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BOOK REVIEWS—RESEÑAS DE LIBROS—RESENHAS DE LIVROS

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Behavioral Ecology of Tropical Birds.—Bridget J. M. Stutchbury & Eugene S. Morton. Academic Press, New York. 165 pp., numerous figures and tables, references, index. ISBN 0-12-675555-8 (hdbk) 0-12-6755556-6 (ppbk).

Stutchbury & Morton argue that most theories in avian behavioral ecology are biased towards temperate zone birds and that these theories do not apply equally well to tropical birds due to fundamental differences in ecological conditions and social traits of tropical species. About 80% of all passerine species breed in the tropics and many other avian taxa also predominate or exist only in the tropics. It is therefore the tropical adaptive realm that typifies avian adaptations and natural history of tropical species that should be viewed as the norm for birds. In contrast, temperate zone species represent only a minority of the avian species that have convergently adapted to the temperate environment. Thus for theories and concepts in avian behavioral ecology to have broad generality, studies of tropical species must be well represented. Unfortunately as the authors point out, relatively little is known about most tropical birds, including basic natural history.

The temperate zone perspective of avian behavioral ecology is not surprising given the fact that most behavioral ecologists reside in temperate North America or Europe and tend to focus on the species closest to home. Stutchbury & Morton observe that many temperate zone behavioral ecologists and ornithologists seem unaware that conventional wisdom applies only to a select group of temperate zone birds that are not representative of avian adaptations in general. The authors recognize however, that behavioral ecologists have not completely ignored tropical birds or tropical adaptations, but they note that their focus has often been on oddities that represent phenomena atypical of the temperate zone. The authors cite tropical studies on cooperative breeders, lekking species, ant-following, mixed-species flocks, and duetting that have attracted attention precisely because they are so different from temperate zone systems. Understudied, from the perspective of Stutchbury & Morton, are the more typical socially monogamous tropical birds wherein the male and female share in parental care duties and year round territorial defense. These socially monogamous species appear superficially similar to temperate zone counterparts, but recent research indicates they differ in important ways as discussed in this book.

Nowhere is the disparity in research effort between temperate and tropical avian behavioral ecology more evident to Stutchbury & Morton than in the several temperate zone species frequently used to test behavioral ecology models. They state that more behavioral ecology studies have been conducted on the Red-winged Blackbird (*Agelaius pheoniceus*) than for all tropical birds combined! This easily applies to the Great Tit (*Parus major*) or Barn Swallow (*Hirundo rustica*) as well. The

authors are not criticizing these temperate zone studies, many of which they recognize as insightful, but rather they cite them as a way of illustrating the temperate zone bias. They ask why shouldn't the Dusky Antbird (*Cercomacra tyrannina*) or some other tropical bird be our model of the typical bird?

Indeed, many of the Stutchbury & Morton's arguments will be provocative to some, but most are more likely to be music to the ears of readers of *Ornitología Neotropical*. Ornithologists working in the tropics will naturally be receptive to the authors' intent, theme, and purpose of their book. According to the authors, their intent was to convince avian behavioral ecologists that lessons learned in the temperate zone do not necessarily apply in the tropics. The book provides examples of where, how, and why tropical birds are so different from temperate zone birds. The intended audience consists of temperate zone biologists for whom Stutchbury & Morton wish to enlighten with tropical biology and to stimulate more research on tropical birds. To stimulate more studies of avian behavioral ecology in the tropics the authors provide a theoretical framework for understanding differences between temperate and tropical behavioral ecology. This is based on latitudinal differences in extra-pair mating and biotic interactions and their influence on life history traits in tropical birds, a framework that is evident throughout the book.

Extra-pair mating systems figure prominently in Stutchbury & Morton's examples of temperate zone biases in avian behavioral ecology. As recent temperate zone studies of paternity (usually by DNA fingerprinting) have repeatedly demonstrated, extra pair fertilizations (EPFs) are common (often representing over 20% of a female's chicks) in previously presumed monogamous species. EPFs are now considered the norm for most birds and hence the distinction between social monogamy (pair raise young together) and genetic monogamy (pair mate exclusively with each other). However, the authors question whether extra-pair mating systems are the norm for birds, by citing tropical evidence to the contrary. They note that male tropical passerines have smaller testes than temperate zone species (often 1/10th the size) which predicts a low level of sperm competition among males, indicating few EPFs in tropical species. Moreover, the few socially monogamous tropical species that have been fingerprinted have few or no extra-pair young. From this evidence the authors argue that extra-pair mating systems are likely to be uncommon in socially monogamous tropical birds, and hence extra-pair mating systems are not the norm for birds.

Stutchbury & Morton argue that the original misconception that extra-pair mating systems were the avian norm arose from the fact that temperate zone birds are forced to breed synchronously, and synchronous breeding in turn fosters the evolution of extra-pair mating systems. More recent tropical studies indicate that long breeding seasons result in asynchronous breeding and absence of extra-pair mating. Thus it is the breeding season length, determined largely by latitude that determines breeding synchrony and hence the incidence of extra-pair matings.

Similarly, in the view of Stutchbury & Morton our understanding of the role of testosterone in male reproductive behavior has been biased by temperate zone studies. The temperate zone evidence indicates that testosterone production in monogamous males increases (associated with testes size increase) during territory establishment and pair formation and then subsequently declines when males are feeding young. The authors cite experimental studies indicating that increases in testosterone suppresses male parental care, but increases male attractiveness to females including success in obtaining extra-pair fertilizations. This has become our textbook

example of testosterone's role in monogamous birds.

But again, the authors argue that our view has been clouded by the temperate zone bias, as recent evidence from the tropics indicates. Males of tropical species have been shown to have small testes and low testosterone output throughout the breeding season despite active territorial defense and song output. Thus our generally accepted scenario of high testosterone output required by males for mate attraction and territorial defense, may be limited to temperate zone birds where synchronous breeding requires elevated testosterone production as an adaptation to intense competition for EPFs.

Temperate-tropical comparisons are used effectively throughout the book to help identify underlying factors selecting for various characteristics associated with the timing of breeding, life history, mating systems, territoriality, communication, and various biotic interactions. The comparative approach is not just limited to latitudinal comparisons but includes comparisons of species behavior among tropical habitats as well as between closely related species within the same habitat (e.g., two *Elaenia* species), which are valuable in supporting their arguments. In addition, a thorough review of the relevant tropical literature is provided and serves as a useful source for avian behavioral ecology in the tropics.

Given that relatively few tropical species have been studied, many of the conclusions of the authors appear to be somewhat speculative, but if viewed as working hypotheses these should stimulate future tropical research. The book is an excellent source for identifying important questions or issues for research in the tropics and it is for this reason that this text is required reading for all my University of Puerto Rico students. All those with an interest in tropical birds should read this book and those with interests in temperate zone behavioral ecology will benefit by seeing the behavior of temperate zone birds in a different perspective.—Joseph M. Wunderle, Jr., International Institute of Tropicial Forestry, U.S. Forest Service, Box 490, Palmer, PR 00721, USA.