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Description of the final-instar larva of *Heliogomphus selysi* Fraser (Odonata: Gomphidae)

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Abstract

The final instar larva of *Heliogomphus selysi* Fraser, 1925, is described and illustrated for the first time based on specimens collected in Ratchaburi province, Thailand. Antennae, legs and paraprocts are similar morphologically to *H. kelantanensis* and *H. scorpio* but with a unique combination of dorsal hooks and lateral spines.

Key words: description, Anisoptera, *Heliogomphus*, Thailand, larva

Introduction

The Asian gomphid genus *Heliogomphus* Laidlaw, 1922, currently comprises 21 valid species (Schorr *et al.* 2013). To date, the final-instar larvae of only 5 species have been described and illustrated: *H. kelantanensis* Laidlaw, 1902 (Lieftinck 1932), *H. retroflexus* (Ris, 1912) (Matsuki 1978), *H. scorpio* (Ris, 1912), *H. bakeri* Laidlaw, 1925, and *H. drescheri* Lieftinck, 1929 (Matsuki 1990). The larvae of *Heliogomphus* can be distinguished from those of other genera by the combination of the following characters: very distinctive antennae, with the first two segments small and cylindrical, the third enormously enlarged and plate-shaped, and the fourth absent; abdomen flattened dorsoventrally and segments 5 to 9 with robust dorsal hooks; legs short and robust (Lieftinck 1932). Here we describe the final-instar larva of *Heliogomphus selysi* Fraser, 1925, for the first time based on reared material.

Material and methods

The larvae were collected at a first-order tributary of the Phachi River, Ratchaburi Province, in western Thailand (13°28.6'N, 99°14.5'E; altitude 230 m). The stream bed was mostly composed of boulders, cobble, sand and leaf litter. Gomphid larvae were found among leaf litter in a pool. Larvae were reared in an earthenware pot which aids in reducing water temperature (rearing device for single larva with net cover). Each rearing chamber was connected to an air supply by aquarium tubing. The four larvae were reared in the laboratory and fed chironomid larvae until the emergence of adults. The exuviae were preserved in 80% ethanol and adults were pinned and dried. The identification was determined based on adult characters presented by Asahina (1986). Measurements (mm) and photographs were taken using a NIKON SMZ800 stereoscopic microscope. All drawings were made with the aid of a camera lucida attached to a stereoscopic microscope. The material is deposited in the collection of ZMKU (Zoological Museum, Kasetsart University, Bangkok, Thailand). Mandibular terminology and formulae follow Watson (1956). S1–10 = abdominal segments 1 to 10. Measurements in millimeters.

be similar to *H. retroflexus*. Yet the larva of *H. retroflexus* is more similar to the genus *Microgomphus*, especially the antennal shape. Nevertheless, the larva reported here is most similar to those of *H. scorpio* and *H. kelantanensis*, not just in overall appearance but more significantly in antennal morphology. Further research with these two genera will be necessary to clarify what now is a confusing situation. The most distinctive morphological character separating *H. selysi* larva from that of other congeners is the less well-developed dorsal hooks on S4–9 and lateral spines on the abdomen. The larva of *H. selysi* is most similar to *H. kelantanensis*, which has dorsal hooks on S4–9. However, *H. kelantanensis* has dorsal hooks better developed than *H. selysi*. In addition, sharp lateral spines on S6–9 are characteristic of *H. kelantanensis* (Table 1).

TABLE 1. Comparison of adult and larval characteristics of four species of *Heliogomphus*.

Species	<i>H. kelantanensis</i>	<i>H. retroflexus</i>	<i>H. scorpio</i>	<i>H. selysi</i>
Male cerci	black, not so expanded (Fig. 14)	white, not so expanded (Fig. 15)	black, very expanded (Fig. 16)	white, slightly expanded (Fig. 17)
Male abdomen	predominantly black	yellow rectangular spot on S5–8	large yellow rectangular spot on S8	predominantly black
Larval antennae	3 segments; 3rd enormously enlarged and plate-shaped	4 segments; 3rd club-shaped, 4th short	3 segments; 3rd huge, flattened and fan-shaped	3 segments; 3rd enlarged and plate-shaped
Larval abdominal dorsal hooks	absent on S1–3; well-developed on S4–9	absent on S1–8, only on S9	on S1–9 but not well-developed	absent on S1–3; less well-developed on S4–9
Larval abdominal lateral spines	well-developed and sharp on S6–9	less well-developed	less well-developed	less well-developed

Heliogomphus selysi is found in India, Myanmar and Thailand (Fraser 1934; Schmidt 1964; Hämäläinen & Pinratana 1999). Only adults of *H. selysi* Fraser, 1925, and *H. svihleri* Asahina, 1970 are reported and illustrated in Asahina (1986) from Thailand. *H. selysi* adults also have been recorded in Ratchaburi province (Day *et al.* 2009), where larvae for rearing were collected. The discovery of *H. selysi* larvae adds to the gomphid larvae known from Thailand, including *Gomphidictinus perakensis* (Ferro & Sites 2006), *Megalogomphus icterops* and *Phaenandrogomphus asthenes* (latter two reared by author).

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