



A new species of *Dohrnemesa* from Brazil, with notes on the male of *D. carvalhoi* and on *D. albuquerquei* (Hemiptera: Heteroptera: Reduviidae: Emesinae)

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Abstract

Dohrnemesa oliveirai sp. nov. (Hemiptera: Heteroptera: Reduviidae: Emesinae: Emesini) is described from state of Pará, Brazil, based on a male specimen. The male genitalia of *D. carvalhoi* (Wygodzinsky, 1966) is described for the first time and some notes about *D. albuquerquei* (Wygodzinsky, 1966) are furnished.

Key words: Emesini, Neotropical Region, new species, arachnophilous association, cave

Introduction

In addition to habitats shared with many other Reduviidae (Hemiptera: Heteroptera), some species of Emesinae have adapted to specific environments such as bird nests, caves, and spider and psocid webs (Wygodzinsky 1966, Pape 2013, Gil-Santana *et al.* 2015).

Although Wygodzinsky (1966) emphasized that in cavernicolous emesines no loss of pigment is observed, Gil-Santana *et al.* (2007) argued that the clear general coloration of *Phsmatocoris xavieri* Gil-Santana *et al.*, 2007 could perhaps be related to its habitat inside caves with little or no light. A thorough summary of the literature and a discussion on the known ecology and biology of emesines found or living in caves were recently provided by Pape (2013).

While some species associated with spider webs have been shown to be primarily or obligatorily spider predators (Schuh & Slater 1995, Soley *et al.* 2011), other emesines are probably rather opportunists (Wygodzinsky 1966). The latter hypothesis seems to be concordant with the report of *Emesa mourei* Wygodzinsky, 1946 occurring both on spiders' and caterpillars' webs (Gil-Santana & Jurberg 2003). In any event, the association with spider webs has resulted in various morphological modifications of the body and legs of these insects (Wygodzinsky 1966, Soley *et al.* 2011, Gil-Santana *et al.* 2015).

The dorsal surface of the fore tibiae of many emesines presents a more or less extended group of serially arranged and obliquely inclined stiff bristles, which somewhat resembles the calamistrum of cribellate spiders. These spiders use the calamistrum as a carding apparatus. The existence of this calamistrum-like structure in emesines, which are frequently arachnophilous, is suggestive of a comparable function for this organ (Wygodzinsky 1966). This latter author provided a comparative table of the relative position of the calamistrum-like structure on the fore tibiae among 19 species belonging to four tribes in Emesinae, including *Dohrnemesa lanei* Wygodzinsky, 1945. On the other hand, Gil-Santana (2015) considered it curious that Wygodzinsky (1966) discussed the positions of the calamistrum-like structure among several emesines, including *Phsmatocoris minor* (McAtee & Malloch, 1925) and *P. praecellens* (Bergroth, 1911), in a chapter about the external structure of these Reduviidae (Wygodzinsky 1966:19), but did not mention it in his taxonomic description of *Phsmatocoris* Breddin, 1904 or in his descriptions of new species of this genus in the same work.

Pape (2013) furnished a detailed description of the vestiture of the fore tibiae in *Phsmatocoris labyrinthicus*

Pape, 2013. In addition to the calamistrum-like brush formed by clustered stiff setae on the dorsal excavation of the fore tibiae, Pape (2013) highlighted a lateral, parallel auxiliary row of a few setae (a dozen in *P. labyrinthicus*) along the apical two thirds of the brush and an isolated small, dense pre-apical (or subapical) cluster of golden setae on the ventral side of the fore tibiae. All of these may potentially have functions relating to manipulation of spider silk, presumably compatible with an arachnophilous association.

Gil-Santana (2015) recorded all these features in four additional species of *Phasmatorcoris*, among which three were also described from caves.

Dohrnemesa Wygodzinsky (1945) currently contains nine described species, six of which are known only from Brazil (Maldonado 1990). However, one of these species, *Dohrnemesa feminata* Wygodzinsky, 1947 has been considered as of provisional generic placement, because no winged specimens, particularly males, are known (Wygodzinsky 1947, 1966).

It is noteworthy that all *Dohrnemesa* species have been described based on a single specimen each (Dohrn 1860, Wygodzinsky 1945, 1947, 1950, 1958, 1966) and very few additional specimens of *Dohrnemesa* spp. have been recorded subsequently. For example, a fifth-instar nymph of *D. feminata* was described in addition to the female holotype in the original description (Wygodzinsky 1947); and one male (erroneously designated as allotype) of *D. buyassuana* Wygodzinsky, 1958 was mentioned (Wygodzinsky 1966), subsequent to its description (Wygodzinsky 1958). Champion (1898) mentioned a “single specimen” of *D. difficilis* (Dohrn, 1860) (as *Westermannia difficilis*), but according to Wygodzinsky (1966), judging by its figure, it would not really be this species, although it would indeed belong to the “*difficilis* group”.

In the present study, *Dohrnemesa oliveirai* **sp. nov.** is described from Brazil based on a single male specimen. The male genitalia of *D. carvalhoi* (Wygodzinsky, 1966) is described for the first time and some notes about *D. albuquerquei* (Wygodzinsky, 1966) are furnished.

Material and methods

Observations were made using a stereoscopic microscope (Zeiss Stemi) and a compound microscope (Leica CME). Measurements were made using a micrometer eyepiece and were expressed in millimeters (mm). Dissections of the male genitalia were made by firstly removing the pygophore from the abdomen with a pair of forceps and then clearing it in KOH solution for 24 hours. The dissected structures were studied and photographed in glycerol. Images of external and genital structures were taken with digital cameras (Nikon D5200 with a Nikon Macro Lens 105 mm, Sony DSC-W830 and Sony DSC-HX400V). The vestiture (setation) was omitted in the ink drawings showing several genital structures (Figs. 6–8, 22, 25, 28–30), in order to make the shape and/or structure of these portions better visible.

The general terminology used here, including for the portions of the male genitalia, are primarily in accordance with Wygodzinsky (1966). However, the visible segments of the labium are numbered as II to IV, given that the first segment is lost or fused to the head capsule in Reduviidae (Weirauch 2008, Schuh *et al.* 2009).

The acronym used for the institution and collection cited in this paper is the following: MNRJ: “Museu Nacional da Universidade Federal do Rio de Janeiro”, Brazil.

Taxonomy

Subfamily Emesinae

Tribe Emesini

Genus *Dohrnemesa* Wygodzinsky, 1945

Dohrnemesa Wygodzinsky, 1945: 251–252 (description); Wygodzinsky 1949: 25 (catalog); Wygodzinsky 1966: 221 (key), 230–231 (redescription); Putshkov & Putshkov 1985: 22 (catalog); Maldonado 1990: 83 (catalog); Forero 2004: 148 (diagnosis), 184 (key).

Type species: *Dohrnemesa lanei* Wygodzinsky, 1945, by original designation.

The somewhat concise original description of *Dohrnemesa* (Wygodzinsky 1945) was followed by a detailed redescription of this genus by Wygodzinsky (1966). All species known so far are conspicuously marked with light and dark colors (Wygodzinsky 1966). Among the New World Emesini, *Dohrnemesa* can be separated from the other genera by the following combination of characters: scutellum and metanotum with a spine; fore tarsi three-segmented; forewings with two cells, base of basal cell very narrowly truncated with a short free vein emitted from its base in addition to an elongated vein leading to the axillary region (Wygodzinsky 1966, Forero 2004).

***Dohrnemesa albuquerquei* Wygodzinsky, 1966**

(Figs. 1–2)

Dohrnemesa albuquerquei Wygodzinsky, 1966: 231 (key), 232–233, 235 (description); Maldonado 1990: 83 (catalog).

Dohrnemesa albuquerquei was described based on a single male (Fig. 1) collected in Petrópolis, a city located in a mountainous region of the state of Rio de Janeiro, Brazil. Some details about an additional male (Fig. 2) found dead on a spider's web on a wall of a house in Nova Friburgo, another city in the mountains of the state of Rio de Janeiro, are furnished below.

Remarks. Male (specimen from Nova Friburgo). Selected measurements (mm): total length to tip of abdomen 12.3; to tip of forewings 13.3; head length 1.2; pronotum: length of fore lobe 2.2; length of hind lobe 1.5; length of forewing 8.8. Fore tibiae somewhat curved, without dorsal depression, with a few longer, straight, obliquely inclined, pale setae on distal half dorsally, and a cluster of stiff, somewhat curved, golden setae on apical extremity ventrally.

The specimen examined is very similar to the holotype. The pair of elongated markings on the hind lobe of the pronotum is lighter-colored than in the holotype.

Comments. It would seem that the specimen of *D. albuquerquei* found dead on the spider's web was not prey for the spider that built it, since its body and appendages were entire and not covered with spider silk. When alive, it had more likely gone there to seek prey such as other Emesinae that have been found on spider's webs (Wygodzinsky 1966, Pape 2013, Gil-Santana *et al.* 2015, Kulkarni & Ghate 2016). The record of longer, obliquely inclined setae on the distal dorsal half and an apical cluster of stiff setae of the fore tibiae of this species, features that are presumably compatible with an arachnophilous association (Pape 2013), reinforces this hypothesis.

Specimens examined. BRAZIL, Rio de Janeiro, MALE HOLOTYPE: Petrópolis, Alto da Mosela, xi.1956, Albuquerque leg. (MNRJ); 1 male, Nova Friburgo (22°17'S 42°29'W, ca. 1049 m a.s.l.), 4.xi.2005, found dead on a spider web on a wall of a house, H. Gil-Santana leg. (MNRJ).

***Dohrnemesa carvalhoi* Wygodzinsky, 1966**

(Figs. 3–12)

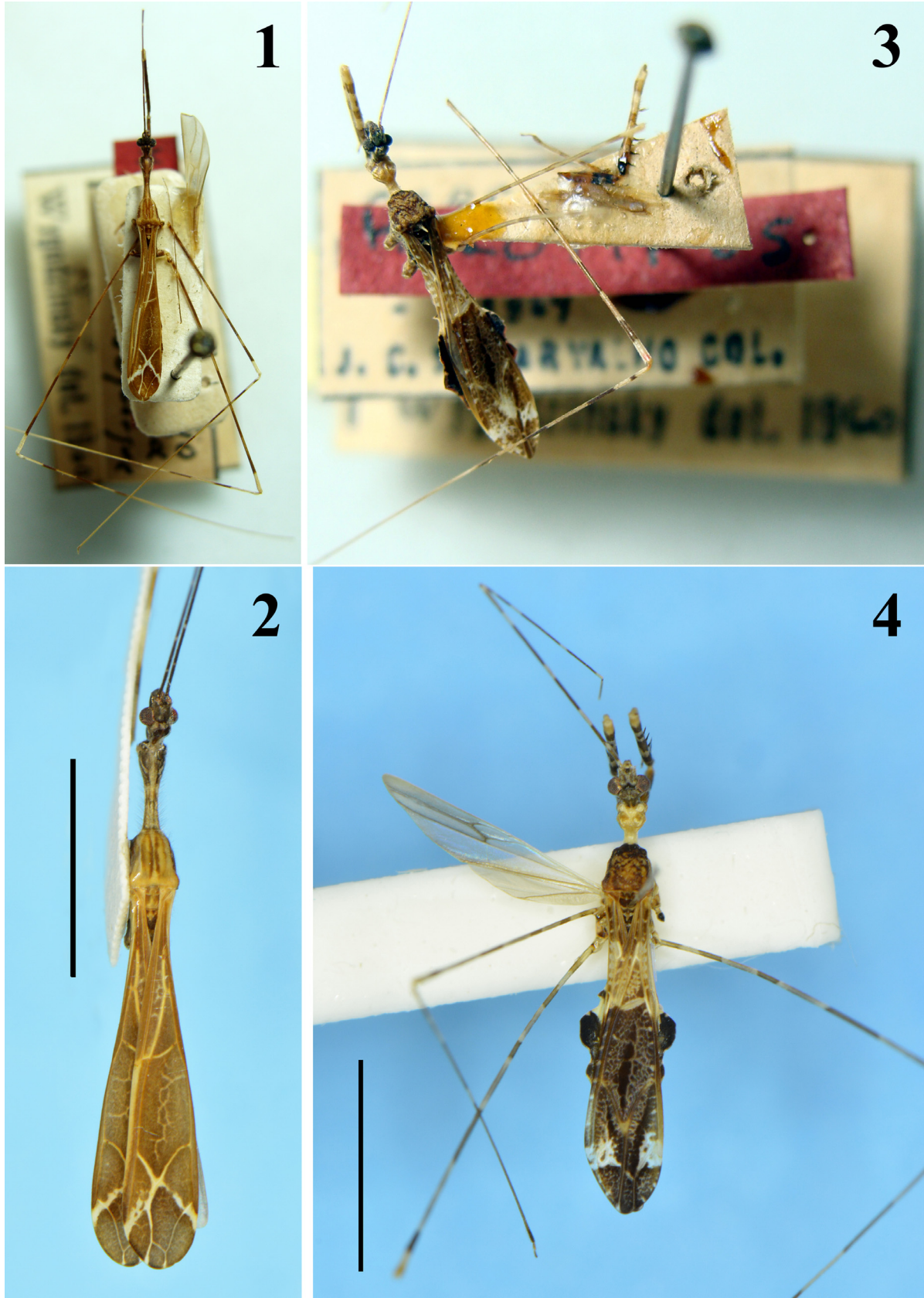
Dohrnemesa carvalhoi Wygodzinsky, 1966: 231 (key), 235, 237 (description); Maldonado 1990: 83 (catalog).

Dohrnemesa carvalhoi was known until now only through its female holotype (Fig. 3), which was collected on a hill (Corcovado) in the city of Rio de Janeiro, state of Rio de Janeiro, Brazil. A male of this species, attracted to light at night, collected in Nova Friburgo, another city in the mountains of the state of Rio de Janeiro, was studied here (Figs. 4–12).

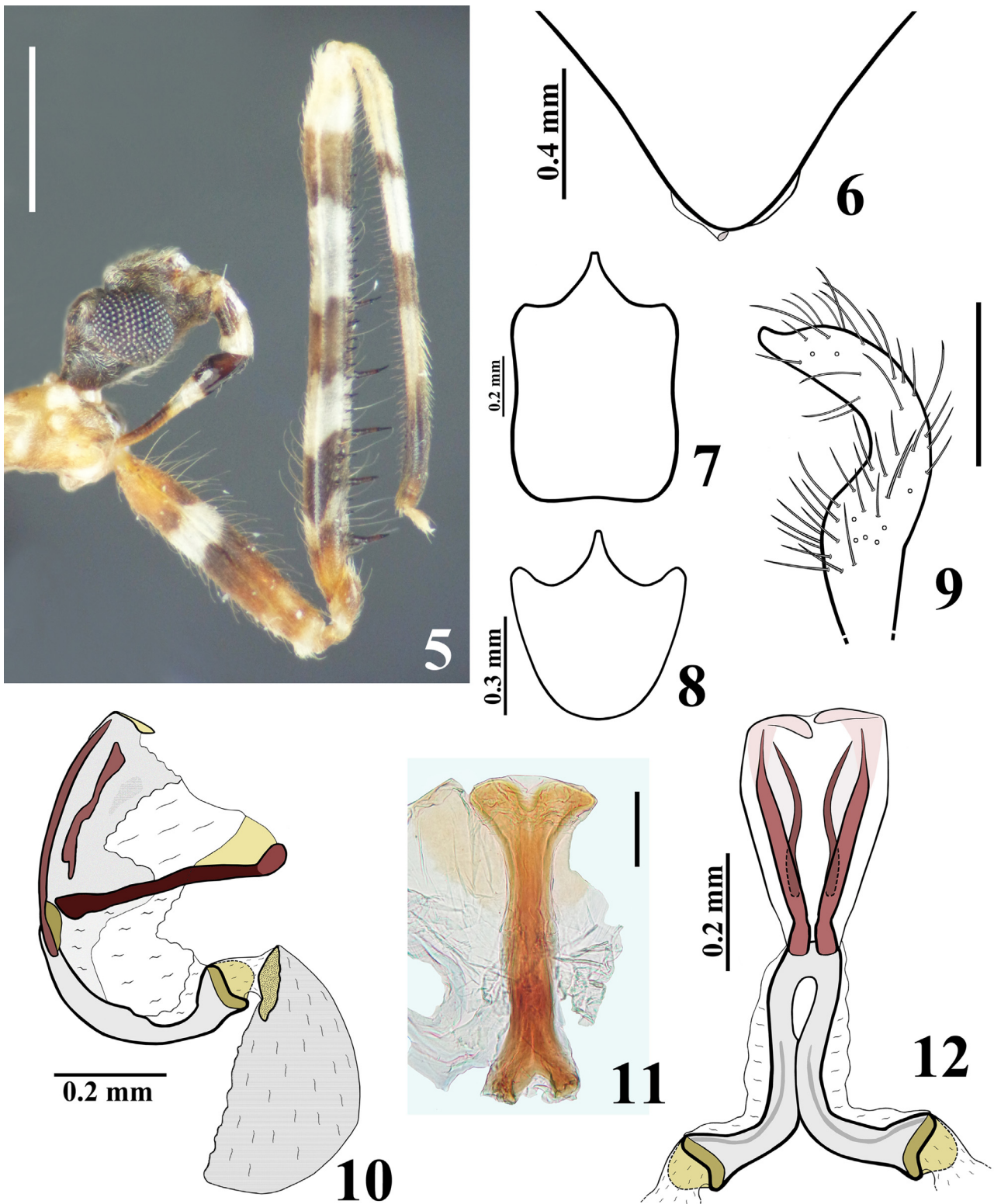
Remarks. Male. Selected measurements (mm): total length to tip of abdomen 9.3; to tip of forewings 10.7; length of head 1.0; pronotum: length of fore lobe 1.1; length of hind lobe 1.2; length of forewing 7.5. Fore tibiae (Fig. 5) somewhat curved, without dorsal depression, with some longer, straight, obliquely inclined, pale setae on distal half dorsally, and a cluster of stiff, somewhat curved, golden setae on apical extremity ventrally.

The male examined is very similar to the female holotype. The following differences are recorded: eyes are somewhat larger; a darkened subapical area is present on forewing (Fig. 4), which is whitish in female (Fig. 3); abdomen is less wide at median portion; connexival lateral expansion of the fifth segment is somewhat smaller.

Last tergite prolonged posteriorly, with a rounded posterior margin, covering pygophore, leaving only tips of parameres exposed in dorsal view (Fig. 6). Eight sternite with numerous short and several long setae on its exposed



FIGURES 1–4. 1–2, *Dohrnemesa albuquerquei*, males, dorsal view, 1, holotype deposited in MNRJ, 2, specimen found dead on a spider web, scale bar 5.0 mm. 3–4, *Dohrnemesa carvalhoi*, dorsal view, 3, female holotype deposited in MNRJ, 4, male, scale bar 5.0 mm.



FIGURES 5–12. *Dohrnemesa carvalhoi*, male, 5, head and fore leg, lateral view, scale bar 1.0 mm, 6, apex of abdomen, dorsal view, 7–8, pygophore without parameres, 7, ventral view, 8, posterior view, 9, right paramere, apical two-thirds, scale bar 0.2 mm, 10, phallus, lateral view, 11, struts, dorsal view, scale bar 0.1 mm, 12, articulatory apparatus, basal plate extension, ventral sclerotizations of phallosoma and paired process of endosoma, ventral view.

portion, covering approximately two thirds of the pygophore ventrally; anterior margin medially rounded towards distal portion; posterior margin sinuous, curved at midportion.

Male genitalia (Figs. 7–12): pygophore subrectangular in dorsal and ventral views (Fig. 7), with numerous

short and moderate long, and several long setae on distal third (i.e. on naturally exposed surfaces); anterior dorsal sclerotization narrow; basal margin slightly curved backwards on midportion ventrally; posterior process triangular; apex subacute (Figs. 7–8). Parameres symmetrical, distal half very curved, with several moderately long setae; apex subrounded (Fig. 9). Phallus symmetrical. Basal arms of articulatory apparatus short (Fig. 12); basal plate extension elongated (Fig. 12), struts long, elongated, almost entirely fused, divided at extreme base and apex, at the latter much more broadly, with apical margins rounded (Fig. 11). A pair of elongated somewhat narrow ventral sclerotizations on phallosoma (= ventral sclerotization of phallobase *sensu* Wygodzinsky 1966), followed by a pair of apparently articulated short extensions apically (Fig. 12); between the sclerotizations on the phallosoma and the struts, a pair of elongated, thin, double curved and somewhat sclerotized processes, which are divergent in distal half; apex acute (Fig. 12). These processes lie on a somewhat denser layer of tissue. Endosoma wall smooth (Fig. 10).

Specimens examined. BRAZIL, Rio de Janeiro, FEMALE HOLOTYPE: Rio de Janeiro, Corcovado [Hill], 1959, J.C.M. Carvalho leg. (MNRJ); 1 male, Nova Friburgo (22°17'S 42°29'W, ca. 1049 m a.s.l.), 28.xi.2004, attracted to light, H. Gil-Santana leg. (MNRJ).

Comments. Only minor differences were found between the examined male and female; it is unclear whether these are due to sexual dimorphism or individual variation, and it could be decided only when more specimens of both sexes will be available in the future. The male genitalia are generally similar to those of other species of *Dohrnemesa* in which they were previously documented (Wygodzinsky 1966); the struts, however, have been recorded as short in other species of the genus, whilst they are elongated in *D. carvalhoi* (Fig. 11).

***Dohrnemesa oliveirai* sp. nov.**

(Figs. 13–35)

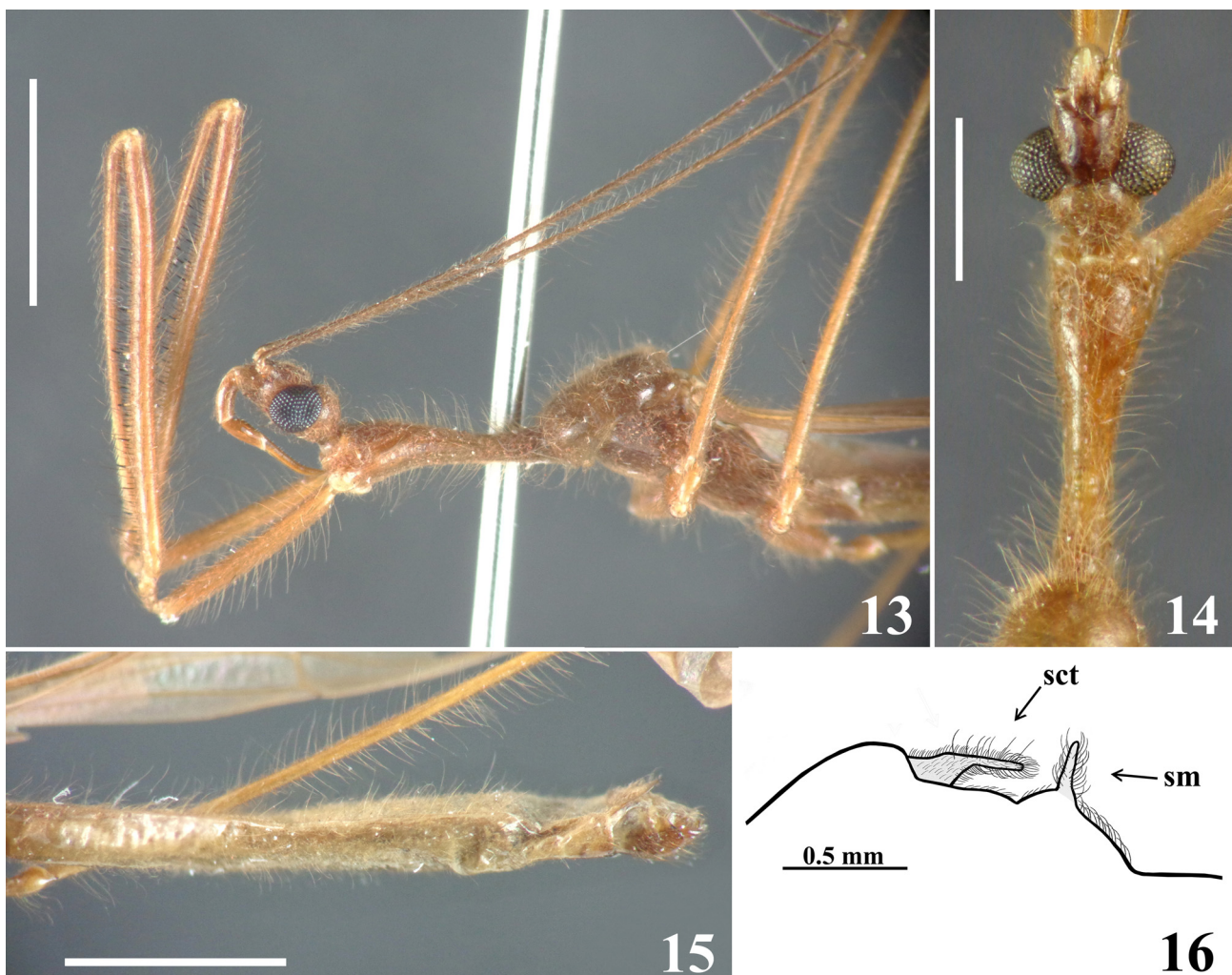
Diagnosis. *Dohrnemesa oliveirai* sp. nov. can be readily differentiated from other species of *Dohrnemesa* by its coloration, which, is almost completely light brown, with the exception of the lighter-colored antennal segment IV, fore and mid femorotibial articulations, prothoracic supracoxal lobes and lateral margins of the stridulitrum; other congeners are conspicuously marked (Wygodzinsky 1966). Another diagnostic character of the new species is the vestiture comprising very long and very numerous, thin, light-colored setae, thus contrasting with the “more or less numerous interspersed slender hairs” (thin, long setae) that have been recorded in other species of *Dohrnemesa* (Wygodzinsky 1966).

Description. Male. Measurements (mm): total length: to tip of abdomen 12.5; to tip of forewings 14.5; head: length 1.2; length of anteocular portion 0.5; length of postocular portion 0.2; lengths of antennal segments: I: 6.5; II: 5.8; III: 0.8; IV: 1.8; lengths of labial segments: II [first visible]: 0.5; III: 0.45; IV: 0.7. Thorax: pronotum: length of fore lobe 2.1; length of hind lobe 1.5; width at posterior margin 1.2; length of forewing 9.6. Fore legs: length of coxa 1.9; length of femur 4.3, maximum width of femur 0.2; length of tibia 3.8; length of tarsus 0.45; middle legs: length of femur 8.5; length of tibia 12.6; length of tarsus 0.45; hind legs: length of femur 11.1; length of tibia 17.5; length of tarsus 0.45. Abdomen: length 6.7; maximum width 1.3.

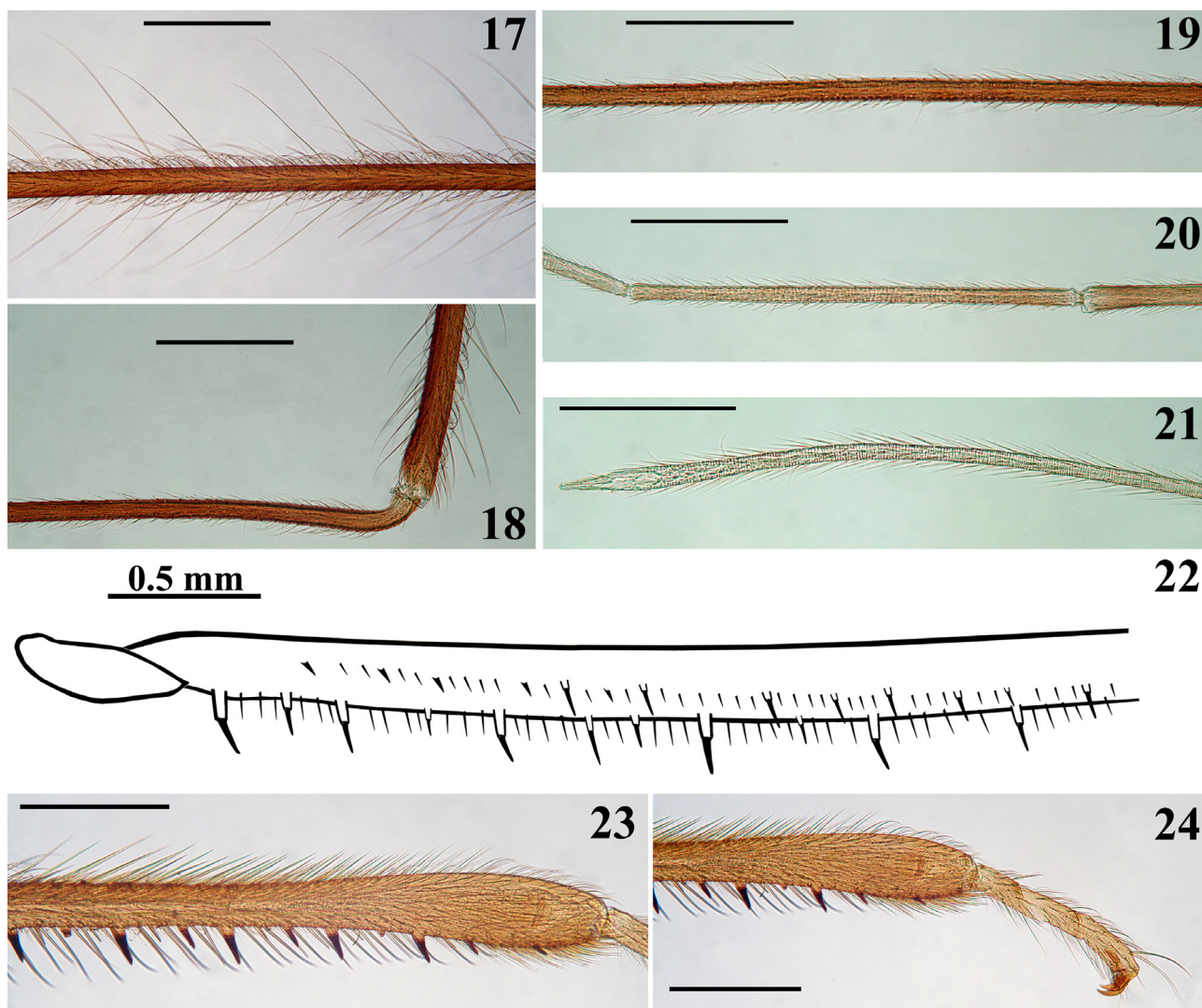
Coloration: light brown, except for antennal segment IV, fore and mid femorotibial articulations, prothoracic supracoxal lobes and lateral margins of stridulitrum, which are light-colored (yellow-whitish to whitish). **Vestiture:** head, first antennal segment, thorax, coxae, trochanters, femora and tibiae covered with very numerous and long thin setae, and with a short and very dense pubescence formed by thin, curved setae (Figs. 13–17). The setae are pale, from yellowish to golden-yellowish. Antennal segment I with setae of intermediate length between the adpressed setae of the pubescence and longer setae; these intermediate setae lie somewhat parallel to the segment (Fig. 17); segments II–IV covered with short, adpressed, straight or somewhat curved, thin setae (Figs. 18–21); eight trichobothria were observed on segment II, seven of them in its basal portion. One in its middle third. Labium: segment II (first visible) with somewhat numerous moderately short setae; segment III with some very short setae ventrally; segment IV glabrous. Hind lobe of pronotum somewhat less setose on central portion dorsally. Scutellum and spine of metanotum with numerous moderately short, thin setae (Fig. 16). Forewing: basal plates with groups of moderately long, thin setae (Fig. 26); costal vein with long, thin setae, which are more numerous on basal half and sparse on median third (Figs. 26–27); some long, thin setae at basal portion of PCu+1A vein too (Fig. 26); remainder of the fore wing and hind wing glabrous. Ventral surface of fore femora with two series (posteroventral and anteroventral) of spine-like setae (Fig. 22).

Posteroventral series beginning at base of femur, composed of large and small spiniferous processes; large processes with lighter base and darkened distal spiny portion, numbering about sixteen elements, subequal in size, the most basal of which with its apex inclined (Fig. 22); among these large processes, several small spiniferous processes; at apical portion of femur, the larger processes are absent and the others are smaller. Anteroventral series beginning somewhat apicad of posteroventral one (Fig. 22), not interrupted at base, composed of around eleven medium-sized spiniferous tubercles, among which there are also several sharp small spines. Posteroventral series accompanied by numerous long, slender, sclerotized setae, which become shorter at distal portion. Fore tibiae with numerous stiff setae on subapical dorsal depression (Fig. 23); ventral surface with about twenty larger spiniferous processes, subequal in size, most of which with lighter base and darkened spiny distal portion, among which numerous small sharp spines (Figs. 23–24); long ventral setae somewhat straighter and more sclerotized; a cluster of stiff somewhat curved golden setae on apical extremity, ventrally (Figs. 23–24). Tarsi covered with moderately long setae (Fig. 24). Vestiture of abdomen similar to that of thorax (Fig. 15), but there are also many setae of intermediate length between the short setae that form the pubescence and the longer setae.

Structure. Integument moderately shiny. **Head** (Figs. 13–14) elongated; anteocular portion longer than postocular; transversal (interocular) sulcus deep, situated somewhat posteriad to middle of eyes; eyes globose, prominent in dorsal view (Fig. 14), reaching dorsal outline of head at interocular sulcus and slightly surpassing ventral outline of head ventrally. Antenna inserted somewhat closer to apex of head than to the eyes; antennal segments progressively thinner, very slender (Figs. 13, 17–21); segments I–III straight (Figs. 17–20); segment IV somewhat curved, with apex fusiform (Fig. 21). First two visible labial segments thicker than the distal segment (Fig. 13); apex of segment III at level of midportion of eye (Fig. 13); segment IV ending at level of anterior portion



FIGURES 13–16. *Dohrnemesa oliveirai* sp. nov., male holotype, 13, head, fore legs and thorax, lateral view, scale bar 2.0 mm, 14, head and fore lobe of pronotum, dorsal view, scale bar 1.0 mm, 15, abdomen, scale bar 2.0 mm, 16, scutellum and metanotum, lateral view, sct, scutellum, sm, spine of metanotum.



FIGURES 17–24. *Dohrnemesa oliveirai* sp. nov., male holotype, 17–21, antenna, lateral view, scale bar 0.3 mm, 17, segment I, midportion, 18, apical and basal portions of segments I and II, respectively, 19, segment II, midportion, 20, apex of segment II, segment III and basal portion of segment IV, 21, segment IV, except basal portion, 22, fore femur, basal two thirds, latero ventral view, 23–24, lateral view, scale bar 0.3 mm, 23, fore tibia, apical fourth, 24, apex of fore tibia and fore tarsus.

of stridulitrum. **Thorax:** pronotum pedunculate (Fig. 13); fore lobe approximately 1.4 times longer than hind lobe, elongate, somewhat oval on anterior portion (Fig. 14); anterior projections of collar rounded; transverse interlobar sulcus faint; hind lobe bell-shaped in dorsal view; lateral margins of stridulitrum conspicuous. Humeral angles rounded and somewhat elevated. Spine of scutellum somewhat elongated, directed backwards, horizontal, apex obtuse (Fig. 16); spine of metanotum of approximately the same length as the spine of scutellum, similar shape but directed upwards (Fig. 16). Fore legs slender (Fig. 13); fore coxae elongated, almost as long as fore lobe of pronotum; fore femora about 21 times as long as its greatest width, almost straight but slightly curved at midportion; fore tibiae slightly shorter than fore femora, somewhat curved and about half the thickness of the fore femora at their midportion; slightly depressed in dorsal portion subapically; thickened at apex, where the inner surface is somewhat flattened and has a very small subdistal pecten (Figs. 23–24). Mid and hind legs very long and slender, with tibiae somewhat thinner than femora and slightly curved in distal third. Tarsi short, three-segmented, slender (Fig. 24). Forewings surpassing apex of abdomen by approximately 2.0 mm, venation as in Figs. 25–27; basal cell subtriangular, with its base narrowly truncated and with two basally veins emitted from its base (Fig. 25, 27); the outer vein shorter (Figs. 25–26); PCu meeting basal cell slightly before its inner distal angle (Figs. 25, 27); pterostigma ending far from apex of the wing (Fig. 25). Hind wings badly damaged therefore venation could not be observed. **Abdomen:** slender, sides parallel. Last tergite with a short tongue-shaped prolongation posteriorly, with a rounded posterior margin, slightly approaching tip

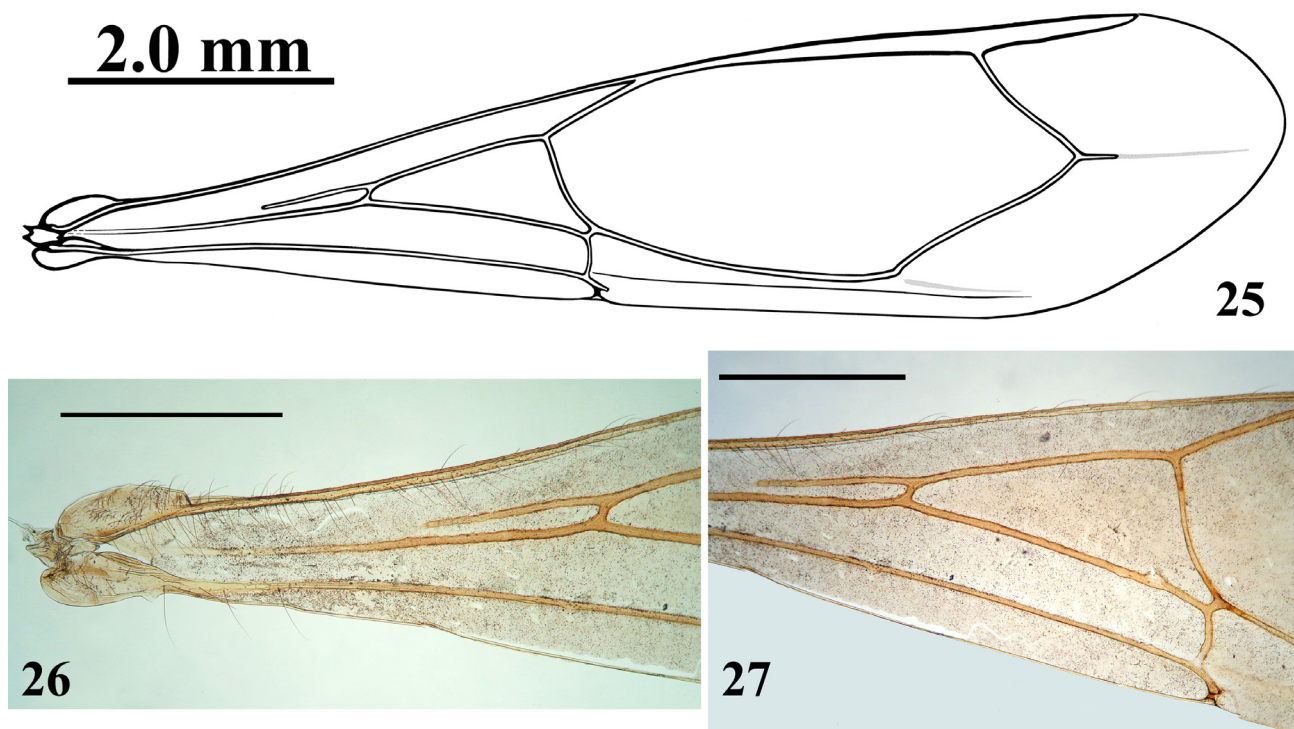
of pygophore (Fig. 28). Eight sternite with numerous long setae on its exposed portion, covering approximately two thirds of the pygophore, ventrally; anterior margin curved backwards at mid portion; posterior margin straight. **Male genitalia** (Figs. 29–35): pygophore subrectangular in dorsal and ventral views (Fig. 29), with numerous long setae on distal third (i.e. on naturally exposed surfaces); anterior dorsal sclerotization narrow; basal margin curved backwards on midportion ventrally (Fig. 29); posterior process triangular, apex subrounded (Fig. 30). Parameres symmetrical, curved and with moderate long and non-numerous setae in distal half; apex subrounded (Fig. 31). Phallus symmetrical. Basal arms of articulatory apparatus very short (Figs. 33–34); basal plate extension elongated, somewhat narrower towards apical half (Fig. 34); struts long, elongated, and almost entirely fused, divided at extreme base and apex, at the latter more broadly, with apical margins rounded (Fig. 34). A pair of elongated large ventral sclerotizations on phallosoma (= ventral sclerotization of phallobase *sensu* Wygodzinsky 1966) (Fig. 34), which also have a submedian prolongation directed laterally; between the latter and struts, a pair of elongated, thin and somewhat sclerotized processes, with arms parallel in proximal half and divergent in distal half; apex acute (Fig. 35). These processes lie on a denser and rough subrectangular layer of tissue, with a subrounded smoother base (Fig. 35). Endosoma wall smooth (Fig. 32).

Distribution. Brazil, state of Pará.

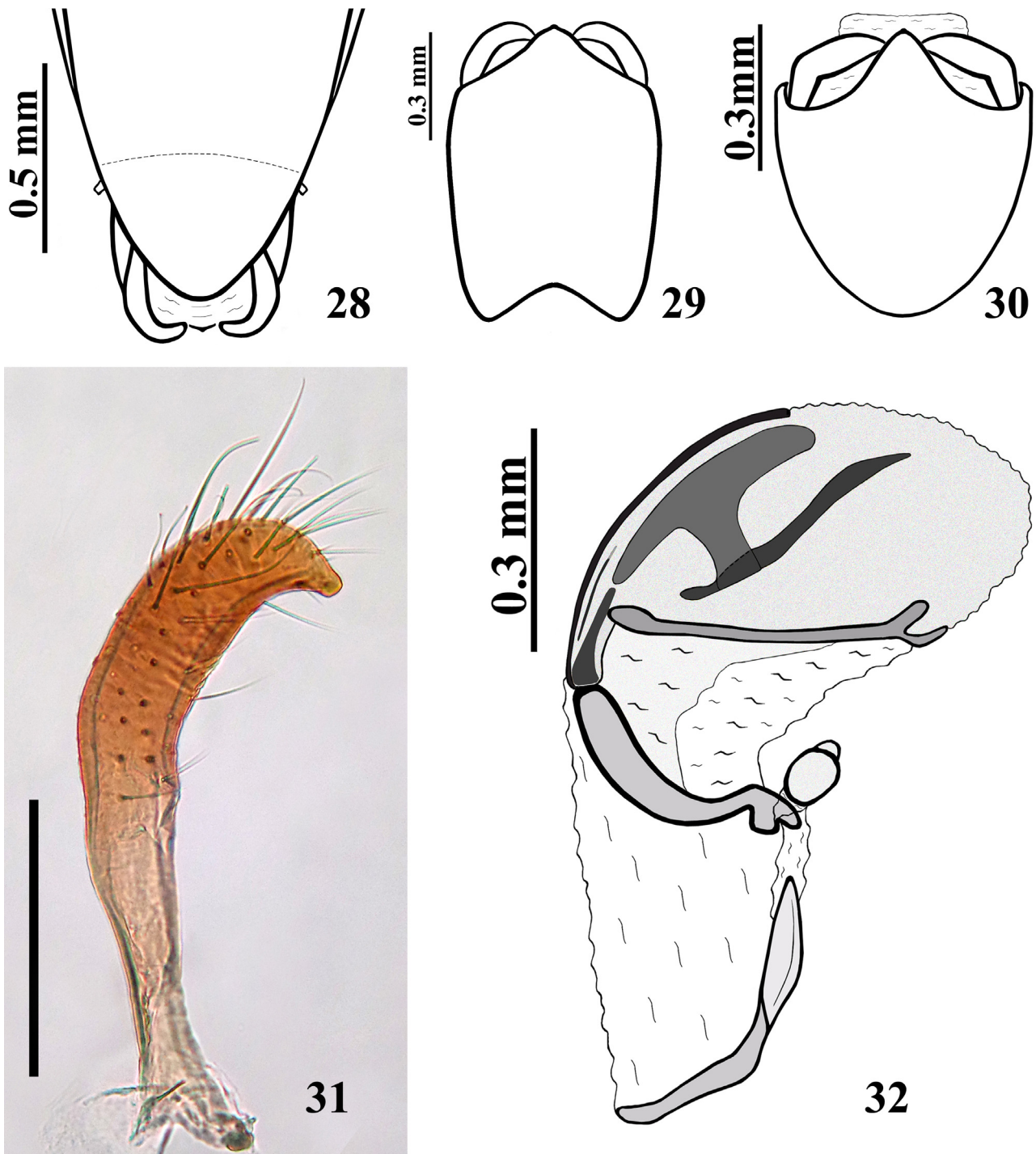
Etymology. The new species is named in honor of Marcus Paulo de Oliveira, biospeleologist, for his contributions to the knowledge of the ferruginous caves of Carajás region, northern Brazil.

Specimen examined. MALE HOLOTYPE: **BRAZIL, Pará**, Parauapebas, Cave GEM, 1756, (50°8'12.110"W 6°7'58.369"S), 7.iv.2011, Marcus Paulo de Oliveira leg., 1 male (MNRJ).

Bionomics. The cave GEM 1756 (also known as cave N5SM2-040) has a length of 186 meters and it is in a dendritic “canga” (a superficial ferruginous breccia). It is located in a well-preserved area inside the Carajás National Forest. The cave has a large entrance that provides shelter for many invertebrates inhabiting the forest, which thus are not true cave-dwelling species. The holotype of *Dohrnemesa oliveirai* **sp. nov.** was found near the main cave entrance, around 6 meters from it, in a disphotic zone. Although 102 caves have been sampled in the region (known as “Morro II”), in both the dry and the rainy seasons, only one specimen was found. This strongly suggests that the finding of this species was probably accidental and its main habitat is more likely to be the forest rather than the caves. It is important to emphasize that although members of Emesinae are common in Brazilian caves, not all the species can establish populations in those habitats.



FIGURES 25–27. *Dohrnemesa oliveirai* **sp. nov.**, male holotype, forewing, 26–27, scale bar 1.0 mm, 26, basal portion, 27, subbasal portion.

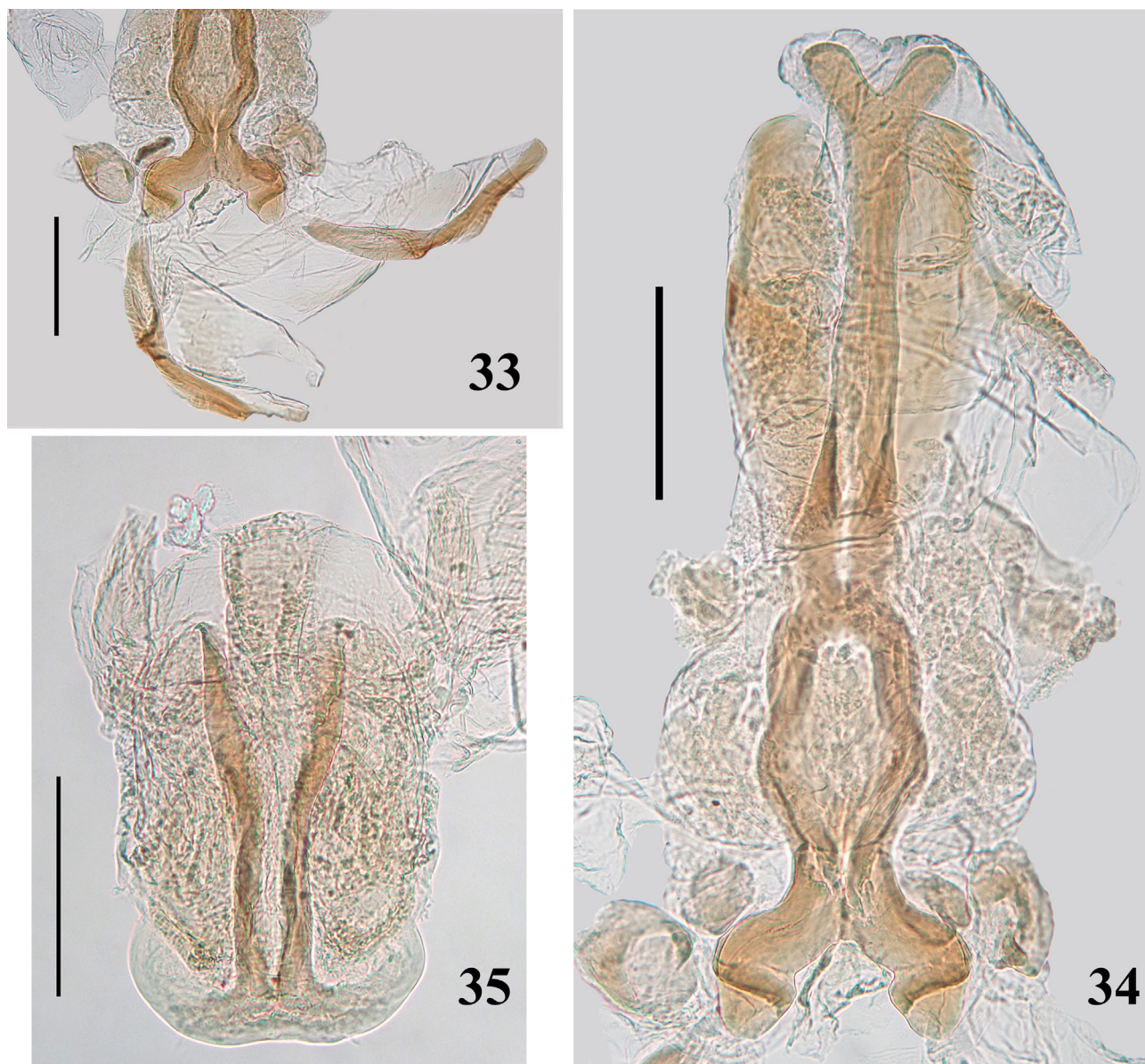


FIGURES 28–32. *Dohrnemesa oliveirai* sp. nov., male holotype, 28, apex of abdomen, dorsal view, 29–30, pygophore and parameres, 29, ventral view, 30, posterior view, 31, left paramere, scale bar 0.2 mm, 32, phallus, lateral view.

Comments

In the description of *Dohrnemesa*, Wygodzinsky (1966) mentioned the conspicuously marked body and the vestiture including more or less numerous interspersed slender hairs (thin, long setae) as diagnostic for this genus. The main distinguishing characteristics of *Dohrnemesa oliveirai* sp. nov. are, however, the almost uniform coloration, and a vestiture composed by very long and very numerous thin setae (Figs. 13–15). Nevertheless, the remaining features of the new species are in accordance with the definition of *Dohrnemesa* (Wygodzinsky 1945, 1966). The latter includes:

the forewings with two cells, in which the base of the basal cell is narrowly truncated with two veins emitted from it, one of them shorter (Figs. 25–27); the fore tarsi three-segmented (Fig. 24); and the scutellum and metanotum with a spine (Fig. 16). Therefore the placement of *D. oliveirai* **sp. nov.** in *Dohrnemesa* is justified. The characters in which the new species is unique within *Dohrnemesa*, i.e. the coloration and vestiture, are frequently variable within several other emesine genera.



FIGURES 33–35. *Dohrnemesa oliveirai* **sp. nov.**, male genitalia, scale bar 0.2 mm, 33–34, ventral view, 33, articular apparatus and basal portion of basal plate extension, 34, articular apparatus, basal plate extension, struts and median portion of ventral sclerotizations of the phallosoma, 35, paired process of endosoma, dorsal view.

Most of the features of the male genitalia of *D. oliveirai* **sp. nov.** are very similar to those of the other species of *Dohrnemesa* too, with the exception of the length of the struts and the width of the ventral sclerotizations on the phallosoma (= ventral sclerotization of phallobase *sensu* Wygodzinsky 1966) (Fig. 34). While the struts are elongate in *D. oliveirai* **sp. nov.**, they were recorded as being short in other species of *Dohrnemesa* (Wygodzinsky 1966). The ventral sclerotizations on the phallosoma are “in shape of two slender rods” (Wygodzinsky 1966), whereas in *D. oliveirai* **sp. nov.** they are large and they are provided with a submedian prolongation directed laterally. Taking into consideration that the struts are also elongate in another species of this genus (*D. carvalhoi*) (Fig. 11), it seems that the length of the struts vary from short to elongate within *Dohrnemesa*. Concerning the presence of large ventral sclerotizations on the phallosoma (Fig. 34), which also had lateral prolongations in *D. oliveirai* **sp. nov.**, if this is not

shown in other species of *Dohrnemesa* in which the male genitalia have not been studied yet, it could possibly be regarded as a unique feature of this species.

Discussion

The hypothesis of Gil-Santana *et al.* (2007) that the pale general coloration of *Phasmatocoris xavieri* could be related to its cavernicolous habitats has not been confirmed in other cave-dwelling species of *Phasmatocoris* (Pape 2013, Gil-Santana 2015). Regarding the species of *Dohrnemesa*, with the exception of *D. oliveirai* **sp. nov.**, which has almost uniform coloration and was collected near the main entrance of a cave, all other species of this genus are conspicuously marked (Wygodzinsky 1966), without any mention of collection of these other species inside a cave (Dohrn 1860, Wygodzinsky 1945, 1947, 1950, 1958, 1966). Therefore, there is a need for further records relating to the biology of *D. oliveirai* **sp. nov.** in order to ascertain whether its coloration is related to the life habits of this species.

Similarly to what Gil-Santana (2015) recorded in relation to *Phasmatocoris* and some species of this genus described by Wygodzinsky (1966), the latter author recorded the calamistrum-like structure of *Dohrnemesa lanei*, in a chapter on the external structure of these Reduviidae (Wygodzinsky 1966:19), but curiously did not mention this in his taxonomic descriptions of *Dohrnemesa*, *D. albuquerquei* and *D. carvalhoi*, in the same work too. Nonetheless, *D. albuquerquei* was shown to have some, *D. carvalhoi* a few more (Fig. 5) and *D. oliveirai* **sp. nov.** numerous longer straight obliquely inclined setae on the distal half of the fore tibiae, dorsally (Fig. 23). Further documentation of the vestiture and structure of the fore tibiae in other species of *Dohrnemesa* will make it possible to come to a better conclusion regarding whether the presence of these setae on the fore tibiae, compatible with a calamistrum-like structure, should or should not be regarded as a feature of this genus. Although other modifications to the fore tibiae recorded by Pape (2013), i.e. the dorsal excavation and a lateral, parallel auxiliary row of a few setae were not recorded, the presence of modified setae on their distal portion and the apical cluster of stiff setae could still suggest that a potential arachnophilous association exists. However, currently no field observations on the bionomics of these species are available to confirm it.

The male genitalia of the species described here agree almost entirely with the generic level description of *Dohrnemesa* and showed similarities to those described in other species of this genus by Wygodzinsky (1966). This author did not mention any structure similar to the pair of elongated, thin, double curved and somewhat sclerotized endosoma processes recorded for *D. carvalhoi* and *D. oliveirai* **sp. nov.** (Figs. 12, 35). However, in his drawing (Fig. 69, M) of the phallus of *D. exporrecta* Wygodzinsky, 1958, a very similar process was depicted, thus showing that this feature is shared by at least three species of the genus. The length of the struts should be considered to be either short or elongate in *Dohrnemesa*. On the other hand, *D. oliveirai* **sp. nov.** is the first species of *Dohrnemesa* in which the ventral sclerotizations of the phallosoma were recorded as large (Fig. 34) and with lateral prolongations, while in other species in which the male genitalia are known, including *D. carvalhoi* studied here, they are only narrow. Unless the same feature as presented by *D. oliveirai* **sp. nov.** is subsequently recorded in other species of *Dohrnemesa*, it can be considered as exclusive to this species.

With the new species described here, 10 species are now included in *Dohrnemesa*, seven of them recorded only from Brazil.

Acknowledgments

We would like to thank Luiz A. A. Costa (MNRJ) for allowing the senior author (HRG-S) to examine the types of *D. albuquerquei* and *D. carvalhoi* deposited in his Museum. Our thanks to the team at the “Centro de Estudos em Biologia Subterrânea” (CEBS/UFLA), especially to Marcus Paulo de Oliveira, for collecting the holotype of *D. oliveirai* **sp. nov.** The junior author (RL Ferreira) is grateful to Vale Company for the financial support and to the National Council for Scientific and Technological (CNPq) for research grant No. 304682/2014-4.

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