

Mullen GR, Durden LA [Eds.]. 2018. *Medical and Veterinary Entomology*, 3rd edition. Academic Press, London, United Kingdom. 792 pp. ISBN 978-0-12-814043-7. US \$93.50 (paperback).

The importance of medical and veterinary entomology continues to be felt, because perpetual pests and vector-associated diseases relentlessly take their toll on humans and other animals. Malaria, lymphatic filariasis, dengue, bovine babesiosis, Nagana, Lyme disease, and many others continue to affect a disproportionate burden on the poorest of people, including their economic development, let alone their comfort and survival, while emergent diseases, such as Zika captivate the world. The World Health Organization (WHO) has estimated that 17% of all infectious diseases are vector-borne, causing more than 700,000 deaths annually. Billions of people are at risk of infection with dengue and the emergent Zika virus threatening millions, even placing the 2016 Olympic Games at risk. A recent outbreak of typhus in Los Angeles, California, USA, has highlighted that many of these ancient diseases can and do adapt to our modern world.

The field of medical and veterinary entomology is far from static. New discoveries, and an increased understanding of pathogens and new routes of passage through vectors, as well as the invasive nature of many of the most important pests and emergent pathogens means that timely updates of the most relevant information are needed. Such an approach can be challenging with a textbook. Mullen and Durden worked with over 40 authors to update all chapters, including improved images and maps, and have greatly improved the reach of this text.

The third edition of this book is the first revision in 10 years and includes contributions by 14 new authors. The initial 2 editions were exceptional, and this version takes the compiled knowledge and updated presentation of the material 1 step further. The book is expansive at over 790 pages, but well organized and divided into 28 chapters, and includes a concluding appendix listing the arthropod-associated viruses. An exceptional glossary is found at the back of the book with over 1,700 terms that, in itself, facilitates a greater understanding of the science. Although this book may seem quite daunting to students, the exceptional organization makes using the book quite easy.

As with the previous editions, this edition includes new chapters or expanded coverage to earlier chapters. Chapter 3: Venoms and Toxins, includes coverage on the expected spiders, scorpions, wasps, and bees, but also the less frequently thought of organisms in the Lepidoptera and Coleoptera. Chapter 28: Molecular Tools Used in Medical and Veterinary Entomology, first introduced in the 2nd edition, has nearly doubled in size, as would be expected with this ever-growing field. Important emerging mosquito-borne viruses are now covered, including

Zika, chikungunya, and tick-borne pathogens, including Bourbon and Heartland viruses, rickettsioses, and the red meat allergy associated with tick feeding.

As with previous editions, the book opens with an updated introductory chapter covering the historical perspective and types of problems caused by arthropods. Thereafter, 4 chapters provide an overview on morphological adaptations of parasitic arthropods, the aforementioned toxins and venoms, an exploration of epidemiology of vector-borne diseases, and forensic entomology.

Design of chapters is as in previous editions with taxonomy, morphology, life history, and behavior and ecology sections, followed by an overall split in sub-section topics by their public health or veterinary importance. Within the importance sections, the principal diseases or vectors and pests are presented. Such consistency makes use of the chapters exceptionally easy and functional. In most chapters, a section detailing prevention and control concludes the chapter. Each chapter is illustrated with images of the arthropods, distribution maps of the arthropods or diseases, and tables that concisely outline the great diversity of the relevant pest, pathogen, or disease information. Color imagery enhances the tables and figures, increasing their value to the reader. A great many line drawings are included, an important addition for use in arthropod identification.

This book is essential for teaching a course in either medical or veterinary entomology, and may be used as a supplemental reference for forensic entomology. That this edition is available in eBook format makes it an even better choice for many libraries, or for use in the many distance-based courses that are now offered. In addition to its use in a teaching setting, this book serves as an exceptional general reference for academics, physicians, veterinarians, and regulatory groups, as well as pest control. It is noted that this edition is the first not offered in a hard cover printing. Although having a paperback version can be helpful to students in keeping costs down, a hard cover option will be desired by many readers for both comfort in use, and durability of the textbook. A companion laboratory manual would be a welcomed addition, as current options are quite limited.

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