

## SYSTEMATICS, MORPHOLOGY AND PHYSIOLOGY

New Species of *Brachygasterina* Macquart (Diptera: Muscidae) from High Altitudes of Colombia, Ecuador and VenezuelaELAINE D.G. SOARES<sup>1</sup> AND CLAUDIO J.B. DE CARVALHO

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*Neotropical Entomology* 36(3):424-430 (2007)

Especies Novas de *Brachygasterina* Macquart (Diptera: Muscidae) de Altas Altitudes da Colômbia, Equador e Venezuela

RESUMO - *Brachygasterina* Macquart é um gênero endêmico de Muscidae da América do Sul que compreende sete espécies. Aqui, três novas espécies são descritas a partir de material proveniente de regiões de altas altitudes da Colômbia, Equador e Venezuela. Uma chave para as espécies do gênero é fornecida.

PALAVRAS-CHAVE: Reinwardtiini, América do Sul, taxonomia

ABSTRACT - The genus *Brachygasterina* Macquart (Muscidae), comprising seven species, is endemic in South America. Three new species are herein described from the highlands of Colombia, Ecuador and Venezuela. A key to the species of this genus is provided.

KEY WORDS: Reinwardtiini, South America, taxonomy

*Brachygasterina* Macquart is a recently revised genus of South American Reinwardtiini (Carvalho & Pont 2006). Seven species have already been described: *Brachygasterina violaceiventris* Macquart; *B. stuebeli* (Röder); *B. fulvohumeralis* (Malloch); *B. major* Malloch; *B. valdiviensis* (Pamplona & Couri); *B. andina* Carvalho & Pont and *B. maculata* Couri, Carvalho & Pont. Since the original description, the genus was known only from Chile and Argentina. Recently, the combination of *Hydrotaea stuebeli* in *Brachygasterina* (Carvalho *et al.* 2005) and the description of *B. andina*, increased the distribution of the genus to Colombia and Venezuela, and all the known species were recently redescribed (Carvalho & Pont 2006).

*Brachygasterina* is probably a near relative of *Psilochaeta* Stein (Diptera: Muscidae) (Malloch 1934; Carvalho 1989b,c; Carvalho & Couri 2002) due to the common metallic blue coloration and their overlapping geographical distribution, *Psilochaeta* does not have exclusive characters while *Brachygasterina* has dilated palpus and antenna (Carvalho & Couri 2002). A recent cladistic analysis that focused on *Palpibracus* Rondani (Diptera: Muscidae) (Soares & Carvalho 2005) recognized *Psilochaeta* as a paraphyletic genus, related to *Dalcyella veniseta* (Dodge) (Diptera: Muscidae), *Brachygasterina* and *Palpibracus*. All these genera show a partially overlapping distribution in Chile and Argentina. *B. maculata* was shown to be outside of the *Brachygasterina* clade (Couri *et al.* 2007), based on the data

matrix in Soares & Carvalho (2005). These data suggest that *Brachygasterina*, *Dalcyella*, *Palpibracus* and *Psilochaeta* should be treated as single genus.

The generic concept of *Brachygasterina* was enlarged to include *B. maculata*, since this Chilean species has characters that disagreed with the earlier *Brachygasterina* concept (Couri *et al.* 2007): palpus not dilated, absence of interfrontal seta and katepisternals 2:2.

Based on the most recent *Brachygasterina* concept (Couri *et al.* 2007), herein we describe three new species of the genus from high altitudes of Ecuador, Colombia and Venezuela, with a key to the ten current species of *Brachygasterina*.

### Material and Methods

The material examined is in the Field Museum of Natural History, United States of America, Illinois, Chicago (FMNH) and to the Instituto de Investigación de Recursos Biológicos Alexander von Humboldt, Colombia, Bogotá (IAvH). Terminology follows McAlpine (1981), with modifications by Carvalho (1989a).

Here we present a new diagnosis of *Brachygasterina* to include the discussion of the characters of the three new species, despite the recent revision of the genus (Carvalho & Pont 2006) and the diagnosis (Couri *et al.* 2007).

**Brachygasterina Macquart, 1851**

**Type species.** *B. violaceiventris* Macquart (original designation)

**Diagnosis.** General body coloration dark-brown with metallic blue, bluish-purple or greenish-blue shining, except by *B. fulvohumeralis* with humeral callus and prothoracic spiracle orange-yellow and *B. maculata* with shining blackish-brown thorax and blackish-brown grey dusted abdomen, yellow sternites, tergites 1-3 with yellow lateral marks, most of tergite 5 yellow and sternite 5 with a heart-shaped yellow area on basal two-thirds.

Male holoptic, eyes short or long ciliated; arista almost bare; first flagellomere strongly dilated; palpus dilated, except in *B. maculata*; interfrontal seta present in female, absent in *B. maculata*, *Brachygasterina bochica* **sp. nov.** and *Brachygasterina muisca* **sp. nov.**; presutural acrostichal setae developed, except in *B. bochica* **sp. nov.**; prealar seta present or absent; dorsocentrals 2:4; katapisternals 1-2:2-3; meron and katepimeron bare; notopleuron ciliated; base of  $R_{4+5}$  with or without cilia; veins  $R_{4+5}$  and  $M_{1+2}$  parallel apically except in *B. stuebeli*, *Brachygasterina humboldti* **sp. nov.**, *B. muisca* **sp. nov.** and *B. bochica* **sp. nov.**; mid femur with 1-2 preapical anterior setae; hind tibia with the a strong calcar, with an apical anterodorsal seta but no posteroventral; ovipositor long, with tergite 6 anchor-shaped, tergite 7 slightly larger, and sternites 6 and 7 divided posteriorly.

**Monophyly.** The monophyly of *Brachygasterina* is not well established since Couri *et al.* (2007) placed *B. maculata* outside of *Brachygasterina* clade, using the data matrix of Soares & Carvalho (2005).

**Comments.** The new species have flagellomere less dilated than the flagellomere of the previously known species of *Brachygasterina*.

**Geographical record.** Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Juan Fernandez Island, Peru, Venezuela and Uruguay

**Key to Species of *Brachygasterina* Macquart**  
(males are unknown for *B. andina*, *B. fulvohumeralis*, *B. stuebeli*, *B. valdiviensis*, *B. maculata* and *B. muisca*)

1. General color shining blackish-brown; abdomen blackish-brown with light grey dust, with yellow marks at sides of tergites 1-2, 3 and 4, most of tergite 5 yellow; sternite 5 with a heart-shaped yellow area on basal two-thirds; ventral face of abdomen yellow. Male: unknown. Female: palpus falciform, interfrontal seta absent (Chile).....*B. maculata* Couri, Carvalho & Pont  
– General color subshining dark metallic violet-blue, at most with humeral callus and prothoracic spiracle orange-yellow. Palpus dilated.....2

2. General color metallic violet-blue; humeral callus and prothoracic spiracle orange-yellow, notopleuron dull reddish-yellow; calypters dark-brown. Male: unknown (Chile) .....*B. fulvohumeralis* (Malloch)  
– General color subshining dark metallic violet-blue, including humeral callus and notopleuron; prothoracic spiracle black; calypters brownish with dark-brown margins.....3

3. Base of  $R_{4+5}$  on wing with cilia on both faces; prealar seta absent (male) or weak (female), shorter than anterior notopleural seta; sternite 1 ciliated. Female: fore tibia on anterodorsal face with 4 short setae on apical half (Argentina, Chile).....*B. major* Malloch  
– Base of  $R_{4+5}$  on wing bare on both faces; prealar seta sub equal to or much longer than anterior notopleural seta; sternite 1 bare.....4

4. Vein  $M_{1+2}$  slightly curved toward  $R_{4+5}$ . Usually with two strong anterior katapisternals (*B. humboldti* **sp. nov.** may have only one).....5  
– Vein  $M_{1+2}$  parallel to  $R_{4+5}$ . One strong anterior katapisternal, with or without a weaker setae.....8

5. Eye with sparse hair. Female: interfrontal seta absent .....6  
– Eye with long dense hair. Female: interfrontal seta present .....7

6. Presutural acrostichal setae not developed. Facial ridge ciliated until the mid-length of flagellomere; katapisternals 2:2 (Colombia).....*B. bochica* **sp. nov.**  
– Presutural acrostichals developed. Facial ridge ciliated on basal half. Male: unknown. (Colombia)..*B. muisca* **sp. nov.**

7. Facial ridge with cilia reaching the mid level of facial ridge. Female: frontal plate with only interfrontal seta; ovipositor short (fig. 7-8) with seventh sternite disconnected medially, and posterior portion forming a plate around setae (fig. 8) (Colombia, Ecuador, Venezuela).....*B. humboldti* **sp. nov.**  
– Facial ridge with cilia reaching almost the level of arisal insertion. Male: unknown. Female: frontal plate with cilia besides interfrontal seta; ovipositor long with seventh sternite disconnected medially, posterior portion forming two small plates around setae (Colombia, Ecuador).....*B. stuebeli* (Röder)

8. Facial ridge bare. Male unknown. Female: parafacial narrow, in lateral view at narrowest point 0.2 of width of first flagellomere (Ecuador).....*B. andina* Carvalho & Pont  
– Facial ridge with a few cilia, reaching only the mid-level of flagellomere. Female: parafacial very narrow, in lateral view at narrowest point less than 0.2 times the width of first flagellomere.....9

9. Male: hind femur on posteroventral face with long setae on apical half, shorter on basal half. Female: fore tibia on dorsal face without a preapical seta; length of sternite 6 about half the length of the segment; 3 spermathecae (Argentina, Chile).....*B. violaceiventris* Macquart

– Male unknown. Female: fore tibia on dorsal face with a preapical seta; length of sternite 6 about 1/3 the length of the segment; 2 spermathecae (Chile).....  
 .....*B. valdiviensis* (Pamplona & Couri)

***Brachygasterina humboldti* sp. nov. Soares & Carvalho**  
 (Figs. 1-3; 7-8)

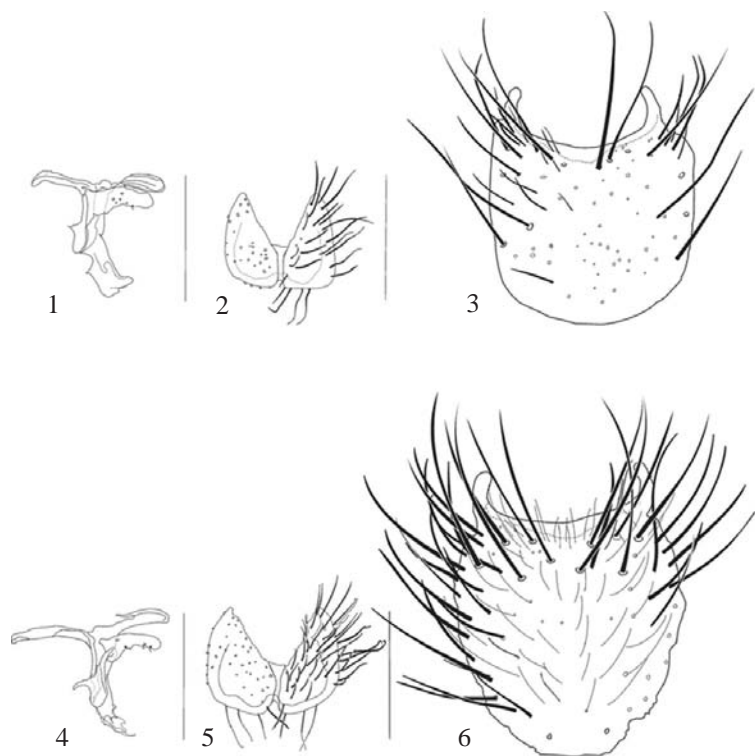
**General color.** General body coloration metallic blue to bluish-purple, metallic green in alcohol. Palpus and antenna dark-brown. Fronto-orbital plate, face, parafacial and gena dark-brown with metallic blue shine, gena in anterior portion reddish-brown. Lunule yellowish. Scutum with four dark sub-shining dorsal stripes with silver pruinosity, scutellum with two vittae. Anepisternum and katepisternum dark-brown with metallic blue shine. Anepimeron and meron dark-brown. Calypters brownish, with dark-brown margins, halter dark-brown. Wings brownish with brown veins. Legs reddish-brown, claw black and pulvillus yellowish. Abdomen metallic blue, bluish-purple or greenish-blue.

**Male.** Length. Body: 5.93-7.11 mm. Wing: 5.93-6.87 mm

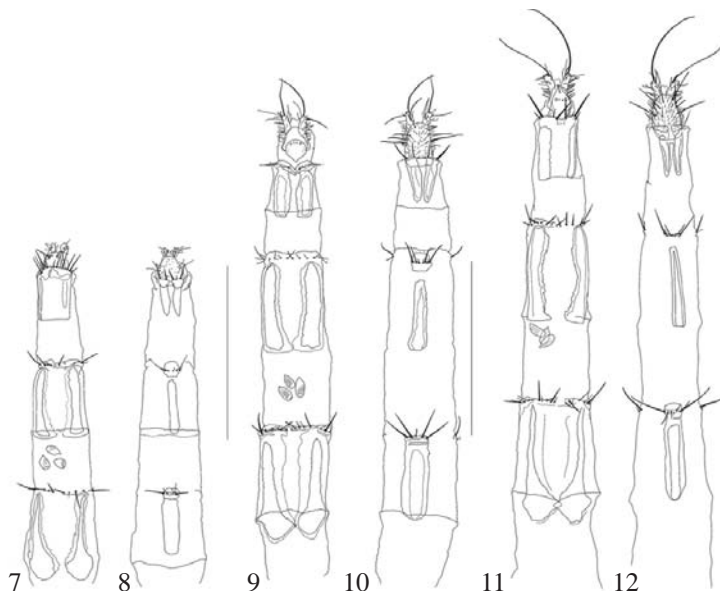
**Head.** Male holoptic, eyes densely long ciliated, frons narrow, about 0.09 times the head width at the level of anterior ocellus. Anterointernal ommatidia enlarged. Antenna long,

weakly dilated, antennal insertion around the mid level of eye, with 0.8 of the facial height, flagellomere 1.6 times the pedicel height. Arista almost bare. Inner vertical seta shorter than outer vertical seta, inner vertical convergent, outer vertical divergent. 11 pairs of frontal setae. Facial ridge densely ciliated with cilia reaching almost the level of arisal insertion, a little above the mid-length of flagellomere. Fronto-orbital plate ciliated. Parafacial wide at the level of pedicel with 0.28 of gena height below eye. Palpus spatulated apically.

**Thorax.** Dorsocentral setae 2:4; acrostichals 3:2-4; 3-4 humerals, anterior weak; two posthumeral; 1 presutural; 2 intra-alars; prealar seta stronger than anterior notopleural; 2 supra-alars, posterior weaker than anterior. Two notopleurals, the posterior a half of anterior, notopleuron with sparse cilia. Scutellum with a pair of weak basal setae, 2 strong laterals, a pair of strong apicals, discals asymmetrical, 1-2 discals in each side, coverage cilia short and weak. Proepisternum and proepimeron with many long cilia associated with setae, thus main setae not well distinguished. Anepisternum with a irregular row of setae associated with coverage cilia similar in length to the main setae in the posterior edge. Katepisternum 1-2:2-3, with long coverage cilia next to the setae. Katepimeron bare. Posterior spiracle kidney-shape. Wing veins bare except costa,  $M_{1+2}$  slightly curved toward  $R_{4+5}$ . Lower calypter smaller than upper (3/4). Fore coxa with sparse long cilia on anterior face, posteroventral face



Figs. 1-6. (1) Aedeagus *B. humboldti* sp. nov., lateral view; (2) cercal plate *B. humboldti* sp. nov., dorsal view; (3) Fifth sternite *B. humboldti* sp. nov.; (4) aedeagus *B. bochica* sp. nov., lateral view; (5) cercal plate *B. bochica* sp. nov., dorsal view; (6) Fifth sternite *B. bochica* sp. nov. All figures in same scale, short bar - 0.25 mm and long bar - 0.5 mm.



Figs. 7-12. Ovipositor: (7) *B. humboldti* sp. nov., dorsal view; (8) *B. humboldti* sp. nov., ventral view; (9) *B. muisca* sp. nov., dorsal view; (10) *B. muisca* sp. nov., ventral view; (11) *B. bochica* sp. nov., dorsal view; (12) *B. bochica* sp. nov., ventral view. All figures in same scale - 0.5 mm.

may have two long and very closely inserted setae. Femur with a row of setae in posterodorsal and posteroventral faces, and posterior face with many long weak cilia. Tibia with a preapical seta and a weak median dorsal face and an apical posteroventral. First tarsomere with two basal cilia in ventral face. Mid femur with a row of sparse setae in the basal two thirds of posteroventral-ventral face; three preapical setae inserted between the posterior and dorsal faces. Tibia with two medians and a preapical posterodorsal setae; four apical setae, ventral longer. Hind femur with a row of strong setae in anterodorsal face, anteroventral with a row of 4-5 strong setae in apical third, first shorter; dorsal face with a preapical setae. Tibia with a strong calcar; anterodorsal face with 2-3 setae in median third and a strong preapical; two weak setae inserted from anterodorsal to anterior face; anteroventral with a row of 2-4 in median third and a strong apical.

Abdomen. First abdominal sternite bare. Terminalia (Figs. 1-3). Aedeagus with the gonopode slender (Fig. 1). Cercal plate moderately ciliate, without setae in lower portion, except by the lower margin, which presents four long setae; each plate triangular with lower margin almost straight, plates separated by a sclerotized depression, upper incision deep and lower one discrete (Fig. 2). Fifth sternite subquadrangular, with posterior margin as large as anterior one, with long setae in posterior and lateral margin (Fig. 3).

**Female.** Length. Body: 7.11-9.1 mm. Wing: 6.09-8.69 mm. General body coloration similar to the male one. Frontal vitta dark-brown. Eyes separated by 0.26 of head width at the level of anterior ocellus. Interfrontal seta present. Ocellar triangle shining, short, a third of frontal vitta. Chaetotaxy similar to the male but frontal setae with 8-10 pairs; acrostichal setae 3:2.

Coverage cilia of proepimeron, proepisternum and katepisternum weaker than in male, and clearly differentiate from main setae, the proepisternum and proepimeron with two developed setae each. Katepisternal setae with variable chaetotaxy, 1:2 with few long cilia; 2:3, 2:3 with 2<sup>nd</sup> and 3<sup>rd</sup> weak or 2:4.

Ovipositor (Figs. 7-8). Short, membranous area reticulate and without microtrichiae; seventh sternite medially disconnected, posterior portion forming a plate around setae; eighth tergite quadrangular with posterior margin strongly sclerotized, mainly around setae.

**Holotype.** Male: "Ecuador: Napo/ 27km. NW Baeza/ 2700m: 2-6:3:/ 1976: leg. S. Peck" [White typed label]; "FM(HD) #76-581/ carrion trap 2" [White typed label] (FMNH). **Paratypes.** One male [dissected], 12 females [one dissected]: "Ecuador: Napo/ 27km. NW Baeza/ 2700m: 2-6:3:/ 1976: leg. S. Peck" [White typed label]; "FM(HD) #76-581/ carrion trap 2" [White typed label] (FMNH). three females: "ECUADOR: Napo/ Prov., 27km. NW/ Bdeza [sic], 2700 m./ (2-6)-III-1976" [White typed label]; "FMHD #76-572./ S. Peck" [White typed label] (FMNH). three females: "Ecuador: Napo/ 24km. NE Baeza / 1300m: 3-6:3:/ 1976: leg. S. Peck" [White typed label]; "FM(HD) #76-603/ carrion trap 14" [White typed label] (FMNH). one female: "Ecuador: Napo/ 42km./ NW/ Baeza/ 3300m:2-6:3:/ 1976: leg. S. Peck" [White typed label]; "FM(HD) #75-531/ dung trap 46/ bamboo sho." [White typed label] (FMNH). one male, two females: "ECUADOR: Cotopaxi Prov./ 95km W. Latacunga, 3km/ E. Pilalo, 9500'./ (21-31)-VII-1976" [White typed label]; "FMHD #76-324./ bamboo moss /Forest, S. Peck" [White typed label] (FMNH). nine female: "ECUADOR: Pichincha, 35km / E. Tandapi, 9300'./ (24-29)-VI- 1975" [White typed label]; "FMHD #75-542/ bamboo

shrub, / S. Peck" [White typed label] (FMNH). 22 females: "Ecuador: Pichincha/ 35 km. Tandopi [sic]/ 24-29: 6: 1975/ leg. S. Peck" [White typed label]; "FM(HD) #75-526/ carrion trap 44/ bamboo shrubs" [White typed label] (FMNH). 17 females: "Ecuador: Pichincha/ 34 km. E. Tandapi/ 9300'; 24-29: 6:/ 1975: leg. S. Peck" [White typed label]; "FM(HD) #75-531/ dung trap 46/ bamboo sho." [White typed label] (FMNH). one female: "Ecuador: Pichincha/ 21 km. E. Tandapi/ 2600m; 7-14: 6:/ 1976: leg. S. Peck" [White typed label]; "FM(HD) #76-253/ dung trap/ moss forest" [White typed label] (FMNH). one male, 10 females: "COLUMBIA: Colom N./ Sant., 8000', 50 km/ S. Chinacota, (10-/ 14)-V-1974/ S. Peck" [White typed label] (FMNH). one female: "COLOMBIA Valle del Cauca / PNN Farallones de Cali Cgto./ La Meseta 3° 34' N 76° 40' W/ 1960 m Malaise 10-24.xii.2003 / S. Sarria & M. Losso Leg. M. 4552" [White typed label] (FMNH). one female: "Venezuela - Dto. Federal El Quila/ Parque Nacional/ Pico Naiquata/ 2700m 16.V.75" [White typed label]; "Robert e. Dietz. / leg." [White typed label]; "Propiedad del MIZA / Fac. Agronomía UCV / Maracay. Venezuela" [Green typed label]; (IAvH).

Other examined material: Colombia - SFF [Sanctuary of Fauna and Flora] Iguaque, Lagunilhas; 5° 25' N 73° 27' W, 3380 m Malaise 9-28-iii-2001 / P. Reina leg. (one female, IAvH); Valle del Cauca, PNN Farallones de Cali Cgto., La Meseta 1960m Malaise 10-24.xii. 2003, S. Sarria & M. Losso leg. (one female, IAvH).

**Etymology.** This name honours Alexander von Humboldt, a Prussian naturalist who collected many elements of the American fauna and flora in South and Central America, including Ecuador, Colombia and Venezuela in the early eighteenth Century. His expeditions through South America provided biological material for several dipterologists, such as C.R.W. Wiedemann, A.J.B. Robineau-Desvoidy and P.J.M. Macquart whose research was important for knowledge of the South American Muscidae.

**Geographical distribution.** Colombia, Ecuador and Venezuela.

**Comments.** *B. humboldti* **sp. nov.** is similar to *B. stuebeli* differing by the frontal plate ciliated in *B. stuebeli*. The ovipositor of *B. humboldti* **sp. nov.** is the shortest amongst *Brachygasterina* species. The shape of the ovipositor sternites also differs from those of *B. stuebeli*. The two close inserted setae in fore coxa of some exemplars of *B. humboldti* **sp. nov.** resemble the strong spine compounded by two fused setae or two very close setae of *Palpibracus*. The coverage of cilia in the notopleuron and the dilated palpus separate *B. humboldti* **sp. nov.** from *Palpibracus*.

***Brachygasterina muisca* sp. nov. Soares & Carvalho**  
(Figs. 9-10)

**General color.** General body coloration metallic blue. Palpus and antenna dark-brown. Fronto-orbital plate, face,

parafacial and gena dark-brown, gena with metallic blue shine in lower portion. Lunule reddish-brown. Scutum with four dark sub-shining dorsal stripes with silver pruinosity; scutellum metallic blue; anepisternum and katepisternum dark-brown with metallic blue shine; anepimeron, meron, katatergite and anatergite dark-brown. Calypters brownish with margins dark-brown, halteres dark-brown. Wings brownish with brown veins. Legs dark-brown with bluish shine in femur, claw black and pulvillus yellowish. Abdomen metallic greenish-blue.

**Female.** Length. Body: 7-8.5mm. Wing: 8-9 mm

Head. Eyes ciliate long and sparsely, separated by 0.32 of the width of the head at the level of anterior ocellus. Anterointernal ommatidia not enlarged. Ocellar triangle pruinose, medium, 0.5 of frontal vitta. Antenna long, weakly dilated, antennal insertion above the mid level of eye, with 0.89 of the facial height, flagellomere 1.5 of pedicel height. Arista almost bare. Inner vertical seta shorter than outer vertical seta, inner vertical convergent, outer vertical divergent. 7-8 pairs of frontal setae. Interfrontal seta absent. Facial-ridge ciliated in the basal-half. Fronto-orbital plate with cilia. Parafacial at the level of pedicel with 0.67 of gena height below eye, narrowest portion a half of the broadest portion. Palpus spatulated apically.

Thorax. Dorsocentral setae 2:4; acrostichal setae 2:2-3, anterior postsutural weak, posterior next to scutellum; four humerals, two strong setae in posterior margin; one post-humeral; one presutural; two intra-alar setae; prealar setae stronger than notopleural anterior; two supra-alar setae, posterior a half of the anterior. Two notopleural setae, the posterior a half of the anterior, notopleuron with sparse cilia around the posterior seta. Scutellum with a pair of weak basal setae, two pairs of strong subapical setae; a pair of strong apical; two pairs of discal setae similar to the basal pair, sparse short coverage cilia. Proepisternum and proepimeron with many long cilia associated with main setae, thus main setae not well distinguished. Anepisternum with a row of eighth setae in posterior margin and two slight differentiate upward curved setae in the upper anterior portion, weak coverage cilia. Katepisternum 2:3 (1 slender), with long coverage cilia close to the main setae. Katepimeron bare. Posterior spiracle kidney-shape. Wing veins bare except costa,  $M_{1+2}$  slightly curved toward  $R_{4+5}$ . Calypter similar in size. Fore coxa with sparse long weak cilia, without differentiate setae in anterior face. Femur with a row of setae in posterodorsal and posteroventral faces. Tibia with or without a stout dorsal and a posteroventral preapical setae. First tarsomere with a basal cilia in ventral face. Mid femur with anterodorsal face with a preapical seta directed to the apex and a row of setulae in the mid third curved to the anterior face; 3 preapical setae inserted between the posterior and dorsal faces; ventral face with a row of setae in basal two thirds. Tibia with a median and a submedian posterodorsal setae; four apicals, ventral longer. Tarsomere without differentiated setae. Hind femur with a row of four strong setae in apical third of anteroventral face, basal two thirds with a dense row of strong setae; anterodorsal face with a row of strong setae in apical two

thirds, longer in apical third; an preapical in posterodorsal face; ventral face with a row of sparse long weak setae in basal third. Tibia with a strong calcar; a strong median and a preapical in the anterodorsal face; two median and a strong apical setae in anteroventral face.

Abdomen. First abdominal sternite bare.

Ovipositor (Figs. 9-10). Membranous area reticulate and without microtrichiae; seventh sternite disconnected medially, posterior portion forming a plate around setae; eighth tergite large and fused just in posterior margin which is strongly sclerotised.

**Male.** Unknown.

**Holotype.** Female: "Colombia Cundinamarca/ PNN Chingaza Carrascales/ 4°31'N 73°45'W 2990m/ Malaise 29.vi.12.vii.2001/L. Cifuentes, leg. M. 1976" [white label with black margin typed] (IAvH). **Paratype.** One female: "Colombia Cundinamarca/ PNN Chingaza Carrascales/ 4°31'N 73°45'W 2990m/ Malaise 26.iv.17.v.2001/ L. Cifuentes, leg. M. 1976" [white label with black margin typed] (IAvH) [dissected]. One female: "Colombia Cundinamarca/ PNN Chingaza Carrascales/ 4°31'N 73°45'W 2990m/ Malaise 26.iv.17.v.2001/L. Cifuentes, leg. M. 1985" [white label with black margin typed] (IAvH).

Other examined material: Colombia Valle del Cauca, PNN Farallones de Cali Cgto., La Meseta 2200m Malaise 27.i-10.ii.2004, S. Sarria & M. Losso leg. (one female, IAvH), ibidem 10-24.xii.2003 (one female, IAvH).

**Etymology.** The name honours the Muisca, a pre-Columbian people who inhabited the Cundiboyacense highlands, in central Columbia. Today, this area is within the PNN Chingaza Carrascales protection area, where the type materials were recollected. Muisca were a very developed and rich culture that dominated the northern highlands of South America in pre-Columbian times.

**Geographical distribution.** Colombia

**Comments.** Coverage cilia of scutum, scutellum, proepisternum, proepimeron, anepisternum and katepisternum longer than in *B. bochica* sp. nov., thus the main setae of these sclerites are not well distinguished in *B. muisca* sp. nov. As in *B. maculata* and *B. bochica* sp. nov. there is no interfrontal setae.

***Brachygasterina bochica* sp. nov. Soares & Carvalho**  
(Figs. 4-6; 11-12)

**General color.** General body coloration metallic blue. Palpus and antenna dark-brown. Fronto-orbital plate dark-brown, face black, parafacial and gena reddish-brown with silver pruinose. Lunule brownish. Scutum with four dark sub-shining dorsal stripes with silver pruinosity, scutellum

undusted. Anepisternum and katepisternum dark-brown with metallic blue shine, anepimeron and meron dark-brown. Calypters brownish, with dark-brown margins, halteres dark-brown. Wings brownish with brown veins. Legs dark-brown with bluish shine in femur, claws black and pulvillus yellowish. Abdomen metallic greenish-blue in male and metallic bluish-purple in female.

**Male.** Length. Body: 9.98 mm. Wing: 9.03 mm

Head. Male holoptic, eyes sparsely and long ciliated, frons narrow, about 0.078 of head width at the level of anterior ocellus. Anterointernal ommatidia enlarged. Antenna long, weakly dilated, antennal insertion around the mid level of eye, with 0.83 of the facial height, flagellomere 1.75 pedicel height. Arista almost bare. Inner vertical seta shorter than outer vertical seta, inner vertical convergent, outer vertical divergent. Ten pairs of frontal setae. Facial ridge ciliated, at most, until the mid-length of flagellomere. Fronto-orbital plate ciliated. Parafacial at the level of pedicel with 0.75 of the gena height below eye. Palpus spatulated apically.

Thorax. Dorsocentral setae 2:4; acrostichal setae 0-1:1-2, when present presutural very weak, postsutural next to scutellum strong, anterior, if present, weaker; four humeral, two stronger in posterior margin; one posthumeral; one presutural; two intralar setae; prealar seta stronger than anterior notopleural; two supra-alar, the posterior a half of the anterior. Two notopleural setae, the posterior a half of the anterior, notopleuron ciliated around the posterior seta. Scutellum with a pair of weak basal setae, two pairs of strong long subapical setae, the anterior longer than the posterior; a pair of strong apical setae; a pair of weak discal and some long coverage cilia. Two proepisternal and two proepimeral setae, coverage cilia shorter and weaker than the main setae. Anepisternum with long coverage cilia associated with the posterior row of setae and two slight differentiate upward curved setae anteriorly in the upper portion. Katepisternum 2:2, with long coverage cilia in the posterior angle. Katepimeron bare. Posterior spiracle kidney-shape. Calypters similar in size. Wing veins bare except costa,  $M_{1+2}$  slightly curved toward  $R_{4+5}$ . Fore coxa in anterior face with sparse long weak cilia and with a set of very long and strong downward curved cilia in the apex. Femur with a row of setae in dorsal, posterior and posteroventral faces. Tibia with a median seta in dorsal face, a preapical in dorsal and anteroventral face. First tarsomere with two basal cilia in ventral face. Midfemur with anterior face with a seta directed to the apex in the middle of the apical third and a row of weak setae at the basis of the median third curved to anterior face; three preapical setae inserted between the posterior and dorsal faces; ventral face without differentiate setae. Tibia with posterodorsal face with two median setae; four apical, ventral stronger. Hind femur with a row of four strong setae in apical third of anteroventral face, basal third with sparse fine setae; ventral face with a row of sparse long weak setae in basal third; anterodorsal face with a row of weak setae in basal half becoming sparser and stronger in apical half, posterodorsal face with two setae in apical third. Tibia slight sinuous; calcar strong; dorsal face with a median setae and a short preapical; anteroventral face with a row of four

weak setae from a stronger median to the middle of the apical third; a strong apical in the anteroventral face.

Abdomen. First abdominal sternite bare. Terminalia (Figs. 4-6). Aedeagus with the gonopode stouter and distiphallus slender than in *B. humboldti* **sp. nov.** (Fig. 4). Cercal plate with more setae than *B. humboldti* **sp. nov.**, setae reaching lower portion; each plate larger than in *B. humboldti* **sp. nov.**, with sub parallel margins and lower margin almost straight, cercal plates separated by a sclerotised depression as in *B. humboldti* **sp. nov.** (Fig. 5). Fifth sternite triangular, with posterior margin larger than anterior, with long setae in lateral and posterior margin (Fig. 6).

**Female.** Length. Body: 8.61-9.45 mm. Wing: 8.5-9.45mm. General body coloration similar to the male except by the bluish-purple abdomen. Frontal vitta, parafacial and upper portion of gena reddish-brown or dark-brown. Lower portion of gena dark-brown with bluish shine. Parafacial at the level of pedicel with 0.75 of the gena height below eye, narrowest portion 0.2 of the broadest portion. Eyes separated by 0.27 of head width at the level of anterior ocellus. Ocellar triangle shining, medium, a half of frontal vitta; nine pairs of frontal setae. Interfrontal seta absent. Chaetotaxy similar to the male, however with shorter coverage cilia in the scutellum and katepisternum; anterior coxa without differentiated setae, fore leg with first tarsomere with 1-3 basal setae in anteroventral face; hind tibia in anteroventral face with a row of three strong setae from a stronger median to the half of apical third.

Ovipositor (Figs. 11-12). Long, membranous area reticulate and without microtrichiae, eighth tergites weakly sclerotised quadrangular with two parallels bars and posterior margin strongly sclerotised, mainly around setae; sternite with a less sclerotised connection in posterior portion.

**Holotype.** Male: "COLUMBIA Colom N./ Sant., 8000', 50km/ S. Chinacota, (10-/14)-V-1974/S. Peck" [white label typed] (FMNH). **Paratypes.** Four females: "COLUMBIA Colom N./Sant., 8000', 50km/ S. Chinacota, (10-/14)-V-1974/S. Peck". [white label typed] [one dissected] (FMNH).

**Etymology.** The name honors Bochica, the founder of Muisca's civilization. Bochica lived for many years teaching his people arts and laws. He became their main god after his death.

**Geographical distribution.** Colombia

**Comments.** *B. bochica* **sp. nov.** is very similar to *B. muisca* **sp. nov.** differing by the absence of developed acrostichal presutural setae and the shorter coverage cilia of thorax, mainly on proepimeron, proepisternum and katepimeron, that can be clearly differentiated of the main setae. *B. bochica* **sp. nov.** is the only species without developed presutural acrostichal setae. *B. bochica* **sp. nov.**, as well as *B. maculata* and *B. muisca* **sp. nov.**, do not have interfrontal setae.

## Acknowledgments

We are grateful to Silvio Nihei for the critical review of the manuscript and to James J. Roper for the English review. To Conselho Nacional de Desenvolvimento Científico e Tecnológico for the grant support to EDGS (process 140086/2004-5) and CJBC (process 302454/2005-5). This is the paper number 1633 of the Departamento de Zoologia da Universidade Federal do Paraná, Curitiba, Brazil.

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Received 01/VIII/06. Accepted 29/IX/06.