

categories: morphological description, habitat, foodplant, distribution, and subspecies. No common names are given, for the simple but surprising reason that no popular common names for butterflies have evolved in Galicia!

The four appendices provide a hint of the kind of useful data and detailed analysis to be presented in the forthcoming two-volume work. Appendix I discusses the origin, establishment, and composition of the butterfly fauna of Galicia in terms of geographic realms, fossil history, and Miocene and Pliocene refugia and dispersal routes. It concludes with a table that lists for each gallegan species Fernández Vidal's assessment of its geographical origin, geological time of establishment, and the probable route of passage by which it entered the region.

Appendix II is a checklist of butterflies of Galicia and their occurrence in the four provinces. There are 155 species recorded from the region, distributed among the provinces as follows: Lugo (146 species), Orense (133), Pontevedra (94), and (ironically) in Fernández Vidal's home province of La Coruña (92).

In Appendix III is given the date of the discovery of each of the species in the region, listing them chronologically in order of the published documentation of their occurrence in Galicia, from 1866 through 1991. Of the 155 species, Fernández Vidal himself has documented 40 between 1977 and 1991, including 18 reported for the first time in this book. In addition, Fernández Vidal has named thirteen new subspecies and forms from Galicia during this time period.

The final Appendix (IV) is a bibliography of the butterflies of Galicia, which contains only 31 entries. Significantly, fully half of the cited publications (15) are authored by Fernández Vidal, underscoring his important contribution to the better understanding of the butterflies of this little-known region of Spain.

The book is sturdily bound and attractively designed. There is an index to species, but not one to subjects—a major drawback. Although the photographs are not first-rate, the line drawings are excellent. Much of the information presented here is new and, especially in the appendices, of great interest. Of course, those unable to read Spanish will find much of this interesting information inaccessible. Although this book is an excellent introduction to the butterflies of Galicia, I look forward to the appearance of the more detailed two-volume publication with its greatly expanded coverage of the topics that are treated briefly, but tantalizingly, in the appendices of the present work.

BOYCE A. DRUMMOND, *Natural Perspectives*, P.O. Box 9061, Woodland Park, Colorado 80866.

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THE OWLET MOTHS OF OHIO—ORDER LEPIDOPTERA, FAMILY NOCTUIDAE, by Roy W. Rings, Eric H. Metzler, Fred J. Arnold, and David H. Harris. 1992. Bulletin of the Ohio Biological Survey (new series) Vol. 9, no. 2. vi + 223 pp., 8 color & 8 B/W plates. Softcover, 21.5 × 28 cm, ISBN 0-86726-110-8. \$20 (+ \$3 p & h). (Order from Ohio Biological Survey, 1315 Kinnear Road, Columbus, Ohio 43212-1192; Ohio residents add 5.75% tax.)

The appearance of this book in 1992—along with *The Butterflies and Skippers of Ohio* by D. Iftner, J. Shuey, and J. Calhoun—marks the first substantial fruits of what is probably the most well-organized state faunistic survey of Lepidoptera ever undertaken in the Americas. The book is an annotated checklist for 708 species of Noctuidae, but it is also much more.

Introductory sections include an abstract, acknowledgments, lists of figures and plates, and an Introduction giving historical perspective. Sections follow that are useful to users, from beginner to professional: Nomenclature and Systematics, Collection and Preservation of Specimens (accompanied by Ohio map of counties), Identification of Owllet Moths

(emphasis on wing and genitalic features), and Developmental Biology of Owlet Moths (an overview of noctuid life histories). A short essay on Conservation of Owlet Moths follows, indicating threats to populations by habitat loss, pesticides, and human exploitation. A tone of responsible stewardship of moth populations is projected, with an appeal to collectors to inspect netted specimens before killing only those wanted, to release gravid females, and to collect selectively at lights. Gardening practices to foster Lepidoptera breeding are recommended. Land management practices by state government parks and wildlife agencies to protect Lepidoptera are acknowledged and recommended (specific recommendations appear in the Descriptions of Special Habitats section later in the book).

Next comes a systematic checklist of the species, arranged according to the R. Hodges et al. (1983) *Check List of Lepidoptera of America North of Mexico*, but with modifications reflecting changes and additions since that work was published. Then the meat of the book: species treatments, with Hodges and McDunnough checklist numbers, scientific names (no English names), author name and date of publication, references to books illustrating the moths (and corrections of names used in them when needed), Status (rare, common, etc.), History (dates of earliest and latest records), and Host (food-plant references and new host records, if known). A Remarks entry with useful identification notes or nomenclatural annotations is added for less than half of the species treated. A miniature Ohio map with dots for county records accompanies each species entry. In the right margin are two bars (one for northern and the other for southern counties), each divided into squares for months of the year. These are variously shaded to represent number of capture records, ranging from white for no records, and increasingly darker for 1–3 records and 3–10 records, to black for more than 10 records. There are usually 5–7 species treatments per page.

Next comes a section entitled "Owlet moths that qualify for special attention in Ohio." It lists one species (*Catocala pretiosa*) as Extirpated, 13 as Endangered, 5 as Threatened, 13 as rating Special Concern, 40 under Status Unknown, and 44 as species of Special Interest. Those already officially listed as Endangered by the Ohio Department of Natural Resources, Division of Wildlife, are indicated with an asterisk. Explanations of each category are explained. Following this listing is a description of eight habitats that contain significant numbers of species deserving concern, and why each is at risk. Recommendations for improved management of these preserves are given.

Short sections follow listing migrant species, a list of species expected but not yet recorded (hypothetical checklist), and list of species excluded from the list (with reasons in seven categories for exclusion). An alphabetical list of host plants is given next, with noctuid species listed that reportedly feed on them. A glossary, a list of regional lepidopterists' societies, Ohio county abbreviations, literature cited, bibliography of "useful publications in the study of Noctuidae," a checklist to Hodges et al. (1983) *Check List* numbers (moths listed alphabetically), and general index round out the text.

There are 16 plates, the first 8 of which are black and white photos of eggs (I–III) and larvae (IV–VIII). The rest are composite color plates of owl moths specially selected as not illustrated previously in color, or shown next to closely similar species for better comparison (criteria for selection listed on page 6).

Besides being a thorough and carefully prepared annotated checklist for Ohio Noctuidae, this book is loaded with biological and taxonomic information. It brings up to date the nomenclatural changes since publication of the Hodges et al. *Check List* of 1983 (notably R. Poole's 1989 *Lepidopterorum Catalogus*, New Series, covering worldwide Noctuidae) and lists other recent literature pertinent to Ohio Noctuidae. It functions as a manual for tougher species, with identification aids in the text and sharp life-size color photos of moths such as *Zanclognatha* and *Renia* species that are troublesome to identify. The sections dealing with species and habitats of concern are unique, wedding interests of the lepidopterist to those of the people and institutions concerned with natural resources management and protection. The sheer numbers of records—garnered through visits to museums and extensive collecting by members of the Ohio Lepidopterists and other collaborations—make coverage of range, flight periods, and status more authoritative than in any previous state faunal list of moths.

I highly recommend this book to anyone interested in eastern North American moths

and as a model faunistic study for emulation in any geographic area. Companion works on other moth families are planned, and when completed will provide coverage of Lepidoptera unexcelled by that of any other American faunistic study.

CHARLES V. COVELL JR., *Department of Biology, University of Louisville, Louisville, Kentucky 40292.*

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BIOLOGIA Y MORFOLOGIA DE LAS ORUGAS. LEPIDOPTERA. VOL. 9. NYMPHALIDAE—SATYRIDAE—LYCAENIDAE—ZYGAENIDAE, by Carlos Gomez de Aizpurua. 1991. Boletín de Sanidad vegetal. Fuera de Serie No. 21. Ministerio de Agricultura, Pesca y Alimentación, Centro de Publicaciones, 1 Paseo de la Infanta Isabel, 28014 Madrid, Spain. Softcover, 18.5 × 25 cm, 226 pp., text in Spanish. 3000 pesetas (about \$30.00 U.S.).

This book is one of a series of volumes on the immatures of Spanish Lepidoptera. It includes a map for each species; a chart of the months of presence for eggs, larvae, pupae, and adults; a little about the habits of adults and immatures; and a brief mention of hostplants. But most of the text consists of lengthy descriptions of the colors of older larvae, pupae, and adults, with each stage illustrated by photographs. Unfortunately, descriptions and photographs of eggs and young larvae are not included and the book lacks such rigorous systematic niceties as morphological descriptions and setal patterns of larvae and pupae. Not all Spanish butterflies are included, and some groups are poorly represented (only one species of Melitaeini, for instance). Zygaenidae are included (Europeans treat burnet moths like butterflies because of their abundance and colorful appearance).

The book's best feature is its nice photos of older larvae and pupae. The photos are high quality, with most of each animal in sharp focus, permitting valuable comparisons with larvae and pupae of other species in other localities. In leafing through the photos, I was amazed to note that the larva of *Hipparchia statilinus* appeared identical to the larva of "*Neominois*" *ridingsii* I was rearing from Colorado, complete with the same head and body pattern and the same dark subdorsal mid-body stripe above a pink stripe. Comparison of *ridingsii* under the microscope with the photos did reveal some difference (the pink stripe of *ridingsii* is actually one stripe position lower than the pink stripe of *statilinus* and corresponds to the white spiracular stripe of *statilinus*). But surely the amazing larval resemblance must be due to phylogenetic relationship rather than to coincidence, and indeed Lee Miller (1968, Mem. Amer. Ent. Soc. 24, p. 119) placed both genera next to each other within tribe Satyrini of his family Satyridae, based on adult traits. I will be bold here, and declare that *ridingsii* is really *Hipparchia* (*Neominois*) *ridingsii*. (Furthermore, the Himalayan *Karanasa* is very close to *Neominois* according to Miller and others, so it should be demoted to a subgenus of *Hipparchia* as well.) Because generic limits are arbitrary, surely the color patterns of larvae and pupae can help harmonize the differing generic concepts in America and Europe.

The larva of *Erebia meolans* is similar to American *E. epipsodea*. The pupa and adults of Spanish *Celastrina argiolus* resemble Colorado *C. "neglecta"* more than Colorado *C. "lucia"-type*," which could help in determining whether any American form deserves the name *argiolus*. The theory that American *Lycaena phlaeas americana* came from Europe by ship suffers a setback because photographs of the Spanish adults (and English and other European adults I have seen) show the tails too long and the underside too brown to match American *americanus*; only ssp. *polaris* from Lapland has the underside gray enough and the tails short enough to match *americana*, but it has a brassy upperside. For this theory to hold water, a European population will have to be found that matches *americana*. A further setback for the theory: proponents of ship transport cite *americana*'s use of introduced European *Rumex acetosella* in America and Europe as proof, but