



Taxonomic changes in the emerald moths (Lepidoptera: Geometridae, Geometrinae) of East Asia, with notes on the systematics and phylogeny of Hemitheini

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Abstract

The following taxonomic changes in the East Asian Geometrinae are proposed: *Jodis orientalis* Wehrli, 1923, **stat. n.**; *Jodis angulata* Inoue, 1961, **syn. n.** of *Jodis putata orientalis* Wehrli, 1923; *Aoshakuna* Matsumura, 1925, **stat. nov.**, from synonymy with *Chlorissa* Stephens, 1831; *Nipponogelasma* Inoue, 1946, **syn. n.** with *Aoshakuna* Matsumura, 1925; *Aoshakuna sachalinensis* Matsumura, 1925, **syn. n.** of *Gelasma lucia* Thierry-Mieg, 1916; *Aoshakuna lucia* (Thierry-Mieg, 1916), **comb. n.**; and *Microloxia chlorissoides* (Prout, 1912), **comb. n.** *Aoshakuna lucia ussurica*, **ssp. n.**, is described from the continental part of East Asia. The tribal concept of Hemitheini and putative phylogenetic relationships among the genera related to *Aoshakuna* are discussed.

Key words: Lepidoptera, Geometridae, Geometrinae, Hemitheini, new synonymy, new subspecies, systematics, phylogeny, East Asia

Introduction

Adults of the subfamily Geometrinae are mostly small green moths of similar external appearance with wing patterns that often are reduced or lost owing to an abundance of the green pigment geoverdin. The similarity in wing pattern frequently results in misidentifications, especially if the genitalia have not been examined. Two older misidentifications were discovered during the examination of Wehrli's and Matsumura's types augmented by recent material from the Russian Far East. As a result, several nomenclatural changes are necessary. I propose these changes and discuss the generic composition of, and relationships within, the tribe Hemitheini.

Abbreviations of collections are as follows: BMNH – The Natural History Museum, London, UK; EIHU – Entomological Institute, Hokkaido University, Sapporo, Japan; IBSS – Institute of Biology and Soil Science, Vladivostok, Russia; MNHN – Muséum national d'Histoire naturelle Paris, France; and ZFMK – Zoologische Forschungsmuseum und Museum Alexander Koenig, Bonn, Germany.

Systematics

Jodis orientalis Wehrli, **stat. n.**

(Figs 1, 2)

Jodis putata f. *orientalis* Wehrli, 1923, *Iris* 37: 62. Syntypes: 1 ♂, 4 ♀ (ZFMK), "Mokanschan, Schanghai" [China: Zhejiang, Mogan Shan Mnt., 50 km SW Hangzhou]. The name is available based on ICZN (1999) article 45.6.4. because