

Literature

Burdon, J. J. & Leather, S. R. 1990: Pests, pathogens and plant communities. — Blackwell Scientific Publications, Oxford. ISBN 0 632 02561 1. Price GBP 59,50 (hardback).

If we were to protect natural plant communities from insect pests and pathogens, would it really have any dramatic effect on their species composition or productivity? Has the really important role of pathogens and pests been as 'ultimate' factors, i.e. their evolutionary role in the past? Do we miss the real role of pathogens and pests by concentrating our attention on communities where they are present? Do we concentrate research on the pests and diseases that are really important in plant communities? Can we treat the interactions between a plant species and its pathogen (or pest) as a closed two-species system? Are there lessons for ecologists from pathology and epidemiology and *vice versa*?

These are some of the fundamental questions addressed in the book, which is a collection of 19 articles (reviews) by a total of 27 authors. The book arose from a meeting organized by the British Society for Plant Pathology in conjunction with the Association of Applied Biologists and the British Ecological Society. The organizers are to be congratulated for the ambitious attempt to bring much needed interdisciplinarity into well established, and therefore often too narrowly defined, individual disciplines. The edited volume of the proceedings brings fresh and challenging views and ideas into plant pathology, agricultural entomology, plant ecology, and related disciplines. I hope that these ideas will penetrate the thinking of scientists and stimulate relevant research in applied ecology and agriculture, because more holistic approaches are needed to solve many urgent pest, pathogen and weed problems.

As can be expected, a multi-authored volume seldom reaches the uniformity of a single-authored, 'proper' book. Sometimes they are not much more than a collection of reviews around a

similar topic, without any attempt at a coherent synthesis. In this book the chapters are allocated into four sections. The first section is called 'Overviews', comprising three contributions. I consider them the most insightful chapters of the book; particularly that by J. L. Harper, who in fact synthesizes the contents of the book in his opening review. H. F. van Emden then focuses on the limitations of herbivore abundance, and H. M. Alexander on the plant-pathogen interactions in natural plant communities. These reviews still keep well up to the main theme of the book. The focus on interdisciplinarity and on the multifaceted interactions between plants, pathogens, herbivores, and other players in the ecosystem, is soon lost, however, in the subsequent chapters of the book.

All the reviews in the book are, nevertheless, excellent descriptions of the state of knowledge and of the problems involved in the various ecological situations which are addressed. The second section examines demographic interactions between plant and parasite populations. The effects of host and parasite biology, natural and man-made environmental variation, and spatial phenomena are considered. Section three reviews genetic interactions between plant and parasite populations, including the occurrence and distribution of major gene resistance, interactions between insects and secondary plant metabolites, and coevolution. The final section, named 'Long-term consequences of host-parasite interactions', uses both empirical and theoretical examples to illustrate the complex nature of plant-parasite interactions.

The articles in the book provide a lot of stimulus for thought to those dealing with practical problems of the topic area, such as those in

the selection of biological control agents. For example, there is evidence that much of what we see now in the nature of plants and the composition of their communities represents 'the ghosts of their disease and predation past'. Plenty of evidence comes from the successful biological control of weeds, where often the weed and its control agents have been reduced to low densities, and the herbivore and its effects are now only rarely seen. This implies that a herbivore — or a pathogen, — may control the density of a plant host, but seldom is seen to cause any damage. On the other hand, a hazard in the life of a plant population may be common and obvious, but ecologically almost irrelevant — while some other hazard (agent) may be rarely seen, but has or has had a crucial role in determining the abundance of its host. Insights arising from such considera-

tions may help to improve our choice of biological control agents.

Many other similar questions on other aspects of pest-pathogen-plant interactions are dealt with in the book. They make this volume highly recommendable to anyone interested in understanding the dynamics of ecosystems, and the role of pests and pathogens in shaping plant communities. The implications of this knowledge are of crucial importance for scientists dealing with the management of ecosystems, including agriculture, forestry, and conservation areas. The book can also be recommended, at least partially, for use as required reading on advanced plant protection courses — unfortunately it has been priced well outside the broad student market.

Heikki Hokkanen

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