



## Larval morphology of *Amphiops mater mater* Sharp (Coleoptera: Hydrophilidae: Chaetarthriini)

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### Abstract

The larval morphology of *Amphiops mater mater* Sharp, 1873 is described, including chaetotaxy and morphological transformation between instars. Among genera of the family Hydrophilidae, the larvae of *Amphiops* Erichson, 1843 may be distinguished by the following combination of characters: coronal line present; clypeolabrum almost symmetrical; mandibles symmetrical and with three inner teeth; dorsal surface of palpomere 1 completely sclerotized; mentum with strongly projecting and sharply pointed anterior corners; ligula absent; spiracular atrium well developed. Several primary sensilla are absent from all instars of *A. mater mater*, in contrast to the stable chaetotaxy in the majority of Hydrophilidae species studied in detail to date.

**Key words:** aquatic beetles, water scavenger beetle, Hydrophilinae, immature stage, morphological transformation, chaetotaxy, Japan

### Introduction

*Amphiops* Erichson, 1843 is a small genus of the tribe Chaetarthriini (Hydrophilidae: Hydrophilinae) and is represented by 20 species from the Old World, including the Australian Region (Hansen 1991, 1999; Short & Hebauer 2006; Short & Fikáček 2011). Members of the genus generally inhabit lentic waters, including artificial ponds and paddy fields. Adults are easily recognized by their hemispherical body and compound eyes divided into dorsal and ventral portions. The general larval morphology of genus *Amphiops* has been described in several previous studies (e.g., Bertrand 1935, 1936, 1972; Yoshimura 1959; Marche-Marchad 1974; Berge Henegouwen 1982; Watts 2002; Hayashi 2009, 2011), however the larvae of only two species, *A. queenslandicus* Balfour-Browne, 1939 (Watts 2002) and *A. mater mater* Sharp, 1873 (Hayashi 2009, 2011) have been precisely identified; the remaining descriptions were based on unassociated material. Furthermore, the chaetotaxy of the genus has never been described.

In Japan, the only representative of the genus, *A. mater mater*, has been recorded throughout the country, excluding Hokkaidô. The immature stages of this species have been only superficially studied: Hosoi (1952) observed the behavior of egg-case construction and described the egg-case; Yoshimura (1959) described the larva of the species as '*Hydrophilus* sp.', and Hayashi (2009, 2011) described briefly the larva and egg-case. In this paper, we describe larvae of *A. mater* in detail, including chaetotaxy and morphological transformation between instars, based on Japanese specimens.

### Material and methods

General methods follow Minoshima and Hayashi (2011a). The examined specimens are deposited in the authors' collections and in National Museum, Prague, Czech Republic (M. Fikáček). Larvae were preserved in screw-cap vials with 80% ethanol or were mounted on HS-slides (Higgins-Shirayama slide; Shirayama *et al.* 1993) (Kanto