

## BOOK REVIEW

SONENSHINE D.E. & ROE R.M. 2013: BIOLOGY OF TICKS. 2nd ed. Oxford University Press, New York. Vol. 1: ISBN 978-0-19-974405-3 (hard cover), 560 pp., price USD 133.00, GBP 97.00; Vol. 2: ISBN 978-0-19-974406-0 (hard cover), 496 pp., price USD 133.00, GBP 97.00.

The second edition of *Biology of Ticks* is a long-awaited second release of the original Daniel Sonenshine's comprehensive work on the biology of ticks and tick-borne diseases, first published in 1991 (volume 1) and 1993 (volume 2), respectively. The first edition met with widespread success and is currently out of print. This second edition, in line with the previous one consists of two volumes written by a spectrum of renowned experts from across the globe. It examines a great variety of different aspects of tick biology including tick genomic data, phylogeny and systematics, structure and histology, ecological adaptations and an updated account of the molecular aspects of their metabolism, which underpins the growth, development and worldwide survival of these blood feeding ectoparasites and vectors of numerous human and animal diseases. This edition is dedicated to the memory of the American entomologist and parasitologist Dr. Harry Hoogstraal (1917–1986).

Volume 1 covers the biology of ticks in 18 different chapters. First chapter is an overview of tick biology and tick borne diseases by the editors Daniel E. Sonenshine and R. Michael Roe. Two chapters review tick systematics, evolution and lifecycles. One chapter is an integrated overview of all aspects of tick internal and external anatomy. Remaining chapters are on specific organ systems including integument, digestive organs, nervous and sensory systems, salivary glands, body waste disposal, respiratory system, haemolymph and circulatory system, and male and female reproductive organs.

Volume 2 comprises 16 chapters with sections on ecology, immunological response to parasitism by ticks, and the control of ticks and tick borne diseases. Chapters 1 and 2 are on the ecology of non-nidicolous (ticks dispersed widely in the landscape and surviving in soil and vegetation and attacking passing hosts) and nidicolous ticks (surviving in sheltered environments such as caves and nests waiting and feeding on nesting vertebrate hosts), respectively. Chapter 3 reviews tick genetics and genomics (including the genome of the Lyme disease vector *Ixodes scapularis*). Two chapters review immunological aspects of tick-host-pathogen interactions, including host immune responses to tick feeding and specific modulation of these responses by the

components of tick saliva, as well as the tick's innate immune system that prevents and/or controls microbial infections. Chapters 6 through 10 cover the many diseases caused by the major tick-borne pathogens including tick-borne protozoa, viruses, bacteria (including all types of rickettsiae and the Lyme disease agent *Borrelia* spp.). Chapter 11 reviews tick induced-paralysis and toxicoses caused by tick bites. Chapters 12–15 are on the control of ticks including anti-tick vaccines, acaricides, repellents, bio-control and alternative strategies. Last chapter is on techniques for breeding ticks including in-vivo and in-vitro feeding procedures and factors affecting survival, development and fecundity of ticks. This is a very important aspect since high-quality laboratory reared individuals are a basic prerequisite for statistically relevant experimental outcomes.

Those readers who favoured a new release of the same book published in the early 90's are likely to be disappointed by the editorial decision to include "new" information, an overview of the results that have appeared since the first edition of *Biology of Ticks* was published two decades ago. As declared in the preface to the first volume of the current edition, most of the contents of the original book on morphology and anatomy of ticks is not included in the second edition because it can be found online in the Vectorbase website ([www.vectorbase.org](http://www.vectorbase.org)). In my opinion, this could negatively affect the expected role of *Biology of Ticks* as a universal modern reference book so eminently fulfilled by the first edition. Although most of the descriptions are comprehensive and fully up-to-date, the new edition of *Biology of Ticks* is a broad collection of review chapters of variable quality rather than a universal account of tick biology by an eminent scholar. Some chapters such as those on Colorado Tick Fever and Relapsing Fever, haeme processing and evolution of haematophagy and especially that on the nervous and sensory systems are first rate, while some others could be more extensive or better elaborated.

Despite these criticisms, I expect this book to be very well accepted by entomologists and advanced students doing research on tick biology (acarology) and other specialists such as physicians, veterinarians and public health officials. I attribute this mainly to the amount of information in this edition on ticks and their global effect as blood feeding ectoparasites and vectors of numerous human and animal diseases.

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