

## Literature

Kosztarab, M. & Kozar, F. 1988: Scale Insects of Central Europe. — 456 pp., 16 colour plates. Dr. W. Junk Publishers. Dordrecht-Boston-Lancaster. ISBN-9061936233. Price DFL 225.—.

The scale insects (Homoptera, Coccoidea) can be regarded as a "difficult" group of insects. A good knowledge of plants is very useful in collection as well as in determination of these insects. Knowledge of scale insects in Scandinavia is sparse, mainly species lists having been published. The reason for this situation is that no good standard work within one cover has been available. The present book will remedy this lack.

The book contains two chapters of text: "General part" (21 pp.) and "Systematic part" (356 pp.), and many lists and indexes.

The general part is divided into several short and concentrated sections. The authors begin by elucidating the state of knowledge of scale insects in Central Europe. We are informed that this book is the first since Lindinger's work from 1912, to treat all groups of scale insects. Central Europe is not interpreted geographically in a strict way, thus the number of species (233) covers also species from adjacent regions. Introduced and indoor species are, however, omitted. On commenting the reference list, the authors say that it covers only the most important references for the average user, although there are more than 700 references. Short descriptions of the morphology of female, male and immature stages are given, as well as life cycle, biology and dispersal. In the phylogeny section we learn that the primary radiation of the group occurred in the Lower Cretaceous or earlier. The diverse conditions within Central Europe are described in the ecological section, including the fact that the coccoids display a wide range of host-specificity, but only a few species are monophagous. The resistance of plants against the coccoids has also been confirmed. The parasites of coccoids include the Hymenopteran families Encyrtidae, Aphelinidae and Eulophidae, and among predators the most important are Coleoptera (Coccinellidae, Anthribidae, Nitidulidae), Lepidoptera (Sesiidae), Diptera (Chamaemyiidae) and Acarina (Hemisarcoptidae). The interesting relationship between coccoids and ants is also mentioned. Then short sections follow on geographical distribution, economic

importance and forecasting and control of coccoids. At the end, collecting, preserving, mounting and rearing of coccoids are briefly described.

In the systematic part we find notes on the classification, the keys and the descriptions of the species. Twelve families in Central Europe are recognized and a new proposal for the relationships of families is presented. The keys are always primarily based on exact morphological features, the host plant being used only as an additional characteristic. For the beginner the keys are certainly complicated, but the large number of pictures and good descriptions will be of great help. More than 100 species are illustrated in detail, and in addition 37 colour pictures (on 16 plates) appear at the beginning of the book. There are standard descriptions of each species including literature, synonyms, information on general distribution, biology, host plant and natural enemies. The host plant is treated only on generic level in most cases, although it is quite clear that the coccoid does not occur at random on all species of the host genus. There are, however, numerous host genera for many coccoid species, and accordingly the host species list would have been quite long.

Finally there is an appendix listing 42 new species of coccoids in Central Europe (mostly from Romania) which have been reported during preparation of the book. Then follow the 700 cited references, a list of countries (or other units) with reference numbers for all coccoid species found, an index to host plants, an index to parasites, predators, ants and other associated organisms and at the end an index to scale insect names (scientific and common names).

The scale insects have been largely neglected in Finland and all the naturally occurring Finnish species thus far reported are treated in the present book. As the number of reported species from Sweden and adjacent regions in Russia is much higher than in Finland, many new species are still to be found here. This handbook will certainly be of great help in the future study of our coccoids.

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