

SCHWARTZ, M.D. AND R.G. FOOTFIT 1998. Revision of the Nearctic Species of the genus *Lygus* Hahn, with a Review of the Palearctic Species (Heteroptera: Miridae). *Memoirs on Entomology* 10. International Associated Publishers. Gainesville, Florida v-vii, 1-428 pp. 497 figs. ISBN 1-566665-066-6. Hardback. \$65(plus \$5 for post and packing).

It is really impossible in a short review to do justice to this important and exhaustive study. The economically important mirid genus *Lygus* has remained one of the most intractable and perplexing groups of Heteroptera despite the efforts of such outstanding North American plant bug specialists as H. H. Knight and L. A. Kelton. The present study is one of the most comprehensive and thorough monographs to appear

in the heteropterological literature in many years. The limits of the genus as well as the difficulty of species recognition has been a major problem for taxonomists and economic entomologists alike. This has apparently been due not only to the similarity of many species but to the variability within many species both geographically and due to seasonal difference caused by the multivoltine nature of the life cycles.

For the first time the authors have treated both the Nearctic and Palearctic species and have produced a cladogram (with a clear explanation of character polarities) that indicates what are sister taxa throughout the entire genus.

This however is really almost ancillary to the main text of the book which includes a key to all the species (with 79 figures accompanying the key alone and not repeated elsewhere in the text).

For the Nearctic region 29 species are recognized and each is treated exhaustively with one or more full page dorsal view illustrations, scanning micrographs of the head, pronotum, corial surface and of the pretarsus. For most species there is also a dorsal view of the fifth instar nymph, from two to six views of details of the male genitalia, a view of the dorsal wall and the sclerotized rings of the female genitalia and a very detailed map of the distribution. These maps are extremely valuable for they are based upon the examination of an amazing amount of material—over 17,000 specimens of *Lygus lineolaris* (P. B.) and over 15,000 of *Lygus elisus* Van Duzee alone. For each species there is a detailed Diagnosis as well as a formal description, a series of measurements, a discussion of variability, host plant data (much of it new), differences in seasonal generations and an exhaustive list of the locality data.

With a molecular study now in progress it is hard to imagine what the authors could have done to have improved the quality and thoughtfulness of this study.

The Palearctic fauna is treated in a more abbreviated fashion than is the Nearctic, but is especially valuable for comparative purposes.

In addition the limits of *Lygus* are closely defined, and two new genera are established for species previously placed in the genus (one unfortunately with the rather inappropriate name *Nonlygus*). Three new Nearctic species are described and eleven junior synonyms proposed.

For the first time it is now possible to see the genus *Lygus* in an intelligible geographic sense. It is a genus of temperate Holarctic distribution with all of the Oriental, African and Neotropical species removed. In fact the majority of species in the Western Hemisphere have a distinctly northern and western distribution, only one species occurring south well into Mexico and with a number of species occurring only along the Pacific coast and many more that extend from Alaska and or British Columbia eastward only in montane habitats in the Rocky Mountains or the Great Plains. A few species extend across Canada while only two seem to have primarily an eastern distribution in North America. Thus it is surprising that the authors recognize only two species as being Holarctic. This suggests that either more study of the fauna of the eastern Palearctic is needed, or that speciation has been relatively rapid since the breakdown of the Bering land bridge. Even the widespread species may have ranges that have expanded recently as several of these feed on various plants in agricultural areas and suggest range expansions (possibly from the northern Great Plains?) with the spread of agriculture.

With the completion of this study not only can one determine species of this difficult and important genus but it allows study of related taxa in other parts of the world that have previously been placed into what the authors rather inelegantly refer to as "garbage genera".

The careful and complete nature of this admirable study will not only be of value to mirid specialists, but to students interested in relationships of what seem to be strictly Nearctic-Palearctic groups and actually anyone interested in the biogeography of North American insects.

It is a rare pleasure to be able to recommend a book with as much enthusiasm as this reviewer has for this one. It should be on the shelf of all Heteroptera students and those of other taxonomists and many applied entomologists as well.

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