Preface

Gustavo Seron Sanches
Maria Izabel Camargo-Mathias

All the contents of this work, except where otherwise noted, is licensed under a Creative Commons Attribution 4.0 International license.
Ticks are blood-sucking ectoparasites, which have long been known to cause itching due their bites, and for their ability to transmit pathogens responsible for diseases that can cause physical harm to pets, livestock, wild animals, and humans, sometimes with considerable economic losses, notably in the cattle industry. The medical and veterinary importance of ticks is currently increasing in the wake of global environmental and climatic changes, which are promoting increases in some tick populations and expansion of their geographic distribution. As a consequence, contact with humans and the incidence of tick-borne diseases are on the rise.

The control of tick infestations has traditionally been carried out using chemical acaricides. However, in addition to the high costs and risks of environmental contamination associated with these chemicals, their indiscriminate use has also contributed to the selection of resistant tick populations. Therefore, there is an unquestioned need not only for the rational use of this class of acaricides, but also for the development of alternative and effective environmentally safe methods of tick control, including the use of plant extracts, biological control agents, and anti-tick vaccines.
A sound knowledge of tick biology, anatomy, and morphology are essential for an understanding of the physiology, adaptations, and evolutionary success of these organisms. Moreover, such knowledge is indispensable for the establishment of strategies for their control and management of tick-borne diseases. Tick organs represent important targets for the evaluation of a wide range of experimental conditions, including the response to pathogen infection and their distribution, the toxicological effect of substances with potential acaricidal activities and their dose-response relationship, the effects of anti-tick protein antibodies and gene silencing, the interactions between parasitoids and ticks for application in biological control, and an infinity of other issues.

Histology, although considered a basic science, has fundamental importance for understanding tissue structure and composition in relation to their specialized functions in different circumstances. Histological and histochemical techniques are rapid, powerful, and valuable tools that provide abundant visual and descriptive information, and in the past decade have contributed significantly to all fields of tick research.

In this context, the present book was conceived and written by recognized expert morphologists belonging to the Brazilian Central of Studies on Ticks Morphology (BCSTM) –Unesp, Rio Claro (SP) Brazil. The objective of this publication is to clarify tick morphohistology, through a compilation of studies conducted by these researchers, illustrating how histological techniques have been applied in tick studies.

This book was designed in an electronic format (eBook) and comprises 13 chapters that cover the following themes: histological and histochemical techniques; an overview of the biology, morphology, and taxonomy of the main tick species studied histologically; tick organ
histology, histological techniques applied to analyze acaricidal effects on ticks’ organs; and new perspectives on tick salivary glands for selection of compounds with pharmacological properties. These chapters are complemented by illustrations of high quality that were carefully chosen with a view toward greatly enhancing the reader’s comprehension.

Finally, we hope that this work will make a substantial contribution to the field of acarology, and that it will motivate and encourage further research in the areas described.

Gustavo Seron Sanches
Maria Izabel Camargo-Mathias