

Molecular Markers, Natural History, and Evolution. 2nd edition

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BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

So long as its shortcomings are recognized, this book has a wealth of information on the distribution and ecological biogeography of birds. Ornithologists would be aided by having it on their bookshelves as a reference for examples of major distributional patterns, island biogeography, apparent habitat limitations, and bird movements. It is not a modern assessment of speciation or historical biogeography. After major revisions to the first section on systematics, subsequent editions could be profitably retitled "A Global Perspective on The Ecology of Avian Distributions."—ROBERT M. ZINK AND ANDREW W. JONES, *Bell Museum and Department of Ecology, Evolution and Behavior, University of Minnesota, St. Paul, Minnesota 55108, USA.* E-mail: rzink@cbs.umn.edu

LITERATURE CITED

- BARKER, F. K., G. F. BARROWCLOUGH, AND J. G. GROTH. 2002. A phylogenetic hypothesis for passerine birds: Taxonomic and biogeographic implications of an analysis of nuclear DNA sequence data. *Proceedings of the Royal Society of London, Series B* 269:295–308.
- FELSENSTEIN, J. 1985. Phylogenies and the comparative method. *American Naturalist* 125:1–15.
- MAYR, E., AND P. ASHLOCK. 1990. *Principles of Systematic Zoology*. McGraw-Hill, New York.
- SHAPIRO, B., D. SIBTHORPE, A. RAMBAUT, J. AUSTIN, G. M. WRAGG, O. R. P. BININDA-EMONDS, P. L. M. LEE, AND A. COOPER. 2002. Flight of the dodo. *Science* 295:1683.
- SIBLEY, C. G., AND J. AHLQUIST. 1990. *Phylogeny and Classification of Birds*. Yale University Press, New Haven, Connecticut.
- SLOWINSKI, J. B., AND C. GUYER. 1989. Testing the stochasticity of patterns of organismal diversity: An improved null model. *American Naturalist* 134:907–921.
- are used across organismal biology. How far we have come in a decade! Until it went out of print, the first (1993) edition was probably the most frequently borrowed—and least often returned—volume from my office bookshelf. Describing the many ways molecular tools could be brought to bear on ecological and evolutionary questions and written in a style that illuminated the excitement of pursuing those studies, Avise's first edition was an engaging introduction for upper-level undergraduates interested in a research career or for graduate students searching for research themes.
- Despite my open enthusiasm for the first edition, in less than the mean-generation time of a typical seabird, the world of molecular markers has been transformed, making the 1993 edition sorely antiquated. Whole subdisciplines have risen and fallen: basic phylogeography (a term coined by Avise) was all the rage in the early 1990s, but today, journals such as *Evolution* and *Molecular Ecology* have adopted editorial policies that deter descriptive phylogeography, unless it is used to explore broader patterns or theories. Sequencing has eclipsed RFLP-based (restriction fragment length polymorphism) techniques, microsatellites have replaced fingerprinting, the molecular sexing bandwagon has traveled far down the road, and hundreds of genomes have been sequenced (though we are still waiting for a passerine).
- Given this background of a rapidly evolving discipline, the big questions in assessing this second edition are (1) has Avise retained the sense of intellectual excitement that made his first edition such a compelling and inspiring read, and (2) how well has the volume adapted to the changing landscape of molecular tools and their myriad applications?
- The new edition succeeds on both fronts, with only a few caveats. Its best feature is the five long chapters on particular applications of molecular markers (Individuality and Parentage; Kinship and Intraspecific Genealogy; Speciation and Hybridization; Species Phylogenies and Macroevolution; Conservation Genetics) that make up the bulk of the book. Those chapters cover their respective topics thoroughly, giving example after example of how molecular markers have provided a window onto processes that were otherwise obscure or intractable. They retain the narrative excitement that characterized the first edition, and they are highly

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Molecular Markers, Natural History, and Evolution. 2nd edition.—John C. Avise. 2004. Sinauer Associates, Sunderland, Massachusetts. 684 pp. ISBN 0-87893-041-8. Paper, \$59.95 (no cloth edition).—This is the second edition of John Avise's survey of how molecular markers

readable, with jargon usually limited to the requisite minimum; only occasionally does more arcane language creep in, and those chapters will be accessible to (if sometimes challenging for) upper-level undergraduates. The examples are rich enough that more experienced readers will also find much of interest here, and my own review copy has a number of dog-eared corners indicating topics or citations I want to explore more deeply.

I was less engrossed by the three preceding chapters (History of Interest in Genetic Variation; Molecular Techniques; Philosophies and Methods of Molecular Data Analysis) that survey the history and composition of the molecular toolbox. Those sections are essentially retrospective, an understandable slant for the history chapter but a less positive attribute of the techniques chapters. There is detailed coverage, often with full-page figures, of many methods that are no longer in broad use, such as gradient centrifugation for purifying mitochondrial DNA, RFLP techniques for assaying mtDNA variation, and the UPGMA (unweighted pair-group method with arithmetic mean) tree-reconstruction algorithm. At the same time, there is surprisingly sparse coverage of some high-profile newer techniques that are more likely to be used by current and future students, such as single-nucleotide polymorphism (SNP) markers and Bayesian phylogenetics, each of which is allocated only a single short and not very informative paragraph with no figures and few citations to other sources of information. This backwards focus in the methods-oriented chapters is especially unfortunate, given Avise's oft-demonstrated knack for quickly adopting new methods and seeing before most of his peers how they can be applied in novel ways; his take on the current crop of new techniques would have been interesting to hear.

This retrospective orientation is not carried forward into the later natural-history chapters, in which classic references are given alongside an impressive array of very recent citations. As befitting a maturing discipline, the bibliography in the second edition has roughly twice the number of citations included in the first edition. In a number of cases, I learned of an interesting forthcoming paper from Avise's bibliography substantially before the paper came out in print—an indication of the contemporary nature of the book's citation base.

An additional strength of this volume is its taxonomic breadth: it covers examples ranging from clonality in bdelloid rotifers to the (not very challenging) forensics of identifying the origin of the blood on O. J. Simpson's famous glove. Given Avise's long-term research program, it is not surprising that many examples are drawn from fish; but if there is a bias, it is one that ornithological readers will approve of: birds are the most-cited organismal group by a substantial margin.

One drawback of the book is its low-quality binding. At present, this second edition is available only in paper covers, and these are not durable—with any sort of regular use, pages begin to detach. This book is likely to be adopted in seminar-level courses, and the poor binding may be a strategy to avoid resale on the used textbook market. If so, it is unfortunate that a hard-cover edition is not available for long-term users, including libraries.

In summary, this is an impressive reworking of a book that was certainly worth updating. This volume is not a detailed review of a particular topic or theory or a thorough users' guide to a set of techniques, but rather an unusual combination of the two with substantial hybrid vigor. At heart, Avise's book is an inspiring reminder of how field and laboratory perspectives can be combined to answer profound biological questions, and of how fun it is to become immersed in these explorations of molecular natural history.—IRBY J. LOVETTE, *Laboratory of Ornithology, Cornell University, 159 Sapsucker Woods Road, Ithaca, New York, 14850, USA. E-mail: ijl2@cornell.edu*

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Birds of Thailand.—Craig Robson. 2002. Princeton University Press, Princeton, New Jersey. 272 pp., 128 color plates, ~965 maps. ISBN 0-691-00700-4. Paper, \$24.95. Cloth, \$49.50.—This field guide is a condensed version of Robson's *A Field Guide to the Birds of Southeast Asia* (2000) and uses most of the same illustrations, taxonomy, and nomenclature. At the same time, this