



Elimaea Stål (Orthoptera: Tettigoniidae: Phaneropterinae) and its relative from China, with description of twenty-three new species

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Abstract

Elimaea Stål is a comparatively large genus in the subfamily Phaneropterinae, which is mostly characterized by symmetric exposed tibial tympana and commonly distributed in Asia. The genus includes 6 subgenera and 131 valid species. However, species diversity of the genus *Elimaea* has been occasionally investigated in China. Here we provide a checklist of 53 species in the genus *Elimaea* and its relative from China, among which 23 species are new to science. We also establish one new subgenus *Rectielimaea* subgen. nov. for the type species *Elimaea (Rectielimaea) percauda* sp. nov., which is distinguished from other subgenera by the phallus with a long log-like sclerite horizontally produced outwards. In addition, we consider that proximal part of MP+CuIP vein in tegminal dorsal part is possibly more or less different among species and subgenera: (a) straight in the subgenera *Elimaea* and *Rectielimaea* subgen. nov. and in the species *Elimaea (Schizelimaea) mira* Gorochov, 2009, or (b) more or less convex laterad in the other subgenera without exception of other species in the subgenus *Schizelimaea*. Necessary illustrations are provided.

Introduction

Elimaea Stål 1874 is a comparatively large genus in the subfamily Phaneropterinae. Many authors have established a few subgenera (Karny 1926a; Ingrisch 1998, 2011; Gorochov 2009), and described a few widespread and numerous endemic species (Brunner von Wattenwyl 1878, 1891; Kirby 1906; Hebard 1922; Karny 1926a–c, 1931; Tinkham 1943; Bei-Bienko 1951, 1962, 1965; Ingrisch 1990, 1998, 2011; Kang & Yang 1992; Liu 1993, 2004; Jin & Xia 1994; Mu et al. 1999, 2002; Gorochov 2009, 2011). Until now, the online list of Eades et al. (2011) includes 6 subgenera and 131 valid species in the *Elimaea* (without the exception of *Elimaea bispinosa* Liu, 2004 distributed in China), which is mostly distributed in Asia, and seems to possess the richest biodiversity in South-east Asia.

Three authors (Karny 1926; Ingrisch 1998, 2011; Gorochov 2009) provided significant contributions to the genus. Karny (1926) divided *Elimaea* into three subgenera, *Orthelimaea*, *Rhaebelimaea*, and *Elimaea* s. str., among which *Orthelimaea* possesses the straight fore femur, and the latter two subgenera possess the curved fore femur. The latter two differs in the radius sector branching before (*Elimaea* s. str.) or about in the middle of (*Rhaebelimaea*) the tegmen. Ingrisch (1998) gave a review of the genus from South-east Asia, described nine new species, presented many synonyms after examining the types, and provided a checklist from the world. More importantly, he presented a few new diagnostic characters, including the male stridulatory file on the underside of the left tegmen, the male sclerotised structures of the phallus, and the female gonangulum (a large sclerite at the base of the ovipositor). In addition, he divided the subgenus *Elimaea* into two species groups according to the width of the tegmen, which is (a) wider than the pronotal length (*Elimaea* s. str.) or (b) narrower than the pronotal length in males and of subequal width in females (*Elimaea poaefolia*-group). Gorochov (2009) raised the subgenus *Orthelimaea* as a separate genus, described 3 new subgenera, *Schizelimaea*, *Pseudectadia*, and *Bornelimaea*, and divided the subgenus *Elimaea* s. str. into two species groups, after examining the specimens of *Elimaea* from South-East and East Asia deposited in his institute. *Schizelimaea* differs from the other subgenera in the upper part of fore coxa with a distinct short spine, and the other subgenera and the species groups differ from each other in the male copulatory apparatus. He also described 52 new species. Recently, Ingrisch (2011) raised his species group (*Elimaea poaefolia*-group) to the subgenus level, and established the subgenus *Poaefoliana* for the type species *Locusta (Phaneroptera) poaefolia* De Haan, 1842. He also presented descriptions of four new species of the genus *Elimaea* and two new species of the genus *Orthelimaea*.

After examining specimens of *Elimaea* species (including type specimens of a few species) from China, we discovered unexpectedly rich regional diversities in this genus. Herein, we provide a checklist of 53 species in *Elimaea* and *Orthelimaea* from China, among which 23 new species are described, and *Elimaea* contains 4 subgenera and 51 species. We also establish one new subgenus *Rectielimaea* subgen. nov. for the type species *Elimaea (Rectielimaea) percauda* sp. nov., which is distinguished from other subgenera by the phallus with a long log-like sclerite horizontally produced outwards. In addition, we find that one character, proximal part of MP+CuIP vein in tegminal dorsal part, is more or less different through species or subgenera, (a) straight in the subgenera *Elimaea*