

## **ADVANCES IN PARASITOLOGY, VOLUME 97**

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## BOOK REVIEW

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**Advances in Parasitology, Volume 97.** By David Rollinson and J. Russell Stothard (serial editors). Academic Press, London, UK. 2017. 336 pp. Print ISBN: 978-0-12-811558-9, Ebook ISBN: 978-0-12-811559-6. US \$231 print (£140) or US \$231 Ebook (£168).

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*Review by Renée E. Carleton*

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*Advances in Parasitology*, a serial published for over five decades, is internationally recognized as a premier review journal covering a vast spectrum of modern and traditional topics in parasitology. Individual volumes within the series typically focus on a particular theme or topic. The editors of *Volume 97* continue this history by providing six chapters detailing updated information and exciting advancements for some of the major parasitic protists affecting man and animals. Although the majority of chapters cover causative agents of human diseases, this volume contains a diversity of information that should interest nearly anyone working or studying within the fields of parasitology, epidemiology, disease ecology, or wildlife diseases. Each one is thoughtfully and thoroughly written and well-researched by leaders in their respective fields, as would be expected of a journal series receiving an ISI impact factor greater than 6.0.

Chapter 1, “Chagas Disease Diagnostic Applications: Present Knowledge and Future Steps,” presents an extensive review of what is currently known about the biology and epidemiology of *Trypanosoma cruzi*, the causative agent of Chagas disease. The

chapter also provides important information on recent advances in serologic and molecular detection and point-of-care diagnosis. The graphics included are top-notch, with a schematic figure of the parasite life cycle that is well-detailed without sacrificing clarity and a highly useful table summarizing diagnostic methods, estimated performance under chronic, acute, and congenital case categories, and appropriateness in a point-of-care-setting. The chapter concludes with a discussion of biomarkers as a future diagnostic tool.

The highlight of Chapter 2, “Host-Parasite Relationships and Life Histories of Trypanosomes in Australia,” is an overview of trypanosomes infecting Australian wildlife and a brief history of the discovery of each. The very useful Table 1 lists all trypanosome species identified to date in Australian wildlife with their vertebrate hosts, a reference for each, and whether the identification was based on morphologic or genetic data. Oddly, this information is not presented until the seventh page of the chapter. Within the first six pages, the authors present a comprehensive review of trypanosome biology, descriptions of human trypanosome-caused diseases in the Americas and Africa, and general animal trypanosomiasis. Although this is important information, it is standard material that could easily be found in other sources, including in Chapter 1. Also unnecessary, and distracting in my opinion, is the first of two side boxes, “Investigating and understanding *Trypanosoma* life histories,” which spans a bit over five pages of the electronic version I read. The authors get back on track in the

chapter's third section with a comprehensive and thought-provoking discussion of Australian trypanosome life histories and evolutionary relationships. The final section begins with a review of the effects of certain trypanosomes on Australian wildlife species. I found this information particularly significant in terms of the conservation of endangered endemic species including koalas (*Phascolarctos cinereus*) and woylies or brush-tailed bettongs (*Bettongia penicillata*). Unfortunately, the following paragraphs move tangentially away from this focus to describe the intracellular behavior of *T. cruzi* and other American and African trypanosomes before returning to intracellular trypanosomes of Australia. The final section nicely discusses problems with current knowledge and future directions for research regarding trypanosomes in Australia.

Chapter 3, "The Compatibility Between *Biomphalaria glabrata* Snails and *Schistosoma mansoni*: An Increasingly Complex Puzzle," addresses the interesting phenomenon of polymorphic compatibility between a parasite and its intermediate host. The review discusses two current hypotheses proposing why certain snails exhibit resistance to infection and provides molecular evidence suggesting that multiple factors (i.e., genetic and environmental) likely influence host-parasite compatibility.

Transmission-blocking as a means to suppress infection is the focus of Chapter 4, "Targeting the Parasite to Suppress Malaria Transmission." This chapter begins with a detailed review of *Plasmodium falciparum* biology and mosquito control efforts. The following sections discuss, albeit too briefly, transmission-blocking strategies including use of antiparasitic drugs, vaccines, and genetically modified mosquitoes. In the final section, the authors propose methods to analyze the success of such strategies and champion a seasonal application based on mosquito biology.

Chapter 5, "The Role of Spatial Statistics in the Control and Elimination of Neglected Tropical Diseases in Sub-Saharan Africa: A Focus on Human African Trypanosomiasis, Schistosomiasis and Lymphatic Filariasis," is

not for those "faint-hearted" in the realm of spatial analysis. It is a solid, but highly technical, introduction to an increasingly important tool in statistical analysis and epidemiology. Although focused on human diseases, the material within could be applied to many diseases affecting wildlife (e.g., those mentioned in Chapter 2 of this volume). I found the fifth section of this chapter, "Sources of spatially referenced data," especially interesting and potentially very useful. The section contains a bounty of information on global disease databases and resources for disease risk tracking. Also included are brief reviews of applicable software programs with hyperlinks.

The final chapter of the volume, "Is Predominant Clonal Evolution a Common Evolutionary Adaptation to Parasitism in Pathogenic Parasitic Protozoa, Fungi, Bacteria, and Viruses?" provides a review of the recently proposed Predominant Clonal Evolution model for micropathogens. Supportive evidence for and an extensive discussion of the model is contained within the thirteen sections making up this long chapter.

The electronic version, which I read for this review, contains hyperlinks to all figures, tables, and cited references including external links to referenced websites. This is a very useful feature but, annoyingly, the "return to previous history item" tab does not necessarily take the reader back to the original hyperlinked location. I tried this several times and frequently was returned to the first page of section or of the particular chapter containing the hyperlink. There are also instances of misspelled words, grammatically odd phrasing, out-of-place punctuation, and improperly capitalized words which could be attributed to the conversion of text to pdf. One example of this occurs in Chapter 2 wherein Noisy Miner (*Manorina melanophrys*; Avibase 2017) appears more than once as Noisy Minor.

*Advances in Parasitology, Volume 97* is a fine source of updated information on or related to certain parasitic protists of medical and, to a much lesser extent, veterinary or wildlife significance. The tables and figures

included in each chapter are informative, complete, and composed with clarity. I would highly recommend this book to researchers and graduate students working on the protists prominently featured in the chapters. Although many readers of the *Journal of Wildlife Diseases* should find certain chapters interesting and useful, it is not a reference book that would be retrieved frequently from one's bookshelf. It is, however, very deserving of access through an institutional library

where the information could be obtained without the expensive investment.

#### LITERATURE CITED

Avibase. 2017. *Bird checklists of the world: Australia*. <https://avibase.bsc-eoc.org/checklist.jsp?region=AU&list=clements>. Accessed September 2017.

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