BOOK REVIEW

A. Hoerauf and R.U. Rao (Eds.): *Wolbachia: A Bug's Life in another Bug. Issues in Infectious Diseases*, Vol. 5. Karger, Basel, 2007. ISBN 978-3-8055-8180-6, VIII + 150 pp., 25 figs., 7 in colour, 1 tab., hard cover. Price: EUR 139.50, USD 177.25.

Bacteria of the genus *Wolbachia* are the most widely distributed and most frequently studied intracellular symbionts. During the last thirty years, covered by the Web of Science, more than thousand studies have been published on various aspects of biology of this fascinating microorganism. Typically, *Wolbachia* are found in association with various groups of arthropods; particularly in insects they are supposed to infect substantial portion of the extant species. It is however not the ubiquity that attracted such an exceptional attention to these symbionts. The main impetus to *Wolbachia*-centred research came with finding that they are causative agents of many reproductive distortions in their hosts, such as cytoplasmic incompatibility or feminisation. This feature alone would suffice to make *Wolbachia* one of the most interesting microorganisms.

The book "*Wolbachia: A Bug's Life in another Bug*" is however not focused on this most popular aspect of *Wolbachia* biology. Instead it points out yet another interesting and relatively recently discovered feature of these symbionts. In the middle of 1990s, *Wolbachia* were identified as obligatory symbionts in several species of medically important filarial nematodes. The aim of this book is to summarise current information on distribution and potential significance of *Wolbachia* in their filarial hosts. Although it takes such a seemingly narrow view and is composed of only nine short chapters, the book interconnects surprisingly heterogeneous collection of topics. This arrangement seems to be a lucky decision, since the prevailing emphasis on applied science is thus balanced with more general parts providing non-specialists with a broader background. This can be well illustrated by the first chapter, which brings a unique overview of the *Wolbachia* history from an obscure intracellular microorganism identified in the first half of twentieth century to one of the most widely distributed and frequently studied bacterium. The rest of the book traverses various aspects of *Wolbachia*-centred research. It for example summarises current view on the *Wolbachia* phylogeny and stresses the main questions concerning origin, evolution and possible horizontal transfers of wolbachial lineages. It is particularly valuable that this evolutionary issue is not restricted to *Wolbachia* found in nematodes, but is discussed in a broader context covering the whole genus.

However, the main idea of the book is, as metaphorically expressed in the title of the chapter three, to present *Wolbachia* as "an Achilles' heel of filarial nematodes". This core chapter briefly summarises the main strategies of controlling filarial infections and proceeds with presenting *Wolbachia* as a

novel and promising target of antifilarial drugs. For non-specialists it might be particularly interesting to find an overview on *Wolbachia* involvement in the immunological interplay between filaria and vertebrate hosts. The nematode-centred issue is further elaborated in two more specialized chapters, one dealing with veterinary important filaria and the other with the role of *Wolbachia* in pathogenesis of river blindness, a parasitosis caused by the filarial worm *Onchocerca volvulus*.

Particular attention is given to genome analysis of nematode-associated *Wolbachia*. This topic is discussed in two chapters. The chapter four provides a concise historical and methodological overview of genomic studies in *Wolbachia*. In addition, it summarises the features of *Wolbachia* genome that play crucial role in metabolic interaction with nematode and are therefore potentially suitable targets for the antifilarial drugs. Different angle of view is taken in chapter six. It discusses more general features of wolbachial genomes, namely the gene rearrangements and presence of mobile DNA elements, and attempts to deduce consequences of these properties for the genomic evolution and population biology.

It was certainly a lucky idea that, despite its obvious focus on the nematodes-inhabiting *Wolbachia*, the book includes a chapter dealing exclusively with arthropod-associated *Wolbachia*. This compensates for one potential drawback of the book's design: since the filarial *Wolbachia* live as obligatory mutualists, they lack many of the biologically interesting features found in arthropod-associated lineages. These features are mainly connected to various forms of interference with the host reproduction. This chapter characterizes the most common and best known phenotypic effects, feminisation, parthenogenesis, male killing and cytoplasmic incompatibility. The inclusion of this chapter also stresses the potential of *Wolbachia* in control of arthropod-borne filarioses. Due to its capability to spread quickly throughout the insect populations, *Wolbachia* has previously been suggested as a suitable vehicle for driving desired genes into the vector populations. Together these two phenomena, vector manipulation and *Wolbachia*-dependent effect of antifilarial drugs, make this flexible bacterium a prospective agent in control of infections caused by filarial worms.

Due to its composition, the book provides a natural interconnection between purely theoretical biology and applied science. As a result, the book is an important source of information for parasitologists and also an interesting over-view of the less known aspects of the *Wolbachia* biology.

Václav Hypša