PANAMJAS
Pan-American Journal of Aquatic Sciences

Scientific Note

First record of the association between the leech *Helobdella triserialis* (Hirudinea, Glossiphoniidae) and two species of *Pomacea* (Gastropoda, Ampullariidae) in Brazil

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Abstract. The occurrence of *Helobdella triserialis* associated with two freshwater snails, *Pomacea diffusa* and *Pomacea canaliculata*, is recorded for the first time in Brazil. We also point out the new association between the leech and *P. diffusa* in nature.

Key words: new records, leech, new association, *Pomacea canaliculata*, *Pomacea diffusa*

Resumo. Primeiro registro de ocorrência da sanguessuga *Helobdella triserialis* (Hirudinea: Glossophonidae) associada com duas espécies do caramujo *Pomacea* no Brasil. A ocorrência de *Helobdella triserialis* associada aos caramujos *Pomacea diffusa* e *Pomacea canaliculata* é registrada pela primeira vez no Brasil. Apontamos também a nova associação entre essa sanguessuga e *P. diffusa* na natureza.

Palavras chave: novos registros, sanguessuga, nova associação, *Pomacea canaliculata*, *Pomacea diffusa*

The genus *Pomacea* Perry, 1810 is considered the most diverse group among the continental freshwater snails of the family Ampullariidae (Simone 2006). It has a wide geographical distribution, occurring from southeastern North America to Argentina, in tropical and subtropical latitudes (Hayes *et al*. 2009). The conchological and anatomical characteristics (i.e. morphological complexity) of the genus provide favorable environments for the establishment of various associated organisms, such as leeches of the family Glossiphoniidae (Simone 2004, Damborenea *et al.* 2006, Negrete *et al.* 2007). Among the glossiphoniids, the genus *Helobdella* Blanchard, 1896 includes 48 species recorded in South America, some of which can live in association with

freshwater snails (Christoffersen 2009). The present paper aims to report the association between the leech *Helobdella triserialis* (Blanchard, 1849) and the snails *Pomacea canaliculata* (Lamarck, 1822) and *Pomacea diffusa* Blume, 1957 for the first time in Brazil.

Snails were collected by manual capture in freshwater environments from southeastern Brazil (Figure 1 and Table I). The shell length (mean ± standard deviation) was measured with a digital caliper. Leeches were removed manually, preserved in 70% ethanol and identified through literature (Ringuelet, 1985). Voucher specimens were deposited in the malacological collection and invertebrates collection of the Museu de Zoologia da Universidade de São Paulo (catalogued as MZSP 113477 and MZSP 0216, respectively), and Zoological collection of Santa Cecília University (catalogued as AZUSC 436, 634 and 634.1). A total of 30 specimens were captured, being five individuals of *Pomacea canaliculata* and 25 of *P. diffusa* in the states of Minas Gerais (MG) and São Paulo (SP), Brazil, respectively (Figure 2).

Six specimens of *H. triserialis* were found attached to specimens of *P. canaliculata* (43.3 ± 6.2 mm) from Minas Gerais (Figure 3). In addition, nine specimens of *H. triserialis* were found associated with *P. diffusa* (33.8 ± 1.8 mm) from São Paulo (Figure 4). Only in one case, in Minas Gerais, more than one specimen of *H. triserialis* were found on a single snail (2 specimens). The specimens were found attached to the mantle cavity and foot, or fixed on the gastropods' shell. All leeches presented a dorso-ventrally flattened body with multiple longitudinal strips of brownish pigments on the dorsal surface. The leech specimens from São Paulo exhibit 5 longitudinal rows of conspicuous papillae on the dorsal surface, one row medial and two pairs laterally arranged (Figure 4a). This anatomic pattern was less conspicuous in specimens from Minas Gerais (Figure 3a). In all cases, papillae are located on a2 of each segment. Two individuals from São Paulo were found carrying cocoons and young leeches attached to the ventral surface. Leeches of the genus *Helobdella* are well known for their highly variable morphology, for example, specimens that exhibit differences in coloration and papillar patterns show almost no genetic variation (Siddall & Borda 2003, Oceguera-Figueroa *et al*. 2010). However, the presence of longitudinal stripes of brownish pigments, a pair of eyespots, a single annuli between gonopores and the absence of bacteriomes in the specimens studied here are consistent with those described for *Helobdella triserialis.*

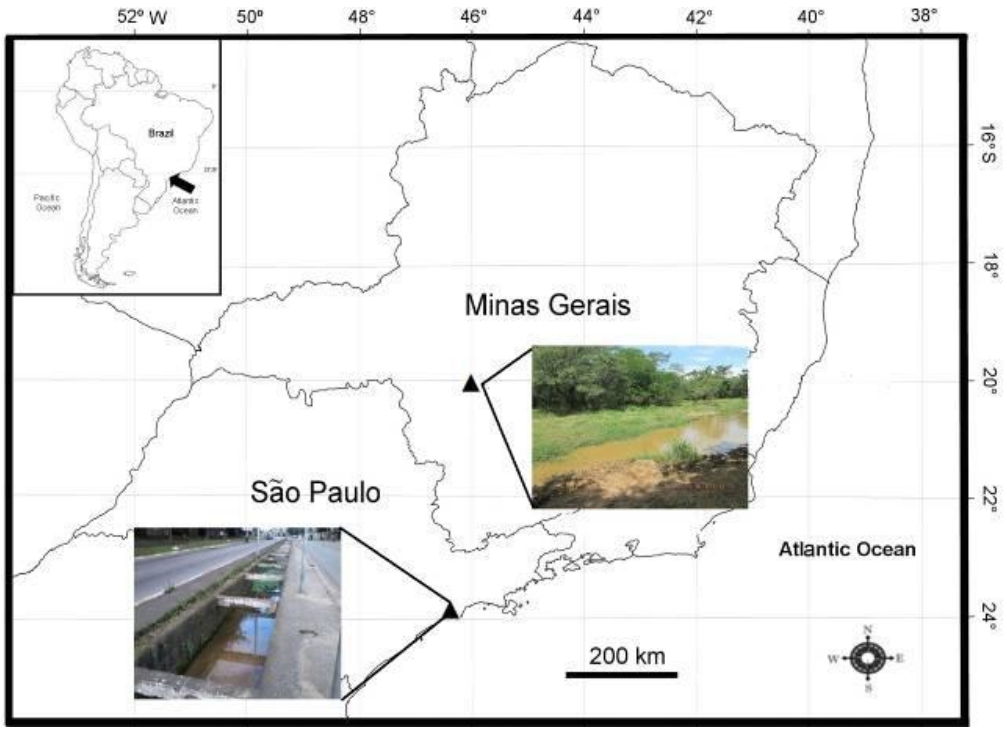

Figure 1. Map of Brazil showing the collection sites of *Pomacea canaliculata* (AZUSC 436 and MZSP 113477) and *Pomacea diffusa* (AZUSC 634) associated with *Helobdella triserialis* (▲).

Table I. Locality and total number (*n*) of *Helobdella triserialis* for the collection sites in the states of Minas Gerais (MG) and São Paulo (SP).

Collection sites	Voucher number	*n*	City	Date	Locality	Geographical coordinates		Habitat
						Lat	Long	
MG	MZSP 0216	6	Pratápolis	March/2013	Temporary pond	20°39	46°50	Lentic
SP	AZUSC 634.1	9	São Vicente	July/2013	Drainage channel	23°58	46°22	Lotic

Figure 2. Conchological variation in *Pomacea canaliculata* (AZUSC 436 and MZSP 113477) (A) and *Pomacea diffusa* (AZUSC 634) (B) collected in Minas Gerais and São Paulo states. Scale bar: 10 mm.

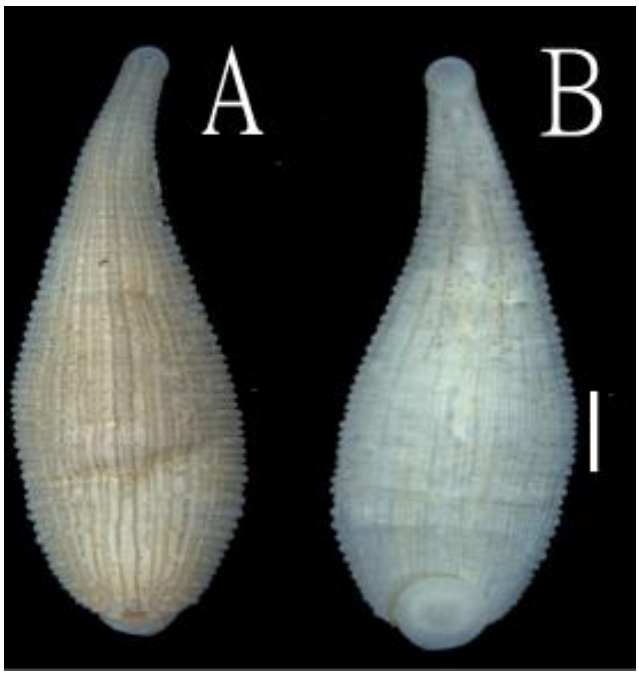

Figure 3. Specimens of *Helobdella triserialis* (MZSP 0216) found attached to snails from Minas Gerais state. A: Dorsal view. B: Ventral view. Scale bar: 2 mm.

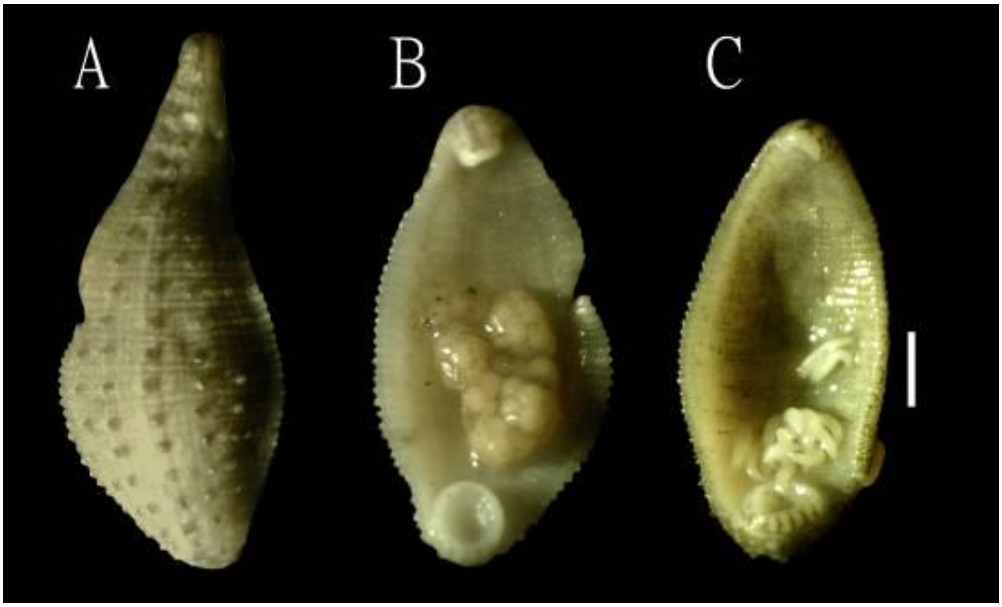

Figure 4. Specimens of *Helobdella triserialis* (AZUSC 634.1) found attached to snails from São Paulo state. A- Dorsal view. B – C Ventral view; notice the egg capsule and the young leeches attached to the ventral surface of the specimens. Scale bar: 2 mm.

The association of *Helobdella triserialis* with snails of the genus *Pomacea* is reported for the first time in Brazil. We also report the association between *H. triserialis* and *P. diffusa* in nature for the first time. The new records presented herein allow for an expansion of the occurrence of *H. triserialis* to Minas Gerais state (for details, see Christoffersen 2009). However, there are no studies of this ecological interaction (leeches and apple snails) in Brazil, which precludes further comparisons. The leech *Helobdella triserialis*, much like other congeners, is adapted to predation due to its proboscis, which is capable of sucking body fluids and soft parts of its prey (Negrete *et al.* 2007), a feeding strategy known as liquidosomatophagia (Sawyer 1986). Guimarães *et al.* (1983) investigated the predatory behavior of the leech on the gastropod *Biomphalaria glabrata* (Say, 1818) (Planorbidae) in laboratory conditions, noting its preference for newly hatched and young individuals. Damborenea & Gullo (1996) reported the presence of the annelid in the mantle cavity of *P. canaliculata*, suggesting that such association could offer protection and nutrition to leeches. In laboratory, Aditya & Raut (2005) found that *Glossiphonia weberi* (Blanchard, 1897) prey on *Pomacea bridgesii* Reeve, 1856, at a rate of three snails per day. Vega *et al.* (2006) studied a symbiosis of invertebrates and two species of the genus *Pomacea*. In their research, a greater abundance of the turbellarian *Temnocephala iheringi* Haswell, 1893 and the leech *Helobdella ampullariae* Ringuelet, 1945 were observed in *Pomacea canaliculata*. In a single record from Brazil, Dias *et al.* (2006) made a survey on the ciliate protozoans from Peritrichid and Suctorian taxa, epibionts of *Pomacea lineata* Spix, 1927.

Further studies aiming to comprehend the relationship between these species are needed to better understand the details and duration of such interactions, and to have a better characterization of the population dynamics of each participant of this association.

Acknowledgments

The first author thanks Agatha Manzi-Decarli for her helping in the field. Lucas R. P. Paschoal thanks the scholarship provided by Coordenadoria de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) and Universidade Estadual Paulista (UNESP/Rio Claro – PPG Ciências Biológicas/Zoologia). Permits were granted by ICMBio, SISBIO 12829-1 (São Paulo) and 36210-1 (Minas Gerais).

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Received January 2014
Accepted May 2014
Published online August 2014