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BOOK REVIEW

WIKEL S.K. (ed.): THE IMMUNOLOGY OF HOST-ECTOPARASITIC ARTHROPOD RELATIONSHIPS. CAB International, Wallingford, 1996, 331 pp. Hb: ISBN 0-85199-125-4. Price GBP 60.00.

Immunoparasitology has recorded an explosive growth in the last decade, being supported by tremendous advances in cellular and molecular immunology. An increasing interest in the immunobiology of the host-ectoparasitic arthropod interface is satisfied by this book, edited by Stephen Wikel. His laboratory at Oklahoma State University belongs to the leading laboratories in this field. Seven of thirteen chapters of the book have been written by members of this laboratory. The other chapters have been prepared by specialists from other universities in the USA, UK and Australia.

The immunological interaction between a host and an ectoparasite at least partly determines the nature of the host-parasite relationship. It is important not only for ectoparasites as pests of humans and animals but also for ectoparasites as vectors of important pathogens. The immune response of a host to an ectoparasite arthropod in its complexity includes the modulation of this response by the ectoparasite. The basic studies of this immunological relationship lead to the development of immunological-based control of arthropod species of human and veterinary public health importance.

This is the first book summarizing an extensive work in the field of immunoentomology. It covers not only ticks, the immune response against which is best understood, but also the immunity to fleas, bugs, lice, mosquitoes, flies and mites is discussed in detail.

The first six chapters provide the fundamental information about the physiology and pharmacology of ectoparasite feeding, immunology of the skin and arthropod modulation of host immune responses.

In the first chapter, an overview of the immune response is shortly outlined, followed by the more detailed information about the skin immune system. Various types of skin cells are discussed concerning their role in the skin immune response. The emphasis is on the cytokine production by particular cells and the regulation of the skin immune system. In the second chapter, the anatomy of mouthparts and feeding mechanisms are described for several arthropod orders including Hemiptera, Siphonaptera, Diptera and subclass Acari. The third chapter is devoted to the salivary gland physiology and pharmacology of haematophagous arthropod saliva. Salivary glands are discussed not only as the source of profeeding molecules, but also as an essential organ of osmoregulation. The control of salivary secretion in ixodid ticks is described on the molecular level. Inevitably, the role of the salivary gland in the transmission of various pathogens is included in this chapter. Chapter four deals with the pharmacology of haematophagous arthropod saliva, mostly from the point of view of its antihaemostatic and vasodilatory effects. This chapter documents the increasing knowledge about various inhibitors of platelet aggregation (apyrase, disintegrin-like peptides), vasodilators (tachykinins, prostaglandins, nitric oxide) and blood coagulation inhibitors. Chapter five faces a very important and interesting field – arthropod modulation of the host immune responses. The majority of our knowledge from this field comes from tick-host interactions. The role of mechanisms of natural resistance and adaptive immunity is described in detail, including the cytokine regulation of the immune response. Arthropods, like other parasites, have developed a number of mechanisms operating against the host immunity. These mechanisms, covering both innate and adaptive immunity, are described with emphasis on their impact on the cytokine production and Th1, Th2 dichotomy. At the end of this chapter, the significance of arthropod saliva-mediated modulation of the host immunity for the transmission of arthropod-born pathogens is discussed. The last of the first six chapters deals with the digestion and fate of the bloodmeal in insects. In this chapter, the fate of host antibodies in the insect body is discussed in connection with transmission blocking vaccines, when host antibodies attack on the developmental stage of a parasite in the insect.

The following chapters review both the key historic and current research information about the immune responses to various groups of ectoparasitic arthropods, including fleas, bugs, sucking lice, mosquitoes and flies, scabies mites, mange mites, chiggers and ticks. Most of these chapters include the modulation of the host immunity by arthropod saliva and the results of vaccination experiments. Unfortunately, many data shown in chapter five devoted to the arthropod modulation of host immune responses are repeated in chapter nine, reviewing the immunology of the tick-host interface. The next to the last chapter is called Immunological-based control of blood-feeding arthropods. It documents that an immunological control can be achieved for both rapid and long-term blood feeders. The most important thing is the identification of specific immunogens. In this chapter, the only commercially successful vaccine against the *Boophilus microplus* tick, utilising "concealed" immunogens of the tick midgut, is discussed in detail. The exciting idea of "antiimmunosuppressant" vaccine is suggested, depending on the identification of immunosuppressive factor(s) in arthropod saliva. In the last chapter, Stephen Wikel defines current problems in immunoentomology and raises questions to be answered.

In conclusion, this book draws together our knowledge of the greatly-expanding field of the immunology of host-ectoparasitic arthropod interface. It is aimed at medical and veterinary entomologists and acarologists, as well as general immunologists. For people working in the field of immunoentomology it represents an invaluable source of information.

J. Kopecký