

of pest ant identification, biology, behavior, and management. The book does an excellent job of providing a well-organized and easy-to-use guide that will primarily appeal to pest management professionals and the interested public. After a brief introductory chapter on ant evolution and ecology, the volume progresses through six chapters conveniently arranged by subfamily. Each of these chapters provides a dichotomous key to species with line drawings, a wealth of information on species biology, habits, distribution, and up-to-date data on species-specific management methods. The remaining two chapters provide practical information on medical consequences of ant stings and current technologies available for ant management. Overall, this contribution is an important source of information on the biology and management of urban pest ants and constitutes a welcome successor to the first book of this kind, *Field Guide for the Management of Structure-Infesting Ants* (S. A. Hedges. 1998. Second Edition. Cleveland (OH): GIE Media, Inc.).

The only things about this volume that are less than ideal are the poor quality of the black-and-white photographs, as well as the lack of individual species photographs with size reference bars and species distribution maps. However, anyone frustrated by the dearth of lively color photographs and still unable to decide whether the "[m]esosomal dorsal profile [is] evenly or . . . not evenly rounded" (p. 54) will be happy to know that this reasonably priced paperback may itself be an economical and effective ant control tool when used to smash unidentified ants walking across one's desk.

GRZEGORZ BUCZKOWSKI, *Entomology, Purdue University, West Lafayette, Indiana*

CHALLENGES FOR DIADROMOUS FISHES IN A DYNAMIC GLOBAL ENVIRONMENT. *Based on a symposium held in Halifax, Nova Scotia, Canada, 18–21 June 2007. American Fisheries Society Symposium, Volume 69.*

Edited by Alexander J. Haro, Katherine L. Smith, Roger A. Rulifson, Christine M. Moffitt, Ronald J. Klauda, Michael J. Dadswell, Richard A. Cunjak, John E. Cooper, Kenneth L. Beal, and Trevor S. Avery. Bethesda (Maryland): American Fisheries Society. \$69.00. xxiii + 943 p.; ill.; no index. ISBN: 978-1-934874-08-0. 2009.

This edited volume is a compilation of contributions from an American Fisheries Society symposium held in 2007. It features recent research into the evolution and ecology of diadromous fishes and describes the threats facing these species in a dynamic geophysical, biological, and sociopolitical environment. This is a timely publication given that many diadromous fish species around the

world are in steep decline due to habitat alteration, harvesting, pollution, hydropower development, and global climate change.

Diadromous fishes are characterized by life cycles that involve migrations between freshwater and marine habitats. The most familiar forms of diadromy are anadromy (reproduction in freshwater and growth at sea, as exemplified by salmonids) and catadromy (reproduction at sea and growth in freshwater, as exemplified by anguillid eels). However, diadromy comprises a broad spectrum of migratory behaviors that vary considerably among species, among populations within species, and even within populations.

This volume begins with two plenary papers, which characterize the complexity of diadromous fish life cycles (McDowall; Quinn et al.). Following these papers are the six main sections that comprise the book: The Dynamic Nature of Diadromy; Climate Change and Anthropogenic Influences; Ocean Migration of Diadromous Fishes in a Changing Global Environment; Linkages with Ecosystem Energetics; Population and Habitat Restoration; and Management and Governance of Diadromous Fishes: Sociological, Economic, Political, and Ecological Considerations. Rounding out the volume are concluding remarks from the plenary speakers, contributions from poster sessions, and poster abstracts.

The spatially and temporally complex migration patterns of diadromous fishes present biologists, resource managers, and policymakers with challenges in understanding and ultimately conserving diadromous fishes. This volume contains papers that describe a wide array of innovative approaches and technologies that are being applied to diadromous fish research, including population genetic and phylogenetic analyses (Dodson et al.; Bradbury et al.), otolith microchemistry (McCleave and Edeline; Howland et al.), acoustic tagging techniques (Grothues et al.; Bradford et al.; Kocik et al.; Stokesbury et al.), modeling approaches (Lassalle et al.; Monk and Curry; Jellyman and Bowen; Woodland et al.), physiological assays (McCormick et al.), paleolimnological reconstructions (Gregory-Eaves et al.), and stable isotope-based food web analyses (Jardine et al.; Sinnatamby et al.; Swanson and Kidd). In addition to papers that describe research on the biology of diadromous fishes, this volume contains contributions focused on the design and implementation of effective conservation and restoration strategies for diadromous species. Several papers draw upon the traditional cultural and economic importance of diadromous fishes to inform effective management (Haggan et al.; Anderson et al.; Siddique), while others focus on the importance of understanding the complex couplings between natural ecosystems and human sociopolitical systems (Lackey;

Bevacqua et al.; Hammer; Blaber; Rochard et al.) and the role played by science in decision-making (Hill; Trial; Willis). Overall, this volume contains a valuable collection of research papers and reviews that will be useful for students, researchers, and resource managers interested in the many biological questions and conservation challenges presented by these diverse and fascinating fishes.

ERIC P. PALKOVACS, *Marine Laboratory, Nicholas School of the Environment & Earth Sciences, Duke University, Beaufort, North Carolina*

REPRODUCTIVE BIOLOGY AND PHYLOGENY OF FISHES (AGNATHANS AND BONY FISHES): PHYLOGENY, REPRODUCTIVE SYSTEM, VIVIPARITY, SPERMATOOZOA. *Reproductive Biology and Phylogeny, Volume 8A.*

Edited by Barrie G. M. Jamieson. Enfield (New Hampshire): Science Publishers. \$145.00. xiv + 788 p.; ill.; index. ISBN: 978-1-57808-580-4 (Volume 8A); 978-1-57808-271-1 (series). 2009.

This book is one of a number of volumes in a series entitled Reproductive Biology and Phylogeny that addresses a wide variety of taxonomic groups. One major feature of the book, as with others in the series, is the attention to phylogeny and classification as a framework for understanding reproductive biology, although not all of the chapters may have a phylogenetic perspective.

This particular contribution is the first of two parts that examine agnathans and bony fishes. It comprises 17 chapters, each of which includes references for the literature cited in the chapter. Collectively, the contributions are authored by several internationally recognized researchers. The first chapter specifically addresses phylogeny and classification. The following three chapters are concerned with teleost reproduction: ovarian structure, folliculogenesis, and oogenesis; morphological modifications of ovaries and testes for viviparity; and testicular morphology and spermatogenesis. One chapter summarizes knowledge of the anatomy, histology, and fine structure of the efferent testicular duct system in Euteleostomi (=Osteichthyes). Eleven chapters each focus on the ultrastructure of spermatozoa in a particular taxonomic group of fishes. The final chapter addresses sperm modifications for insemination in teleosts.

An enormous amount of information is compiled in this text. Without a doubt it will be an invaluable reference for a wide variety of biologists, notwithstanding the cost of obtaining a copy.

DAVID C. HEINS, *Ecology & Evolutionary Biology, Tulane University, New Orleans, Louisiana*

REPRODUCTIVE BIOLOGY AND PHYLOGENY OF FISHES (AGNATHANS AND BONY FISHES): SPERM COMPETITION, HORMONES, SEXUAL SELECTION, REPRODUCTIVE MODES, FERTILIZATION, SEX DETERMINATION, PARENTAL CARE, CONSERVATION, CRYOPRESERVATION, EMBRYOLOGY, GENETICS. *Reproductive Biology and Phylogeny, Volume 8B.*

Edited by Barrie G. M. Jamieson. Enfield (New Hampshire): Science Publishers. \$139.50. xii + 540 p.; ill.; index. ISBN: 978-1-57808-581-1 (Volume 8B); 978-1-57808-271-1 (series). 2009.

Reading this book makes one wonder why all zoologists, or at least those interested in reproduction, evolution, or ecology, do not work exclusively on fish. The roughly 28,000 species of fish encompass far more diversity in physiology, life history, and mating system than any other vertebrate clade, and in a much shorter span of evolutionary time, the fish have diverged to such an extent that they often rival the invertebrates. Most of this diversity is contained within the bony fishes, which also comprise the vast majority of species. This diversity grants a great deal of power for comparative study, and that is what motivates many of the chapters of this edited volume.

The book, part of the series Reproductive Biology and Phylogeny, is organized into 13 chapters, each written by respective experts. The chapters reflect a range of biological perspectives, including development, endocrinology, conservation, aquaculture, and ecology, and the different points of view create an overall appreciation for the utility of these animals in science and society. Most chapters survey the title clade, or large portions of it, although a few chapters are more narrowly focused (the chapter on sex determination is primarily concerned with the rice-fish genus *Oryzias*, which is a shame as other fish species have some marvelously bizarre ways of determining sex).

This volume will be most useful to evolutionary ecologists, as it collects together excellent chapters on parental care, sexual selection, and sperm competition that both review and synthesize the literature. This evolutionary ecology focus is complemented by a deeper understanding of the physiological aspects of reproduction from several other chapters. Taken as a whole, the various contributions assume that readers have both biological literacy and training, and the book is intended more for a specialist than a generalist audience.

JUDITH E. MANK, *Zoology, Edward Grey Institute, University of Oxford, Oxford, United Kingdom*

THE RISE OF AMPHIBIANS: 365 MILLION YEARS OF EVOLUTION.

By Robert Carroll. Baltimore (Maryland): Johns Hopkins University Press. \$65.00. xiii + 360 p. + 16 pl.; ill.; index. ISBN: 978-0-8018-9140-3. 2009.

This substantial book provides a valuable synthetic introduction to the evolutionary history of a group of tetrapods that are loosely called amphibians.