

BOOK REVIEW

Ecology and Evolution in the Tropics

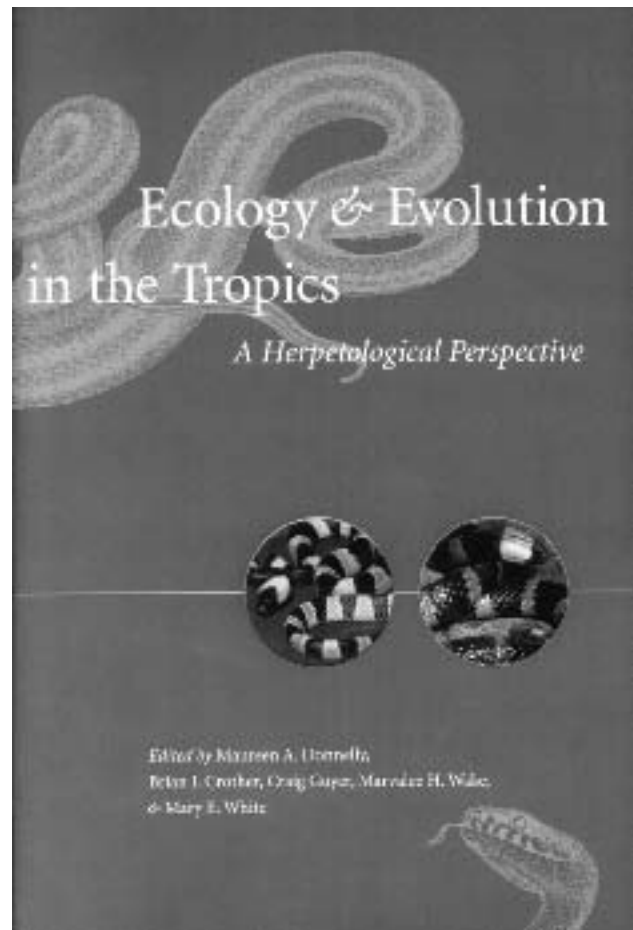
Donnelly, M. A., B. I. Crother, C. Guyer, M. H. Wake, and M. E. White (eds.). 2005. *Ecology & Evolution in the Tropics: A Herpetological Perspective*. The University of Chicago Press, Chicago, Illinois. 675 pp. Softcover. ISBN 0-226-15658-3. \$45.00 (hardcover also available for \$95.00).¹

This edited volume contains a short foreword by Luis D. Gómez dedicating this compendium to Jay M. Savage (author of the monumental 2002 book: *The Amphibians and Reptiles of Costa Rica: A Herpetofauna between Two Continents, between Two Seas*), a brief preface acknowledging a host of contributors and reviewers, 18 separately authored chapters organized into two sections (“Part I: Evolution and Biogeography” and “Part II: Ecology, Biogeography, and Faunal Studies”), followed by a 65-page listing of references, affiliations of contributing authors, and extensive indices to subjects and taxa.

Although typically organized around a central theme, collections of contributed papers often suffer from deficiencies in focus that might be inevitable in many instances. In this instance, the individual chapters often provide extensive, useful, and timely information, but an almost total lack of cohesion and continuity leaves the reader feeling that they might as well have appeared separately in scientific journals. Only the connection of many of the contributors to Jay Savage (whose publications and interests were as diverse as this collection) and a general tropical theme unite them.

However, even the “tropical” theme so prominently featured in the title is misleading (might this have been imposed by the publisher in order to entice a more diverse readership?). Only a few systematic chapters address taxa found north of Costa Rica, only one (on taxonomic theory) is widely applicable, only one (on evolution of anoles assigned to the genus *Norops*) touches on the West Indies, and only three (on higher-level snake phylogeny, elapid relationships, and long-term frog monitoring by local people in Papua New Guinea) focus largely on areas outside the Neotropics. The title promised a much broader overview.

Consequently, the value of this volume must be evaluated on the basis of its individual parts. These vary from the theoretical to practical and highly technical to readable and entertaining. All are professionally written and edited, and adequately illustrated (although the volume cries out for more illustrations of especially the more unfamiliar taxa discussed in many chapters). However, many are so narrow in scope that few readers will find more than a couple of chapters applicable to their own interests.



Part I begins with Arnold Kluge proposing a new system of classification, which he illustrates by using eublepharid geckos. His rankless hierarchy of names effectively reflects phylogenetic relationships and is undoubtedly superior to traditional Linnaean nomenclature in doing so. Whether its utility in this context will lead to wide acceptance remains to be seen. Chapter 2, by Marvleen Wake, Gabriela Parra-Olea, and Judy Sheen, examines phylogenetic relationships in Central American caecilians. Although data generated by using various techniques have yet to establish an unambiguous phylogeny for these poorly known fossorial amphibians, current data have shed new light on evolutionary patterns of reproductive modes. David Wake, in Chapter 3, uses phylogenetic and distributional information to infer how Costa Rican salamanders radiated to fill their current niches. Wake concludes his chapter with a very timely discussion of amphibian declines in Costa Rica. Chapter 4, by Ronald Heyer, Rafael de Sá, and Sarah Muller, addresses conflicting hypotheses seeking to explain the distribution of *Leptodactylus silvanimbus*, a

¹ This review is being published simultaneously in the *Bulletin of the Chicago Herpetological Society*.

frog found only in the cloud forests of Honduras. The authors conclude that the species is a relict and has no close relationships with any other Middle American forms. Shyh-Hwang Chen, in Chapter 5, uses chromosomal data to elucidate historical relationships in two groups of *Eleutherodactylus* frogs from Central America. In Chapter 6, Sharon Emerson examines the physiological basis of sexual dimorphism in frogs. The next two chapters deal with snake phylogeny. Chapter 7, by Mary White, Maria Kelly-Smith, and Brian Crother, examines the origins of snakes, whereas Chapter 8, by the late Joseph Slowinski and Robin Lawson, takes a narrower view by using molecular data to elucidate relationships among elapids. The last chapter in this section, by Harry Greene and Roy McDiarmid, honors Alfred Russel Wallace and Jay Savage for their contributions to our understanding of venomous snake mimicry. For both its historical value and well-written evaluations of mimicry systems, this may be the most broadly appealing and even entertaining contribution in the entire volume. The content entices even non-snake biologists with its potentially wider applications, and the very subject is so innately fascinating that any biologist, professional or amateur, will be entranced.

Part II begins with Karen Lips using a detailed examination of a single breeding season of the recently described, leaf-breeding frog, *Hyla calypsa*, to evaluate reproductive modes in tropical anurans. In Chapters 11 and 12, Craig Guyer and Maureen Donnelly explore interspecific competition among co-occurring hylid frogs at a reproductive site in Costa Rica and Norman Scott and Luz Aquino describe foraging strategies of frogs in the Gran Chaco of Paraguay. I love the title of the latter, "It's a Frog-Eat-Frog World in the Paraguayan Chaco," and I very much appreciate the color plates that illustrated a few of the species mentioned (as indicated previously, many of the other chapters would have benefited from doing the same). David Bickford, in Chapter 13, uses a study in Papua New Guinea to describe how an integrated conservation and development project can be used to answer scientific questions about frog diversity and conservation. Although narrowly focused, this contribution has broad applicability for similar projects that might be designed and implemented in developing tropical nations throughout the world. In Chapter 14, Kirsten Nicholson focuses on mainland taxa to explore the origins and radiation of anoles placed in the genus *Norops*. Similarly, in Chapter 15, Steven Werman used phylogenies for Neotropical pitvipers to infer a most likely historical scenario. Chapters 16 and 17 present faunal inventories by Roy



Leptodactylus silvanimbus, found only in the cloud forests of Honduras, is the subject of one of the very few chapters addressing Neotropical species found north of Costa Rica.

McDiarmid and Jay Savage (of the Osa Peninsula in Costa Rica) and by Maureen Donnelly, Megan Chen, and Graham Watkins (of the Iwokrama Forest in Guyana). The volume's final chapter presents an overview of the presumably ancient herpetofaunal diversity of Guyanan tepuis, odd, elevated geological formations that form habitat islands within a broad region.

Because of Jay Savage's vast body of work and the fact that contributors are linked to him by academic genealogy or collaboration, a few common ideological threads are apparent. Both detailed phylogenetic studies and examinations of natural history traits are of tremendous value in expanding our understanding of amphibians and reptiles. Combining them is less common, of even greater value, and some of the chapters in this volume are testament to Savage's example for integrated studies using various methods once thought to be independent or even mutually exclusive of one another. On the other hand, formal recognition of the genus *Norops*, for example, although advocated by many scientists who study mainland anoles, is less enthusiastically received by others who work primarily in the West Indies. Similarly, historical biogeographies that emphasize vicariance versus over-water dispersal for the origins of many West Indian species are less than universally accepted. Presenting these without discussion of alternative hypotheses does the uninformed reader a disservice by implying a concordance that doesn't exist.

So, who should buy (or at least read) this book? Professional herpetologists will certainly find at least a few chapters of interest, conservation biologists should definitely read the chapter by David Bickford on using local resources when implementing conservation projects, and everyone should read Harry Greene and Roy McDiarmid's chapter on mimicry. Although relatively inexpensive by modern standards, I doubt that very many non-professionals will find enough of interest to justify purchasing the volume. Instead, they should prevail on friends who make the plunge or on the nearest university library to read the selections applicable to their own interests.

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The Knight Anole (*Anolis equestris*), mistakenly attributed to South America, was used as an outgroup in the analysis of relationships among anoles assigned to the genus *Norops*.