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ORIGINAL ARTICLE

A new Neotropical species of *Atrichopogon* Kieffer, and a redescription of *A. casali* Cavalieri & Chiossone (Diptera: Ceratopogonidae)

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Abstract
A new species of *Atrichopogon* with distinctively pigmented wings, *A. clastrieri*, is described and illustrated from males and females collected in several localities of northern Argentina and Paraguay, and compared with its most similar congeners *A. bicuspis* Borkent & Picado, *A. nubeculosus* Macfie and *A. nebulosus* Macfie. Male and female of *A. casali* Cavalieri & Chiossone were collected together in northeastern Argentina and Paraguay and are described and illustrated. The allotype of *A. casali* was misidentified in the original description and belongs to some other, possibly undescribed, species.

Resumen
Sobre la base de macho y hembra capturados en diferentes localidades del norte de Argentina y de Paraguay, se describe e ilustra una especie nueva de *Atrichopogon* con alas pigmentadas, *A. clastrieri*. Esta nueva especie es comparada con *A. bicuspis* Borkent & Picado, *A. nubeculosus* Macfie and *A. nebulosus* Macfie, sus congéneres con alas pigmentadas mas similares. Se describen e ilustran el macho y la hembra de *A. casali* Cavalieri & Chiossone, capturados en asociación en el noreste de Argentina y Paraguay. El alotipo de *A. casali* fue identificado erróneamente en la descripción original y pertenece a otra especie no identificada.

Keywords: Argentina, *Atrichopogon*, *Atrichopogon casali*, new species, Paraguay, pigmented wings

Introduction

The worldwide genus *Atrichopogon* Kieffer, one of the most speciose in the family Ceratopogonidae, includes species that are very similar in appearance and most of them cannot be confidently identified (Edwards, 1926; Debenham, 1973; Borkent & Picado, 2004). Borkent & Spinelli (2000) listed 75 species south of the USA, and there have been subsequently described for this area one species from Mexico (Huerta, 2001), one from Argentina (Marino & Spinelli, 2003) and 18 from Costa Rica (Borkent & Picado, 2004). Of these, however, the following seven species have distinctively pigmented wings, and based on this feature they can be easily distinguished from other members of the genus: *A. nebulosus* Macfie, 1939, *A. nubeculosus* Macfie, 1949, *A. maculipennis* Clastrier, 1968, *A. casali* Cavalieri & Chiossone, 1973, *A. pictipennis* Clastrier, 1979, *A. ornatipennis* Clastrier, 1987 and *A. bicuspis* Borkent & Picado, 2004.

As a result of numerous collecting trips carried out in northern Argentina and Paraguay during the past 20 years, several specimens of *Atrichopogon* with distinctively pigmented wings were discovered. The study of these specimens reveals the presence of males and females of *A. casali* as well as those of an undescribed species. Study of the types of *A. casali* showed that both sexes were incorrectly associated by Cavalieri & Chiossone (1973). The male allotype belongs to a different species. The purpose of this paper is to describe the new species and the male of *A. casali*, as well as to redescribe the female of the latter species.

Materials and methods

Specimens were slide mounted in Canada balsam and examined, measured and drawn using a binocular compound microscope with attached

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camera lucida. The types of the new species are deposited in the collection of the Division Entomología, Museo de La Plata, Argentina (MLP). Some paratypes will be deposited in the collection of the Natural History Museum, London (BMNH).

Terms for structures follow those used in the *Manual of Nearctic Diptera* (McAlpine et al., 1981). For special terms applying to *Atrichopogon* see Borkent & Picado (2004). Terms for wing veins follow the system of the *Manual of Nearctic Diptera*, with modifications proposed by Szadziewski (1996) and summarized by Spinelli & Borkent (2004).

Results

Atrichopogon clastrieri sp. n. (Figures 1–11)

Diagnosis

Male. Only extant species of *Atrichopogon* with pigmented wings in the New World with the apex of tergite 9 with a small medial lobe.

Female. Only extant species of *Atrichopogon* with pigmented wings in the New World and with flagellomeres 1–8 contrasting, and darker than flagellomeres 9–13.

Description of male

Head. Golden brown. Ommatidia (Figure 1) with interfacet spicules, abutting medially for length of two to three ommatidia. Antenna (Figure 2) with plume setae well-developed, flagellomeres 2–10 at least partially fused, flagellomeres 9–10 without plume setae, 1–10 dark brown, 11–13 slightly paler, elongated, 10 longer than 1–9; flagellomere 13 with apical nipple, not basally constricted; AR 0.95 (0.90–0.97, $n=5$). Maxillary palpus (Figure 3) pale brown; third segment slender, moderately elongate, with shallow sensory pit near midlength; segments 4, 5 closely appressed; segment 5 conical; PR 3.49 (3.11–3.87, $n=5$). Proboscis length 0.256 (0.248–0.264, $n=5$) mm; P/H ratio 1.00 (0.94–1.10, $n=5$).

Thorax. Dark brown except humeral areas yellowish brown. Scutum with setae arising directly from surface, not in pits; with lateral suture. Paratergite blackish, with one stout seta. Anepisternum well-developed, slightly bilobed posteriorly. Legs uniformly yellowish brown; hindtibia slightly expanded at apex; hindtibial spur length slightly longer than width of hindtibia at midlength; hindtibial comb with eight or nine spines; prothoracic TR 3.65 (3.56–3.67, $n=5$), mesothoracic TR 4.375 (4.25–4.50, $n=5$), metathoracic TR 3.03 (3.00–3.08, $n=5$); claws curved, moderately stout, bifid at tip; empodia present. Wing with two distinct darker patches in area of r-m and in cell r_3 posterior to apex of R_3; with macrotrichiae in apical portion of cells r_3, m_1; second radial cell 2.5 times longer than first; first radial cell well-developed; wing length 1.04 (1.02–1.08, $n=4$) mm; width 0.38 (0.36–0.40, $n=5$) mm; CR 0.60 (0.57–0.62, $n=4$). Halter pale brown.

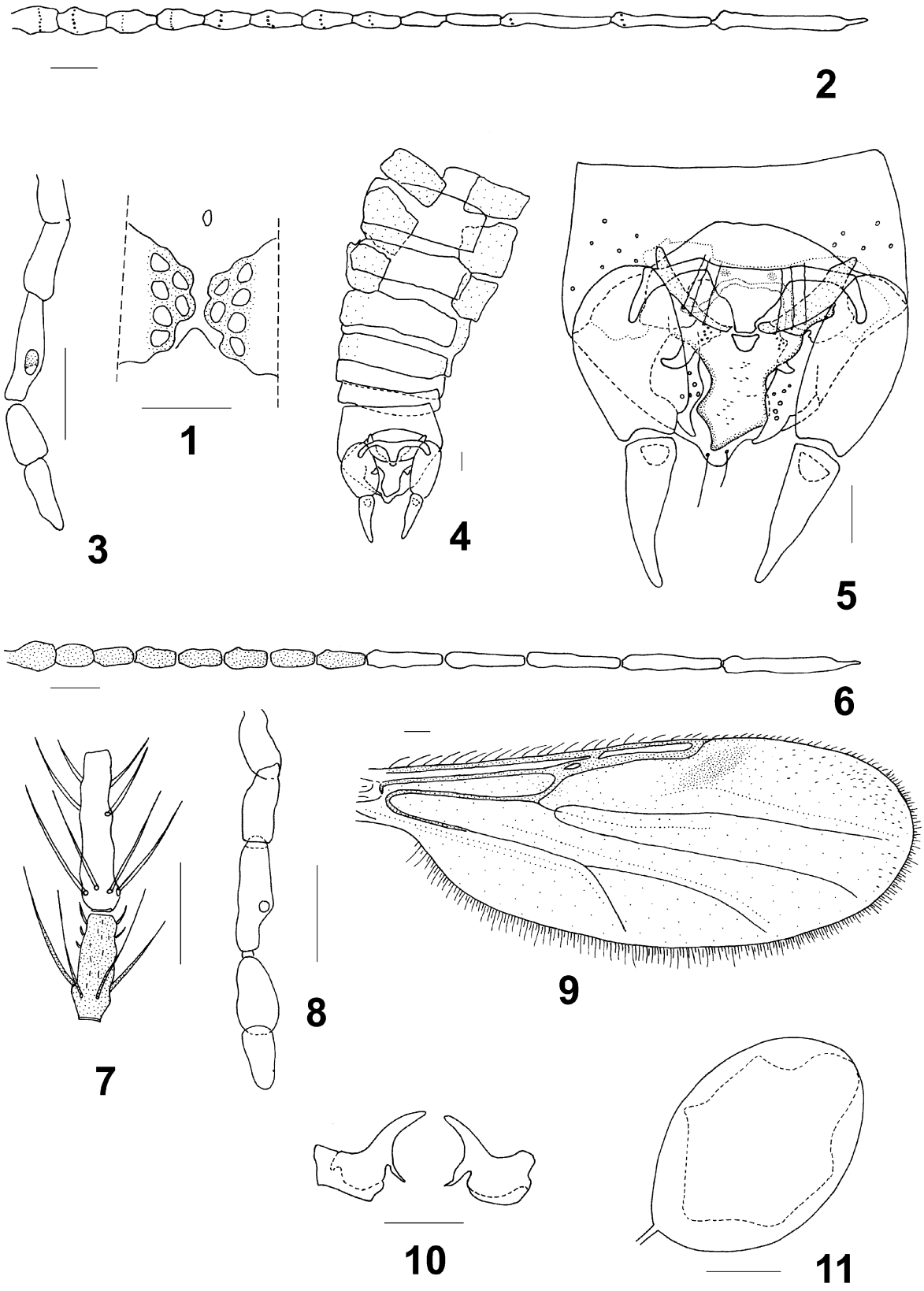
Abdomen (Figure 4). Tergites uniformly brown. Sternites more or less similarly rectangularly shaped.

Genitalia (Figure 5). Dark brown. Segment 9 about equal in width to segment 8; tergite 9 elongate, extending beyond apex of gonocoxite; posterior margin rounded, apex with small medial lobe bearing two setae; sternite 9 narrow, with posterior margin broadly concave, with lateral group of setae. Gonocoxite without medial lobe, moderately stout, 1.7 times longer than greatest breadth. Gonostylus paler than gonocoxite, 0.80 as long as gonocoxite, swollen at base, gradually narrowed distally, apex narrowly rounded. Aedeagal–parameral complex broad, posterolateral margin rounded, surface wrinkled; posterodorsally tongue-shaped, lateral margins sinuate, apex pointed; ventrally with stout, posteriorly directed prong, with lateral arms directed posterolaterally, apex cap-like. Cercus broad basally, apex pointed, not extending beyond margin of tergite 9.

Description of female

As for male, with following differences: proportions of flagellomeres as shown in Figure 6, flagellomeres 1–8 dark brown, slightly longer than broad, vasiform, with numerous sensillae chaetica, trichodea, basiconica (Figure 7), flagellomeres 9–13 pale brown, elongated; AR 1.35 (1.30–1.44, $n=5$). Maxillary palpus (Figure 8) with third segment slightly swollen for basal two-thirds with shallow sensory pit near midlength; segments 4, 5 separate, broadly abutting, its combined length longer than third segment; PR 2.76 (2.64–2.90, $n=5$); proboscis length 0.29 mm (0.264–0.312, $n=5$); P/H ratio 1.35 (1.29–1.39, $n=5$). Mandible poorly developed, without teeth.

Prothoracic TR 3.38 (3.22–3.55, $n=5$), mesothoracic TR 4.14 (4.00–4.37, $n=5$), metathoracic TR 2.92 (2.83–3.00, $n=5$); claws curved, not bifid at tip. Wing (Figure 9) with the same pattern of pigmented membrane, with numerous macrotrichiae in cells r_3, m_1; radial cells narrow, second 3.5 times longer than first; wing length 1.06 (1.00–1.14, $n=5$) mm; width 0.42 (0.38–0.46, $n=5$) mm; CR 0.60



Figures 1–11. *Atrichopogon clastrieri* n. sp. (1) Ommatidia (♂). (2) Flagellum (♂). (3) Palpus (♂). (4) Abdominal terga (♂). (5) Genitalia (♂). (6) Flagellum (♀). (7) Flagellomeres 8–9 (♀). (8) Maxillary palpus (♀). (9) Wing (♀). (10) Sternite 9 (♀). (11) Spermatheca (♀). Scale bars: 0.05 mm.

(0.58–0.61, $n=5$). Abdominal tergites 1–7 brown, segments 8–10 dark brown. Sternite 9 (Figure 10) rounded, joined medially, as an anteriorly, faintly pigmented loop. One spermatheca very large, lightly sclerotized, ovoid with long, slender neck, measuring 0.172×0.116 mm (Figure 11). Cercus dark brown.

Distribution

Argentina (Misiones, Jujuy, Tucumán), Paraguay (Itapua).

Type material

Holotype, male: ''Argentina, Misiones, Corpus, VII.2001, col. G. Spinelli, CDC light trap''. Allotype, female: Misiones, Montecarlo, 13 June 1994, col. G. Spinelli, CDC light trap. Other paratypes, four males, four females, as follows: same data as holotype, one male; Jujuy, Calilegua National Park, 30 November 1986, col. G. Spinelli, one female, sweep net; Tucumán, La Florida, 2 October 2003, col. J. Dantur, one male, one female, CDC light trap; same data except Sargento Moya, 13 May 2003, one male. Paraguay, Itapua, Aguapey, 20 October 1993, col. H. Ferreyra, one female, CDC light trap; Itapua, Bella Vista, 1–2 August 2001, col. A. Ortiz and D. López, one female, CDC light trap (BMNH); same data except Encarnación, 5–6 June 2001, one male (BMNH).

Taxonomic discussion

Males and females were associated by their similar wing pigmentation pattern and were collected at the same locality and date in the province of Tucumán, Argentina.

Of the Neotropical species with distinctively pigmented wings, the male of *A. bicuspis* from Costa Rica is similar to the male of *A. clastrieri*. However, in *A. bicuspis* the posterior margin of the tergite 9 is bifid and the posterior margin of sternite 9 is bilobed, among other genital differences. The female mandible of *A. bicuspis* is armed with 21 teeth.

Atrichopogon nubeculosus from tropical Mexico, and *A. clastrieri* both posses a large, lightly sclerotized spermatheca. However, *A. nubeculosus* is a smaller species and the third palpal segment is greatly swollen, narrowed distally with large pit. The male of the latter species is unknown. *Atrichopogon nebulosus* from Brazil also shows a contrasting coloration of the female antenna, but in this species the flagellomeres 9–13 are darker than the flagellomeres 1–8.

Etymology

This species is named after the late Jean Clastrier, who described three species of Neotropical *Atrichopogon* with pigmented wings, and in recognition of his valuable contribution to ceratopogonid taxonomy.

Atrichopogon casali Cavalieri & Chiossone (Figures 12–23)

Atrichopogon casali Cavalieri & Chiossone, 1973, p. 153 (female, male; Argentina, Misiones); Borkent & Wirth, 1997, p. 23 (in catalogue to World species); Borkent & Spinelli, 2000, p. 10 (in catalogue to the species south of the USA).

Diagnosis

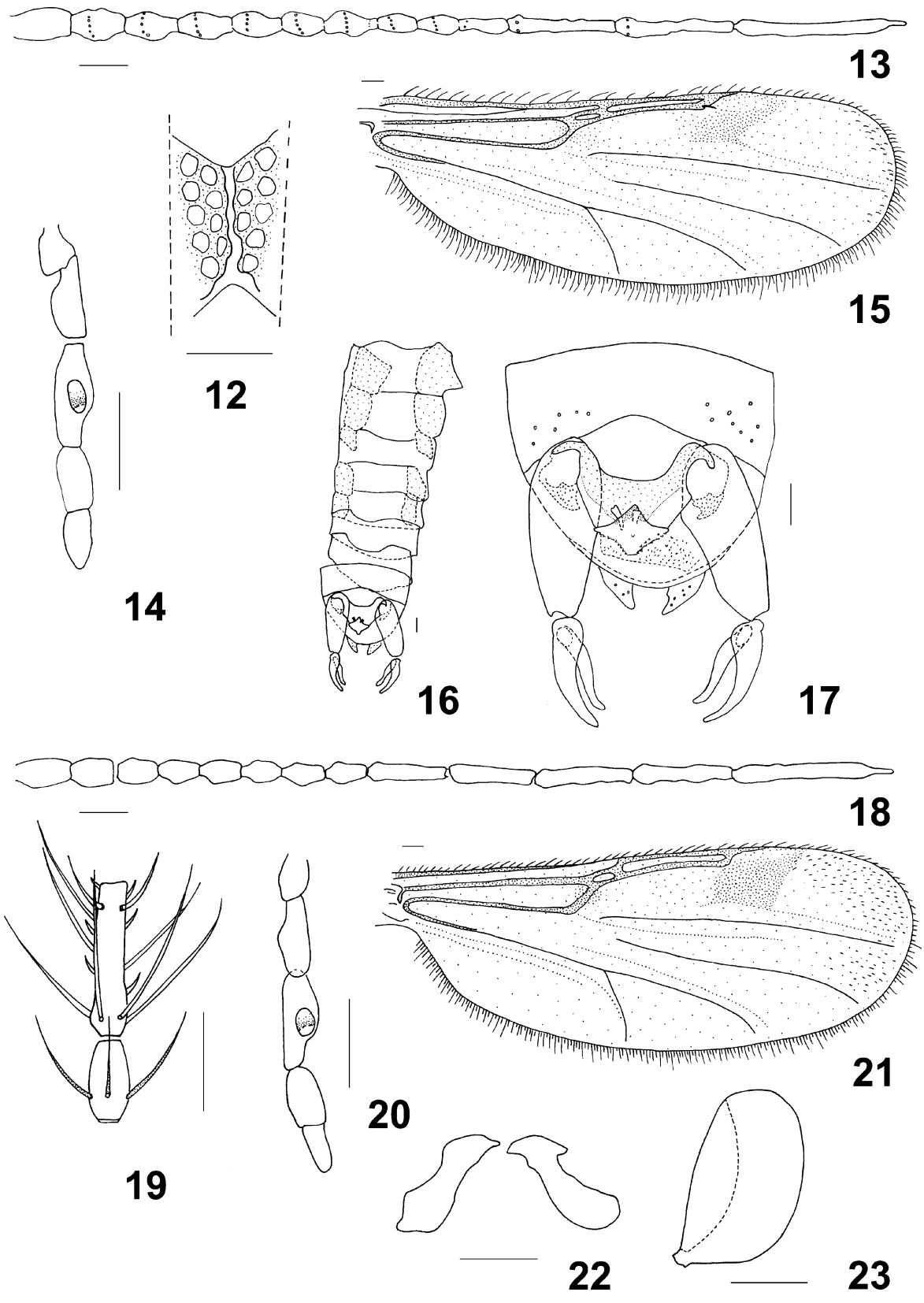
Male. Only extant species of *Atrichopogon* with pigmented wings in the New World with double, articulated gonostylus.

Female. Not diagnosable.

Description of male

Head. Golden brown. Ommatidia (Figure 12) with interfacet spicules, abutting medially for length of five ommatidia. Antenna (Figure 13) pale brown with plume setae moderately developed, flagellomeres 2–10 fused, flagellomeres 9–10 without plume setae, 11–13 elongated, 10 not longer than 1–9; flagellomere 13 with apical nipple, not basally constricted; AR 1.03 (1.00–1.08, $n=4$). Maxillary palpus (Figure 14) pale brown with third segment moderately elongate, swollen for basal two-thirds, with deep sensory pit opening near midlength; segments 4, 5 closely appressed; segment 5 conical; PR 2.77 (2.50–3.00, $n=4$). Proboscis short, length 0.240 mm ($n=4$); P/H ratio 0.90 (0.88–0.94, $n=4$).

Thorax. Dark brown. Scutum with setae arising directly from surface, not in pits; with lateral suture. Paratergite with one stout seta. Anepisternum well-developed, broadly bilobed posteriorly. Legs uniformly yellowish brown; hindtibia slightly expanded at apex; hindtibial spur length about equal to width of hindtibia at midlength; hindtibial comb with 10–11 spines; prothoracic TR 3.58 (3.44–3.75, $n=4$), mesothoracic TR 3.84 (3.75–3.88, $n=4$), metathoracic TR 3.07 (2.83–3.27, $n=4$); claws curved, bifid at tip; empodia present. Wing (Figure 15) with two distinct darker patches in area of r-m and in cell r_3 posterior to apex of R_3; with



Figures 12–23. *Atrichopogon casali* Cavalieri & Chiossone. (12) Ommatidia (♂). (13) Flagellum (♂). (14) Palpus (♂). (15) Wing (♂). (16) Abdominal terga (♂). (17) Genitalia (♂). (18) Flagellum (♀). (19) Flagellomeres 8–9 (♀). (20) Maxillary palpus (♀). (21) Wing (♀). (22) Sternite 9 (♀). (23) Spermatheca (♀). Scale bars: 0.05 mm.

macrotrichiae in apical portion of cells r_3, m_1; both radial cells well formed, second nearly four times longer than first; wing length 1.16 (1.12–1.20, $n=4$) mm; width 0.41 (0.38–0.42, $n=4$) mm; CR 0.65 (0.64–0.66, $n=4$). Halter whitish.

Abdomen (Figure 16). Tergites 2–6 yellowish brown with lateral patches darker, 7–8 entirely yellowish brown.

Genitalia (Figure 17). Segment 9 about equal in width to segment 8. Tergite 9 short, not extending to apex of gonocoxite, posterior margin rounded; sternite 9 narrow, with posterior margin broadly concave, with scattered setae. Gonocoxite moderately stout, without medial lobe, 2.2 times longer than greatest breadth. Gonostylus double, articulated at base, both portions tapering from bases, apical one-third curved; outer portion 0.65 times as long as gonocoxite, apex narrowly rounded; inner portion slightly shorter, paler than outer one, apex pointed. Aedeagal–parameral complex well-developed with lateral arms curved, directed posterolaterally; stout, with posterior margin broad, rhomboidal, spiculate, directed ventrally. Cercus elongate, broad basally, apex pointed, extending beyond margin of tergite 9.

Description of female

As for male, with following differences: flagellum brown, proportions of flagellomeres as shown in Figure 18; flagellomeres 1–8 longer than broad, vasiform, flagellomeres 9–13 elongated (Figure 19); AR 1.51 ($n=3$). Maxillary palpus (Figure 20) with third segment slender, with deep sensory pit opening near midlength; segments 4, 5 separate, their combined length slightly longer than third segment; PR 2.62 (2.36–2.80, $n=3$); proboscis length 0.266 (0.256–0.272, $n=3$) mm; P/H ratio 1.12 (1.07–1.17, $n=3$). Mandible with about 20 teeth. Scutum with humeral areas yellowish. Legs uniformly yellowish brown; prothoracic TR 3.80 (3.75–3.88, $n=3$), mesothoracic TR 3.92 (3.88–4.00, $n=3$), metathoracic TR 2.87 (2.85–2.92, $n=3$); claws curved, not bifid at tip. Wing (Figure 21) with the same pattern of pigmented membrane, with many macrotrichiae of cells r_3, m_1; radial cells narrow, second 3.75 times longer than first; wing length 1.21 (1.18–1.24, $n=3$) mm; width 0.48 (0.46–0.50, $n=3$) mm; CR 0.65 (0.64–0.66, $n=3$).

Abdomen. Tergites 1–6 pale brown with lateral patches darker, 7–10 uniformly yellowish brown. Sternite 8 without elongate, curved setae. Sternite 9 (Figure 22) stout, joined medially. One spermatheca (Figure 23) ovoid with short neck, strongly sclerotized, measuring 0.130×0.074 mm. Cercus yellowish brown.

Distribution

Argentina (Misiones), Paraguay (Itapua).

Types

Holotype, female; allotype, male: Argentina, Misiones, Puerto Iguazú, 27 June 1965, col. O. Casal and M. García, Shannon light trap (MLP 2730/1–2, examined).

Other specimens examined

Paraguay, Itapua, Bella Vista, 3–4 October 2000, col. A. Ortiz and D. López, CDC light trap, three males; same data except 1–2 August 2001, one female; same data except 2–3 August 2000, one male; Argentina, Misiones, Posadas, Arroyo Mártires, 15 May 1994, col. G. Spinelli, one female, CDC light trap (MLP).

Taxonomic discussion

Males and females were associated by their similar wing pigmentation pattern and were collected at the same locality and date.

The male of *Atrichopogon casali* is the only Neotropical species with distinctively pigmented wings and with a double gonostylus. The gonostylus of *Atrichopogon pictipennis* from French Guiana bears a basal, inner projection, but it is not articulated with the main portion.

The wings of the allotype of *A. casali* are not pigmented, and the abdomen lacks the dark lateral patches in segments 2–6, clearly indicating that it was wrongly associated with the holotype of *A. casali* by Cavalieri & Chiossone (1973). Its identity is uncertain.

Acknowledgments

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