
Foreword

A book on ecology and evolutionary biology focusing on parasites and other pathogens would have been unthinkable only 20 years ago but has now become unavoidable: ecology has fundamentally changed and this is fortunate—because what is more universal than host–parasite systems? The days are over when ecology text-books haughtily ignored the impact of parasites and their evolution on the dynamics of ecological systems. As living organisms, we are all an integral part of the host–parasite systems with which this book is concerned.

Putting an end to the practice that for too long has marginalized parasites and other pathogens, Frédéric Thomas, Jean-François Guégan, and François Renaud offer us here an entirely new—or rather refocused—subject with a broad perspective. By abandoning the traditional approach and treating the ecology and evolution of host–parasite systems, Frédéric Thomas and his colleagues show us the ubiquity and subtleties of parasite biology: no ecologist, biologist, or naturalist can now ignore pathogens or parasites under the pretext of studying only bird behaviour, animal (mammals and birds) population regulation, sexual selection, human immune defences, or the functioning of ecosystems.

This book is thus a truly innovative ecology or general biology text, which should motivate students, scientists, or anyone intrigued by the wonders and mysteries of the living world and its biodiversity. Addressing the biology, ecology, and evolution of living organisms—all living organisms—through their host–parasite relationships is an excellent strategy to get to the foundations of the dynamics and evolution of biodiversity. Parasites and pathogens 'are part of the book of life, just as we are', and their study offers a wide-ranging introduction to the biology and evolution of living organisms.

'What are the roles of pathogens in the ecology and evolution of free-living organisms?' ask Thomas, Guégan, and Renaud. This is the thread that links the different chapters of the book and provides its consistency and educational purpose. I will give three examples, arbitrarily selected from the many possibilities provided by the original approach of this group of authors, concerning first epidemiology, second immunology, and third ethology.

Taking the perspective of parasites, even micro-parasites such as viruses or bacteria, does not by any means narrow the ecologist's line of vision: Jean-François Guégan, Guillaume Constantin de Magny, Patrick Durand, and François Renaud declare that it broadens the scope of epidemiology and parasitology, opening up the 'window of observation' in order to set the foundations of a truly ecological and evolutionary epidemiology. The point actually is to develop more comprehensive systematic analyses that take into account the set of forces, actors, and parameters concerned in the emergence and spread of infectious and parasitic agents. This is explained with the example of cholera and the effects of the El Niño phenomenon, and Lyme disease and the fluctuations that touch ecosystems, landscapes, and their inhabitants—rodents, ticks, deer, etc.

The evolutionary ecology of immune responses, addressed by Gabriele Sorci, Thierry Boulinier, Michel Gauthier-Clerc, and Bruno Faivre, reminds us that the immune system is critical for the survival and fitness of individuals. The authors clearly explain the emergence of immuno-ecology—a new discipline that combines the study of immunological mechanisms with the selection pressures acting on hosts and their parasites.

Finally Frank Cézilly and Marie-Jeanne Perrot-Minnot help us discover up to what point parasites can affect host behaviour—in its sexual, feeding, or

social aspects since they are potent factors in selection (sexual selection or otherwise).

In conclusion, these authors offer us a text on the ecology and evolution of host-parasite relationships that attests to the tremendous development of evolutionary ecology, the variety of approaches,

and possible applications, all in a very consistent manner that still allows for a diversity of points of view—an essential addition to 'traditional' ecology manuals.

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