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Stygocampsomeris manauara (Hymenoptera: Scoliidae: Scoliinae), a new scoliid from the Amazon forest

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ABSTRACT

A new species of Amazonian ectoparasitoid wasp, *Stygocampsomeris manauara* **sp. nov.**, is described almost 50 years after being collected in the region of Manaus, in the central Brazilian Amazon, and stored in the invertebrate collection of the Instituto Nacional de Pesquisas da Amazônia (Brazil). We provide a detailed morphological description and illustrations of the female, a diagnostic comparison of the new species with *Stygocampsomeris servillei* Lepeletier, and a key for the identification of females of *Stygocampsomeris*.

KEYWORDS: taxonomy, Campsomerini, Neotropical region, ectoparasitoid wasps

Stygocampsomeris manauara (Hymenoptera: Scoliidae: Scoliinae), um novo escoliídeo da floresta amazônica

RESUMO

Uma nova espécie amazônica de vespa ectoparasitóide, *Stygocampsomeris manauara* **sp. nov.**, é descrita quase 50 anos após ter sido coletada em Manaus, na Amazônia central brasileira e armazenada na coleção de invertebrados do Instituto Nacional de Pesquisas da Amazônia (Brasil). Apresentamos uma descrição morfológica detalhada e ilustrações da fêmea, uma comparação diagnóstica da nova espécie com *Stygocampsomeris servillei* Lepeletier e uma chave de identificação para as fêmeas de *Stygocampsomeris*.

PALAVRAS-CHAVE: taxonomia, Campsomerini, região Neotropical, vespas ectoparasitóides

Scoliidae is a commonly found family composed by approximately 560 species distributed across all regions of the globe, except the poles (Osten 2005). Members of this family are ectoparasitoids of coleopteran larvae, mainly Scarabeidae, Lucanidae and Passalidae, usually found underground or in decaying wood (Fernández 2006). The female wasp locates, paralyzes and deposits only one egg in the host, which will develop and feed on the beetle until the pupal stage (Grisell 2007; Kumar and Pham 2015). Due to this habit, some species of these wasps can be used for biological control (Abbate et al. 2018). As adults, Scoliidae are floral visitors, often seen obtaining nectar and pollen, thus playing the role of pollinators for several plant species (Gadallah 2004).

Currently, the family is divided into two extant subfamilies (Proscolinae and Scoliinae) and one extinct subfamily (Archaeoscolinae) (Day *et al.* 1981; Rasnitsyn 1977; Rasnitsyn 1993). Only Scoliinae is found in the Neotropical region and is composed of two tribes: Campsomerini and Scoliini (Gupta and Jonathan 2003; Osten 2005). Belonging to Campsomerini, *Stygocampsomeris* Bradley, 1957 is a genus commonly found in South America, especially throughout Brazil (Bradley 1945). This genus currently has three valid species: *Stygocampsomeris servillei* Lepeletier, 1845, *S. corrigenda* Schulz, 1906, and *S. sanctae-theresae* Bradley, 1945 (females of this last species are unknown) (Bradley 1957). Both *S. servillei* and *S. corrigenda* have a wide distribution, the former being present from Mexico to Argentina and southeastern Brazil (extremely abundant in northern South America) and the former from Guatemala to central-western Brazil. *Stygocampsomeris sanctae-theresae* has a more restricted distribution, with records from French Guiana and southeastern Brazil (Bradley 1945; Bradley 1957).

Scoliidae and its genera, however, are still a neglected taxon of Hymenoptera, despite being commonly collected and deposited in collections all over the world (Elliott 2011). Studies with this group are outdated, especially for the Neotropical fauna, for reasons such as the lack of identification keys, poor and/or confusing species descriptions, and the extreme sexual dimorphism in the family, which hinders sex association and increases synonymies (Bradley 1945; Gupta

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and Jonathan 2003; Elliott 2011). Therefore, new and detailed studies on Scoliidae taxonomy are necessary to aid in future efforts to organize this common yet poorly understood group of wasps.

During a visit to the invertebrate collection of the Instituto Nacional de Pesquisas da Amazônia (INPA), two specimens, both female, without identification and with odd characteristics were found. The only information, present on the specimen labels, shows that both were collected in Manaus (Amazonas/Brazil) on September 24, 1977, by C. Gondim. After being analyzed, we concluded that these specimens did not fit any previous description and therefore it was a new species. Thus, in this manuscript, we describe a new species of *Stygocamposimeris* from Brazil, almost 50 years after it was collected and deposited in an entomological collection, with a detailed diagnosis and digital images.

The two female specimens were used for the analysis of the external morphology. The morphological terminology followed Betrem (1928, 1935), Bradley (1945, 1957), Gupta and Jonathan (2003), and Harris (1979) for surface sculpturing. The specimens were examined under a Leica M205 C stereoscopic microscope and photos were taken with an attached Flexacam C1 camera using the LASx software, and later edited with the software Adobe Photoshop CS6 (San Jose, CA, USA).

The type specimens are deposited in the invertebrate collection of INPA, Manaus, Brazil (Holotype – *voucher material:* INPA-HYM 034730), and Universidade Estadual Paulista (UNESP), São José do Rio Preto, São Paulo, Brazil (Paratype – *voucher material:* DZSJRP-Hym 00000863).

Stygocampsomeris manauara Golfetti **sp. nov.**

(Figures 1 and 2a,c,e,g,i)

Type material

Holotype: Female, Manaus, AM [Amazonas], Brazil, 24.ix.1977, C. Gondim col. (INPA-HYM 034730); **Paratype:** Female, same label data as holotype (DZSJRP-Hym 00000863).

ZooBank registration: http://zoobank.org/urn:lsid:zoobank.org:pu:24D51806-BA40-4B46-8A5A-E0B555BFFA35

Description

Female: Body length: 28-32 mm**. Head.** Last antennal flagellomere larger than previous segments. Mandibles with well-marked diagonal and lateral grooves. Anterior margin of clypeus with a slight median projection, surrounded by a broad slight rounded border. Discal region somewhat flattened, slightly striated longitudinally and anteriorly with lateral depressions. Subapical and lateral margin of clypeus with dense coarse punctation and numerous black setae. Frontal spatium wide with coarse punctation densely covered with erect, black setae between antennae and extending laterally to sinus of each eye. Median carina absent. Frontal lamina widely separated, narrow and prominent. Frontal fissure reaching posterior ocelli, passing through anterior ocellus. Anterior ocellus larger than posterior ones and in a shallow ocellar depression. Posterior ocelli connected by a straight transverse groove. Ocellar region elevated and practically impunctate. Ocular sinuses with a deep internal depression. Front and vertex with dense coarse punctation with black setae. Occiput with dense black setae and occipital carina present but interrupted medially. **Mesosoma.** Pronotum with coarse dense punctation with erect black setae, dorso-posterior region of pronotum adjacent to mesoscutum slightly elevated and without punctations. Mesoscutum with irregular coarse and dense punctation, discal region elevated with

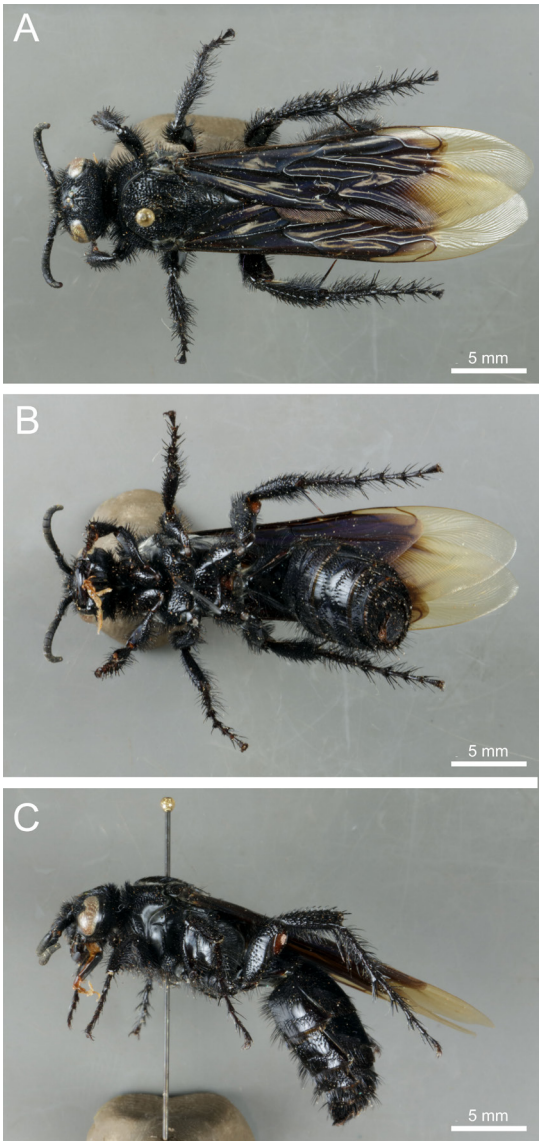

Figure 1. *Stygocampsomeris manauara* **sp. nov.**, female, holotype. A – dorsal view; B – ventral view; C – lateral view. Scale bar = 5 mm. This figure is in color in the electronic version.

a V-shaped region impunctate, and with deep notaulices. Scutellum and metanotum with coarse and sparse punctations medially. Dorso-median area of propodeum with deep sparse punctation, with a triangular area impunctate medially, with fine sparse punctation laterally, and having a slight central tubercle-like protuberance. Dorso-lateral area of propodeum with two smooth regions close to propodeal spiracles, fine dense punctation and short setae. Medial-posterior area of propodeum smooth, impunctate. Postero-lateral area of propodeum laterally with fine sparse punctations and projections in transition between posterior and lateral faces. Mesopleura with a sharp vertical ridge below the tegula with a deep transverse furrow crossing it. Punctation restricted to upper and lower areas of mesopleura. Propodeal lateral carina reaching propodeal spiracle and forming strong carina between lateral and posterior face of propodeum. Metasternal plate without a keel. Posterior spurs acute and with black coloration. First tarsomere of hind legs with long setae all over inner surface. **Metasoma.** First tergite (T1) without a median tubercle. T1 with punctation and erect setae basally. T2–T4 with sparse fine punctation present in the discal region of the tergites. T1–T4 with sub-apical line formed by sparse long setae, after which there is a slight depression, T1–T4 with line of dense long setae apically. T5 with dense coarse punctation and dense bristles except basally and medially. T6 slightly convex, with rounded apex, dense coarse punctation, and long dense bristles throughout, except for apical region. First sternite S1 almost impunctate and with two lateral intumescences. S2 with median tubercle and basal surface truncate, forming an angle with S1. S2–S5 having sub-apical lines with sparse long setae and apical lines with dense long setae. S2–S3 setae shortened medially in apical line. Hypopygium with rounded apex and two lateral processes spine-like, largely concealed by stiff bristles. **Coloration.** Integument and setae all black. Wing membrane and veins dark brown with strong violet reflections, especially at the base, apical area yellow hyaline; membrane asetose, second recurrent vein present.

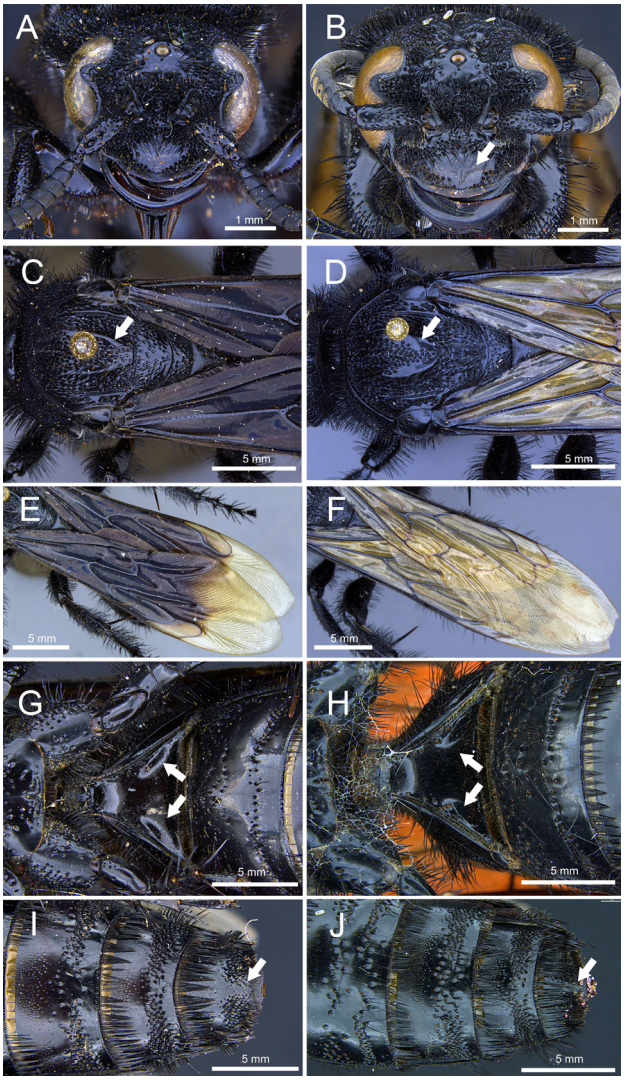

Figure 2. Morphological differences between females of *Stygocampsomeris manauara* **sp. nov.** (A, C, E, G, I) and *Stygocampsomeris servillei* (B, D, F, H, J). A–B – Head, frontal view. Arrow shows stronger longitudinal striations; scale bar = 1 mm; C–D – Mesonotum, dorsal view. Arrows point to areas without punctation; scale bar = 5 mm; E–F – Wings, dorsal view; scale bar = 5 mm; G–H – First sternite, ventral view. Arrows point to lateral protuberances; scale bar = 5 mm. I–J – Hypopygium, ventral view. Arrow shows smooth posterior central region; scale bar = 5 mm. This figure is in color in the electronic version.

Male: Unknown.

Distribution: Brazil – Amazonas – Manaus (Figure 3).

Biological notes: Host unknown.

Etymology: This specific name is in reference to the location of the type-series. "Manauara" is a junction of the city name "Manaus" with the indigenous Tupi suffix "ara", meaning "originating, belonging or private to the city of Manaus". Treat as a non-Latin singular noun used in apposition.

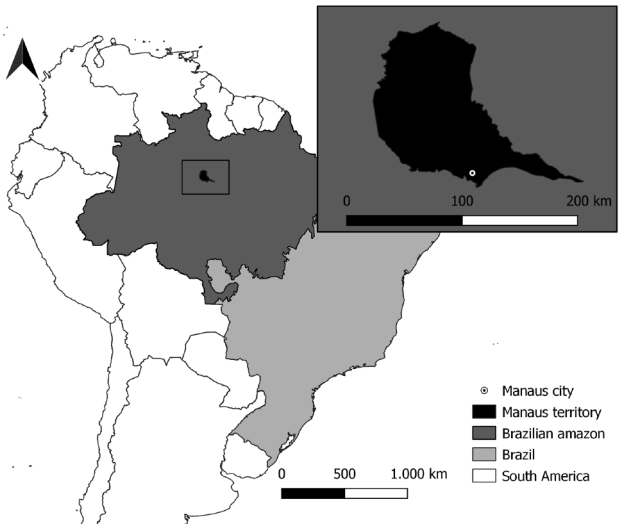

Figure 3. Map of South America showing the boundaries of the Brazilian Amazon. In highlight the municipality of Manaus where the new species was found.

Comparative diagnosis

As normally found in *Stygocampsomeris*, *S. manauara* presents typical traits for the genus such as females having completely black integument and a pilosity pattern, coarse and dense punctation strongly demarcated, the central dorsal surface of the propodeum with an impunctate triangle, the postero median area of the propodeum smooth, and the posterior tibial spurs very long and acute. To complement the positioning of *S. manauara* as belonging to *Stygocampsomeris*, we compared the new species with *S. servillei*, type species of the genus and closely related with the new species.

Unlike in females of *S. manauara* sp. nov., in females of *S. servillei* (Figure 2b,d,f,h,j) the apical margin of the clypeus is projected medially and the discal region has evident longitudinal striations (Figure 2b), the discal region of the mesonotum is without punctations, forming a wide V-shape (Figure 2d), the wing membrane is hyaline, sometimes yellowish, and with dark brown veins (Figure 2f), the first sternum has lateral protuberances which do not extend posteriorly (Figure 2h), and the hypopygium is concave with a narrow impunctate central area (Figure 2j). In females of *S. manauara*, the apical margin of the clypeus is slightly projected medially and the discal region has light longitudinal striations (Figure 2a), the central region of the mesonotum is impunctate, forming a narrow V-shape (Figure 2c), the wing membrane is dark brown with strong violet reflections, especially at its base, and the apical area is yellow and hyaline (Figure 2e), S1 has lateral protuberances extending posteriorly (Figure 2g), and the hypopygium is slightly concave with a wider impunctate central region (Figure 2i).

Identification key for females of *Stygocamspomeris*

1. Dorso-median area of propodeum with a triangular area impunctate medially, fine sparse punctation laterally and with a slight central tubercle-like protuberance; wing membrane completely hyaline or at least with apical region hyaline (Figure 2e–f) 2

1'. Dorso-median area of propodeum with a narrow impuctate line medially, fine dense punctation laterally and without a slight central tubercle-like protuberance; wing brown, with violet reflections ..... *Stygocampsomeris corrigenda*

2. Mesonotum with discal region impunctate, forming a narrow V-shape (Figure 2c); wing membrane and veins dark brow with strong violet reflections, especially at base, apical area yellow hyaline (Figure 2e); first sternum with lateral protuberances extending posteriorly (Figure 2g) ..... *Stygocampsomeris manauara* sp nov.

2'. Mesonotum with discal region without punctation, forming a wide V-shape (Figure 2d); wing membrane hyaline, sometimes yellowish, and with dark brown veins (Figure 2f); first sternum with lateral protuberances not extending posteriorly (Figure 2h) ..... *Stygocampsomeris servillei*

The new species described here adds to the diversity of Scoliidae in the Neotropics, which now includes four species. The identification key presented in here is the first exclusive key for females of *Stygocampsomeris*, with updated diagnostic characteristics for the species. The updated diagnosis for *S. manauara* and *S. servillei* improves the diagnostic features for both species and makes their differentiation easier. This is the first new species described for *Stygocampsomeris* since its designation by Bradley (1957), despite the specimens having been collected 46 years ago. This shows that entomological collections are an essencial source of biological information, especially regarding poorly understood groups and scarce information available.

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DATA AVAILABILITY

The data that support the findings of this study were published in this article and the specimens used are deposited in the entomological collections of the Instituto Nacional de Pesquisas Amazônicas (INPA) with the identifying code [*Voucher material*: INPA-HYM 034730 (Holotype)] and Universidade Estadual Paulista (UNESP), São José do Rio Preto, São Paulo, Brazil with the identifying code [*Voucher material:* DZSJRP-Hym 00000863 (Paratype)].