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BOOK REVIEW

SCHUH R.T. & SLATER J.A.: TRUE BUGS OF THE WORLD (HEMIPTERA: HETEROPTERA): CLASSIFICATION AND NATURAL HISTORY. Cornell University Press, Ithaca and London, 1995, 336 pp., 178 b&w illus. Hardback. ISBN 0-8014-2066-0. Price US $ 85.00.

This large tome has been written by two leading specialists on the morphology, phylogeny, and systematics of the true bugs, with considerable cooperation by Pavel Štys who wrote chapters on enicocephalomorphan and dipsocoromorphan families and keys for water bugs (Nepomorpha).

The introductory parts include information upon the history of the study of the Heteroptera (including short curricula vitae of some important heteropterists), basic techniques and major collections. They are followed by general biological chapters concerning habitats, feeding types, competition, dispersal, pterygopolymorphism, mimicry and protective coloration and shape (including myrmecomorphy), economic importance, biogeography and, particularly, morphology. This last chapter includes subsections on skeletal morphology, sound-producing and sound-recepting organs, mechanoreceptors, exocrine glands, salivary glands, alimentary canal, symbiotic microorganisms, nervous system, circulatory system, eggs, sperms, fertilization, chromosomes, karyotypes and nymphs, together with the key for heteropteran infraorders (Enicocephalomorpha, Dipsocoromorpha, Gerromorpha, Nepomorpha, Leptopodomorpha, Cimicomorpha, and Pentatomomorpha). Unfortunately, some important topics remain out of scope of the book, although they may be of a great phylogenetic importance, specifically embryology.

The great majority of the volume concentrates on a detailed systematic account of heteropteran infraorders, families, and subfamilies. The superfamilial and tribal ranks are only mentioned, the tribes are described only in the highly diverse Lygaeidae: Rhyparochrominae. All families are described according to a unified scheme: general, (morphological) diagnosis, classification, specialized morphology, natural history, and distribution and faunistics; the chapters concerning infraorders include general, diagnosis, and (historical, faunistic, bibliographic, and phylogenetic) discussion. The infraordinal to familial classification employed is based largely on the pioneering work of Štys & Kerzhner (*Acta Entomol. Bohemoslov.* **72**: 64–79, 1975), with important modifications and updating (several new higher taxa were recognized since 1975); higher-level phylogeny is based on that of Schuh (*Syst. Zool.* **28**: 653–656, 1979) which was supported and modified only slightly by the recent molecular phylogenetic study (Wheeler et al., *Entomol. Scand.* **24**: 121–137, 1993). However, comparing this book with another recent review of heteropteran diversity (Slater, in Parker: *Synopsis and Classification of Living Organisms, Vol. 2,* McGraw Hill, New York, pp. 417–447, 1982), the reader should be able to find all higher taxa, however reclassified, or the discussion concerning their invalidation. This is not the case for *Eumenotes* Westwood. This pentatomoid genus was classified as a family Eumenotidae by previous authors but, subsequently, reclassified as a member of Dinidoridae: Megymeninae by Durai (*Orient. Insects* **21**: 163–360, 1987). More significantly, the heteropterists obtain, for the first time, a comprehensive, lucid and richly illustrated survey of heteropteran morphology and natural history down to subfamilial rank. The monograph is concluded by an extensive bibliography (including about 1,350 entries) and a glossary of terminology.

However, I have an objection which is not aimed to decrease the great value of the present book. The systematic hemipterist will lack for a discussion of the phylogenetic position of the Heteroptera within hemipterans in general. The authors do not follow Carver & Gross' (in CSIRO: *Insects of Australia*, Melbourne University Press, Carlton, pp. 479–480, 1991) disputable classification of peloridiids as an additional heteropteran infraorder, but present them as the only extant representatives of the Coleorrhyncha (a sister group of the Heteroptera within Heteropterodea = Prosorrhyncha). However, they do not discuss this recently raised problem of delimitation of the Heteroptera as an order. The relationships among individual infraorders and families are only outlined, but not substantiated by discussion of the data. This requires morphological and bionomic characterization of superfamilies, probably the most important rank of heteropteran classification, with reference to alternative phylogenetic hypotheses. The mere survey of formal classification, for example, that idiostolids are sometimes classified within lygaeoids (as the present authors do) and sometimes as an independent superfamily, includes no systematic information. This book, in short, accentuates what has been done rather than what should be done; however, this should not be considered to be a failure of this monograph.

In conclusion, I recommend this book most sincerely to all biologists looking for an overview of the present systematic knowledge of this fascinating insect group (which is the most diverse taxon of non-holometabolous insects), to all non-systematist hemipterists, and, last but not least, to all heteropteran systematists who seek any information outside of limits of their own beasts.

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