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BOOK REVIEW

MICROLEPIDOPTERA, by Elwood C. Zimmerman. 1978. Insects of Hawaii, volume 9, xxiv + 1903 pages, 1355 cuts. Price: U.S. $60. University of Hawaii Press, Honolulu.

The first 200 pages are an overview of the Lepidoptera that includes a) classification, b) identification keys to the immature stages of the species found in Hawaii and separate keys to the larvae and pupae found in specific habitats, c) morphology of the immatures and adults, and d) techniques for preparing and handling adults and immatures for collections and for wing and genital studies. A checklist of the described (only previously described or misidentified species are treated) genera and species and list of nomenclatural changes are useful. Fourteen of the 80 genera and 605 of the 681 species are endemic. A synopsis of the distribution of genera and species by island illustrates the high degree of species' endemicity; however, lack of adequate collecting makes the tables preliminary.

The systematic treatment is a good survey of the microlepidoptera of Hawaii. Illustrations are abundant and cover the immature as well as the adult stages. Zimmerman has developed identification keys to most of the taxa. A notable exception is to the species of *Hyposmocoma* Butler. New generic names are proposed and defined when necessary. He has brought together published drawings of structural parts of adults and larvae of as many species as possible and reproduced them in this volume; so, the user has before him much of the extant illustrative material.

Zimmerman proposes a relatively conservative higher classification at the family level within the so-called microlepidoptera that is particularly noteworthy in the Gelechioidea. He places the Oecophorinae, Ethmiinae, Xyloryctinae, Blastobasinae, Chrysopeleiinae, Momphinae, Cosmopteriginae, and Gelechiinae as subfamilies of the Gelechiidae. Based on strict priority of family-group names, the superfamily and family should be Oecophoroidea and Oecophoridae (Bruand, 1850), not Gelechioidea and Gelechiidae (Stainton, 1854). I agree with Zimmerman's philosophy on the inflation of the classification of the microlepidoptera but not with all of his conclusions. However, the final word definitely is not written on classification, particularly that of the Gelechioidea. Some major differences are the following: *Thyrocopa* Meyrick is in the Autostichinae of the Oecophoridae rather than in the Xyloryctinae of the Gelechiidae. *Chedra* Hodges and *Batrachedroides* Zimmerman are in the Batrachedrinae of the Coleophoridae rather than in the Momphinae, Gelechiidae. Momphidae, *sensu stricto*, do not occur in Hawaii. Cosmopterigidae have two subfamilies in Hawaii, Cosmopteriginae with four genera, and Chrysopeleiinae with one introduced species and genus. Symmocinae are a subfamily of Blastobasidae rather than a tribe of the Gelechiinae. The correct spelling for Dichomerini is Dichomeridini. *Sitotroga* Heinemann and *Pectinophora* Busck are in the Chelariinae rather than the Gelechiinae. *Merimnetria* Walsingham is in the Anomologinae rather than the Aristoteliini.

Defining the limits of genera is often one of the most difficult problems that taxonomists face. Zimmerman's perplexion in dealing with the extremely large genus *Hyposmocoma,* with an estimated 500+ species endemic to Hawaii, is understandable. He synonymized 13 generic names under *Hyposmocoma* after finding no consistent differences to separate groups associated with the previously proposed generic names. Six hundred thirty pages of the two-volume work are devoted to the 350 described species of *Hyposmocoma.* I strongly recommend this section as an example of the morphological diversity that can occur in a genus. Zimmerman states that a life's work could be spent on this genus. With a projected 150 undescribed species and without an identification key to the described species, determination of species is problematical, but a far greater start has been made to deal with them than ever before. He lists a number of criteria that he discovered to be significant and that may be helpful to the person who attempts to devise such a key.

The text is written in a highly readable style. It is often interspersed with biting comments relative to lack of support for this immense project that, without personal knowledge of his situation, may appear incongruous. I strongly agree with his oftenmade observation that Hawaii has been visited by many, but our knowledge of the microlepidoptera that occur on the islands is so inadequate as to be appalling—the same is true for the continental United States. From the vantage point of a systematist working at the U.S. National Museum of Natural History and considering that Hawaii is one of the States, I am a bit troubled that nearly all of the specimens reside in the British Museum of Natural History.

By and large typographic errors are few. The most annoying feature of the book is that often the text is cut up and separated by illustrations, in one instance with 124 pages of them. But, I can understand the view of wanting to have the illustrations near the associated text. I am puzzled by the large number of illustrations of adult morphology that do not accompany any text. The wealth of information about Lepidoptera in general and the microlepidoptera specifically is welcomed. All students of the Hawaiian biota and of the microlepidoptera will find much of interest, many facts to digest, and many leads for further research. I congratulate Zimmerman on a fine accomplishment.

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