

Review

Heliövaara, K. & Väisänen, R. 1993: *Insects and Pollution*. — CRC Press. Roca Baton, Florida. 8+393 pp. ISBN 0-8493-6191-5. Price in USA and Canada USD 99.90, overseas USD 120.

The authors are well-known Finnish entomologists. Kari Heliövaara is now Professor of Forest Zoology at the University of Helsinki; Rauno Väisänen is the recently appointed Chief of Nature Protection at the Finnish Forest and Park Service.

The Preface begins: "In this book we have attempted to provide an overview of both the direct and indirect effects of pollution on insects and to discuss the ecological and economic consequences of these changes at the individual, population and ecosystem levels". The authors review a large amount of the literature dealing with pollution. The book includes material reproduced from original sources published in many journals and other publications (the list of references consists of 1676 items). The material included in the book could have been, at least in some cases, more "digested" by the authors, not merely reproduced from the original sources.

In the brief *Introduction* (6 pages) including e.g. background and objectives, the pollution dealt with in this book is defined to be anthropogenic pollution whereas natural (volcanoes etc) and biological (alien organisms) pollution is excluded. In the Chapter 2 (26 pp.) *Studies on Insects in Relation to Pollution*, trophic groups, insect orders and developmental stages are discussed, rather briefly. The Chapter 3 *Effects of Pollution in Different Environments* (21 pp.) gives data about investigations done in different climatic and vegetation zones and in different habitats, forests being treated in more detailed. A majority of text pages deals with *Pollution in Terrestrial* (Chapter 4, 105 pp.) and *in Aquatic Ecosystems* (Chapter 5, 71 pp.). A wide variety of pollutant types are discussed separately. Besides the ordinary pollutants, like chemicals, radiation etc, some unusual examples are given, e.g. outdoor lighting which may explain the decline of some nocturnal insects. Among metals cadmium, probably due to its great toxicity, is treated most thoroughly. In the Chapter 6 *Response Mechanisms in Insects* (32 pp.), a wide spectrum of physiological, ecological, and evolutionary effects of pollution is presented, e.g. in the plant-herbivore interface, predation, industrial melanism and development of resistance. Finally, the Chapter 7 *The Cost of Possible Impacts* (19 pp.) deals with, for example, the loss of biodiversity (surprisingly briefly), bioindicators, ecosystem dynamics and critical loads,

and economic consequences including medical and veterinary problems, losses in honey and silk production as well as losses in fish, game, crops and timber. There is a short Conclusion in Chapters 2–7. The list of *References* (75 pp.) and *Index* (29 pp.) takes more than one fourth of the book.

In addition to insects, information is often presented from studies dealing with other arthropods, such as spiders, mites and crustaceans. In some cases even studies dealing with vertebrates are reviewed.

The illustrations consist mainly of diagrams from the original publications; in addition there are some maps and a few photographs of the insects studied. There are also some tables, neatly summarizing the various different topics. The cover of the book carries an impressive picture of destroyed spruce forest in Poland.

The vast majority of the papers included were originally written in English; the proportion of papers in German (58, i.e. 3.5%) is relatively small. The number of papers by Russian writers is very low (20 of which only 12 were originally written in Russian). The Finnish authors could have tried to present more data from Russian and also German research dealing with the serious environmental problems of Eastern Europe and the former USSR; these studies are not particularly familiar in the English-speaking countries.

The text itself seems to have been carefully checked, but there are too many misprints in the Index, as well as an unfortunate error in the (now outdated) address of the first author on the title page. The names given incorrectly in the Index seem to be, fortunately, in the correct form in the text. The price (USD 100/120), for a book with 400 pages and sparse illustration, is too high.

These critical comments, however, are minor ones; *Insects and Pollution* is a welcome and important reference work providing information on pollution and arthropods. It is in my opinion suitable for advanced undergraduate and graduate students, researchers in entomology and the environmental sciences, and civil servants and administrators concerned with the environment; this is in fact the potential audience described by the authors in the Preface.

Seppo Koponen