A Guide to the Lepidoptera of Japan

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A GUIDE TO THE LEPIDOPTERA OF JAPAN by F. Komai, Y. Yoshiyasu, Y. Nasu, and T. Saito (editors); xx + 1308 pages, including 248 color plates, 25.5 x 18 cm. Text in Japanese with English figure captions. Tokai University Press, Hadano, Kanagawa, Japan. Publication date: February 2011. ISBN 978-4-486-01856-8. Price: 40,000 Yen (ca. $473.00 US) including postage (payment: Visa or Master Card, contact E. Ina: inaair@tsc.u-tokai.ac.jp).

A picture is worth a thousand words. I trust that this old adage is true because I'm reviewing this book without ever reading a word of it...I've only looked at the pictures! I am assuming that the hundreds of pictures in it are equivalent to hundreds of thousands of words because the text is almost entirely in Japanese, which I cannot read.

With over 1300 pages, this Guide is truly an encyclopedic treatment of the Lepidoptera of Japan, from the most primitive to the most advanced, from morphological structures to the chemical structures of pheromones, from food plants to photographs, and from Adelidae to Zygaenidae, including butterflies and moths and everything in between. The text of this handsome volume is divided into three main sections: Morphology and Biology (56 pages), Phylogeny and Higher Classification (441 pages), and Diversity of Japanese Lepidoptera (445 pages). These sections are followed by 248 beautiful color plates, an impressive list of References, and indices in both English and Japanese.

The first section, Morphology and Biology, is further divided into three chapters: 1. Morphology, 2. Foods and Feeding Habits of the Lepidoptera, and 3. Various Chemical Structures of Lepidopteran Sex Pheromones, each of which is authored or co-authored by well known authorities on these subjects. For example, the chapter on pheromones was written by T. Ando, which based on my very narrow tortricid bibliography (Brown et al. 2010), is the author of countless important laboratory and field studies on pheromones and sex attractants. The text of each chapter is augmented by numerous line drawings. In the morphology chapter, English names of morphological structures are sprinkled throughout the text and labeled on the accompanying figures. There are plates of heads, antennae, thoracic sclerites, legs, wings (including venation and wing coupling mechanisms), female reproductive configurations, male and female genitalia, chaetotaxy of larvae, and structures of the pupae.

The second section, Phylogeny and Higher Classification, starts with a brief historical review of Lepidoptera classification from Linnaeus (1758) through Kristensen et al. (2007); the latter is nearly identical to that presented in the Handbook of Zoology (Kristensen 1998) and is used as the outline/sequence in which superfamilies are presented in the Guide. The most recently proposed classification of the order, currently in press (van Nieukerken et al. 2011), could not be followed because this Guide was already in press by the time the new scheme was proposed. As in the first section, the text is contributed by the leading Japanese experts on each taxon, with each superfamily comprising a standalone treatment accompanied by one or more black-and-white photographs of exemplars and numerous line drawings. The contribution on Gelechioidea, co-authored by T. Saito and T. Ueda, includes two full plates of black-and-white images of spread specimens of gelechioids—44 images total. There is a plate of line drawings of labial palpi, three plates of wing venation, and various drawings of abdominal modifications (e.g., the spines characteristic of Blastobasidae and Coleophoridae), genitalia, and chaetotaxy. There also is a very nice plate illustrating the diversity of submental "pits" of the larval head—and I thought they were found only in blastos and scythridids! Consistent with the instability of gelechioid classification, this contribution includes a table showing the various classifications of the superfamily proposed from 1990 through 1998.

The contribution on Tortricoidea, by F. Komai and Y. Nasu, is among the best (I suspect), given the prominence of these two authors on this taxon. The classification is very up-to-date, with *Arotrophora* treated as a tribe independent from Archipini and Cnephasiini (based on unpublished molecular studies by Sperling, Horak & Zwick). As with other contributions, there are two plates of adults along with line drawings of wing venation, larvae, and pupae. Also illustrated by photographs are interesting features of the antennae, male forewing costal folds, abdominal scent structures, genitalia, and the anal combs of various larvae.

Not surprisingly, the contribution on Noctuoidea requires the greatest number of pages and includes an impressive four-page fold-out summarizing classifications of the superfamily from Hampson (1898–1913) to the contemporary and competing classifications proposed by Lafontaine and Schmidt

(2010), Kononenko (2010), and Zahiri et al. (2010). Each subfamily receives its own brief account.

The third and final section, Diversity of Japanese Lepidoptera, is further divided into four chapters: 1. Lepidopteran Fauna of Japan, 2. Lepidopterous Pests in Japan, 3. Key to the Families and to Some Subfamilies of Japanese Lepidoptera, and 4. Biology of Japanese Lepidoptera. The last represents the lion's share of this section and is comprised primarily of accounts of high profile species of each superfamily/family arranged in a sequence that parallels that of the second section. I actually have no clue what percentage of the fauna is treated, but in Tortricoidea, 122 species accounts (i.e., species numbered 239 through 361, which refer to the plates in the back of the book) are included, which may represent 15–20% of the tortricids known from Japan.

Following the text are 248 pages of color illustrations, with 4 species per page (no translation required!); these are illustrations of the species treated in the accounts of the previous section and are numbered sequentially, consistent with the previous section for easy reference. For many species there is an image of a pinned spread adult, a larva, a pupa, and an adult in typical resting posture, but these vary from family to family and from species to species. For example, for many pyraloids an image of damage to the host plant is substituted for the live adult. For some sexually dimorphic species, both sexes are shown. And for many geometrids, multiple images of larvae are provided instead of the pupa and live adult. The images illustrate a broad range of highly interesting biological features, from mating pairs to gregarious larval feeding, and from egg clusters to everted coremata. All of the images are of high quality.

This "Guide" is an impressive tome; it is a good thing it isn't sold by the pound! Nonetheless, it isn't cheap—no good books are. The four editors have done an exceptional job of enlisting the expertise of 26 authorities on the Japanese Lepidoptera and have brought together the contributions of those experts in a well organized, very attractive, contemporary, and apparently very thorough treatment. Although the text is nearly all in Japanese, the Latin binomials of host plants and animals, the use of English for morphological structures and in figures, and the English index all combine to make this work accessible even to those of us with no ability to decipher Japanese. Anyone who collects books on Lepidoptera will want to add this superlative book to their collection.

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