

BOOK REVIEWS

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THE BUTTERFLIES OF COSTA RICA AND THEIR NATURAL HISTORY, VOLUME II, RIODINIDAE, by P. J. DeVries. 1997. Princeton University Press, 41 William Street, Princeton, New Jersey 08540. vi-xxv + 288 pp., including 25 color plates, 59 figures, 11 tables, ISBN: 0-691-02890-7. Available from BioQuip Products for \$90.00 U.S. (\$29.95 paperback).

This is the second in a series of field guides to the diurnal lepidoptera of Costa Rica, and an excellent introduction to this poorly known family of butterflies. Like volume one, this book contains not only admirable coverage of the species from this area, but also an amazing wealth of natural history information. Illustrations of the early stages of many species are included, as well as scanning electron micrographs of a selection of eggs and larval morphological features. This work now stands as the most useful tool for identifying and studying riodinids in Costa Rica and the neotropics in general.

This book is much more than a simple field guide. As it allows the reader to accurately identify riodinid species from Costa Rica (and genera from most of Central and South America), it is undeniably useful as a field guide; however, it is also the most complete work covering all aspects of riodinid biology. Its usefulness as a guide to the biology, systematics and identification is surpassed only by its utility as a springboard towards further research and fieldwork on this poorly known group of butterflies. Some problems with the printing notwithstanding (See corrections in Swinethrottle 1997), any student of butterflies can use this book in the field to quickly identify a specimen, assess the current state of knowledge concerning its biology, and act accordingly in gathering important data. It is indeed, far more than a guide to labeling specimens, and is instead an important tool to be used by all students of butterfly biology and natural history.

Following in the tradition of D'Abrera, the plates included in this volume are of superior quality and useful for identifying pinned specimens. While each species is also described in detail in the text, including mention of similar species, I found myself wishing the author had included more information on identifying butterflies in the field and while on the wing. For example comparisons or notes on the prominent color patterns visible in flight would be extremely useful for use of this work in the field. The section on *Calephelis*, written by G. T. Austin, is especially useful for identification purposes, as it includes a table of characters useful in separating species of this confusing genus. This type of a table might have also been useful for other confusing genera such as *Theope* or *Euselasia*.

In addition to the color plates, this volume includes a small selection of electron micrographs of riodinid eggs. While I realize the limitations imposed by printing costs, it is a shame that more of these wonderful pictures could not have been included. These detailed views of such an important stage in the butterflies' life are wonderful not only for identifying and comparing eggs, but also for stimulating thought on the functional morphology and biology of these structures.

As in Volume I, the artist Jennifer Clark has provided beautiful and informative drawings of the larvae and pupae of many species. The drawings in this volume surpass those from the previous work in quality as well as clarity. However, the location of these drawings,

dispersed throughout the text, is unfortunate. As this book is obviously more than a guide to the adults, it was disappointing to have to search through the text in order to locate illustrations of larvae. It would have been more helpful to have a consolidated grouping of these drawings that would allow easier larval identification.

Included in the text of this book is a reanalysis of a previously published morphological phylogeny. While others may feel this is inappropriate for a field guide, I maintain that its inclusion is not only interesting, but accomplishes its mission by stimulating critical thought and pointing out our lack of knowledge about riodinid butterflies. I did find that Table 3, which is a matrix of those characters used in the reanalysis, was of minimal utility since the reader must look up the original publication for a full description of the characters analyzed. Overall, the sections covering riodinid systematics, mimicry, enemies and defenses, and life cycles and morphology are extremely useful as an introduction to the study of these organisms.

While I was disappointed to find my personal hero, the Rev. Miles Moss, was not mentioned in the section covering butterfly biologists, I was nevertheless delighted to find this section included. As with all aspects of biology, our understanding of butterfly biology and our ideas for further study rest upon the shoulders of those who came before us. Any serious student of butterflies will be fascinated by this section and be pleasantly surprised to find it included in this book.

As with the previous volume covering the papilionids, pierids, and nymphalids, Volume II includes an astounding amount of natural history and behavioral data for most of the species included. Observations are taken from the literature as well as the extensive fieldwork of the author, and serve to whet the appetite of anyone aspiring to study butterflies. The formatting of the species descriptions is as detailed as possible, yet concise and easy to read, with an occasional humorous anecdote illustrating a particular point. One additional section included in the species descriptions, which was left out of the earlier volume, is the listing of localities for each species with associated dates. I did not find these data particularly useful and feel that they take up space that could be better used for more illustrations or more extensive comments on field identification.

This book is far more than a field guide, but rather an invaluable collection of data on a group of organisms that are not only poorly known, but also are facing possible extinction from the pressures of industrialization and expanding human civilizations. The natural history data, along with the pictures for species identification, make this a useful book in the field as well as in the library. This book belongs not only on the shelf of all tropical lepidopterists, but in the hands of every biologist attempting to unravel the mysteries of our dwindling tropical ecosystems.

LITERATURE CITED

SWINETHROTTLER, R. B. 1997. A commentary on the recent book, *Butterflies of Costa Rica and their natural history: vol. 2*. *J. Res. Lep.* 34:154-160.

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ations in several languages, but this recent book, with its beautiful illustrations and concise English text, is a welcome, up to date, identification guide.

The main text consists of introductory material (7 pages), a key to the European genera (3 pages), checklist (10 pages), and the systematic treatment of the 32 genera and 139 species (89 pages). The male and female genitalia illustrations are included in a section near the end of the book (49 pages) and followed by a distribution table, an extensive list of references, index to hostplants, and index to entomological names. The 16 color plates are bound near the middle of the book. Color photos of adults of all but 2 species are included as well as the larvae and/or pupae of 12 species. The photographs are, with little exception, of excellent quality. Text and line illustrations are attractively printed on glossy paper, color plates on a

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MICROLEPIDOPTERA OF EUROPE, VOLUME 1, PTEROPHORIDAE, by Cees Gielis. 1996. P. Huemer, O. Karsholt, and L. Lyneborg, editors. Published by Apollo Books, Kirkeby Sand 19, DK-5771 Stenstrup, Denmark. 222 pages, 16 color plates. Hardcover, 17.5 x 25 cm, ISBN 87-88757-36-6. Recently listed at DDK 400 by publisher.

Delicate spindly moths, most with the wings elegantly divided into feather-like lobes or plumes, the Pterophoridae have historically been a popular group with European lepidopterists. The palearctic fauna has been documented with an abundance of scattered publi-

slightly thicker matte stock. Together with an apparently good quality binding, these features result in an altogether handsome book.

The introduction begins with "Historical notes", with attentive citations of authors and years of significant contributions to the European fauna from Linnaeus, up to the first two decades of the twentieth century with Tutt, and Meyrick. The section ends somewhat abruptly with mention of names of more recent authors from Europe and other regions, but without citing any specific significant publications.

The next section, "General remarks", gives an overview of adult external morphology, emphasizing wing shapes, maculation, venation, and head characters. Included is a labeled dorsal habitus drawing of an adult, venation figures representing six genera, a lateral view of an adult head, and 3 figures showing scaling on labial palpi. The rows of specialized scales which arise from the median and cubital vein on the hind wing undersurface of both sexes are mentioned. As a defining characteristic of the family, it is unfortunate that the arrangement of these scales is not depicted on an enlargement of one of the venation figures. The reader is referred to labeled figures appearing in the illustration section for terminology of the male and female genitalia. A discussion of these terms, patterns and peculiarities within the family would have been appropriate.

Four subfamilies are defined: Agdistinae, Pterophorinae, Ochroticinae, and Deuterocopinae, the first two occurring in Europe. Gielis refers to his 1993 revision of the superfamily Pterophoroidea (Zool. Verhand., Leiden 290: 1–139) as the basis for the arrangement of genera and the subfamily groupings. The "General remarks" section ends in an interesting discussion of the variety of habitats, larval hosts, and habits, and simplified descriptions of the variety features found in the immature stages.

Under the heading "How to collect plume-moths" the author makes some general comments about responsible collecting practices. Techniques for collecting adults with nets and lights are outlined. Although applicable to other moth groups, specific points are made about pterophorid flight habits, attraction to different types of light, and the tendency to rest at the periphery of an attracting light source. The author stresses the importance of labels and the advantages of field processing material but does not recommend specific techniques for killing and setting, pin types or sizes, or offer any tips on collecting or rearing larvae.

The introductory section entitled "The preparation of genital slides" includes a detailed protocol for preparing slides and comments on alternative mounting media. The techniques generally apply to most microlepidoptera. As the first volume in this series, this is certainly valuable information, but prone to repetition in subsequent volumes. There might have been some comments specific to pterophorid genital preparations such as whether or not to completely remove particular scale-hair tufts in males of *Hellinsia*, *Oidaematophorus*, and *Stenoptilia*, and noting the fragility of valvular lobes in the *Oxyptilus* group.

The key to the European genera uses external characters, male and female genitalia characters, and forewing venation. The user may need specimens of both sexes and a forewing venation slide. The last couplet refers to the point of origin of the ductus seminalis. This structure is unfortunately not labeled in any drawings. Most of the couplets do, however, refer to figures. As completely illustrated as the book is, the key is more a formality, and along with the diagnoses and illustrations, most genera can be suitably recognized.

The checklist includes 139 species and their synonyms. Each valid species is assigned a number which is also used in the systematic treatment and the indices. One species, *Stenoptilia brigantienensis* Nel & Gibeaux, 1992, is assigned the number "50a" as it was apparently only recently regarded as distinct by the author. Perusing the checklist, one notices a number of recent synonyms, 3 of which are newly established with this book (noted in the "Abstract" and species accounts). The genus *Stenoptilia* is particularly troublesome, with 13 synonyms preceded by a question mark to indicate their uncertain status and need for future verification. In the systematic treatment of *Stenoptilia* and *Crombrugghia*, Gielis makes some comments regarding the work of certain authors in France. Indeed, looking at the European checklist, since 1960 (most from the 80's) there have been 38 European pterophorid species described by French authors. Of these, only 5 are now treated as valid species.

The "Editorial foreword" notes Gielis' conservative view and the potential controversy over some of his decisions. There is little doubt that the taxonomy of the family will continue to fluctuate. It is important to note, however, that Gielis has worked on this family with a worldwide scope for over 20 years and is keenly aware of the range of variation exhibited by certain species.

The systematic treatment of species includes accounts of each genus and species. Each begins with an annotated synonymy followed by text under the headings: diagnosis, male genitalia, female genitalia, variation (where applicable), distribution, biology, and remarks. Some of the diagnoses are very short depending on the complexity of the species. Repetition is avoided in genitalia descriptions of several species by referring to the genus account or related species. The distribution statements are very general and include the distribution outside of Europe. These are supplemented with a table near the end of the book which indicates the European distribution in greater detail. The table lists the species with 38 country/political regions denoted by two letter codes across the top. Presence in a region is marked by an "x", doubtful records with a "?". Traditional distribution maps would have been more aesthetically pleasing and informative, especially for countries covering larger areas, but the chart does allow the reader to quickly determine the fauna recorded for a particular region. The biological information is nicely summarized for each species and includes flight season, broods, hosts, larval habits, habitats, and pupation sites where known. This information is not always complete given what is available in earlier literature but essential references are cited which lead the reader to further information. Larval hosts are cross-referenced in the index by species number. Additional, non-European hosts mentioned in the genus accounts are not indexed.

One can't help but notice the incongruous backgrounds of the adult photographs assembled together to form each plate. Still, the photographs are impressive and of great value for identifications. All are printed to 2.5x the natural size. The specimen data for each is given in the captions. Some specimens are damaged or lack abdomens but these evidently belong to species of limited availability. The host and locality data is lacking from the larva and pupa photographs. These excellent photographs, however, result from years of dedicated work on the family. It is curious that no photographs showing the natural (and very characteristic) resting positions of adults were included in this book.

The genitalia illustrations are generally of consistent quality with significant structures emphasized by stippling and arrows. Like the adult photos, they include corresponding specimen data and slide numbers in the captions, thus adding to the lasting scientific value of the publication. Males and females for nearly all species are illustrated, the females of many species, though, with only the ostium and ductus bursae depicted. While 31 pages are devoted to male illustrations, only 18 pages illustrate females. It seems it would have been worthwhile to include a complete female genital drawings of at least one species per genus. Certain characters mentioned in the diagnoses are missed in these partial illustrations, such as the distinctive "blotches" on the lamina postvaginalis of *Platyptilia* species, three-tipped apophyses anteriores in *P. farfarellus*, or "long" apophyses anteriores of *P. nemoralis*. The partial drawings appear to be on a larger scale but unfortunately no scale lines are indicated for any of the drawings.

This is an excellent book despite a few shortcomings in content and overlooking typographical errors. The author has done a remarkable job of condensing essential characters and biological data into a useful reference. The book is also the result of years of examining specimens, type material, and literature to untangle the taxonomic webs created by two centuries of lepidopterists. The European fauna is by no means completely known, there are still species groups to closely examine along with life histories to describe, unknown hosts and biological information, and species with sketchy distributional data. This book is a steppingstone for enthusiasts and a practical guide for any lepidopterist encountering these moths.

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