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Description of immatures of *Berosus decolor* Knisch, 1924 (Coleoptera: Hydrophilidae: Berosini), with emphasis on chaetotaxy and morphometry

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Abstract

The preimaginal stages of *Berosus decolor* Knisch, 1924 are described for the first time, including illustrations of the egg case and all larval instars. Larval morphology of this species is studied emphasizing chaetotaxic and morphometric analyses. The egg case lacks a mast and contains 2–3 eggs; all larval instars are characterized by the following features: presence of 6 teeth on anterior margin of nasale; left epistomal lobe carrying 14–16 strong and curved setae (gFR2); seta FR1 elongate, inserted posteriorly to seta PA7; pore FR14 absent; parietale with spinulae in the area between setae PA5 and PA12; mandibles asymmetrical; seta MN1 minute; first antenommere with a digitiform projection on distal inner margin; antennal sensilla AN8 and AN9 absent; maxillary sensilla MX10 hair-like, MX11 and MX16 with an intermediate shape between hair-like and spine-like; labial sensilla LA4 and LA15 absent; seta LA2 present, minute; abdomen with 7 pairs of tracheal gills. The morphology of the egg cases and larvae within the genus *Berosus* are compared and discussed.

Key words: Water scavenger beetles, Berosini, egg case, larvae, sensilla

Introduction

The cosmopolitan genus *Berosus* Leach 1817, includes 287 species (Hansen 1999; Short & Fikáček 2011, Oliva & Short 2012), of which 144 occur in the New World. Members of this genus are common inhabitants in a wide range of aquatic habitats throughout South America, where they have radiated considerably resulting in almost 100 described Neotropical species (Archangelsky 1999, Oliva & Short 2012). In spite of this high diversity, few descriptions of Neotropical *Berosus* larvae are available, and studies including detailed chaetotaxic analyses are lacking. Spangler (1966) described an unidentified species from Perú, Archangelsky (1999, 2002) described *B. aulus* Orchymont, 1941; *B. auriceps* Boheman, 1859; *B. toxacanthus* Oliva, 1989; *B. coptogonus* Jensen-Haarup, 1910 and *B. cornicinus* Knisch, 1922. Also, Fernández & Campos (2002) described the immatures of *B. alternans* Brullé, 1841. The remaining larval descriptions of New World *Berosus* are from the Nearctic region (Richmond 1920, Wilson 1923, Van Tassell 1966, Archangelsky 1994, 1997).

The current classification of *Berosus* is based mainly on adult morphology (Oliva, 1989). As with most holometabolous insects, the different life stages within Hydrophiloidea are very dissimilar morphologically, and the characters provided by immatures have proven to be very useful in the development of more comprehensive classificatory systems (e.g., Archangelsky 2004, 2008; Fikáček *et al.* 2013; Minoshima *et al.* 2013; Fikáček & Vondráček 2014). In the past recent years, the study of the preimaginal stages of Hydrophilidae has improved considerably with the incorporation of detail morphometric and chaetotaxic analyses (e.g., Fikáček *et al.* 2008; Torres *et al.* 2008, 2011, 2014; Minoshima & Hayashi 2011, 2012, 2015; Minoshima *et al.* 2012, 2013). In particular, larval chaetotaxy is recognized as a source of characters potentially useful both in the establishment of diagnostic differences among species and in the development of phylogenetic hypotheses (Bousquet & Goulet 1984; Alarie 1997, 1998; Fikáček 2006). Archangelsky (1999) suggested that a worldwide revision of *Berosus* is needed, and that larval and pupal characters may support the subdivision of the genus into natural groups.