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BOOK REVIEW

LEHANE M.J. & BILLINGSLEY P.F. (eds): BIOLOGY OF THE INSECT MIDGUT. Chapman & Hall, London, 1997, 486 pp. Hb: ISBN 0-412-61670-X. Price USD 99.95, GBP 65.00.

Recent literature concerning the insect digestive system is very broad. You may find papers on that subject in almost all biological journals. From time to time, it is necessary to collect together new results and integrate them with classical ones into book which serves as a "springboard into the literature and research field" (as expressed by the editors in the book preface). Mike Lehane and Peter Billingsley as editors, together with 33 other known scientists as contributors, prepared such a book on insect midgut as one of the most important components of the digestive system.

The book is composed of 16 chapters logically grouped into 4 basic parts: structural biology of the midgut, digestion and transport, the midgut as a target for control strategies and the midgut as an environment for other organisms. Part one (structural biology of the midgut) seems to be the most complex part of the book. Editors in their introductory chapter cover the basic cell types and other specialized structures in the insect midgut. The second chapter concerning midgut development is slightly superficial (not only the text, but also more references are needed). In the third chapter, Sehnal and Žitňan inform us on a very modern area of gut investigation: midgut endocrine cells. Here you can find new and original results complemented also with information from apterygotes. The peritrophic matrix chapter by Tellam informs us on the structure and function of that interesting component of the insect midgut. The last chapter in the "structural" part by Lane, Dallai and Ashurst deals very precisely with modifications of the cell membrane and the extracellular matrices. The chapter is complemented with excellent electron micrographs.

Part two (digestion and transport) has a difficult role: to inform us in limited space on such a complicated subject as the function of the digestive system is. Chapters on digestive enzymes and mechanisms controlling their synthesis and secretion acknowledge that role very well. The third chapter represents a modern view on digestion, summarized by describing compartmentalization of digestive processes in insects. Ion transport, the subject of the fourth chapter in the "functional" part of the book, covers situations in Lepidoptera as a representative of insects. Of course, that is possible, but data from other insect orders are interesting, too. The last two chapters concern, in detail, absorption of amino acids, lipids and sugar.

Part three (the midgut as a target for control strategies) tries to introduce us to wider aspects of the digestive system. The first chapter deals with a relatively recent idea representing the midgut of blood-feeding insects as a target of immunological responses which could play protective roles. Such research brings not only theoretical, but also practical outputs, so important for pest management. Development of a potential vaccine is a direction which could complement that investigation into a practical tool. The second chapter of part III can be considered as an example of how endotoxins of one model bacterium (*Bacillus thuringiensis*) act on the insect midgut. The authors of last chapter of the third part of the book explain to us how plants use defence mechanisms (especially antinutritive ones) against herbivores. Also, that chapter, even though theoretical, has a connection to practical outputs.

Part four (the midgut as an environment for other organisms) informs us briefly on a dynamic field to which older, as well as recent, authors often pay attention. Microbial symbionts and insect-transmitted pathogens represent two basic subjects in the field and the two last chapters cover it very well.

In the preface of the book, the editors convince us that they "...have tried to encompass the broad and the specific, the classical and the modern, the observational and the experimental". I agree. The insect midgut is so complex a subject that a book covering all aspects would be probably composed of several volumes, thousands pages each. This reviewed book represents a very good level of knowledge about the insect midgut, bringing us more or less detail in individual chapters. The book is recommend to all scientists, as well as students, wishing to understand the midgut as an important insect organ.

F. Weyda