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Book Review: Tangled Trees: Phylogeny, Cospeciation, and Coevolution

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BOOK REVIEWS

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Page, R. D. M. (ed.). 2002. TANGLED TREES: PHYLOGENY, COSPECIATION, AND COEVOLUTION. University of Chicago Press, Chicago, Illinois, 378 pp. ISBN 0-226-64467-7, price (paper), $28.00.

Host-parasite associations and the study of their coevolution and cospeciation have long been of strong interest to evolutionary biologists. This book does an excellent job of bringing readers up to date in the field, including both theoretical and empirical reports, the development of novel methodological approaches, and the incorporation of molecular data. The book is divided into 2 sections; the first presents theoretical developments in the field, while the second focuses on experimental results.

In the first chapter, Page briefly but thoroughly summarizes the current state of the art and defines cospeciation, noting the problems encountered in jointly reconstructing the evolution of hosts and parasites. In addition, Page provides a historical sketch, in which he highlights the most influential experimental research in host-parasite coevolution and advances in analytical methodologies. This introduction sets the stage well for the rest of the book.

Chapters 2–5 present theoretical developments, ranging from the formal requirements of a method of coevolution reconstruction to exploration of how population level processes may influence coevolutionary patterns. Chapter 2 (Ronquist) illustrates the potential of exploring different event-based methods in a parsimony framework, contrasting these with pattern-based methods. In Chapter 3, Charleston and Perkins exemplify the use of the Jungles algorithm using *Anolis* lizards and malaria as a system. Huelsenbeck et al. (Chapter 4) present a statistical framework for comparing topologies and length of host and parasite trees, incorporating information about the relative depths of the nodes into analyses. This chapter is must reading for those interested in hypothesis testing in a phylogenetic context, as the authors present the varied important issues clearly and succinctly. The last chapter in this section (Rannala and Michalakis) deals with the effect of different population-level phenomena on the likelihood of detecting cospeciation events.

It is in the empirical section, I believe, where mammalogists are likely to find the most interesting reading, as mammals are the system of choice in 5 of the 8 chapters in this section. Research on pocket gophers and their associated lice has been instrumental to the development of host-parasite studies. Accordingly, 2 chapters of the book are devoted to this system. In the first, Hafner et al. review advances in our understanding of this system, beginning with the set of events that prompted the first bout of research and following up to their ongoing research efforts, while the second of these chapters (by Desmastes et al.) focuses on discussing how discrepancies between the phylogenies of gophers and their chewing lice might have arisen. In these days where natural history research receives little attention, these chapters should be read by all those who believe any given mammal can be reduced to a single dimension.

Two chapters present broad assessments of coevolutionary patterns in murine viruses (Chapter 7, by Martin et al.) and chewing lice (Chapter 10, by Taylor and Purvis) and their respective mammalian hosts. In light of the recent SARS outbreak, this type of study may prove critical to a better understanding of animal-borne disease dynamics. The following 2 chapters focus on birds and their lice, comparing cospeciation patterns between doves and their wing and body lice (Chapter 11), and estimating parasite extinction rates from the observed patterns of association (Chapter 12). Finally, the closing chapter provides a solid review of the different ecological processes that influence coevolutionary patterns.

This book maintains a useful balance between theoretical and empirical research while covering a wide array of topics. Even more impressive is that, despite being the product of a symposium and covering a broad range of material, this book can be read in one sitting. In short, this is an outstanding book that should bring biologists interested in the topic up to date with the state of the art in host-parasite coevolution research.—FEDERICO G. HOFFMANN, *School of Biological Sciences, University of Nebraska, Lincoln, NE 68588-0118, USA; fhoffman@biocomp.unl.edu*.

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