Book Review

ART for ART's Sake

Oliveira, R. F., Taborsky, M. & Brockman, J. (eds) 2008: Alternative Reproductive Tactics: An Integrative Approach. Cambridge University Press, Cambridge. 518 pp. Paperback: £38.00. ISBN-13 9780521540063. Hardback: £80.00. ISBN-13 9780521832434.

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It is a sad fact of life that while all males may be created equal, some end up being less equal than others. Intra-specific variation is obviously ubiquitous among organisms, and in situations of social competition, small variations can spell the difference between reproductive success and failure. This book is about the competitive consequences of such variations. It concentrates on one particular type of variation, in which (for one of several possible reasons) variants are clustered around discrete behavioural (and sometimes morphological) forms or morphs, and there are few or no intermediates. Such alternative reproductive tactics (ARTs) are extremely common – in fact the typical bifurcating developmental pathways that produce phenotypes probably predispose organisms to develop alternative variations. The topic is thus of very basic importance for understanding the behaviour (and morphology) of organisms.

The book is intelligently planned and executed, and is more useful than most multi-author, edited volumes. The editors have produced a relatively coherent final product, largely avoiding the dangers of a multi-authored sprawl. They chose authors with outstanding experience with different topics, and asked them to write reviews of their areas of expertise rather than to simply present their own latest research results. In addition, the editors included a clear introductory chapter which provides a framework for much of the field, and a wide-ranging, virtuoso final chapter in which they sum up what they see as the major lessons of the book. The editors' own wide-ranging interests are largely complementary rather than overlapping, so they were particularly well-qualified to achieve the objective of a large, general overview of the field that includes mechanisms involved in producing ARTs, ideas about the ultimate causes and origins of such discontinuous variation, and a taxonomically diverse set of examples.

This large scale perspective provides interesting insights into overall patterns of ARTs. For instance, the phylogeny of male ARTs in three groups of fishes shows that ARTs arose repeatedly during the course of evolution, but are found only at the tips of branches, thus suggesting that ARTs may rarely become permanent features of deeper clades. The editors argue that this pattern is not surprising, because the frequency of ARTs is especially responsive to environmental and social conditions, and thus one of the morphs can easily go extinct. Once ARTs have evolved and there is a developmental uncoupling of dimorphic structures and behaviour, however, then the alternative tactics may evolve at least partially independently. This large scale perspective also helps map out productive future topics. For instance, the editors note that the available mechanistic models for the evolution of ARTs need to be verified, and that many questions remain. What genes are involved in these threshold [?] mechanisms and are there patterns or homologies for the genes affecting ARTs? How does the genetic architecture of ARTs change as tactics evolve? Are there common patterns or underlying constraints in this process? Are there constraints on the underlying mechanisms that affect the kinds of options that are available as ARTs, or that make some ARTs more common than others?

The four divisions of the book indicate its scope: the selective advantages and evolutionary origins of ARTs; proximal mechanisms in the production of ARTs (e.g. neural, endocrine, gene–environment interaction mechanisms); reviews of ARTs in different taxonomic groups (including chapters on insects, crustaceans, fish, amphibians, reptiles, birds, non-primate mammals and primates; this section occupies

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nearly half of the book – 223 of 489 pages); and new connections between ARTs and other fields (including communication, mate choice, sexual conflict and cooperative breeding). Interesting connections with communication, for example, include the idea that the more information that is available to an animal, the more likely it is that facultative alternative strategies will pay, thus linking the field to eavesdropping behaviour, and predators and competitors in information networks. Knowledge of the underlying basis for trade-offs will help evolutionary biologists understand the likely evolutionary trajectory for ARTs, and assist physiologists in understanding the developmental expression of ARTs.

The editors did not impose their own conceptual ideas, and there is variation among the chapters in their conceptual frameworks; such variation, which can be seen as either strength or weakness, is inherent in a currently evolving field of study. The book is idiosyncratic in some views (e.g. a relatively large billing for ESS ideas in the face of wide support for facultative alternatives, leading to contradictions between the introduction and later parts of the final summary chapter). Subtle thinking informs much of the writing, such as the recognition that females do not always necessarily prefer bourgeois over parasitic males (in fact, preferences for parasitic males may be especially likely when parasitic tactics are first evolving).

As the editors note, there is only one other comparable general book on alternative tactics, that of Shuster & Wade (2003). The present book largely complements the Schuster and Wade book, as it (happily to my mind) is more concerned with variety and scope of biological examples, and less with mathematical models. The taxonomic coverage is wide, and many chapters include substantial tables of empirical data.

In sum, this is a very useful, well-crafted book. Its special value is not as a systematic, textbook-like review of the entire field, but rather as a basic reference to be consulted by students and researchers interested in the evolution of ARTs.

Literature Cited

Shuster, S. M. & Wade, M. J. 2003: Mating Systems and Strategies. Princeton Univ. Press, Princeton.

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