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# Unveiling the hidden robber-fly diversity: *Merucata*, a new Neotropical Asilinae genus (Diptera, Asilidae) with description of seven new species

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## Abstract

*Merucata* **gen. nov.** is erected to include the following seven new species that are herein described and illustrated from Brazil: *Merucata caipora* **sp. nov.**, *M. capixaba* **sp. nov.**, *M. cerradensis* **sp. nov.**, *M. contiae* **sp. nov.**, *M. curupira* **sp. nov.**, *M. pujoli* **sp. nov.**, and *M. vieirai* **sp. nov.** In addition, *Merucata elliptica* (Scarbrough & Perez-Gelabert, 2010) **comb. nov.** described from Trinidad and Tobago is transferred from *Martintella* Artigas, and newly recorded from Venezuela. The new genus is placed into the *Myaptex* group of the subfamily Asilinae based on the following set of characters: wing with cells $r_{2+3}$ and $r_4$ not separated by a recurrent vein (i.e., only two submarginal cells), vein $R_5$ ending after wing apex, scutellum tumid, with no sign of an impressed rim and with at least one pair of well-developed marginal scutellar macrosetae, claws acute, and abdominal tergites with lateral marginal macrosetae. *Merucata* **gen. nov.** can be differentiated from the other genera of the group by the scutum lacking anterior dorsocentral setae, abdominal sternites lacking macrosetae, male epandrium with inner medial dorsal process covered with short and dense macrosetae, and phallus with three long prongs, encompassing about half of the phallus length. An updated key to the genera of the *Myaptex* group along with an illustrated identification key to the males of the species of *Merucata* **gen. nov.** and distribution maps are also provided.

**Key words:** Assassin flies, Cerrado biome, Linnaean shortfall, *Myaptex* group, Pantanal biome

## Introduction

The Asilinae are one of the most diverse subfamilies of Asilidae, with representatives in all biogeographic regions except Antarctica (Londt & Dikow 2017). Worldwide 187 valid extant genera are known (Camargo *et al.* 2022a, 2023; Soares *et al.* 2025). In the Neotropical Region, 70 genera are recognized (Papavero 2009; Camargo *et al.* 2022a, 2023; Soares *et al.* 2025). From these, 15 genera are monotypic, and two (e.g., *Efferia* Coquillett and *Mallophora* Macquart) are the most speciose, with the remaining genera encompassing about two to 20 species.

Their representatives are medium to large-sized flies (10–40 mm), usually predominant in hot and warm regions inhabiting sunny, relatively open areas at lower elevations. Some representatives also occur in lowland tropical areas, and some are restricted to higher elevations (Fisher 2009).

In the Neotropical Region, the subfamily has received more attention in the past 15 years with the erection of four new genera (Vieira & Rafael 2014; Artigas & Vieira 2014; Camargo *et al.* 2022a; Soares *et al.* 2025) and the description of more than 50 new species, including the revalidation of two genera (see Camargo *et al.* 2022a for detailed references) denoting that its diversity is still extremely underestimated.

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Interestingly, all these new genera (except *Longivena* Vieira & Rafael, 2014) were proposed in the so-called *Myaptex* group of genera (Artigas & Papavero 1995). This artificial group was proposed together with several others by Artigas & Papavero (1995, 1997), aiming to facilitate the identification of the Neotropical Asilinae. These groups are mainly based on morphological characters, especially those of male and female terminalia. Currently, 10 genera are assigned to the *Myaptex* group, which has a disjunct distribution from Mexico, Central America, the Caribbean, Chile, Brazil, Paraguay and Argentina (Papavero 2009; Soares *et al.* 2025).

Several areas in the Neotropical region remain inadequately surveyed, especially for Diptera. In Brazil, the SISBIOTA-Diptera Brazilian Network research program was developed to document the diversity of flies in endangered and understudied areas and biomes (Lamas *et al.* 2023), attempting to address Linnaean and Wallacean shortfalls. A new genus and four new robber fly species have already been described based on material collected during this survey, including new records for several other species (Camargo *et al.* 2022b; Camargo *et al.* 2024; Soares *et al.* 2025).

The purpose of this paper is to describe and illustrate a new Asilinae genus and seven new species from Brazil. Additionally, a new combination is being proposed for *Martintella elliptica* Scarbrough & Perez-Gelabert, 2010. A placement of the new genus in the key of the *Myaptex* group of genera (Soares *et al.* 2025) is provided as well as a key for the species within the new genus, including distribution maps.

## Material and methods

The studied specimens are housed at Coleção de Invertebrados do Instituto Nacional de Pesquisas da Amazônia, Manaus, AM, Brazil (INPA), Coleção Zoológica da Universidade Federal de Goiás, Goiânia, GO, Brazil (ZUFG), Museu de Zoologia da Universidade de São Paulo, São Paulo, SP, Brazil (MZUSP), Coleção Entomológica do Departamento de Zoologia da Universidade de Brasília, Brasília, DF, Brazil (DZUB), and Natural History Museum Vienna, Vienna, Austria (NHMW), with photographs of specimens held at the National Museum of Natural History, Washington D.C., USA (USNM).

Terminology follows Cumming & Wood (2017). Abdomen and terminalia were removed, treated with hot 85% lactic acid, dismembered with the aid of entomological stylets, and placed in a microvial with glycerin after examination and photographs.

Photographs were obtained using the Zeiss® Discovery V20 stereomicroscope with a Zeiss AxioCam Mrc5 camera attached, connected to a desktop computer through Zeiss AxioVs40 v. 4.8.2.0 software. Image sequences were assembled in Helicon Focus 6.7.1 software, with some further editing with Adobe Photoshop. Label data for the primary types are cited verbatim in quotation marks (each line separated by a vertical line "|"), with annotations in square brackets. Distribution maps were created with QGIS Software (2016) (Version 3.24), using the data present on the specimen labels.

## Results

### *Merucata* Soares, Camargo & Lamas gen. nov.

Type species: *Merucata caipora* Soares, Camargo & Lamas **sp. nov.** by present designation. Type locality: Brazil, state of Mato Grosso, Poconé.

**Etymology.** From the Tupi-guarani *meru* = fly and *cata* = savanna-like vegetation, alluding to the known distribution of the genus occurring mainly in the Cerrado biome (Brazilian Savanna). The gender is feminine.

**Included species.** *Merucata caipora* Soares, Camargo & Lamas **sp. nov.** (Brazil, states of Goiás, Mato Grosso, Mato Grosso do Sul and Tocantins), *M. capixaba* Scorpione, Soares & Camargo **sp. nov.** (Brazil, state of Espírito Santo), *M. cerradensis* Soares, Camargo & Lamas **sp. nov.** (Brazil, state of Mato Grosso), *M. contiae* Soares, Camargo & Lamas **sp. nov.** (Brazil, state of Mato Grosso do Sul), *M. curupira* Soares, Camargo & Lamas **sp. nov.** (Brazil, state of Piauí), *M. elliptica* (Scarbrough & Perez-Gelabert, 2010) **comb. nov.** (Trinidad and Tobago and newly recorded from Venezuela), *M. pujoli* Scorpione, Soares & Lamas **sp. nov.** (Brazil, Federal District), and *M. vieirai* Soares, Camargo & Lamas **sp. nov.** (Brazil, state of Mato Grosso do Sul).

**Diagnosis.** ***Head*** (e.g., Figs 1C, D, 6C, D, 8C, D). Scape about 2 times longer than pedicel; postpedicel lanceolate, slightly tapered distally, about as long as scape and pedicel combined, apical 2/3 covered with squamiform setae; stylus with two bare elements, slightly longer than postpedicel and abruptly tapered at apex; frons with convergent slopes; face slightly gibbose at lower 1/3 to 1/2 with dorsal margin sloping very gradually to facial plane; mystax dense to sparse, occupying entire facial gibbosity; palpus short, one-segmented. ***Thorax*** (e.g., Figs 1A, B, 12B, D, 17A, B). Scutum tumid, 1–6 pairs of postsutural dorsocentral macrosetae (sometimes slightly thinner than other macrosetae of thorax), 2 notopleural macrosetae, 1 supra-alar and 1–2 postalar macrosetae; dorsal anepisternal seta absent, posterior anepisternal setae white; scutellum tumid as scutum, without impressed rim on posterior border; 2 scutellar macrosetae on posterior border, with sparse, fine, short setae on disc; anatergal setae absent; katatergite with row of white or mixed white and black macrosetae, meron + metanepisternum with slender white setae; postmetacoxal bridge absent, postmetacoxal area entirely membranous. **Wing** (e.g., Figs 1E, 4E, 8F, 10E). Cell $r_1$ closed before wing margin; without costal dilatation; bifurcation of $R_{4+5}$ at level or after apex of discal cell; $R_5$ ending after wing apex; supernumerary stump crossvein on $R_4$ absent (sometimes present only in one wing, but not forming cell (Figs 10E, 12E)); cells $m_3$ and *cua* closed. **Legs** (e.g., Figs 1A, 10A, 15A). Femora mostly covered with short white setae (except in *M. capixaba* **sp. nov.** with anterior and dorsal surfaces wholly covered with black setae (Fig. 4A, D)); empodia and pulvilli present. **Abdomen** (e.g., Figs 1A, B, 2A, B, 3A, B, 10A, B). Mostly covered with black setae; tergite 1 with distinct macroseta laterally; tergites 2–8 with row of macrosetae at posterior margin (usually longer laterally and diminishing in size towards dorsal posterior margin, sometimes indistinguishable from remaining dorsal setosity); sternites without macrosetae. **Terminalia** (Figs 2, 5, 7, 9, 11, 14, 16, 18). Narrow (as wide as tergite 8 (e.g., Figs 1A, 14A)) or wide (wider than tergite 8 (e.g., Figs 7A, 9A)) in dorsal view. Epandrium with inner dorsal process, covered with short spiniform macrosetae, with apicoventral projection in *M. curupira* **sp. nov.** (Fig. 11B, D); hypandrium usually with posterior row of slender to strong macrosetae (e.g., Figs 2L, 5J, 9K); phallus divided into three long prongs, encompassing about half of phallus length (e.g., Figs 2G, 5G, 9G).

**Female.** Similar to male, except abdomen tapering towards apex and presence of three spermathecae (Fig. 3).

**Remarks.** In the identification key provided by Papavero *et al.* (2009), the new genus runs to the *Myaptex* group, based on the following set of characters: antennal stylus bare; subalar sclerite without conical projection; anatergite bare; scutellum with at least one pair of well-developed marginal macrosetae and without an impressed rim; wing with only two submarginal cells; costal section between tips of veins $R_5$ and $M_1$ subequal to or much shorter than costal section between tips of veins $R_4$ and $R_5$ (i.e., $R_5$ ends after wing apex); claws acute; abdominal tergites 2–8 with posterolateral macrosetae; male terminalia not forming an angle of 90° with body axis.

Using the most recent key for the *Myaptex* group of genera (Soares *et al.* 2025), *Merucata* **gen. nov.** keys to couplets 8 and 9. To avoid ambiguity and facilitate accurate identification, the final two couplets of the key have been revised and updated to accommodate the new genus. This revision was necessary primarily due to variability at the base of vein $R_4$, which can lead to misidentification. In some species of the new genus, this vein is slightly angled, while in others it appears nearly straight. Additionally, one of the characters used in couplet 8 of the key by Soares *et al.* (2025), "mystax restricted to middle of face, resembling a mohawk", was based on a misidentified specimen. The specimen shown in figure 12 (A, B) of that work does not belong to *Martintella*, but is in fact a representative of *Nevadasilus* Artigas & Papavero, 1995.

At first glance, without running the specimens through a key, they may resemble representatives of *Eicherax* Bigot. However, they can be easily differentiated by the presence of posterolateral macrosetae on abdominal tergites 2–8. The genus may also resemble *Eichoichemus* Bigot, but differs by the presence of only two submarginal cells and acute claws. Interestingly, the phallus of the new genus is similar in general shape to that of *Triorla* Parks, with about half of its length composed of three divided prongs, including a similarly shaped short fan-like ejaculatory apodeme directed anteriorly in both genera. However, *Triorla* can be easily separated from the new genus by the longer distance between tips of veins $R_5$ and $M_1$, and absence of ocellar setae.

**Distribution.** The new genus is mainly distributed in Brazil, ranging from the state of Piauí (Northeast region) to Mato Grosso do Sul (Central-West region), near to the border with Paraguay. It occurs across multiple biomes, including the Atlantic Forest, Caatinga, Cerrado and Pantanal. *Merucata elliptica* **comb. nov.** is the only species recorded outside Brazil; originally described from Trinidad and Tobago, it is newly recorded from Venezuela (Figs 19, 20).

## Updated key to *Myaptex* group of genera

(only last couplets (8–10) modified from Soares *et al.* (2025)

8 Mystax composed of few sparse macrosetae mostly restricted to lower facial margin (fig. 16C–D in Soares *et al.* (2025)); at least one pair of well-developed anterior dorsocentral macrosetae (fig. 16A, D in Soares *et al.* (2025)); vein $R_4$ ending at wing apex (fig. 393 in Papavero *et al.* (2009)); phallus ending in one prong; three coiled spermathecae (figs 398, 402 in Papavero *et al.* (2009)) (Chile). . . . . *Rhadinosoma* Artigas, 1970

- Mystax composed of abundant and dense macrosetae not restricted to lower facial margin (Fig. 1C, D; fig. 1 in Vieira *et al.* (2014); fig. 17C–E in Soares *et al.* (2025)); anterior dorsocentral macrosetae absent (Fig. 1A; fig. 1 in Vieira *et al.* (2014); fig. 17A in Soares *et al.* (2025)); vein $R_4$ ending before wing apex (Fig. 1E; fig. 19 in Vieira *et al.* (2014); fig. 17B in Soares *et al.* (2025)); phallus ending in two or three prongs; two or three oval spermathecae (figs 410, 413, 422 in Papavero *et al.* (2009); fig. 28 in Vieira *et al.* (2014)). . . . . 9

9 Frons with parallel edges dorsally in anterior view (fig. 17D, E in Soares *et al.* (2025)); fore and mid femora with uniform white long macrosetae and setae (fig. 17A in Soares *et al.* (2025)); phallus with two prongs and female with two oval spermathecae (figs 410, 413 in Papavero *et al.* (2009)) (Mexico) . . . . . *Scarbroughia* Papavero, 2009

- Frons with convergent edges dorsally in anterior view (Fig. 1C); fore and mid femora without uniform white long macrosetae and setae (Fig. 1A); phallus with three prongs (Fig. 1G, H) and female with three oval spermathecae (Fig. 3F; figs 6, 28 in Vieira *et al.* (2014)). . . . . 10

10 Postpedicel lanceolate (Fig. 1C, D); posterior margin of sternite 8 simple and straight, without projections (Figs 2J, 5I, 7I); epandrium wide in lateral view (Fig. 2B, D); gonocoxite mostly subtriangular in lateral view (Figs 2F, 11F, 14F); gonostylus more or less straight with base hidden behind gonocoxite in lateral view (Figs 2E, K, 5E, 11E, J); phallus unconcealed, ending in three long prongs (Fig. 2G); female tergite 8 only 1.5 times length of tergite 7 (Fig. 3B, C, E); female sternite 8 with setae basally (Fig. 3B, D, E) (Trinidad and Tobago, Venezuela and Brazil). . . . . *Merucata* **gen. nov.**

- Postpedicel oval (figs 1, 17, 26, 29 in Vieira *et al.* (2014)); posterior margin of sternite 8 with projections or strongly bulged and pronounced at posterior margin (figs 24, 36 in Vieira *et al.* (2014)); epandrium more or less elongate and subrectangular in lateral view (figs 3, 20, 32 in Vieira *et al.* (2014)); gonocoxite more or less slender, tapering towards a rod-like rounded apex; gonostylus arched and visible from its base in lateral view (figs 4, 25, 34 in Vieira *et al.* (2014)); phallus concealed ending in three short prongs (figs 6, 23, 35 in Vieira *et al.* (2014)); female tergite 8 more than 2 times length of tergite 7; female sternite 8 bare (figs 26, 28 in Vieira *et al.* (2014)); (Mexico and Costa Rica) . . . . . *Martintella* Artigas, 1996

## Key to males of species of *Merucata* gen. nov.

1 All femora and tibiae black (e.g., Figs 1A, 4A) . . . . . 2

- Femora and/or tibiae partly yellow to orangish (e.g., Figs 8A, E, 10A, 12A) . . . . . 5

2 Face mostly covered with golden pruinosity (Fig. 4C); anterior surfaces of femora II and III covered with black setae (Fig. 4A, D); epandrium glove-shaped in lateral view (Fig. 5B, D) [Brazil: Espírito Santo] . . . . . *M. capixaba* **sp. nov.**

- Face mostly covered with silvery pruinosity (e.g., Figs 1C, 6C); anterior surfaces of femora II and III mostly covered with white setae (e.g., Figs 1A, 6A); epandrium subrectangular in lateral view (e.g., Figs 2B, D, 7B, D). . . . . 3

3 Mystax occupying 2/3 of face, composed of mixed black and white macrosetae, not forming dense tuft of macrosetae on ventral margin (Fig. 6C, D); male terminalia wider than tergite 8 in dorsal view (Fig. 7A); inner margin of inner process of epandrium obscured by dense, short and black macrosetae (Fig. 7C) [Brazil: state of Mato Grosso] . . . . . *M. cerradensis* **sp. nov.**

- Mystax occupying 1/2 of face, composed of white macrosetae (only a few black setae at middle of face) forming dense tuft of white macrosetae on ventral margin (Figs 1C, D, 17C, D); male terminalia as wide as tergite 8 in dorsal view (Figs 2A, 18A); inner margin of inner process of epandrium not obscured by dense, short and black macrosetae (Figs 2C, 18C) . . . . . 4

4 Anterior surface of femur I with short black setae (rarely with a few sparse white setae), ventral surface mostly bare, with a few sparse short white setae (Fig. 1C); 1 postalar macroseta; apical 1/3 of anterior surface of femora II and III covered with short black setae (Fig. 1A); hypandrium with apical tuft of black macrosetae at middle of posterior edge (visible without dissection) (Fig. 2B, L) [Brazil: Goiás, Mato Grosso, Mato Grosso do Sul and Tocantins] . . . . . *M. caipora* **sp. nov.**

- Anterior surface of femur I with short white setae, ventral surface with short white setae and row of slender white macrosetae at basal 1/2 (Fig. 17C); 2 postalar macrosetae; anterior surface of femora II and III wholly covered with white setae (Fig. 17A); hypandrium only with sparse posterolateral macrosetae (Fig. 18K) [Brazil: Mato Grosso do Sul] . . . . . *M. vieirai* **sp. nov.**

5 Femora dark brown to black anteroventrally and pale brown to orangish dorsally and posteriorly; tibiae entirely orangish or brownish with basal third slightly orangish (Figs 8A, D, 15 A, C) . . . . . 6

- Femora wholly dark brown to black; tibiae entire orangish or with orangish basal half and brownish distal half (Figs 10A, 12A) . . . . . 7

6 Antenna with scape and pedicel mostly yellow to orangish (Fig. 15C, D); abdominal sternites pale brown (Fig. 15A); male terminalia as wide as tergite 8 in dorsal view (Fig. 16A); hypandrium almost bare, only with a few short and slender setae (Fig. 16K) [Brazil: Federal District] . . . . . *M. pujoli* **sp. nov.**

- Antenna wholly black (Fig. 8C, D); abdominal sternites dark brown to black; male terminalia wider than tergite 8 in dorsal view (Fig. 9A); hypandrium with dense macrosetae (Fig. 9K) [Brazil: Mato Grosso do Sul]. . . . . *M. contiae* **sp. nov.**

7 Wings with bifurcation of $R_4$ and $R_5$ at apex of discal cell (Fig. 12E); apicoventral margin of epandrium not projected (Fig. 14D); inner margin of epandrium with short digitiform dorsal process (Fig. 14C) [Trinidad and Tobago and Venezuela] . . . . .

. . . . . .*M. elliptica* (Scarbrough & Perez-Gelabert, 2010) **comb. nov.**

- Wings with bifurcation of $R_4$ and $R_5$ after apex of discal cell (Fig. 10E); apicoventral margin of epandrium projected, forming rounded lobe (Fig. 11B, D); inner margin of epandrium with wide dorsal process (Fig. 11C, D) [Brazil: Piauí]. . . . . .*M. curupira* **sp. nov.**

***Merucata caipora* Soares, Camargo & Lamas sp. nov.**
(Figs 1–3, 19)

**Diagnosis (male).** The new species can be easily distinguished from the congeners by the mystax composed of dense white macrosetae below and with a few black macrosetae above (Fig. 1C, D); 1 postalar macroseta; anterior surface of femur I mostly covered with short black setae (Fig. 1C); anterior surface of femora II and III covered with short white setae, except apical 1/3 of femur II and apical 1/4 of femur III with short black setae (Fig. 1A); inner edge of epandrium with a median short, pointed dorsal process (Fig. 2C); posterior margin of hypandrium with a tuft of long macrosetae at middle (Fig. 2L).

**Description. Holotype male** (Fig. 1A). Body Length: 9.5 mm; wing length: 6.4 mm. **Head** (Fig. 1A, C, D). Antenna wholly black, scape and pedicel with short black setae. Face wholly silvery pruinose, except middle of face with narrow stripe with mixed silvery and golden pruinosity; face slightly gibbous at lower half, mystax restricted to gibbosity, with dense white macrosetae below and a few black macrosetae above and at oral margin, facial setae short and white; parafacial setae short and white. Frons mostly covered with golden pruinosity, except black short diamond-shaped area between ocellar tubercle and silvery pruinose base of antenna; a few long, white orbital setae; ocellar tubercle with 2 pairs of slender black setae; a few slender mixed white and black occipital median setae; upper-most 5 postocular macrosetae black, remaining postocular macrosetae white and slender; postcranium silvery pruinose, ventral half with dense, long and branched white setae. Palpus short, about 1/4 as long as proboscis, black and covered with concolor macrosetae; proboscis black, about 1/2 as long as eye height, basal 1/2 of ventral surface covered with long, slender white setae, apex with short and slender pale brown setae. **Thorax** (Fig. 1A, B). Antepronotum and pronotum covered with long, slender white setae, with mixed silver and golden pruinosity, antepronotum with anterior row of short, strong white setae. Scutum wholly covered with short, scattered black setae, mostly golden and silvery mixed pruinose, except by median black stripe, wide anteriorly, narrowed towards posterior margin and discontinued from U-shaped macula at posterior margin; 2 black spots, 1 presutural, at level of notopleuron and 1 postsutural. One black postsutural dorsocentral macroseta, 2 black notopleural macrosetae, 1 black postsutural supra-alar macroseta, 1 short seta and 1 black postalar macroseta. Scutellum with 1 pair of black apical macrosetae, dorsal surface silvery pruinose and with scattered white short setae. Pleura mostly silvery pruinose, except for a few areas of anepisternum, katepisternum and meron golden pruinose; katatergite with vertical row of white macrosetae, a few sparse, long and slender white setae at posterior margins of anepisternum and katepisternum, and at anterior margin of meron. **Legs** (Fig. 1A, C). Black, except all coxae obscured with dense silvery pruinosity, claws black, pulvilli reddish-brown. Legs with black setae/macrosetae, except as noted. **Leg I.** Anterior surface of coxa with dense, strong white macrosetae. Femur with anterior and dorsal surfaces with short black setae; ventral surface with white, short and sparse setae; posterior surface with longer and dense white setae. Tibia covered with short white setae, except apical 2/3 of anteroventral surface covered with comb of dense coppery setae in anterior view; ventral to anteroventral row of 4 macrosetae from basal 2/3 to apex; ventral row of slender, sparse setae; dorsal row of short, strong and sparse setae, with crown of strong short setae at apex. Basitarsus with 1 posteroventral macroseta near base, with crown of setae at apex; tarsomeres 2–4 with apical crown of strong setae; tarsomere 5 only with slender macrosetae at apex. **Leg II.** Apical edge of anterior surface of coxa with fringe of white macrosetae, lateral surface with 3–4 white macrosetae near apex. Femur mostly covered with short white setae, except ventral surface mostly bare; apical 1/3 of anterior surface with short black setae; anteroventral row of 3–4 short, strong and sparse setae; 2 short and strong anterior setae, 1 at basal 1/2 and 1 at apical 1/2, 1 short preapical posterior seta. Tibia covered with short white setae; posteroventral row of 3–4 short setae, 3–4 ventral longer setae at apical 1/2; apex with crown of short setae. Basitarsus with 1 anterior and 1 posterior strong seta, with crown of setae at apex; tarsomeres 2–5 as in leg I. **Leg III.** Apical edge of anterior surface of coxa with a few short, strong and white setae; posterior edge of dorsal surface with 1 short, strong and white seta at mid-length, surrounded by a few short, slender and white setae. Femur covered with white short setae, except apical 1/4 of anterior surface with black setae, 2 anterior short and strong setae, 1 at basal 1/2 and 1 at apical 1/2; 1 short, strong anterodorsal

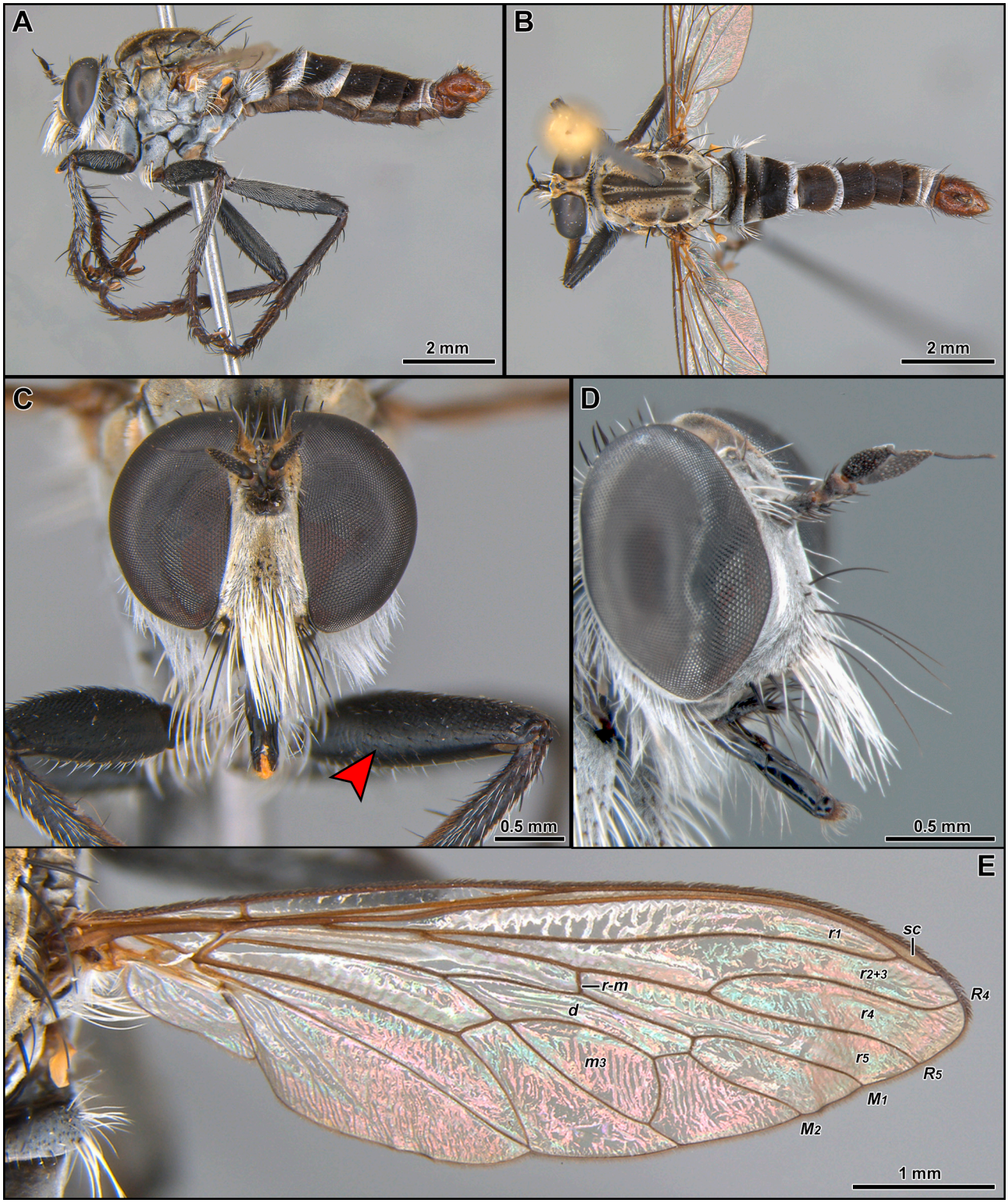


**FIGURE 1.** *Merucata caipora* **sp. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C, D.** Head in anterior and anterolateral views, respectively (arrow pointing the short black setae); **E.** Wing. Abbreviations: *d* = discal cell; $M_1$ = first branch of media; $M_2$ = second branch of media; $m_3$ = third medial cell; *r-m* = radial-medial crossvein; $r_1$ = first radial cell; $r_{2+3}$ = second + third radial cell; $r_4$ = fourth radial cell; $r_5$ = fifth radial cell; $R_4$ = upper branch of third branch of radius; $R_5$ = lower branch of third branch of radius; *sc* = subcostal cell.

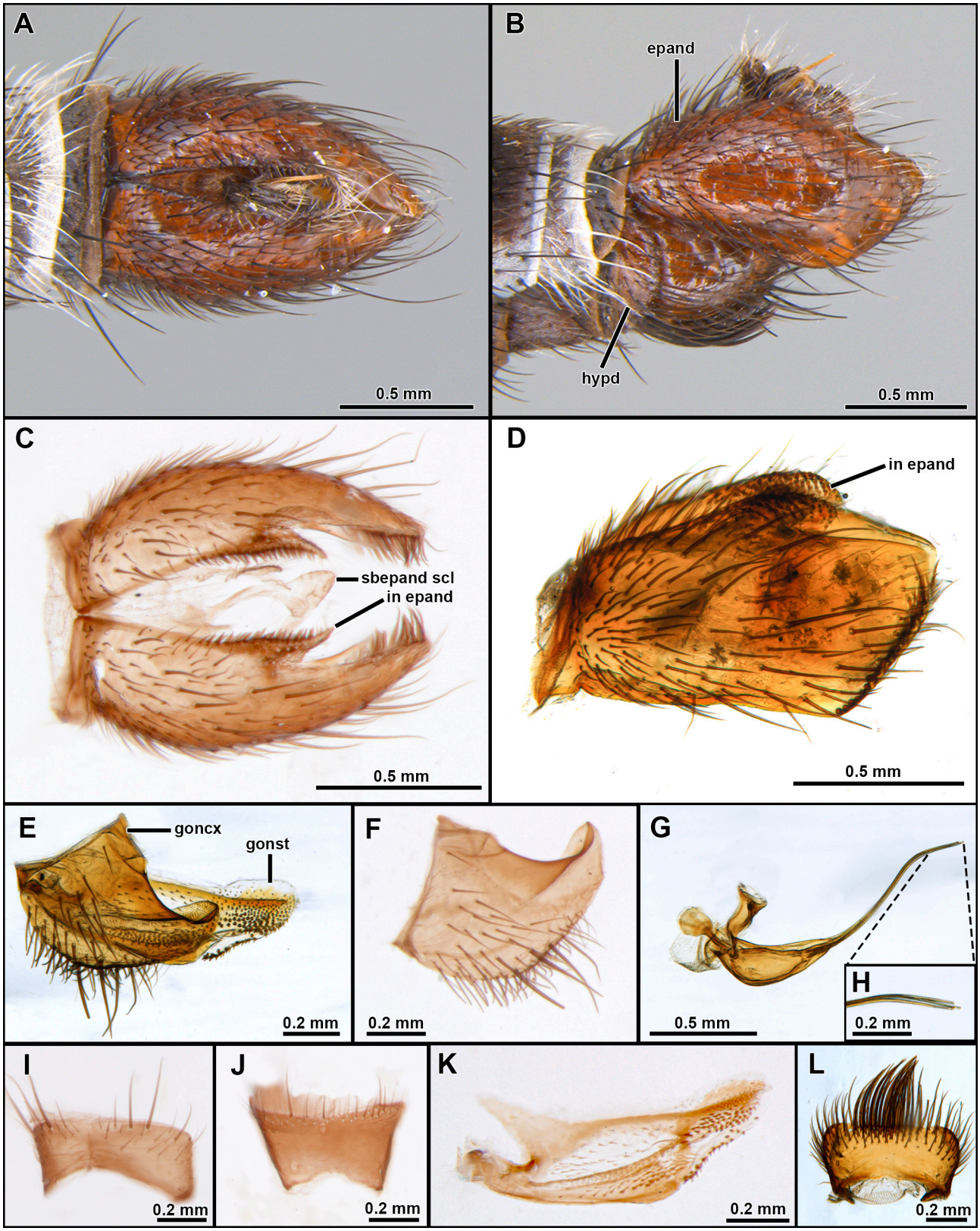


**FIGURE 2.** *Merucata caipora* **sp. nov.** (male paratype). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Terminalia in dorsal and lateral views (after dissection); **E.** Gonocoxite and gonostylus; **F.** Gonocoxite; **G.** Phallus and ejaculatory apodeme; **H.** Apex of phallus; **I.** Tergite 8; **J.** Sternite 8; **K.** Gonostylus; **L.** Hypandrium. Abbreviations: epand = epandrium; goncx = gonocoxite; gonst = gonostylus; hypd = hypandrium; in epand = inner dorsal process of epandrium; sbepand scl = subepandrial sclerite.

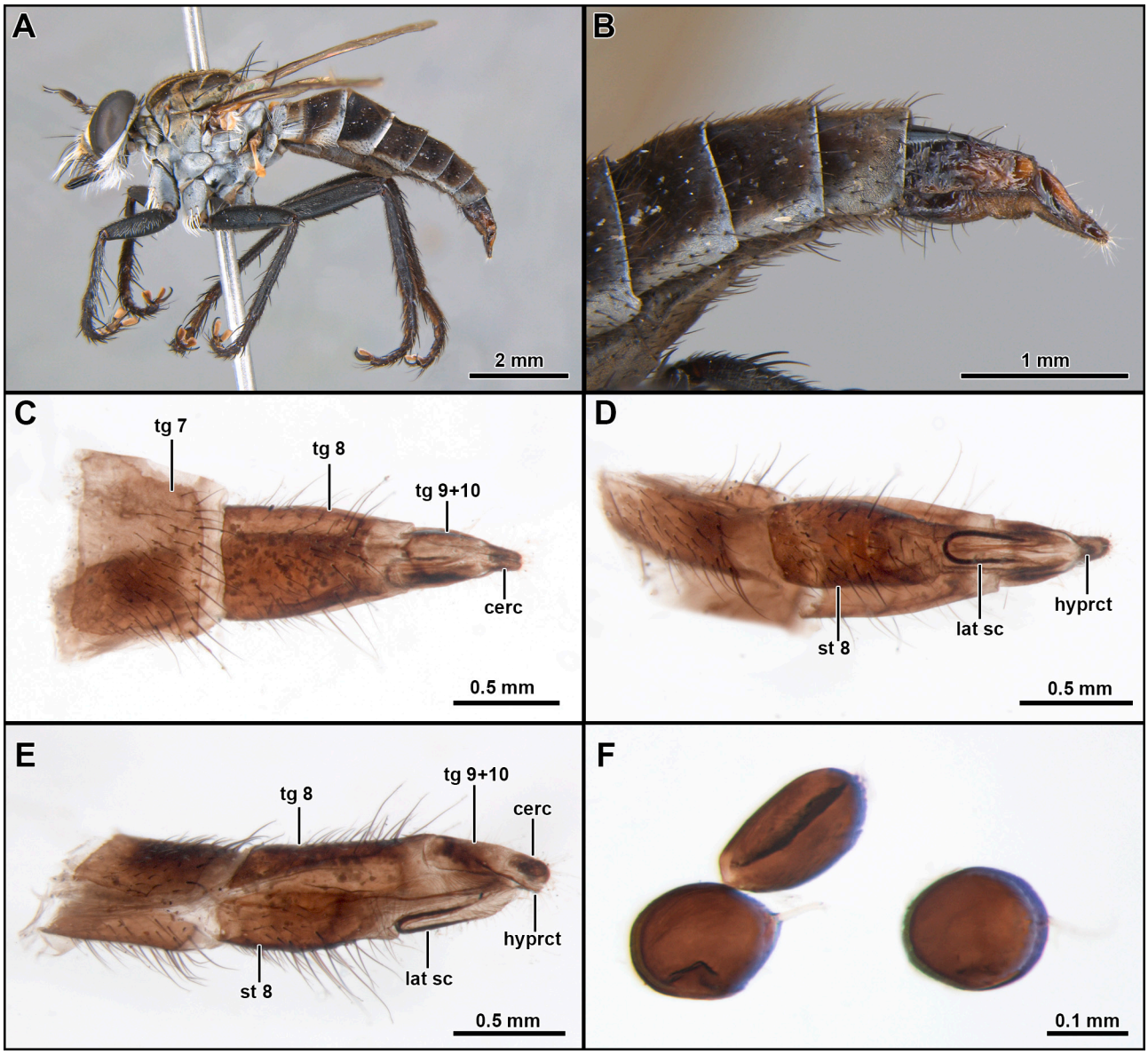


**FIGURE 3.** *Merucata caipora* **sp. nov.** (female paratype). **A.** Habitus lateral; **B.** Abdomen, lateral view; **C–E.** Terminalia in dorsal, ventral and lateral views, respectively; **F.** Spermathecae. Abbreviations: cerc = cercus; hyprct = hypoproct; lat sc = lateral sclerite of genital fork; st = sternite; tg = tergite.

preapical seta; anteroventral row of 4 short, strong and sparse setae; 2–3 short, strong posteroventral setae at basal 1/2. Tibia covered with short white setae, except apical 2/3 of posterior surface with brush of coppery setae, extending to posterior surfaces of tarsomeres 1 and 2; 3 pairs of short, strong antero- and posterodorsal setae, 1 near base, 1 at middle and 1 at apical 1/3; 2 short, strong anteroventral setae at apical 1/2; one crown of short, strong setae at apex. Basitarsus with 1 long antero- and 1 posteroventral seta near base; one crown of setae at apex; tarsomeres 2–5 as in tarsomere of leg I. **Wing** (Fig. 1E). Hyaline, veins brown. Apex of cell *sc* weakly microtrichose; bifurcation of veins $R_4$ and $R_5$ at apex of discal cell; cell *cua* closed shortly before wing margin, petiole shorter than humeral vein. **Abdomen** (Fig. 1A, B). Mostly black, covered with coppery pruinosity, except tergite 1; anterior and posterior margins of tergite 2, posterior margins of tergites 3, 6 and 7, posterolateral margins of tergites 2–4 and lateral margins of tergites 5–7 with dense silvery pruinosity. Tergites mostly covered with short black setae, except tergite 1 with 5–7 posterolateral white macrosetae, preceded by group of long and slender white setae, and mostly covered with short white setae; tergites 2–8 with posterolateral black and/or white macrosetae. Tergite 8 somewhat saddle-shaped, narrowing at middle of anterior edge, with posterior row of sparse black macrosetae (Fig. 2I). Sternites

black and wholly covered with short black setae and brownish pruinosity. Sternite 8 somewhat trapezoidal, with short concavity at anterior edge and a few long black short setae at posterior edge (Fig. 2J). **Terminalia** (Fig. 2). Orangish-brown (Fig. 2A, B). Epandrium mostly rectangular in lateral view (Fig. 2D), inner edge with median short and pointed dorsal process, inner margin of dorsal process covered with dense, short spine-like setae; apical edge of epandrium with comb of short setae (Fig. 2C). Cercus short, digitiform. Subepandrial sclerite short, weakly sclerotized, with apex triangular, with wide opening at middle (Fig. 2C). Hypandrium saddle-shaped, posterior margin with short setae, with tuft of long black macrosetae at middle (Fig. 2L). Gonocoxite mostly squared basally, narrowed and curved dorsally at apex, forming short concavity at apicodorsal edge; outer edge covered with short setae, with a few macrosetae at apicoventral margin (Fig. 2E, F). Gonostylus longer than gonocoxite, mostly knife-shaped, weakly sclerotized at middle; apex covered with spicules; base with deep concavity, forming triangular lobe dorsally (Fig. 2E, K). Ejaculatory apodeme short, somewhat fan-shaped (Fig. 2G). Phallus long and thin, about as long as gonostylus; posterior half divided into three long prongs (Fig. 2G, H).

**Female** (Fig. 3). Similar to male, except anterior surface of femur III mostly covered with short black setae (Fig. 3A). Body length: 8.25–10 mm; wing: 5.7–7 mm (n = 3). **Terminalia** (Fig. 3B–F). Orangish-brown to black. Laterally compressed, long and slender, about 1.5 times longer than tergite 7, covered with short black setae, tergite and sternite 8 with a few sparse black macrosetae. Tergite 9+10 somewhat U-shaped in dorsal view, about 3 times longer than cercus. Cercus short, digitiform, covered with short white setae. Three sclerotized and rugose spermathecae present.

**Variation.** Body length 6.5–10.5 mm, wing length 5–7.8 mm (n = 10). Orbital setae black; mystax with more mixed black setae; 2–3 pairs of postsutural dc; anterior surface of femur I with a few sparse short white setae; ventral surface of femur I with a few short spiniform setae at basal 1/3 to basal 1/2; femora II and/or III with apical 1/2 of anterior surface covered with short black setae; katatergite with vertical row of mixed white and black setae.

**Type material. HOLOTYPE** ♂ (MZUSP) labelled: "Brasil: MT [state of Mato Grosso]: Poconé | Fazenda Rio Clarinho | Antiga Transpantaneira | 16º35'28,7"S 56º43'57,1"W | Malaise 53 | 19.x–30.xii.2012 | Lamas, Nihei & eq. cols." "HOLOTYPE | *Merucata caipora* | Soares, Camargo & Lamas [red label]". Holotype condition: Good, not dissected. **PARATYPES:** Same data as holotype (3 ♂, 2 ♀, one dissected, MZUSP; 1 ♀, NHMW); Chapada dos Guimarães—Trans. Ciliar/Cerrado, Trilha da Cachoeira Véu de Noiva, 15°24'33.5"S 55°49'59.0"W, Malaise 17, 22.xii.2011–22.i.2012, Lamas, Nihei & eq. col. (1 ♂, INPA); same data, except, Trilha do Cerrado, Transição Ciliar / Cerrado, 15°24'34.1"S 55°49'56.0"W, Malaise 49, 31.x–29.xi.2012 (1 ♂, INPA); same data, except, 15°24'47"S 55°50'27"W, Malaise, 03–12.xi.2008, Almeida col. (1 ♂, NHMW); Cuiabá, Condomínio Flor do Cerrado, 15°29'29.7"S 56°04'30.4"W, Malaise 21, 04.xi–12.xii.2011, Lamas, Nihei e eq col. (5 ♂, MZUSP). **Mato Grosso do Sul**, Corguinho, Taboco, Reserva Quinta do Sol, 19°46'40.8"S 55°14'59.0"W, Malaise 12, 29.ix–12.x.2012, Lamas, Nihei e eq. cols. (3 ♂, MZUSP); same data, except: 19°46'45.4"S 55°14'36.2"W, Malaise 13, 12.x–12.xi.2012 (1 ♂, MZUSP); same data, except: 19°46'36.8"S 55°14'55.7"W, Malaise 14, 12–29.xi.2012 (1 ♂, MZUSP); same data, except: 12.x–12.xi.2012 (1 ♀, NHMW); Aquidauana, Reserva Ecológica UEMS, Vegetação Aberta/Flor. Est. Decidual, 20°25'59"S 55°39'20.8"W, Malaise 08, 26.x–11.xi.2011 (2 ♂, INPA); same data, except, 26.ix–11.x.2011 (1 ♂ NHMW); Três Lagoas, Horto Barra da Moeda, 28–30.vii.2009, S.P. Rosa col. (1 ♂, MZUSP); Rio Verde, Pousada Quedas D'Água, 18°9'38.7"S 54°9'00.1"W, Malaise 39, 01–05.iv.2012, Lamas, Nihei & eq. col. (1 ♂, MZUSP); same data, except: 15–30.vi.2012 (1 ♂, MZUSP); same data, except: 30.viii–14.ix.2012 (1 ♂, MZUSP); same data, except: 18°9'39.3"S 54°08'59.6"W Malaise 40, 14–30.x.2012 (1 ♂, MZUSP). **Goiás**, Niquelândia, RPDS Legado Verdes do Cerrado, Malaise 3—Cerrado *s.s.* 3, 14°36'46.65"S 48°29'54.33"W, 21.x–19.xi.2019, Oliveira R.S. & Lopes, W. cols. (2 ♂, one dissected, UFG; 1 ♂ dissected, MZUSP); same data, except: Malaise 2—Mata de Galeria 2, 14°36'43.71"S 48°28'49.93"W, 24.vi–21.vii.2021 (1 ♂, UFG); Silvânia, Floresta Nacional de Silvânia, Malaise Cerrado 1, 24.x–29.xi.2019, Oliveira R.S. & Lopes, W. cols. (10 ♂, MZUSP; 7 ♂ UFG); same data, except: Mata de Galeria 1, 16°38'20.08"S 48°39'27.06"W, 20.xii.2019–30.i.2020 (2 ♂, MZUSP); Mineiros, PARNA das Emas, Malaise—Parcela 2, Mata, 17°54'08.0"S 52°59'47.1"W (1 ♂, NHMW); Formosa, Distrito do Bezerra, Fazenda Santo Antônio, 15°18'27.2"S 47°11'45.0"W, 28.i–05.ii.2012, Excursão Disciplina Entomologia de Verão (1 ♂, DZUB). **Tocantins**, Caaseara [ca 9°16'14.6"S 49°57'12.0"W], PEC. 27–31/v/07, JRPujol col. (1 ♂, dissected, DZUB).

**Remarks.** The new species is remarkably similar to *M. vieirai* **sp. nov.** by the legs black, bifurcation of veins $R_4$ and $R_5$ nearly at apex of discal cell, and male terminalia narrow in dorsal view, but can be easily segregated by the anterior surface of femur I mostly covered with short black setae (Fig. 1C), only one postalar macroseta

present, apical 1/3 of anterior surface of femora II and III covered with short black setae (Fig. 1A) and hypandrium with apical tuft of black macrosetae at posterior edge (Fig. 2L) *versus* anterior surface of femur I with short white setae (Fig. 17C), 2 postalar macrosetae present, femora II and III wholly covered with white setae (Fig. 17A) and hypandrium only with posterolateral black macrosetae at posterior edge (Fig. 18K) in *M. vieirai* **sp. nov.**

**Distribution.** Brazil (states of Goiás, Mato Grosso, Mato Grosso do Sul and Tocantins), along the biomes of Cerrado and Pantanal (Fig. 19).

**Etymology.** From the Tupi-guarani: *kaa* = woods, forest, and *pora* = inhabitant. *Caipora* is a mythological entity, protector of the forests and animals. Most of the specimens of this species were collected in forest fragments, demonstrating the importance of preserving and maintaining these areas. The species' name is treated as a noun in apposition.

### *Merucata capixaba* Scorpione, Soares & Camargo

(Figs 4, 5, 20)

**Diagnosis (male).** This species can be distinguished from other congeners by the face mostly covered with golden pruinosity (Fig. 4C); anterior surface of all femora wholly covered with short black setae (Fig. 4C, D); middle posterior region of hypandrium bare, with a long tuft of macrosetae at mid-lateral region of posterior margin (Fig. 5J); and gonostylus distinctly hook-shaped, with three apical projections and a series of short spines (Fig. 5F).

**Description. Holotype male** (Fig. 4A). Body length: 7.4 mm; Wing length: 5.2 mm. Similar to *M. caipora* **sp. nov.**, except as noted: **Head** (Fig. 4A, C, D). Face mostly golden pruinose, except at middle with discrete narrow stripe with mixed silvery pruinosity; mystax with dense black macrosetae, and tuft of white macrosetae at middle of gibbosity; facial and parafacial setae short and black. Frons mostly golden pruinose, except for ocellar tubercle and a small triangular area between base of antenna and ocellar tubercle black; a few long and black orbital setae; ocellar tubercle with 4–5 pairs of slender black setae, a few slender, white occipital median setae; upper-most 5 postocular macrosetae black; occiput silvery pruinose, except dorsal 1/3 golden pruinose. **Thorax** (Fig. 4A, B). Antepronotum with row of strong black macrosetae. Scutum covered with short and sparse black setae, mostly golden pruinose, 2 black postalar macrosetae; 4–6 postsutural dorsocentral macrosetae, scutellum with 4–5 apical black macrosetae, dorsal surface covered with scattered black short setae. Anepisternum with black and white fine setae on dorsal and posterior margins; middle of anepimeron with vertical row of fine white setae; posterior margin of katatergite with vertical row of black macrosetae surrounded by white fine setae; metanepisternum with row of fine white setae at anterior margin. **Legs** (Fig. 4A, C, D). **Leg I**. Coxa with dense white macrosetae anteriorly and a few black macrosetae near outer edge. Femur with anterior and dorsal surfaces with short, black setae; ventral surface with sparse, long, white setae, mixed with some black setae; posterior surface with longer white setae. Tibia mostly covered with short black setae and posterior surface covered with longer white setae. **Leg II**. Coxa with strong white macrosetae at apical edge, posteriorly with white macrosetae and a few black macrosetae extending to middle, anteriorly. Femur with anterior and dorsal surfaces with short black setae; ventral surface with sparse white setae, mixed with a few black setae; posterior surface with longer sparse white setae. Tibia covered with short black setae, except posterior surface, with short white setae; posteroventral row of 3 black macrosetae; ventrally with 3–4 longer, black, macrosetae at apical 1/2; apex with crown of macrosetae. **Leg III**. Dorsal surface of coxa with a few short white setae, with 1–2 black setae near apex. Femur mostly covered with short black setae, except posteroventral surface with few sparse white setae. Tibia covered with short black setae. **Wing** (Fig. 4E). Hyaline light brown, slightly darker at apex, veins brown; cell cua closed and petiolate, petiole subequal to length of humeral vein. **Abdomen** (Fig. 4A, B). Mostly black, except posterior margins of tergites 1–3, 6 and entire tergite 7 with dense silvery pruinosity in dorsal view; antero- and posterolateral margins of tergites 2 and 3; posterolateral margins of tergites 4–6 with triangular areas with dense silvery pruinosity. Tergites mostly covered with short black setae; tergite 1 with posterolateral white and black macrosetae, preceded by some long and slender white setae, and mostly covered with short white setae, except posterior margin covered with black setae; tergites 2–6 covered with short black setae, except for posterolateral margins, with slender white setae, mostly confined to triangular pruinosity areas; posterior margin with a row of macrosetae, black in middle and white laterally; tergite 7 mostly covered with white setae, except for a few middorsal black setae. Tergite 8 slightly concave at middle of anterior margin and covered with short black setae and few black macrosetae at posterolateral margins (Fig. 5H). Sternites mostly covered with short black setae, except for a few mixed short white setae. Sternite 8 subrectangular, with short

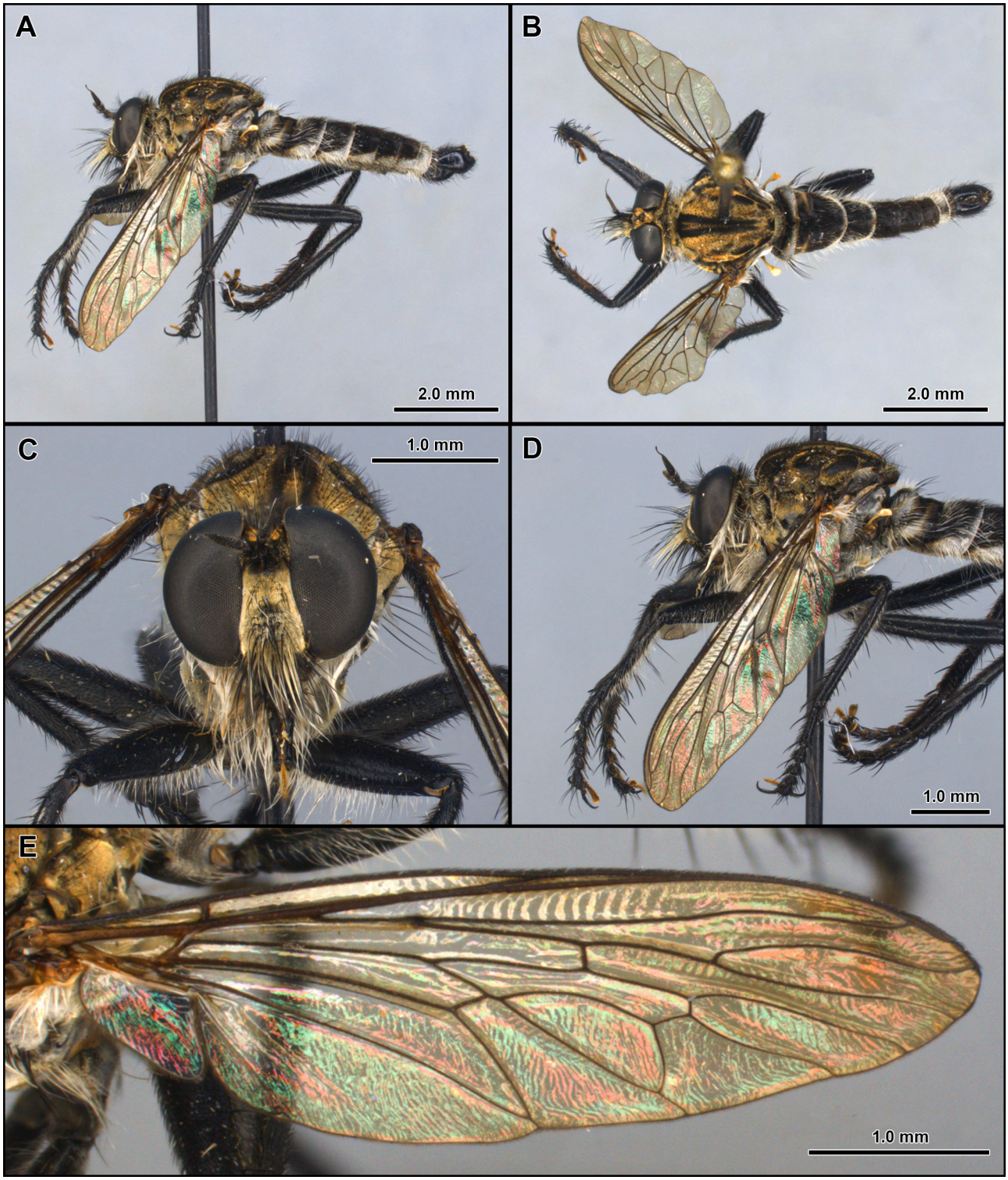


**FIGURE 4.** *Merucata capixaba* **sp. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C.** Head in anterior view; **D.** Head and thorax in lateral view; **E.** Wing.

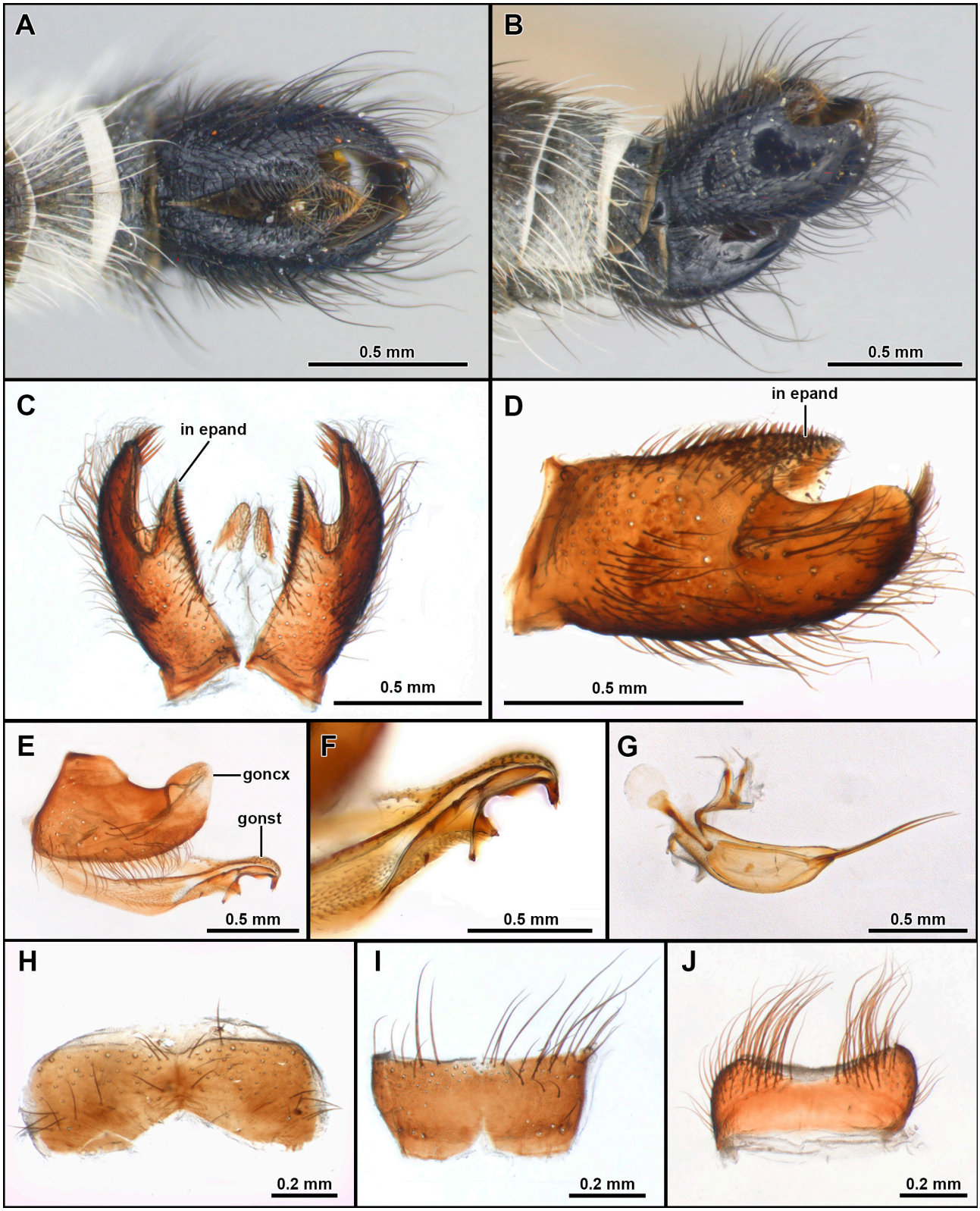


**FIGURE 5.** *Merucata capixaba* **sp. nov.** (male paratype). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Epandrium in dorsal and lateral views, respectively; **E.** Gonocoxite and gonostylus; **F.** Apex of gonostylus; **G.** Phallus and ejaculatory apodeme; **H.** Tergite 8; **I.** Sternite 8; **J.** Hypandrium. Abbreviations: goncx = gonocoxite; gonst = gonostylus; in epand = inner dorsal process of epandrium.

concavity at middle of anterior margin and long macrosetae at posterior margin (Fig. 5I). **Terminalia** (Fig. 5). Black and covered with black macrosetae/setae. Epandrium glove-shaped in lateral view with strong U-indentation at dorsal posterior margin (Fig. 5D); inner edge with median short, pointed dorsal process; inner margin covered with dense, short spine-like macrosetae (Fig. 5C); apical edge of epandrium with comb of short and stout macrosetae (Fig. 5D). Hypandrium subrectangular, slightly concave at mid-posterior margin with middle region asetose and posterior corners with long macrosetae, lateral margins with short setae (Fig. 5J). Gonocoxite broad basally, narrowed and curved dorsally at distal apex, forming short concavity at mid-dorsal length; outer edge covered with short setae, dense at ventral margin (Fig. 5E). Gonostylus about 1/3 longer than gonocoxite, basally elongated and hook-shaped apically, somewhat resembling an adjustable plumb plier, with three projections, including apical hook, which is sclerotized, covered in spicules; projections with small spines at tip; deep concavity starting at mid-length, reaching apex of gonostylus (apex seems folded horizontally) (Fig. 5E, F). Ejaculatory apodeme spoon-shaped, weakly sclerotized (Fig. 5G).

**Female.** Unknown.

**Type examined. HOLOTYPE:** ♂ (DZUB) labelled: "BRASIL, ES [Espírito Santo], Sooretama | Rebio Sooretama | 15.xii–20.xii.2019 | -19,054281 -40,148633 | Armadilha Malaise (III) | Waichert et al col." "HOLOTYPE | *Merucata capixaba* | Scorpione, Soares & Camargo [red label]" "UNB | 241748". **PARATYPE:** Same data as holotype except, -19,053911 -40,148978, Armadilha Malaise (IV) (1 ♂, dissected, MZUSP).

**Remarks.** The new species is easily recognized by the face mostly golden pruinose (Fig. 4C), legs black and dense covering of short black setae on the anterior surfaces of all femora (Fig. 4A, C, D), and by the glove-shaped male epandrium in lateral view (Fig. 5D). The terminalia closely resembles that of *Merucata pujoli* **sp. nov.**, but can be distinguished by the gonostylus, which in *M. pujoli* has two projections (Fig. 16E, J), while in *M. capixaba* **sp. nov.** has three projections and is covered with a greater number of spines (Fig. 5E, F).

**Distribution.** Brazil (state of Espírito Santo) (Fig. 20). This is the only known species recorded from the Atlantic Forest biome.

**Etymology.** From the Tupi-guarani: *kopi'xawa* = farmland. Used by the native people who lived in the territory now corresponding to the state of Espírito Santo, to call their corn and cassava plantations. It is used as a gentilic nowadays to denote the inhabitants of this state. The species name is treated as a noun in apposition.

### *Merucata cerradensis* Soares, Camargo & Lamas sp. nov.

(Figs 6, 7, 20)

**Diagnosis (male).** Mystax occupying 2/3 of face, composed with mixed black and white sparse macrosetae (Fig. 6C, D); femur I with ventral rows of dense, long and white setae (Fig. 6C); terminalia wider than tergite 8 (Fig. 7A); inner surface of inner projection of epandrium covered by dense and spiniform setae (Fig. 7C); gonostylus long, about twice longer than gonocoxite and truncated at apex (Fig. 7E, J).

**Description. Holotype male** (Fig. 6A). Body Length: 9.2 mm; wing length: 7.0 mm. Similar to *M. caipora* **sp. nov.**, except as noted: **Head** (Fig. 6C, D). Mystax occupying 2/3 of face, composed with mixed black and white sparse macrosetae, parafacial setae slender and white. Frons covered with mixed golden and silvery pruinosity, a few long and black orbital setae, ocellar tubercle with 2–3 pairs of long and slender black setae, occipital median setae black; upper-most 5–6 postocular macrosetae black and strong, remaining postocular setae white and slender. **Thorax** (Fig. 6A, B). Antepronotum with row of short, strong and black macrosetae. Scutum covered with short black setae, longer at posterior 1/2, 2–3 postsutural dorsocentral black macrosetae, 2 postalar macrosetae. Scutellum dorsally covered with short black setae. **Legs** (Fig. 6A, C). Wholly black. **Leg I.** Anterior surface of coxa with dense white and slender macrosetae. Femur covered with short white setae, longer at ventral 2/3, with a few short black setae at apex. Tibia with ventral to posteroventral row of 3–4 white macrosetae. **Leg II.** Femur covered with short white setae, longer at ventral 1/2, 3 anteroventral short, strong and black setae, except basal most white. Tibia with 3–4 short, strong and white posterior setae, 2 short white dorsal setae at apical 1/2 and 1 white short ventral seta at middle. **Leg III.** Coxa with 1 short white macroseta near apex. Femur covered with short white setae, longer at base of dorsal and posterior surfaces; a few black short setae at apex; ventral row of 4 short macrosetae, 2 basal most white, 2 short, anterior macrosetae, basal most white. Tibia with antero- and posterodorsal rows of white setae. **Wing** (Fig. 6E). Hyaline, veins brown. Bifurcation of vein $R_4$ and $R_5$ at about length of crossvein *m-m* after apex of discal cell. **Abdomen** (Fig. 6A). Mostly black, and silvery pruinosity. Tergite 1, anterior margin of tergite 2,

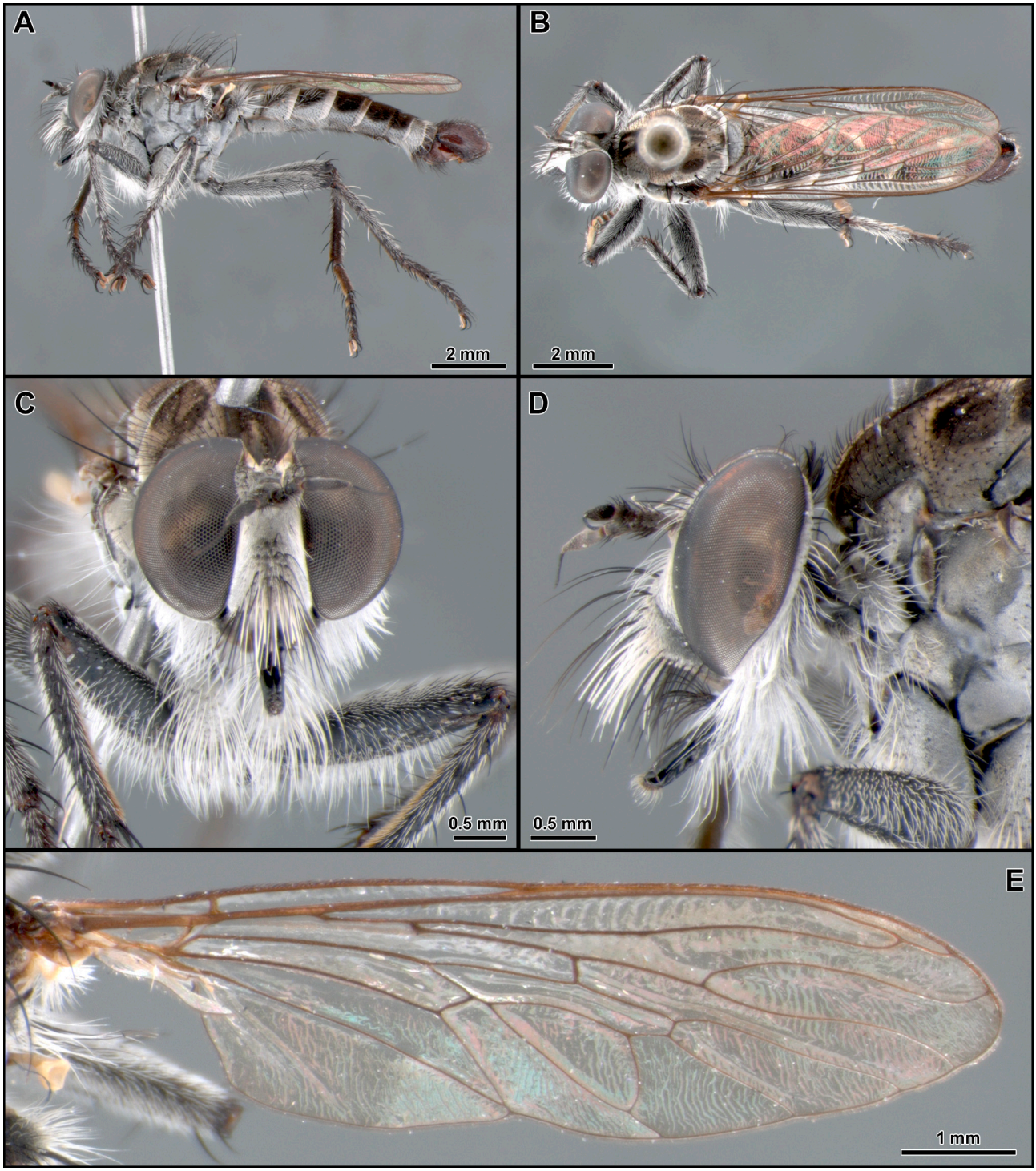


**FIGURE 6.** *Merucata cerradensis* **sp. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C, D.** Head in anterior and lateral views, respectively; **E.** Wing.

posterolateral margins of tergites 2 and 3, lateral margins of tergites 4–6 and wholly tergite 7 covered with dense silvery pruinosity. Tergites 1–3 wholly covered with white macrosetae, except posterior margins with black macrosetae; tergites 4–6 wholly covered with short black setae, longer at posterior margin; tergite 7 wholly covered with white setae, longer at posterior margin. Sternites wholly covered with silvery pruinosity and short white setae. Tergite 8 and sternite 8 subrectangular with somewhat rounded concavities at anterior margins (Fig. 7H, I), sternite 8 setose at posterior margin. **Terminalia** (Fig. 7). Dark reddish-brown and black setose (Fig. 7A, B). Epandrium extremely narrow basally broadening towards rounded posterior margin, ovoid in dorsal view with inner epandrial

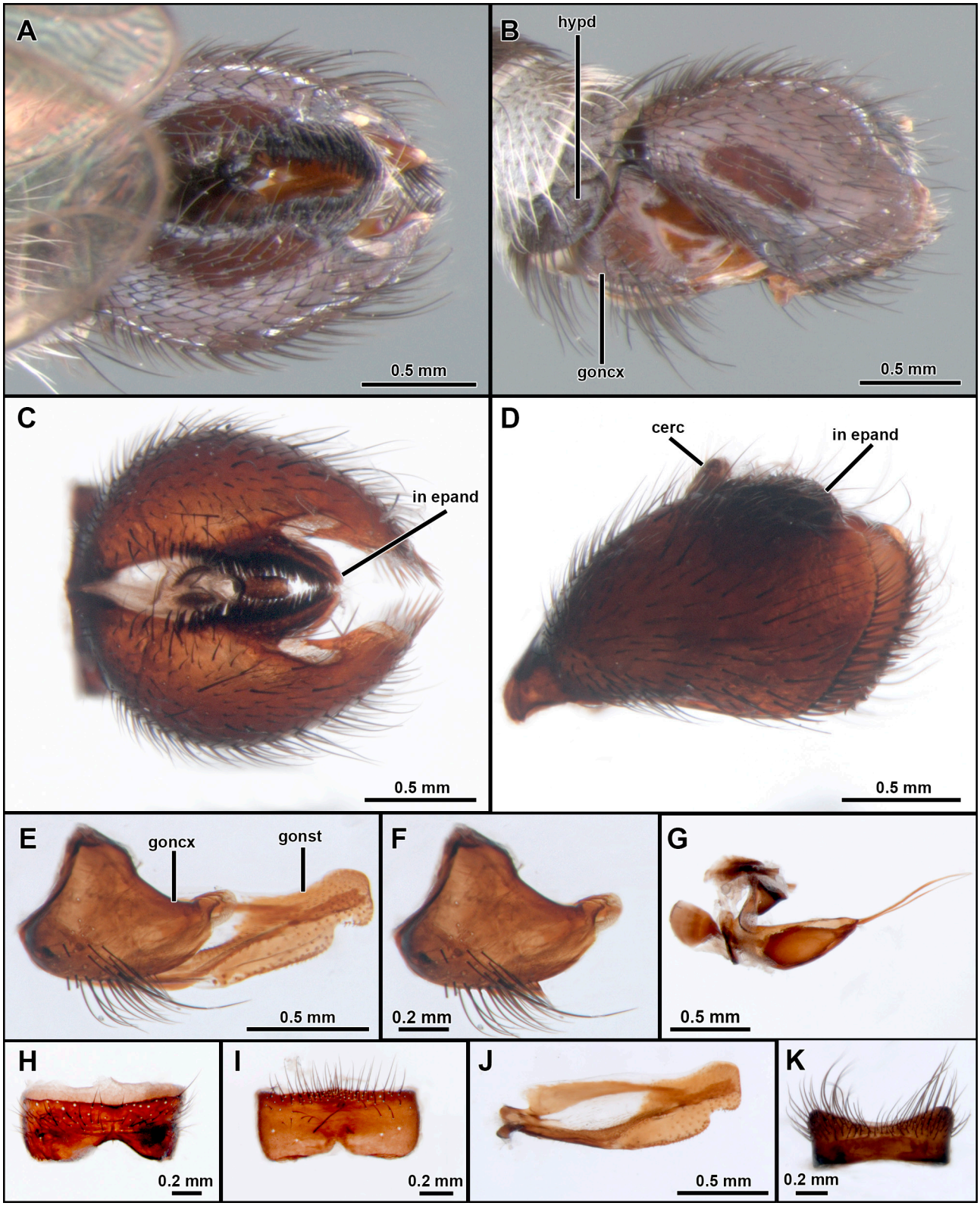


**FIGURE 7.** *Merucata cerradensis* **sp. nov.** (male paratype). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Terminalia in dorsal and lateral views (after dissection); **E.** Gonocoxite and gonostylus; **F.** Gonocoxite; **G.** Phallus and ejaculatory apodeme; **H.** Tergite 8; **I.** Sternite 8; **J.** Gonostylus; **K.** Hypandrium. Abbreviations: cerc= cercus; goncx = gonocoxite; gonst = gonostylus; hypd = hypandrium; in epand = inner dorsal process of epandrium.

dorsal process arising at mid-length followed by V-shaped indentation (Fig. 7A–D); inner epandrial dorsal process with row of short, stout macrosetae (Fig. 7C); distal posterior margin of epandrium with comb of relative short, stout black macrosetae (Fig. 7C, D). Cercus and subepandrial sclerite short and subrectangular. Hypandrium concave and mostly asetose at middle posterior edge, with macrosetae along posterolateral margin (Fig. 7K). Gonocoxite subtriangular in lateral view, narrowing towards rod-like rounded apex; somewhat depressed along mid-dorsal length; bearing macrosetae along ventral margin (Fig. 7E). Gonostylus about twice as long as gonocoxite, subrectangular in lateral view, gentle concave at dorsal margin; apex truncate with rounded corners, possessing indentation at ventral margin subapically (Fig. 7J). Ejaculatory apodeme fan-shaped (Fig. 7G). Prongs of phallus long, about half its length (Fig. 7G).

**Female.** Unknown.

**Type material. HOLOTYPE** ♂ (MZUSP) labelled: "Brasil, Mato Grosso, Parq. | Nac. Chapada Guimarães | 15°25'52"S 55°50'27"W | 03.xi.2008, cerrado | J. C. Almeida col."; "HOLOTYPE | *Merucata cerradensis* | Soares, Camargo & Lamas [red label]". Holotype condition: Good, not dissected. **PARATYPE.** Mato Grosso, Cuiabá, Cond. Flor do Cerrado, 15°29'29.7"S 56°04'30.4"W, Malaise 21, 28.x–04.xi.2011, Lamas, Nihei & eq. col. (1 ♂, dissected MZUSP).

**Remarks.** The broad distal half of the epandrium resembles that of *M. contiae* **sp. nov.**, however, the gonostylus with truncate apex (Fig. 7E, J) readily distinguishes it from that species. Additionally, *M. contiae* **sp. nov.** possesses bicolored femora (Fig. 8A, D) while in this species the femora are entirely black (Fig. 6A).

**Distribution.** The new species is only known from the state of Mato Grosso, Central-West Brazil in the Cerrado biome (Fig. 20).

**Etymology.** The specific epithet *cerradensis* is derived from Cerrado, the name of the tropical savanna biome that covers much of central Brazil, combined with the Latin suffix *-ensis*, meaning "originating from" or "inhabiting". The name refers to the species' distribution within this biome, especially in areas of Cuiabá and Chapada dos Guimarães, in the state of Mato Grosso.

### *Merucata contiae* Soares, Camargo & Lamas sp. nov.

(Figs 8, 9, 20)

**Diagnosis (male).** Easily recognized by the mystax composed of sparse macrosetae, not forming a dense ventral tuft (Fig. 8C, D); femora mostly reddish brown, except ventral surface, black (Fig. 8A, D); wing hyaline light brown, bifurcation of vein $R_4$ and $R_5$ distinctly distal to apex of discal cell (Fig. 8F); terminalia wider than tergite 8 in dorsal view (Fig. 9A); hypandrium with short concavity at middle of posterior edge, covered with long and slender tuft of setae (Fig. 9K); gonocoxite broad basally, slightly narrowing towards somewhat spear-shaped apex, mid-dorsal margin with a concave indentation at it mid-length, external surface sparsely setose (Fig. 9F).

**Description. Holotype male** (Fig. 8A). Body Length: 9.7 mm; wing length: 8.6 mm. Similar to *M. caipora* **sp. nov.**, except as noted: **Head** (Fig. 8A, C, D). Face wholly silvery pruinose; mystax composed with sparse macrosetae mixed black dorsally and white ventrally, not forming dense tuft of macrosetae below. Frons covered with golden pruinosity, except by short triangular area between ocellar tubercle and base of antenna black in anterior view; orbital setae yellow; occipital setae black; upper-most 5–6 postocular macrosetae black. **Thorax** (Fig. 8A, B, D). Antepronotum with row of short black macrosetae. Scutum covered with long setae at posterior margin, with median black stripe narrow, and mostly divided into two stripes, not reaching posterior margin of scutum; 2–3 black postsutural dorsocentral macrosetae, 2 black postalar macrosetae, dorsal surface of scutellum covered with scattered mixed white and black short setae. **Legs** (Fig. 8A, C–E). Mostly reddish brown, except anteroventral surface of femora, apex of tibiae and apical tarsomeres black. **Leg I.** Anterior surface of coxa with dense, slender white macrosetae. Femur mostly covered with white setae; ventral surface with rows of white and slender macrosetae at basal 2/3. Tibia with ventral to anteroventral row of 2–3 white macrosetae from basal 2/3 to apex. **Leg II.** Femur II covered with short white setae, longer at basal 1/3; 3 short, strong anteroventral setae at apical 2/3, 1 short anterior seta at apical 1/2. **Leg III.** Femur covered with short white setae; ventral row with 3–4 short white macrosetae, and 1 short preapical black macroseta, 1 antero and 1 posterodorsal preapical short macrosetae. **Wing** (Fig. 8F). Hyaline light brown, veins brown. Bifurcation of vein $R_4$ and $R_5$ at distance of one crossvein *m-m* distal to apex of discal cell; petiole of cell *cua* short, as long as humeral vein. **Abdomen** (Fig. 8B). Lateral and posterior margins of tergites 2–6 covered with silvery pruinosity, except tergite 5 mostly coppery pruinose, and tergite wholly silvery pruinose.

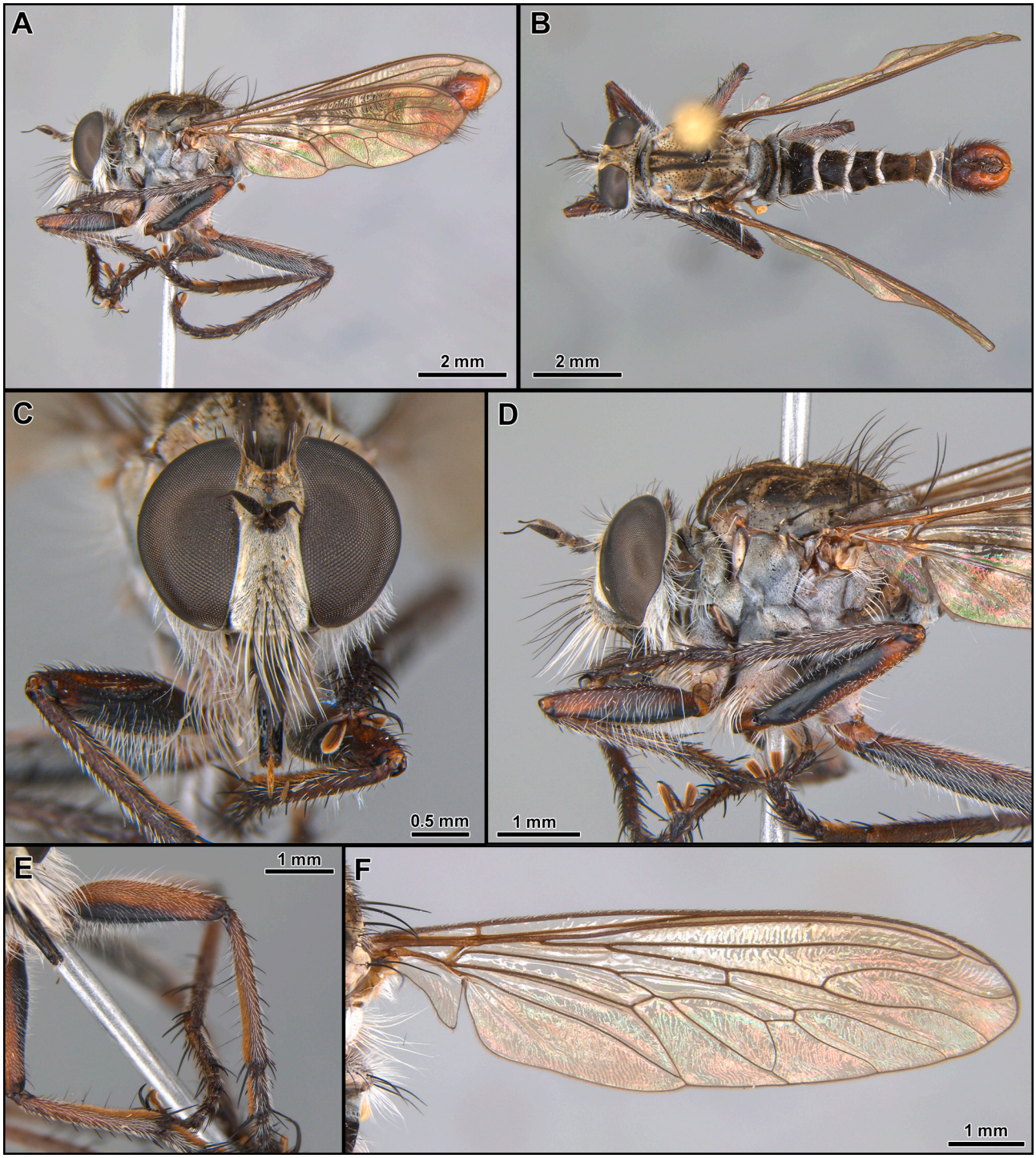


**FIGURE 8.** *Merucata contiae* **sp. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C.** Head in anterior view; **D.** Head and thorax in lateral view; **E.** Fore leg, anterior view; **F.** Wing.

Tergite 1 with 2–3 black lateral macrosetae and posterior row of short black setae; tergites 2–7 with lateral mixed black and white macrosetae, sternites wholly covered with weak silvery pruinosity. Tergite 8 narrowing at middle of anterior and posterior edges; posterior corners with black macrosetae (Fig. 9H). Sternite 8 somewhat rectangular, with narrow concavity at middle of anterior edge, and posterior row of long black macrosetae (Fig. 9I). **Terminalia** (Fig. 9). Orangish-brown (Fig. 9A, B). Epandrium broad in dorsal view, somewhat subrectangular in lateral view; inner edge with wide median short digitiform dorsal process, almost reaching apex of epandrium; inner margin of dorsal process covered with dense, short spine-like macrosetae; apical edge of epandrium with comb of short macrosetae

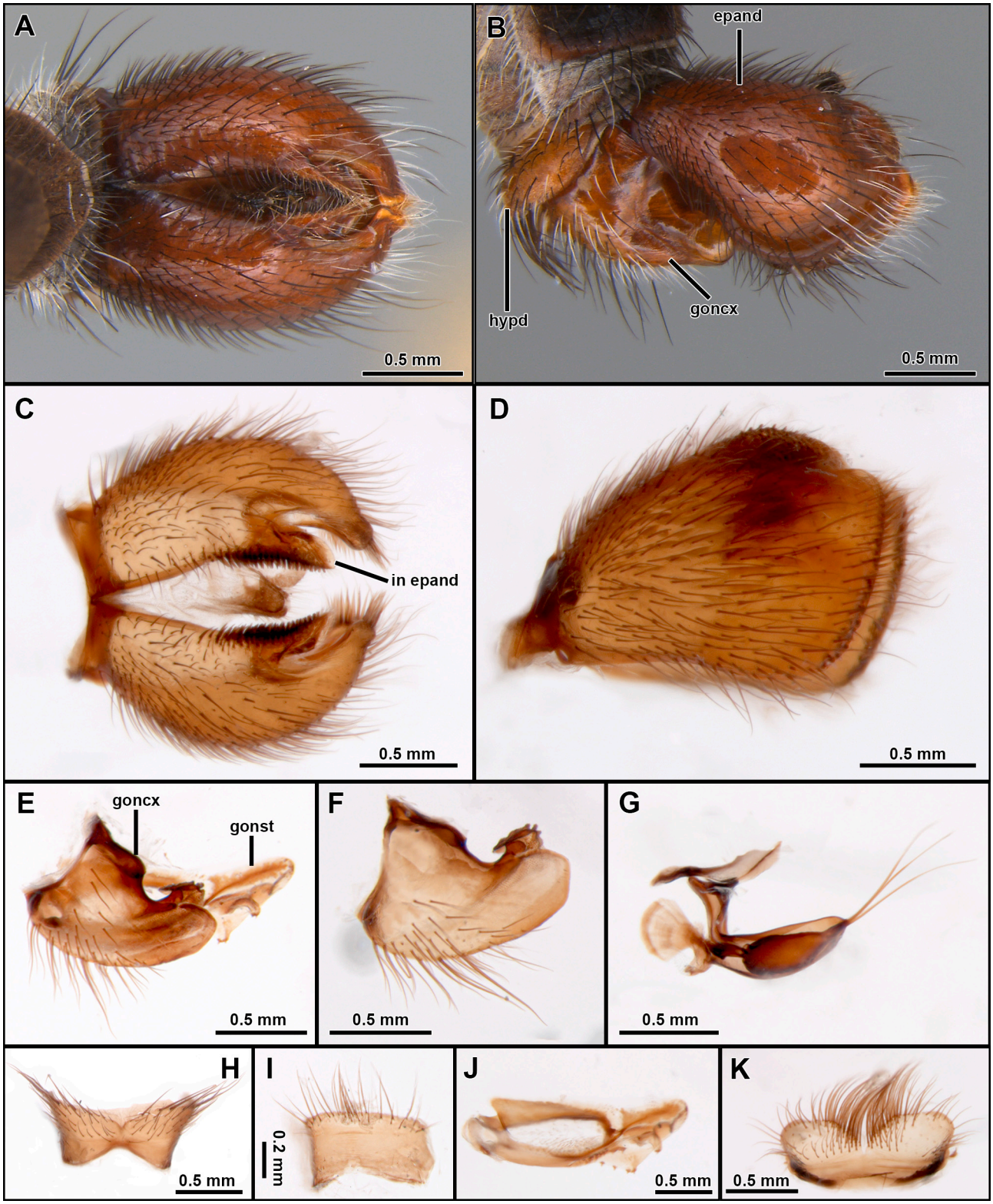


**FIGURE 9.** *Merucata contiae* **sp. nov.** (male paratype). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Terminalia in dorsal and lateral views (after dissection); **E.** Gonocoxite and gonostylus; **F.** Gonocoxite; **G.** Phallus and ejaculatory apodeme; **H.** Tergite 8; **I.** Sternite 8; **J.** Gonostylus; **K.** Hypandrium. Abbreviations: epand = epandrium; goncx = gonocoxite; gonst = gonostylus; hypd = hypandrium; in epand = inner dorsal process of epandrium.

(Fig. 9A–D). Hypandrium somewhat saddle-shaped, posterior margin with short concavity at middle, covered with dense black macrosetae; posterior corners with short setae (Fig. 9K). Gonocoxite mostly squared basally, abruptly narrowed at apical 1/2, with apicodorsal projection covered with spicules; basal 1/2 of outer edge covered with short setae, with a few macrosetae at basoventral margin (Fig. 9E, F). Gonostylus longer than gonocoxite, mostly knife-shaped, weakly sclerotized at middle; apicoventral margin and inner edge with short denticles; base with short concavity, forming short triangular lobe dorsally (Fig. 9E, J).

**Female:** Body length: 10.6–12.45 mm, wing length: 7.5–9.3 mm (n = 10). Similar to male, except as noted: face and frons mostly golden pruinose. Terminalia as in *M. caipora* **sp. nov.**

**Variation.** Body length: 9.7–11.8 mm, wing length: 7–9.4 mm (n = 10). Mystax with mixed black and white macrosetae, katatergite with mixed black and white macrosetae, femora almost entirely reddish-brown.

**Type material. HOLOTYPE** ♂ (MZUSP) labelled: "BRASIL, MS [Mato Grosso do Sul], Aquidauana | Res. Ecol. UEMS—Mata Ciliar | Corrego Fundo | 20°26'07.2"S 55°39'32.8"W | Malaise 09 | 11–26.ix.2011 | Lamas, Nihei & eq. col. Holotype condition: Good, not dissected. **PARATYPES:** Same data as holotype (7 ♂, 1 ♀, MZUSP); Same data, except: 26.ix–11.x.2011 (8 ♂, 3 ♀, MZUSP); same data, except: 11–26.x.2012 (2 ♂, 3 ♀, MZUSP); same data, except: 11–26.x.2011 (2 ♂, MZUSP); same data, except: 26.x–11.xi.2011 (1 ♂, 2 ♀, MZUSP); same data, except: 26.xi–11.xii.2011 (2 ♂, 1 ♀, MZUSP); same data, except: 26.ix–11.x.2012 (1 ♂, 1 ♀, MZUSP); same data, except: 26.xi–11.xii.2012 (2 ♀, MZUSP); same data, except: 26.x–11.xi.2012 (2♂, MZUSP); same data, except: 11–26.xi.2011 (2 ♀, MZUSP); same data, except: 11–26.ix.2012 (1 ♂, MZUSP); same data, except: Vegetação Aberta, Floresta Estacional Decidual 20°25'59.0"S 55°39'20.8"W, Malaise 08, 11–26.ix.2011 (8 ♂, 6 ♀, INPA); same data, except: 11–26.x.2012 (3 ♂, 4 ♀, MZUSP); same data, except: 26.ix–11.x.2011 (17 ♂, one dissected, 3 ♀, MZUSP); same data, except: 11–26.ix.2012 (5 ♂, MZUSP); same data, except: 11–26.x.2011 (4 ♂, 4 ♀, NHMW); same data, except: 26.x–11.xi.2011 (4 ♂, 1 ♀, MZUSP); same data, except: 11–26.xi.2011 (1 ♂, dissected, 3 ♀, MZUSP); same data, except: 26.viii–11.ix.2012 (2 ♂, MZUSP); same data, except: 26.ix–11.x.2012 (3 ♂, 2 ♀, MZUSP; 1 ♂, 1 ♀, NHMW); same data, except: 26.vi–11.vii.2012 (1 ♂, MZUSP); same data, except: 11–26.viii.2012 (1 ♂, MZUSP); same data, except: 11–26.xii.2011 (1 ♀, MZUSP); same data, except: Vegetação Fechada, 20°26'03.7"S 55°39'20.8"W, Malaise 07, 11–26.x.2012 (3 ♂, 2 ♀, MZUSP); same data, except:11–26.x.2011 (4 ♂, 1 ♀, MZUSP); same data, except: 11–26.ix.2012 (2 ♂, 2 ♀, MZUSP); same data, except: 26.x–11.xi.2012 (2 ♂, MZUSP); same data, except: 11–26.xi.2011 (2 ♂, one dissected, 1 ♀, MZUSP); same data, except: 26.x–11.xi.2011 (1 ♂, NHMW; 1 ♀, MZUSP); same data, except: 11–26.viii.2012 (1 ♂, MZUSP); same data, except: 26.viii–11.ix.2012 (1 ♂, MZUSP); same data, except: 26.ix–11.x.2012 (1 ♀, MZUSP); Porto Murtinho, 21°40'59.7"S 57°46'42.5"W, Malaise 31, 10–25.i.2012, Lamas, Nihei & eq. cols. (1 ♀, MZUSP); Corguinho, Taboco, Reserva Quinta do Sol, 19°46'40.8"S 55°14'59.0"W, Malaise 12, 29.viii–12.ix.2012, Lamas, Nihei & eq. cols. (1 ♂, MZUSP).

**Remarks.** This new species is similar to *M. pujoli* **sp. nov.** based on the fact that both possess bicolored femora, however *M. pujoli* **sp. nov.** has a complete yellow scape and pedicel (Fig. 15D), epandrium narrower than tergite 8 in dorsal view (Fig. 16A), and gonocoxite without concave indentation on its mid-dorsal length (Fig. 16E, F), contrasting, the antenna is wholly black (Fig. 8D), the epandrium is wider than tergite 8 (Fig. 9A) and the gonocoxite abruptly narrowed at apical 1/2, with an apicodorsal projection covered with spicules (Fig. 9E, F) in *M. contiae* **sp. nov.** This new species can also be considered similar to *M. cerradensis* **sp. nov.** based on the shape of male epandrium, broad at distal half in lateral view. However, in the latter the epandrium is somewhat oval in dorsal view and the gonocoxite does not possess a concave indentation on its mid-length dorsally.

*Merucata contiae* **sp. nov.** was the most frequently sampled species of the genus, with a total of 143 specimens examined (94 males and 49 females). Interestingly, the vast majority of specimens (141) were collected in the Ecological Reserve of the State University of Mato Grosso do Sul (UEMS), located in the municipality of Aquidauana. Additional material is represented only by a single female specimen collected in the city of Corguinho and one male in Porto Murtinho. No specimens of *M. contiae* **sp. nov.** were found in the municipality of Corumbá, at the Pantanal Research Station (Base de Estudos do Pantanal—BEP) of the Federal University of Mato Grosso do Sul (UFMS), nor in the municipalities of Bodoquena and Rio Verde, despite similar sampling efforts being conducted across all these localities (Lamas *et al.* 2023).

The high degree of endemism observed highlights the strategic importance of the UEMS Biological Reserve for biodiversity conservation. The municipality of Aquidauana, where the reserve is located, lies in the west-central portion of the state of Mato Grosso do Sul, between latitudes 18°35'18.2893"S and 20°30'50.3655"S, and longitudes 56°59'57.9281"W and 55°03'32.3429"W. A defining feature of this region is its location at the interface between

the Pantanal lowlands and the Maracaju-Campo Grande Plateau, which contributes to its rich biodiversity typical of ecotonal environments (Rodrigues *et al.* 2017).

The concentration of endemic species in this reserve underscores its role as a critical refuge and reinforces the need for continued scientific investigation and conservation efforts aimed at preserving the ecological integrity of this biologically diverse transition zone.

**Distribution.** The new species is recorded only from the state of Mato Grosso do Sul, in Central-West Brazil, in biomes of Cerrado and Pantanal (Fig. 20)

**Etymology.** Named after Camila Conti, biologist and technician at the Laboratório de Diptera (MZUSP), in recognition of her essential contribution to the maintenance and organization of the Diptera collection, as well as her active involvement in the fieldwork, including the collection, sorting, and preparation of specimens.

### *Merucata curupira* Soares, Camargo & Lamas sp. nov.

(Figs 10, 11, 19)

**Diagnosis (male).** Easily recognized by the bifurcation of vein $R_4$ and $R_5$ after apex of discal cell (Fig. 10E); apicoventral margin of epandrium with rounded projection (Figs 10A, 11B, D); hypandrium with slightly concavity at middle of posterior edge, lacking apical tuft of setae (setae only at posterolateral margins) (Fig. 11K); gonocoxite short, about 1/2 as long as gonostylus, subtriangular, and with 2–3 black macrosetae at ventral edge (Fig. 11E, F).

**Description. Holotype male** (Fig. 10A). Body Length: 11 mm; wing length: 7.5 mm. Similar to *M. caipora* **sp. nov.**, except as noted: **Head** (Fig. 10C, D). Face wholly silvery pruinose; mystax with mixed sparse black and white macrosetae, parafacial setae long and white; orbital setae short and white; occipital median setae black and curved dorsally; upper-most 5–6 postocular macrosetae black and strong. **Thorax** (Fig. 10A, B). Scutum covered with longer setae at posterior 1/2, with 2–3 dorsocentral macrosetae; 2 postalar macrosetae. **Legs** (Fig. 10A, C). Black, except tibiae and tarsus dark yellow to reddish brown. **Leg I.** Anterior surface of coxa with dense, slender white macrosetae. Femur covered with short white setae, longer and dense at basal 2/3 of ventral surface; a few short black setae at apical 1/3 of dorsal surface. Tibia with 4 posteroventral white macrosetae; apical crown of mixed white and black setae. **Leg II.** Femur covered with short white setae, longer at basal 1/2 of ventral surface, 2 anterior and 2 anteroventral short white macrosetae at apical 1/2. Tibia wholly covered with white setae, except apical crown of setae with a few black setae. Tarsus with mixed white and black setae. **Leg III.** Posterior margin of dorsal surface of coxa with 1–2 short white macrosetae. Femur covered with short white setae, ventral row of short, strong white setae; 2 short, strong anterior setae, 1 at basal 1/2 and 1 at apical 1/2; 1 antero- and 1 posterodorsal short, strong, short white preapical setae. Tibia wholly covered with white setae. Tarsus with mixed white and black setae. **Wing** (Fig. 10E). Hyaline, veins brown. Bifurcation of vein $R_4$ and $R_5$ about 2 times length of crossvein *m-m* after apex of discal cell; petiole of cell *cua* as long as humeral vein; stump vein on vein $R_4$ present only on right wing. **Abdomen** (Fig. 10A, B). Mostly black, becoming orange from posterior edge of segment 5. Posterior edge of tergites 1–4 with black macrosetae; posterolateral edges of tergites 1–6 with white macrosetae. Tergite 8 somewhat bow tie shaped, with row of black, sparse macrosetae at posterior edge (Fig. 11H). Sternites wholly covered with weak silvery pruinosity. Sternite 8 somewhat rectangular, with posterior row of short setae (Fig. 11I). **Terminalia** (Fig. 11). Orangish-brown (Fig. 11A, B). Epandrium mostly subrectangular in lateral view, with apicoventral rounded projection; inner edge with median short, rounded process dorsally; inner margin of dorsal process covered with sparse, short spine-like macrosetae (Fig. 11C); apical edge of apicoventral projection of epandrium with comb of short macrosetae (Fig. 11C). Hypandrium somewhat subrectangular, with rounded posterior corners, mostly covered with short black setae, longer at posterolateral margins and bare at middle (Fig. 11K). Gonocoxite short, about 1/2 as long as gonostylus, mostly subtriangular, with rounded apex; outer edge covered with short setae, with 2–3 macrosetae at ventral margin (Fig. 11E, F). Gonostylus about 2 times longer than gonocoxite, mostly subrectangular, weakly sclerotized at middle; apex digitiform, covered with spicules; base with short concavity, forming almost inconspicuous triangular lobe dorsally (Fig. 11E, J). Ejaculatory apodeme short, somewhat spoon-shaped (Fig. 11G).

**Female.** Similar to male, except by: Body length: 7.5–10.3, wing length: 6–7 mm (n = 2). Terminalia as in *M. caipora* **sp. nov.**

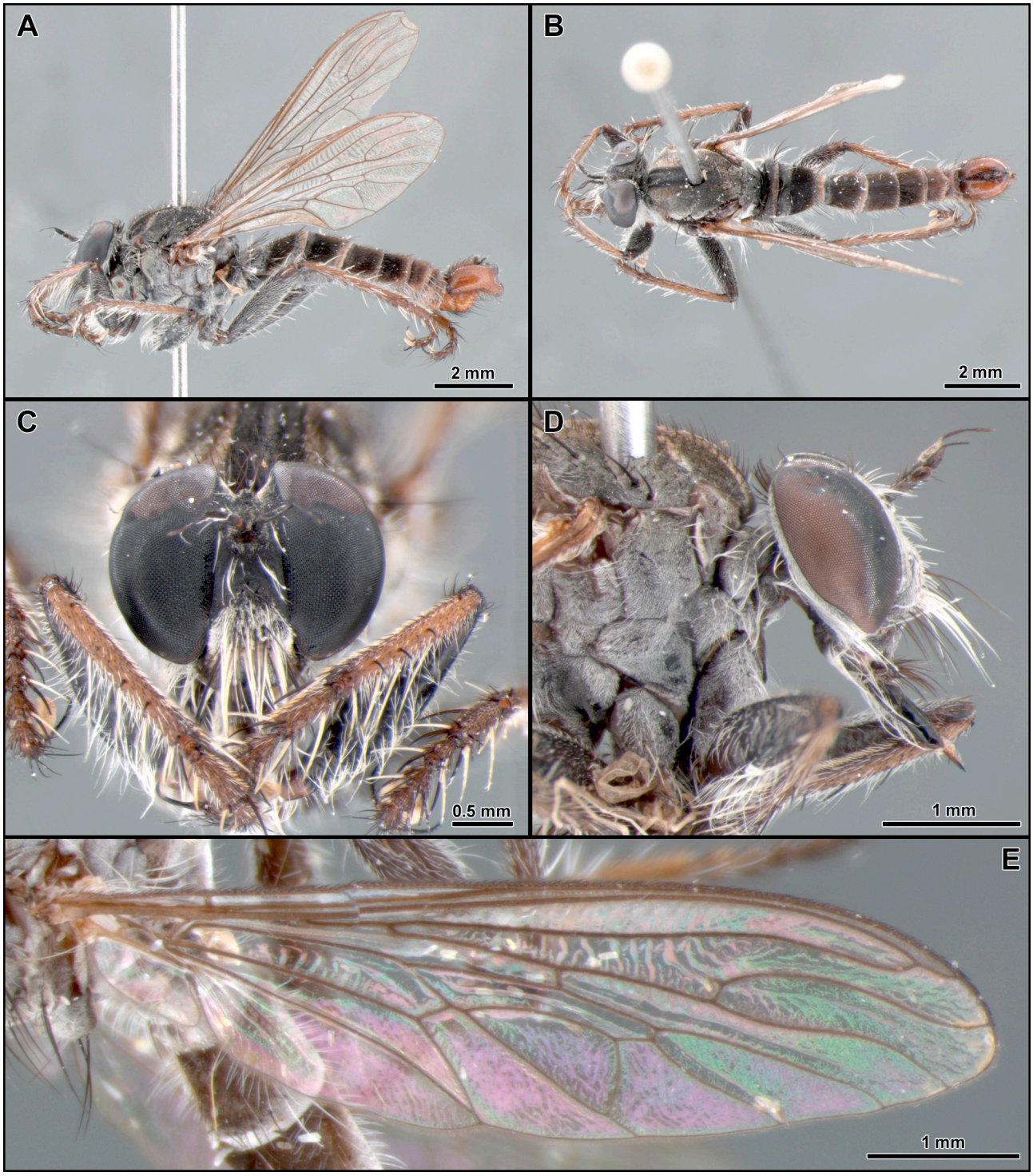


**FIGURE 10.** *Merucata curupira* **sp. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C, D.** Head in anterior and lateral views, respectively; **E.** Wing.

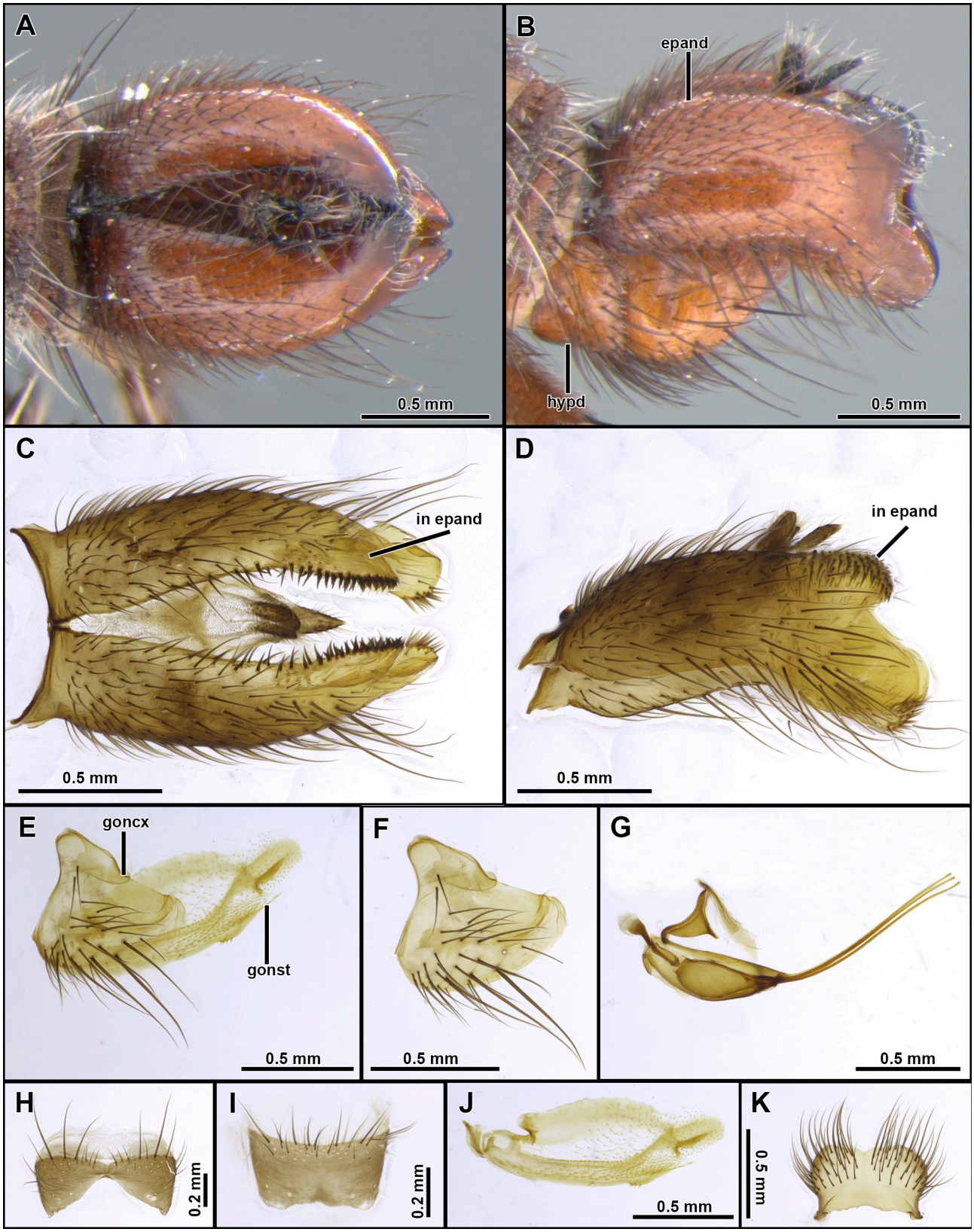


**FIGURE 11.** *Merucata curupira* **sp. nov.** (male paratype). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Terminalia in dorsal and lateral views (after dissection); **E.** Gonocoxite and gonostylus; **F.** Gonocoxite; **G.** Phallus and ejaculatory apodeme; **H.** Tergite 8; **I.** Sternite 8; **J.** Gonostylus; **K.** Hypandrium. Abbreviations: epand = epandrium; goncx = gonocoxite; gonst = gonostylus; hypd = hypandrium; in epand = inner dorsal process of epandrium.

**Variation.** Specimens from the municipality of Bom Jesus are distinctly smaller than the holotype male from the municipality of Corrente, both in the state of Piauí, but the male terminalia are virtually identical. This size difference may be an artifact of the preservation method, as the specimens from Bom Jesus were collected using Malaise traps with pyrethroid-treated tapes, whereas those from Corrente were initially preserved in alcohol. Alternatively, the observed variation may reflect environmental influences associated with the distinct biomes in the region. The municipalities of Corrente and Bom Jesus, both located in the southern region of the state of Piauí, are situated in a transitional zone between the Cerrado and Caatinga biomes. As a result, these areas exhibit a high degree of biome diversity, with a predominance of Cerrado and Caatinga vegetation, along with ecotonal zones and remnants of Atlantic Forest. Consequently, the region includes both drier environments, typical of the Caatinga, and more humid areas, associated with the Atlantic Forest and some Cerrado formations, which may influence the morphological variation observed among specimens.

Such pronounced intraspecific variation is common in Asilidae, and therefore, molecular tools should be applied to better understand it. For the time being, the shorter specimens from Bom Jesus are not being designated as paratypes.

**Type material. HOLOTYPE** ♂ (MZUSP) labelled: "BRASIL: PI [state of Piauí]: Corrente [ca 10°26'20.9"S 45°09'20.6"W] | 23–27.xi.1991 | Amarante, Brandão, Cancello | Martins & Ponte col." "HOLOTYPE | *Merucata curupira* | Soares, Camargo & Lamas [red label]". Holotype condition: Good, not dissected. **PARATYPE:** same data as holotype (1 ♂, dissected, MZUSP).

**Additional material examined.** Piauí, Bom Jesus, Riacho Palmeira, 09°03'04.04"S 44°21'25.3"W, 29–01.xi.2018, Malaise, Fialho, R. J.; Miranda, S. B. S. C.; Aragão, J. S.; Silva, B.; Câmara, J. T. (2 ♂, both dissected, 1 ♀, INPA; 1 ♂, 1♀, dissected, MZUSP).

**Remarks.** The new species is easily recognized by the male epandrium with an apicoventral rounded projection (a unique and apomorphic condition in the genus).

**Distribution.** Brazil, state of Piauí (Fig. 19). The specimens were collected in the municipalities of Bom Jesus and Corrente in the state of Piauí, both in the transition zone between the Cerrado and Caatinga biomes.

**Etymology.** After the Brazilian native people legend of 'Curupira'—a boy who lives in the wild, has the feet turned backwards and a hair of 'fire' and protects the forest from hunters and other nature wasters.

### *Merucata elliptica* (Scarbrough & Perez-Gelabert) comb. nov.

(Figs 12, 13, 14, 19)

*Martintella elliptica* Scarbrough & Perez-Gelabert, 2010: 194, figs 1–12. Type locality: Trinidad and Tobago, Maracas.

**Diagnosis (male).** The species can be segregated from the congeners by mystax composed with dense white macrosetae below, with a few black macrosetae above (Fig. 12A, C, D); face wholly covered with golden pruinosity (Figs 12C, 13C); 2–3 dorsocentral postsutural macrosetae (Fig. 12A, D); 2 postalar macrosetae; base of vein $R_4$ nearly straight (Fig. 12E); anterior surface of femur I mostly covered with short black setae, basal 2/3 of ventral surface with long rows of white and slender setae; basal 1/2 of anterior surfaces of femora II and III mostly covered with short white setae, apical 1/2 mostly with short black setae (Fig. 12A); epandrium subtriangular in lateral view, and inner projection somewhat elliptical (Fig. 14C).

**Type material examined. HOLOTYPE** ♂ (NMNH, based on photographs (Fig. 13)) labelled as: "TRINIDAD | Maracas [ca 10°45'31.0"N 61°26'29.1"W] | July 1.15, 62 | J. Maldonado C." "HOLOTYPE *Martintella* | *elliptica* Scarbrough & | Perez-Gelabert [red label]" "USNMENT | 01071658".

**Additional material examined.** Cumbre de Aguirre [ca 10°13'26.2"N 68°16'10.1"W]—CA, Venezuela, 12-I.54, 800m (1 ♂, dissected, MZUSP).

**Remarks.** *Merucata elliptica* **comb. nov.** was originally described in *Martintella*. However, Vieira *et al.* (2014: 454) already suspected about its placement in that genus and suggested that the generic placement may need additional study. In *Martintella* the postpedicel is oval (drop-shaped); male sternite 8 has projections or is strongly bulged at posterior margin (see Vieira *et al.* 2014, figs 24, 35); gonostylus is arched and visible from its base in lateral view (after dissection); phallus is concealed ending in three short prongs down-curved distally (hook-shaped) (Vieira *et al.* 2014, figs 6, 23, 35); female tergite 8 is more than 2 times the length of tergite 7; and the female sternite 8 is asetose. In contrast, *M. elliptica* **comb. nov.** and all new species described here in *Merucata* **gen. nov.** possesses

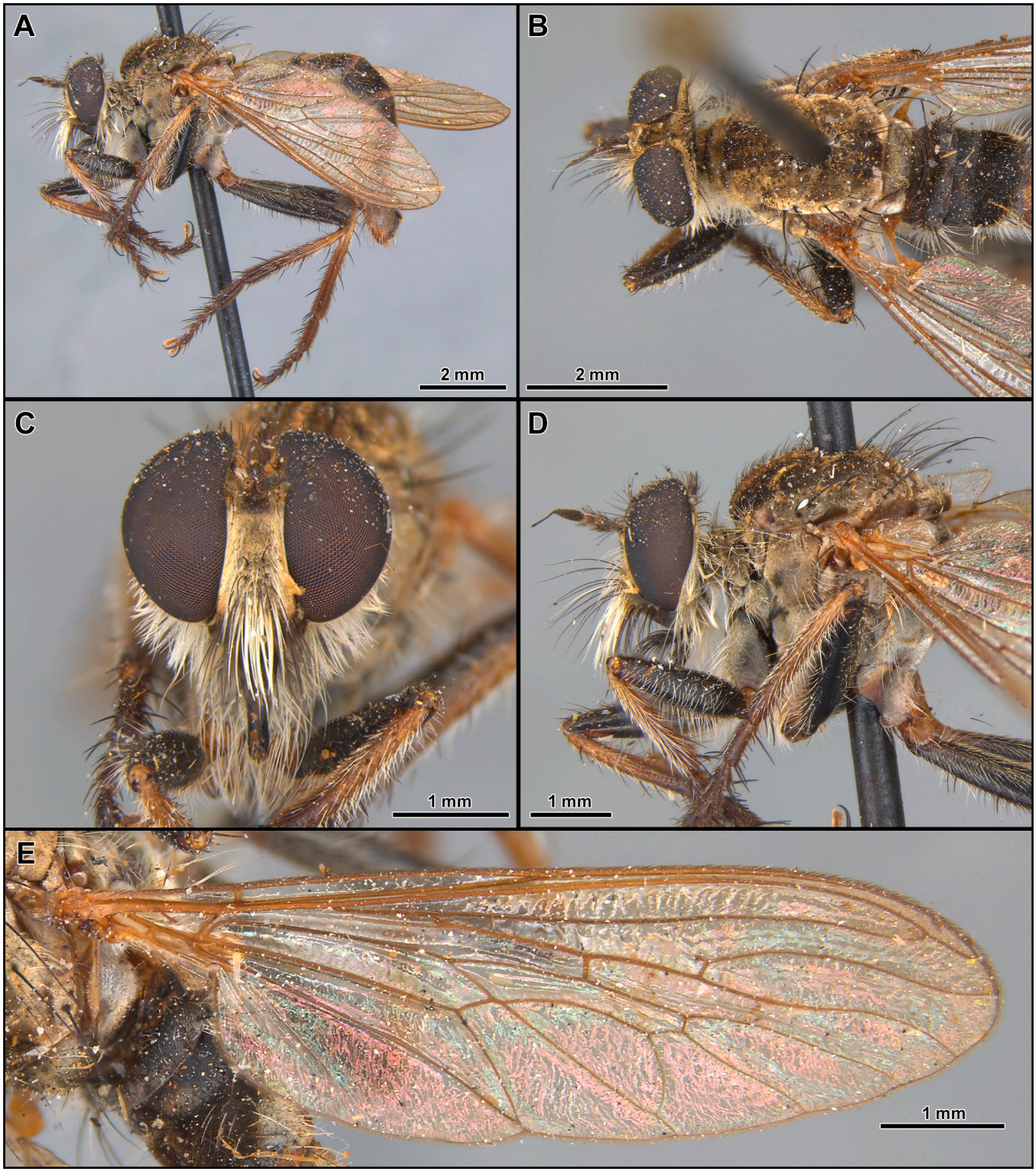


**FIGURE 12.** *Merucata elliptica* **comb. nov.** (identified male from Venezuela, before dissection). **A, B.** Habitus in lateral and dorsal views, respectively; **C.** Head in anterior view; **D.** Head and thorax in lateral view; **E.** Wing.

the postpedicel lanceolate; male posterior margin of sternite 8 somewhat rectangular or squared (simple and straight, without projections) (e.g., Figs 2J, 5I, 7I); gonostylus is more or less straight with its base hidden behind gonocoxite (after dissection); phallus is unconcealed, ending in three long prongs (prongs about half the length of phallus) and straight distally; female tergite 8 is only about 1.5 times the length of tergite 7; and female sternite 8 is setose basally. These characters fully justify the transference of this species to the new genus. Thus, the previous generic combination with *Martintella* cannot be maintained and *Merucata elliptica* (Scarbrough & Perez-Gelabert, 2010) **comb. nov.** is a new combination with *Merucata* **gen. nov.** herein proposed.

**Distribution.** *Merucata elliptica* **comb. nov.** is the only species recorded outside Brazil, previously registered from Trinidad and Tobago and newly recorded from Venezuela (Fig. 19).

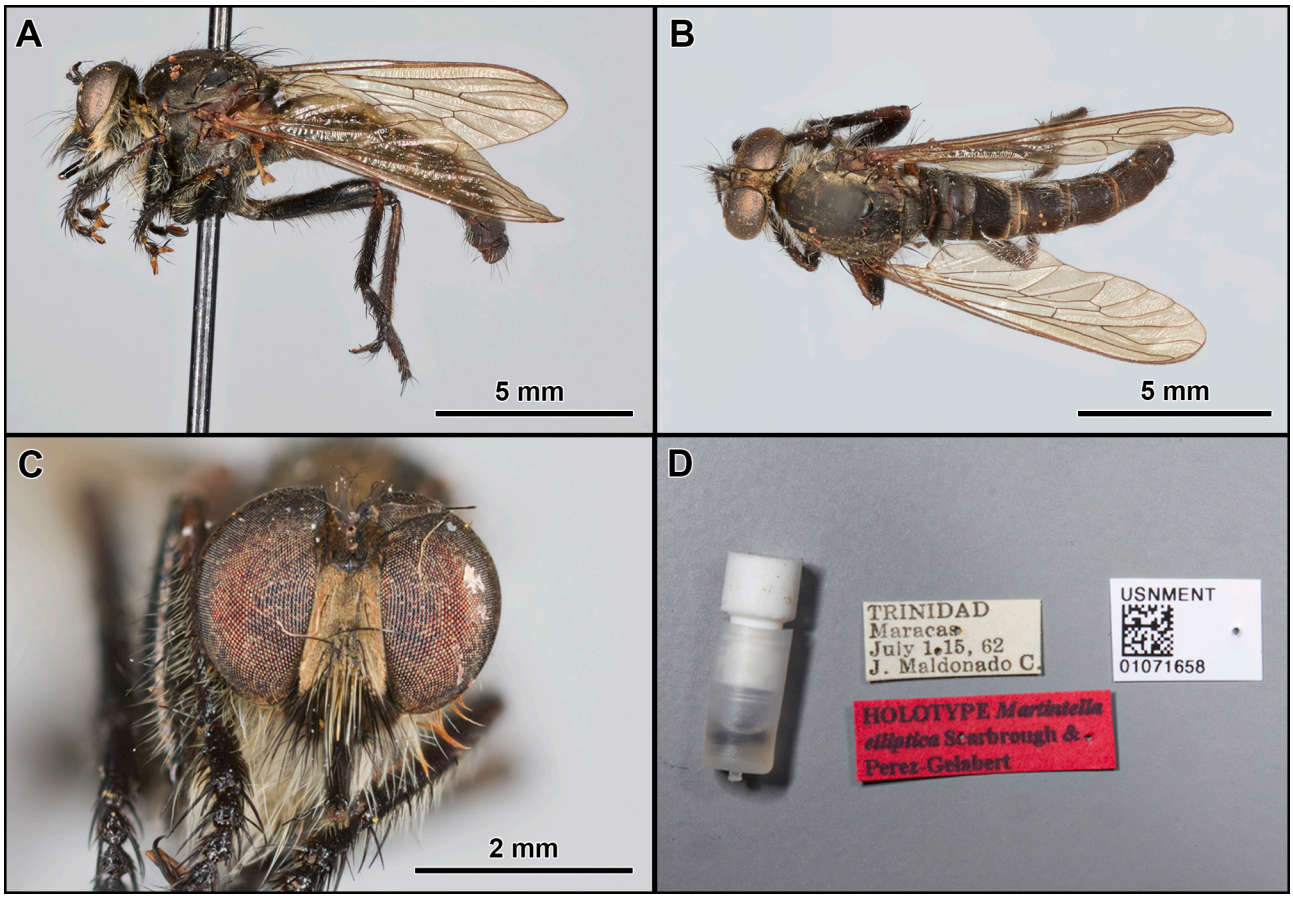


**FIGURE 13.** *Merucata elliptica* **comb. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C.** Head in anterior view; **D.** labels and microvial with genitalia.

### *Merucata pujoli* Scorpione, Soares & Lamas sp. nov.

(Figs 15, 16, 20)

**Diagnosis (male).** Easily distinguished by congeners by antenna with scape and pedicel yellow (Fig. 15A, D); tibiae mostly orangish brown to pale brown (Fig. 15A); lateral edges of tergites and sternites yellowish (Fig. 15A); hypandrium almost bare, only with few short and slender setae at posterior edge (Fig. 16K); gonostylus with two apical dentiform ventral projections (Fig. 16E, J).

**Description. Holotype male** (Fig. 15A). Body length: 9.2 mm; wing length: 7.0 mm. Similar to *M. caipora* **sp. nov.**, except as noted: **Head** (Fig. 15A, C, D). Antenna yellow, except postpedicel and stylus black; scape and pedicel covered with short white setae. Face silvery pruinose, except by narrow golden pruinose stripe close to eye margin; mystax with dense white macrosetae below, with a few black macrosetae above and at oral margin; facial setae long and white. Frons mostly covered with golden pruinosity, except ocellar tubercle and small triangular area in front of ocellar tubercle black; ocellar tubercle with 5–6 pairs of long, slender black setae; orbital setae long and white; a few long and slender, mixed black and white occipital median setae. Upper-most 5–6 postocular macrosetae black and strong, remaining postocular setae slender and white. **Thorax** (Fig. 15A, B). Antepronotum pale brown, sparsely covered with golden pruinosity, marginal row of short and strong white setae, with abundant slender white setae laterally. Scutum mostly covered with short black setae (remarkable longer than in *M. caipora* **sp. nov.**) and golden pruinosity, except notopleuron, postpronotal lobe and above postalar callus with short white setae; dorsocentral region in front of scutellum with abundant long and slender setae and 2–3 pairs of dorsocentral macrosetae. Scutellum covered with golden pruinosity, dorsal surface with sparse long white setae. Pleura mostly pale brown, sparsely covered with mixed silvery and golden pruinosity; katatergite with vertical row of strong

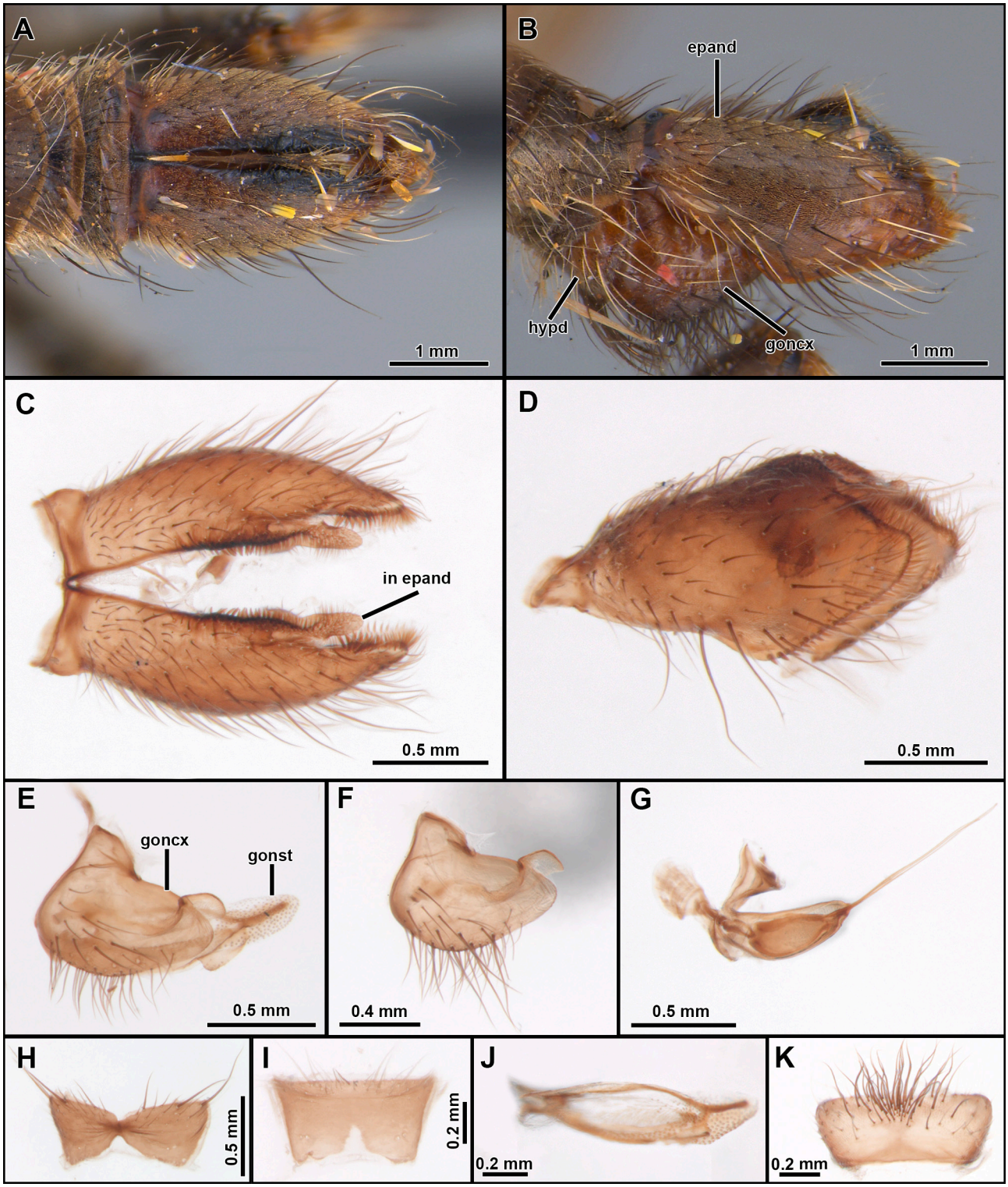


**FIGURE 14.** *Merucata elliptica* **comb. nov.** (identified male from Venezuela). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Terminalia in dorsal and lateral views (after dissection); **E.** Gonocoxite and gonostylus; **F.** Gonocoxite; **G.** Phallus and ejaculatory apodeme; **H.** Tergite 8; **I.** Sternite 8; **J.** Gonostylus; **K.** Hypandrium. Abbreviations: epand = epandrium; goncx = gonocoxite; gonst = gonostylus; hypd = hypandrium; in epand = inner dorsal process of epandrium.

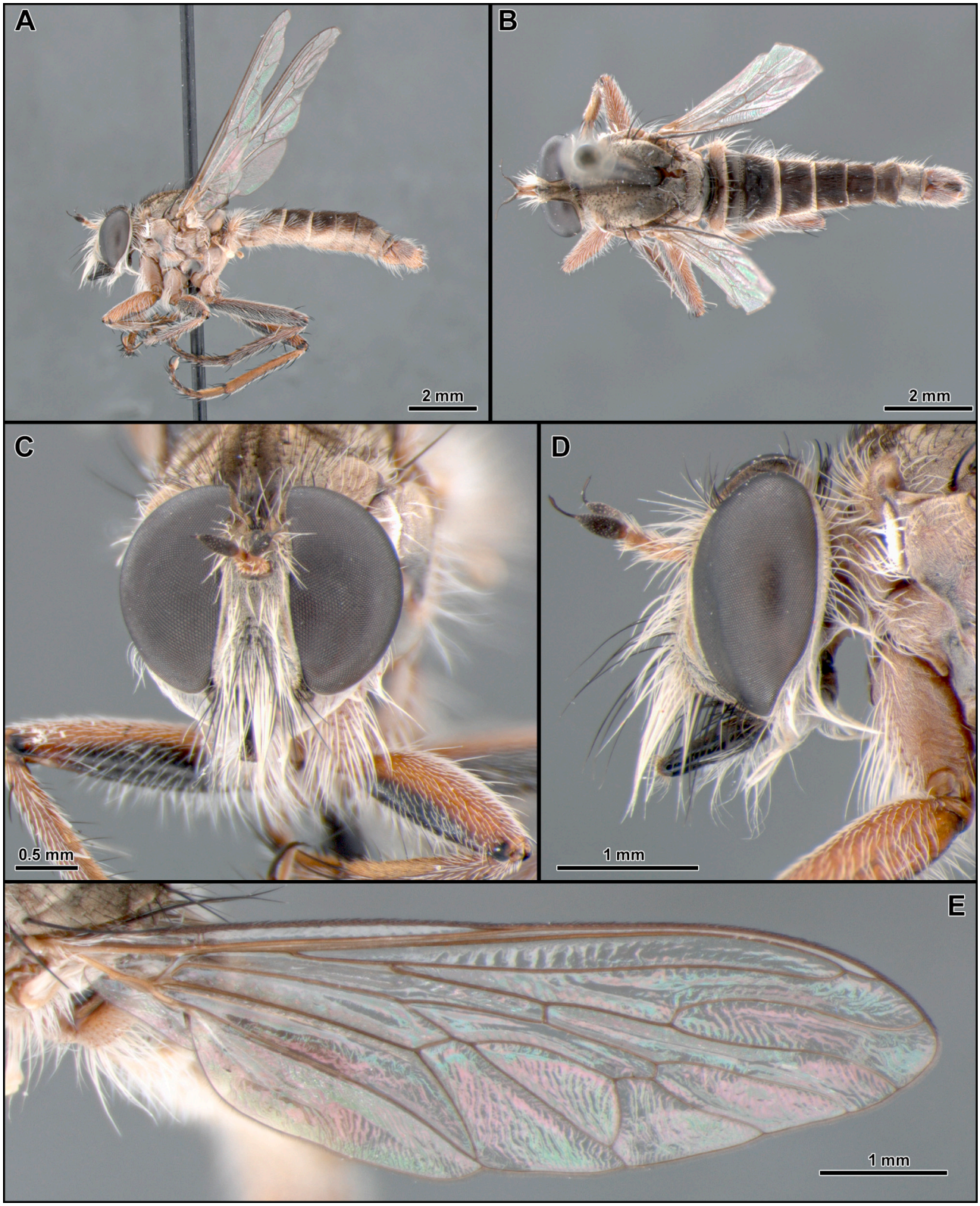


**FIGURE 15.** *Merucata pujoli* **sp. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C, D.** Head in anterior and lateral views, respectively; **E.** Wing.

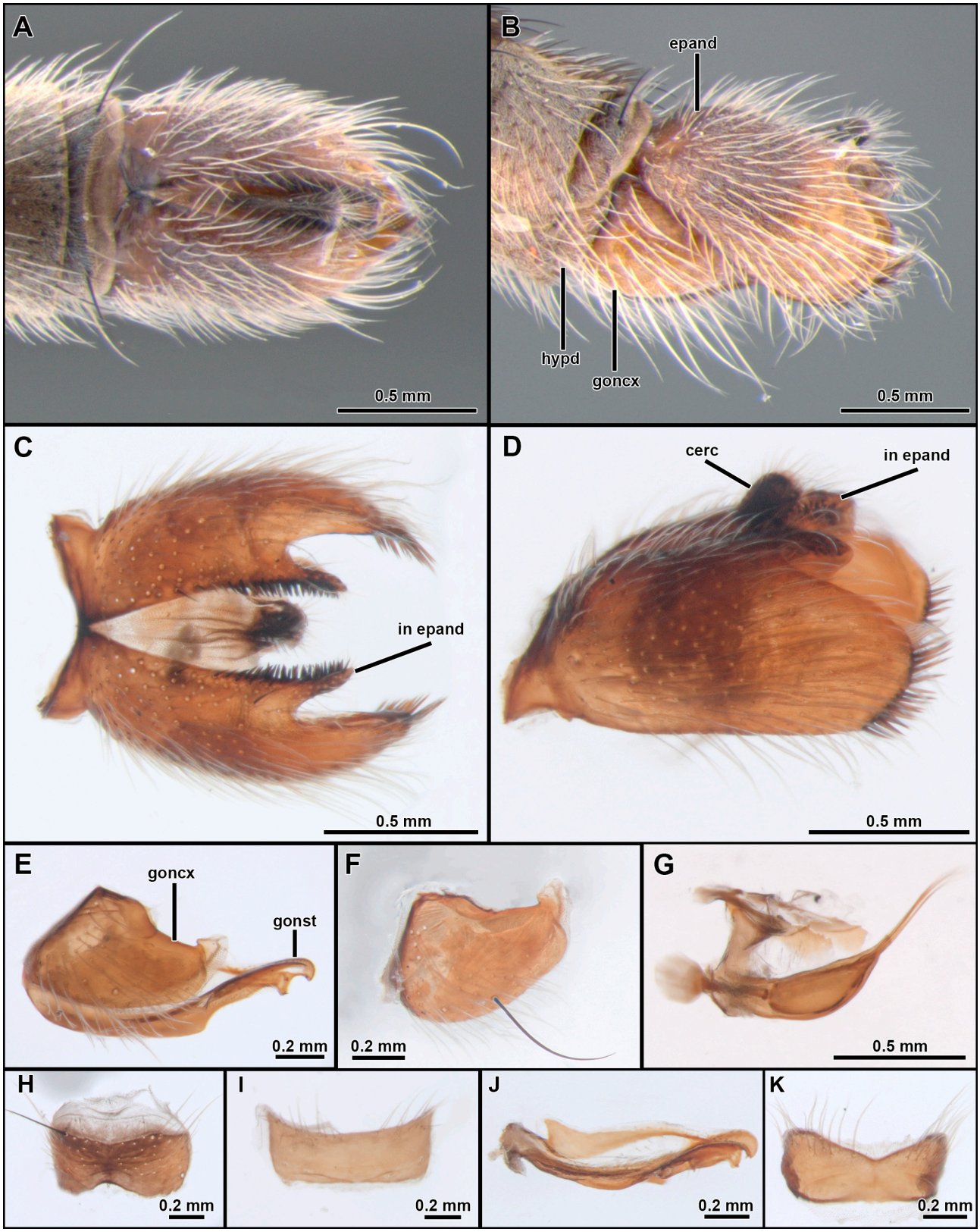


**FIGURE 16.** *Merucata pujoli* **sp. nov.** (male paratype). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Terminalia in dorsal and lateral views (after dissection); **E.** Gonocoxite and gonostylus; **F.** Gonocoxite; **G.** Phallus and ejaculatory apodeme; **H.** Tergite 8; **I.** Sternite 8; **J.** Gonostylus; **K.** Hypandrium. Abbreviations: cerc = cercus; epand = epandrium; goncx = gonocoxite; gonst = gonostylus; hypd = hypandrium; in epand = inner dorsal process of epandrium.

white macrosetae (with 1–2 black macrosetae), with a few sparse long and slender white setae at posterior margins of anepisternum and katepisternum, and anterior margin of meron. **Legs** (Fig. 15A). Mostly orangish brown to pale brown, except anterior and ventral surfaces of all femora and apical 1/2 of all last tarsomeres dark brown to black. **Leg I**. Coxa sparsely covered with silvery pruinosity; anterior surface with abundant long, slender white macrosetae. Femur covered with short white setae; ventral row of white, slender macrosetae decreasing in length towards apex. Tibia with dorsal row of short, strong black setae; 3–4 white posteroventral macrosetae; crown of black macrosetae at apex. **Leg II**. Apical edge of anterior surface of coxa with strong white macrosetae; dorsal surface with row of slender white setae, ending in 2–3 strong near apex. Femur with anteroventral row of 3–4 short, strong white macrosetae, ending in 1 black macroseta near apex; 2 anterior short, strong white macrosetae, 1 at basal 1/2 and 1 at apical 1/2; 2 short, black posterior macrosetae near apex; ventral row of long, slender setae decreasing in length towards apex. Tibia with dorsal row of short black setae from basal 2/3 to apex; posteroventral row of long white setae from base to apex; 3 long, black ventral setae at apical 1/2; crown of strong black setae at apex. Tarsus II as in tarsus I. **Leg III.** Posterior edge of coxa with row of short, strong white macrosetae. Femur with 2 short, strong white anterior macrosetae near middle; 1 antero- and 1 posteroventral rows of short and strong white macrosetae from base to apex; 1 anterodorsal, 1 dorsal and 2 posterior strong black macrosetae near apex. Tibia with 3 anterodorsal short, strong setae, 2 black at basal 1/2 and 1 white near apex; posterodorsal row of short, slender black setae from base to apical 2/3, 2–3 short, strong anteroventral setae at apical 1/2; crown of short, strong black setae at apex. Tarsus as in tarsus I. **Wing** (Fig. 15E). Hyaline, veins brown; bifurcation of vein $R_4$ and $R_5$ at apex of discal cell at a distance as long as humeral vein; cell *cua* closed, petiole shorter than humeral vein. **Abdomen** (Fig. 15A, B). Tergites mostly brown, except lateral margins of all tergites yellowish to pale brown; sternites wholly pale brown. Tergites mostly covered with short black setae, becoming white at lateral margins; tergite 1 almost entirely covered with white setae, with a few black setae at posterior margin. Tergites 1–8 with lateral macrosetae, wholly white on tergite 1 and mixed white and black on remainder. Tergite and sternite 8 subrectangular, anterior margin of tergite 8 slightly concave, bearing a few macrosetae along posterior margin (Fig. 16H); sternite 8 only with a few setae along posterior margin (Fig. 16I). Sternites wholly covered with white setae. **Terminalia** (Fig. 16). Orangish-brown and mostly white setose (Fig. 16A, B). Epandrium subrectangular in lateral view with posterior margin rounded, bearing comb of short, stout brown macrosetae (Fig. 16C, D); inner dorsal margin with inner dorsal process subapically followed by deep U-shaped indentation; inner dorsal process and inner epandrial margin at mid-length with row of short, stout black macrosetae (Fig. 16C). Cercus and subepandrial sclerite short, shorter than inner epandrial dorsal process, rounded distally (Fig. 16C, D). Hypandrium subrectangular with posterior margin concave and with a few slender setae along posterior corners (Fig. 16K). Gonocoxite subtriangular with dorsal margin slightly depressed at mid-length; external basal and ventral margins setose bearing 2–3 macrosetae (Fig. 16E, F). Gonostylus slender, about 1/3 longer than gonocoxite with apex down curved forming subapical U-shaped concavity; ventral margin prior to concavity slightly depressed; resembling adjustable plumb plier (Fig. 16E, J); ejaculatory apodeme fan-shaped (Fig. 16G); phallus ending in three separated prongs as long as half of phallus length (Fig. 16G).

**Female.** Unknown.

**Type material. HOLOTYPE** ♂ (MZUSP) labelled: "BRASIL, DF [Federal District], Brasília | Faz. Água Limpa-FAL UnB | Ponto 1 | 15°56'55.2"S/47°54'25.99"W | 17.v–16.vi.2023 | Armadilha Malaise | Equipe LADDi col." "UNB | 241743" "HOLOTYPE | *Merucata pujoli* | Scorpione, Soares & Lamas [red label]. Holotype condition: Good, not dissected. **PARATYPES:** same data as holotype, except: "UNB | 241754", "UNB | 241755" (1 ♂, dissected, MZUSP; 2 ♂, DZUB); same data, except: 11.viii–06.ix.2023, "UNB | 241756" (1 ♂, DZUB); same data, except: Ponto 2, 15°56'48"S 47°54'35,9"W, 07–19.vii.2023, "UNB | 241750", "UNB | 241751", "UNB | 241752", "UNB | 241753" (1 ♂, MZUSP; 3 ♂, DZUB); same data, except: Córrego Taquara, 15°56'18"S 47°54'59"W, 7.vii.2023, coleta manual, "UNB | 241757", "UNB | 241758" (2 ♂, MZUSP); same data, except: Armadilha Malaise, "UNB | 241759" (1 ♂, MZUSP); same data, except: 14.vii.2023, Armadilha Pan Trap, "UNB | 241760" (1 ♂, DZUB).

**Remarks.** *Merucata pujoli* **sp. nov.** is the most contrasting species of the genus, easily segregated from the congeners by the more "lighter" color pattern, mainly the scape and pedicel yellow (Fig. 15C, D), femora bicolored (Fig. 15A, C), lateral margins of tergites without dense silvery pruinosity (Fig. 15A) and sternites pale brown, besides the hypandrium almost bare, with only a few and sparse slender setae at posterior margin (Fig. 16K).

**Distribution.** The new species is only known from the Água Limpa farm, in the city of Brasília, Federal District, Brazil in the Cerrado biome (Fig. 20).

**Etymology.** Named after Dr. José Roberto Pujol-Luz, dipterist, professor and head of the "Laboratório de

Desenvolvimento e Metamorfose de Diptera" (LADDi - UnB), responsible for collecting the individuals used to describe this species.

### *Merucata vieirai* Soares, Camargo & Lamas sp. nov.

(Figs 17, 18, 19)

**Diagnosis (male).** The new species is remarkably similar to *M. caipora* **sp. nov.**, contrasting mainly by femora mostly covered with white setae (Fig. 17A) (remarkable on anterior surface of femur I (Fig. 17C)); 2 postalar macrosetae; hypandrium only with posterolateral macrosetae at posterior edge (Fig. 18K).

**Description. Holotype male** (Fig. 17A). Body length: 9.5 mm; wing length: 6.4 mm. Similar to *M. caipora* **sp. nov.** except as noted: **Thorax** (Fig. 17A, B). Scutum covered with more dense short black setae, slightly longer at posterior 1/2; 2–3 black postsutural dorsocentral macrosetae; 2 black postalar macrosetae. **Leg I.** Anterior surface of coxa I with slender white macrosetae. Femur almost wholly covered with short white setae, with 4–5 long white setae at ventral ½ (Fig. 17C). Tibia with ventral to anteroventral row of 4 white macrosetae from basal 2/3 to apex. Basitarsus with 1 posteroventral white macroseta near base. **Leg II.** Femur wholly covered with white setae. Tibia with posteroventral row of 3–4 short white setae, 1 ventral and 1 posteroventral white setae at apical 1/2; 2–3 dorsal short white setae at apical 1/3. Basitarsus with 1–2 posteroventral white setae. **Leg III.** Femur wholly covered with white setae, except for 1 antero- and 1 posterodorsal and 1 posterior preapical black seta. Tibia with 2 anterodorsal and 2 anteroventral white setae at apical 1/2. **Wing** (Fig. 17E). Cell *cua* closed and petiolate with petiole as long as crossvein *r-m*. **Abdomen.** Tergite 8 with wide concavity at anterior margin, with rounded posterior corners, with a few black macrosetae (Fig. 18H). Sternite 8 subrectangular, covered with a few short setae at posterior edge (Fig. 18I). **Terminalia** (Fig. 18). Orangish brown to dark brown. Inner dorsal process of epandrium longer and digitiform (Fig. 18C). Hypandrium somewhat saddle-shaped, only with posterolateral macrosetae at posterior edge (Fig. 18K). Gonocoxite subtriangular, dorsal edge truncated, membranous at apex; outer edge covered with short black setae; ventral edge with black macrosetae (Fig. 18E, F). Gonostylus 1.5 times longer than gonocoxite, mostly subrectangular, weakly sclerotized at middle and apex; apex rounded, slightly curved dorsally, covered with spicules (Fig. 18J).

**Variation.** Body length: 8.75–11 mm, wing length: 6.8–7.5 mm (n = 11).

**Female.** Similar to male, except as noted: body length: 9.3–12.2 mm, wing length: 6.6–8.2 mm (n = 8). Face and frons sometimes golden pruinose, mystax not forming dense tuft of macrosetae ventrally. Terminalia as in *M. caipora* **sp. nov.**

**Type material. HOLOTYPE:** ♂ (MZUSP) labelled: "Brasil: MS: Corguinho | Taboco | Reserva Quinta do Sol | 19º46'40,8"S 55º14'59,0"W | Malaise 12 | 12.x–12.xi.2012 | Lamas, Nihei & eq. cols." "HOLOTYPE | *Merucata vieirai* | Soares, Camargo & Lamas [red label]". Holotype condition: Good, not dissected. **PARATYPES:** Same data as holotype (1 ♂, dissected, 3 ♀, MZUSP); same data, except: 19°46'36.8"S 55°14'55.7"W, Malaise 14, 12–29.xi.2012 (2 ♂, 2 ♀, MZUSP); same data, except: 19°46'40.8"S 55°14'59"W, Malaise 12, 12.x–12.xi.2012 (3 ♂, MZUSP); Porto Murtinho, Fazenda Retiro Conceição, Trilha da Mata Bruta, 21°41'52.0"S 57°45'57.1"W, Malaise 33, 01–15.xi.2012, Lamas, Nihei e eq. cols. (6 ♂, 1 ♀, MZUSP; 1 ♀, NHMW); same data, except: 21°40'59.7"S 57°46'42.5"W, Malaise 31, 26.xii.2011–10.i.2012 (1 ♂, MZUSP); Aquidauana, Reserva Ecológica UEMS, 20°26'01.6"S 55°29'30.4"W, Ativa, 12.xii.2013, Lamas e eq. cols. (1 ♂, dissected, 3 ♀, MZUSP); Camisão, Trilha do Mirante, 20°26'40"S 55°38'22.5"W, Ativa, 13.xii.2013, Lamas & eq. cols. (1 ♂, 1 ♀, NHMW); Bodoquena, Fazenda Califórnia, 20°41'53.5"S 56°52'55.7"W, Ativa, 15.xii.2013, Lamas eq. cols. (1 ♂, NHMW).

**Remarks.** The new species is remarkable similar to *M. caipora* **sp. nov.** as discussed above in the remarks of *M. caipora* **sp. nov.** but it can be easily distinguished by the characteristics presented in the diagnosis and in the key to species.

**Distribution.** Brazil (state of Mato Grosso do Sul) (Fig. 19).

**Etymology.** Named after Dr. Rodrigo Vieira (SEDUC/AM) for his remarkable contribution to the knowledge of the Neotropical robber fly fauna.

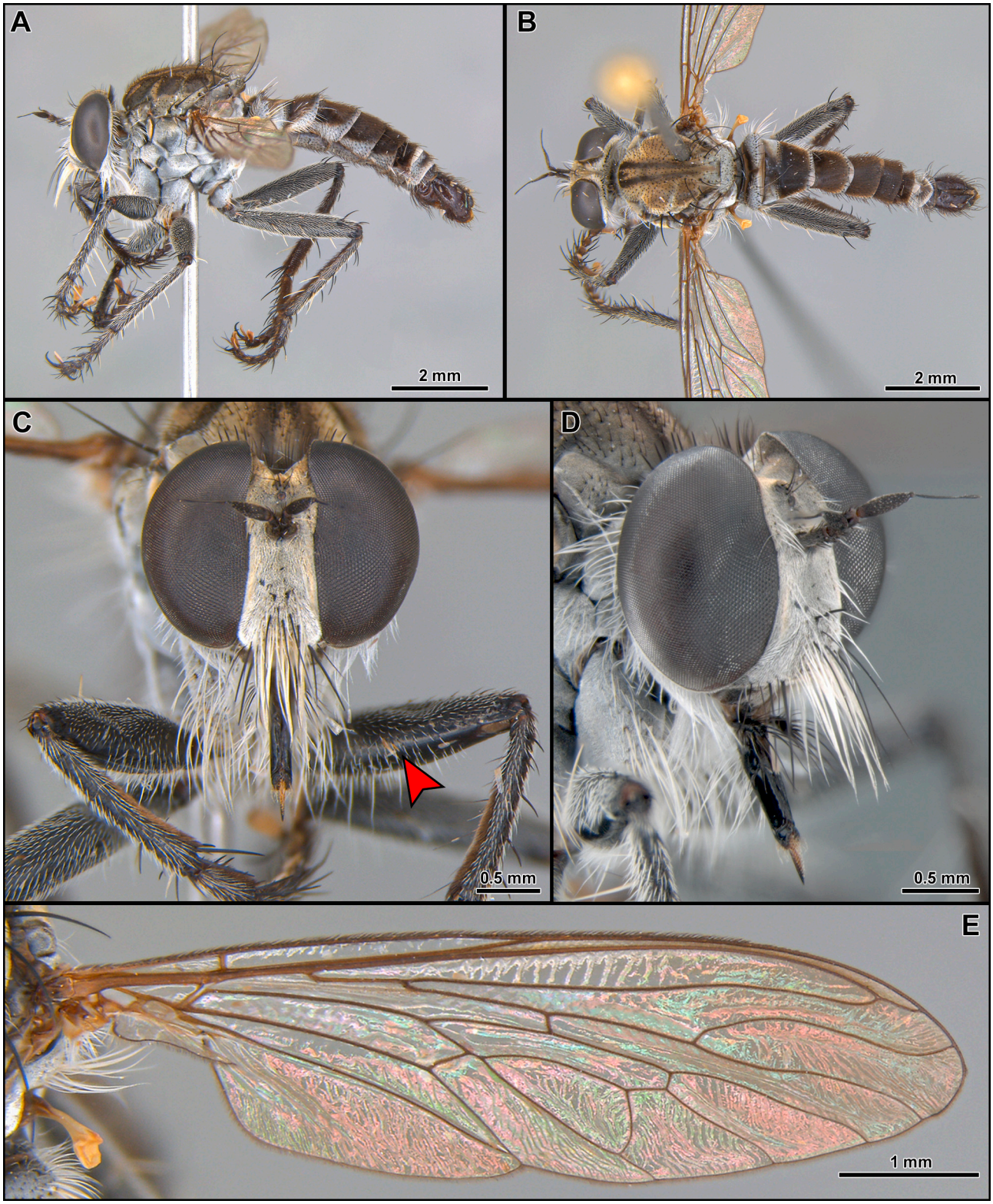


**FIGURE 17.** *Merucata vieirai* **sp. nov.** (male holotype). **A, B.** Habitus in lateral and dorsal views, respectively; **C, D.** Head in anterior and anterolateral views, respectively (arrow pointing the short white setae); **E.** Wing.

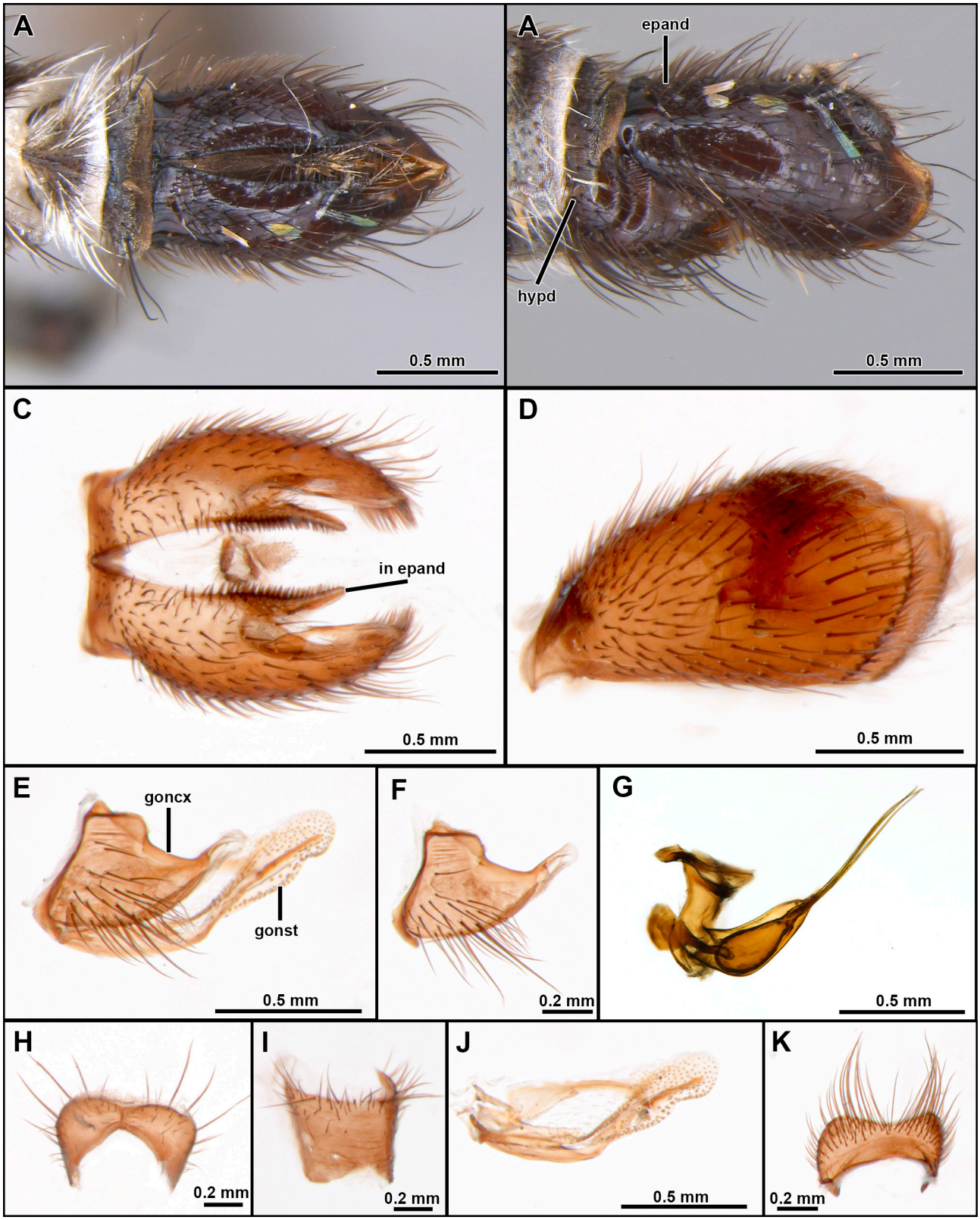


**FIGURE 18.** *Merucata vieirai* **sp. nov.** (male paratype). **A, B.** Terminalia in dorsal and lateral views (before dissection); **C, D.** Terminalia in dorsal and lateral views (after dissection); **E.** Gonocoxite and gonostylus; **F.** Gonocoxite; **G.** Phallus and ejaculatory apodeme; **H.** Tergite 8; **I.** Sternite 8; **J.** Gonostylus; **K.** Hypandrium. Abbreviations: epand = epandrium; goncx = gonocoxite; gonst = gonostylus; hypd = hypandrium; in epand = inner dorsal process of epandrium.

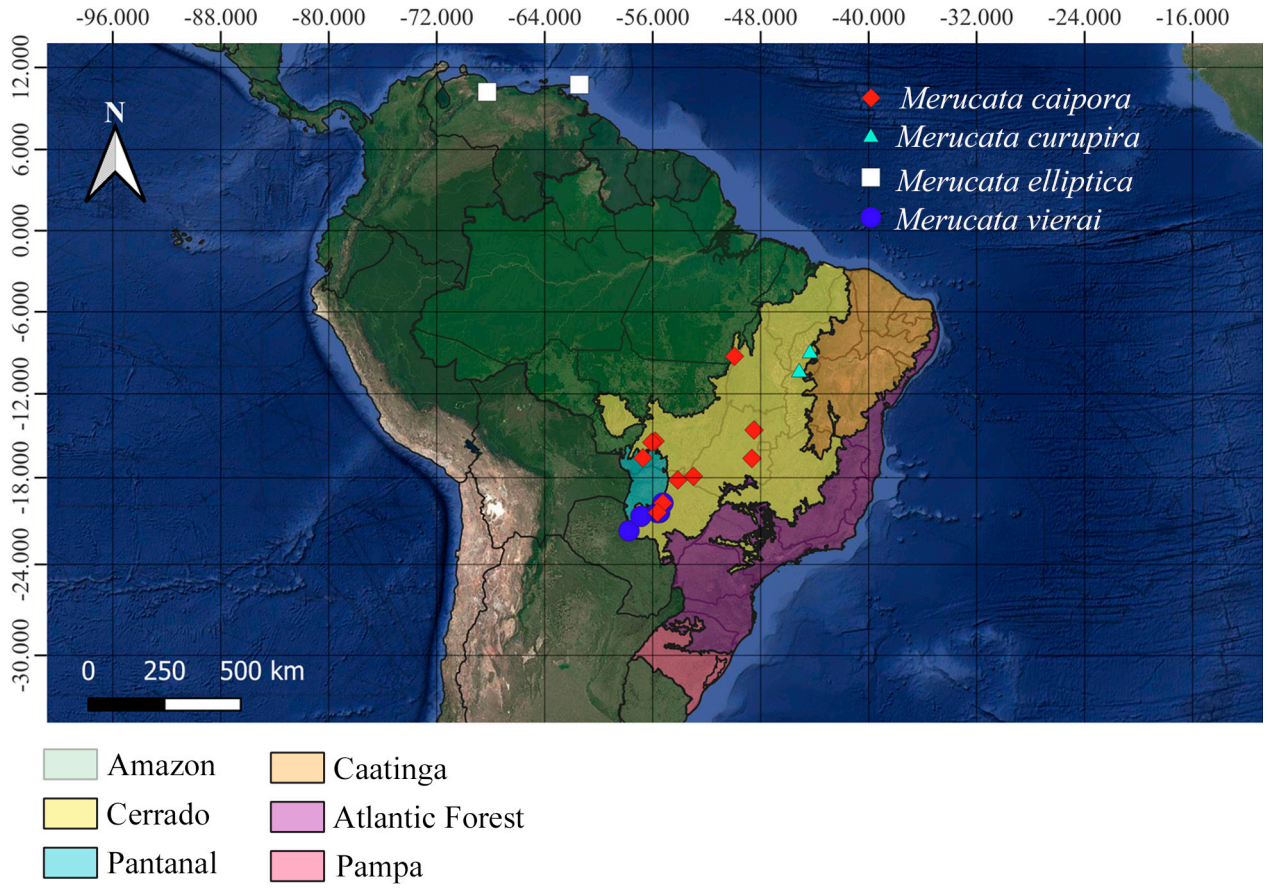


**FIGURE 19.** Known geographical distribution of *M. caipora* **sp. nov.**, *M. curupira* **sp. nov.**, *M. elliptica* **comb. nov.** and *M. vieirai* **sp. nov.**

## Discussion

Six of the eight species recognized in the new genus were collected in the Cerrado (Brazilian Savanna) biome or in ecotonal habitats between the Cerrado and Caatinga (semi-arid), Cerrado and Pantanal, as well as in a small relict of the Chaco biome in Brazil (Figs 19, 20). These areas share the common feature of having distinct dry and rainy seasons. Contrastingly, *M. capixaba* **sp. nov.** was collected in the coastal region of the Atlantic Forest in Brazil, in Lowland Dense Ombrophilous Forest, also known as the *Mata dos Tabuleiros*, which is the main vegetation type in the Sooretama Biological Reserve (Rebio Sooretama). Additionally, *M. elliptica* **comb. nov.** has been recorded in ecologically distinct environments: savanna habitats in Venezuela and coastal forested areas in Trinidad and Tobago. Despite an evident preference for opened dry biomes for most of the known species, the distribution of *M. elliptica* **comb. nov.** and *M. capixaba* **sp. nov.** suggests a broader ecological tolerance, encompassing both seasonally dry and humid tropical environments. Further surveys are necessary to improve our understanding of the genus distribution and to determine whether its apparent disjunct pattern is driven by intrinsic biological traits, environmental factors, or is merely an artifact of sampling bias, such as the lack of inventories in forested regions (which could account for its apparent absence from the Amazon Forest), or specimens misidentified or unrecognized in collections.

However, previous studies on bee flies (Lamas *et al.* 2014, 2024), which are known to often inhabit drier environments, suggest that if any *Merucata* **gen. nov.** species are found in the Amazon Forest, such records are likely artifactual and restricted to areas with campos rupestres vegetation, similar to the Brazilian savanna, sandy riverbanks, or transitional ecosystems between the Amazon and the semi-arid Caatinga. In the case of the bee fly genera *Heterostylum* Macquart (Lamas *et al.* 2014) and *Bryodemina* Hull (Lamas *et al.* 2024), which are strikingly distinct in both size and appearance, misidentification in collections is unlikely. Consequently, current knowledge of their distribution is likely closer to their true range, and their presence in the Amazon appears to be restricted to

the previously mentioned open environments. If the distribution of these bee fly genera is indeed congruent with the pattern observed in this study, species of *Merucata* **gen. nov.** would be expected to occur as far north as Mexico and as far south as Bolivia, Paraguay, and Argentina. Given that representatives of the new genus exhibit a general external resemblance to other Asilinae genera (e.g., *Eicherax* and *Eichoichemus*), it is highly likely that additional specimens may be misidentified and overlooked in collections.

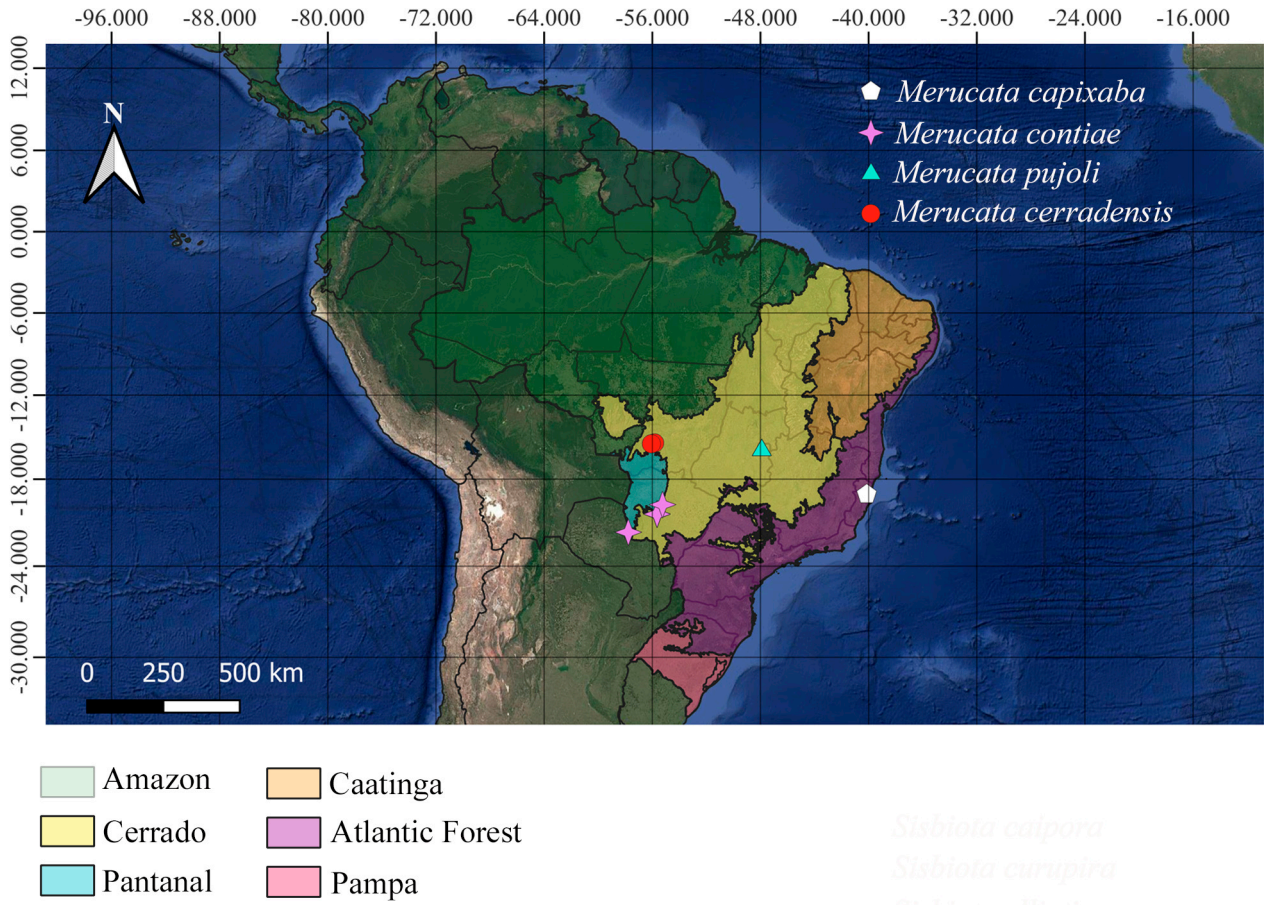


**FIGURE 20.** Known geographical distribution of *M. capixaba* **sp. nov.**, *M. cerradensis* **sp. nov.**, *M. contiae* **sp. nov.** and *M. pujoli* **sp. nov.**

The body plan of *Merucata* **gen. nov.** representatives are consistent across all included species, particularly regarding the male and female terminalia characters (see diagnosis and key to genera for detailed description of structures). Notable features include the lanceolate postpedicel and the presence of a pair of strong apical macrosetae on the scutellum, which may provide a natural delimitation for this assemblage of species. One feature that calls attention is the presence in all species of *Merucata* **gen. nov.** of a distinct medial to sub-medial dorsal process on the inner edge of the epandrium, followed by a distinct, more or less U-shaped indentation posteriorly to it. Two of the three known species of *Martintella* (e.g., *M. lestes* (Williston, 1901) and *M. aurata* Viera, Rafael & Fisher, 2014) also possess a process on the inner margin of the epandrium; however, in these two species, this process is relatively less distinct and located apically to sub-apically on the epandrium, and unlike *Merucata* **gen. nov.**, these processes are not followed by a distinct indentation at their bases posteriorly. Despite the differences, the presence and absence of epandrial projections, processes, or indentations may be considered useful in further studies to shed light on potential relationships among the artificial *Myaptex* genera and genera in other Asilinae groups.

As previously noted in the Remarks section, the phallus of representatives of the new genus is similar to that of *Triorla*, despite the two genera being highly distinct in general morphology. This similarity is not surprising, given that *Merucata* **gen. nov.**, *Eicherax*, *Martintella* and *Triorla* all share a male terminalia ground plan more closely resembling the "*Efferia*"-like "gestalt". This layout is characterized by a phallus ending in three prongs, which may be either long (exceeding half the phallic length) or short (usually less than a third of the phallic length), and females with three spermathecae.

The new genus is provisionally placed for convenience in the *Myaptex* group (Artigas & Papavero 1995, 1997), as it fits the current available diagnosis of the group and can be readily identified using the available keys for genera in the literature. A more "natural" placement would require a comprehensive phylogenetic reevaluation of all related groups, which is beyond the scope of the present work.

Historically, the study of Asilidae in Brazil has been concentrated in the Southeast region, largely due to its proximity to major centers, especially São Paulo and Rio de Janeiro, including southern Minas Gerais and Northeast Paraná where the main entomological collections are located. Outside these areas, material collected by Fritz Plaumman and Ceslau Biezanko complements knowledge of the South region, while collections such as those of the Goeldi Museum (Belém, Pará) and National Institute of Amazonian Research - INPA (Manaus, Amazonas) have contributed to understanding in the North region. Material from these collections and collectors largely constitutes the works of Messias Carrera (MZUSP), Nelson Papavero (MZUSP), and Jorge Artigas (MZUC-UCC). More recently, knowledge of the family has been significantly expanded by the works of Rodrigo Vieira (SEDUC/AM) and Alexssandro Camargo (NHMW), especially in the North and Northeast regions (states of Amazonas, Maranhão, and Bahia). Unfortunately, other regions of the country have been neglected over the years in taxonomic investigations involving Asilidae, with some Brazilian states still officially recording only a single species to date (Papavero 2009; Lamas & Camargo 2025).

As expected in a megadiverse country like Brazil, the diversity of Diptera still remains largely unknown. To address this gap, the Brazilian SISBIOTA-Diptera Network was developed with the purpose of investigating Diptera diversity in the Amazon (western arc), Cerrado and Pantanal biomes located in the North and Central-West regions of Brazil in the states of Rondônia, Mato Grosso and Mato Grosso do Sul respectively, encompassing some of the least explored areas for Diptera in Brazil. By 2023, the project had reached more than two thousand species across over 500 genera, increasing the known species count for the three states combined by more than 40%. Robber flies were among the ten most diverse and species-rich families in that survey (Lamas *et al.* 2023). Among this material, two new genera and eight new robber fly species have already been described, including new records for several other species (Camargo *et al.* 2022b, 2024; Soares *et al.* 2025, present work). New taxa and new occurrence records have also been reported for several other Diptera families (see Lamas *et al.* 2023: supplementary file 3, for a detailed list of publications) demonstrating the importance of the SISBIOTA program, which can already be considered a milestone in the history of Brazilian dipterology, especially in the Central-West region.

Asilidae surveys in the Neotropics are scarce. Two of the most extensive available ones are the report of the Tambopata Reserve (Fisher 1985) and the survey at Mitaraka in French Guiana (Vieira *et al.* 2019). In both reports, about two-thirds of the asilid species could not be confidently identified to species level, confirming that the Neotropical Asilidae fauna is still far from well-known. Several species, especially those described during the nineteenth century, are poorly described or illustrated, with type material often difficult to access, in poor condition, or even missing. Even today, some descriptive works avoid providing detailed descriptions, good illustrations, and dissections of male terminalia, which constitutes malpractice and may increase taxonomic impediment and ambiguity.

In the past 15 years, four new genera have been erected in the Neotropical Region (Vieira & Rafael 2014; Artigas & Vieira 2014; Camargo *et al.* 2022a; Soares *et al.* 2025), including the revalidation of two genera (see Camargo *et al.* 2022a for detailed references) highlighting that the diversity of this group is still greatly underestimated and dispelling the widespread belief that Asilidae are a "well-studied" group, thus justifying the title of the present work: "unveiling the hidden diversity".

## Acknowledgments

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do Parque Nacional das Emas, Goiás" (CNPq process 428471/2016-1). We thank Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP, Brazil) (proc. n. 2023/17951-0 [post-doctoral fellowship grant to MMMS]; 2010/52314-0 and 2022/12640-3 to CJEL) and the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, Brazil) for financial support to CJEL (proc. n. 563256/2010-9 and 310997/2023-2).

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