which discuss site-specific recombination, are particularly worth mentioning because they read well, cover the aspects in great detail, and go beyond the mechanistic view to provide evolutionary and applied aspects of recombinases. Selected groups of mobile genetic elements are also well described. The chapter on the F-plasmid is particularly enjoyable. The authors provide an interesting historical context, a detailed description of the mechanism of transfer, and briefly describe the role of F-plasmids in the still ongoing controversy on adaptive mutations in bacteria (adaptive mutations are also nicely discussed from a slightly different perspective in Chapter 10). Although conjugation and natural genetic transformation is thoroughly described with stand-alone chapters, transduction is not presented in an individual chapter. Transduction is, however, mentioned in several chapters, so the topic is not omitted completely.

The final section of this volume deals with the consequences of genome dynamics. All four chapters are well written, informative, and are important contributions for the book as a whole. Especially interesting is Hughes and Norström's discussion of the biological consequences of recombination, which focuses on the physiological effects of intragenomic deletions, duplications, and acquisition of foreign DNA.

In summary, this volume is recommended. Each chapter may be read independently, and together they make a comprehensive perspective for somewhat experienced microbiologists.

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Dictionary of Microbiology and Molecular Biology. *Third Edition, Revised.*

By Paul Singleton and Diana Sainsbury. Chichester (United Kingdom) and Hoboken (New Jersey): John Wiley & Sons. $110.00 (paper). xi + 895 p; ill.; no index. ISBN: 0-470-03545-5. 2006.

Genomics and Evolution of Microbial Eukaryotes.

Edited by Laura A Katz and Debashish Bhattacharya. Oxford and New York: Oxford University Press. $110.00. xi + 243 p; ill.; index. ISBN: 0-19-856974-2. 2006.

Are you a protistologist, phycologist, or comparative genomicist? Are you interested in the evolution of eukaryotes and their organelles? If the answer is "yes" to either of these questions, you should buy this book. Katz and Bhattacharya have assembled a set of 15 articles by leading researchers. Their goal was to "convey a basic understanding" (p 1) of this broad topic to a wide scientific audience, and in this they have succeeded.

The volume is separated into three parts. The first part contains a single article by Simpson and Patterson on eukaryotic classification from the combined perspective of morphological and molecular data. The least "genomic" of the chapters, it is up to date, comprehensive, and authoritative, laying down an evolutionary framework for the articles that follow. It also serves as an excellent stand-alone reference source. Part II is comprised of seven well-written chapters on the evolutionary genomics of eukaryotic microbes, and showcases the amazing genomic diversity found within and between members of reasonably well-studied protist groups (e.g., ciliates and apicomplexans), as well as more enigmatic lineages such as dinoflagellates and foraminiferans. Chapter 3, on dinoflagellates, which possess permanently condensed chromosomes and humungous genomes (the smallest being roughly the size of the human genome!), will fascinate readers more familiar with animals and plants. This section also has comprehensive chapters on photosynthetic organelles (Sommer et al., Chapter 6) and lateral (horizontal) gene transfer in anaerobic protists (Andersson, Chapter 7) and apicomplexans (Huang and Kissinger, Chapter 8).

Part III, Analyses of Complete Genomes, begins with the "nuts and bolts" of genome sequencing by Bartholomeu et al. (Chapter 9): physical mapping, shotgun libraries, and genome finishing, among other topics. The chapter is a gem: clearly written and accessible, it is detailed enough to be of interest to anyone with a basic understanding of genomics, yet still accessible to those entering the field from more traditional disciplines. It also highlights some of the technical challenges faced by the genome projects described in detail in the six chapters that follow. These include an overview of trypanosome comparative genomics (Stuart and Myler, Chapter 10), the miniaturized "nucleomorph" genomes of cryptophyte and chlorarachniophyte algae (Kawach et al., Chapter 13), and the genomes of *Entamoeba histolytica* (Clark, Chapter 11), microsporidia (Keeling, Chapter 12), diatoms (Armbrust et al., Chapter 14), and *Dictyostelium* (Schaap, Chapter 15). They are all very well referenced and provide solid launch points into the primary literature. Collectively, they underscore the tremendous molecular diversity seen in eukaryotic microbes and the challenges this represents for anyone trying to infer the evolution of their genomes.

Genomics and Evolution of Microbial Eukaryotes will be an excellent resource for researchers who want a comprehensive, all-in-one volume on the field of microbial eukaryotic comparative genomics. At the

same time, it highlights areas to be tackled in the coming years as new genome sequencing technologies promise to put the field into overdrive. Indeed, the long list of protist groups presented in Chapter 1 (for which little or no molecular data currently exist) provides a sobering reminder of how little we know about microbial eukaryotes—and how much is yet to be discovered.

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PLANT SCIENCES

PLANT GENOME: BIODIVERSITY AND EVOLUTION. *Volume 1, Part D: Phanerogams (Gymnosperm) and (Angiosperm-Monocotyledons).*

Edited by A K Sharma and Archana Sharma. Enfield (New Hampshire): Science Publishers. $95.00. xiv + 350 p; ill.; authors index. ISBN: 1-57808-420-2. 2006.

Plant molecular biology can be said to have undergone a revolution as a result of the recent feasibility of genomic and other large-scale sequencing projects, but it is also true that, with more than a quarter of a million higher plant species, this approach can only sample a very thin sliver of the diversity of plants. Although benefiting from these advances, the study of most species will still depend (for years to come) on more targeted and limited approaches, such as those showcased in this volume.

This is a collection of 11 articles of variable length and quality that deal mostly with unrelated phylogenetic, population biology, or karyological studies of specific plant species or genera. The two exceptions are a thorough and well-organized article on the evolution, geographical distribution, and characteristics of the 11 genera of cycads, as well as a comprehensive review of chromosome number and population biology studies in orchids. Although limited to the study of *Festuca* and related grasses, Chapter 10 is a good example of how molecular phylogeny can be combined with morphological, karyological, and biogeographical information to produce a better understanding of the evolution, diversification, and geographical dispersion of a complex group of species. The remaining articles have a narrower focus and will be of interest mainly to those researchers directly involved in the plant groups covered, which include Mediterranean pines, date and oil palms, and the genera *Allium, Cymbidium, Luzula, Bromus,* and *Avena.*

This book would have benefited from more careful editing, as well as additional figures in some chapters. The series that *Plant Genome* is part of appears to lack a clear focus and organization, with several articles on monocots already included in previous volumes and with fungi covered among the lower groups of plants.

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REGULATION OF TRANSCRIPTION IN PLANTS. *Annual Plant Reviews, Volume 29.*

Edited by Klaus D Grasser. Ames (Iowa): Blackwell Publishing Professional. $199.99. xviii + 350 p + 2 pl; ill.; index. ISBN: 1-4051-4528-5. 2006.

PLANT EVOLUTION IN THE MEDITERRANEAN.

By John D Thompson. Oxford and New York: Oxford University Press. $169.50 (hardcover); $89.50 (paper). viii + 293 p + 4 pl; ill.; index. ISBN: 0-19-851533-2 (hc); 0-19-851534-0 (pb). 2005.

Poet, novelist, and classical scholar, Robert Graves (1895–1985) insisted that the Mediterranean basin was under the rule of a triple-faced goddess. As maiden, mother, and crone, she controlled all vegetation cycles except for the "hot and intemperate" onion. Botanist John D Thompson does not agree with this view. He insists that the density, diversity, and distribution of Mediterranean species are based on the histories of three dominant factors, namely geology, climate, and human activities. I find Thompson's long-term explanation far more plausible and interesting, although he has little to say about the disobedient members of the genus, *Allium.*

A book devoted almost exclusively to plant evolution in the Mediterranean seems overspecialized, but it is my opinion that anyone teaching botany courses in the Northern Hemisphere needs immediate access to this volume. Many of the examples we use in our lectures and student laboratories derive from this geographic region. Morphologists are likely to use crocuses and tulips to discriminate between corms and bulbs, respectively. Biochemists return to its many fragrant shrubs and herbs to explain the genesis of resins and essential oils. Lecturing on the origins of agriculture and early crops always means returning to the genetic and archeological discoveries about the Fertile Crescent.

Thompson fills in this gap with six extremely dense chapters, reinforced by many tables, maps, graphs, schematic diagrams, and four pages of color photographs. The book concludes with the author's interpretation of modern arguments for conservation to preserve endemism. For those who use large reference works to catch up on literature