

Book Reviews

The Biology of Disease Vectors, 2nd Edn. (ed. Marquardt, W. C.), pp. 785. Elsevier Academic Press, USA, 2005. ISBN 0 12 473276 3. £62.99. doi:10.1017/S0031182005219674

Vector biology has become a fast moving field. Spurred on by the recent exciting advances in the molecular biology, genomics and latterly proteomics of vector insects and their pathogens, researchers are using new approaches and our knowledge is rapidly increasing. The second edition of this volume very much reflects these advances. The editor, William Marquardt, has assembled a team of section editors to oversee the production of 57 short chapters, divided into 7 parts. With a few exceptions, these experts are drawn from the USA, a reflection no doubt of the history of the first edition which was produced to accompany the Biology of Vector Disease course, given at Colorado State University. The text is aimed at post-graduate and post-doctoral researchers, working in a range of areas associated with vector biology and vector-borne diseases. It provides an excellent opportunity to obtain an initial overview of a new area or to dip into a field that may be peripheral to the topic under investigation.

The 7 sections are arranged such that chapters covering wide-ranging aspects of vector biology are sandwiched between an initial introduction to vectors and the pathogens that they transmit and a final section devoted to methods of containment, care and maintenance. Part One takes a traditional approach by focussing upon arthropod taxonomy and evolution and most chapters include an outline of key aspects of pathogens transmitted by the respective vectors. Part Two is devoted to epidemiology and surveillance and chapters cover theoretical aspects of the vector–pathogen relationship and its application to population biology. Practical aspects of surveillance include the use of molecular and geographical information system methods with up-to-date examples such as the spread of West Nile virus across the USA. The section on physiology covers aspects particularly relevant to blood feeding, pathogen transmission and defence. This is followed by a section on vector genetics composed of 3 comprehensive chapters covering vector competence, genome evolution and population genetics and a section on molecular biology. Both of these sections provide clear, well-illustrated explanations of the latest methodologies, culminating in examples of studies using gene silencing and stable transformation of vectors. Part Six covers strategies for control of insects and acarines. The final section provides practical advice and many useful tips for successful arthropod husbandry.

The time-lag that inevitably occurs during the publication of a volume such as this has resulted in the references and further reading lists generally lacking reviews and articles post 2001–2 but, without exception, chapters provide an excellent grounding from which the reader can consult the latest publications. The book is illustrated throughout with line drawings, diagrams and colour plates of a very high standard and is pleasing to the eye, though rather heavy to carry. The style is light, but informative, and both attracts and keeps the reader's attention whilst encouraging further study *via* the recommended reading lists. The reasonable price makes it good value for money and I recommend it highly to new investigators and old hands alike.

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Keys to the Trematoda. Volume II (ed. Jones, A., Bray, R. A. and Gibson, D. I.), pp. 768. Commonwealth Agricultural Bureau International (CABI Publishing), UK and The Natural History Museum, London, UK, 2005. ISBN 0 85199 587 X. £150.00. doi:10.1017/S0031182005229670

Trematodes (flukes or digeneans) are by far the most abundant group of parasitic flatworms (Neodermata), and their importance for human and animal health is indisputable. In addition, they exhibit a variety of unique adaptations to parasitism and, probably most remarkably, possess extraordinarily complicated life-cycles. Classification of trematodes represents a very difficult task due to the huge number of existing species and variety of morphological forms, sites of infection within invertebrate and vertebrate hosts and ability to infect a wide spectrum of animals. Therefore, identification of any trematode may represent a problem even for an experienced specialist. This is the reason why I appreciated so much the publication of the first volume of the *Keys to the Trematoda* in 2002.

The second volume of the *Keys* appeared a few months ago and continues in the same style as the first volume. This means that the basal taxonomic category considered is a superfamily, with individual families treated as separate units. Each chapter starts with a brief overview of taxonomic history and nomenclatorial and systematic problems of individual genera are commented on. The core of each chapter represents the keys to genera with detailed diagnoses. As in the first volume, the authors

of most chapters based their conclusions on their own evaluation of specimens, including types.

The second volume provides keys to superfamilies, families and genera of the order Echinostomida and some of those in the order Plagiorchiida of the subclass Digenea of the class Trematoda. The following superfamilies are included: Echinostomatoidea Looss, 1899; Haploporoidea Nicoll, 1914; Haplospinoidea Poche, 1926; Heronimoidea Ward, 1917; Microscaphidioidea Looss, 1900; Paramphistomoidea Fischöeder, 1901; Pronocephaloidea Looss, 1899; Allocreadioidea Looss, 1902; and Lepocreadioidea Odhner, 1905.

The book was prepared by 17 specialists from Australia, Brazil, Bulgaria, India, UK and USA. Most contributors have established world-wide reputations but it is pleasing that some young researchers were also invited. The text has been carefully edited and the editors also substantially contributed to the second volume as authors. The heaviest load was shouldered by Arlene Jones, who completely covered the most complicated and extensive group of this volume, amphistomes (superfamily Paramphistomoidea), in addition to other minor groups, such as liver flukes (Fasciolidae). Besides the editors, a most considerable contribution was made by Aneta Kostadinova from Bulgaria (Echinostomatidae, Cathaemasiidae, part of Liliatremidae) and Tom Cribb and David Blair from Australia with their co-workers.

Since I work on fish helminths, I particularly enjoyed the very detailed and well-illustrated chapters on haploporids (Robin Overstreet and Stephen Curran from USA) and allocreadiids (Janine Caira from USA and Tami Bogéa from Brazil). In general, most chapters are of excellent quality and they should serve as an example of how modern taxonomic papers should look, being based on thorough examination of good-quality specimens.

Just one year after the first volume of the Keys had appeared, a fundamental paper on the systematics and phylogenetic relationships of the Digenea was published (Olson *et al.* 2003: *International Journal for Parasitology* **33**, 733–755). The authors proposed some substantial changes in the classification of trematodes, including invalidity of the Echinostomida, one of the three orders accepted in the Keys. Conclusions and taxonomic actions proposed by Olson *et al.* (2003) could not be considered due to shortage of time and because the priority of the Keys was to provide guides for the identification of adult digeneans based on their morphology. The groups, in which classifications inferred from morphological characters and molecules are not congruent, await future investigations.

In reviewing the first volume (*Folia Parasitologica* **50**, 56, 2003), I mentioned the problem of lists of species within each genus. It is obvious that such lists would be extremely helpful but this task is not

feasible, for three main reasons. First, preparation of these lists would require a revision of each genus with assessment of taxonomic status of each species, which would take much time. Secondly, there are insufficient specialists with adequate knowledge to cover all trematode groups. Thirdly, addition of species lists would considerably increase the number of pages in the Keys. The larger size of the second volume, compared with the previous one (by 200 pages), is undoubtedly one of the reasons for the high price of the book. However, it will serve as an invaluable source of taxonomic information for helminthologists, veterinarians and zoologists for many years ahead.

It is my pleasure to congratulate the editors for their effort and time spent in editing the book and to all contributors for their excellent work that will facilitate our studies on one of the most numerous and fascinating groups of parasitic animals.

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Leeches, Lice and Lampreys. A Natural History of Skin and Gill Parasites of Fishes. By G. C. Kearn, pp. 446. Springer, The Netherlands, 2005. ISBN 1 4020 2925 X. £63.00 (90.00).
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Fish parasitology has become an enormous field. The preface to this volume explains that the scope has been trimmed by focusing on those parasites most likely to be encountered by aquarists, anglers and naturalists – the external parasites; this approach excludes tapeworms, nematodes and most protozoans. The examples are mainly taken from the British fauna, but readers from other regions will find the subjects familiar.

This book is truly comprehensive. It begins with an overview of relevant features of the hosts and this sets the scene for later consideration of site specificity, effects of infection on various host tissues, and the capacity for resistance and repair. There is a chapter on protozoan parasites and then 4 chapters (90 pages) on monogeneans, the group on which Kearn has made such a distinctive research contribution. A major section is devoted to crustacean parasites – 8 chapters (over 140 pages), including 5 chapters on copepods – while further chapters consider molluscs and, as promised in the title, leeches and lampreys.

There is rich diversity in this spectrum of different phyla associated with the outsides of fishes. The final chapter summarizes this range with respect to reproduction, attachment, feeding, host and site specificity, pathogenic and immune interactions.

There is vivid demonstration of the inventiveness of parasitic adaptations – the incredibly complex jaw-like clamps of some monogeneans operated by a system of muscles, tendons, fairleads and pulleys. In *Argulus*, the crustacean limb, the first maxilla, has been transformed into a powerful sucker, but the steps involved in this evolutionary change defy the imagination. In this concluding chapter, Kern emphasizes the numerical dominance of crustaceans and the enormous diversity of their parasitic associations. This is the area familiar in older textbooks of ‘classical’ parasitology where readers may marvel at bizarre inventions, especially with regard to sex. Thus, some cymothoids change sex during life and the presence of one sex determines the sexual development of colleagues; loss of a female from the host results in males becoming female. Chondracanthid copepods have diminutive males attached to the female and probably parasitic on her. All this makes one wonder whether application of modern research techniques to these parasites might uncover fundamental principles about sex determination, developmental regulation and tissue differentiation.

The preface outlines the remit “to produce a well-structured text that is up-to-date and sufficiently informative to satisfy the professional biologist, whilst comprehensive and interesting for the enquiring amateur”. The book succeeds in all of this, and specialist parasitologists interested in ectoparasites and fish will find both a rich vein of new information and a satisfying review of well-established (“classic”) knowledge. The descriptive style produces a thoughtful, flowing narrative with an obvious fascination for detail. There is no concession to simplification or popularization for the “enquiring amateur”: the overviews represent a top-class discussion by a leading authority of this research field. The descriptive accounts benefit from the author’s extensive knowledge of the history of his field and of the literature, much of it out-of-reach to present-day readers, where remarkable insight was obtained by careful microscope observation. The author’s approach creates encyclopaedic coverage of the broad field. Much will be learnt about parasites largely unknown to non-specialists, while for parasites with which readers may have a general acquaintance this book provides meticulous detail: thus, the common fish louse, *Argulus*, is given a 27 page chapter. Particularly satisfying for the many parasite biology courses that cite *Entobdella* as a “type example”, a 24-page chapter includes a comprehensive review bringing together the author’s findings published since the early 1960s that make this the most intensively studied of monogeneans.

The book’s subtitle “*A natural history of ... parasites*” allows Kern to range comprehensively across all aspects of the biology of the organisms

within his remit; but, it should not be taken to suggest a general readership. Thus, there is a bibliography of 43 pages (with nearly 600 references) that is up-to-date and very valuable to researchers venturing across diverse fields. The thoroughness of approach is also reflected in detailed indices (another 14 pages), appendices of names of hosts and parasites (12 pages), and a comprehensive glossary of scientific terms (9 pages). An attractive and informative feature of this book, following the tradition of all Kern’s publications, is the wealth of illustrations. Most are Kern’s own line drawings, while many of those taken from other sources have been redrawn, giving a pleasing uniformity. The publishers have made an excellent job of production.

Lecturers in general parasitology and wider aspects of zoology, and students in search of essay material, will find a rich synthesis of “special interest topics”, such as circadian rhythms, host specificity, convergent evolution, symmetry, and many others. This is a work of great scholarship.

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Nematode Behaviour (ed. Gaugler, R. and Bilgrami, A. L.), pp. 432. CABI Publishing UK, 2004. ISBN 0 85199 818 6. £75.00 (US\$140.00). doi:10.1017/S0031182005249673

This book is dedicated to my Ph.D. advisor, Neil Croll (1941–1981), whose seminal text “The Behaviour of Nematodes” launched the field in 1970. The current effort is a thick, heavy tome when compared to Croll’s slim and elegant little book, directly reflecting the explosion of interest in the topic, due in no small part to a single nematode *Caenorhabditis elegans*. However, *C. elegans* is not the star of this book. The present effort is meant to be broad in its taxonomic scope, attempting to consolidate disparate nematode behaviours into a comprehensive up-to-date volume. Indeed, this is a formidable task in a world in which 4 out of every 5 metazoans is a nematode, and the end result is a bit uneven. To cover the taxonomic breadth, several chapters focused on simply describing proximate behaviours. Thus, Chapter 1 – Ecological and behavioural adaptations; Chapter 3 – Orientation; Chapter 4 – Feeding; Chapter 7 – Osmoregulation; and Chapter 8 – Physiological and biochemical basis of behaviour, were generally not synthetic, and read like catalogues of behaviour descriptors, often with little context on the natural history or biology of the responses. These chapters are not accessible to the non-specialist student, and their value lies primarily in their extensive literature searches. On the other hand, there are several wonderful pieces,

including Chapter 5 – Reproductive behaviour and Chapter 6 – Ageing and development, whose compelling and clearly written stories cut across the artificial lines of plant, insect, animal, and parasite designations, to address the essence of our understanding of nematode behaviour. In this group, I particularly liked Chapter 2 – Locomotion, for the succinct incorporation of historical ideas into the growth of current thinking in this area. Chapter 9 – Molecular basis of behaviour, was an excellent presentation of behaviour in the *C. elegans* model system, and the authors did an outstanding job making the concepts and techniques in this high-tech area accessible to students of general biology. The

remaining 4 chapters fell somewhere in the middle of the continuum. Overall, I think this a good effort, and I recommend this book for the shelves of every nematode biologist. It is valuable because of the sheer amount of information on nematode behaviour that it contains, and especially for the reference lists. For the 4 or 5 well-written chapters, this book is priceless!

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