Book reviews

Microbiol Lipids, Vol. 1, edited by C. Ratledge and S.G. Wilkinson (Academic Press Ltd., 24/28 Oval Road, London NW1 7DX, England, 1988, 963 pp., $110).

In this book, the editors have chosen to include viruses, actinomycetes, bacteria, algae, fungi and protozoa under the heading of microbes. Volume 1 focuses on lipid composition and distribution. Biochemistry, metabolism and function will be covered in Volume 2.

Approximately 25 years ago, enough data had been gathered to enable a reviewer (M. Kates, **Advances in Lipid Research 2,** 1964, Academic Press) to consider the correlation of lipid composition with taxonomic classification. At that time, it also was known that the effect of culture conditions on lipid composition had to be considered. The first part of this book reviews the structure of lipids found in microbes. The last chapter presents an overview of the chemotoxonomic use of lipids. A variety of useful generalizations has emerged. These are based on the presence or absence of polyunsaturated fatty acids, sterols, plasmalogens and/or sphingolipids. Some of the older, initial generalizations—such as the occurrence of branched-chain fatty acids in gram-positive bacteria—are subject to various exceptions. Each chapter in between could be simplistically described as examining the relevant data for a given group of microbes. Representative data have been developed for a rather large number of organisms.

The present volume gathers and correlates an impressive and, at times, overwhelming quantity of such information. Two-, three- and four-page tables are relatively common. In one section, a 14-page table is immediately followed by an 11-page table. These comparisons and correlations are what make the book such an excellent resource but, at times, rather dull reading. The literature citations in most chapters extend through 1984. Some later references were apparently added to some chapters after initial preparation. Although probably directed to microbiologists, this book has much information of interest to biologically oriented lipid chemists.

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Single Cell Oil, edited by R.S. Moreton (John Wiley & Sons Inc., 605 Third Ave., New York, NY 10158-0012, 1988, 165 pp., $61.95).

I liked this book from the very start when, in the foreword, the editor states that except for special situations, there is little prospect of single cell fats and oils competing with conventional processes. In spite of this burst of reality, the various authors have done an admirable service by giving varied and detailed consideration of several aspects of single cell oils. This book offers an insight into a field with future prospects, if not present commercial successes. I also liked the sprinkling of innocent typos that served as smile-provokers and ego-builders when discovered by the intense reader.

The book contains five chapters. The first chapter, "Physiology of lipid accumulating yeasts" by R.S. Moreton, explores world demand for fats and oils, and the effects of media components and fermentor parameters on the yield and composition of single cell oils. This chapter and the second by C. Ratledge,"Biochemistry, stoichiometry, substrates and economics,"serve in conjunction to present the basic and, to a lesser degree, the applied science underlying single cell oil biosynthesis. Additionally, the second chapter discusses the realities of single cell oil economics. It is a gray picture; the most favorable prospects are in special situations, particularly in waste stream utilization.

Whereas the first two chapters concentrate primarily on oleaginous microorganisms, especially yeasts, the third chapter by A.H. Scragg and R.R. Leathers,"Production of fats and oils by plant and algal cell cultures," deals with plant cell and and oils. Some details of plant cell techniques and the composition of lipids from conventional and cell culture sources—both differences and similarities—are discussed. Emphasis is given to *Theobroma cacao* and its production of cocoa butter. A brief summary of algal lipids introduces these organisms as potential sources of useful single cell oils.

The fourth chapter,"Yeast oil from cheese whey-process development" by R.J. Davies, is a detailed description of the development of a specific process in design, production and economic terms. It offers a model system and how and why it was developed. It provides a real-life situation to illustrate the vagaries involved in bringing a concept to reality. The fifth chapter, E.G. Hammond and B.A. Glatz's "Extraction and analysis of single cell oils," explains the methods available for analytical use, but also stresses the difficulty and complexity of obtaining a total, quantitative fingerprint of a single cell oil. It is a source of many useful references pertinent to the analytical field.

This volume should be of great value to those in management and science who are looking for a short and intelligent state-of-the-art exposition in the area of single cell oils. It provides a fast-track education in this specialized field of interest.

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An Introduction to Zeolite Molecular Sieves, by Alan Dyer (John Wiley and Sons Inc., 605 Third Ave., New York, NY 10158-0012, 1988, 149 pp., $64.95).

This book contains 10 chapters. Chapters 1-5 define what a zeolite is and discuss natural zeolites, zeolite structure, identification, characterization and synthesis (pp. 1-62). Chapter 8 addresses zeolite thermal, hydrothermal, acidic, alkali and ionizing radiation stability as well as chemical modification (an ambitious task for 10 pages). Chapters 6, 7 and 9 deal with applica-

tions: ion exchange, molecular sieves, drying agents and catalysts. The final chapter provides information about zeolites containing elements other than Si or Al in tetrahedral framework sites (i.e., $AlPO_4$).

Many fine drawings and photographs are provided. A bibliography at the end of each chapter would be helpful, but the author chose to have a selected bibliography containing only 27 references at the end of the book. This makes it somewhat difficult to go directly to the source in an area of particular interest.

The book would be useful to those who desire a broad, general overview on the topic of zeolites. It reads well and the author attempts to add historical perspective to information given. In providing a broad overview, the author provides the reader new to zeolites with basic jargon and background with which to delve more deeply into areas of specific interest.

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Plant Flavonoids in Biology and Medicine II: Biochemical, Cellular and Medicinal Properties, edited by Vivian Cody, Elliott Middleton Jr., Jeffrey B. Harborne and Alain Beretz (Alan R. Liss Inc., 41 East 11th St., New York, NY 10003, 1988, 484 pp., $80).

This book presents the proceedings of a meeting entitled "Plant Flavonoids in Biology and Medicine" held in Strasbourg, France, Aug. 31–Sept. 3, 1987, and is the second in a series. The purpose of the meeting was to bring together scientists of different backgrounds working with plant flavonoids to emphasize how these naturally occurring dietary substances produce their effects in plants and animals, and how their recognized antiallergic, antiinflammatory and anticarcinogenic properties may lead to their application in the treatment of various diseases. This volume consists of 24 chapters based on invited guest lectures and 24 chapters selected from the contributed lectures and poster sessions.

The text is reproduced from camera-ready copy including a potpourri of type styles and sizes. The index is not exhaustive but serves to locate most subjects and organisms discussed in the text.

The first chapter is a tribute to Szent-Györgi on the 50th anniversary of his Nobel Prize for work on flavonoids. Subsequent chapters deal with flavonoid chemical structure, distribution among plants, ecological function, colorant and or-

ganoleptic properties, reactions with several types of enzymes, and interaction with the immune system in animals. Antifungal, antiviral, antioxidant, antigonadotropic, thyroid, dermatitic, spasmolytic and antihepatotoxic activities of this widespread group of plant compounds are examined. A variety of other medicinal and physiological effects are considered.

The role of tannins in plant-animal interactions — as components of wine, as scavengers of oxygen-free radicals and as components of traditional medicines — makes up another element of this volume.

Many chapters are well-written and highly informative. Those by Harborne ("Flavonoids in the Environment: Structure-Activity Relationships"), Cody ("Crystal and Molecular Structures of Flavonoids"), Wollenweber ("Occurrence of Flavonoid Aglycones in Medicinal Plants"), Tomas-Barberan *et al.* ("Antifungal Flavonoids from the Leaf Surfaces of *Helichrysum nitens* and from the Stem Bark of *Erythrina berteroana*"), Waterman ("Tannins and Plant-Animal Interactions"), Brouillard and Cheminat ("Flavonoids and Plant Color"), Beretz and Casenave ("The Effect of Flavonoids on Blood-Vessel Wall Interactions"), Timberlake and Ferriola ("Effects of Flavonoids on Protein Kinase C: Relationship to Inhibition of Human Basophil Histamine Release"), Nomura and coworkers ("Chemistry and Anti-Tumor Promoting Activity of *Morus* Flavonoids"), Köhrle *et al.* ("Flavonoid Effects on Transport, Metabolism and Action of Thyroid Hormones"), Benezra ("Plants Causing Adverse Skin Reaction") and Anton ("Flavonoids and Traditional Medicine") pack in the largest body of information. Others update and review interesting areas of research. Several short chapters deal with relatively esoteric topics, primarily medical and physiological. As might be expected in a volume written by so many authors, the quality is somewhat variable.

The chapters that will be of greatest interest to most readers of *JAOCS* are those by Welton *et al.* ("Flavonoids and Arachidonic Acid Metabolism") and Salvayre *et al.* ("Protective Effect of Plant Flavonoids, Analogs and Vitamin E Against Lipid Peroxidation of Membranes"). These interactions are extremely important as they are linked to production of prostaglandins. Lipid peroxidation also is a factor in aging, inflammation and atherosclerosis.

This volume does not present extensive data on the chemical and physical properties of flavonoids and should not be compared to the series edited by J.B. Harborne and, formerly, T.J. Mabry. The strength of this volume (and its predecessor) is that much of the diverse literature on activity of bioflavonoids is brought together in one series.

Who should buy this book? Workers involved in flavonoid research will want to acquire a copy. Biologists interested in plant-animal or plant-fungal interactions will find many chapters useful. Those interested in pharmacognosy, enzymology, plant biochemistry, animal and plant physiology and in immunology should certainly examine the contents as many relevant works are included. Finally, most major libraries should consider this book as it has widespread appeal to a variety of scientists.

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New books

Gas Chromatography and Lipids: A Practical Guide, by W.W. Christie, The Oily Press Ltd., 36 Woodend Rd., Alloway, Ayr, Scotland KA7 4QR, 1989, 307 pp., £30.

Fire and Explosion Protection: A Systems Approach, by Dinko Tuhtar, John Wiley & Sons, 605 Third Ave., New York, NY 10158-0012, 1989, 150 pp., $59.95.