The Biology of Echinostomes: From the Molecule To the Community

Bernard Fried and Rafael Toledo (Editors), Springer, New York, NY 10013, USA (Springer Science + Business Media LLC, 2009), 333 p, ISBN 978-0-387-09576-9.

The Biology of Echinostomes: From the Molecule to the Community is comprised of 13 review articles. The first chapter (Chapter 1) provides a review of the most significant literature on the recent findings in echinostomatid systematics and life-cycles (by Esteban and Muñoz-Antoli). The second chapter (Chapter 2) reviews the complex interactions in the first intermediate snail host, especially *Biomphalaria-Echinostoma* system and recent advances in their immunological and molecular interactions (by Coustau et al.). Chapter 3 is on the host-parasite dynamics in the second intermediate hosts: the biology of metacercariae (encystment, site selection, development and excystation), species of second intermediate hosts, behavioral and morphological changes of infected hosts, pathology of metacercariae in infected hosts and the effects of pesticides, herbicides, and marinades on the echinostome metacercariae (by Keeler and Huffman). Chapter 4 is on the establishment and development within the definitive hosts: host specificity and infectivity, excystment, habitat and distribution, growth and development, mating behavior, and fecundity of echinostomes in the definitive hosts (by Toledo).

In Chapter 5, the studies on maintenance, cultivation, and excystation of echinostomes (on maintenance of life-cycles in the laboratory) were reviewed, studies of which were mainly carried out in Bernard Fried's laboratory from 1999 to 2007 (by Fried and Peoples). Chapter 6 is on some aspects of the biology of certain species of echinostomes in the wild and the experimental models developed with the purpose to gain a better understanding of the biology of this group of parasites (by Maldonado and Lanfredi). The following chapter, Chapter 7, treats the echinostomes infecting humans. It contains the valuable and wide-ranging information on the taxonomy, biology, epidemiology, pathology, symptomatology, diagnosis, treatment, prevention, and control of these food-borne trematode infections (by Chai). Chapter 8 reviews the literature on the pathol-

ogy and immunology in animal host-parasite systems. This chapter provides useful information on the manifestations and mechanisms of resistance to infection, experimental strategies, and antigenic characterizations of echinostomes (by Toledo).

In Chapter 9, genomic and proteomic studies are analyzed in detail to indicate advantages and pitfalls in the research using echinostome organisms. Despite the lack of a genome sequence project and the low number of sequences deposited in the databases, genomic studies have been preceded by some research groups, and their genomic data will deeply affect the future studies. The proteomic studies are focused on the excretory/secretory proteins and their role in host-parasite relationships (by Marcilla). Chapter 10 treats the chromatographic and atomic spectrometric methods used for the qualitative and quantitative analysis of organic and inorganic constituents of echinostomatid flukes and occasionally host tissues (by Sherma and Fried). Chapter 11 is a review of host-parasite interactions in nature associated with the emergence of *Ribeiroia* spp. (members of echinostome group in broader sense) and echinostome infections in the amphibian populations of North America. These trematode metacercariae provoke severe pathological changes, and are important cause of population decreasing in amphibians (by Johnson and McKenzie). Chapter 12 reviews host-parasite interactions in experimental rodent hosts with echinostomes, which are concurrently infected with heterologous species of *Echinostoma* and other helminths or protozoans (by Nolan and Graczyk). Finally, Chapter 13 briefly reviews on the use of echinostomes in chemotherapeutic studies and provides a comprehensive overview of metabolic profiling using an *Echinostoma caproni*-mouse model (by Saric et al.).

Comprehensively, this book provides the most recent information on echinostome researches, and widely covers from the basic biology to the application of novel techniques on the host-parasite interactions. Especially in the field of experimental parasitology, echinostomes will undoubtedly be an excellent experimental model because their life cycles are easily maintained in the laboratory. Therefore, this book will be very useful to obtain the valuable and wide-ranging information on experimental

concepts, methodologies, and technologies for the study of helminths, in particular, echinostomes. It will also be useful for researchers of medical and veterinary fields.

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