

BOOK REVIEW

Chironomidae of the Holarctic region. Keys and diagnoses. Vol. 1. Larvae, edited by Torgny Wiederholm. Entomologica Scandinavica Supplement 19. 455 pp. 1983. \$73. *A catalogue of the chironomid genera and subgenera of the world including synonyms (Diptera: Chironomidae)*, by Patrick Ashe. Entomologica Scandinavica Supplement 17. 68 pp. 1983. \$15. *A review of the genera Doithrix n. gen., Georthocladus Strenzke, Parachaetocladus Wülker and Pseudorthocladus Goetghebuer (Diptera: Chironomidae, Orthocladiinae)*, by Ole A. Saether and James E. Sublette. Entomologica Scandinavica Supplement 20. 100 pp. \$19. 1983.

The Chironomidae are a group of aquatic insects long shunned by many aquatic biologists, and with good reason. Ubiquitous, incredibly abundant and numerous in genera and species, their identification, even at the generic level, has long posed a considerable problem. The works reviewed here go a long way towards solving that problem.

Chironomids have long been considered key elements in any aquatic fauna, but, in general, their identification and taxonomy have been so difficult that the group is often listed only at the family level in many studies. Although a number of identification keys have appeared, these suffer from a lack of information, illustrations, incorrect taxonomy and misdeterminations. The *Chironomidae of the Holarctic region* provides the necessary information that benthic biologists have long been seeking.

The book is hardbound and printed on high quality paper. It is arranged in 12 chapters, with two introductory chapters, and two final chapters devoted to references and an index. Eight of the ten subfamilies of Chironomidae are represented in the Holarctic region; each is provided with its own chapter. The list of authors of the chapters reads like a "Who's Who" of chironomid specialists: Brundin, Cranston, Fittkau, Oliver, Pinder, Reiss, Roback and Saether.

Too often, benthic biologists rely solely on dichotomous keys for identification of organisms, or perhaps just a picture that "matches." In this volume, we have the best combination—keys, illustrations, and most importantly, diagnoses. With a group as complicated as the Chironomidae, keying to a genus in a key is insufficient. It is far too easy to make a mistake and land in the wrong place! A diagnosis should always be consulted, and those offered in this volume are concise and often contain crucial information needed for separating similar genera. Each genus also has its own page (or pages for more complex genera) of clear illustrations of important generic characters. Keys to subgenera or species groups are offered for some genera. Comments are also given on distribution and general ecology for each genus.

This volume belongs on the shelf of every aquatic entomologist and/or benthic biologist involved in faunal surveys or identification work. However, it can not be considered a panacea for their identification woes. The keys are for fourth instar larvae; earlier instars may differ. Not all genera are known in the larval stage (described genera with unknown larvae are listed in each chapter). The keys often utilize structures which can only be observed in correctly prepared specimens

under high magnification. The book is not an easy tool for the uninitiated in chironomid morphology to use. Explanation of morphological terms used in the keys is limited to three pages of explanatory plates in the second chapter. It is recommended that the novice worker obtain a copy of Saether's *Glossary of chironomid morphology terminology* (Entomologica Scandinavica Supplement 14, 1980, \$13.60) to use with the holarctic keys. Many of the characters used in the keys, such as the frontal apotome, will be new to North American workers. The keys themselves work fairly well. The Tanypodinae key seems ponderous, but does enable one to finally separate the genera of the *Thienemannimyia* group. The key for the Chironominae works extremely well.

The volume suffers only in some minor aspects. First, it appears to me that very few people are aware of its existence. Many state environmental personnel and consulting biologists I have been in contact with did not know of it. Sales of the first volume in the United States have been rather low according to information I've received from the various authors of the text and the editors. This may be due to overzealous xeroxing, probably as a result of the high price of the volume. *Entomologica Scandinavica* is fast becoming *the* journal for chironomid systematics papers, but cannot continue to publish such papers if copies are not sold because of the reluctance of some workers to purchase them. This volume is but the first of a proposed three volume set dealing with the larvae, pupae and imagines. The complete set was (and may still be) available at a substantial discount if one purchased all three volumes together. (The second volume, covering pupae, will soon be published.)

Typographical errors are minor and few. The most noticeable occurs on page 383, where *holoprasinus* is misspelled *holoprasinatus*. The one mistake I could find was in the Chironominae chapter. In figure 10.62, the authors illustrate the mentum and antenna of *Polypedilum (Polypedilum) tuberculum* Maschwitz. However, since the species is described in Maschwitz's unpublished Ph.D. thesis, the authors have created a nomen nudum. "Publication" of a xeroxed copy of a thesis by University Microfilms does not constitute publication according to the International Code of Zoological Nomenclature. The new (1985) Code makes this position relatively clear in regards to theses and dissertations.

The second work, Ashe's *Catalogue of chironomid genera*, is a godsend for chironomid taxonomists. In this paper, Ashe lists all known chironomid genera, a total of 524, of which 355 are considered valid. Valid genera are listed in boldface type; their synonyms, nomina dubia and nomina nuda in lighter type. Also included are the authors' name(s), date, type-species and comments concerning the taxonomy of the genus if necessary. A special section at the end of the paper deals with fossil genera, most of which are considered incertae sedis. A perusal of this listing of 23 generic names makes it clear that much remains to be done with the taxonomy of fossil chironomids.

Ashe has done an incredible amount of work in producing this paper; he has seen all of the literature involved and has consulted with experts on various genera. Anyone who does not make chironomid taxonomy a specialty knows what a nightmare it is to trace a given name; it is exasperating and time-consuming to one already equipped with a well-stocked library of chironomid literature. Eminently clear, concise and readable, this catalogue stands out as a model for catalogues for other families. No chironomid systematist should be without it.

The third paper reviewed deals with a monophyletic group within the subfamily Orthoclaadiinae. It is a paper done in the typical Saether style, well illustrated (by Saether's wife, Unni), and covering adult males and females, pupae and larvae when possible. Sublette's influence is seen in the number of scanning electron micrographs presented. Modern chironomid taxonomy demands that characters from all life stages be used to delimit taxa whenever possible. Characters from one life stage are not sufficient to unravel complex relationships between genera or groups of genera. This paper utilizes all the taxonomic information available.

Most of the chironomids covered in this paper are apparently semi-terrestrial or found in seeps, small springs, etc. Much of the material utilized by the authors was collected by an extremely adept and dedicated collector, Pat Hudson. Hudson's collecting efforts in areas not heavily collected for chironomids have gone a long way towards advancing the state of chironomid systematics.

We have here three excellent papers dealing with chironomid systematics, all published by a journal which is becoming a major voice in that field (and we need one). The first two are a must for anyone dealing with chironomids in general, the third more for specialists. I would encourage workers to purchase the entire three volume set of the *Chironomidae of the Holarctic region*. These publications can be ordered from Scandinavian Entomology Ltd., P.O. Box 24, S-240 17 S. Sandby, Sweden (include \$2.75 for postage for each item ordered). The discount for ordering all three volumes of the Holarctic keys may still be in effect. You will be acquiring a state of the art series of monographs which are destined to become classics.

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