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Description of a new leech species of *Helobdella* (Clitellata: Glossiphoniidae) from Mexico with a review of Mexican congeners and a taxonomic key

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Abstract

To date, six species of the leech genus *Helobdella* have been recorded from Mexico: *Helobdella atli*, *Helobdella elongata*, *Helobdella octatestisaca*, *Helobdella socimulcensis*, *Helobdella virginiae* and *Helobdella temiscoensis* **n. sp.** This new species is characterized by a lanceolate body, the presence of a nuchal scute, uniform brown pigment on both dorsal and ventral surfaces, the absence of papillae, well-separated eyespots, six pairs of testisacs and five pairs of crop caeca, the last of which forms posterior caeca. In addition, we provide new geographic records for *Helobdella* species from Mexico resulting from our own collections, vouchers deposited at the Colección Nacional de Helmintos from the Instituto de Biología, UNAM, Mexico and vouchers at the Invertebrate Zoology Collection of the Smithsonian's National Museum of Natural History (USNM) Washington D.C., USA. We present a comprehensive review of Mexican *Helobdella* species, including the new species, with notes on the characteristic morphology and geographic distribution of each species with 91 new records from 20 states. In addition, we provide a taxonomic key for the identification of the Mexican species.

Key words: Hirudinea, Annelida, freshwater fauna

Introduction

Helobdella is comprised of more than 80 species of freshwater leeches with an eversible proboscis, a single pair of eyespots and one annulus separating the gonopores. Most of the species have a dorsoventrally flattened body with a general leaf-like shape (lanceolate). However, *Helobdella elongata* Castle 1900 and at least another three species have an elongated body shape that is semicircular in cross section. Members of the genus lack bacteriomes or esophageal accessory organs. All feed on the haemolymph and soft tissues of snails and other freshwater invertebrates, a behavior known as liquidosomatophagia; none of the species is known to be sanguivorous on vertebrates. Species of *Helobdella* are also remarkable in their display of parental care (Sawyer 1986; Siddall & Borda 2002). The bulk of the diversity (>45 species) has been described from South America, however, 12 species are known from North America, two from Europe, two from Africa and two from Asia (Christoffersen 2009; Lai *et al.* 2009; Moser *et al.* 2013; Ringuélet 1985; Sawyer 1986).

The phylogenetic relationships of the species of *Helobdella* have been investigated previously using analyses based primarily on molecular data (Siddall & Borda 2002; Siddall *et al.* 2005). These analyses recovered two major groups: the first includes species with a nuchal chitinous scute (the *stagnalis* series) and the second includes species with complex dorsal patterns of longitudinal stripes and metameric papillae (the *triserialis* series). Two species, *Helobdella europaea* (Kutschera 1985) and *Helobdella octatestisaca* Lai & Chang 2009 have been introduced accidentally to regions well-removed from their native distributions (Oceguera-Figueroa *et al.* 2010; Reyes-Prieto *et al.* 2013; Siddall & Budinoff 2005).

In a previous study of the genetic variation (*cox1*) of species of *Helobdella* from Mexico, Oceguera-Figueroa *et al.* (2010) recovered a previously unidentified cluster within the *stagnalis* series (*Helobdella* “*stagnalis*” 2). In

- 3 (2) Dorsum without papillae; body without lateral projections4
 3' Dorsum with a medial longitudinal row of papillae on a2; body with lateral projections on a2 and a3, particularly conspicuous on the posterior half; testisacs 6 pairs; postcaeca (diverticula) absent
 *Helobdella atli* Ocegüera-Figueroa & León-Règagnon 2005.
 4 (3) Testisacs 4 **OR** 5 pairs. *Helobdella octatestisaca* Lai & Chang 2009
 4' Testisacs 6 pairs *Helobdella temiscoensis* n.sp.
 5 (2) Dorsum with five, seven, nine **OR** more heavily pigmented longitudinal stripes and multiple longitudinal rows of prominent papillae on a2 of mid-body somites *Helobdella socimulcensis* (Caballero 1931)
 5' Dorsum with irregularly arranged spots on the dorsal surface without any metameric pattern. Known only from Catemaco, Veracruz. *Helobdella virginiae* Ocegüera-Figueroa 2007.

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