

Research article

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Revision of the Neotropical species of *Pareucamptonyx* Olmi (Hymenoptera, Dryinidae) with descriptions of new species

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Abstract. The genus *Pareucamptonyx* Olmi, 1991 is endemic to the New World and comprises three described species, two from the Neotropical region and one from the Nearctic. Here is presented the first revision of species of *Pareucamptonyx* from the Neotropical region, including four new species described from Brazil: *P. albopictus* Martins sp. nov., *P. kumagaiae* Martins sp. nov., *P. niger* Martins sp. nov. and *P. paranaensis* Martins sp. nov. Detailed illustrations, distribution map, and key to females are provided, as well as a revised diagnosis of the genus and notes about the method of collection. Additionally, new distribution records for *P. townesi* (Olmi, 1984) are reported.

Keywords. Brazilian fauna, Chrysidoidea, Gonatopodinae, pincer-wasps, taxonomy.

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Introduction

The Dryinidae Haliday, 1840 (Hymenoptera, Chrysidoidea) are commonly known as parasitoids pincer-wasps and usually also as predators of Auchenorrhyncha (Guglielmino *et al.* 2013; Martins *et al.* 2021). This family is distributed worldwide and currently comprises about 1920 species, grouped in 53 genera and 17 subfamilies, and in the Neotropical region about 500 species (Olmi & Virla 2014; Martins 2015, 2018, 2022; Martins *et al.* 2015a, 2015b, 2020, 2021; Olmi & Xu 2015; Olmi *et al.* 2019, 2020, 2022; Speranza *et al.* 2019; Martins & Olmi 2021; Martins & Perioto 2021).

Gonatopodinae Kieffer & Marshall, 1906 is the most diverse subfamily of Dryinidae with about 11 genera and 560 known species of which about 130 species and eight genera are recorded from the Neotropical region (Olmi & Virla 2014; Martins 2018; Olmi *et al.* 2019; Martins *et al.* 2021). Most

of the females are apterous, except the genera *Adryinus* Olmi, 1984, *Echthrodelphax* Perkins, 1903 and *Neodryinus* Perkins, 1905 (Olmi & Virla 2014; Martins 2019). The species of this subfamily are associated with several families of auchenorrhynchos Hemiptera as follows: Acanaloniidae Amyot & Serville, Cicadellidae Latreille, Delphacidae Leach, Flatidae Spinola, Lophopidae Stål, Issidae Spinola, Meenoplidae Fieber, Nogodinidae Melichar, Ricaniidae Amyot & Serville, and Tropiduchidae Stål (Guglielmino *et al.* 2013; Martins & Krinski 2016; Martins & Domahovski 2017a, 2017b; Olmi *et al.* 2019; Martins *et al.* 2021).

Among the genera of Gonatopodinae, *Pareucamptonyx* Olmi, 1991 is more closely related to *Eucamptonyx* Perkins, 1907, with the shared feature of the enlarged claw of the chela with the apex rounded, without a tooth. However, *Pareucamptonyx* can be separated from *Eucamptonyx* by the enlarged claw of the chela with one row of bristles and the palpomeres in the proportion 6:3, while in *Eucamptonyx* the enlarged claw has one row of lamellae (Olmi & Virla 2014: fig 148b–c) and palpomere formula 5:3 or 6:3. Both genera are distributed in the New World (Nearctic and Neotropical regions), but *Eucamptonyx* has also been recorded from the Australian region (Olmi & Virla 2014).

Pareucamptonyx is one of the smallest genera of Gonatopodinae, currently including three species endemic to the New World (Olmi & Virla 2014; Guglielmino *et al.* 2016). This genus is considered rare because few specimens are available in zoological collections and males are unknown, as well as its biology and hosts (Olmi & Virla 2014; Guglielmino *et al.* 2016; Martins, pers. obs.).

Pareucamptonyx was described based on *P. costaricanus* Olmi, 1991 from Puntarenas, Golfo Dulce Forest Reserve (Costa Rica). Olmi (1998) transferred *Gonatopus townesi* Olmi, 1984 (from Brazil) to *Pareucamptonyx* and proposed a new combination and synonymy of *Gonatopus zulianus* Olmi, 1986 (= *P. costaricanus*) including it among the species of *Pareucamptonyx*. The third species, *P. waldreni* Guglielmino, Olmi & Speranza 2016 from USA, represents the first, and currently the only known species from the Nearctic region (Guglielmino *et al.* 2016).

Here, we present a revision of the genus *Pareucamptonyx* from the Neotropical region, with descriptions of four new species, identification key, illustrations and taxonomic notes for the species.

Material and methods

We examined 17 female specimens of *Pareucamptonyx*, belonging to the institutions listed below. The holotypes of *P. townesi* (Olmi, 1984) and *P. zulianus* (Olmi, 1986) (*Gonatopus zulianus*) were examined by photographs provided by the respective curators.

Institutional abbreviations

DZUB	=	Coleção Entomológica da Universidade de Brasília, Brasília, Distrito Federal, Brazil – Dr Antônio J.C. Aguiar
DZUP	=	Coleção Entomológica Pe. Jesus Santiago Moure, Universidade Federal do Paraná, Curitiba, Paraná, Brazil – Dr Gabriel A.R. Melo
EMUS	=	Department of Biology Insect Collection, Utah State University, Logan, Utah, USA – Dr James Pitts
LRRP	=	Laboratório de Sistemática e Bioecologia de Parasitoides e Predadores, Ribeirão Preto, São Paulo, Brazil – Dr Nelson W. Perito
MZSP	=	Museu de Zoologia da Universidade de São Paulo, São Paulo, São Paulo, Brazil – Dr Carlos R.F. Brandão
UFMG	=	Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil – Dr Fernando A. Silveira

The external morphology was examined using a LEICA M125 stereo microscope equipped with a micrometer eyepiece. The species were identified using the keys proposed by Olmi & Virla (2014) and Olmi (1984). Morphological terminology follows Olmi and Virla (2014) and the sculpture of the integument follows Harris (1979) and Olmi & Virla (2014). The term rhinaria sensu Olmi (1984) and Olmi & Virla (2014) used herein is equivalent to “ADOs”, antennal dorsal organs, in the sense of Riolo et al. (2016).

The photographs were obtained using a LEICA digital camera, DFC295, attached to the LEICA stereoscopic microscope, and stacked using Zerene Stacker software (ver. 1.04 Build). Scanning electron microscopy (SEM) images were obtained through the VEGA3 TESCAN equipment at the Electronic Microscopy Center of the Universidade Federal do Paraná. The figure boards were made using Adobe Photoshop CS5 software and illustrations of the chelae using Adobe Illustrator CS6.

The labels of the specimens were transcribed as follows: a backslash (\) indicates the different lines on the label; two bars (//) indicate information in vertical lines; and two quotation marks (“ ”) indicate different labels on the same specimen.

Geographical coordinates not indicated on the labels were obtained using the Google Earth 4.0 software. The distribution map was created using SimpleMappr (Shorthouse 2010). Additional records of *P. zulianus* were compiled from the information presented in Olmi and Virla (2014) and Martins *et al.* (2015a) for the following countries: Bolivia, Brazil, Costa Rica, French Guiana and Venezuela.

Abbreviations

OL	=	ocellar line
OOL	=	ocello-ocular distance
POL	=	post-ocellar distance
TL	=	distance between the posterior margin of the eye and the occipital carina

Results

Taxonomy

Order Hymenoptera Linnaeus, 1758
Superfamily Chrysidoidea Latreille, 1802
Family Dryinidae Haliday, 1833
Subfamily Gonatopodinae Kieffer & Marshall, 1906

Genus *Pareucamptonyx* Olmi, 1991
Figs 1–11

Pareucamptonyx Olmi, 1991: 375.

Type species

Pareucamptonyx costaricanus Olmi, 1991: 375, synonymy of *Pareucamptonyx zulianus* (Olmi, 1986), by monotypy and original designation.

Diagnosis

Female

Apterous (Figs 2–9); head excavated; occipital carina absent; (ocellar ratio with OL longer than POL (Neotropical species) or OL as long as POL (Nearctic species); antenna with flagellum clavate, flagellomeres 5–8, 6–8 or 7–8 with rhinaria (Fig. 1); palpal formula 6:3; pronotum smooth and crossed

by strong and anterior transverse furrow (Fig. 2A–B); disc of pronotum (Fig. 2A–B) located in posterior surface; mesoscutum with (Fig. 5D) or without (Fig. 9) two small lateral pointed apophyses; meso-metapleural suture obsolete (Fig. 2D); notauli absent; chela with rudimentary claw (Fig. 2C), enlarged claw (Fig. 2C) with apex slightly rounded, not pointed, without subdistal tooth or lamellae; with one row of four to nine bristles; propodeum (Fig. 2D) with dorsal and posterior surfaces convex and crossed by many transverse carinae; tibial spurs 1/0/1.



Fig. 1. Rhinaria in different flagellomeres of the female in species of *Pareucamptonyx* Olmi, 1991. **A.** Rhinaria in flagellomeres 7–8 of *P. albopictus* Martins sp. nov. **B.** Rhinaria in flagellomeres 5–8 of *P. kumagaia* Martins sp. nov. **C.** Rhinaria in flagellomeres 5–8 of *P. niger* Martins sp. nov. **D.** Rhinaria in flagellomeres 6–8 of *P. paranaensis* Martins sp. nov. **E.** Rhinaria in flagellomeres 6–8 of *P. townesi* (Olmi, 1984). Scale bars = 1.0 mm.

Male

Unknown.

Host

Unknown.

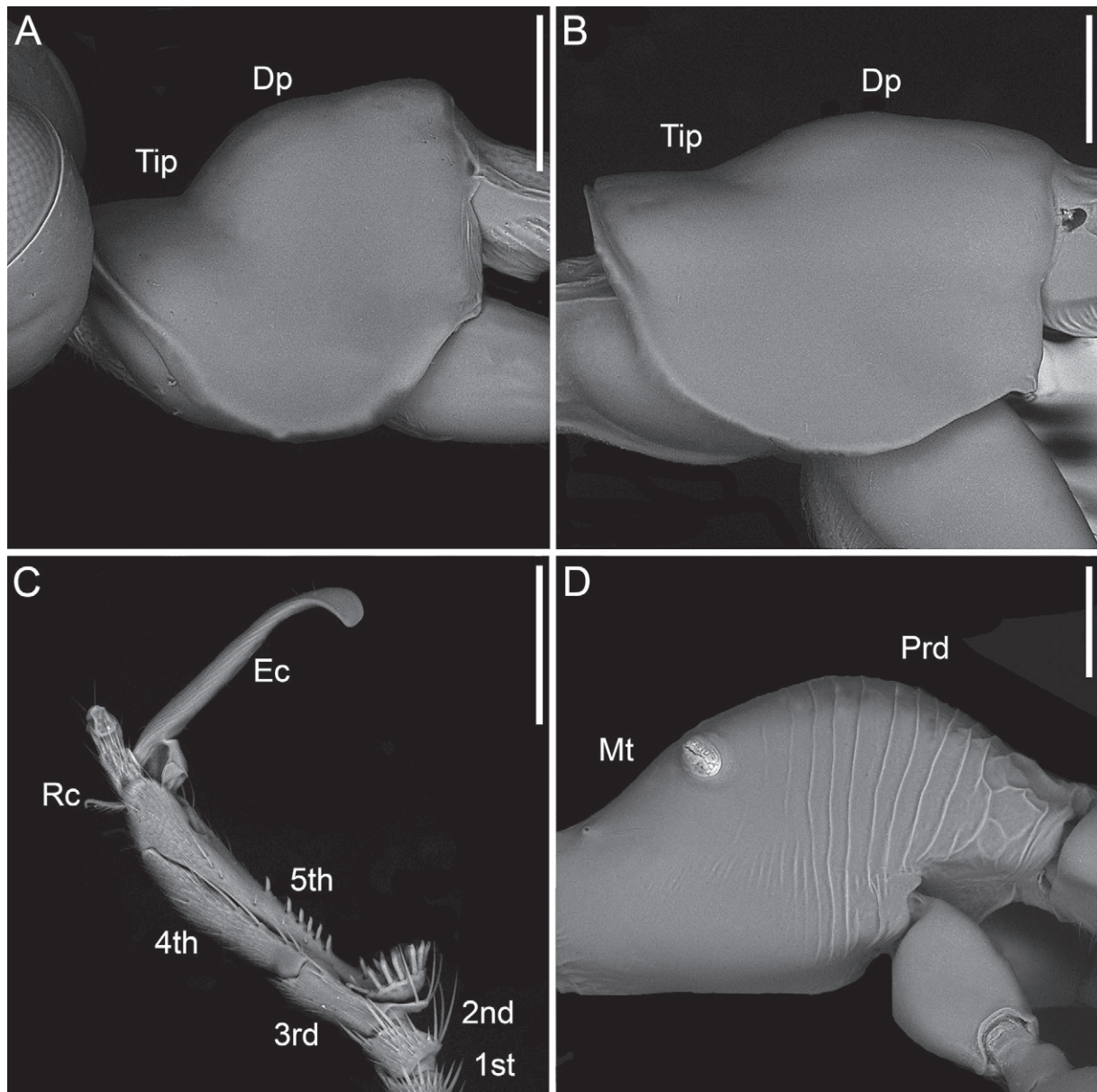


Fig. 2. Electron micrography of external morphology of *Pareucamptonyx* Olmi, 1991. **A.** Pronotum of *P. kumagaii* Martins sp. nov., lateral view. **B.** Pronotum of *P. paranaensis* Martins sp. nov., lateral view. **C.** Chela of *P. kumagaii* sp. nov., lateral view. **D.** Mesosoma of *P. kumagaii* sp. nov., lateral view. Abbreviations: 1st = first protarsomere; 2nd = second protarsomere; 3rd = third protarsomere; 4–5th = fourth and fifth protarsomeres; Dp = disc of pronotum; Ec = enlarged claw; Mt = metanotum; Prd = propodeum; Rc = rudimentary claw; Tip = transversal impression of pronotum. Scale bars = 200 μm.

Key to females of species of *Pareucamptonyx* Olmi, 1991 from the Neotropical region

1. Mesoscutum without lateral pointed apophyses (Fig. 4D–E)..... 2
 - Mesoscutum with lateral pointed apophyses (Figs 3D–E, 6D–E, 9A, D, F)..... 5
2. Inner margin of 5th protarsomere (Olmi & Virla 2014: fig. 215c–d) with 16–20 lamellae..... *P. zulianus* (Olmi, 1986)
 - Inner margin of 5th protarsomere (Fig. 10B–C; Olmi & Virla 2014: fig. 215e) with 10 or fewer lamellae. 3
3. Flagellomeres 6–8 with rhinaria (Fig. 1E); mesoscutum rugose (Fig. 9E), without longitudinal carinae; inner margin of 5th protarsomere with two rows of 10–14 lamellae and six long bristles (Olmi & Virla 2014: fig. 215e)..... *P. townesi* (Olmi, 1984)
 - Flagellomeres 5–8 with rhinaria (Fig. 1B–C); mesoscutum with variable sculpture, smooth or rugose, and with or without longitudinal carinae; inner margin of 5th protarsomere with one row of five or six lamellae and two or three long bristles 4
4. Body predominantly brown testaceous (Fig. 4A); frontal line absent; mesoscutum rugose (Fig. 9B), except by the irregular longitudinal carinae; chela with inner margin of the 5th protarsomere with one row of six lamellae and three long bristles (Fig. 10B) *P. kumagaiiae* Martins sp. nov.
 - Body predominantly black, except pronotum, legs and metasoma dark brown (Fig. 5A); frontal line complete; mesoscutum smooth (Fig. 9C), except some longitudinal carinae on lateral surface (Fig. 5D); chela with inner margin of the 5th protarsomere with one row of five lamellae and two long bristles (Fig. 10C) *P. niger* Martins sp. nov.
5. Head with vertex smooth (Fig. 3C); scape with ventral surface whitish (Fig. 3B); flagellomeres 7–8 with rhinaria; mesoscutum smooth (Figs 3D–E, 9A), except some area rugose; legs black and whitish; 4th protarsomere with one row of four long setae; chela with enlarged claw with one row of five bristles and inner margin of 5th protarsomere with 23 lamellae, about 11 long bristles and apex with 21 lamellae (Fig. 10A)..... *P. albopictus* Martins sp. nov.
 - Head with vertex rugose (Fig. 6C); scape brown testaceous (Fig. 6B–C); flagellomeres 6–8 with rhinaria; mesoscutum rugose and with sparse and longitudinal carinae (Figs 6D–E, 9D, F); legs black and testaceous; 4th protarsomere with one row of five long setae; chela with enlarged claw with one row of seven bristles and inner margin of 5th protarsomere with about 23 lamellae, five long bristles and apex with 23 lamellae (Fig. 10D) *P. paranaensis* Martins sp. nov.

***Pareucamptonyx albopictus* Martins sp. nov.**

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Figs 1A, 3, 9A, 10A, 11

Diagnosis

Body predominantly black, except antenna brown testaceous, mandible and ventral surface of scape white; legs brown, except part of coxa, trochanter, tibia and tarsomeres whitish; metasoma dark brown testaceous. Body with short and sparse pilosity, except malar space, part of frons and clypeus with dense and long pilosity. Body predominantly smooth, except part of head rugose; frontal line presente; posterior surface of mesopleuron, metapleuron and propodeum with sparse transverse carinae. Enlarged claw with one row of four bristles; inner margin of 5th protarsomere with two rows of 21 lamellae and distal apex with 21 lamellae.

Etymology

The name *albopictus* derives from the Latin words, ‘*albo*’ for ‘white’, and ‘*pictus*’ for ‘colour’. It refers to the white scape.

Material examined

Holotype

BRAZIL – Minas Gerais • ♀; “Brasil, MG, Ouro Preto, \ RPPN Vale das Borboletas\ 20°17'35.8"S; 43°34'04.6"W\ 1015m, 8-17.iii.2013, Malaise\ A. Kumagai leg.// UFMG IHY\ 1701174”; UFMG.

Distribution

Minas Gerais State, Brazil (Fig. 11).

Description

Female

Apterous, body length 3.67 mm.

COLORATION. Head black (Fig. 3A–C); clypeus whitish, except by central region brown testaceous (Fig. 3B); antenna with scape testaceous, except ventral surface white (Fig. 3A–B), pedicel and 1st flagellomere brown testaceous and 2–8 flagellomeres brown (Figs 1A, 3A); mandible whitish (Fig. 3B–C), except teeth brown testaceous; pronotum black (Fig. 3A, D–E), except lateral surface brown testaceous; mesoscutum black (Figs 3D–E, 9A); legs dark brown black and whitish (Fig. 3A), except apex of coxae, base and apical margin of trochanter, apex of femur and protarsus whitish, and part of protarsomeres brown testaceous; petiole black; metasoma dark brown testaceous.

PUBESCENCE. Head with thin and short pilosity (Fig. 3B–C), except malar space (Fig. 3B) and inner margin of eyes, near to antennal alveolus, with dense pilosity; clypeus with dense pilosity (Fig. 3B); gena, pronotum, mesoscutum, metanotum, mesopleuron, metapleuron and legs with short and sparse pilosity (Fig. 3); mesoscutellum with fine and sparse pilosity (Fig. 3D); propodeum glabrous; metasoma with short and sparse pilosity.

HEAD. Excavated, smooth, except face partially rugose and granulate (Fig. 3B–C); gena and clypeus smooth, except central region rugose. Antennomere lengths in following proportions: 20:12:32:23:19:15:13:11:10:17; rhinaria present on flagellomeres 6–8 (Fig. 1A). Frontal line present and restricted to near ocelli (Fig. 3C). Ocellar ratio: OL= 8; POL= 5; OOL= 18.

MESOSOMA. Pronotum smooth (Fig. 3D–E); mesoscutum rugose; mesoscutum with lateral pointed apophyses (Fig. 3D–E); mesoscutellum and metanotum smooth; mesopleuron smooth, except small area on posterior surface with some transverse carinae; metapleuron smooth, except posterior surface with transverse carinae; propodeum smooth (Figs 3D–E, 9), except for several fine transverse carinae. Dorsal surface of propodeum shorter than posterior (20:30).

LEGS. Protarsomeres in following proportions: 30:7:15:30:53 and enlarged claw (43). Chela, enlarged claw with one row of five bristles (Fig. 10A); inner margin of 5th protarsomere with two rows of 23 lamellae and about 11 long bristles and distal apex with 34 lamellae.

Remarks

Pareucamptonyx albopictus Martins sp. nov. resembles *P. paranaensis* Martins sp. nov. by the body predominantly black (Figs 3, 6); ocellar ratio with OL longer than POL and mesoscutum with lateral pointed apophyses (Figs 3D–E, 6D–E, 9A, D, F). However, *P. albopictus* differs by the scape with

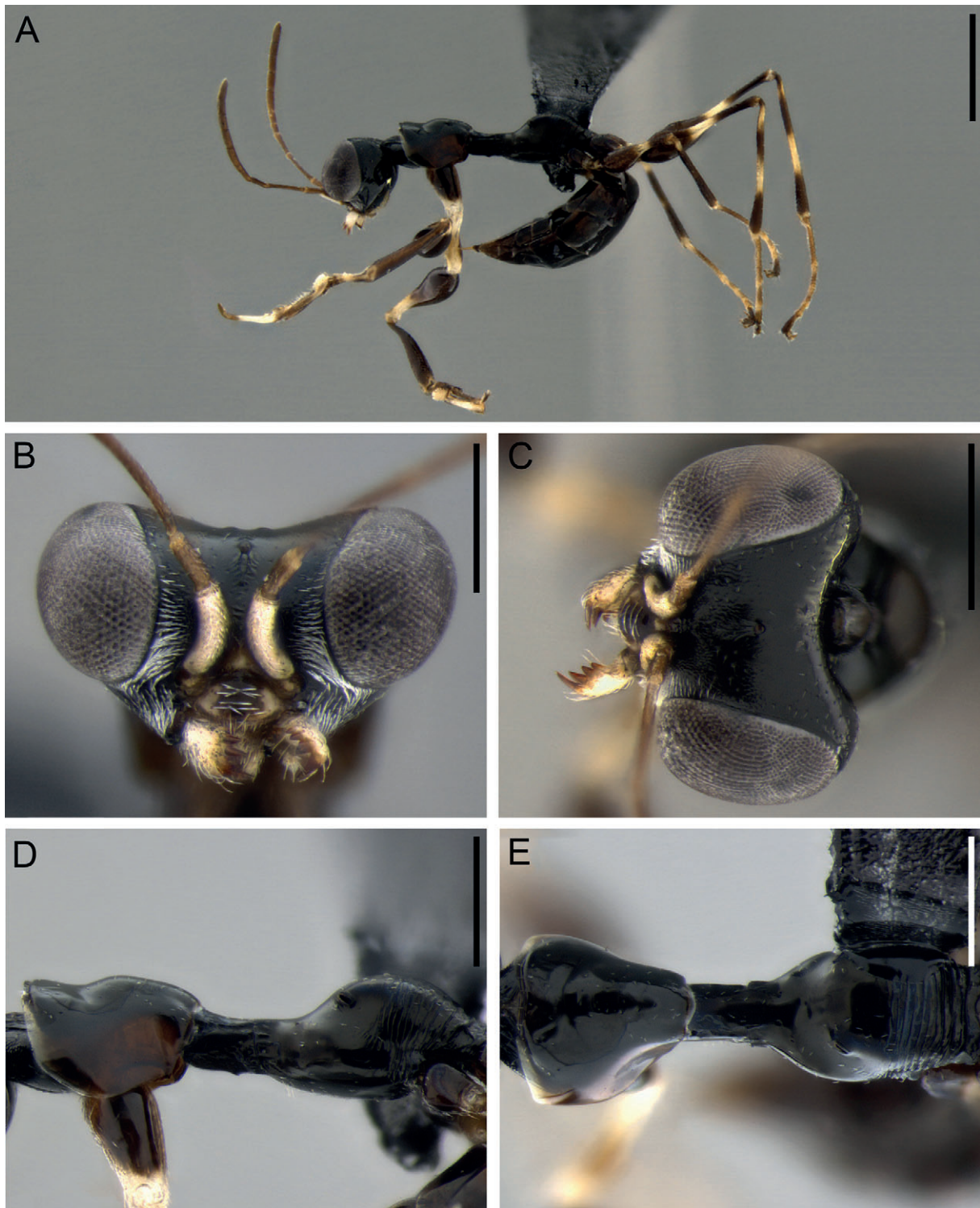


Fig. 3. *Pareucamptonyx albopictus* Martins sp. nov., holotype, ♀ (UFMG). **A.** Habitus, lateral view. **B.** Head, frontal view. **C.** Head, dorsal view. **D.** Mesosoma, lateral view. **E.** Mesosoma, dorsal view. Scale bars = 1.0 mm.

ventral margin white; flagellomeres 6–8 with rhinaria; head with vertex smooth and with sparse pilosity, malar space, mandible and inner margin of face, near to eye, with dense and long pilosity; mandible with teeth brown, part of clypeus and ventral surface of scape whitish; mesoscutum smooth, except some area rugose (Fig. 9A); metanotum smooth; chela with enlarged claw with one row of five bristles and inner margin of 5th protarsomere with 23 lamellae, about 11 long bristles and apex with 21 lamellae (Fig. 10A).

Pareucamptonyx kumagaiae Martins sp. nov.

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Figs 1B, 2A, C–D, 4, 9B, 10B, 11

Diagnosis

Body predominantly brown testaceous and with fine and short pilosity; head rugose, except part of face and vertex smooth; frontal line and occipital carina absent; flagellomeres 5–8 with rhinaria; mesoscutum without lateral pointed apophyses; propodeum with several irregular transverse carinae. Enlarged claw with one row of five bristles, and 5th tarsomere with inner margin with one row of six lamellae and apex with about 10 lamellae.

Etymology

The new species is named in honor of Dra Alice Fumi Kumagai, an entomologist of the Universidade Federal de Minas Gerais, Belo Horizonte, Brazil, for her dedication to the study of Neotropical Ichneumonidae.

Material examined

Holotype

BRAZIL – **Minas Gerais** • ♀; “BRA, MG, Belo Horizonte, \ UFMG Estação Ecológica \ 19° 52'30"S; 43°58'20"W \ 842m, 1-8.xi.2013, \ Malaise, A. Kumagai leg.// UFMG IHY \ 1502988”; UFMG.

Paratype

BRAZIL – **Minas Gerais** • ♀; “BRA, MG, Belo Horizonte, \ UFMG Estação Ecológica \ 19°52'30"S; 43°58'20"W \ 842m, 1-8.xi.2013, \ Malaise, A. Kumagai leg.// UFMG IHY \ 1701175”; DZUP.

Distribution

Minas Gerais State, Brazil (Fig. 11).

Description

Female

Apterous, body length 3.47 mm.

COLORATION. Head brown testaceous (Fig. 4A–C), except clypeus brown; antenna with scape and pedicel brown testaceous (Fig. 4A–B), except flagellomeres brown (Fig. 4A); pronotum brown testaceous (Fig. 4B–C), except one transverse black band; mesosoma brown testaceous (Figs 4D–E, 9C), except mesoscutum, and posterior surface of metapleuron and propodeum black; legs brown testaceous (Fig. 4A), except apex of procoxa, protibia and part of 3rd, 5th and enlarged claw whitish; petiole black; metasoma brown testaceous.

PUBESCENCE. Body with sparse and short pilosity (Fig. 4A–D), except head with fine pilosity; clypeus with dense pilosity (Fig. 4B); propodeum glabrous; metasoma with dense pilosity on last tergum and sternum.

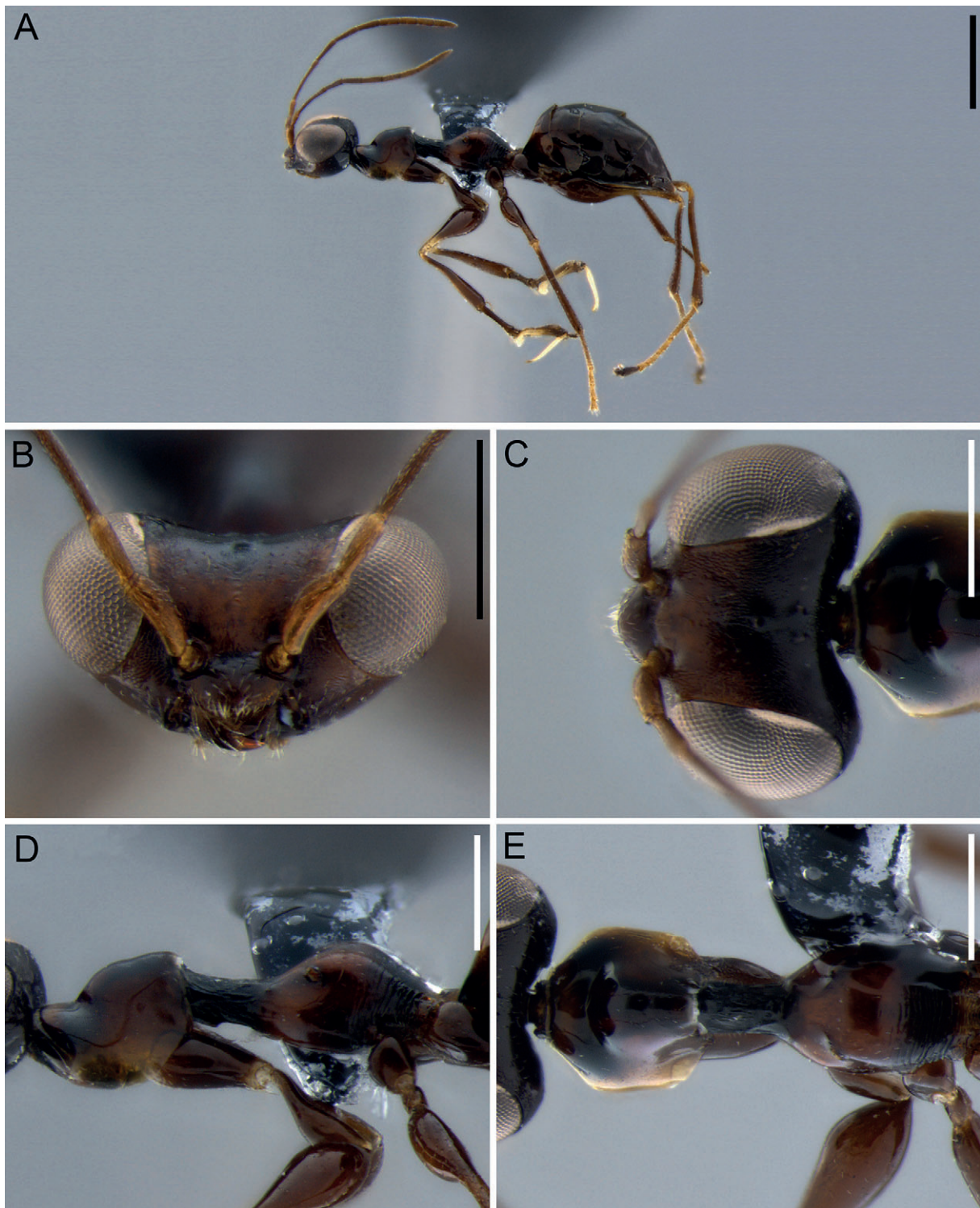


Fig. 4. *Pareucamptonyx kumagaiae* Martins sp. nov., holotype, ♀ (UFMG). **A.** Habitus, lateral view. **B.** Head, frontal view. **C.** Head, dorsal view. **D.** Mesosoma, lateral view. **E.** Mesosoma, dorsal view. Scale bars = 1.0 mm.

HEAD. Excavated, rugose, except part of face and vertex smooth (Fig. 4B–C); clypeus smooth; gena smooth, anterior surface near to malar space granulate (Fig. 4B). Palpomere formula 6:3. Antennomeres in following proportions: 21:15:40:23:21:20:16:14:14:20. Flagellomeres 5–8 with rhinaria (Fig. 1B). Frontal line absent. Ocellar ratio: OL = 8; POL = 5; OOL = 18.

MESOSOMA. Pronotum smooth (Figs 2A, 4D–E); mesoscutum rugose and with irregular longitudinal carinae, without lateral pointed apophyses (Figs 4D–E, 9C); mesoscutellum smooth (Fig. 4D–E); metanotum smooth; mesopleuron smooth, except posterior surface with transverse carinae; metapleuron smooth, except transverse carinae on posterior surface; propodeum with several irregular transverse carinae (Figs 2D, 9B).

LEGS. Protarsomeres in following proportions: 32:7:11:27:45 and enlarged claw (43). Chela enlarged claw with one row of five bristles, 5th tarsomere with inner margin with one row of six lamellae and apex with about 10 lamellae (Figs 2C, 10B).

Remarks

Pareucamptonyx kumagaii Martins sp. nov. resembles *P. niger* Martins sp. nov. due to the rhinaria on flagellomere 5–8; mesoscutellum without lateral pointed apophyses; and by the number of lamellae on the inner margin of the 5th protarsomere. However, *P. kumagaii* differs by the body predominantly brown testaceous; frontal line absent; mesoscutum rugose, with irregular longitudinal carinae (Fig. 9B); chela with inner margin of the 5th protarsomere with one row of six lamellae and three long bristles (Fig. 10B).

Pareucamptonyx niger Martins sp. nov.

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Figs 1C, 5, 9C, 10C, 11

Diagnosis

Body predominantly black, except part of antenna, pronotum, legs and metasoma brown testaceous and chela white. Head with short and sparse pilosity, except gena glabrous; pronotum and legs with short and sparse pilosity; head rugose, except vertex partially smooth and clypeus granulate; gena smooth, except region near to malar space granulate; occipital carina absent; frontal line incomplete; pronotum, mesoscutum, mesoscutellum and metanotum smooth; mesoscutum without lateral pointed apophyses; mesopleuron and metapleuron smooth, except posterior surface with some transverse carinae; propodeum smooth and with many sparse transverse carinae. Enlarged claw with one row of five bristles; inner margin of 5th protarsomere with five lamellae and distal apex with 17 lamellae.

Etymology

The species name comes from the Latin word ‘*niger*’ for ‘black’. It refers to the black colour of the body.

Material examined

Holotype

BRAZIL – Paraná • ♀; “Brasil, Paraná, Estrada dos Castelhanos, 790m, 23.xi-14.xii.2003, G. Melo, Malaise”; DZUP.

Paratype

BRAZIL – Minas Gerais • ♀; “Brasil, MG, 6Km S de Itamarandiba, pista de pouso, 1015m, 17.913°S 42.871°W, 9-17.ii.2013, G. Melo, Arm. Malaise”; DZUP.

Distribution

Minas Gerais and Paraná states, Brazil (Fig. 11).

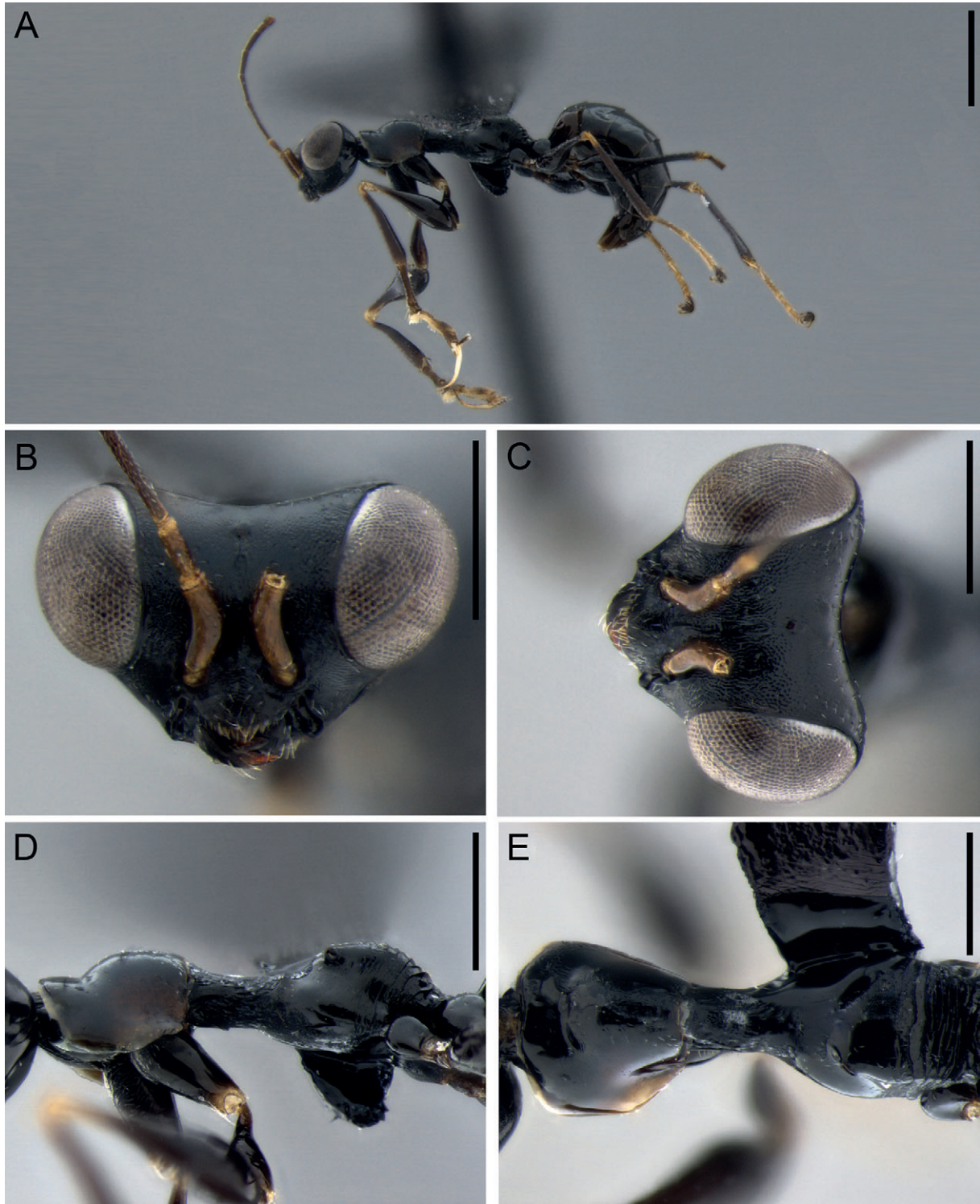


Fig. 5. *Pareucamptonyx niger* Martins sp. nov., holotype, ♀ (DZUP). **A.** Habitus, lateral view. **B.** Head, frontal view. **C.** Head, dorsal view. **D.** Mesosoma, lateral view. **E.** Mesosoma, dorsal view. Scale bars = 1.0 mm.

Description

Female

Apterous, body length 4.25 mm.

COLORATION. Head black (Fig. 5A–C), except antenna with scape and pedicel brown testaceous and flagellomeres 1–5 brown (Fig. 5A); mandible black, except teeth brown testaceous (Fig. 5B); pronotum black, except lateral surface testaceous (Fig. 5D–E); mesoscutum black (Fig. 5D–E); legs dark brown, except protarsomeres brown testaceous and chela white; petiole black; metasoma dark brown.

PUBESCENCE. Head with fine and sparse pilosity (Fig. 5B–C); clypeus with short pilosity (Fig. 5B); gena predominantly glabrous and with sparse pilosity; pronotum with sparse and short pilosity (Fig. 5D–E); mesoscutum, mesoscutellum and metanotum glabrous (Fig. 5A, D–E); legs with short and sparse pilosity (Fig. 5A); mesopleuron and metapleuron with sparse and short pilosity (Fig. 5D); propodeum glabrous; metasoma with short and sparse pilosity.

HEAD. Excavated, rugose (Fig. 5B–C), except vertex partially smooth, clypeus granulate (Fig. 5B); gena smooth, except region near malar space granulate; vertex granulate (Fig. 5C). Palpomeres formula 6:3. Antennomeres in following proportions: 23:15:41:22:23:20:17:14:12:19. Flagellomeres 5–8 with rhinaria (Fig. 1C). Frontal line complete (Fig. 5C). Ocellar ratio: OL= 8; POL= 6; OOL= 18.

MESOSOMA. Pronotum, mesoscutellum and metanotum smooth (Fig. 5D–E); mesoscutum predominantly smooth (Fig. 9C), except some longitudinal carinae on lateral surface; without lateral pointed apophyses. Mesopleuron and metapleuron smooth, except posterior surface with some transverse carinae; propodeum smooth with many sparse transverse carinae (Figs 5D–E, 9C).

LEGS. Protarsomeres in following proportions: 32:8:18:27:48 and enlarged claw (50). Chela enlarged claw with one row of five bristles (Fig. 10C); inner margin of 5th protarsomere with five lamellae and distal apex with one group of 17 lamellae (Fig. 10C).

Remarks

The right antenna of the holotype lacks flagellomeres 6–8 and the left antenna lost its pedicel and flagellomeres. Therefore, measurements and description of the coloration were made from the paratype. *Pareucamptonyx niger* Martins sp. nov. resembles *P. kumagaiae* Martins sp. nov. due to its mesoscutellum without lateral pointed apophyses; flagellomere 5–8 with rhinaria; 5th protarsomere with reduced number of lamellae and number of bristles of the enlarged claw. However, *P. niger* differs by the body predominantly black or brown ferruginous; frontal line complete; mesoscutum predominantly smooth (Fig. 9C), except some longitudinal carinae on lateral surface; chela with inner margin of the 5th protarsomere with one row of five lamellae and two long bristles (Fig. 10C).

Pareucamptonyx paranaensis Martins sp. nov.

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Figs 1D, 2B, 6, 9D, F, 10D, 11

Diagnosis

Body predominantly black, except part of antenna, pronotum, legs and metasoma brown testaceous. Head with short and sparse pilosity except on malar space with dense and long whitish pilosity; pronotum, mesosoma, legs and metasoma with short and sparse pilosity. Head rugose, except gena smooth; pronotum smooth; mesopleuron and metapleuron smooth, except with transverse carinae on posterior surface; mesoscutum with two lateral pointed apophyses; propodeum smooth and with

transverse carinae. Enlarged claw with one row of seven bristles on inner margin; inner margin of 5th protarsomere with two rows of about 23 lamellae and four long bristles, apex with about 23 lamellae.

Etymology

The species name refers to the state of Paraná where the type series was collected.

Material examined

Holotype

BRAZIL – **Paraná** • ♀; “Brasil, Paraná, São José dos Pinhais, 25°36'18"S 49°1137"W 880m 17-27.xii.2014\ A. C. Domahovski leg.”; DZUP.

Paratype

BRAZIL – **Paraná** • ♀; “Brasil, PR, Piraquara, Mananciais da Serra, 25.4967°S 48.9839°W, 1010m, 16.ii-11.iii.2019, Melo & Martins, Malaise”; DZUP.

Distribution

Paraná State, Brazil (Fig. 11).

Description

Female

Apterous, body length 5.5 mm.

COLORATION. Head black, except antenna with scape brown testaceous, pedicel and flagellomeres brown (Fig. 6A–C); mandible whitish (Fig. 6B); pronotum black, except lateral surface testaceous; mesoscutum black (Fig. 6A, D–E); legs predominantly brown testaceous and some regions darkened (Fig. 6A); tarsomeres testaceous and enlarged claw whitish; petiole black; metasoma predominantly brown testaceous and some regions darkened (Fig. 6A).

PUBESCENCE. Body with sparse and short pilosity, except malar space with dense pilosity (Fig. 6); clypeus with fine pilosity (Fig. 6B–C); mesoscutum with short pilosity (Fig. 6D–E); metanotum with sparse pilosity (Fig. 6D–E); legs with dense and sparse pilosity (Fig. 6A); and metasoma with erect setae only on apical portion.

HEAD. Excavated, rugose, except gena smooth (Fig. 6B–C). Palpomeres formula 6:3. Antennomeres in following proportions: 35:7:55:36:30:24:18:17:14:23. Flagellomeres 6–8 with rhinaria (Fig. 1D). Frontal line present only near anterior ocellus (Fig. 6B–C). Ocellar ratio: OL = 8; POL = 5; OOL = 23.

MESOSOMA. Pronotum smooth (Fig. 6A, D–E); mesoscutum smooth, except for longitudinal and incomplete carina (Fig. 6D–E); mesoscutum with two lateral pointed apophyses (Fig. 9F). Mesoscutellum rugose and with sparse longitudinal carinae (Fig. 9D, F) and metanotum smooth (Fig. 6D–E); mesopleuron and metapleuron smooth, except posterior surface with transverse carinae (Fig. 6D); propodeum smooth and with transverse carinae (Fig. 6D–E).

LEGS. Protarsomeres in following proportions: 45:10:22:42:72 and enlarged claw (68). Chela enlarged claw with one row of seven bristles on inner margin (Fig. 10D); inner margin of 5th protarsomere with two rows of about 23 lamellae and four long bristles, apex with 23 lamellae.

Remarks

Pareucamptonyx paranaensis Martins sp. nov. resembles *P. albopictus* Martins sp. nov., as the body (Figs 3, 6) is predominantly black; ocellar ratio with OL longer than POL; and mesoscutum with lateral

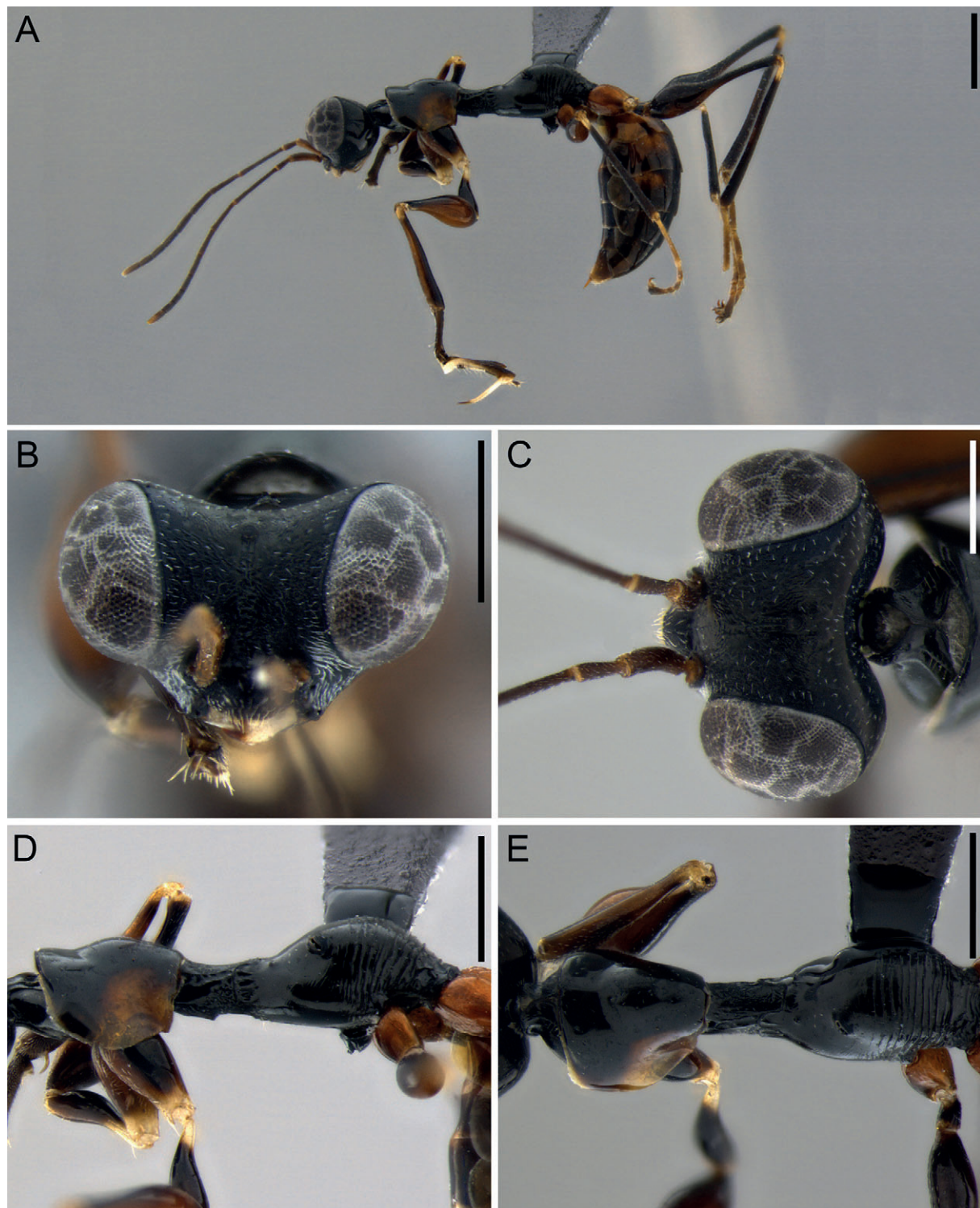


Fig. 6. *Pareucamptonyx paranaensis* Martins sp. nov., holotype, ♀ (DZUP). **A.** Habitus, lateral view. **B.** Head, frontal view. **C.** Head, dorsal view. **D.** Mesosoma, lateral view. **E.** Mesosoma, dorsal view. Scale bars = 1.0 mm.

pointed apophyses (Figs 3D–E, 6D–E, 9A, D, F). However, *P. paranaensis* differs by the head with vertex rugose and with dense pilosity, except malar space and inner margin of face, near to eye, with short pilosity; mandible with teeth testaceous, clypeus black and scape brown testaceous; flagellomeres 6–8 with rhinaria; mesoscutum rugose and with sparse longitudinal carinae (Fig. 9D, F); metanotum smooth; legs black and some parts whitish; chela with enlarged claw with one row of seven bristles and inner margin of 5th protarsomere with about 23 lamellae, five long bristles and apex with 23 lamellae (Fig. 10D).

***Pareucamptonyx townesi* (Olm, 1984)**

Figs 1E, 7, 9E, 11

Gonatopus townesi Olm, 1984: 1748. Female, holotype. Brazil: Mato Grosso, Sinop (EMUS, examined through photographs).

Diagnosis

Apterous, body length 2.0 mm in holotype and 3.5–3.9 mm in the additional material.

Body predominantly black, except palpomeres, mandible and antenna testaceous; clypeus and part of face brown testaceous; lateral margin of pronotum testaceous; legs brown testaceous, except apical margin of procoxa, protrochanter and chela whitish; metasoma dark brown testaceous. Head glabrous, except dense and long pilosity on part of face, malar space and clypeus (Fig. 7B–C); legs and metasoma with sparse and short pilosity. Frontal line absent (Fig. 7C); antenna with rhinaria on flagellomeres 6–8 (Fig. 1E), occipital carina absent (Fig. 7C). Mesoscutum rugose, without lateral pointed apophyses (Figs 7D, 9E); propodeum with several transverse carinae (Fig. 7D). Enlarged claw with four bristles and 5th protarsomere with inner margin with two rows of 10 lamellae and six long bristles (in holotype) or two rows of 14 lamellae (in additional material); distal apex with about 12 lamellae (in holotype) or about 38 lamellae (in additional material).

Material examined

Holotype

BRAZIL – **Mato Grosso** • ♀; “Sinop, M. Grosso\ 12°31’S 55° 37’W\ X.1974 Brazil\ M. Alvarenga” “Holotype\ *Gonatopus\ townesi* Olm” “Type\ 1656”; EMUS.

Additional material

BRAZIL – **Distrito Federal** • ♀; “Brasil, DF, Brasília,\ Fazenda Água Limpa,\ 15.9592°S 47.9331°W,\ 19.i.2010, A. J. C. Aguiar,\ Armadilha Malaise” (DZUB) • 3 ♀♀; same collection data as for preceding, except “2010” (DZUB). – **Goiás** • 1 ♀; “Brasil, GO, Novo Mundo,\ Plantação de Algodão,\ 13.9292°S 49.9716°W,\ 23.vi.2012, 282m, M.\ Paulo, Malaise” (DZUB). – **Paraná** • 1 ♀; “Brasil, PR, Foz do\ Jordão, Salta Segredo,\ 13-20.x.2004,\ E. D. G. Doares,\ Arm. Malaise”; DZUP.

Distribution

Distrito Federal, Goiás, Mato Grosso and Paraná states, Brazil (Fig. 11).

Remarks

Pareucamptonyx townesi resembles *P. zulianus* as the mesoscutum lacks lateral pointed apophyses (Fig. 4D–E). However, *P. townesi* differs in the absence of a frontal line and the inner margin of the 5th protarsomere with 10–14 lamellae and six long bristles (Fig. 10B–C; Olm & Virla 2014: fig. 215e).



Fig. 7. *Pareucamptonyx townesi* (Olmí, 1984), ♀ **A–D.** Specimen from Distrito Federal. **A.** Habitus, lateral view. **B.** Head, frontal view. **C.** Head, dorsal view. **D.** Mesosoma, dorsal view. **E–F.** Holotype, ♀. **E.** Habitus of holotype, lateral view. **F.** Labels of holotype. Scale bars = 1.0 mm.

Pareucamptonyx zulianus (Olm, 1986)

Figs 8, 11

Gonatopus zulianus Olmi, 1986: 96. Female, holotype. Venezuela: Zulia, Tucuco (EMUS, examined through photographs).

Pareucamptonyx costaricanus Olmi, 1991: 376. Female, holotype. Costa Rica: Puntarenas, Golfo Dulce Forest Reserve (AMNH, examined through photographs).

Diagnosis

Apterous, body length 3.25 mm. Body predominantly black, except mandible, scape and pedicel testaceous; flagellomeres 1–7 brown, and 8th whitish (Fig. 8A, C–D); legs dark brown testaceous

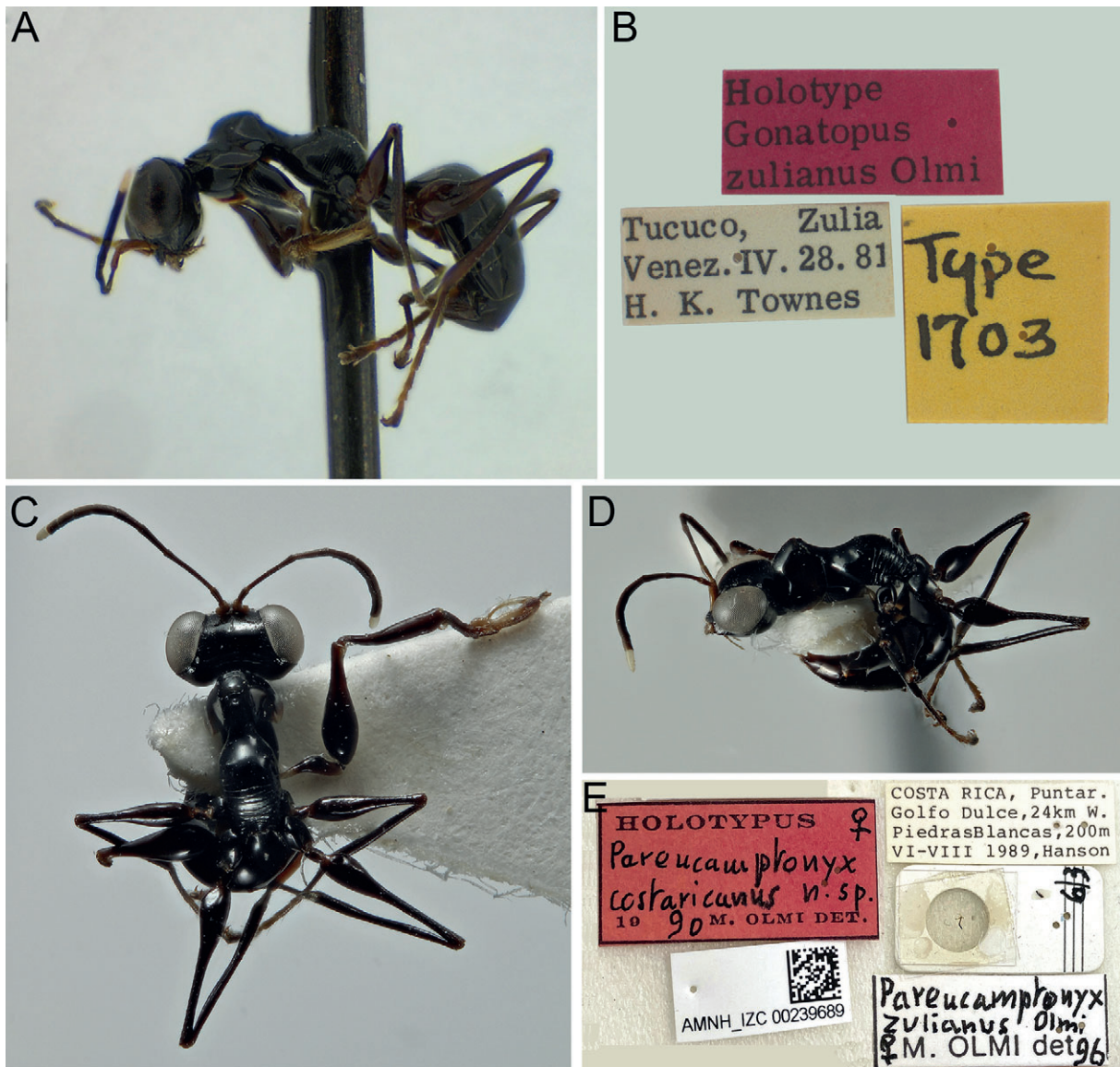


Fig. 8. A–B *Pareucamptonyx zulianus* (Olm, 1986), holotype, ♀ (EMUS). A. Habitus of *Gonatopus zulianus* Olmi, 1986, lateral view. B. Labels of *G. zulianus*. C–D. *P. costaricanus* Olmi, 1991, holotype, ♀ (AMNH_IZC 00239689). C. Habitus of *P. costaricanus* Olmi, 1991, dorsal view. D. Labels of *P. costaricanus*. E. Labels of holotype.

and tarsomeres testaceous; metasoma dark brown and black. Head smooth, shiny, and finely punctate; frontal line incomplete (Fig. 8C), only present in front of anterior ocellus; occipital carina absent. Flagellomeres 6–8 with rhinaria. Pronotum smooth and shiny; mesoscutum shiny, smooth, with longitudinal striae, without lateral pointed apophyses (Olmi & Virla 2014: fig. 215a–b). Propodeum

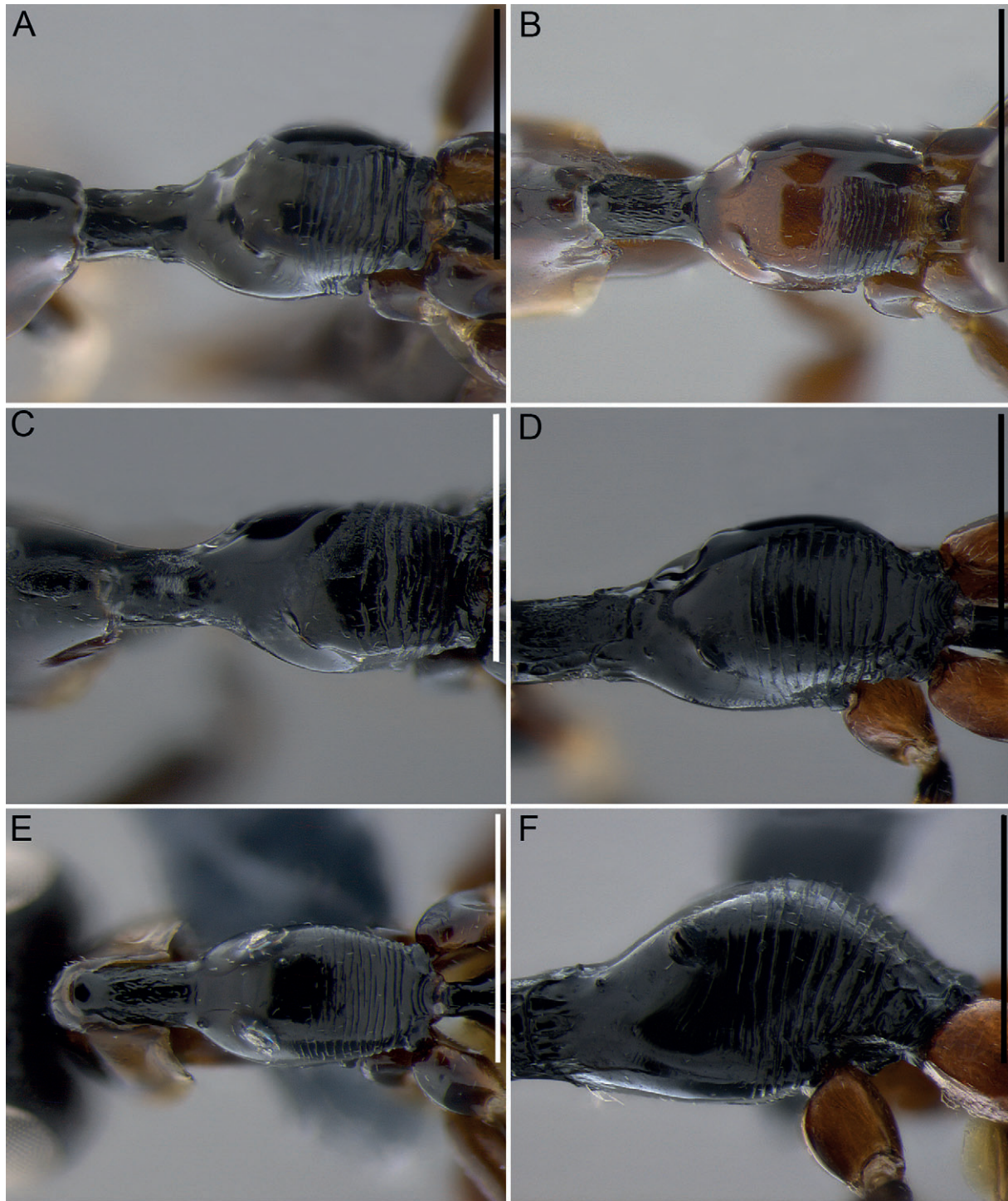


Fig. 9. Mesosoma in dorsal and lateral view of species of *Pareucamptonyx* Olmi, 1991. **A.** *P. albopictus* Martins sp. nov. **B.** *P. kumagaiae* Martins sp. nov. **C.** *P. niger* Martins sp. nov. **D, F.** *P. paranaensis* Martins sp. nov. **E.** *P. townesi* (Olmi, 1984). Scale bars: A–C, E–F = 1.0 mm; D = 0.5 mm.

with anterior and posterior surfaces shiny, smooth, and posterior surface transversely striate (Fig. 8A, C–D). Enlarged claw with distal apex rounded, not pointed, without subdistal tooth, with one row of 6–9 bristles (Olmi & Virla 2014: fig. 215C–D). Fifth protarsomere with two rows of 16–20 lamellae (Olmi & Virla 2014: fig. 215c–d); distal apex with 20–33 lamellae.

Material examined

Holotype of *Pareucamptonyx zulianus* Olmi, 1986

VENEZUELA • ♀; “Tucuco, Zulia, \ Venez. IV.28.81 \ H. K. Townes” “Type \ 1703” “Holotype \ *Gonatopus \ zulianus* Olmi”; EMUS.

Holotype of *Pareucamptonyx costaricanus* Olmi, 1991

COSTA RICA • ♀; “Costa Rica, Puntar \ Golfo Dulce 24Km W \ Piedras Blancas, 200m \ VI-VIII-1989 Hanson” “*Pareucamptonyx \ zulianus* \ M. OLMÍ det. 96” “Holotypus \ *Pareucamptonyx \ costaricanus* n. sp. \ 1990 M. OLMÍ Det.”; AMNH.

Additional material

BRAZIL – São Paulo • 1 ♀; “BRASIL, SP, São Luiz do Paraitinga, \ Parque Estadual Serra Mar \ Núcleo Santa Virgínia, \ 23°19'24.8"S/45°05'40.1"W, \ Malaise trap, 23.XI.2009, \ N.W. Perioto et al. leg.”; LRRP.

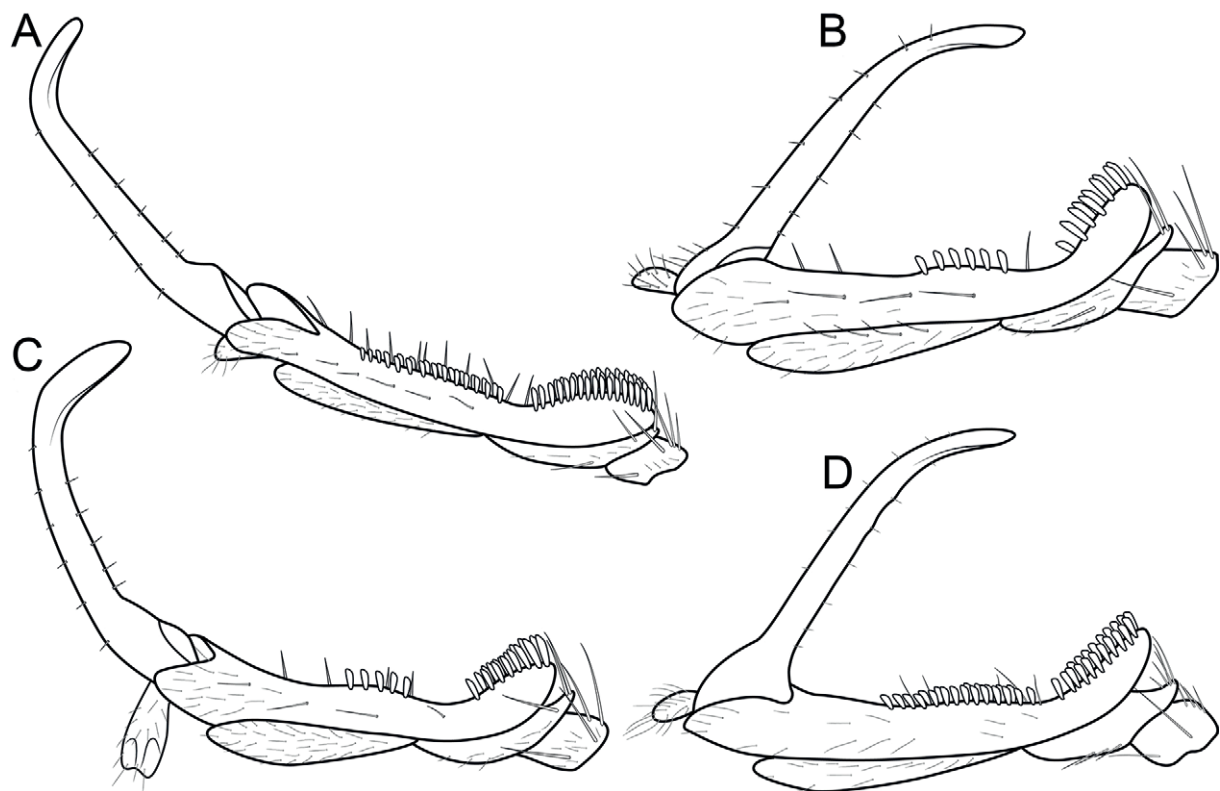


Fig. 10. Chela in lateral view of species of *Pareucamptonyx* Olmi, 1991. **A.** *P. albopictus* Martins sp. nov. **B.** *P. kumagaiae* Martins sp. nov. **C.** *P. niger* Martins sp. nov. **D.** *P. paranaensis* Martins sp. nov.

Distribution

Bolivia (Olmi & Virla 2014; Martins *et al.* 2015a), Brazil (São Paulo and Rio de Janeiro states), Costa Rica, Venezuela and French Guiana (Fig. 11).

Remarks

Pareucamptonyx zulianus resembles *P. townesi* as the antenna has the 8th flagellomere whitish and the mesoscutum without lateral pointed apophyses (Fig. 4D–E). However, *P. zulianus* differs by the presence of a frontal line and the inner margin of 5th protarsomere with 16–20 lamellae (Olmi & Virla 2014: fig. 215c–d).

Discussion

The macropterous (and actively flying) dryinids are frequently collected with yellow pan traps, interception traps, sweep nets, and Malaise traps while the apterous ones are rarely sampled (Olmi & Virla 2014; Versuti *et al.* 2014; Martins & Domahovski 2017a, 2017b; Martins 2018, 2019; Martins *et al.* 2020, 2021). Most of the specimens studied herein were collected with Malaise traps, which is an unexpected result. Perhaps, this can be explained by trapping for long periods, as is the case with those specimens collected in Brasília, DF, Brazil, where the Malaise trap was operated for three

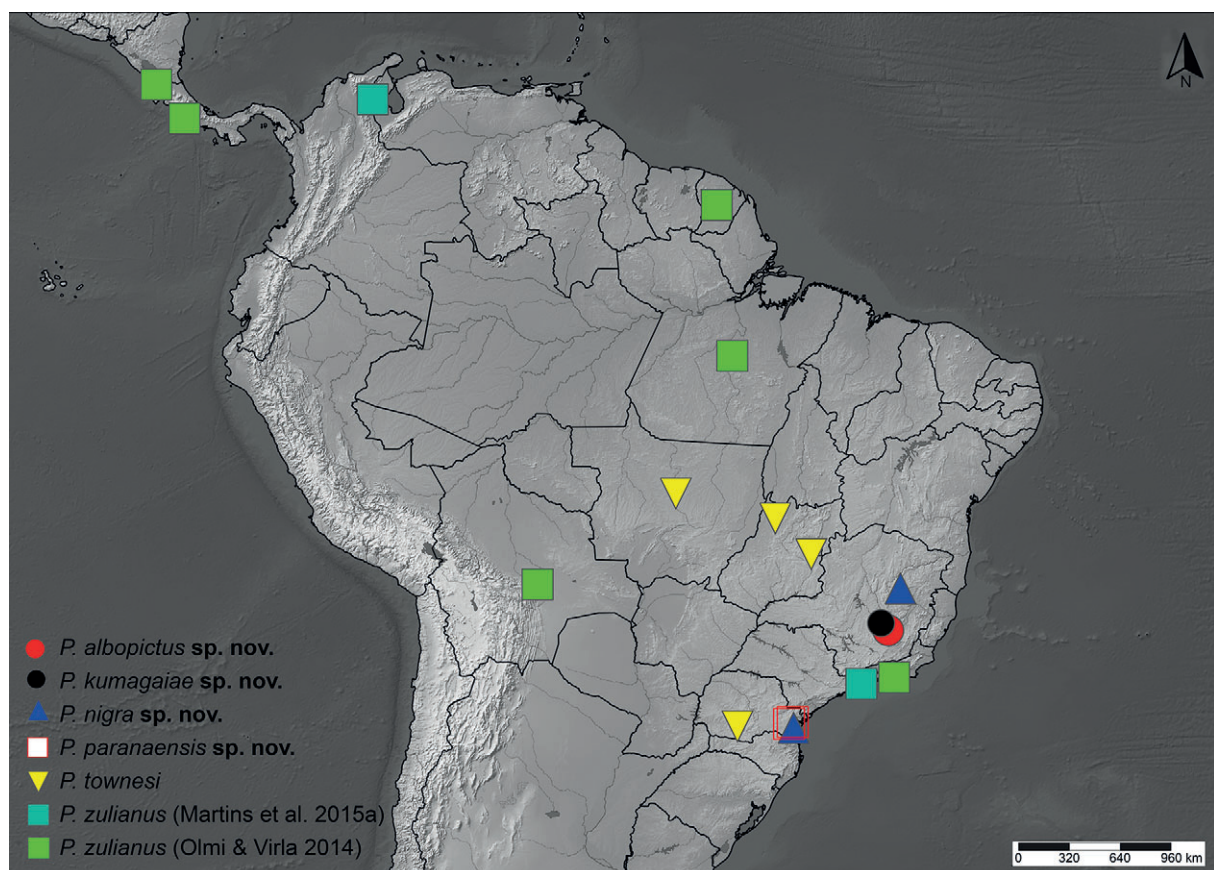


Fig. 11. Geographic distribution of species of *Pareucamptonyx* Olmi, 1991 from the Neotropical region: *P. albopictus* Martins sp. nov. (red circle); *P. kumagaiæ* Martins sp. nov. (black circle); *P. niger* Martins sp. nov. (blue triangle); *P. paranaensis* Martins sp. nov. (square); *P. townesi* (Olmi, 1984) (yellow triangle); *P. zulianus* (Olmi, 1986) (light blue square) (records by Martins *et al.* 2015a); *P. zulianus* (light green) (records by Olmi & Virla 2014).

years, increasing the chance of sampling some apterous dryinids. We suppose that the specimens are occasionally collected when females are foraging near the trap. The most effective method to collect the apterous Gonatopodinae is by sweeping techniques, mainly over shrubs and grasses near the soil (Martins 2019).

Based on the study of the Neotropical species of *Pareucamptonyx* we observed some differences in comparison to the Nearctic species, as follows: (1) in the Neotropical species the ocellar ratio OL is as long as POL, whereas in the Nearctic species, OL is longer than POL; (2) in the Neotropical species the frontal line is variable and may be incomplete in *Pareucamptonyx zulianus*, *P. paranaensis* Martins sp. nov., *P. niger* Martins sp. nov. and *P. albopictus* Martins sp. nov. or absent in *P. townesi* and *P. kumagaiae* Martins sp. nov., whereas in the Nearctic species the frontal line is complete. However, as only one species is currently known from the Nearctic region (*P. waldreni*), perhaps these differences can be confirmed (or not) if more Nearctic species are discovered in the future.

Among the species of *Pareucamptonyx* studied here, *P. zulianus* has the widest distribution in South American countries, although in Brazil it is restricted to the Southeast region. *Pareucamptonyx townesi*, only known from Brazil, is distributed in three states (Goiás, Mato Grosso and Paraná) and in the Federal District, comprising the South and Center-West regions. The distribution of species of Dryinidae in Brazil is poorly known, especially for females of *Gonatopus* and *Pareucamptonyx*. It is unknown for sure how wide the geographical distributions of each of these species are, since they are rarely collected, and as they are apterous, they do not have the ability to disperse through flight, which should restrict their dispersal and geographical distribution compared to other, winged groups.

Although Olmi & Virla (2014) recognize wide interspecific variation for several species in the Neotropics, we believe that interspecific variation is more restricted than this. Based on all specimens studied herein and others that we have been studying, we do not consider that Dryinidae, especially the Gonatopodinae, present wide intraspecific variation in rhinaria, frontal line, integument sculpture or number of lamellae in the elongated claw and, therefore, these characters can be used to delimit species (Martins pers. obs.). Recently, we have reared a relatively large number of species of *Gonatopus* Ljungh, some of them in a relatively large number of specimens, and we have not observed significant polymorphism between specimens for these characters (Martins pers. obs.).

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