

Book reviews

Plant Cytogenetics — Second edition, Ram J. Singh, CRC Press, Taylor and Francis, 2003, ISBN 0-8493-2388-6, £85.00, www.taylorandfrancis.com

The book starts with a brief description of Mendel's breakthrough studies with a timeline depicting the major discoveries in the science of genetics. The book then flows directly into the stream of classical and modern cytological techniques for handling and manipulating plant chromosomes. Chapter 2 is a compilation of detailed yet simple protocols for chromosome staining, pollen staining, fluorescence *in situ* hybridization, genomic DNA extraction, and includes two sections on flow cytometric analysis of DNA (determination of nuclear DNA content, and karyotyping and sorting of chromosomes). Chapter 3 (cell division — mitosis and meiosis) and Chapter 4 (genetic control of meiosis) are mainly classical descriptions of these complex, mysterious and not-yet-completely understood processes. The many photographs, tables and line drawings are extremely helpful and enable a clearer understanding of these phenomena to the budding young cytogeneticist. A new chapter added to the second edition is Chapter 5, which deals with the mode of reproduction in higher plants. This incorporates sexual and asexual reproduction as well as the chromosomal basis for sex determination in plants. Chapter 6 walks through the field of karyotype analysis by examining chromosome nomenclature and comparing analyses based on mitotic and meiotic chromosomes, and includes karyotyping by flow cytometry. Chapter 7 describes in-depth the structural and numerical changes that result in chromosomal aberrations, how these changes originated and are identified, and their use in plant breeding systems. This chapter is furnished with tables, drawings and photographs illustrating the many examples found both in natural species and in highly bred field crops. Genomic relationships among diploid and polyploid species is presented in Chapter 8, and highlights the importance of understanding interaction between genomes from an evolutionary perspective and the impact this has had on current breeding practices. Chromosomal aberrations commonly occurring in *in vitro* cultured plant cells and tissues as well as their regenerants are described in Chapter 9. Another new chapter, Chapter 10, deals with the present status, production and chromosomal aberrations of transgenic crops grown throughout the world. Of interest to the molecular biologist is the section on the cytological basis of gene silencing. The appendices are informative and helpful and include, amongst

others, materials for flow cytometry, a linkage map of barley, and the chromosome numbers of important crops. The glossary is extensive and a welcome addition to the second edition, and ample references are supplied for further reading.

This is a comprehensive handbook that deals both with the theoretical and practical aspects related to plant cytogenetics and will be a valuable reference work for those entering the field for the first time, those who occasionally venture into the field, plant breeders, and those involved in active research.

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doi:10.1016/j.sajb.2007.04.058

Eating and Healing: Traditional Food as Medicine, Andrea Pieroni, Lisa Leimar Price, 2006, 408 pp. with Index, 16 Chapters, \$39.95 soft, ISBN-13:978-1-56022-983-4, \$59.95 hard, ISBN-13:978-1-56022-982-7. Email: tisherwood@haworthpress.com, <http://www.HaworthPress.com>

The important role of certain foods in disease prevention has been practiced for centuries, dating back to Hippocrates in 400BC. 'Eating and Healing-traditional food as medicine' is an interesting accord of lesser explored wild and semi-domesticated foods with an emphasis on their practical importance in the present day. Seaweed, mushrooms, fish and various plant parts grace the pages of this book which explores in detail the relationship between food and medicine. From homemade recipes of chicken soup to chestnuts boiled in red wine the authors cover a range of traditional remedies and compare diet and medicine of independent populations. Included are many interesting accounts of how cultures overlap and influence one another, with each chapter complete with a gripping introduction and a concise conclusion. Experienced researchers contribute from a wide range of disciplines making this book a knowledgeable account of problems connected to global change. Examples include insight into the Tibetans food system

illustrating how highlanders have a low incidence of heart disease despite a diet rich in saturated fat. Closer to home, an interesting account of how two similar agro-economic systems in similar environmental niches lead to the prosperity of the Tswana people of eastern Kalahari yet the downfall of West African Sahel. A number of health systems are discussed and compared, with an emphasis on the need to sustain traditional knowledge. This book, containing many clearly illustrated tables, useful pictures and an extensive reference list, is a valuable contribution to scholars and researchers aimed at a wide range of biological disciplines.

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Natural products from plants — Second edition, Leland J. Cseke, Ara Kirakosyan, Peter B. Kaufman, Sara L. Warber, James A. Duke, Harry L. Brielmann (Eds.) 2006, CRC Press, Taylor & Francis Group, Boca Raton, FL, ISBN-10: 0-8493-2976-0, ISBN-13: 978-0-8493-2976-0, Recommended price £ 85:00, <http://www.taylorandfrancis.com>

The book covers natural products from plants very broadly, ranging from the chemistry of different classes of natural products, their biosynthesis, molecular biology, isolation and pharmacological activity to plant conservation.

The first Chapter introduces the different groups of natural products. The Chapter is too limited for use in a chemically oriented natural products course, but gives a good overview of the different groups of natural products which is sufficient for the reader, who is more interested in the interplay of natural products in plant physiology and ecology.

The next Chapter explains how and why natural products are synthesized. This is a very interesting Chapter that also deals with the intracellular localization of biosynthesis. The third Chapter describes how biosyntheses can be regulated.

Then a series of Chapters on molecular biology of natural products and genomic era approaches to the study of natural products follows. There is also a Chapter on biotechnology and *in vitro* culture of plants producing natural products.

The book then focuses on analysis, isolation and structure elucidation of natural products. Many techniques are discussed, and the NMR section is very advanced.

A Chapter deals with bioassays for activities of natural products. This Chapter overviews a number of assays ranging

from simple anti-microbial assays to highly advanced NMR-based methods. The following Chapter explains about the mode of action at the target site for certain natural products. The main emphasis is on anti-cancer drugs, but also transmembrane signaling and immuno-modulation are covered, for its toxic effects. There is then a Chapter on the uses of natural products mainly for health. This Chapter also covers complementary and alternative medicine, and the regulation thereof. The Chapter has some case studies to illustrate human uses. This is followed by a Chapter on synergism of compounds in producing pharmacological activity. Synergism is often used as a 'black box' to explain observed activities, so it is a pleasure to see a well-written Chapter on this subject, which gives examples of numerous cases of synergy.

In the last Chapters plant conservation and the relationship between people and plants are covered.

The book does a great job in explaining how natural products are interrelated with the environment, and explains physiological and ecological functions of natural products. This is done in a clear, straightforward way, so the reader becomes familiar with the roles natural products play. The book is written in a way that makes it interesting to read, it is obvious that the authors have worked with the language to increase accessibility and to catch the attention of the reader.

A problem with the very broad approach is that it cannot cover the subjects thoroughly. Certain Chapters are difficult to read if one does not have a background within the subject, and if one has, they are probably too basic. The book is useful as an introduction to related subjects for scientist already working in one area of natural products research. I fail to see the use as a text book for undergraduate teaching, though the authors write in the preface that they needed such a book for plant biology courses.

The book is reasonably priced, and gives an introduction and overview of natural products in many contexts. It is a book well worth having.

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doi:10.1016/j.sajb.2007.04.056

Biology of Floral Scent, edited by Natalia Dudareva and Eran Pichersky, £85 hard cover, ISBN 0849322839, orders@taylorandfrancis.com, www.tandf.co.uk.

Humans feel a sense of kinship with other organisms that share their propensity for communication. Thus the discovery that whales and dolphins have an audible language makes these

Plant Cytogenetics, Third Edition follows the tradition of its predecessors presenting theoretical and practical aspects of plant cytogenetics. Chapters describe correct handling of plant chromosomes, methods in plant cytogenetics, cell division, reproduction methods, chromosome nomenclature, karyotype analysis, chromosomal aberrations, genome analysis, transgenic crops, and cytogenetics in plant breeding. This new edition begins with a brief introduction on the historical aspect of cytogenetics and flows directly into handling of plant chromosomes by classical and modern cytological technique