

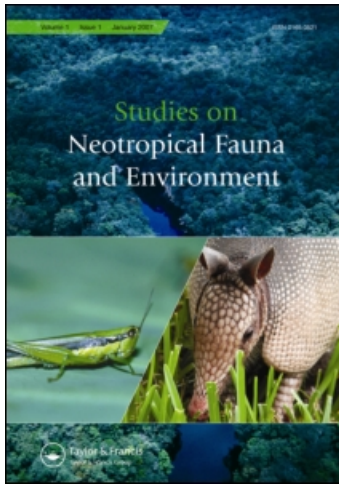
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ORIGINAL ARTICLE

New species and records in the subgenus *Brachypogon* (*Brachypogon*) Kieffer from Peruvian Amazonia (Diptera: Ceratopogonidae)

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The genus *Brachypogon* Kieffer is newly recorded from Perú, and the following four new species of the subgenus *Brachypogon* (*Brachypogon*) Kieffer are described and illustrated: *B. (B.) peruensis* in the *fuscivenosus* group, and *B. (B.) carpinteroï*, *B. (B.) jorgei* and *B. (B.) soavei* in the *impar* group. The material was collected at light in Cuzco province, Peruvian Amazonia. *Brachypogon (B.) apunctipennis* Spinelli & Grogan, *B. (B.) bimaculatus* Spinelli & Grogan and *B. (B.) woodruffi* Spinelli & Grogan are recorded for the first time from the same area.

El género *Brachypogon* Kieffer se cita por primera vez para Perú, y se describen e ilustran las siguientes cuatro especies nuevas del subgénero *Brachypogon* (*Brachypogon*) Kieffer: *B. (B.) peruensis* en el grupo *fuscivenosus*, y *B. (B.) carpinteroï*, *B. (B.) jorgei* y *B. (B.) soavei* en el grupo *impar*. El material estudiado fue capturado a la luz en la provincia de Cuzco, en el Amazonas peruano. *Brachypogon (B.) apunctipennis* Spinelli & Grogan, *B. (B.) bimaculatus* Spinelli & Grogan, y *B. (B.) woodruffi* Spinelli & Grogan se registran por primera vez para este área.

Keywords: Amazonia; *Brachypogon* (*Brachypogon*); new records; new species; Perú

Introduction

The subgenus *Brachypogon* (*Brachypogon*) Kieffer, worldwide in distribution, comprises small to minute predaceous midges. Immatures are aquatic or semiaquatic and are found in mud or wet sand on the margins of ponds and streams or in fens and bogs.

Spinelli & Grogan (1998) reviewed the subgenus for the Neotropical region, providing a key for the identification of the 18 known species. Since then no further species have been described for the Neotropics.

During the past several years, a number of collecting trips were undertaken to different places in the tropical rain forests of Peruvian Amazonia, resulting in a large collection of ceratopogonids which is being studied in the Museo of La Plata, Argentina. Cazorla et al. (2005) published the first results of this study, describing two species of the genus *Stilobezzia* Kieffer. The purpose of the current paper is to describe and illustrate four new species of the subgenus *Brachypogon* (*Brachypogon*) and to provide the first records from this area of three

previously known species. These are the first records of the genus *Brachypogon* from Perú.

Material and methods

Specimens were slide mounted in Canada balsam and examined, measured and drawn using a binocular compound microscope with attached camera lucida. Types of the new species are deposited in the collection of the Division Entomología, Museo de La Plata, Argentina (MLP).

The antennal ratio (AR) presented for males is the value of the combined lengths of flagellomeres 11–13, divided by the value of the combined lengths of flagellomeres 1–10; the AR for females is the value of the combined lengths of flagellomeres 9–13, divided by the value of the combined lengths of flagellomeres 1–8; palpal ratio (PR) is the length of the third palpal segment divided by its greatest width; tarsal ratio (TR) is length of the tarsomere 2 divided by the length of tarsomere 1.

Terms for structures follow those used in the *Manual of Nearctic Diptera* (McAlpine et al. 1981).

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For recognition of species groups see Spinelli & Grogan (1998). Terms for wing veins follow the system of the *Manual of Nearctic Diptera*, with modifications proposed by Szadziewski (1996). As is widely used by other Dipterists, veins are in upper case and cells in lower case.

The holotypes of the new species are deposited in the collection of the Museo Nacional de Historia Natural, Lima, Perú (MNHL); paratypes are deposited in the collection of the Museo de La Plata, Argentina (MLP).

Results

Description of new species

Brachypogon (B.) peruensis sp. n. (Figures 1–12)

Diagnosis

The only Neotropical species of *Brachypogon* (*Brachypogon*) of the *fuscivenosus* group with the following combination of characters: wing with small spots in r_3 , m_1 and m_2 ; male with parameres fused anteriorly, distal portion represented by a pair of long sclerites with stout, mesal processes; lateral arms of aedeagus stout, recurved, main portion triangular, tip blunt, with mesal, pointed prong. Female: mandible with eight or nine coarse teeth; legs pale brown with subbasal, subapical pale rings on femora and tibia; wing with small spots in cells r_3 and m_1 .

Description of male

Head

Dark brown. Ommatidia with interfacet pubescence, abutting medially for length of one to two ommatidia. Antenna (Figure 1) pale brown except flagellomeres 11–13 brown; flagellomeres 2–11 fused, flagellomeres 11–13 elongate; flagellomere 1 not in position to observe sensilla coeloconica; AR 0.89. Palpus (Figure 2) pale brown; third segment moderately stout, with deep sensory pit opening on distal third; segments 4, 5 separate; PR 1.90.

Thorax

Brown except scutellum pale brown. Legs (Figure 3) pale brown, knees slightly darkish; femora with narrow basal, faint subapical pale rings, tibiae with subbasal, subapical pale rings (rings more evident on hindleg); tarsomere 4 cordiform; hindtibial spur short; hindtibial comb with six spines; prothoracic TR 1.83, mesothoracic TR 2.10, metathoracic TR

2.41; claws nearly straight. Wing (Figure 4) with pattern of pigmented membrane, small spots in r_3 , m_1 and m_2 ; costa with row of 12 marginal setae; no setae on R_1 ; wing length 0.69 mm; width 0.26 mm; CR 0.57. Halter whitish.

Abdomen

Tergites uniformly brown. Genitalia (Figure 5): tergite 9 slender, extending to level of apex of gonocoxite, posterior margin truncate, cercus lobe-like, setose; sternite 9 short, without posteromedial excavation. Gonocoxite moderately stout, 1.75 times as long as greatest breadth, anteromesal protuberance blunt; gonostylus slender, deeply curved, as long as gonocoxite, tip pointed. Parameres (Figure 6) fused anteriorly, base of the fused portion U-shaped, strongly sclerotized; distal portion represented by a pair of sclerites separated from the basal portion, each sclerite tapering to slender, pointed tip, with stout, mesal process directed laterally. Aedeagus (Figure 7) 0.6 as long as basal breadth; lateral arms stout, recurved, directed posterolaterally; basal arch low, extending to 0.15 of total length; main portion triangular, tapering to blunt tip; mesal, slender, pointed prong.

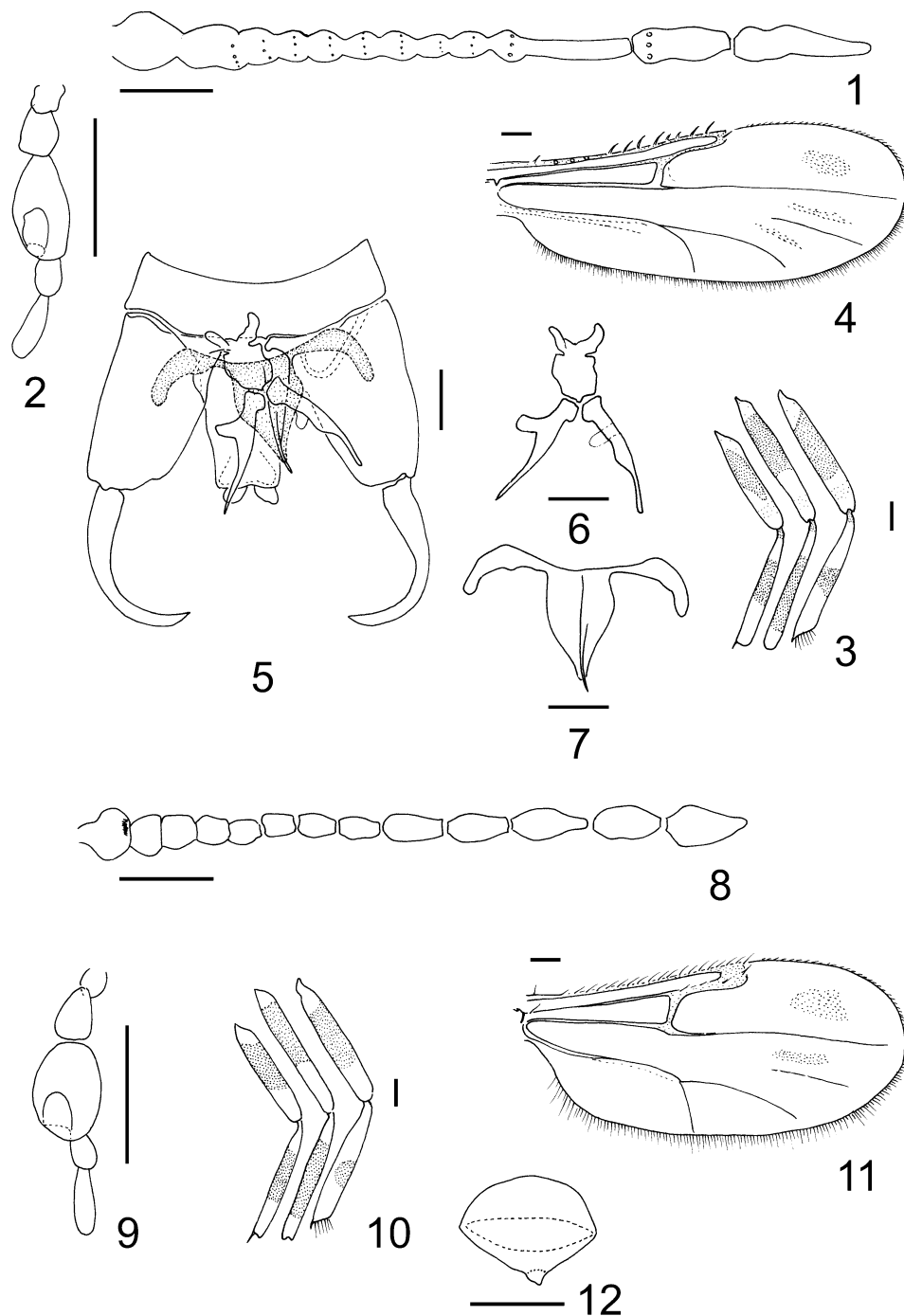
Female

Head

Dark brown. Eyes pubescent, abutting medially for length of one to two ommatidia. Antenna (Figure 8) brown; flagellomere 1 with one or two sensilla coeloconica; AR 1.25. Palpus (Figure 9) pale brown; third segment with deep sensory pit opening on distal third; segments 4, 5 separate; PR 1.38. Mandible with eight or nine coarse teeth.

Thorax

Scutum pale brown except prescutellar depression, brown; scutellum pale brown; postscutellum brown. Legs (Figure 10) pale brown; femora with narrow basal, broad subapical pale rings (more evident on hindleg), tibiae with subbasal, subapical pale rings, mesal dark portion on hindtibia incomplete, not abutting ventral side; tarsomere 4 cordiform; hindtibial comb with six spines; prothoracic TR 2.14, mesothoracic TR 2.54, metathoracic TR 2.76; claws slightly unequal with internal, external basal teeth; CP 17:13, 17:14, 16:12; empodia present. Wing (Figure 11) membrane infuscated, with small spots in r_3 and m_1 ; veins darkly infuscated, especially CuA_1 , CuP , with dark spots on r-m crossvein and end



Figures 1–12. *Brachypogon (B.) peruensis* sp. n. (1) Flagellum (♂). (2) Palpus (♂). (3) Legs (♂) (left to right: fore, mid, hind). (4) Wing (♂). (5) Genitalia (♂), in ventral view. (6) Parameres (♂). (7) Aedeagus (♂). (8) Flagellum (♀). (9) Palpus (♀). (10) Legs (♀) (left to right: fore, mid, hind). (11) Wing (♀). (12) Spermatheca (♀). Scale bars: 0.05 mm.

of costa (stigma); costa with row of 17–19 marginal setae; R_1 with one seta at intersection with r-m crossvein, R_3 with two subapical setae on stigma, M_2 not visible at base; wing length 0.66 mm; width 0.30 mm; CR 0.59. Halter whitish.

Abdomen

Pale brown except segments 8–10 brown. One ovoid, partially collapsed spermatheca with short, conical neck, strongly sclerotized, measuring 0.058 by 0.072 mm (Figure 12). Cercus pale brown.

Distribution

Perú, known only from the type-locality in tropical rain forest of northern Cuzco province.

Type material

Holotype male, allotype female: Perú, Cuzco prov., Pagoreni (11°42'21.9"S, 72°54'21.9"W), 510 m, July 2004, J. Williams, at light.

Taxonomic discussion

The male and female were collected at the same locality and date. This species belongs to the *fuscivenosus* group by virtue of the small spots in r_3 , m_1 and m_2 , the latter only visible in the male, and by the conical neck of the spermatheca. This new species keys out in Spinelli & Grogan (1998) to *B. paraensis* Wirth & Blanton in couplet 21. The male differs from the male of *B. paraensis* by the slender tergite 9, the absence of posteromedial excavation on sternite 9, the gonostylus deeply curved, the distal portion of parameres represented by a pair of sclerites separated from the basal portion, and the main portion of aedeagus triangular, tapering to blunt tip, with mesal, slender, pointed prong. The female differs from the female of *B. paraensis* by the third segment of maxillary palpus with a moderately, deep sensory pit, and the membrane of the wing infuscated, with small spots only in r_3 and m_1 . The male genitalia of *B. peruensis* resembles that of *B. apunctipennis* Spinelli & Grogan by the tergite 9 truncated at apex and extending to the level of the apex of the gonocoxite, the slender and deeply curved gonostylus, and the parameres fused anteriorly with their distal portion represented by a pair of sclerites, and with each sclerite tapering to slender, pointed tip. However, this species differs from *B. apunctipennis* by having the sternite 9 without a posteromedial excavation (deeply excavated in *apunctipennis*), by the main portion of aedeagus tapering to a blunt tip (pointed tip in *apunctipennis*), and by the stouter lateral arms of aedeagus.

Etymology

A reference to Perú, the country where the specimens were collected.

***Brachypogon (B.) carpinteroi* sp. n.** (Figures 13–16)

Diagnosis

The only Neotropical species of *Brachypogon* (*Brachypogon*) of the *impar* group with the male with the following combination of characters: brown legs,

tibiae with subbasal pale rings; midportion of parameres lightly sclerotized with broadly rounded tip; aedeagus broad, triangular, tapering to truncate tip. Female unknown.

Description of male**Head**

Dark brown. Ommatidia with interfacet pubescence, separated for width of two to three ommatidia. Antenna pale brown except flagellomeres 11–13 dark brown; flagellomere 1 with sensilla coeloconica, flagellomeres 2–11 fused, flagellomeres 11–13 elongate; AR 0.72 (0.68–0.75, $n=6$). Palpus dark brown; third segment stout, with deep sensory pit near apex; segments 4, 5 separate; PR 1.50 (1.40–1.56, $n=6$).

Thorax

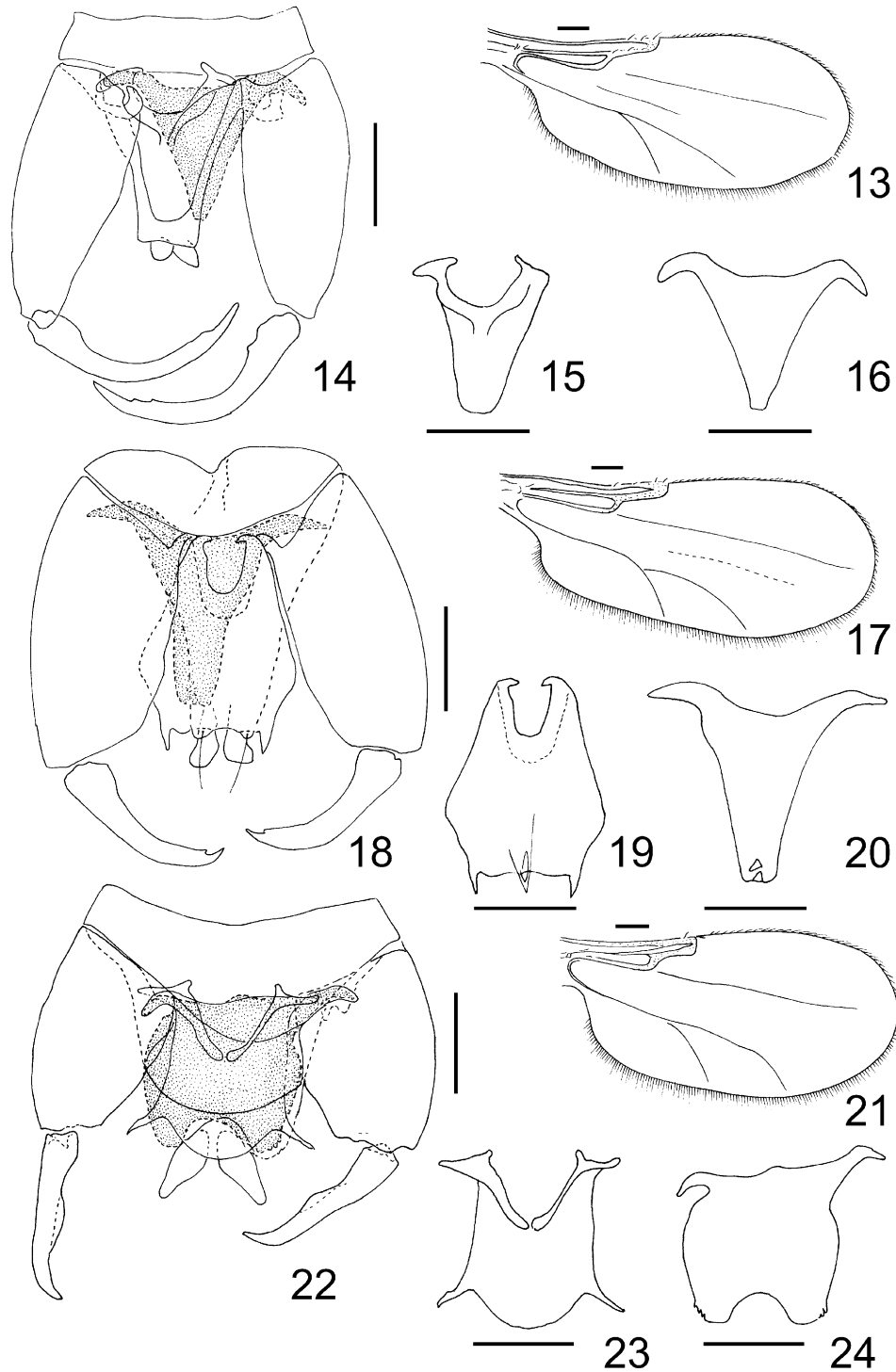
Dark brown. Legs brown, tibiae with subbasal pale rings; tarsomere 4 subcylindrical; hindtibial spur short; hindtibial comb with six spines; prothoracic TR 1.61 (1.55–1.65, $n=7$), mesothoracic TR 1.78 (1.70–1.85, $n=7$), metathoracic TR 2.29 (2.14–2.40, $n=7$); claws small. Wing (Figure 13) plain, without pattern of pigmentation; membrane hyaline, stigma brown, other veins pale; M_1 , M_2 , CuA_2 , CuP not visible at wing margin; costa with three distal marginal setae on stigma; R_1 with seta at intersection with r-m crossvein, R_3 with two subapical setae on stigma; wing length 0.53 (0.51–0.54, $n=6$) mm; width 0.24 (0.22–0.24, $n=7$) mm; CR 0.40 (0.38–0.42, $n=6$). Halter whitish.

Abdomen

Tergites uniformly brown. Genitalia (Figure 14): tergite 9 slender, extending to 0.7 of gonocoxite length; posterior margin truncate; cercus lobe-like, setose. Sternite 9 0.25 times as long as greatest breadth, without posteromedial excavation. Gonocoxite slender, three times longer than greatest breadth, anteromesal protuberance short; gonostylus slender, slightly shorter than gonocoxite, deeply curved, tip pointed. Parameres (Figure 15) fused; basal arms with short, anterolaterally directed processes; basal arch strongly sclerotized, extending to 0.4 of total length; midportion lightly sclerotized, tip broadly rounded. Aedeagus (Figure 16) broad, triangular; lateral arms strongly sclerotized, directed posterolaterally; basal arch low, extending to 0.15 of total length; distal portion slightly sclerotized, tip narrowly truncate.

Female

Unknown



Figures 13–24. *Brachypogon* (*B.*) *carpinteroi* sp. n. (13) Wing (♂). (14) Genitalia (♂), in ventral view. (15) Parameres (♂). (16) Aedeagus (♂). *Brachypogon* (*B.*) *jorgei* sp. n. (17) Wing (♂). (18) Genitalia (♂), in ventral view. (19) Parameres (♂). (20) Aedeagus (♂). *Brachypogon* (*B.*) *soavei* sp. n. (21) Wing (♂). (22) Genitalia (♂), in ventral view. (23) Parameres (♂). (24) Aedeagus (♂). Scale bars: 0.05 mm.

Distribution

Perú, known only from the type-locality in tropical rain forest of northern Cuzco province.

Type material

Holotype, male: Perú, Cuzco prov., Pagoreni (11°42'21.9"S, 72°54'21.9"W), 510 m, July 2004, J.

Williams, at light. Paratypes, six males, as follows: same data as holotype, four males; same data except 15 February 2004, two males.

Taxonomic discussion

This species belongs to the *impar* group by virtue of the wing plain, without pattern of pigmentation. This new species keys out in Spinelli & Grogan (1998) to *B. woodruffi* Spinelli & Grogan in couplet 29 by virtue of the wing lacking spots and by the presence of only three distal marginal setae on the stigma. However, tergite 9 of *B. woodruffi* has short apicolateral processes and the tip of the aedeagus is rounded and broader. The male genitalia of *B. carpintero* also resembles that of *B. bimaculatus* Spinelli & Grogan by the presence of fused parameres with its midportion lightly sclerotized and broadly rounded tip, but the tergite 9 of *B. bimaculatus* bears short apicolateral processes, the gonocoxite lacks anteromesal protuberance and the tip of the aedeagus is rounded.

Etymology

This species is named after Mr. Diego L. Carpintero, entomologist of the Museo de La Plata, in recognition of his excellent work in recognizing ceratopogonids in alcohol-preserved light trap samples.

***Brachypogon (B.) jorgei* sp. n.** (Figures 17–20)

Diagnosis

The only Neotropical species of *Brachypogon* (*Brachypogon*) of the *impar* group with the parameres lightly sclerotized, its main portion broader mesally and posterior margin nearly straight, with two posterolateral, short, sharp processes. Female unknown.

Description of male

Head

Brown. Ommatidia with interfacet pubescence, separated for width of one to two ommatidia. Antenna pale brown, flagellomeres 11–13 slightly darker; flagellomeres 2–11 fused, flagellomeres 11–13 elongate; AR 0.77 (0.76–0.78, $n=2$). Palpus dark brown; third segment stout, with a deep sensory pit near apex; segments 4, 5 separate; PR 1.38 (1.36–1.40, $n=2$).

Thorax

Dark brown. Legs dark brown, knees darkish; femora of fore and hindlegs with subapical pale

rings, tibiae with subbasal, apical pale rings; tarsomere 4 subcylindrical; hindtibial spur short; hindtibial comb with six spines; prothoracic TR 1.70 (1.65–1.74, $n=2$), mesothoracic TR 1.95 (1.94–1.97, $n=2$), metathoracic TR 2.30 (2.29–2.30, $n=2$); claws small. Wing (Figure 17) plain, without pattern of pigmentation; membrane hyaline, stigma, r-m crossvein dark, other veins pale; M_2 not visible, M_1 , CuA_2 , CuP not visible at wing margin; costa with three distal marginal setae on stigma; stigma devoid of setae; wing length 0.58 (0.57–0.59, $n=2$) mm; width 0.25 (0.25–0.26, $n=2$) mm; CR 0.57 (0.76–0.43, $n=2$). Halter missing.

Abdomen

Tergites uniformly brown. Genitalia (Figure 18): tergite 9 slender, moderately elongate, extending to level of apex of gonocoxite; posterior margin slightly notched; apicolateral processes small with one apical seta; cercus elongate, setose. Sternite 9 short, somewhat folded in available specimens, posterior margin apparently convex. Gonocoxite stout, 2.2 times longer than greatest breadth, anteromesal protuberance short; gonostylus 0.6 times as long as gonocoxite, slightly curved distally, tip pointed. Parameres (Figure 19) fused, lightly sclerotized; anterior margin with narrow, deep median excavation, extending to one-quarter of total length; main portion broader mesally; posterior margin nearly straight, with two posterolateral, short, sharp processes; short, pointed posteromesal processes shortly produced distal margin. Aedeagus (Figure 20) broad, triangular; lateral arms sclerotized, slightly recurved, directed laterally; basal arch low, extending to 0.15 of total length; distal portion lightly sclerotized, tip truncate.

Female

Unknown.

Distribution

Perú, known only from the type-locality in tropical rain forest of northern Cuzco province.

Type material

Holotype male, paratype male: Perú, Cuzco prov., Pagoreni (11°42'21.9"S, 72°54'21.9"W), 510 m, 15 February 2004, J. Williams, at light.

Taxonomic discussion

This species belongs to the *impar* group. It is easily recognizable from the other Neotropical species of

the species group by the parameres broader mesally and the posterior margin nearly straight, with two posterolateral, short, sharp processes.

Etymology

This species is named after Prof. Jorge Williams, a herpetologist at the Museo de La Plata, in recognition of his valuable help collecting ceratopogonids in several places of the Neotropics.

Brachypogon (B.) soavei sp. n. (Figures 21–24)

Diagnosis

The only Neotropical species of *Brachypogon* (*Brachypogon*) of the *impar* group with the male with parameres fused with two pointed, posterolateral processes, and the aedeagus stout, broader mesally, with the posterior margin deeply notched, forming two lateral, blunt lobes, each one crenulate on external side. Female unknown.

Description of male

Head

Dark brown. Ommatidia with interfacet pubescence, separated for width of two to three ommatidia. Antenna pale brown except flagellomeres 11–13 dark brown; flagellomeres 2–11 fused, flagellomeres 11–13 elongate; AR 0.67. Palpus dark brown; third segment moderately stout, irregular, deep sensory pit opening on distal third; segments 4, 5 separate; PR 1.63.

Thorax

Dark brown. Legs dark brown, fore, midfemora with faint, subapical pale rings, tibiae with subbasal pale rings, hindtibia with apical pale ring; tarsomere 4 cordiform; hindtibial spur short; hindtibial comb with six spines; prothoracic TR 1.55, mesothoracic TR 1.72, metathoracic TR 2.38; claws small. Wing (Figure 21) plain, without pattern of pigmentation; membrane hyaline, stigma infuscated, veins nearly imperceptible; costa with one marginal setae on stigma; wing length 0.50 mm; width 0.25 mm; CR 0.40. Halter brown.

Abdomen

Tergites uniformly brown. Genitalia (Figure 22): tergite 9 broad, not extending to level of apex of gonocoxite, posterior margin broad, rounded; cercus elongate, setose. Sternite 9 0.4 times as long as greatest (mesal) breadth, posterior margin convex. Gonocoxite stout, 1.5 times longer than greatest breadth, without

anteromesal protuberance; gonostylus paler, 0.9 times as long as gonocoxite, slender, swollen on midportion, nearly straight, tip curved, pointed. Parameres (Figure 23) fused; basal arms slender, bilobed; basal arch deeply sclerotized, extending to one-quarter of total length; distal portion broad, extending to level of apex of gonocoxites, posterior margin rounded; two pointed, posterolateral processes. Aedeagus (Figure 24) stout, broader mesally; lateral arms short, recurved, directed posterolaterally; basal arch very low, sinuate; posterior margin deeply notched, forming two lateral, blunt lobes, each one crenulate on lateral side.

Female

Unknown.

Distribution

Perú, known only from the type-locality in tropical rain forest of northern Cuzco province.

Type material

Holotype, male: Perú, Cuzco prov., Kirigueti (11°38'13"S 73°07'07"W), 395 m, 24 February 2004, J. Williams, at light.

Taxonomic discussion

This species belongs to the *impar* group. It is easily distinguished from the other Neotropical species of the species group by the peculiar parameres with two pointed, posterolateral processes and by the stout aedeagus, broader mesally, with its posterior margin deeply notched.

Etymology

This species is named after Lic. Guillermo Soave, an ornithologist at the Museo de La Plata, in recognition of his valuable support during the fieldtrips in Perú.

New records

Brachypogon (B.) apunctipennis Spinelli & Grogan

Brachypogon (B.) apunctipennis Spinelli & Grogan, 1998, p. 64 (male; Brazil); Borkent & Spinelli, 2000, p. 45 (in catalogue of Neotropical species; distrib.).

Specimens examined

Perú, Cuzco prov., Kirigueti (11°38'13"S, 73°07'07"W), 395 m, 24 February 2004, J. Williams, two males, at light.

Distribution

Perú (Cuzco), Brazil (Rondonia).

***Brachypogon (B.) bimaculatus* Spinelli & Grogan**

Brachypogon (B.) bimaculatus Spinelli & Grogan, 1998, p. 67 (male, female; Colombia); Borkent & Spinelli, 2000, p. 45 (in catalogue of Neotropical species; distrib.); Huerta & Borkent, 2005, p. 117 (Mexico).

Specimens examined

Perú, Cuzco prov., Kirigueti (11°38'13"S, 73°07'07"W), 395 m, July 2004, J. Williams, one male, at light.

Distribution

Mexico (Yucatán), Colombia, Perú (Cuzco), Brazil (Mato Grosso).

***Brachypogon (B.) woodruffi* Spinelli & Grogan**

Brachypogon (B.) woodruffi Spinelli & Grogan, 1998, p. 72 (male, female; Dominican Republic); Borkent & Spinelli, 2000, p. 46 (in catalogue of Neotropical species; distrib.); Huerta & Borkent, 2005, p. 118 (Mexico).

Specimens examined

Perú, Cuzco prov., Kirigueti (11°38'13"S, 73°07'07"W), 395 m, July 2004, J. Williams, five males, seven females, at light.

Distribution

Mexico (Yucatán), Dominican Republic, Perú (Cuzco).

Conclusion

The four new species herein described bring to 22 the total number of Neotropical species of the subgenus

Brachypogon (Brachypogon). The discovery of seven species in a limited area at the tropical rain forest of Peru representing the first records for the country, strongly suggests that many more species remain to be discovered. This assumption could be proved certain if the poorly known areas in the Neotropics, like the Andes, begin to be properly sampled.

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