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Book Review

Placing plant mating in a broad ecological context

Ecology and Evolution of Flowers edited by Lawrence D. Harder and Spencer C.H. Barrett, Oxford University Press, 2006. US$ 75.00 pbk (370 pages) ISBN10: 0198570864, ISBN13: 9780198570868

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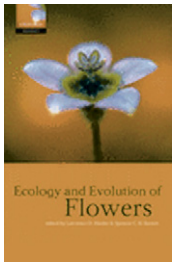

Amazon.com tells us that customers who bought *Ecology and Evolution of Flowers also bought Plant–Pollinator Interactions: From Specialization to Generalization*, edited Nickolas M. Waser and Jeff Ollerton, and *Evolutionary Ecology of Plant Reproductive Strategies*, by Tom de Jong and Peter Klinkhamer, which came out in 2006 and 2005, respectively. However, despite the similar titles, *Ecology and Evolution of Flowers* covers significantly different ground and offers new perspectives on the subject of floral biology.

The 18 chapters of *Ecology and Evolution of Flowers*, authored by well-established workers in the field of flower biology and mating system evolution, are grouped into three sections, each briefly introduced by the editors. The first chapter by Spencer Barrett and Lawrence Harder stands apart, being an assessment of the career and impact of David Lloyd (1937–2006), whose papers continue to stimulate theoretical and empirical work in the area of plant reproductive ecology. By looking at the development of concepts in floral biology over the past 30 years, this historical review sets the stage for the remaining chapters.

The first three chapters, by Martin Morgan, Da-Yong Zhang, and Harder and Matthew Routley, concentrate on modeling approaches and, in several cases, reflect brand-new results, which illustrates the fast editing and production of the book. The references in these chapters include papers published in 2006.

The second set of chapters focuses on the ecological setting for pollination and mating of species. James Cresswell summarizes work on modeling pollinator-mediated gene dispersal, and Monica Geber and David Moeller analyze expected effects of pollinator sharing among coexisting species of *Clarkia*. In recent years, much attention has centered on interaction webs or community networks; that is, quantitative depictions of the usually asymmetric relationships between all pollinators and all plants in local communities. Such networks are at the core of several chapters of *Plant–Pollinator Interactions* but receive little attention in *Ecology and Evolution of Flowers,* except in the chapter by Marcelo Aizen and Diego Vásquez on the effects of anthropogenic disturbance on pollination.

The third set of chapters is entitled 'Mating strategies and sexual systems' and includes several highlights such as a review on reproductive assurance and the evolution of selfing (by Chris Eckert and colleagues), the gynodioecy-dioecy pathway (by Tia-Lynn Ashman), and the interplay between the frequency of population turn-over, scarcity of mates and mating system evolution (by John Pannell). The gynodioecy-dioecy pathway is still not fully understood and, indeed, a study often cited as showing that the gynodioecy-dioecy pathway 'is an important and particularly common pathway' actually reports the opposite [1]. Barrett and Kathryn Hodgins review their recent results on sexual systems and floral design in *Narcissus*, providing a neat example of the importance of a geographically explicit approach to floral biology.

The final chapters deal with studies that link microevolution in floral traits to macroevolution, here, flower differences between populations, species and higher clades. Thus, Jeffrey Conner, in a very informative chapter, reports on experiments addressing the genetic architecture of floral traits, and Carlos Herrera and colleagues describe their work on *Lavandula latifolia* throughout the Western Mediterranean. Their chapter shows how difficult it is to tie floral variation to spatially variable selection from pollinators. An assessment of the changing views on pollination and speciation by Steven Johnson is masterful in the way it contrasts earlier views with the current paradigm, which is that populations diverge primarily in response to a change in selective regime, rather than to an interruption of gene flow. Kathleen Kay and coauthors, in their chapter, focus on floral traits and clade diversification. Unfortunately, current methods cannot distinguish between infrequent trait evolution and the infrequency of a trait owing to its occurrence in species-poor clades [2] and, for this reason, conclusions about the role of flower traits that themselves might influence speciation or extinction rates must be regarded doubly carefully. The volume concludes with a chapter on pollination in hybrid zones (by Diane Campbell and George Aldridge).

Ecology and Evolution of Flowers is beautifully edited and produced, with a glossary, extensive index, numerous graphs, often highly original summary tables and a set of eight color plates. Although it is not meant as a textbook, its chapters could form the basis for a seminar, for example, on the evolution of selfing or on the role of geographically varying selection on floral traits. I highly recommend this book: it covers new topics, provides new angles on old topics and points to lacunae in our knowledge that could now be filled.

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2 Maddison, D.R. (2006) Confounding asymmetries in evolutionary diversification and character changes. *Evolution* 60, 1743–1746

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