Book Review

An Introduction to the Aquatic Insects of North America

R. W. Merritt and K. W. Cummins, eds.
Kendall/Hunt Publishing, Dubuque, IA,
3rd ed., 1996
862 pp., $69.95
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THE SECOND EDITION (1984) OF THIS WORK had a major impact on studies of aquatic insects by providing updated generic keys and a wealth of other information. Since its publication, many changes have occurred in the systematics and taxonomy of aquatic insects, and much has been learned about their biology and ecology, making a revision desirable. Revising the second edition also provided an opportunity to correct errors discovered after a decade of use.

The third edition has many improvements. The content was increased at least 20%, with better formatting resulting in greater utilization of space. There are 400 more figures; many older figures were enlarged and others were redrawn. The new spiral binding does not restrict turning of the pages as did the previous binding, and chapter names along the outer margin of each page make locating a chapter much easier. A chapter-by-chapter comparison with the second edition revealed that some chapters were altered substantially, a few were greatly expanded, and others were changed very little. A chapter on "Use of Aquatic Insects in Biomonitoring," by David Rosenberg and Vincent Resh, is a welcome addition. It summarizes their 1993 book *Freshwater Biomonitoring and Benthic Macroinvertebrates* (Chapman Hall, New York).

The first eight chapters cover general subjects, and the remaining 18 chapters are concerned with the taxonomy, biology, and ecology of Collembola and orders of aquatic insects. A brief summary of changes in each chapter follows.

The rewritten Introduction indicated a greater emphasis on ecology and field techniques.

No changes were made to Chapter 2, "General Morphology of Aquatic Insects."

In Chapter 3, "Design of Aquatic Insect Studies: Collection, Sampling and Rearing Procedures," several changes and updates included an increased emphasis on designing sampling procedures to fit the proposed study. Three figures were added.

Much of Chapter 4, "Aquatic Insect Respiration," was revised, with a significant increase in the section on "Ventilation and Regulation." A section on "Effects of Toxicants" was added.

Chapter 5, "Habitat, Life History, and Behavioral Adaptations of Aquatic Insects," was updated and expanded and has a new eight and one-half page table on voltinism and habitat, with references.

Updating and additions nearly doubled the length of Chapter 6, "Ecology and Distribution of Aquatic Insects." Tables were unchanged, but five figures were added.

Chapter 7, "Use of Aquatic Insects in Biomonitoring," is a new chapter.

In Chapter 8, "Phylogenetic Relationships and Evolutionary Adaptations of Aquatic Insects," figures and other material were updated, but no substantial changes were made.

In Chapter 9, "General Classification and Key to the Orders," many changes were made in the "Life History" section; other changes were minor. Apterous Plecoptera, apterous adult Trichoptera (Dolophilodes), and early instars of hemimetabolous larvae cannot be keyed.

In Chapter 10, "Aquatic Collembola," a new figure (map) was added, but much of its caption should be deleted. Seven couplets were added to the key, and the table summarizing ecological and distributional data was substantially changed.

Changes were substantial in Chapter 11, "Ephemeroptera," with the addition of several new families. Sixteen and 17 couplets were added to larval and adult keys, respectively; 27 figures also were added.

Except for updating, little was changed in Chapter 12, "Odonata." Macromiidae was included as a subfamily of Corduliidae. Separate keys for larvae of Corduliidae and Libellulidae create identification problems that could have been eliminated in a combined key.

Two genera were added to the key and table in Chapter 13, "Semiaquatic Orthoptera."

In Chapter 14, "Plecoptera," the larval key has 22 additional couplets and the adult key 14, resulting in 13 new figures. Changes in the text were minor.

Changes were minor in Chapter 15, "Aquatic and Semiaquatic Hemiptera." Keys to Gerridae, Veliidae, Corixidae, and Naucoridae were modified, and six figures were added.

Additional references were added to Chapter 16, "Megaloptera and Aquatic Neuroptera."

Very little was changed in Chapter 17, "Trichoptera Families." The families Dipseudopsidae, Apataniidae, Goeridae, and Rossianidae (Wiggins 1995) also were not used, making the key and table 17A out-of-date.

In Chapter 18, "Trichoptera Genera," the introduction and keys were modified and updated; family names mentioned above were not used. Nineteen figures were added to the keys.

Only minor changes were made in Chapter 19, "Aquatic and Semiaquatic Lepidoptera."

Except for a rewritten introduction, a section on "Defense Mechanisms," and a paragraph on use of Curculionidae for biocontrol, changes were minor in Chapter 20, "Aquatic Coleoptera." Keys were essentially unchanged, except for modifications to add newly discovered genera; no figures were added. The key to larvae of Dytiscidae is inaccurate, and several recent advances in taxonomy, biology, and ecology were not included or referenced.

Chapter 21, "Aquatic Hymenoptera," was updated but not changed substantially.

Chapter 22, "Aquatic Diptera," was vastly improved and had 48 couplets added to the larval key to include three more families and many additional genera. A key to families of pupae was added, and the key to adults also was updated to include three more families. Also, 199 illustrations were added.

Only minor updates were made to Chapter 23, "Tipulidae."

The text in Chapter 24, "Culicidae," had several modifications, but the keys remained unchanged.

Chapter 25, "Simuliidae," was greatly expanded, mostly by addition of a pupal key, inclusion of subgenera in the adult key, and the addition of 80 figures.

In chapter 26, "Chironomidae," 44 genera and 81 figures were added to the larval key, and 46 genera and 36 new figures were added to the pupal key. Keys to subfamilies and tribes of adults and marine Chironomidae mostly were unchanged.

The Bibliography contains 1,795 additional references.

In spite of a few shortcomings, this is an excellent book that should be owned by every person in North America who works with aquatic insects. Changes made in most chapters of the second edition are so extensive and important that it should be replaced by this third edition.

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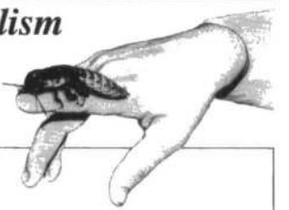

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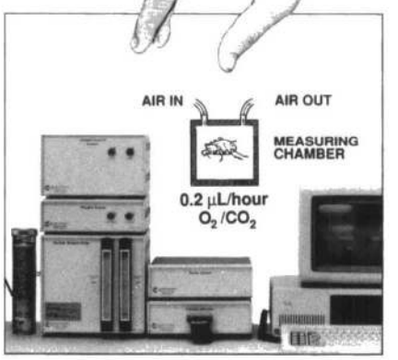

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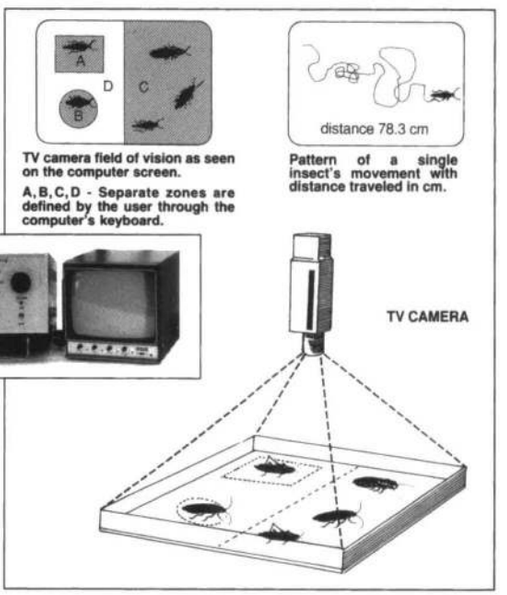

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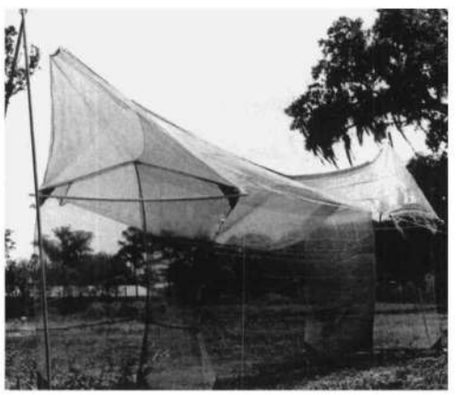

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