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FIRST RECORD OF AULACIDAE (HYMENOPTERA, EVANIOIDEA) FROM URUGUAY WITH DESCRIPTION OF A NEW SPECIES OF *Aulacus*

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ABSTRACT

The presence of the parasitoid wasp family Aulacidae (Hymenoptera, Evanioidea) in Uruguay is registered for the first time. Two species are recorded, *Aulacus castiglionii* **sp. nov.**, and *Pristaulacus ambiguus* (Schetterer). Illustrations and distribution map are presented to both species.

Key words: *Aulacus*, Neotropical fauna, parasitoid wasps, *Pristaulacus*.

RESUMEN

Primer registro de Aulacidae (Hymenoptera, Evanioidea) de Uruguay con descripción de una nueva especie de *Aulacus*. Se documenta por primera vez la presencia de avispas parasitoides de la familia Aulacidae (Hymenoptera, Evanioidea) en Uruguay. Se registran *Aulacus castiglionii* **sp. nov.** y *Pristaulacus ambiguus* (Schetterer). Se presentan ilustraciones y mapa de distribución para ambas especies.

Palabras clave: *Aulacus*, avispas parásitas, fauna Neotropical, *Pristaulacus*

INTRODUCTION

Aulacidae (Hymenoptera, Evanioidea) are cosmopolitan and include 310 extant species based on recent reviews and checklists (Turrisi *et al*., 2009; Chen *et al*., 2016; Turrisi, 2017; Jennings *et al*., 2018; Turrisi & Smith, 2020; Smith & Turrisi, 2020). The family is divided in two genera, *Aulacus* Jurine, 1807, 122 species and *Pristaulacus* Kieffer, 1900 (including the former *Panaulix* Benoit, 1984), 188 species (Turrisi, 2017). Both genera occur throughout the Neotropical Region where *Aulacus* currently includes 27 species and *Pristaulacus* 56 species (Smith, 2001, 2005a, 2005b, 2008, 2016, 2018; Smith & Vilela De Carvalho, 2010; Turrisi, 2017). Neither genus has been fully revised for the Neotropics (Smith, 2018) and there are no formal records of these wasps for Uruguay.

Aulacidae act as koinobiont endoparasitoids of wood-boring larvae of Xiphydriidae (Hymenoptera), Buprestidae and Cerambycidae (Coleoptera) (Skinner & Thompson, 1960; Smith, 2001; Jennings & Austin, 2004; Turrisi & Vilhelmsen, 2010; Smith, 2014).

The current state of knowledge of Aulacidae on the systematics, phylogeny, distribution, and biology is unsatisfactory. In part, this status is due to the fact that these wasps tend to be rarely collected and consequently they are relatively uncommon in collections, with many species known from only one or a few specimens (Turrisi, 2007; Turrisi *et al*., 2009).

In the present study two species of Aulacidae from Uruguay are recorded, one described here as new species. Illustrations and distribution map are presented to both species.

MATERIAL AND METHODS

The specimens studied here were collected by Malaise traps along two years near the municipality of Castillos, Departamento de Rocha, Uruguay, as described by Castiglioni *et al.* (2017) and Fernandes *et al.* (2019).

Images and measurements were taken using a Leica MC170 HD digital camera attached to a Leica M205C APO stereomicroscope with a Leica LED5000 HDI high diffuse dome illumination system, using the Leica Application Suite (LAS version 4.12.0) (Leica Microsystems, Germany). The images were focus-stacked using Helicon Focus version 5.3 (Helicon Soft, Kharkiv, Ukraine). The figures

were prepared using Adobe Photoshop version 11.0 (Adobe Inc., California, USA).

The studied specimens were identified using the most comprehensive modern reviews for central and southern America proposed by Smith (2008, 2018), and taking into account further contributions, and catalogues or checklists for comparisons (Townes, 1950; Smith, 2001, 2005a, 2005b, 2016; Smith & Vilela De Carvalho, 2010; Turrisi, 2017). Morphological terminology follows Crosskey (1951), Huber & Sharkey (1993) and Turrisi (2007); and Harris (1979) for cuticular sculpture.

The consistency of anatomical data with the Hymenoptera Anatomy Ontology project (Yoder *et al*., 2010; Seltmann *et al*., 2012) was determined using the proofing tool available through the Hymenoptera Glossary (HAO, 2019).

Used abbreviations are as follows: F*n*, flagellomeres (*n* = number of the flagellomere); Mt*n*, metasomal tergite (*n* = number of the metasomal tergite); OOL, ocellar-ocular distance; POL, post-ocellar distance.

Specimens examined are deposited at Coleção Entomológica do Laboratório de Sistemática e Bioecologia de Predadores e Parasitoides (LRRP), Instituto Biológico, Ribeirão Preto, São Paulo, Brazil.

RESULTS

Two species of Aulacidae were recognized only at a livestock production area grazed by cattle and sheep in the Departamento de Rocha, Eastern Uruguay (Fig. 1): *Aulacus castiglionii* **sp. nov.** and *Pristaulacus ambiguus* (Schletterer, 1890).

***Aulacus castiglionii* sp. nov.**
(Figs. 2–9, 11)

Type material. **holotype**, female [LRRP], with labels "Uruguay, Rocha, Castillos, 34º05'1.07"S / 53º45'43.08"W, Malaise, 12 / I / 2015, E. Castiglioni e eq., cols."; "*Aulacus* sp. ACC Macedo 2018 det"; "♀ HOLOTYPE*, Aulacus castiglionii* sp. nov., Perioto, Lara, Turrisi, 2020", and "LRRP# 20442". Holotype glued on

Fig. 1. Sampling location of the studied specimens near the municipality of Castillos, in the Departamento de Rocha, Eastern Uruguay.

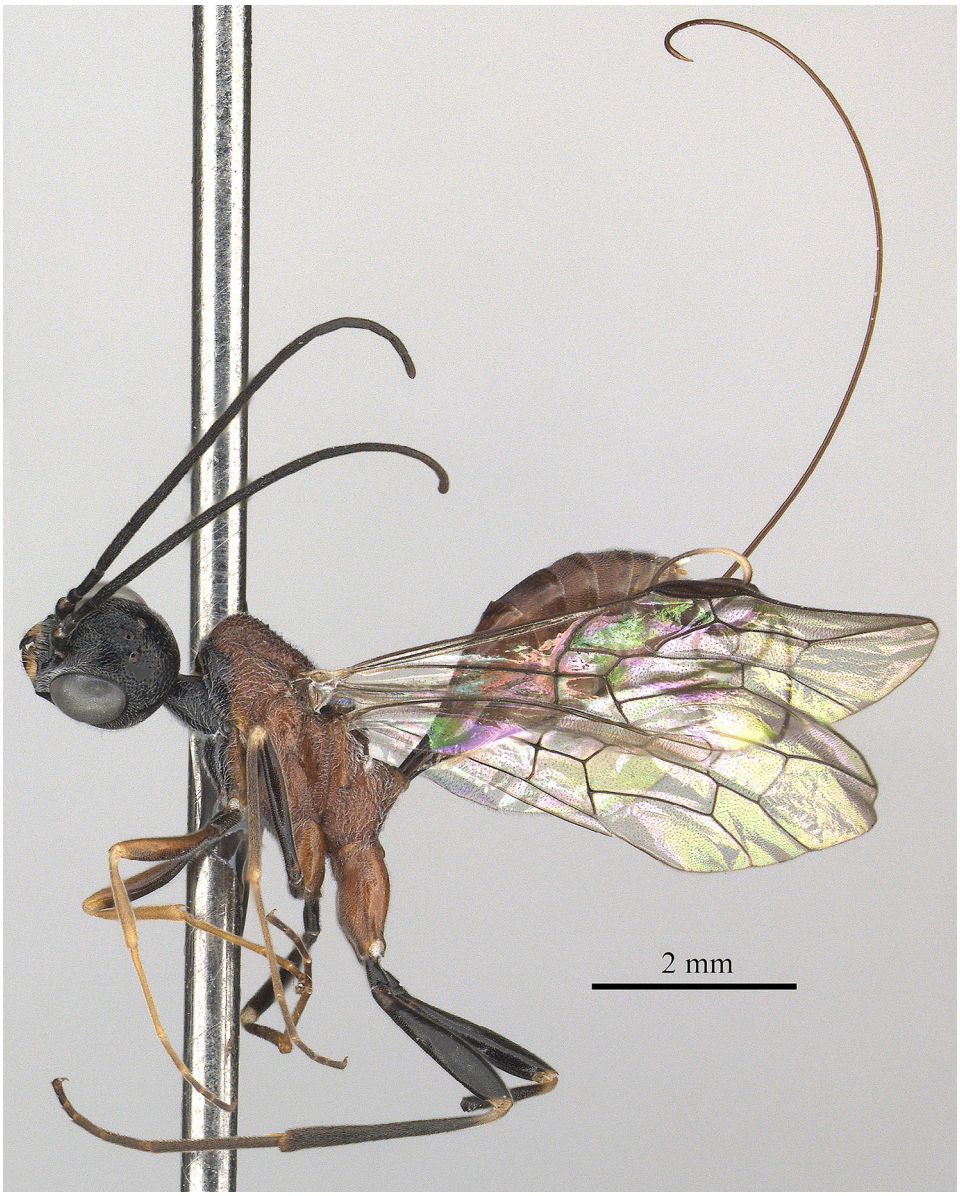

Fig. 2. *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (X holotype): habitus lateral.

pin, in good condition; right metaleg with apical part of tibia and tarsus missing.

Etymology. This species is named in honor of Dr. Enrique Castiglioni Rosales, retired professor at the Universidad de la República, Centro Universitario Regional Este. His story and contributions to the Entomology in Uruguay inspired the etymology presented herein.

Diagnosis. Body 7.7 mm long, excluding ovipositor; forewing 8.9 mm long. Head black; mesonotum orange with propleuron and anterior margin of pronotum black; forewing hyaline. Head densely and minutely punctuated, temple with rounded profile. Malar space one-third of eye height. Mesonotum broadly strigate. Notauli reaching separately the transscutal articulation. Hind coxae shiny with scattered punctures. Ovipositor length 1.3 × forewing length.

Description. Female (Fig. 2): Body 7.7 mm long; forewing 8.9 mm long; ovipositor 6.0 mm long. *Color.* Body mostly orange. Black on: antenna, head, anterior margin of pronotum, transverse band on transscutal articulation, spot on metascutellum medially, propleuron, anterior portion of procoxa, trochanter and femur of mesoleg, and metaleg (except coxa). Brown to light brown on: trochanter and femur of proleg, tibia of mesoleg, and ovipositor sheath (except by white band near apex). Testaceous on: mandible, except brown teeth; tibia and tarsus of proleg and tarsus of

Fig. 3. *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (X holotype): head frontal.

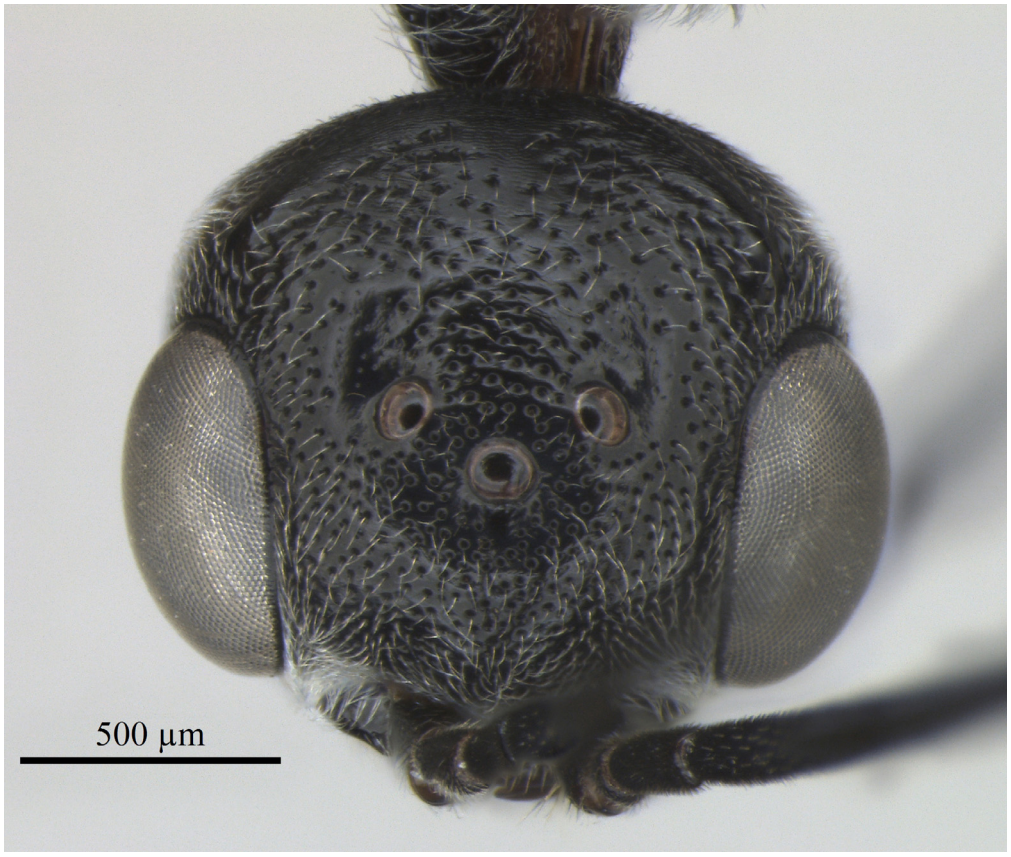

Fig. 4. *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (X holotype): head dorsal.

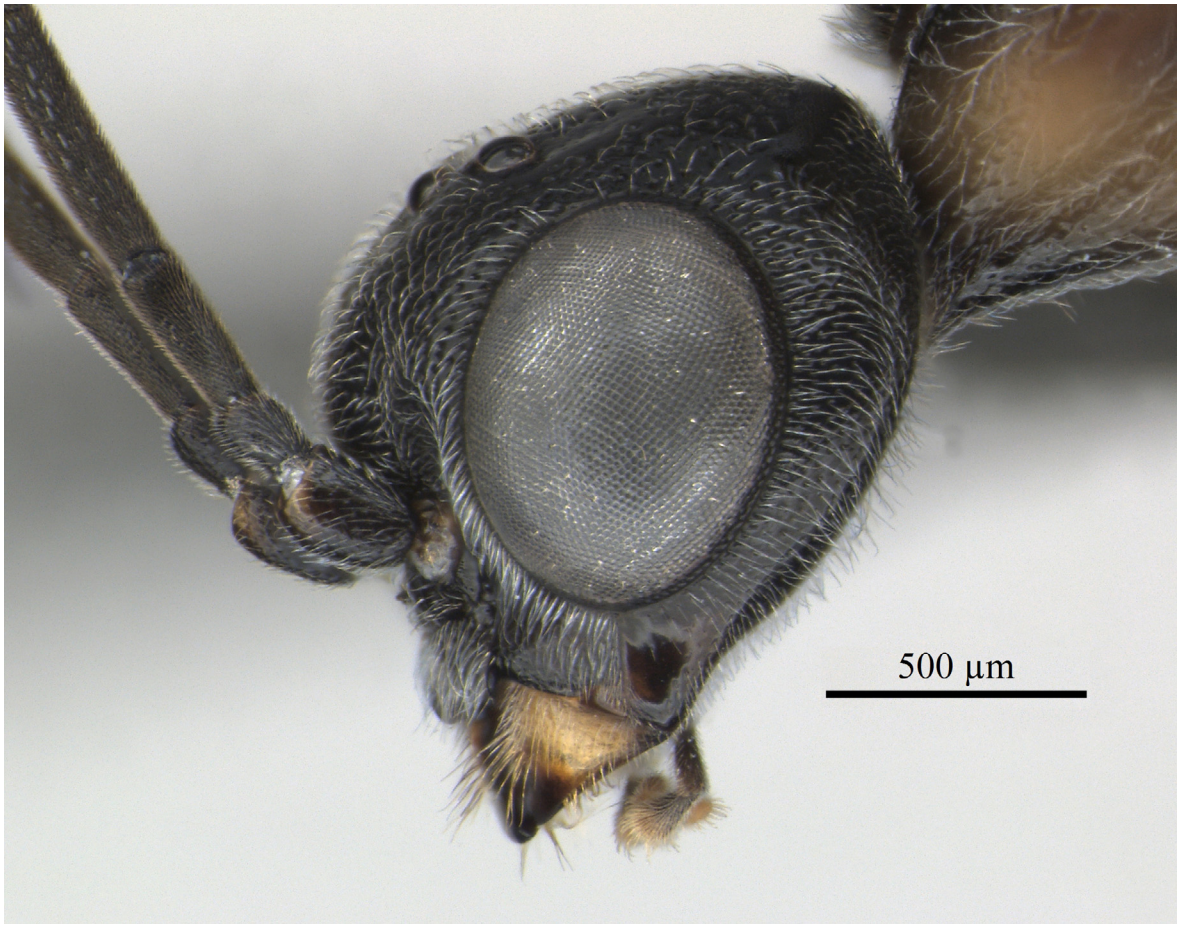

Fig. 5. *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (X holotype): head lateral.

mesoleg. Wings hyaline, veins and stigma brown.

Head (Figs. 3–5). Densely punctated; interspaces shine and about 2 × puncture diameter, wider on vertex; white setae denser on parascrobal area and lower face. Antennal length 3.5 × head width; proportion of F1–F5 as 0.5:0.9:1.0:1.0:0.9. Lower interocular distance 1.1 × eye height; eyes in front view slightly converging; malar space 0.3 × eye height. Clypeus about 2.1 × as broad as long. Head, in dorsal view, 1.1 × as wide as long; temple moderately developed, rounded, about 0.7 × eye length. POL/OOL= 1.2.

Mesosoma (Figs. 6–7). With fine white setae, 2.8 × as long as broad in dorsal view. Propleuron shiny, densely and minutely punctate, punctures separated by flat shiny interspaces about 2–3 × to puncture diameters and long whitish setation; lateral panel of pronotum with transverse carinae similar to mesoscutal midlobe; mesoscutum rounded anteriorly; midlobe of mesoscutum with 13 prominent, evenly spaced, transverse carinae, lateral lobes transversely carinate; notauli reaching separately the transscutal articulation; metascutellum medially with six prominent, evenly spaced, transverse carinae; axillar depression areolate-rugose; propodeum coarsely areolate-rugose. Mesopleuron along lower and upper mesepimeron areolate-rugose; femoral depression rugulose-lacunose ventrally, puncticulate dorsally, interspace mainly smooth and shiny. Metacoxa 1.9 × as long as broad, shiny with scattered punctures, with ovipositor guide on inner surface. Metabasitarsus 1.1 × length of remaining tarsomeres combined, length of tarsomeres as 1.0:0.4:0.2:0.1:0.2. Tarsal claw simple. Forewing 3.4 × as long as wide, length of pterostigma about 0.1 × length of forewing.

Metasoma (Figs. 8–9) pyriform, Mt1+2 dorsally shiny, remaining tergites with dense white pubescence. Ovipositor 1.3 × forewing length.

Male. Unknown.

Biology. Unknown.

Geographical distribution. URUGUAY (Rocha Department) (Fig. 11).

Fig. 7. *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (X holotype): mesosoma lateral.

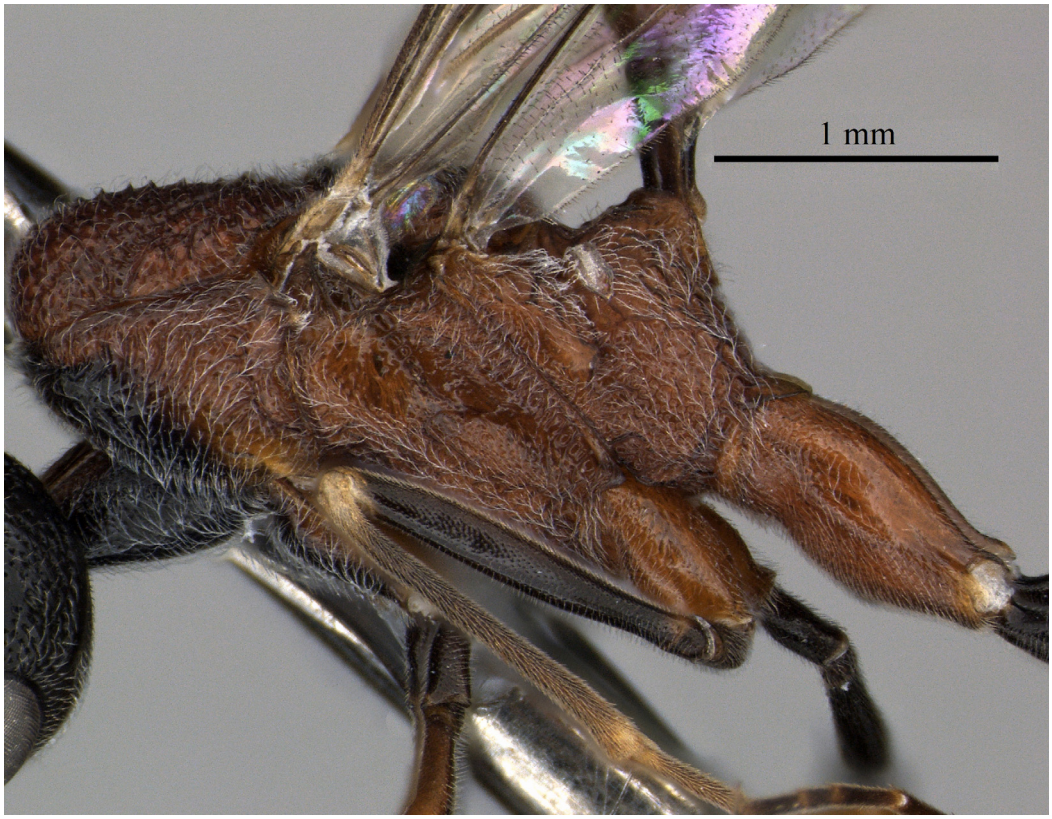

Fig. 8. *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (X holotype): metasoma lateral.

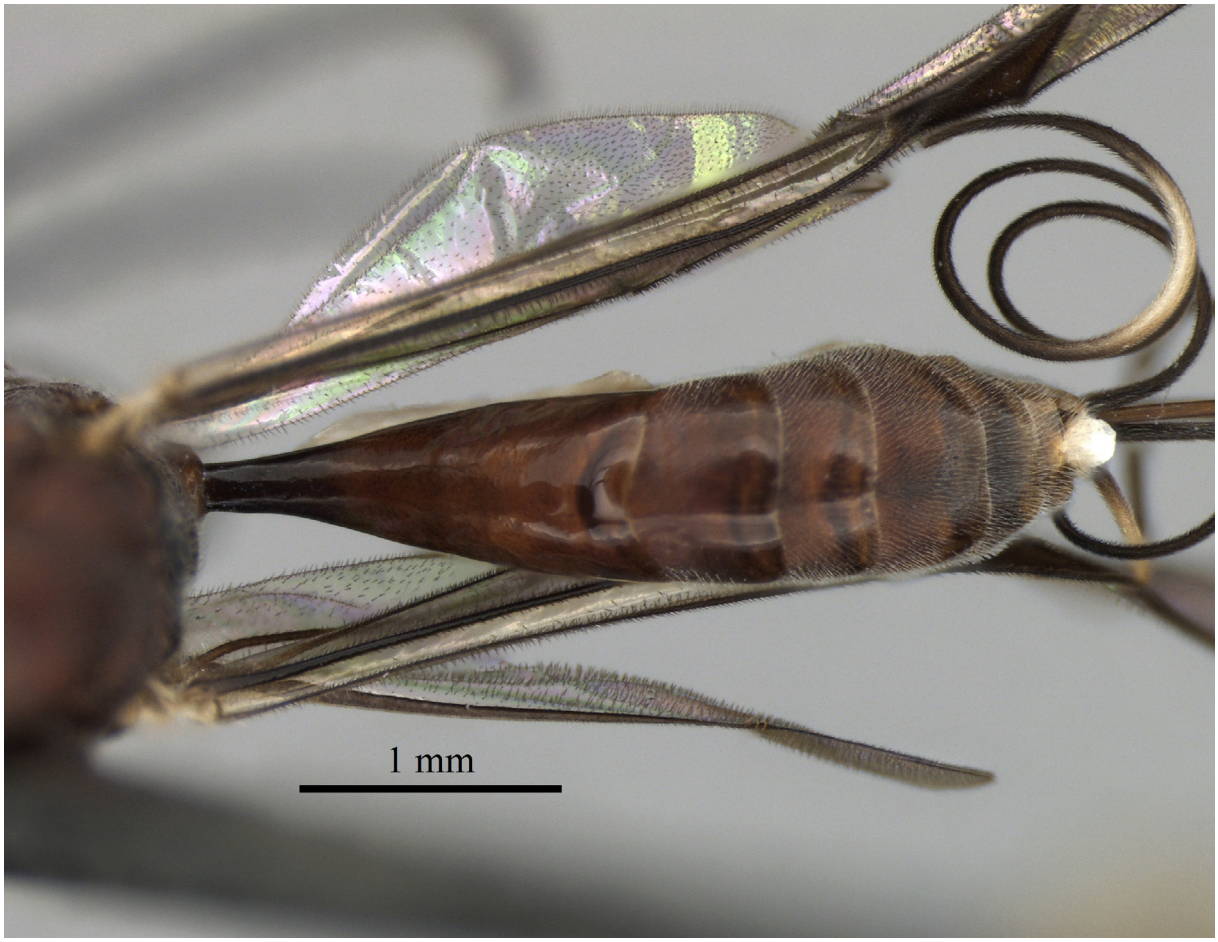

Fig. 9. *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (♀ holotype): metasoma dorsal.

Fig. 10. *Pristaulacus ambiguus* (Schletterer, 1890) (♀): habitus lateral.

Fig. 11. Distribution map of *Pristaulacus ambiguus* (Schletterer, 1890) (black triangles, black triangle with a white dot indicates a new record) and *Aulacus castiglionii* Perioto, Lara, Turrisi, **sp. nov.** (red triangle).

Discussion. Based on the key to species proposed by Smith (2008), *Aulacus castiglionii* **sp. nov.** is easily differentiated from the most central and southern American species due to the forewing hyaline without dark marks (Fig. 8). *Aulacus gerais* Smith, 2010 (in Smith and Vilela De Carvalho 2010) is similar to *A. castiglionii* **sp. nov.** in having the forewing completely hyaline and, the ovipositor sheath with a preapical whitish band. However, *A. castiglionii* **sp. nov.** is separated due to the mesosoma mostly orange (*vs*. black in *A. gerais*), the legs extensively darkened to black (*vs*. orange in *A. gerais*), the ovipositor length 1.3× forewing length (*vs*. subequal in *A. gerais*). A number of central and southern American species have the body extensively reddish orange (*A. dispilus* Townes, 1950; *A. fascius* Smith, 2008; *A. heredia* Smith, 2008; *A. leon* Smith, 2008; *A. veracruz* Smith, 2008), but *A. castiglionii* **sp. nov.** has the head entirely black, as well as the forewing completely hyaline. The most similar species to *A. castiglionii* **sp. nov.** is *A. dispilus* due to the shape and sculpture of the head, and the length of broad whitish preapical band of the ovipositor (Townes, 1950; Smith, 2008). These species can be differentiated once *A. castiglionii* **sp. nov.** presents: the head black (*vs*. orange in *A. dispilus*); the scape and pedicel orange (*vs*. blackish in *A. dispilus*); the mesosoma almost entirely reddish orange except lateroventral margin of pronotum and propleuron blackish (*vs*. orange, extensively blackish on ventral parts of propleuron, mesosternum, and propodeum in *A. dispilus*); the forewing completely hyaline (*vs*. dark brown beyond the middle of the radial cell, and with a light brown area under the stigma in *A. dispilus*); the metacoxa 1.9 × longer than broad, ovipositor guide indistinct (*vs*. 1.7 × longer than broad and ovipositor guide distinct in *A. dispilus*); metasoma entirely reddish orange, Mt1+2 darker (*vs*. metasoma light brown whitish band on Mt1+2, and lighter band/area on the junction of Mt2 and Mt3 in *A. dispilus*).

Pristaulacus ambiguus (Schletterer, 1890)
(Figs. 10, 11)

Aulacus ambiguus Schletterer, 1890: 498, 530, t. 22, f. 143.—Dalla Torre 1902: 1059.

Pristaulacus ambiguus: Kieffer, 1900: 338.—Kieffer 1902: 12.—Kieffer 1903: 455.—Kieffer 1904: 10.—Kieffer 1912: 378, 401.—Hedicke, 1939: 5.—Basibuyuk *et al.* 2000: 635–636 (morphology of sensilla of orbicula).—Smith 2001: 278.—Turrisi *et al.* 2009: 56.

Diagnosis. Body entirely black; forewing hyaline with small black spot at apex; pronotum anteriorly with one projecting spine; frons pucticulate, interspace smooth and shiny (Smith 2018).

Material examined. 1 female, "Uruguay, Rocha, Castillos, 34º05'1.07"S / 53º45'43.08"W, Malaise, 14 / I / 2016, E. Castiglioni e eq., cols."; "*Pristaulacus* sp., ACC Macedo 2018 det"; "*Pristaulacus ambiguus* (Schletterer, 1890), Turrisi, G.F. det. 2019"; "LRRP# 20443".

Species identification. In the key provided by Smith (2018) this specimen runs to couplet 16 and perfectly match with the redescription on page 313.

Biology. Unknown.

Discussion. *P. ambiguus* appears to have a wide distribution in South America with records in Brazil, in the states of Goiás, São Paulo, Paraná and Santa Catarina and in Argentina, in the provinces of Salta, Tucumán, La Rioja, Mendoza and Buenos Aires (Smith, 2018), having been captured in different habitats. Now, a new country record is added, for the Department of Rocha, in eastern Uruguay, in an anthropized habitat (Fig. 11).

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