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MICROLEPIDOPTERA OF EUROPE, VOLUME 2, SCYTHRIDIDAE, by Bengt Å. Bengtsson. 1997. Published by Apollo Books, Stenstrup, Denmark. 301 pp, 14 color plates, 419 text figures. Hard cover, 25 × 17 cm, ISBN 87-88757-11-0. Available from Apollo Books ApS, Kirkeby Sand 19, DK-5771, Denmark, fax +45 62 26 37 80, www.apollobooks.com. 550 Danish Kroners + postage.

Fifteen years ago, Bengtsson published a monograph of the Scythrididae of northern Europe (1984, *Fauna Entomologica Scandinavica*, v. 13), which treated a limited fauna of 33 species. With this new book, the second in the excellent series *Microlepidoptera of Europe*, Bengtsson has expanded his coverage to include the entire European fauna east of the Urals, the Mediterranean basin, Turkey, and the Canary Islands. The Scythrididae have thus been the object of two major works in the span of 15 years, both by the same author, which is rather remarkable for a family of (figuratively and actually) small and obscure moths.

The present treatment includes 237 species in 7 genera, with 40 species described as new. A number of new synonyms are also introduced. The book begins with a general introductory section with parts about Scythrididae morphology, practical hints for identification, genitalia preparation and collecting, biology, as well as brief comments on classification and geographical distribution of the family. This is followed with a checklist of all taxa treated with full synonymy, and then the systematic treatment, which makes up the bulk of the work. Individual species treatments include a diagnosis, a brief description of genitalia of both sexes, and a summary of known geographical distribution and biology. The host plant and biology of very few species is known. The geographical distribution of all species is conveniently summarized in a dense table placed at the end of the systematic section and lists occurrences by country; the table is useful albeit somewhat difficult to read with its 53 columns and 237 lines. The book concludes with an extensive reference list and an index to taxon names.

The most remarkable feature of the book is the 14 color plates, which present 258 superb watercolor paintings of adults (body and set right wings), painted by the author. Scythrids are rather dull-colored moths, many have dark brown coloration with a metallic sheen whose hue varies with the species and with the lighting, making these moths a real challenge to illustrate. The fine rendering of all subtle shades of greys, browns, beiges, off-whites as well as metallic hues is simply remarkable and attests to the great artistic talent of Bengtsson. I can only marvel at the countless hours that were required to produce all these watercolors, a benedictine labor of love.

The genitalia of all species are illustrated with line drawings (419 of them!). Many scythrid species are confusingly similar moths with strikingly different genitalia; conversely several species display a great amount of color variation depending on seasonality and region. Thus genitalia examination will be essential for species identification in many cases, unless one has a fair amount of experience with these moths and their subtle color differences. Curiously, however, the line drawings in this book are of a lesser quality than those produced by Bengtsson in his 1984 work on the northern European species. Generally, the drawings do not render the impression of depth and structural complexity exhibited by the genitalia of scythrids, although they display diagnostic features sufficiently well for species recognition, including arrows pointing at specific features on many. Most illustrations of male genitalia were drawn from standard flattened, dorso-ventral slide mounts, which are often inadequate for

preserving the highly tri-dimensional, and fused scythrid genitalia because they result in a fair amount of distortion making interpretation of parts difficult.

A conspicuous omission in this otherwise fine work is an identification key. This is a significant deficiency considering the large number of species treated (237), most of which belong to the genus *Scythris* Hübner (204 spp.). Species are arranged into species-groups for which diagnoses are provided, but the user wanting to identify specimens has little choice but to wade through the entire set of illustrations to try to match specimens at hand, then go to the diagnoses to read diagnostic features. In some species-groups where similarities among species are high, the process is laborious.

The arrangement of the taxa is somewhat perplexing. On p. 14, paragraph 2, it is stated that species are arranged alphabetically which, although debatable in its value, is understandable. However, this is contradicted largely by the broad arrangement of the genus *Scythris*, by far the largest genus, for which the author states that a "logical order" was used to arrange the species. Actually, the alphabetical order is found only within species-groups. Bengtsson explains his so-called "logical order" as follows (bottom of p. 13): "In order to arrange species in a logical order, the author has based the classification on male genital structure together with the female genital structure and other characters when known." It is not clear what "logical order" means in biological classification.

The short section entitled "Systematics and classification" on pp. 13–14 explains the arrangement of taxa in the book. One is left with the impression that the author could have either expanded some of the points mentioned or omitted them altogether. For example, the statement that (p. 14) "Some of the remaining genera will probably be synonymized in the future when the whole world fauna can be analysed" is difficult to appreciate by the reader because there is little in the book itself to help evaluate this. Bengtsson also discusses his undocumented and unsatisfactory attempt at cladistic analysis: "In addition, species-groups are introduced, based on assumed synapomorphies or similarities of uncertain phylogenetic value. The author has used the computer program Hennig86 for analysis of the phylogeny, including a limited number of species at each evaluation. Starting with a complex and detailed data matrix the author has successively simplified the matrix until the most parsimonious tree structure approximately agreed with the intuitive opinion. Even so, the number of possible trees produced is very high. . . . the phylogeny of the Scythrididae is extremely complicated. Instead of trying to utilise a systematic sequence in the present work, I have dealt with the species in alphabetic order." Because none of the data are presented, we are left with no basis to appreciate how the classification was developed. However, this is an academic point unlikely to bother the average user.

The English style is not always standard, being a little awkward in places and occasionally muddling the intended meaning or clarity, however, I did not find that this reduced the usability of the book. The book is of high quality, printed on glossy paper, clearly typeset, and has an attractive cover. The Smythe-sown binding allows the book to lay flat-open and will contribute to its durability.

Despite the criticisms expressed above, I can only praise Bengtsson for his accomplishment. I recommend unconditionally the book to any serious lepidopterist, if only because it provides a comprehensive treatment of a family for a large geographical region of the world and is part of a series (*Microlepidoptera of Europe*) that is akin to a counterpart of the *Moths of North America* (MONA) series.

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