

First Record of *Pediobius pyrgo* (Walker) (Hymenoptera: Eulophidae) in South America and its Emergence from Egg Sacs of *Latrodectus geometricus* C. L. Koch (Araneae: Theridiidae)

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Abstract. We record the first occurrence of *Pediobius pyrgo* (Walker) (Hymenoptera: Eulophidae) for South America. This is also the first report of *P. pyrgo* emerging from egg sacs of *Latrodectus geometricus* C. L. Koch (Araneae: Theridiidae).

Keywords: Brazil; Chalcidoidea; Parasitism; Spider; Wasps.

Primeiro Registro de *Pediobius pyrgo* (Walker) (Hymenoptera: Eulophidae) na América do Sul e sua Emergência em Sacos de Ovos de *Latrodectus geometricus* C. L. Koch (Araneae: Theridiidae)

Resumo. Registramos pela primeira vez a ocorrência de *Pediobius pyrgo* (Walker) (Hymenoptera: Eulophidae) para a América do Sul. Este também é o primeiro relato de *P. pyrgo* emergindo de sacos de ovos de *Latrodectus geometricus* C. L. Koch (Araneae: Theridiidae).

Palavras-Chave: Aranha; Brasil; Chalcidoidea; Parasitismo; Vespas.

The genus *Pediobius* is composed by small wasps (0.8-1.6mm), characterized by having propodeum medially with 2 subparallel carinae diverging posteriorly and with distinct plicae; frontofacial sutures distinct, petiole in most species with ventrally pointed extension (YEFREMOVA *et al.* 2008; HANSSON 2013). It is a large genus of Eulophidae with 217 known species worldwide, of which 28 occur in the Neotropics (HANSSON 2009; NOYES 2014). The specie *Pediobius pyrgo* (Walker) occurs in Europe, Japan, Korea, USA and Honduras, for the latter there are reports that five females were created from eggs sacs of Theridiidae (Araneae) (unknown specie) (HANSSON 2009). From Brazil, only *Pediobius furvus* (Gahan) is reported (HANSSON 2009, 2013).

Species of *Pediobius* (Eulophidae) can act as parasitoids on eggs, larvae or pupae, or as hyperparasitoids on a wide range of insects as well as egg sacs of cobweb spiders (Theridiidae) (KERRICH 1973; BOUČEK 1988; HANSSON 2009, 2013).

Latrodectus is a cosmopolitan spider genus (Araneae: Theridiidae) commonly known as widow spiders and most species can be easily recognized by the presence of red abdominal marks and by the egg sac, which has a war-mace aspect (ABALOS 1962). Several Hymenoptera have been reported as parasitoids of egg sacs of *Latrodectus* (Table 1) (DOZIER 1931; PIERCE 1939; FULLAWAY 1953; BOUČEK 1988; BRAMBILA & EVANS 2001; SCHWARZ 2002).

Only record of *Pediobius brachycerus* (Thomson) as endoparasitoid of egg sacs of *Latrodectus tredecimguttatus* (Rossi) is known (YEFREMOVA *et al.* 2010). There were no records of *Pediobius* as endoparasitoids of egg sacs of *Latrodectus geometricus* C. L. Koch. Here we report the first record of *P. pyrgo* from South America; it is also the first record of *P. pyrgo* emerging from egg sacs of *L. geometricus*.

One live adult female of *L. geometricus* (Figure 6) with two egg sacs collected in a garden area of Manaus (Amazonas, Brazil – 3°7'56"S 59°58'24"W) was put in glass vial and delivered to the Laboratory of Hymenoptera at INPA. Based on observation that one egg sac had external morphological abnormalities both egg sacs were isolated. After three days small wasps started to emerge from the egg sacs, and were identified as *P. pyrgo* (Figures 1–5), based on the key by SCHAUFF *et al.* (1997), and HANSSON (2013), and afterwards confirmed by Dr. Christer Hansson (Zoological Museum, Lund University, Sweden). The images were made using a Leica (M165C) stereomicroscope with a DFC420 digital camera. Stacks of images was combined using the program Leica Application Suite v3.4.1 (Version 2009). Vouchers of host spiders, egg sacs and parasitoids were deposited at the INPA collection under the number 8799.

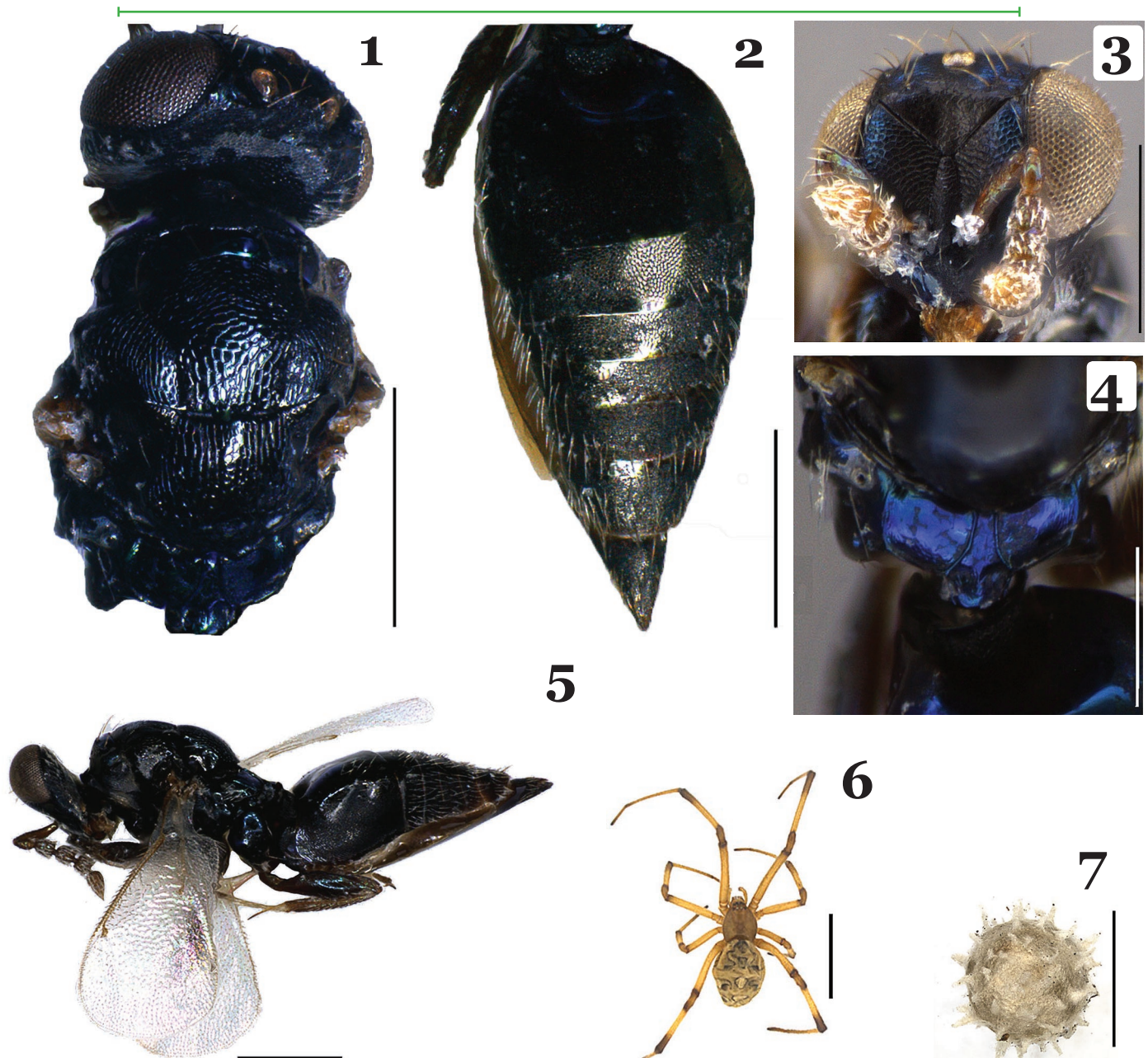
In order to collect more specimens to examine the host-parasite interaction between *Pediobius* and *Latrodectus*, a visit to the same garden where the egg sacs were first collected was conducted. As result we collected three females and two males of *L. geometricus* and five egg sacs which were kept individually isolated in glass vials until spiderlings or parasitoids emerged. After eight days, 31 specimens of *P. pyrgo* emerged from only two egg sacs (9 and 22 parasites in each egg sac, respectively) (Figure 7). After the emergence of the parasitoids, all egg sacs of *L. geometricus* were examined for the presence of other parasitoids, but none was found, indicating that *P. pyrgo* is a primary parasitoid of *L. geometricus*.

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Table 1. Species of Hymenoptera parasitoids of *Latrodectus* egg sacs.

Family	Species	Host	Local and period of research	Reference
Eurytomidae				
	<i>Eurytoma latroedecti</i> Fullaway	<i>Latrodectus geometricus</i> (Koch)		FULLAWAY 1953
		<i>Latrodectus hasselti</i> Thorell	-	BOUCEK 1988
		<i>Latrodectus mactans</i> (Fabricius)	-	BOUCEK 1988
Eulophidae				
	<i>Pediobius brachycerus</i> (Thomson)	<i>Latrodectus tredecimguttatus</i> (Rossi)	Turkey/2006-2008	YEFREMOVA et al. 2010
Ichneumonidae				
	<i>Gelis latroedectiphagus</i> (Hesse)	<i>Latrodectus indistinctus</i> (Cambridge)	-	YU et al. 2012
	<i>Gelis karakurti</i> Rossikov	<i>L. mactans</i>	-	YU et al. 2012
	<i>Gelis marikovskii</i> Kuzin	<i>L. mactans</i>	-	YU et al. 2012
	<i>Gelis scvarskii</i> (Rossikov)	<i>L. mactans</i>	-	YU et al. 2012
	<i>Thaumatogelis neesii</i> Förster	<i>L. mactans</i>	-	YU et al. 2012
	<i>Tromatobia ornata</i> (Gravenhorst)	<i>L. mactans</i>	-	YU et al. 2012
	<i>Tromatobia ovivora</i> (Boheman)	<i>L. mactans</i>	-	YU et al. 2012
Platygastridae				
	<i>Baeus latroedecti</i> Dozier	<i>L. mactans</i>	Haiti/ October 1930	DOZIER 1931
	<i>Baeus californicus</i> Pierce	<i>L. geometricus</i>	Los Angeles/ August 1938	PIERCE 1939
		<i>L. mactans</i>	Los Angeles/ August 1938	PIERCE 1939

- There are no information about the place and period of research, only reports of the parasitoids area cited.



Figures 1-7. *Pediobius pyrgo*, female: 1. Head and mesosoma, dorsal view (scale bar = 200 µm); 2. Gaster, dorsal view (scale bar = 200 µm); 3. Head, frontal view (scale bar = 200 µm); 4. Propodeum, dorsal view (scale bar = 100 µm); 5. Habitus, lateral view (scale bar = 100 µm); 6. *Latrodectus geometricus*, dorsal view (scale bar = 5 mm); 7. *P. pyrgo*, after hatch, on an egg sac (scale bar = 5 mm).

So far there is no information regarding the introduction of *P. pyrgo* in South America. However, we believe that this species occurs naturally in Brazil, since their hosts are also present. The observation of the emergence of *P. pyrgo* from the egg sacs of *L. geometricus* is relevant since contributes with information on the host-parasite biology.

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