotus* species, *Majorana hortensis*, *Hernaria fantanesii*, and *Nicotiana tabacum* and contains chapters on new preparation of triterpenoid 3-sulfates by the use of SO<sub>3</sub>-DMSO complex, novel microbial transformations of steroids, and thermal behavior of steroidal glycosides. The section on chemical identification using NMR and MS deals with application of novel spectroscopic techniques (selective INEPT, tandem MS, liquid secondary ion MS, electrospray ionization MS) utilized in elucidation of structures of saponins as well as steroids and triterpenes. The section of nutritional aspects discusses analysis, heat stability, and physiological effects of saponins from oats, biological effects of feed and forage saponins and their impacts on animal production, effects of guillaja saponins on *in vitro* rumen fermentation, steroidal glycoalkaloids in Andean potatoes, and role of steroidal saponins in hepatogenous photosensitization diseases of sheep. Noteworthy chapters in this volume include "Novel sweet-tasting saponins of the cycloartane, oleanane, secodammarane, and steroidal types" (E.

J. Kennelly, R. Suttisri, and A. D. Kinghorn), "Intensely sweet saponin asladin: synthetic and structural study" (M. Nishizawa and H. Yamada), "Steroidal saponins from Fenugreek and some of their biological properties" (Y. Saivaire *et al.*), "Studies of the phytotoxicity of saponins on weed and crop plants" (R. E. Hoagland, R. M. Zablotowicz, and K. N. Reddy), "The role of cardenolides in a crucifer-insect relationship" (J. A. A. Renwick), "Oxygen radical scavenging activity of DDMP-conjugated saponins and the physiological role in leguminous plants" (K. Okubo and Y. Toshiki), "Novel microbial transformations of steroids" (K. M. Madyastha), "Proton and carbon-13 NMR studies of steroids and triterpenes" (G. A. Cordell, L.-Z. Lin, and R. R. Gil), "A systematic NMR approach for the determination of molecular structure of steroidal saponins" (P. K. Agrawal), "Application of tandem mass spectral approaches to structural determination of saponins" (C. E. Costello), and "Steroidal glycoalkaloids in Andean potatoes" (I. Kubo and K. Fukuhara).

The first volume carries at the end an appendix with information on a saponin network for mass spectrometry and nuclear magnetic resonance, whereas the second volume has, in addition, a second appendix giving information on a plant saponin disease network. Also included in both volumes are lists of participants (with their addresses), a latin name index, and a subject index. Although these two volumes are expensive for the individual purchaser, they are invaluable additions to a library of anyone interested in saponins and, considering the diverse nature of the topics included, may well serve as primers for those beginning research in this area. These two volumes are certainly valuable acquisitions for departmental and university libraries.

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NP970100R

S0163-3864(97)00100-6

**Phytochemical Diversity: A Source of New Industrial Products.** By Stephen Wrigley (Xenova Limited), Martin Hayes (Glaxo Wellcome Research and Development), Robert Thomas (University of Sussex), and Ewan Chrystal (Zeneca Agrochemicals). The Royal Society of Chemistry, Cambridge, England. 1997. xi + 254 pp. 15.5 x 23 cm. \$135.00. ISBN 0-854040-717-4.

This book is a symposium proceedings sponsored by The Royal Society of Chemistry and held in Brighton, U.K., on April 15–17, 1996. The title "Phytochemical Diversity: a Source of New Industrial Products" foreshadows the diversity of contents in these proceedings, which varies from strategies and examples of bioassay-directed natural product discovery in higher plants to computer searching tools, plant biosynthetic pathways, biotransformations, and the outlook for intellectual property rights. While the breadth of subjects covered is laudable, no single topic is addressed comprehensively. The diversity of subject matter makes reading