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TRADE-OFFS IN EVOLUTIONARY ECOLOGY

Fox, Charles W., Derek A. Roff, and Daphne J. Fairbairn, editors. 2001. **Evolutionary ecology: concepts and case studies**. Oxford University Press, New York. xii + 424 p. \$85.00 (cloth), ISBN: 0-19-513154-1 (acid-free paper); \$45.00 (paper), ISBN: 0-19-513155-X (acid-free paper).

As will become clear to anyone reading this book, the most pervasive theme in evolutionary ecology is the trade-off—no organism can be optimally adapted to every challenge in its environment. This is a common problem for advanced textbooks as well, because they may be found in disparate environments, including advanced undergraduate and graduate courses, graduate seminars, and the bookshelves of researchers. In the preface the editors set their sights on all these audiences, and not surprisingly, they have not been completely successful at reaching all of them. However, they have definitely succeeded in producing an excellent overview of research in evolutionary ecology. The book is extremely

up-to-date, authoritative, well written, and mostly well produced.

The first challenge in creating a book for a broad, interdisciplinary, and ill-defined field like evolutionary ecology is the choice of topics. I could not find an explicit attempt to define the field in the book, but it covers five areas: “Recurring themes” (basic population and quantitative genetics), “Life histories,” “Behavior,” “Interspecific interactions,” and “Adaptation to anthropogenic change.” I think this is a pretty good delineation of evolutionary ecology, but some would disagree. For example, Pianka’s (1994; *Evolutionary ecology*, 5th edition. HarperCollins, New York) evolutionary ecology text is far more ecological and less evolutionary than this book.

Textbooks can have one to many authors, and this book takes the extreme life-history strategy of an edited volume of 28 chapters by 35 different authors. The editors certainly are to be commended on the list of authors that they have gathered. The table of contents reads like a miniature who’s who of evolutionary ecology (the complete contents is avail-

able at www.oup-usa.org/toc/tc_019513155X.html; check out the section on interspecific interactions in particular), and includes a good mix of established senior investigators and "young guns." Each author was limited to 8000 words and 30 references. Many of them have recently written books or monographs on their assigned topic. This has allowed the editors to produce a very broad and detailed treatment of an extremely diverse subject in a short period of time. Like a team-taught course, this approach works best for the well-prepared students (e.g., second-year Ph.D. students in their area of concentration) because they are exposed to a variety of viewpoints and the material tends to be at a high level and more up-to-date. This approach tends to be less successful for most undergraduates and beginning graduate students due to looser organization, less integration among the different topics, and the higher degree of difficulty.

Given these inherent trade-offs in using so many authors to reach such a broad audience, in my opinion the editors and authors have come very close to maximizing the difference between their benefit and cost curves (another recurring theme in the book). Most of the chapters do a good job of explaining concepts to beginners, while still providing excellent overviews for graduate students or faculty in evolutionary ecology. However, I think the benefit to the latter group of perhaps doubling the number of references would have outweighed the minor cost in readability. The book is incredibly up to date, with many 1999 and 2000 references, and even some 2001 and 2002! I found very few errors of any kind, either conceptual or typographical, and the binding, printing, and paper quality of the paperback edition is excellent.

The authors and editors have done a better job of referring between chapters than in any other edited volume I have read. They have also imposed a very consistent structure, with each chapter covering historical background, concepts, case studies, and future directions. It is a cliché in reviews of edited volumes to mention the uneven quality of the chapters, but the cliché does not hold for this book. All of the chapters are useful, and virtually all are very well written. Still, the large number of chapters does create a degree of balkanization of topics, causing substantial repetitiveness and missed oppor-

tunities for integration. This seemed particularly true in the life-history section, and the artificial nature of some of the traditional divisions of evolutionary ecology in general was mentioned by some authors. Greater integration across subdisciplines might have made the book both more digestible by beginners as well as more interesting to practitioners, but the very serious trade-off with fewer, more integrated chapters is that it would likely have been more difficult to line up authors for the project. It is much easier to write a short review of an area you know very well than to attempt a synthesis across subdisciplines.

There are chapters that will be difficult for beginners sprinkled throughout the book, particularly in the first section, which covers the inherently difficult topics of population and quantitative genetics. In several chapters throughout the book the equations are not explained thoroughly, and there are no worked examples or problems. Some chapters are a little heavy on the details and light on the unifying concepts. A few of the figures are of poor quality, especially some of the drawings; this likely reflects a trade-off with being up-to-date and affordable, and the latter is more important in my view.

So what about the ambitious goals that the editors lay out for themselves in the preface? If I were teaching a course in evolutionary ecology, I might very well use this book, but I would work hard in lecture to focus on the big picture and to better integrate the various areas. In my opinion there is not enough data or conceptual food for thought in most of the chapters to spark good discussion in a graduate seminar. However, this book will serve graduate students and faculty in evolutionary ecology well, both for background and research ideas. I have already suggested the book to several Ph.D. students preparing for qualifying exams. In spite of the inevitable trade-offs, this is a valuable book for a wide audience.

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