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New species of *Plesiocoelus* van Achterberg and *Mesocoelus* Schulz (Hymenoptera, Braconidae) from Brazil

Marco Aurélio Bortoni[1], Angélica Maria Penteado-Dias[1]

1 *Universidade Federal de São Carlos, Programa de Pós-Graduação em Ecologia e Recursos Naturais, CP 676, CEP 13 565-905, São Carlos, SP, Brazil*

Corresponding author: *Marco Aurélio Bortoni* (marcoabortoni@yahoo.com.br)

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Abstract

Three new species from Brazil, *Plesiocoelus anomalus* **sp. n.**, *P. areolatus* **sp. n.** and *Mesocoelus lobatus* **sp. n.**, are described and illustrated, and new records for *Plesiocoelus bassiformis* van Achterberg are also included. A key to the species of both genera is provided.

Keywords

Biodiversity, Ichneumonoidea, Neotropical Fauna, Taxonomy

Introduction

Plesiocoelus bassiformis van Achterberg, 1990 is the type species and the only described species of the genus. It is characterized by the apically reduced fore wing venation and the merging of discal and first submarginal cells. It has been recorded from Colombia, Ecuador and Honduras (Yu et al. 2012). There are no biological data for the genus.

The genus *Mesocoelus* Schulz, 1918 is recorded from Cuba and Saint Vincent (Yu et al. 2012) and the two known species so far are parasitoids of *Acrocercops* sp. and *Chilocampylla psidiella* Busck (Lepidoptera, Gracillariidae) (van Achterberg 1990). It has reduced apical wing venation, as in *Plesiocoelus*, but differs by the absence of veins 1m-cu and 2RS in the fore wing (Sharkey 2006).

Those morphological similarities led van Achterberg (1990) to revalidate the status of the subtribe Mesocoelina Viereck, also including the genus *Aneurobracon* Brues, 1930. Despite these similarities the subtribe is not consistent phylogenetically. The clade *Aneurobracon* + *Mesocoelus* was not recovered in some analyses in Sharkey et al (2006), but the morphological similarities led the authors to propose them as sister groups (Shakey et al. 2006, 2009). The genus *Plesiocoelus* was recovered in some analyses as closely related to some clades of *Bassus* s.l. (Sharkey et al. 2006). The generic concept of *Bassus* s.l. has gone through changes and split into other genera; now *Plesiocoelus* is thought to be the sister group of *Zacremnops* Sharkey & Wharton and *Therophilus* Wesmael (Sharkey et al. 2009)

In this paper, we describe two new species of *Plesiocoelus* and a new species of *Mesocoelus* and we include new distribution records for *P. bassiformis*. A key to the species of both genera is provided.

Methods

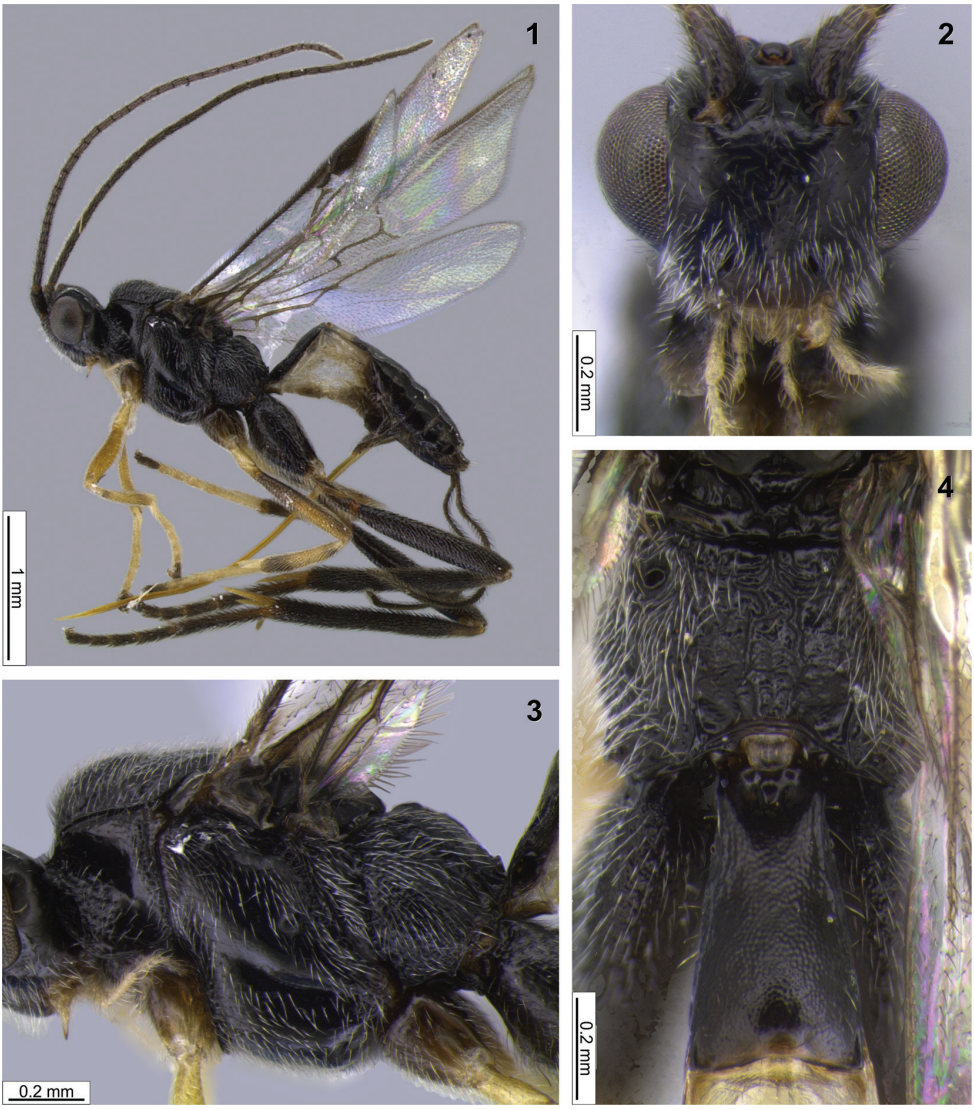
The examined specimens are deposited in the DCBU Collection (Departamento de Ecologia e Biologia Evolutiva da Universidade Federal de São Carlos, São Carlos, SP, Brazil); all were collected in Brazil in the States of Amazonas, Minas Gerais and São Paulo with Malaise traps. The genera were identified using the key by Sharkey (2006) and the species were compared with the description and illustrations in van Achterberg (1990). The morphological terminology follows Wharton (1997), except for "precoxal sulculs" which replaces "sternaulus". The colour photographs were taken and edited with a Leica® M205C with LAS image software.

Results

Plesiocoelus bassiformis van Achterberg, 1990

Figs 1–4

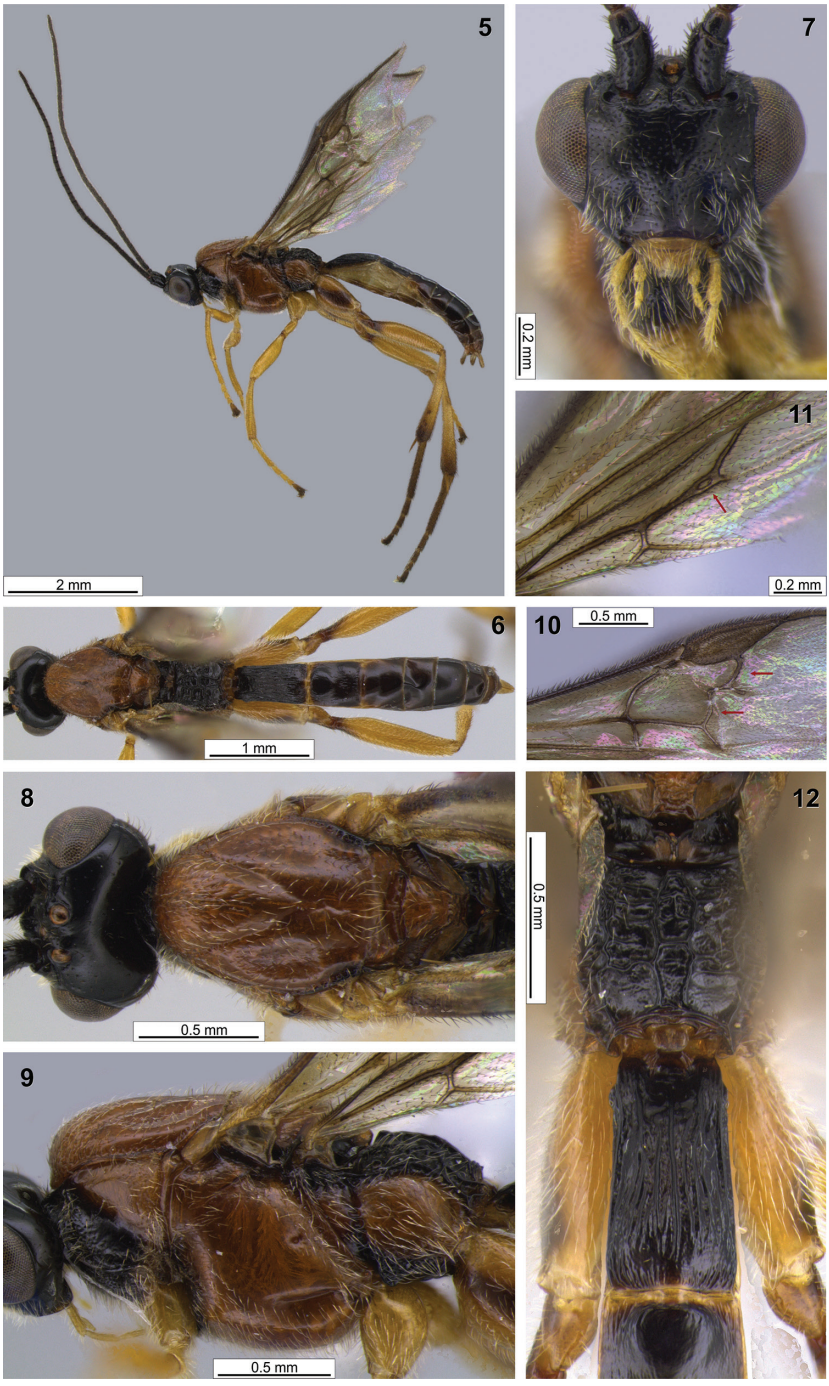
New record. *Plesiocoelus bassiformis* is recorded for the first time from Brazil. One female (DCBU 51443) "Bom Repouso, MG, Brasil, Serra dos Garcias, Armadilha Malaise, S22°29'25.6", W46°11'25.8", 04.V.2010, I.F. Melo col." One female (DCBU 51444) "Ribeirão Grande, SP, Brasil, Pq. Estadual de Intervales, Armadilha Malaise, S24°16'28.8", W48°25'20.6", 22.III.2010, N.W. Perioto e eq. cols."



Figures 1–4. *Plesiocoelus bassiformis* van Achterberg, 1990; **1** Habitus, lateral view **2** Head, frontal view **3** Mesosoma, lateral view **4** Propodeum and T1, dorsal view.

***Plesiocoelus anomalus* sp. n.**
http://zoobank.org/ACECDA73-0CDA-486B-BD0D-0691905BA02D
Figs 5–12

Material examined. Holotype – male. (DCBU 51445) "São Luiz do Paraitinga, SP, Brasil, Pq. Estadual da Serra do Mar, Núcleo Santa Virgínia, 22.XI.2010, Armadilha Malaise, S23°19'27.1", W45°5'38.4", N.W. Periotto e eq. col."



Figures 5–12. *Plesiocoelus anomalus* sp. n.; **5** Habitus, lateral view **6** Body, dorsal view **7** Head, frontal view **8** Head, mesonotum and scutellum, dorsal view **9** Mesosoma, lateral view **10** Fore wing, arrows indicating vein 2RS and 1m-cu present **11** Vein 1M of hind wing, arrow indicating widened part **12** Propodeum and T1, dorsal view.

Description of holotype. Body length: 4.0 mm. Fore wing length: 3.9 mm.

Head. Antenna with 33 segments, whitish setose, length of third segment equal to fourth; length of third, fourth and penultimate segments 3.6, 3.6 and 1.25 times their width, respectively. Maxillary palp with 5 segments and 0.6 times height of head. Length of eye in dorsal view 2.2 times temple. OOL: diameter of ocellus: POL = 15:10:15. Head completely smooth with long whitish setae on lateral parts of face, length of malar space 1.5 times basal width of mandible.

Mesosoma. Length of mesosoma 1.8 times its height. Propleuron sparsely punctate. Pronotum smooth but anteriorly punctate. Mesopleuron smooth, with precoxal sulcus faintly impressed and smooth. Mesonotum smooth, with notauli weakly impressed, crenulate anteriorly and smooth posteriorly. Scutellum smooth. Propodeum areolate.

Fore wing. Mostly infumate and hyaline near apex, length of pterostigma: R1 = 30:40, 1-CU1:2-CU1 = 3:20.

Hind wing. Mostly infumate and hyaline near apex, vein CUb present and tubular, vein 1M widened and with small cell (Fig. 11).

Legs. All legs smooth, length of femur, tibia and basitarsus of hind leg 5.0, 10.7, 8 times their width, respectively. Apex of hind tibia with 15 pegs. Length of hind spur 0.25 times hind basitarsus.

Metasoma. T1 striate, T2 with weakly granulate sculpture, remaining tergites smooth. T1 2.1 times longer than its apical width.

Colour. Head black, except ocelli dark yellow; clypeus, mandible, maxillary and labial palpi and glossa yellow. Mesosoma brown, but propleuron, basal half of pronotum, metanotum, propodeum and ventral margin of metapleuron black. Legs yellow except for brownish to black fore and mid telotarsi; lateral area of hind coxa, hind trochanter, hind trochantellus, base of femur, apex of tibia, hind basitarsus and hind tarsus brownish. Metasoma brown to black, but ventrally yellowish.

Diagnosis. This species differs from all other species of *Plesiocoelus* by the mostly brown mesosoma, completely yellowish legs and striate T1.

Etymology. This species is named after the unique shape of vein 1M of the hind wing (Fig. 11).

Biology. Unknown.

Distribution. Only known from the type locality in Brazil.

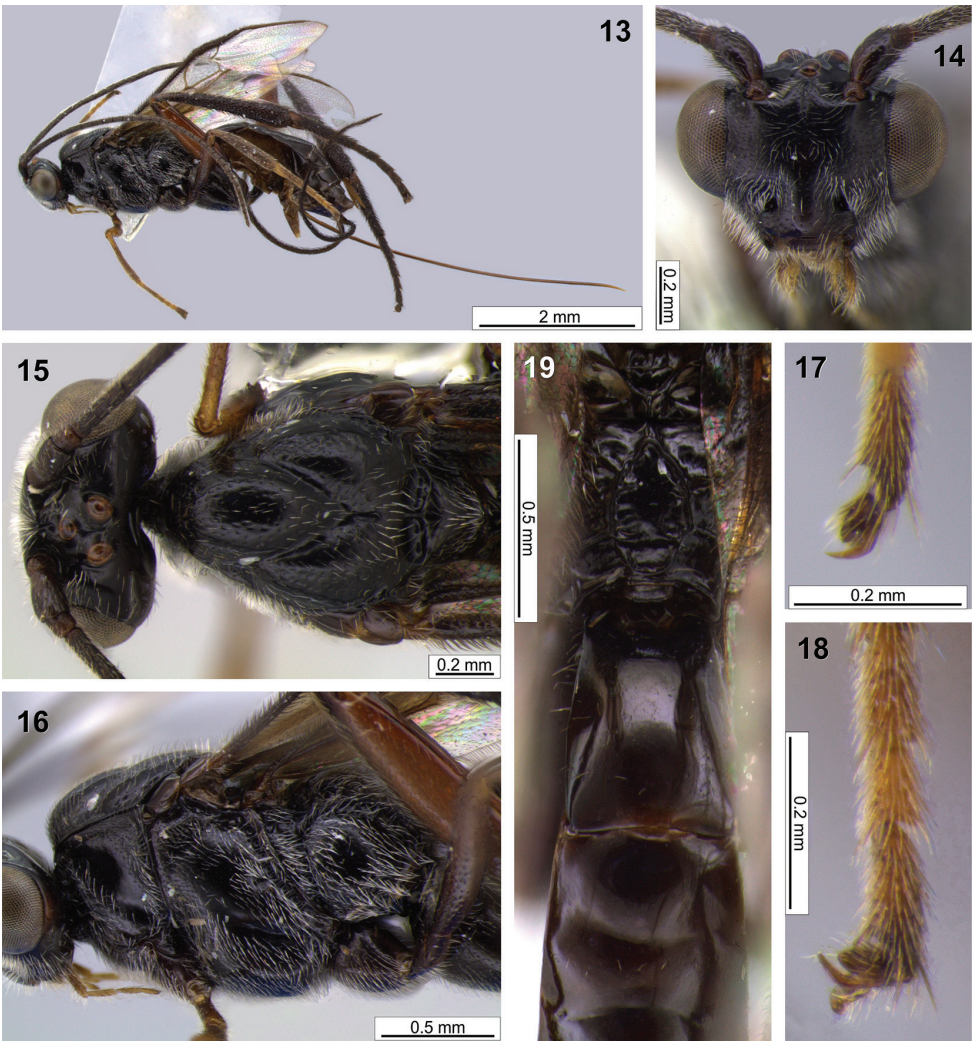
***Plesiocoelus areolatus* sp. n.**

http://zoobank.org/8D4AA3C4-02F6-4937-9864-86DCBD02940C

Figs 13–19

Material examined. Holotype – female. (DCBU 51038) "Manaus, AM, Brasil, Reserva Km 41, trilha, 24-25-XI-2004, S03°05'07", W60°02'4.92", Armadilha Malaise suspensa, R.B.Q. Silva col."

Description of holotype. Body length: 4.5 mm. Fore wing length: 3.2 mm



Figures 13–19. *Plesiocoelus areolatus* sp. n.; **13** Habitus, lateral view **14** Head, frontal view **15** Head, mesonotum and scutellum, dorsal view; **16,** Mesosoma, lateral view **17** Fore tarsus **18** Hind tarsus **19** Propodeum and T1, dorsal view.

Head. Antenna with 34 segments, whitish setose, length of third segment equal to fourth, length of third, fourth and penultimate segments 3.0, 3.0 and 1.5 times their width, respectively. Maxillary palp with 5 segments and its length 0.5 times height of head. Length of eye in dorsal view 2.1 times temple. OOL: diameter of ocellus: POL = 25:12.5:15. Head completely smooth, with long whitish setae on lateral parts of face, length of malar space 1.5 times basal width of mandible.

Mesosoma. Whitish setose, length of mesosoma 2.0 times its height. Propleuron sparsely punctate. Pronotum smooth, but apical and dorsal sides finely punctate. Mesopleuron smooth, with precoxal sulcus smooth. Mesonotum smooth, with notauli

smooth, crenulate anteriorly with apical third joining. Scutellum smooth. Propodeum smooth with large propodeal areola medially.

Fore wing. Infuscate, hyaline apically, length of pterostigma: R1 = 40:70, 1-CU1:2-CU1 = 2:13.

Hind wing. Hyaline, vein CUb present as a very short stub. Vein 1M normal.

Legs. All legs smooth, length of femur, tibia and basitarsus of hind leg 5.0, 10.0, 6.0 times their width, respectively. Length of hind spur 0.5 times length of hind basitarsus.

Metasoma. All terga completely smooth, T1 1.2 times as long as its apical width. Length of ovipositor about 1.4 times fore wing.

Colour. Black, except pedicellus and base of scape dark brown; mandibles, maxillary and labial palps yellowish; fore and mid legs dark brown, hind leg dark brown with femur orange brownish and tibial spurs yellowish. Tegula brownish. Metasoma ventrally yellowish, ovipositor sheath dark brown.

Diagnosis. This species is closely related to *Plesiocoelus bassiformis* but it differs by the anteriorly crenulate notauli, the completely smooth precoxal sulcus, the larger propodeal areola (covering most of the length of the propodeum) and the longer ovipositor sheath (about 1.4 times fore wing).

Etymology. This species is named after the large propodeal areola.

Biology. Unknown.

Distribution. Only known from the type locality in Brazil.

***Mesocoelus lobatus* sp. n.**

http://zoobank.org/25795B99-0CE1-425F-9235-F78E86441F9C

Figs 20–26

Material examined. Holotype – female. (DCBU 51446) "Palestina, SP, Brasil, Faz. Boa Vista, S20°17'18", W49°30'01", 18.VIII.2008, Armadilha Malaise, Noll, F. e eq. col."

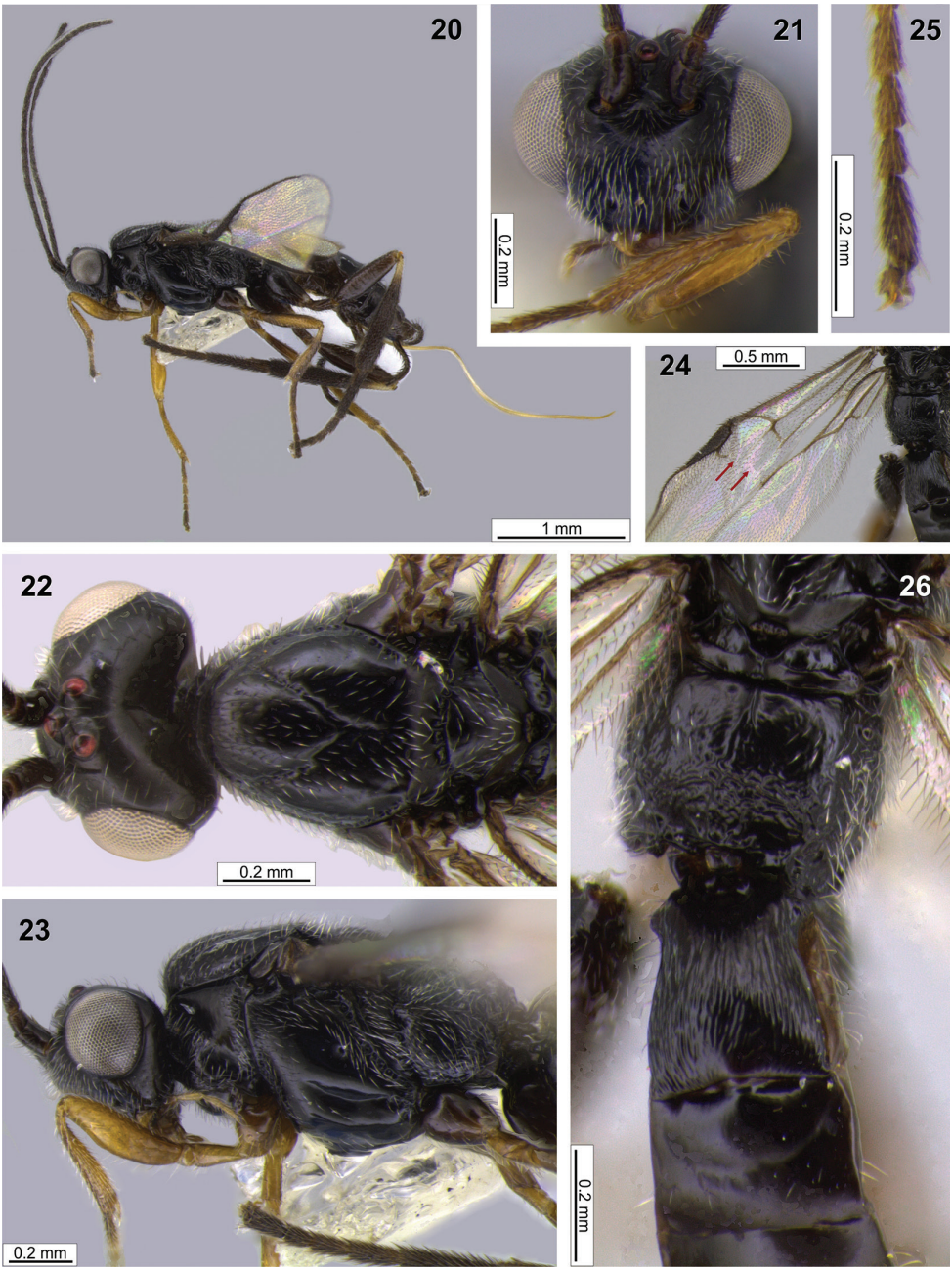
Description of holotype. Body length: 2.8 mm. Fore wing length: 2.7 mm.

Head. Antenna with 25 segments, whitish setose, length of third segment equal to fourth, length of third, fourth and penultimate segments 2.0, 2.0 and 1.2 times their width, respectively. Maxillary palp with 5 segments and its length 0.7 times height of head. Length of eye in dorsal view 2.2 times temple. OOL: diameter of ocellus: POL = 25:10:20. Head completely smooth with long whitish setae on lateral parts of face; length of malar space 1.5 times basal width of mandible.

Mesosoma. Length of mesosoma 2.0 times its height. Propleuron sparsely punctate. Pronotum smooth. Mesopleuron smooth, with precoxal sulcus smooth. Mesonotum smooth, with notauli crenulate anteriorly and smooth posteriorly, joining at apical third. Scutellum smooth. Propodeum rugose medially, apically faintly rugulose and with median longitudinal carina.

Fore wing. Hyaline, length of pterostigma: R1 = 40:70, 1-CU1:2-CU1 = 2:13.

Hind wing. Hyaline.



Figures 20–26. *Mesocoelus lobatus* sp. n.; **20** Habitus, lateral view **21** Head, frontal view **22** Head, mesonotum and scutellum, dorsal view **23** Mesosoma, lateral view **24** Wings, arrows indicating veins 2RS and 1m-cu absent **25** Hind tarsus **26** Propodeum and T1, dorsal view.

Legs. All legs smooth, length of femur, tibia and basitarsus of hind leg 5.0, 10.0, 6.0 times their width, respectively. Length of hind spur 0.25 times hind basitarsus. Tarsal claws with a basal lobe.

Metasoma. T1 striate, remainder of metasoma smooth. T1 length 1.1 times its apical width. Length of ovipositor sheath about 2.0 times hind tibia.

Colour. Black, except antenna dark brown; mandible, maxillary and labial palpi yellowish. Fore and mid legs yellowish with coxae and telotarsi brown. Hind leg dark brown. Metasoma ventrally yellowish, ovipositor sheath dark brown.

Diagnosis. This species differs from the two previously described species by the presence of notauli on the mesoscutum and the mid and hind tarsal claws with basal lobes.

Etymology. This species is named after the presence of tarsal lobes

Biology. Unknown.

Distribution. Only known from the type locality in Brazil.

Key to species of *Mesocoelus* and *Plesiocoelus*

(modified from Sharkey 2006 and van Achterberg 1990).

1 Discal and first submarginal cells of fore wing combined, closed by veins 1m-cu and 2RS (Fig. 10)..... **2**

– Discal and first submarginal cells of fore wing open, veins 1m-cu and 2RS absent (Fig. 24)..... **4**

2 Vein 1M of hind wing widened and with a small cell (Fig. 11). Mesosoma mostly brown (Figs 6, 8, 9). Hind femur yellow. T1 striate (Fig. 12)..... ..... ***P. anomalus* sp. n.**

– Vein 1M of hind wing normal. Mesosoma black (Figs. 3, 15, 16). Hind femur black or brownish. T1 smooth or punctate (Figs 4, 19)..... **3**

3 Propodeum with a large areola medially (Fig. 19). Ovipositor sheath about 1.4 times as long as fore wing. Notauli crenulate anteriorly. Precoxal sulcus smooth posteriorly..... ***P. areolatus* sp. n.**

– Propodeum mostly rugose medially and without distinct areola (Fig. 4). Ovipositor sheath about 0.8 times as long as fore wing. Notauli completely smooth. Precoxal sulcus crenulate posteriorly..... ***P. bassiformis* van Achterberg**

4 Mesonotum with notauli present (crenulate anteriorly and smooth posteriorly; Fig. 22). Mid and hind tarsal claws with basal lobes (Fig. 25)..... ..... ***M. lobatus* sp. n.**

– Mesonotum without notauli. Mid and hind tarsal claws simple, without basal lobes **5**

5 Mesoscutum with round depression medio-posteriorly. Hind basitarsus about 5 times as long as wide. Epistomal suture absent medially. Hind leg largely yellowish. Ovipositor sheath as long as hind tibia. Area between antennal sockets evenly convex ..... ***M. laeviceps*** **(Ashmead)**

– Mesoscutum without round depression medio-posteriorly. Hind basitarsus about 9 times its width. Epistomal suture shallowly impressed medially. Hind leg largely dark brown or blackish. Ovipositor sheath about 0.8 times as long as hind tibia. Area between antennal sockets with a pair of weak crests .... ***M. acrocercopsis*** **Muesebeck**

Acknowledgments

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