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Book Review - Freshwater Macroinvertebrates of Northeastern North America

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Freshwater macroinvertebrates of northeastern North America. B. L. Peckarsky, P. R. Fraissinet, M. A. Penton, and D. J. Conklin, Jr. Cornell University Press, Ithaca, New York, 1990. 442 pp. \$57.50 (cloth), \$26.50 (paperback).

This is the latest contribution to generic or specific-level, regional, identification guides for aquatic insects and other freshwater macroinvertebrates in North America, following such precedents as those of Usinger (1956) for the west coast, Hilsenhoff (1981) for the Great Lakes region, and Brigham et al. (1982) for the mid-Atlantic states. The Introduction indicates that most of the information (except the Hydrachnidia, Mollusca, and Oligochaeta keys) is not original. Justification for the geographic restriction includes (1) reducing user tedium and inefficiency relative to the taxonomically more inclusive keys (e.g., those of Pennak 1989, McCafferty 1981, Merritt and Cummins 1984), (2) improving reliability in keys (which otherwise are based in part on species outside the region), and (3) enabling more numerous tests of the keys with regional species and therefore better communication for incorporation of new information for future revisions.

Geographically, the northeastern North American coverage is generally south to Virginia and west to Michigan, with emphasis on the fauna of New York, Pennsylvania, New England, Ontario, Quebec, and New Brunswick. Taxonomically, this volume includes chapters on semiaquatic Collembola; larvae of aquatic Ephemeroptera, Odonata, Plecoptera, Trichoptera, Lepidoptera, Megaloptera, Neuroptera, and Diptera (with a chapter on Chironomidae by Robert W. Bode); larvae and adults of aquatic and semiaquatic Heteroptera ("Hemiptera") and Coleoptera; and freshwater Crustacea, Hydrachnidia (by Bruce P. Smith), Mollusca (by David Strayer), Oligochaeta (by David Strayer), and Hirudinea (by Donald J. Klemm). The keys are to the generic level for most groups, with selected species keyed for freshwater Crustacea and all species for Mollusca, Oligochaeta, and Hirudinea. Generally, the keys are designed for users who are attempting to identify whole specimens in alcohol, rather than slide-mounted material; Chironomidae, Oligochaeta, and occasional Hydrachnidia are the exceptions that require slide-mounting for generic-level identification.

Brief introductions to the classification, life history, habitats, feeding habits, respiration, collection and preservation techniques, identification, and references to selected publications are provided for each class or order, along with a checklist for the taxa keyed. The bibliography at the end of each chapter usually includes many publications on various aspects of the biology of the taxon in addition to references on systematics. Among these references, those used to construct the keys are noted with an asterisk. Some incompleteness of the literature used, however, will necessitate caution when using the keys. For example, in Trichoptera, the rather rare northeastern genera *Chilostigmodes* (Limnephilidae) and *Beothukus* (Phryganeidae) are not keyed, nor are genera that occur in at least the margins of the region (e.g., published reports indicate that *Anisocentropus* [Calamoceratidae] is found in Delaware and Virginia, *Matrioptila* [Glossosomatidae] in Virginia, and *Oligophlebodes* [Uenoidae] in Michigan). A useful 13-page glossary of morphological terms is provided at the end of the book.

Although the authors make little claim for originality in this work, I found several instances where new diagnostic features are introduced or where clearer wording is provided for features appearing in previously published keys. Evidently nine years of pre-publication student use of the manuscript has provided helpful modifications for the finished product.

Line drawings that support the keys generally are simple, uncluttered, adequate for identification, with good captions. Except for those supporting the keys for Chironomidae (about 80% original), most of the drawings are modified or redrawn from other sources (about 95%). Although a general discussion of the morphology of a class or order is not provided, most chapters have a labelled diagram of the structures that give the main diagnostic characters of the taxon to assist the novice.

The classification of insects used in this book basically is according to that employed by Merritt and Cummins (1984). Nevertheless, an effort has been made to use more recent classification in some cases. For example, the perlid stonefly generic name *Agnatina* is used as the senior synonym of *Phasganophora*, agreeing with the opinion of Zwick (1984), accepted by Stewart and Stark (1988). However, some taxonomic

changes were not adopted, probably because of differences of opinion among taxonomists. To avoid confusion when dealing with other current literature, the authors could have improved their text by mentioning the widely used alternatives. For example, "Hemiptera" is used in this book instead of "Heteroptera", the term preferred by the catalogers of the order (Henry and Froeschner 1988). Although the work by Schuster and Etnier (1978, which considered *Symphitopsyche* [now *Ceratopsyche* in North America, Europe, and Asia] as a distinct genus) is noted as a source of the Trichoptera key, the hydroptychid generic name *Ceratopsyche* (considered a subgenus of *Hydropsyche* by Scheffer et al. 1986) is not mentioned; Merritt and Cummins (1984) and numerous other recent authors have referred to it, usually as a separate genus. The readers of this book would have benefited from at least a clarifying remark or footnote concerning these names, if not a key couplet for their diagnosis.

Technically, the book is well-edited, the printing is crisp, the acid-free paper has a readable, flat finish, and at least the paper edition binding appears sound. The generous page width (17.5 cm) of the paper edition permits the volume to stay open on the lab countertop to within about 100 pages of either end.

The book will be of use as a textbook for students in freshwater biology and aquatic entomology courses and as a standard reference work for benthic ecologists and those monitoring freshwater quality in the Northeast. Because the book includes all the more commonly encountered freshwater macroinvertebrate classes, rather than just insects (e.g., Merritt and Cummins 1984) or just non-insect invertebrates (e.g., Pennak 1989), it is the most complete, modern text available for this region. It can stand alone as an identification guide for those with a basic understanding of the diagnostic characters of the groups; but it should be supplemented by other materials for details of subjects such as morphology, behavior, physiology, ecology, phylogeny, distribution, sampling, and rearing. Therefore, instructors and students in courses on benthic biology in the Northeast will find this an attractive laboratory manual, especially at the paperback price. Nontaxonomic lectures and outside readings may be used to expand the scope of the instruction. Northeastern benthic ecologists and biological-mon-

itoring workers will use it regularly; like many other "good friends" on our reference shelves, this volume will soon show the coffee stains and "dogears" of constant companionship!

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