



Redescription and relationships of *Pseudothilmanus* Pic (Coleoptera: Rhagophthalmidae)—a long-term neglected glow-worm beetle genus from the Himalayas

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Abstract

Pseudothilmanus Pic, 1918 is redescribed and two species, *P. alatus* Pic, 1918 and *P. marginatus* Pic, 1918, are placed in the genus. The subgenus *Drilothilmanus* Pic, 1918 is synonymized with the nominotypical genus on the basis of low morphological divergence and redundancy in classification. *Pseudothilmanus* is newly classified in the family Rhagophthalmidae, in contrast to the original placement in Drilidae. Diagnostic characters for *Pseudothilmanus* and both species placed within the genus are illustrated.

Key words: Coleoptera, Rhagophthalmidae, taxonomy, new synonym, distribution, Himalayas

Introduction

Rhagophthalmidae, as defined by Kawashima *et al.* (2010), is a small elateroid family with about 60 described species distributed mainly in the Oriental region with a few species known from China and Japan. Most species were described before World War II, and later the study of the lineage was nearly neglected until the 1990's (*e.g.*, Wittmer & Ohba 1994; Kawashima 2000; Li *et al.* 2008). The subfamily Rhagophthalminae was erected in Lampyridae for the genera *Dioptoma* Pascoe, *Ochotyra* Pascoe and *Rhagophthalmus* Motschulsky (Olivier 1907), but limits of the lineage have been unstable. Crowson (1972) placed some rhagophthalmine genera in Phengodidae (*Dioptoma*, *Rhagophthalmus*, *Cydistus* Bourgeois, *Diplocladon* Gorham, and *Falsophrixothrix* Pic). The position of *Cydistus* remains contentious (Lawrence *et al.* 2010). *Ochotyra* was synonymized with *Rhagophthalmus* by Wittmer & Ohba (1994), and recently Kawashima (2000) proposed a new genus *Menghuoius* Kawashima, which was synonymized by Li *et al.* (2008). *Bicladodrilus* Pic, *Bicladon* Pic, *Monodrilus* Pic and *Reductodrilus* Pic should also be placed in Rhagophthalmidae as *Bicladodrilus* formed a monophyletic group with *Rhagophthalmus* in the recent molecular phylogeny of Elateriformia (Bocakova *et al.* 2007), and the other genera are similar to this genus. A recent molecular study confirmed the relationships of New World Phengodidae and Asian Rhagophthalmidae and their position close to Elateridae (Bocakova *et al.* 2007).

Pseudothilmanus Pic and its subgenus *Drilothilmanus* Pic were described by the French entomologist Maurice Pic in uninformative notes (Pic 1918). Although catalogued in Drilidae by Wittmer (1944), these taxa have never been studied again and remained in an uncertain position after most genera were transferred from Drilidae to Lampyridae, Rhagophthalmidae, Omethidae, or Lycidae (Crowson 1972). Therefore, the purpose of this paper is to redescribe *Pseudothilmanus* and *Drilothilmanus*, investigate their taxonomic status, and discuss their taxonomic position.

Material and methods

The study is based on male adult semaphoronts. Male genitalia were dissected, cleared in 10% aqueous solution of KOH and photographed in glycerol by a digital camera attached to a stereoscopic microscope. The line illustrations