

greatest activity for Meyrick, Turner, and Walsingham. A second peak of taxonomic activity from 1960 to 1969 was largely the result of the efforts of Kumata and Vari. All catalogue information was entered into a Microsoft Access database, and the fields used for this database are listed. Although no keys or diagnoses are provided for the subfamilies, a brief review of different subfamily applications with their component genera is presented. Also useful in this regard is the listing of all family (and subfamily) group names along with their variant spellings that have been used within Gracillariidae.

The original descriptions, type localities, type depositions, geographical distributions, and parasitoids are summarized for 1,809 recognized species, grouped in 98 genera. In addition, 517 species group and 34 generic group synonyms are treated. The recording of names seems to conclude sometime during 2004, with two species published in 2004 added to the addendum near the end of the catalogue. The authors have followed the practice incorporated in some recent catalogues of treating subspecific names as junior synonyms, "because they often burden the nomenclature without adding significant knowledge to our understanding of interspecific divisions within Gracillariidae." The inclusion of information on gracillariid parasitoids in this work is particularly notable because these valuable data are too frequently omitted from world catalogues. The data on parasitoids were compiled largely from two sources, L. Fulmek, 1962, *Parasitisekten der Blattminierer Europas*, and the online "Universal Chalcidoidea Database." Distributions for each species are first indicated by one or more biogeographical regions followed by the country, and, in a few instances, states. Six biogeographical regions are defined in the introduction, generally by the countries that border them. Summations in the final chapters of the catalogue provide lists of 1) fossil species (two named adult records + seven unnamed species based on fossil mines), 2) unavailable names (mostly nomina nuda), 3) unplaced species (10), and 4) taxa transferred to other families. Totalling 52 pages, the literature references provide an excellent resource for nearly every major article that has been published on Gracillariidae. The complete spelling of all journal citations also is welcomed.

This catalogue will be a vital, necessary reference for all microlepidopterists working with leafmining fauna as well as for any biologist interested in co-evolutionary studies. The list price is unfortunately rather expensive for a catalogue (\$142), but hopefully enough libraries can stock this reference so that it will be readily available to students and professionals alike.

Don R. Davis
Department of Entomology
Smithsonian Institution
Washington, DC. 20013-7012
E-mail: davis.don@nmnh.si.edu

The Leafhoppers and Planthoppers of Germany (Hemiptera, Auchenorrhyncha): Patterns and Strategies in a Highly Diverse Group of Phytophagous Insects

H. Nickel

Pensoft Publishers Sofia-Moscow; Goecke & Evers, Keltern, 2006

460 pp., \$67.00

ISBN 3-931374-09-2

HERBERT NICKEL'S "*The Leafhoppers and Planthoppers of Germany*" summarizes results of the author's many years of study on the fauna of Auchenorrhyncha (leafhoppers and planthoppers) of central Europe. Auchenorrhyncha is one of the most rich and ecologically important groups of insects in terrestrial ecosystems. The group includes $\approx 43,000$ species (Oman and Sailer 1986) from ≈ 30 families. The most recently published check list of Auchenorrhyncha (Nast 1987) comprises data on 1,771 species known from Europe. Almost all Auchenorrhyncha are obligatory phytophages. They are very diverse in different habitats. Species of the group can be found on herbs, shrubs, and trees; nymphs of cicadas and some planthoppers live underground feeding on plant roots, and a few species are known to feed on the fungal mycelia. Some Auchenorrhyncha are important agricultural pests, damaging plants not only directly by sup-sacking but also mostly by transmission of viral and mycoplasmal diseases. Having high biomass compared with other arthropod groups, Auchenorrhyncha play important roles in terrestrial food webs.

Because of their diversity and abundance, information about ecology and life history of Auchenorrhyncha has remained scarce. Nickel's book presents a much-needed attempt to summarize knowledge on the biology, ecology, and distribution of German leafhoppers and planthoppers.

The book has eight chapters and an *Appendix*. The first chapter is an introduction, that provides a brief overview of the group and its importance. The second chapter, "Study Area", provides a physical description of Germany in general and separately for three geographical units: northern plain, the region of Mittelgebirge, and the Alps with their foothills and foreland.

The third chapter of the monograph, "Material and Methods", demonstrates the great experience of the author in study leafhoppers and planthoppers and his talent to gather and process extensive information. The book is based on a database of $>250,000$ determined specimens, many with host plant records, from 500 localities. The author notes that most of information in the book is based on study of the German fauna and that the ecology and life histories of Auchenorrhyncha may differ in other parts of the range of same species. In some cases, additional information from the literature and personal communications with auchenorhynchan specialists also is provided.

The fourth chapter, "Review of Species" (217 pages), gives narrative descriptions of the ecological characteristics of 620 species of leafhoppers and planthoppers. Each description summarizes data on host

plants, life cycles, habitat preferences, distribution, altitudinal range, and the most important literature references. Generally, information is provided for Germany, but it is sometimes supplemented with data for adjacent countries. In some cases, additional information on the economic importance of the species is provided. Where appropriate, the author provides taxonomic notes, including recent synonymy and changes as well as diverging interpretations. Unfortunately, the author follows the International Code of Zoological Nomenclature (1999) too strictly, in some cases overturning well-established taxonomic precedents. For several taxa, for which type material was lost or the original description was based on the female only, this name is rejected, placed to species incertae sedis, and replaced with a younger synonym, even in cases when the neotype was described and/or the name is widely used in taxonomic literature (see, notes to *Macropsis albae* W.Wgn., *Planaphrodes trifasciata* Geofr., *Arboridia spathulata* Rib., *Zygina rosea* Fl., *Jas-sargus pseudocellaris* Fl.). Alternatively, the status of *Psammotettix allienus* Dhlb. is not clarified. This economically important species was synonymized under *P. striatus* L. by Razvjazkina and Pridantseva (1968). Most of Eastern European systematists follow this synonymy. Western European specialists refer to the same species as *P. allienus* Dhlb. This problem is not even mentioned in the book. Genus name *Fruticidia* Zachv. cannot be replaced with the name *Fruticidia*, as it was done in the book, even if it was misspelled in the original publication (see Art. 32.5.1 of the International Code of Zoological Nomenclature, 1999).

The fifth chapter, "Utilization of Plant Resources" (115 pages), is perhaps the most valuable and original contribution of the book, providing the host plant specificity of leafhoppers and planthoppers and description of the guilds associated with different plants. Detailed tables showing plant specialization organized by plant families and Auchenorrhyncha species are provided. They include information about diet breadth (monophagy, oligophagy, or polyphagy), substrate, and overwintering stage. The chapter discusses host shifts, differences in diet preferences between nymphs and adults of leafhoppers and planthoppers, and geographic variations. The last part of the chapter provides some information about agricultural pests.

The sixth chapter, "Life Strategies", is not very long (28 pages), but addresses many important questions related to the evolution of Auchenorrhyncha: host specificity and its possible causes, including advantages of polyphagy and monophagy; plant defense and insect adaptations to it; interspecific competition; and dispersal of leafhoppers and planthoppers and related issues, including the role of wing length and wing dimorphism in dispersal, migration, and colonization. At the end of the chapter, different life cycles of

Auchenorrhyncha and their role in survival and distribution of the group are discussed.

The last two chapters of the book provide a brief summary of the main topics and an extensive list of references (45 pages). Some listed papers from it are not cited in the book, e.g., Dmitriev (1999) reviewing species of the genus *Rhopalopyx*, one of the problematic genera of leafhoppers, is not mentioned, including a long discussion on the taxonomic status of species of the genus.

The *Appendix* provides alphabetical indexes for Auchenorrhyncha genera and species as well as a host plant list.

The monograph by Herbert Nickel is a very good example of study of insect biodiversity, ecology, and insect-host plant relations. It is strongly recommended for use not only by leafhopper and planthopper specialists but also by entomologists studying other groups of insects, ecologists, and botanists not only from Germany but also worldwide. The book is published in English and is the most detailed treatment of the Auchenorrhyncha fauna of any region of the world.

Last, the Herbert Nickel's book is not intended to be a taxonomic or morphological guide and does not provided keys for identification of leafhoppers and planthoppers. These topics are to be covered in separate three volume series of "The Auchenorrhyncha of Central Europe," the first part of which covering Fulgoromorpha and Cicadomorpha excluding Cicadellidae was recently published (Holzinger et al. 2003).

References Cited

- Dmitriev, D. A. 1999. Review of species of the genus *Rhopalopyx* Ribaut, 1939 (Homoptera, Cicadellidae). Entomol. Obozr. 78: 610-624. (In Russian; translated into English in Entomol. Rev. 79: 563-575).
- Holzinger, W. E., I. Kammerlander, and H. Nickel. 2003. The Auchenorrhyncha of Central Europe. Die Zikaden Mitteleuropas, Vol. 1. Fulgoromorpha, Cicadomorpha excl. Cicadellidae. Brill, Leiden, The Netherlands.
- International Code of Zoological Nomenclature. 1999. International Trust of Zoological Nomenclature, 4th ed. London, United Kingdom.
- Nast, J. 1987. The Auchenorrhyncha (Homoptera) of Europe. Ann. Zool. PAN. 40: 535-661.
- Oman, P., and R. I. Sailer. 1986. The role of cataloging in the advancement of systematics and biogeography. Tymbal 7: 16-21.
- Razvjazkina, G. M., and E. A. Pridantseva. 1968. Leafhoppers of the group *Psammotettix striatus* L. (Homoptera, Cicadellidae) - vectors of virus diseases of cereals, their systematics and distribution. Zool. J. 47: 690-696.

Dmitry Alexandrovich Dmitriev
 Illinois Natural History Survey
 607 E. Peabody Dr.
 Champaign, IL 61820
 Phone: (217)-244-9578
 Fax: (217) 244-0729
 E-mail: dmitriev@inhs.uiuc.edu