POLARITY IN PLANTS. *Annual Plant Reviews, Volume 12.*

Edited by Keith Lindsey. Oxford: Blackwell Publishing; Boca Raton (Florida): CRC Press. $169.95. xiv + 346 p + 1 pl; ill.; index. ISBN: 0–8493–2344–4. 2004.

Polarity is a fundamental property of all cells. The molecular mechanisms that underlies the establishment and maintenance of cellular polarity have been intensively studied in animal cells and yeast-like fungi. These studies reveal an emerging general principle whereby positional information is relayed to the cytoskeleton and other morphogenetic functions by conserved signaling pathways. Comparatively less attention has been directed toward the molecular basis of polarized growth in plant cells and tissues. This volume, *Polarity in Plants*, provides a comprehensive review of the topic that should satisfy both hardcore aficionados of plant cell and developmental biology as well as curious investigators interested in drawing comparisons to animal and fungal systems.

The chapters follow a general progression from the topic of polarity at the cellular level (Chapters 1 to 4) to discussions of polarity and pattern formation during embryogenesis (Chapters 5 and 6) and the development of adult tissues (Chapters 7 through 11). The early chapters emphasize the signaling pathways that locally recruit the cytoskeleton and exocytic pathways to polarization sites, whereas the later chapters highlight the roles of transcriptional feedback loops in the establishment of tissue polarity. Strikingly, the same feedback loops are often used in different developmental contexts. A common theme that resonates throughout the volume is the role of the phytohormone auxin in providing positional information.

Overall, the depth of the individual chapters ranges from general summaries to comprehensive overviews. In most cases, the authors effectively integrate insights obtained using the *Arabidopsis* model with those acquired using less tractable systems such as maize, tomato, and lily. One relatively minor complaint is that some chapters would benefit from the inclusion of more figures. Nevertheless, this book will be an essential resource for plant biologists interested in polarity, as there is no comparable volume that covers the topic in such detail. Moreover, any biologist with an abiding interest in understanding how cell and tissue asymmetries are generated will find this book to be a worthwhile addition to their collection.

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A FIELD GUIDE TO THE FUNGI OF AUSTRALIA.

By A M Young; illustrations by Kay Smith. Sydney (Australia): University of New South Wales Press. $29.95 (paper). xvi + 240 p + 35 pl; ill.; index of common names and species index. ISBN: 0–86840–742–9. 2005.

This is an interesting book and should be obtained by both mycologists and libraries. The chapters The Kingdom of Fungi, Some Fungal Facts, Fungi on the Menu, and Classification and the Scientific Names of Fungi are all quite thorough and interesting to read. They also provide readers with a good background for the study of fungi and how they survive in the environment, as well as some nice facts about the biology of fungi and mushrooms.

The watercolor paintings are very pretty and the colors are good but, unfortunately, they are not very helpful for identification purposes. They are randomly inserted at different parts of the book away from the description. The photographs have the same problem in that they are not adjacent to the species description.

There are, however, only 35 photographs included in the book. These illustrations are very nice, but it would have been good to see a photograph with the descriptions rather than a line drawing. Some characters are not well illustrated or are not clear in the drawings (i.e., small pores). It would seem that the illustrator for the line drawings and the watercolor paintings may not have been familiar with the actual species, and was possibly making duplications from photographs. The descriptions all have line drawings, but only 35 species have color photographs. The line drawings that are next to the species descriptions were drawn from these included photographs (it appears that the line drawings are just the negative image of the photograph).

The keys include three levels of division: the myxomycetes, the basidiomycetes, and the ascomycetes. The myxomycete section is rather short and not subdivided. The basidiomycete section of the key eliminates the most conspicuous groups first and then deals with the "Agarics or 'gilled' fungi." This is done by first separating them into groups by habitat/ecotype (i.e., forests and woodlands) and then substrate (i.e., soil and wood). The remaining conspicuous groups of basidiomycetes are then inserted after the Agarics section. We believe it would have been more logical to place all the conspicuous groups together rather than inserting the Agarics in the middle. The ascomycetes are included on two pages but not subdivided. This is because there are not many of these macrofungi

and most of them are conspicuous—at least at the generic level.

The subsections delineated in the "key" are then dealt with by group. The species included in each subsection are then placed together in alphabetical order within the group. If you get to the right subsection in the key, you can then just flip to this section and browse through it. This if fine for the more conspicuous sections represented by a few species, but for the larger groups, it is not preferable. The Agarics section is over 80 pages in length, which makes for some rather unwieldy page flipping. It would have been nice to have a textual key to the smaller groups or even genera within the Agarics. The habitat and substrate divisions in the key are helpful, but they are really not good for an advanced novice who is familiar with other useful morphological characters typically used in Agaric keys. This also requires readers to go to the description for a better understanding of what separates these genera. The logic here was that because the book is not a comprehensive work (nor does it attempt to be), it was unnecessary to provide a detailed textual key. Grouping the material in this manner is good for anyone with a general interest, but will frustrate collectors who cannot put their mushrooms into one of these artificial groups.

Once a person gets to the actual description of the species, they will be pleasantly surprised. They are all quite good and include the typical description of the fruit body, spore size, habitat, and notes and distribution. Unfortunately, all of the descriptions only have a line drawing next to them. When one has to resort to page flipping as they would with the Agarics section, this would be extremely frustrating, as it will be necessary to read every description to get color information.

The glossary is short and concise, which is good for this style of book. The species index is organized alphabetically by genus. Once the genus is located, all the included species are placed in alphabetical order under that genus. It would have been great to include an index that also included the species epithets alphabetically. This is quite helpful when trying to correlate older books that may not have the species in the same genus. This will be especially confusing for novices who may not understand fungal nomenclature and why a taxon would change generic names.

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ANIMAL SCIENCES

The Evolutionary Biology of Flies.
Edited by David K Yeates and Brian M Wiegmann. New York: Columbia University Press. $89.50. ix + 430 p; ill.; index. ISBN: 0–231–12700–6. 2005.

Dipterans, represented by some 150,000 described species, are one of the most abundant arthropod orders. Studies on the ecology, evolution, and development of just a few model species in this group have provided a disproportionately large fraction of modern biological knowledge. However, outside of *Drosophila* and *Anopheles*, the two genera in which genomics are best known (covered in a chapter by Ashburner), resides a wealth of biodiversity, ecology, and evolutionary history, which many evolutionary biologists may have imagined, but relatively few have explored.

This book provides a valuable synthesis and update of the current knowledge base in these areas, including both the rich contributions dipterologists have made to evolutionary biology (in a chapter on the work of Willi Hennig, the founder of phylogenetic systematics, by Meier) and the biogeographic insights from Diptera (by Cranston). The ongoing controversy regarding the position of order Diptera in the superorder Holometabola is thoroughly covered by Whiting, and relationships and evolutionary history of lineages within the Diptera are updated in two articles (by Yeates and Wiegmann; Labandeira). The latter chapter provides an overview of Dipteran paleontology, including many recent insights from amber faunas, and addresses the origins of Dipteran-host plant interactions. The ecology of these interactions is covered in the article by Filchak et al. Admirably, the volume also manages to include reviews of the vast realm of recent insights provided by Dipteran models in developmental evolution (chapters by DeSalle; Merritt; Davies and Roderick), the roles of transposons in genome evolution (Kidwell), and sexual selection and mating system evolution (Wilkinson and Johns). Two final chapters provide strong arguments for greater use of Dipterans as models for current issues in the biology of invasive species (Scheffer) and rainforest community structure and dynamics (Kitching et al.). This book will be especially valuable to graduate students because it will introduce a wide variety of potential systems, many of which are manipulable yet underutilized,