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# ZOOTAXA

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## Revision of the Neotropical species of the subgenus *Atrichopogon* (*Psilokempia*) (Diptera: Ceratopogonidae)

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## Abstract

This revision of the midges in the subgenus *Psilokempia* Enderlein of *Atrichopogon* Kieffer provides a brief description of the subgenus, diagnoses, descriptions, illustrations and a key to adult males and females of the 17 species from the Neotropical region, as well as distributional records of both new and previously described species. Six new species are described and illustrated: *A. arti*, *A. javieri*, *A. longirostris*, *A. nahuelbutensis*, *A. sergioi* and *A. woodruffi* (n. spp.). The type materials of all previously known Neotropical species except *A. penicillatus* Delècolle & Rieb were examined. *Atrichopogon altivolans* Macfie, *A. aridus* Spinelli & Marino, *A. domizii* Spinelli, *A. glaber* Macfie, *A. gordonii* Macfie, *A. insigniventris* Macfie, *A. pectinatus* Macfie and *A. penicillatus* are redescribed and illustrated, and notes on the types of *A. echinodes* Macfie, *A. harrisi* Macfie and *A. sanctaeclarae* Macfie are provided. Lectotypes are designated for *A. glaber*, *A. insigniventris* and *A. pectinatus*. The previously unknown males of *A. altivolans*, *A. pectinatus* and *A. penicillatus* are described and illustrated, and *A. fimbriatus* Macfie is recognized as a junior synonym of *A. gordonii*.

**Key words:** *Atrichopogon* (*Psilokempia*), new species, new synonym, holotypes, lectotypes, Neotropical region, distribution

## Resumen

Esta revisión de las mosquitas del subgénero *Psilokempia* Enderlein de *Atrichopogon* Kieffer provee una descripción breve del subgénero, diagnosis, descripciones, ilustraciones y una clave de machos y hembras de las 17 especies de la región Neotropical, así como registros distribucionales de las especies nuevas y de aquellas descritas previamente. Se describen e ilustran seis especies nuevas: *A. arti*, *A. javieri*, *A. longirostris*, *A. nahuelbutensis*, *A. sergioi* y *A. woodruffi* (n. spp.). Fueron reexaminados los materiales tipo de las especies previamente conocidas, excepto *A. penicillatus* Delècolle & Rieb. Se describen e ilustran a *A. altivolans* Macfie, *A. aridus* Spinelli & Marino, *A. domizii* Spinelli, *A. glaber* Macfie, *A. gordonii* Macfie, *A. insigniventris* Macfie, *A. pectinatus* Macfie y *A. penicillatus*, y se brindan notas referidas a los tipos de *A. echinodes* Macfie, *A. harrisi* Macfie y *A. sanctaeclarae* Macfie. Se designan los lectotipos para *A. glaber*, *A. insigniventris* y *A. pectinatus*. Se describen e ilustran los machos, previamente desconocidos de *A. altivolans*, *A. pectinatus* y *A. penicillatus*, y *A. fimbriatus* Macfie se reconoce como sinónimo menor de *A. gordonii*.

**Palabras clave:** *Atrichopogon* (*Psilokempia*), especies nuevas, nueva sinonimia, holotipos, lectotipos, región Neotropical, distribución

## Introduction

The genus *Atrichopogon* Kieffer, distributed worldwide, is one of the most speciose in the family Ceratopogonidae, surpassed only in the Neotropics by *Culicoides* Latreille and *Forcipomyia* Meigen (Spinelli *et al.*, 2006; Borkent, 2015). It is placed, together with *Forcipomyia* Meigen, in the subfamily Forcipomyiinae Lenz.

The feeding habits of the female adults of *Atrichopogon* are poorly known. Some suck haemolymph from blister beetles (Wirth, 1956a, b), while others are pollinivorous (Soria & Wirth, 1979; Soria *et al.*, 1980) or appear to be autogenous. Larvae are aquatic or semiaquatic and are found on the surface of mud, wet wood, or stones, feeding on diatoms and other algae (de Meillon & Wirth, 1991).

Borkent & Spinelli (2007), in their catalog of the Neotropical ceratopogonids, listed 100 species of *Atrichopogon* for the region, and since then eight species have been described: *A. clastrieri* Spinelli & Marino (2007) from northern Argentina and Paraguay, *A. glukhovae* Huerta (2008) from Mexico, *A. macrodentatum* Marino, Tóthová & Spinelli (2011) and *A. monomorphicus* Marino, Tóthová & Spinelli (2011), the two latter from the *Nothofagus* forest of Patagonia, *A. grogani* Huerta & Dzul (2012) and *A. pachito* Huerta & Dzul (2012) from Mexico, and *A. dactylus* Felipe-Bauer along with *A. cavus* Felipe-Bauer (in Felipe-Bauer *et al.*, 2012) from Brazil.

Borkent & Picado (2004) pointed out that the subgeneric concepts that have been applied with partial success in other biogeographic regions, generally serve poorly in the Neotropical Region. They also remarked that the only apparently good synapomorphy used to group adult *Atrichopogon* at the subgeneric level is the presence of cuticular extensions arising from female abdomen sternites 8 and 9 in *Psilokempia* Enderlein. Actually, these cuticular extensions arise from female sternites 7 and 8, as it is properly described by Szadziewski (2001).

The purpose of this paper is to review the subgenus *Psilokempia* from the Neotropics, including the redescriptions and illustrations, or notes on types, of the already known species, and the descriptions and illustrations of 6 new species. When the two sexes are known, the recognized species are described from male and female adults, except for the male of *A. sanctaeclarae* M., not diagnosable at this time.

## Material and methods

The specimens were slide mounted in Canada balsam using the technique described by Wirth & Marston (1968) and examined, measured and drawn using a binocular compound microscope with attached camera lucida. Terms for structures follow those used in the Manual of Central American Diptera (Brown *et al.*, 2009), for special terms applying to *Atrichopogon* see Borkent & Picado (2004), and for terms on female abdominal cuticular extensions see Szadziewski (2001). The examined specimens include those of the following collections:

BMNH	Department of Entomology, Natural History Museum, London, United Kingdom.
CAIM	Colección de Artrópodos con Importancia Médica, Mexico, D.F., Mexico.
CNCI	Canadian National Collection of Insects, Ottawa, Canada.
FSCA	Florida State Collection of Arthropods, Gainesville, Florida, U.S.A.
MLPA	Museo de La Plata, La Plata, Argentina.
USNM	Smithsonian Institution, U.S. National Museum of Natural History, Washington, D.C., U.S.A.

## Subgenus *Atrichopogon* (*Psilokempia*) Enderlein

**Brief description.** Females with eyes abutting medially, bearing interfacet spicules; antenna with flagellomeres 2–7 short, approximately as broad as long, flagellomeres 9–13 elongate; palpus with segment 3 with deep, distal sensory pit, segments 4 and 5 closely appressed or separate; mandible armed; setae of scutum arising directly from surface, not in pits; lateral suture present; scutellum with 4 strong setae (except *A. penicillatus*, with 2 strong setae) and a few smaller ones; if 4 strong setae are present, the 2 mesal ones are longer than the marginal ones; paratergite with one strong setae (one or 2 additional smaller ones present in some specimens of some species); anepisternum well-developed, broadly bilobed posteriorly; hind tibia slightly expanded at apex; hind tibial spur slender, length

less than width of hind tibia at midlength; claws curved, empodia present; wing membrane with a few distal macrotrichia in cells  $r_3$  and  $m_1$ , or macrotrichia absent; unique cuticular extensions on abdominal sternites 7, 8 or both 7 and 8 (on 6–8 in *A. penicillatus*); one well developed spermatheca, subspherical to ovoid with short or moderately developed neck, heavily sclerotized and bearing minute hyaline punctuations at tip. Males with plume setae also present in flagellomeres 9–10, flagellomeres 10–13 elongate, 10 longer than 9; tarsal claws curved, moderately stout, bifid at tip; wing without macrotrichia on membrane; abdominal segment 9 about equal in width to segment 8; gonocoxal apodemes present or absent; gonocoxite without mesal lobe; gonostylus deeply or gently excavated distally, or recurved at extreme tip; aedeagus and parameres well recognizable, only fused at bases, not forming an aedeagal-parameral complex; parameres stout, with a pair of anterodorsal, triangular lobes, these lobes gradually narrowed posterolaterally and barely visible in some species; aedeagus represented by a stout plate; cercus slender, lobe-like, ventral to tergite 9.

#### Included Neotropical species

- *A. altivolans* Macfie, 1949
- *A. aridus* Spinelli & Marino, 2006
- *A. arti* **n. sp.**
- *A. domizii* Spinelli, 1982
- *A. echinodes* Macfie, 1939
- *A. glaber* Macfie, 1935
- *A. gordonii* Macfie, 1938
- *A. javieri* **n. sp.**
- *A. harrisi* Macfie, 1938
- *A. insigniventris* Macfie, 1935
- *A. longirostris* **n. sp.**
- *A. nahuelbutensis* **n. sp.**
- *A. pectinatus* Macfie, 1939
- *A. penicillatus* Delècolle & Rieb, 1994
- *A. sanctaeclarae* Macfie, 1949
- *A. sergioi* **n. sp.**
- *A. woodruffi* **n. sp.**

#### Taxonomy

##### Key to the adult *Atrichopogon* (*Psilokempia*) of the Neotropical region

The females of the subgenus *Atrichopogon* (*Psilokempia*) may be distinguished from other *Atrichopogon* Kieffer by the presence of cuticular extensions on abdominal sternites 7, 8 or 7-8 (on 6–8 in *A. penicillatus*). In addition, the males of all species have the gonostylus with spoon-shaped, excavated tip, the aedeagus and parameres are well recognizable, not forming an aedeagal-parameral complex, and the parameres bears a pair of anterodorsal, triangular lobes.

The males of *A. (P.) echinodes* and *A. (P.) harrisi* are unknown. The male of *A. (P.) sanctaeclarae* is not diagnosable at this time (see taxonomic discussion under “notes on types” of this species), and therefore it is not included in this key.

- |    |   |  |
|----|---|--|
| 1. | Male .....  | 2  |
| -  | Female .....  | 15   |
| 2. | Scutellum with 2 strong setae .....   | <i>A. (P.) penicillatus</i> Dellècole & Rieb |
| -  | Scutellum with 4 strong setae .....   | 3  |
| 3. | Legs light brown with knees heavily dark, pleurae of abdominal segments 2–7 heavily dark .....                          | <i>A. (P.) woodruffi</i> <b>n. sp.</b>       |
| -  | Legs uniformly brown or light brown, pleurae of abdominal segment 2–7 not darker than sterna and terga .....            | 4  |
| 4. | Gonostylus with distal 1/4 gently excavated (Fig. 34D), or recurved at extreme tip (Figs. 8D, 15D, 25D, 28D, 41D) ..... | 5  |
| -  | Gonostylus spoon-shaped, distal 1/3 (Figs. 2D, 5D, 11D) or distal 1/2 deeply excavated (Fig. 31D) .....                 | 10   |

5. Gonostylus recurved at extreme tip; lateral margins of parameres not folded (Fig. 8C); basal arms of aedeagus well developed, recurved (Figs. 9F, 16F, 26F, 29F, 42F) . . . . . 6  
 - Distal 1/4 of gonostylus gently excavated; lateral margins of parameres folded ventrally (Fig. 34C); basal arms of aedeagus reduced (Fig. 35F) . . . . . *A. (P.) pectinatus* Macfie
6. Heavily dark brown species; aedeagus stout, lateral margins abruptly recurved mesally at 3/4 of aedeagus length, then abruptly recurved distally to stout distal 1/4, apex broad, straight (Figs. 41C, 42F) . . . . . *A. (P.) sergioi* n. sp.  
 - Paler species; aedeagus not as above . . . . . 7
7. Posterior margin of tergite 9 slightly notched mesally; aedeagus short, 0.5 X longer than its basal breadth (Figs. 28C, 29F) . . . . . *A. (P.) longirostris* n. sp.  
 - Posterior margin of tergite 9 straight; aedeagus almost as long as its basal breadth (Figs. 8C, 9F, 16F, 25C, 26F) . . . . . 8
8. Aedeagus triangular, with pointed or blunt and spinose tip (Figs. 8C, 9F); sternite 9 with double row of 9–12 setae (Figs. 9F, 26F); scutum yellowish brown or light brown, without pattern of pigmentation . . . . . 9  
 - Aedeagus subtriangular, with broad, blunt tip (Fig. 15C); sternite 9 with single row of 7–8 setae (Figs. 15C, 16F); scutum yellowish, with pattern of pigmentation . . . . . *A. (P.) glaber* Macfie
9. Aedeagus with spinose tip (Fig. 9F); gonocoxite two X longer than its breadth at midlength . . . . . *A. (P.) arti* n. sp.  
 - Tip of aedeagus not spinose (Fig. 26F); gonocoxite 2.5 X longer than its breadth at midlength . . . . . *A. (P.) javieri* n. sp.
10. Gonocoxite stout, 1.75 X longer than its breadth at midlength (Figs. 5C, 6F) . . . . . *A. (P.) aridus* Spinelli & Marino  
 - Gonocoxite elongate, 2.8–3.2 X longer than its breadth at midlength (Figs. 2C, 11C, 18C, 22C, 28C, 31C) . . . . . 11
11. Heavily dark brown species, scutum with pair of dorsocentral pale stripes, each one anteriorly and posteriorly expanded; distal 1/2 of gonostylus excavated; parameres with pair of distal, admedian, short rods (Fig. 32F) . . . . . *A. (P.) nahuelbutensis* n. sp.  
 - Scutum dark brown, brown or light brown, with pale longitudinal markings forming usual pattern; distal 1/3 of gonostylus excavated; admedian pair and distal rods of parameres, if present, elongate (Figs. 3F, 19F, 23F) . . . . . 12
12. Parameres with two admedian, elongate, slender, sclerotized rods . . . . . 13  
 - Parameres without admedian sclerotized rods (Fig. 12F) . . . . . *A. (P.) domizii* Spinelli
13. Aedeagus slender with blunt tip (Figs. 2C, 3F); gonostylus 0.7–0.75 length of gonocoxite . . . . . *A. (P.) altivolans* Macfie  
 - Aedeagus stout with pointed tip (Figs. 18C, 22C, 28C); gonostylus nearly as long as gonocoxite . . . . . 14
14. Sternite 9 with 10 setae; aedeagus longer than broad (Figs. 22C, 23F) . . . . . *A. (P.) insigniventris* Macfie  
 - Sternite 9 with 5–7 setae; aedeagus broader than long (Figs. 18C, 19F) . . . . . *A. (P.) gordonii* Macfie
15. Proboscis greatly elongate, head width / mouthparts length 0.91–1.05 (Fig. 27A) . . . . . *A. (P.) longirostris* n. sp.  
 - Proboscis not elongate, head width / mouthparts length 1.59–2.78 . . . . . 16
16. Scutellum with 2 strong setae . . . . . *A. (P.) penicillatus* Dellècole & Rieb  
 - Scutellum with 4 strong setae (Fig. 17B) . . . . . 17
17. Sternite 7 with posteromesal cuticular extensions . . . . . 20  
 - Sternite 7 without posteromesal cuticular extensions (Figs. 4D, 6C, 13C, 33D, 35C) . . . . . 18
18. Scutum brown, scutellum paler; legs light brown; abdomen light brown except pleurae of segments 2–7 heavily dark, tip yellowish; second radial cell with broad lumen, approximately five X longer than first radial cell (Fig. 13A) . . . . . *A. (P.) echinodes* Macfie  
 - Uniformly dark brown species, including scutellum, legs and abdomen; second radial cell with narrow lumen, nearly four X longer than first radial cell (Figs. 4B, 33B) . . . . . 19
19. Palpal segment 5 conical, head width / mouthparts length 2.24–2.72 (Figs. 4A, 6B), mandible with 8–9 minute teeth; wing with few macrotrichia marginally in cell  $r_3$  (Fig. 4B); sternite 8 stripe-like with 3 pairs of setae (Fig. 6C) . . . . . *A. (P.) aridus* Spinelli & Marino  
 - Palpal segment 5 with blunt tip, head width / mouthparts length 1.67–1.85 (Figs. 33A, 35B); mandible with 14–15 minute teeth; wing with few macrotrichia marginally in cells  $r_3$  and  $m_1$  (Fig. 33B); sternite 8 broad with 4–5 pairs of setae (Fig. 35C) . . . . . *A. (P.) pectinatus* Macfie
20. Legs light brown with knees heavily dark, pleurae of abdominal segments 2–7 heavily dark (Fig. 43C) . . . . . *A. (P.) woodruffi* n. sp.  
 - Legs uniformly brown, yellowish brown or light brown, pleurae of abdominal segment 2–7 not darker than sterna and terga 21
21. Heavily dark brown species; scutum with pair of dorsocentral pale stripes, each one anteriorly and posteriorly expanded . . . . . 22  
 - Brown, light brown or yellowish species; if lacking pattern of pigmentation, scutum yellowish brown or light brown, not heavily dark brown . . . . . 25
22. Cuticular extensions of sternite 7 represented by a common stem from which arises a bifid tuft of slender, elongate processes (Figs. 30D, 32C) . . . . . *A. (P.) nahuelbutensis* n. sp.  
 - Cuticular extensions of sternite 7 represented by a common stem from which arises a comb of 3–9 nearly straight processes (Figs. 20C, 39C, 40D, 42C) . . . . . 23
23. Wing membrane without macrotrichia (Fig. 39A) . . . . . *A. (P.) sanctaeclarae* Macfie  
 - Wing membrane with macrotrichia distally in cells  $r_3$  and  $m_1$  . . . . . 24
24. Paratergite with 2 additional small setae; first radial cell with minute lumen (Fig. 40B); halter whitish; a comb of 5–6 slender, elongate, pointed processes arising from the common stem of the posterior margin of sternite 7; sternite 8 with 5–6 pairs of setae, membrane with V-shaped fringe of posteriorly directed slender spines (Figs. 40D, 42C) . . . . . *A. (P.) sergioi* n. sp.  
 - Paratergite without additional small setae; first radial cell with broad lumen (Fig. 20A); halter dark brown; three short, bifid at tip processes arising from the common stem of the posterior margin of sternite 7; sternite 8 broad, expanded laterally, with 2 pairs of setae, membrane with group of posteriorly directed slender spines (Figs. 20B–C) . . . . . *A. (P.) harrisi* Macfie
25. Membrane of sternite 8 with V-shaped fringe of posteriorly directed slender spines or with transversal row of elongate, anteriorly

- only directed, finger-like processes .....26
- Membrane of sternite 8 without V-shaped fringe of posteriorly directed slender spines or with transversal row of elongate anteriorly directed, finger-like processes, only with dense pilosity anterolaterally to gonopore (Figs. 21D, 23C) ..... *A. (P.) insigniventris* Macfie
  - 26. Sternite 8 broad expanded posterolaterally in the manner of a pair of triangular, tooth-like, sclerotized projections bearing 3 setae, membrane with transversal row of elongate, anteriorly directed, finger-like processes; large spermatheca (113–128 µm long) (Figs. 17E, 19C) ..... *A. (P.) gordonii* Macfie
  - Sternite 8 without pair of triangular, tooth-like, sclerotized projections, membrane with V-shaped fringe of posteriorly directed slender spines; spermatheca smaller (68–100 µm long) (Figs. 7D, 14D, 24D) ..... 27
  - 27. A comb of 5–6 elongate, straight processes arising from the posteromesal common stem of sternite 7 (Fig. 26C) ..... *A. (P.) javieri* n. sp.
  - A bifid tuft of processes arising from the posteromesal common stem of sternite 7 (Figs. 1D, 3C, 9C, 12C, 14D, 16C) ..... 28
  - 28. Processes of bifid tuft of sternite 7 straight (Fig. 7D); mandible with 18 teeth ..... *A. (P.) arti* n. sp.
  - Processes of bifid tuft of sternite 7 curved (Figs. 1D, 3C, 12C, 16C); mandible with 10–13 teeth ..... 29
  - 29. Flagellum dark brown, pedicel yellowish (Fig. 14A); wing membrane without macrotrichia; both radial cells obliterated (Fig. 14B) ..... *A. (P.) glaber* Macfie
  - Flagellum and pedicel dark brown (Figs. 1A, 10A); wing membrane with macrotrichia in distal portions of cells  $r_3$ ,  $m_1$ ; first radial cell obliterated or with very narrow lumen, second visible (Figs. 1B, 10B) ..... 30
  - 30. Legs uniformly brown; second radial cell nearly two X longer than first radial cell; posterior margin of sternite 7 with a common stem 1.6 X longer than broad, from which arises a bifid tuft of curved processes; sternite 8 broad (Figs. 1D, 3C) ..... *A. (P.) altivolans* Macfie
  - Legs brown, distal 1/2 of femora slightly darker; second radial cell nearly three X longer than first radial cell; posterior margin of sternite 7 with common stem as long as broad, from which arises a bifid tuft of 3–4 straight processes; sternite 8 stripe-like (Figs. 10D, 12C) ..... *A. (P.) domizii* Spinelli

### *Atrichopogon altivolans* Macfie

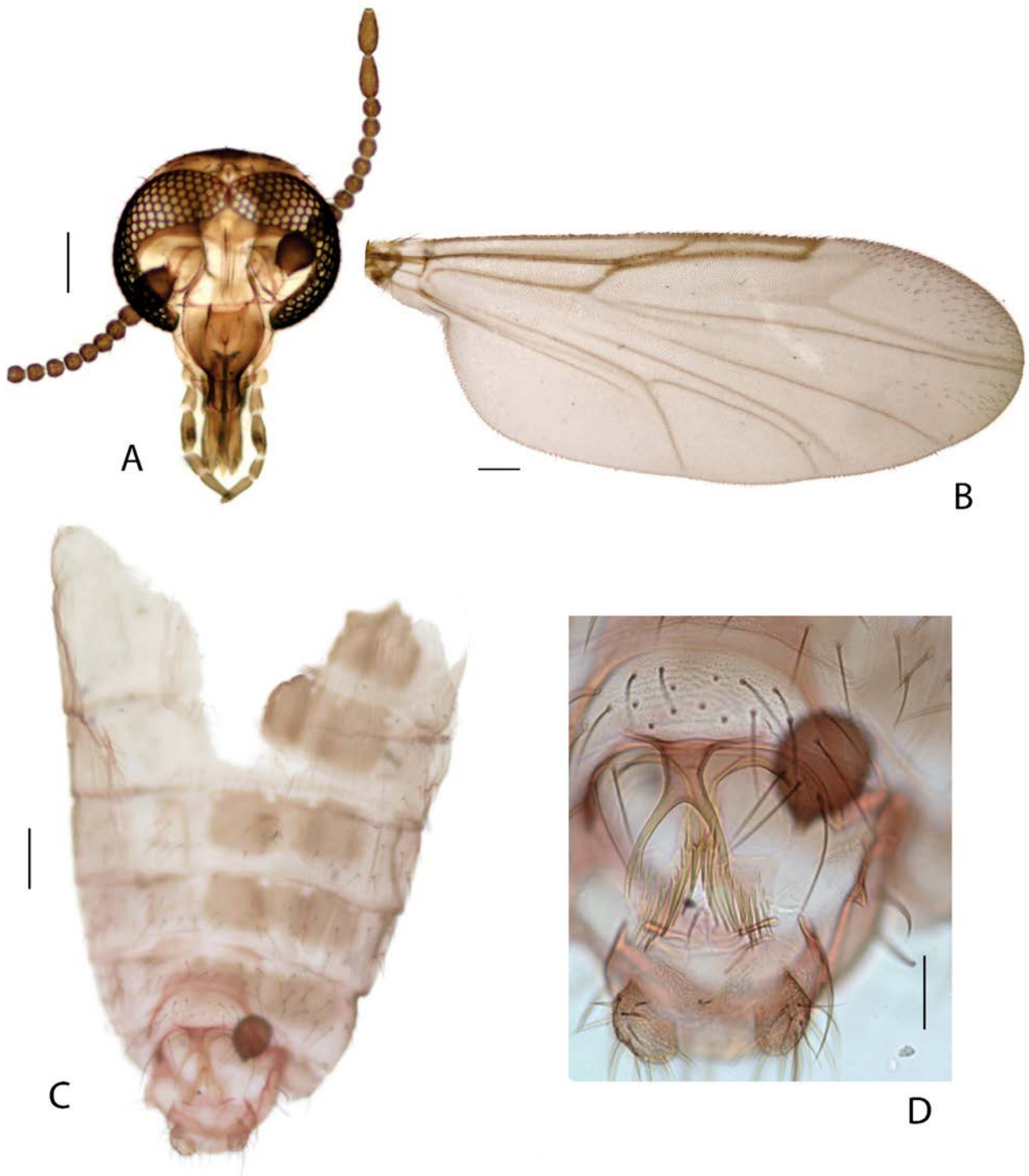
(Figs. 1–3, 46)

*Atrichopogon altivolans* Macfie, 1949: 113 (female; Mexico); Wirth, 1974: 13 (in catalog species south of USA); Borkent & Wirth, 1997: 22 (in World catalog); Borkent & Spinelli, 2000: 10 (in catalog species south of USA); Borkent & Spinelli, 2007: 44 (in Neotropical catalog); Borkent, 2015: 18 (in online World catalog).

**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: scutum brown with pale markings forming the usual pattern. Female: with a bifid tuft of curved and elongate processes branched at tip, arising from the posteromesal common stem of posterior margin of sternite 7; sternite 8 broad, with 3–4 pairs of setae, membrane with V-shaped fringe of posteriorly directed spines. Male: gonocoxite elongate; anterodorsal lobes of parameres extending to tip of parameres main body, and aedeagus slender, subtriangular, with basal arch concave, basal arms short and recurved laterally, and lateral margins gently tapering to rounded tip.

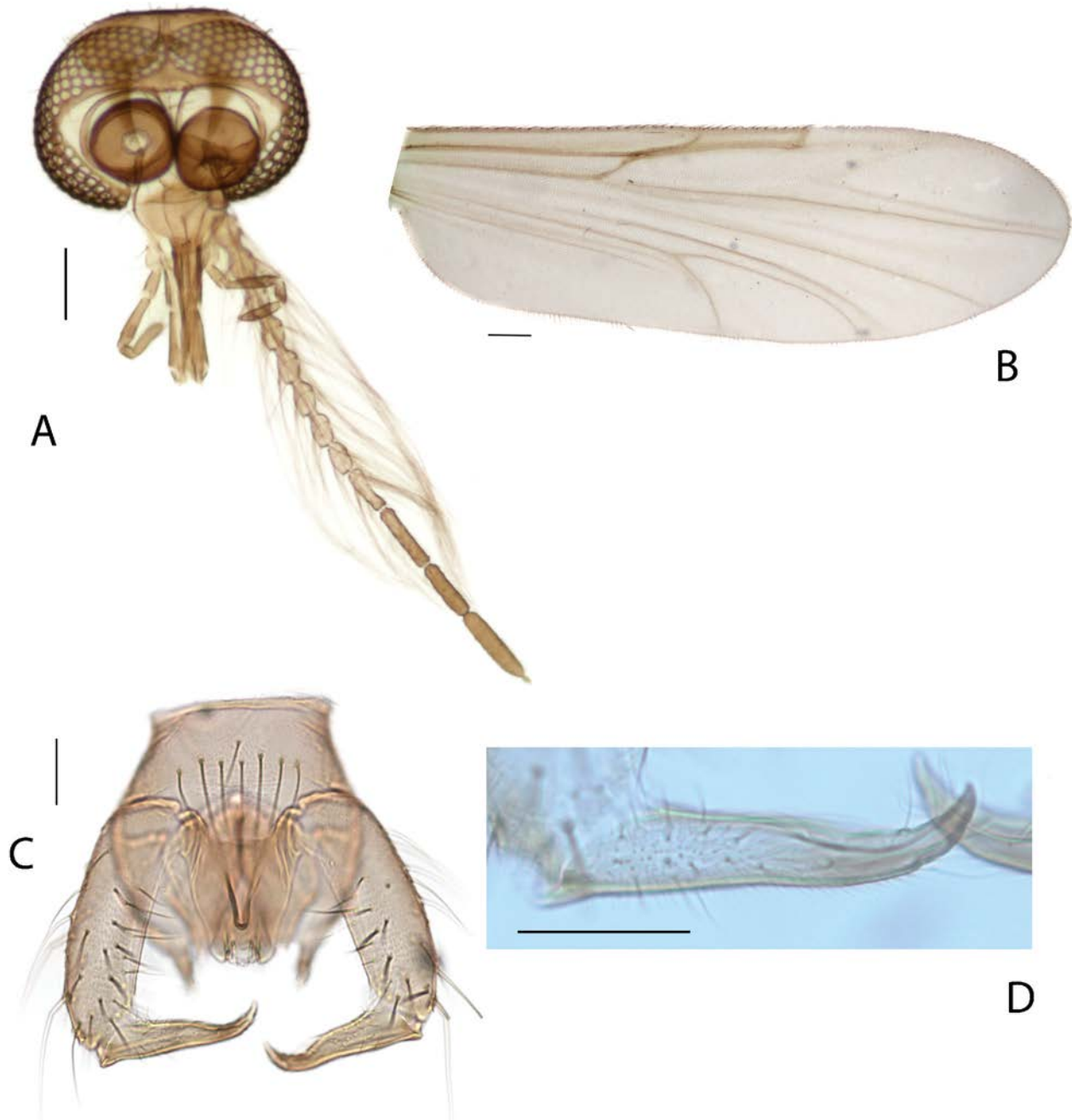
**Redescription of female.** Head (Fig. 1A). Dark brown. Eyes abutting for length of three ommatidia. Antenna with pedicel and flagellum dark brown; proportions of flagellomeres 1–10 as shown in Figs. 1A, 3A; flagellomere 13 with apical nipple slightly constricted basally (last flagellomere visible in one paratype); AR approximately 2.00 (measured from a photograph of a BMNH paratype). Palpus (Figs. 1A, 3B) dark brown; segment 3 slender, with small deep sensory pit opening subapically; segments 4, 5 separated, broadly contacting; segment 5 conical, elongate, subequal to segment 3; PR 2.64–3.08 (2.93,  $n = 4$ ); head width / mouthparts length 1.59–1.72 (1.66,  $n = 4$ ). Mandible with 10–12 minute teeth at extreme apex.

Thorax. Brown. Scutum with pale markings forming usual pattern; scutellum paler, with 4 strong setae. Legs uniformly brown; apex of hind tibia with 7–9 spines; foreleg TR 3.11–3.62 (3.35,  $n = 4$ ), midleg TR 3.20 ( $n = 4$ ), hind leg TR 2.67–2.92 (2.77,  $n = 4$ ). Wing (Fig. 1B) membrane slightly infuscated, with fairly numerous macrotrichia in distal portions of cells  $r_3$ ,  $m_1$ ; first radial cell almost obliterated, second radial cell with narrow lumen, 2.5 X longer than first; wing length 1.44–1.50 (1.48,  $n = 4$ ) mm; breadth 0.60–0.64 (0.62,  $n = 4$ ) mm; CR 0.66–0.69 (0.67,  $n = 4$ ). Halter whitish.



**FIGURE 1.** *Atrichopogon altivolans* Macfie. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.



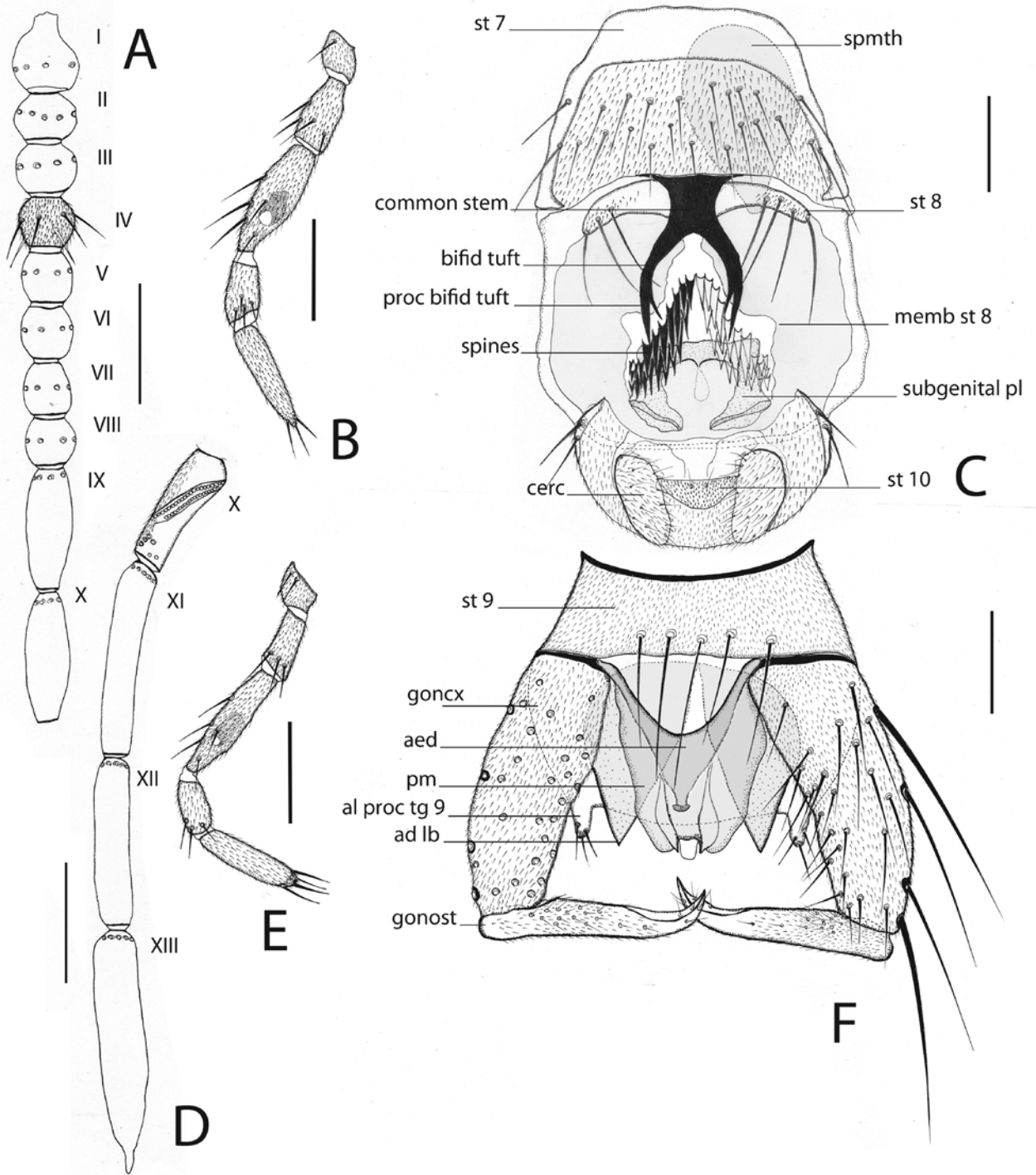


**FIGURE 2.** *Atrichopogon altivolans* Macfie. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

Abdomen (Fig. 1C). Tergites uniformly brown. Genital armature (Figs. 1C–D, 3C): sternite 7 trapezoidal, with cuticular extensions represented by posteromesal common, stout, 1.6 X longer than broad stem, from which arises bifid tuft of curved, elongate processes, each one branched at tip; sternite 8 broad with 3–4 pairs of setae, membrane with conspicuous V-shaped fringe of stout, posteriorly directed spines; subgenital plate well developed, with expanded basal arms, lateral arms heavily sclerotized. Spermatheca (Figs. 1C–D) ovoid with conical neck, heavily sclerotized, measuring 76–100 (90, n = 4) by 52–72 (62, n = 4)  $\mu\text{m}$ . Cercus brown.

Male. As for female, with following differences:

Head. Antenna (Figs. 2A, 3D) with plume setae sparse, flagellomeres 2–8 fused, flagellomeres 10–13 darker; AR 0.84–0.92 (0.88, n = 3). Palpus brown (Fig. 2A); PR 3.27–4.67 (3.95, n = 5). Head width / mouthparts length 1.62–1.76 (1.69, n = 5).



**FIGURE 3.** *Atrichopogon altivolans* Macfie. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm. Legends: (C): cercus (cerc), bifid tuft of genital armature, common stem of genital armature, membrane of sternite 8 (memb st 8), process bifid tuft of genital armature (proc bifid tuft), spines of membrane of sternite 8, spermatheca (spmth), subgenital plate (subgenital pl), sternite 7 (st 7), sternite 8 (st 8), sternite 10 (st 10). (F): aedeagus (aed), anterodorsal lobes (ad lb), apicolateral processes of tergite 9 (al proc tg 9), gonocoxite (goncx), gonostylus (gonost), paramere (pm), sternite 9 (st 9).

Thorax. Legs brown, foreleg TR 3.30–3.87 (3.59, n = 5), midleg TR 3.08–3.44 (3.22, n = 5), hind leg TR 2.64–3.00 (2.81, n = 5). Wing (Fig. 2B) with second radial cell 1.5 X longer than first, with broad lumen; wing length 1.38–1.66 (1.52, n = 6) mm; breadth 0.48–0.56 (0.52, n = 6) mm; CR 0.60–0.62 (0.61, n = 6).

Abdomen. Brown. Genitalia (Figs. 2C, 3F): tergite 9 extending to 3/4 length of gonocoxite, posterior margin rounded; sternite 9 narrow, posterior margin straight with single row of 5–7 setae, one seta anterior to row in one

specimen. Gonocoxite elongate, 3.2 X longer than breadth at its midlength; gonostylus (Fig. 2D) spoon-shaped, 0.7 length of gonocoxite, nearly straight, broad basally, distal 1/3 deeply excavated. Parameres stout, lightly sclerotized, slightly longer than their basal breadth; lateral margins gently tapering to rounded apex; with two admedian, elongate, slender, sclerotized rods from which arises pair of slender, recurved, posteriorly directed processes; anterodorsal lobes lightly sclerotized, elongate, extending to distal margin of parameres main body, tip pointed. Aedeagus slender, nearly as long as its basal breadth; basal arch concave, extending to 1/3 of total length; basal arms short, heavily sclerotized, recurved laterally; lateral margins gently tapering to rounded tip.

**Distribution.** Mexico (Chiapas), Ecuador (Fig. 46).

**Type material.** Holotype female, Mexico, Chiapas, between Santa Julia and Santa Rita, N of Huixtla, 1000–1500 m, 15-III-1938, A. Dampf. Paratypes, same data as holotype except (BMNH), 2 females (examined).

**Other specimens examined.** Mexico, Chiapas, without data, Fauna Mexicana, A. Dampf, 6 males, 4 females (5 males, 3 females in CAIM, 1 male, 1 female in MLPA). Ecuador, Imbabura prov., Chachimbiro, 10/11-I-2014, S. Hochman, 3 males, 3 females, light trap (MLPA).

**Taxonomic discussion.** Males and females were collected at the same locality and date.

This species is very similar to *A. domizii* from eastern Argentina. However, the distal 1/2 of femora of the latter species is slightly darker, the second radial cell of the female wing is larger, the common stem arises from the posterior margin of the female sternite 7 is broader and bears a bifid tuft of straight processes, the female sternite 8 is stripe-like, and the parameres lack the admedian sclerotized rods.

This is the first description of the male of *A. altivolans*, and its first record from Ecuador.

### *Atrichopogon aridus* Spinelli & Marino

(Figs. 4–6, 46)

*Atrichopogon aridus* Spinelli & Marino, in Spinelli *et al.*, 2006: 304 (male, female; Argentina); Borkent & Spinelli, 2007: 44 (in Neotropical catalog); Borkent, 2015: 18 (in online World catalog).

**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: heavily dark brown species, scutum without pattern of pigmentation. Female: posterior margin of sternite 7 without cuticular extensions; sternite 8 stripe-like with 3 pairs of setae, membrane with V-shaped fringe of posteriorly directed spines. Male: gonocoxite stout; parameres stout, with lateral margins subparallel and distal margin broad and finely crenulate mesally; anterodorsal lobes extending to distal margin of parameres main body; aedeagus stout, with basal arch deeply concave, basal arms straight and directed anteriorly, and lateral margins abruptly tapering to conical, blunt tip, folded distally.

**Redescription of female.** Head (Fig. 4A). Heavily dark brown. Eyes abutting for length of 2.5 ommatidia. Antenna with pedicel and flagellum dark brown; proportions of flagellomeres as shown in Figs. 4A, 6A; flagellomere 13 with apical nipple slightly constricted basally; AR 1.34–1.44 (1.39, n = 3). Palpus (Figs. 4A, 6B) dark brown; segment 3 slender, with broad deep sensory pit opening on distal 1/3; segments 4, 5 closely appressed, their combined length longer than segment 3; segment 5 conical; PR 2.27– 3.00 (2.51, n = 3). Head width / mouthparts length 2.24–2.72 (2.56, n = 3). Mandible with 8–9 minute teeth at extreme apex.

Thorax. Heavily dark brown. Scutum without pattern of pigmentation; scutellum with 4 strong setae. Legs uniformly brown; apex of hind tibia with 7–8 spines; foreleg TR 3.12–3.25 (3.16, n = 3), midleg TR 2.67–3.00 (2.81, n = 3), hind leg TR 2.55–2.73 (2.67, n = 3). Wing (Fig. 4B) with few macrotrichia marginally in cell  $r_3$ ; first radial cell obliterated, second radial cell with narrow lumen, nearly three X longer than first; wing length 1.04–1.14 (1.09, n = 3) mm; breadth 0.44–0.48 (0.46, n = 3) mm; CR 0.67–0.68 (0.67, n = 3). Halter whitish.

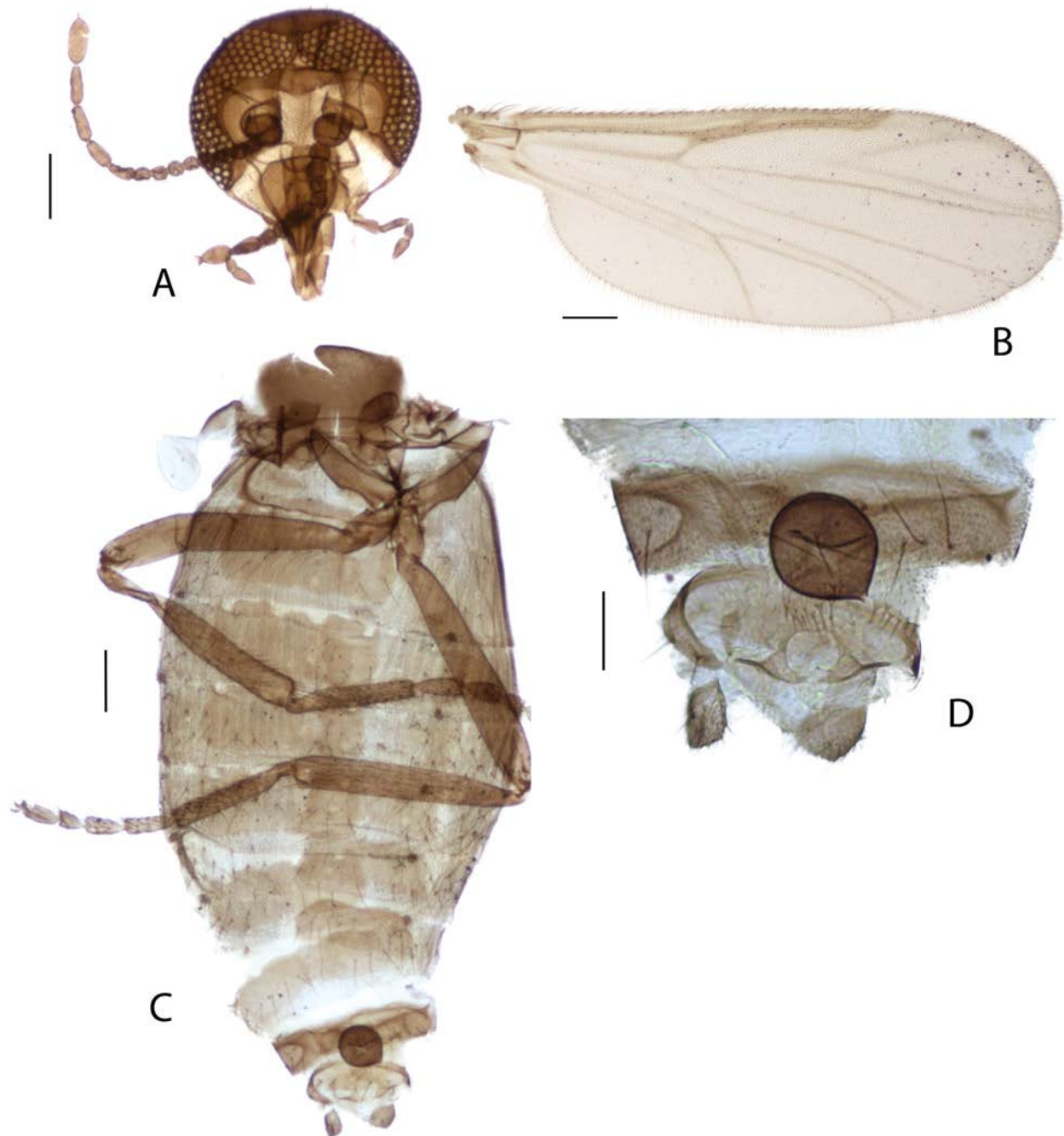
Abdomen (Fig. 4C). Tergites uniformly brown. Genital armature (Figs. 4D, 6C): sternite 7 subquadrangular, posterior margin without cuticular extensions; sternite 8 stripe-like with 3 pairs of setae, membrane with V-shaped fringe of posteriorly directed slender spines (Fig. 6C); subgenital plate well developed, with slender basal arms. Spermatheca (Figs. 4C–D) ovoid with short neck, heavily sclerotized, measuring 80–92 (87, n = 3) by 60–72 (67, n = 3)  $\mu\text{m}$ . Cercus light brown.

Male. As for female, with following differences:

Head. Antenna (Figs. 5A, 6D) with plume setae well developed; flagellomeres 2–8 fused; AR 0.84–0.86 (0.85,

n = 3). Palpus (Figs. 5A, 6E) brown; PR 3.22–3.88 (3.40, n = 3). Head width / mouthparts length 2.40–2.56 (2.48, n = 3).

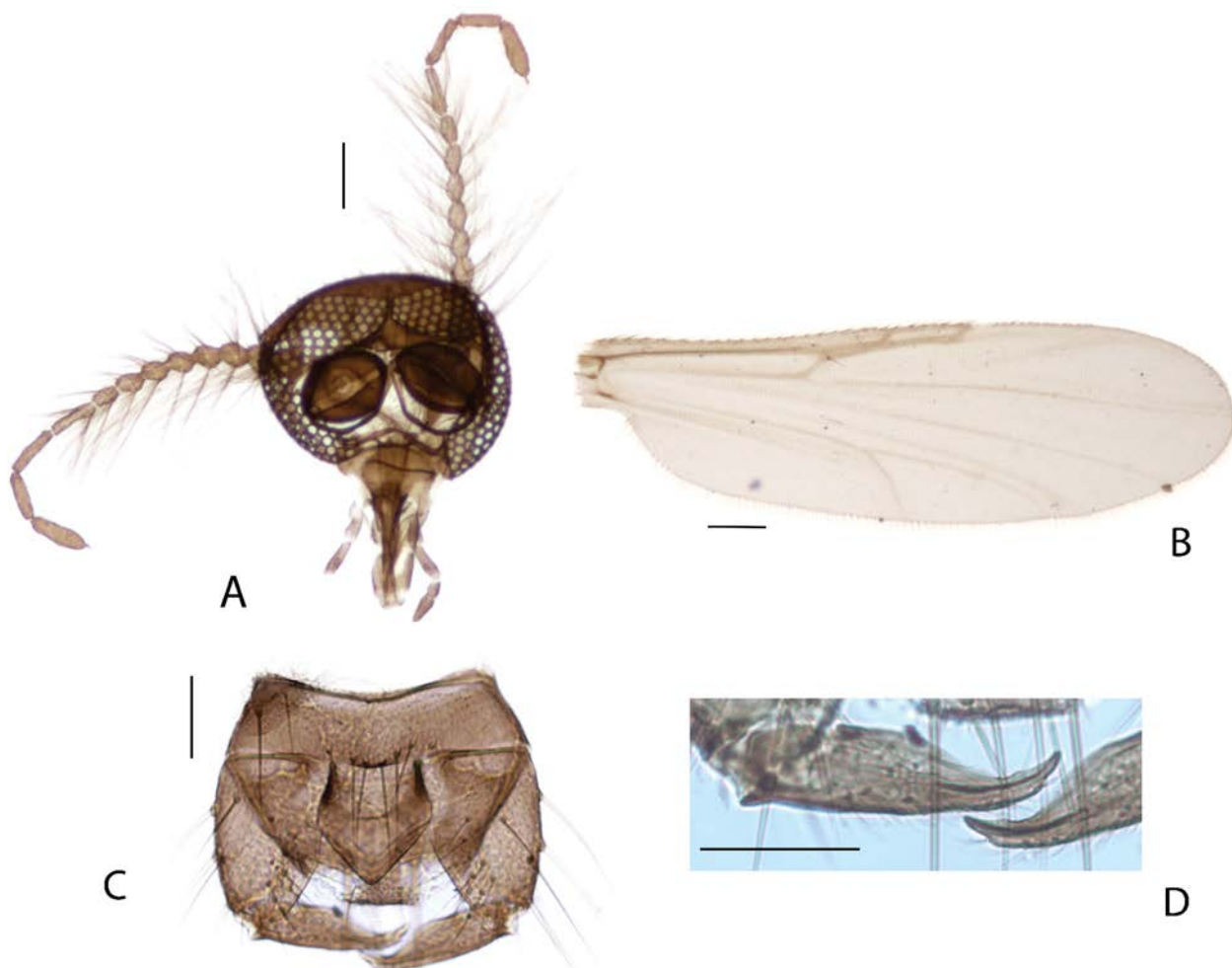
Thorax. Legs brown, foreleg TR 3.14–3.43 (3.28, n = 3), midleg TR 2.75–3.00 (2.88, n = 3), hind leg TR 2.60–2.80 (2.70, n = 3). Wing (Fig. 5B) with second radial cell two X longer than first, lumen broad; wing length 1.14–1.16 (1.15, n = 2) mm; breadth 0.38–0.40 (0.39, n = 3) mm; CR 0.58–0.59 (0.58, n = 2).



**FIGURE 4.** *Atrichopogon aridus* Spinelli & Marino. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.

Abdomen. Tergites uniformly brown. Genitalia (Figs. 5C, 6F): tergite 9 short, extending to 3/4 length of gonocoxite, posterior margin straight; sternite 9 narrow, posterior margin nearly straight with single row of 7–8 setae. Gonocoxite stout, 1.75 X longer than breadth at its midlength; gonostylus (Fig. 5D) spoon-shaped, 0.7 length of gonocoxite, swollen at base, distal 1/3 excavated, tip pointed. Gonocoxal apodemes reduced. Parameres stout, hyaline, as long as their basal breadth; lateral margins subparallel, distal margin broad, finely crenulate mesally;

anterodorsal lobes sclerotized, elongate, extending to distal margin of parameres main body, tip pointed. Aedeagus stout, as long as its basal breadth; basal arch deeply concave, extending 2/5 of total length; basal arms straight, heavily sclerotized, directed anteriorly; lateral margins abruptly tapering to conical, blunt tip, folded distally.



**FIGURE 5.** *Atrichopogon aridus* Spinelli & Marino. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

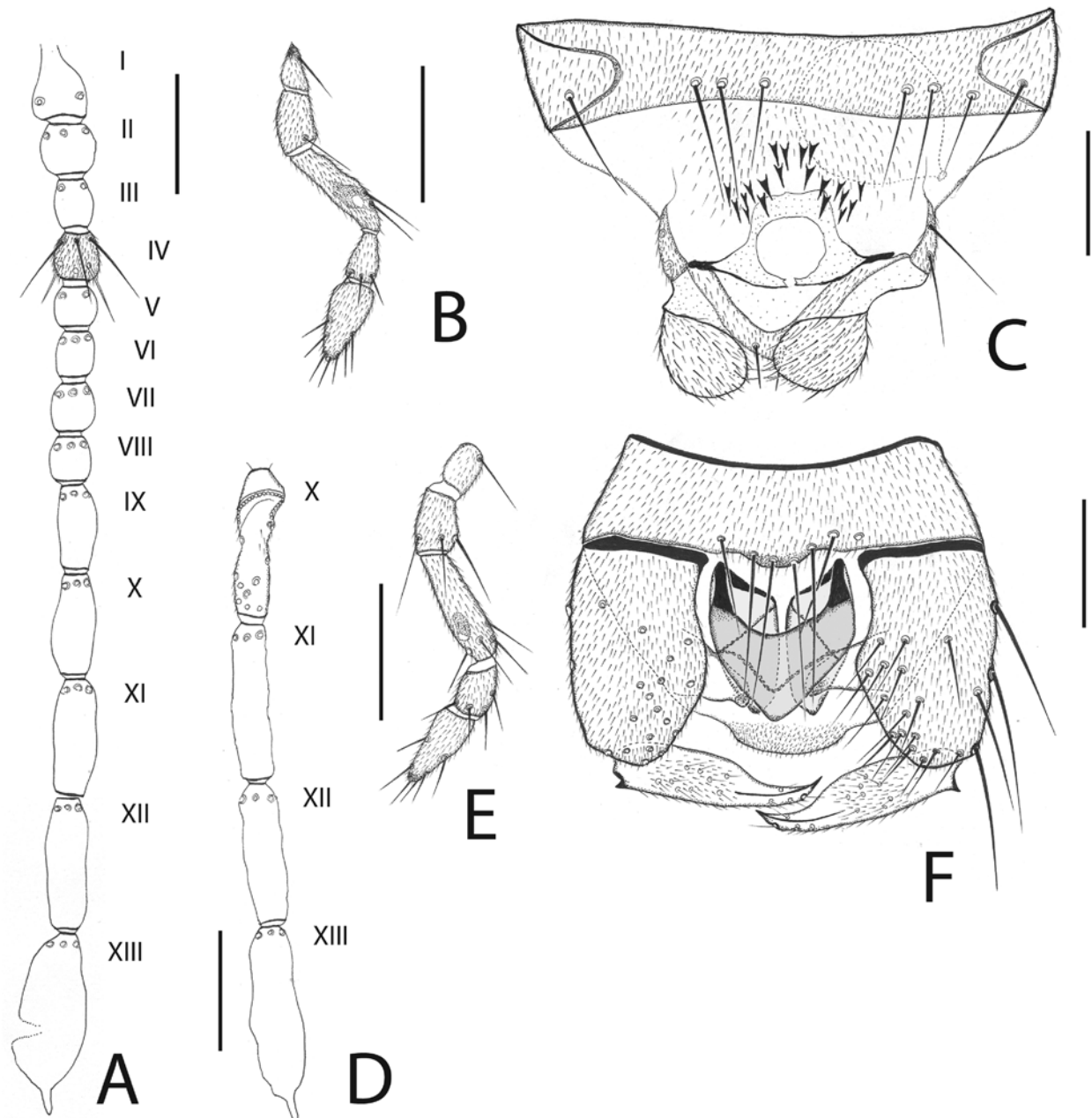
**Distribution.** Argentina, in arid zones of Mendoza and Río Negro provinces (Fig. 46).

**Type material.** Holotype male, allotype female, Argentina, Mendoza, Malargue, 10-XI-1994, G. Spinelli, sweep net. Paratypes, 2 males, 2 females, as follows: same data as holotype, 2 males, 1 female; Río Negro, Bariloche, Río Limay (anfiteatro), 4-II-1981, G. Spinelli, 1 female, at light (MLPA, examined).

**Taxonomic discussion.** Males and females were collected at the same locality and date.

This species is very similar to *A. pectinatus* by virtue of the heavily dark brown coloration and by the female sternite 7 lacking posteromesal cuticular extensions. However, in the females of the latter species the palpal segment 5 is not conical but has blunt tip, the proboscis is shorter, the mandible is armed with 14–15 teeth, the wing membrane bears macrotrichia not only in cell  $r_3$  but in cell  $m_1$ , and the sternite 8 is broad with 4 pairs of setae. With regard to males, the posterior margin of the sternite 9 in *A. pectinatus* is slightly convex, the gonostylus is nearly straight with its distal 1/4 gently excavated, the lateral margins of parameres are folded ventrally and the distal margin is not crenulate, the anterodorsal lobes only extends to midlength of parameres main body, and the aedeagus is triangular with reduced basal arms.

Characters to distinguish this species from *A. echinodes* may be found in the key and in the discussion under the description of the latter species.



**FIGURE 6.** *Atrichopogon aridus* Spinelli & Marino. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

***Atrichopogon arti* n. sp.**

(Figs. 7–9, 46)

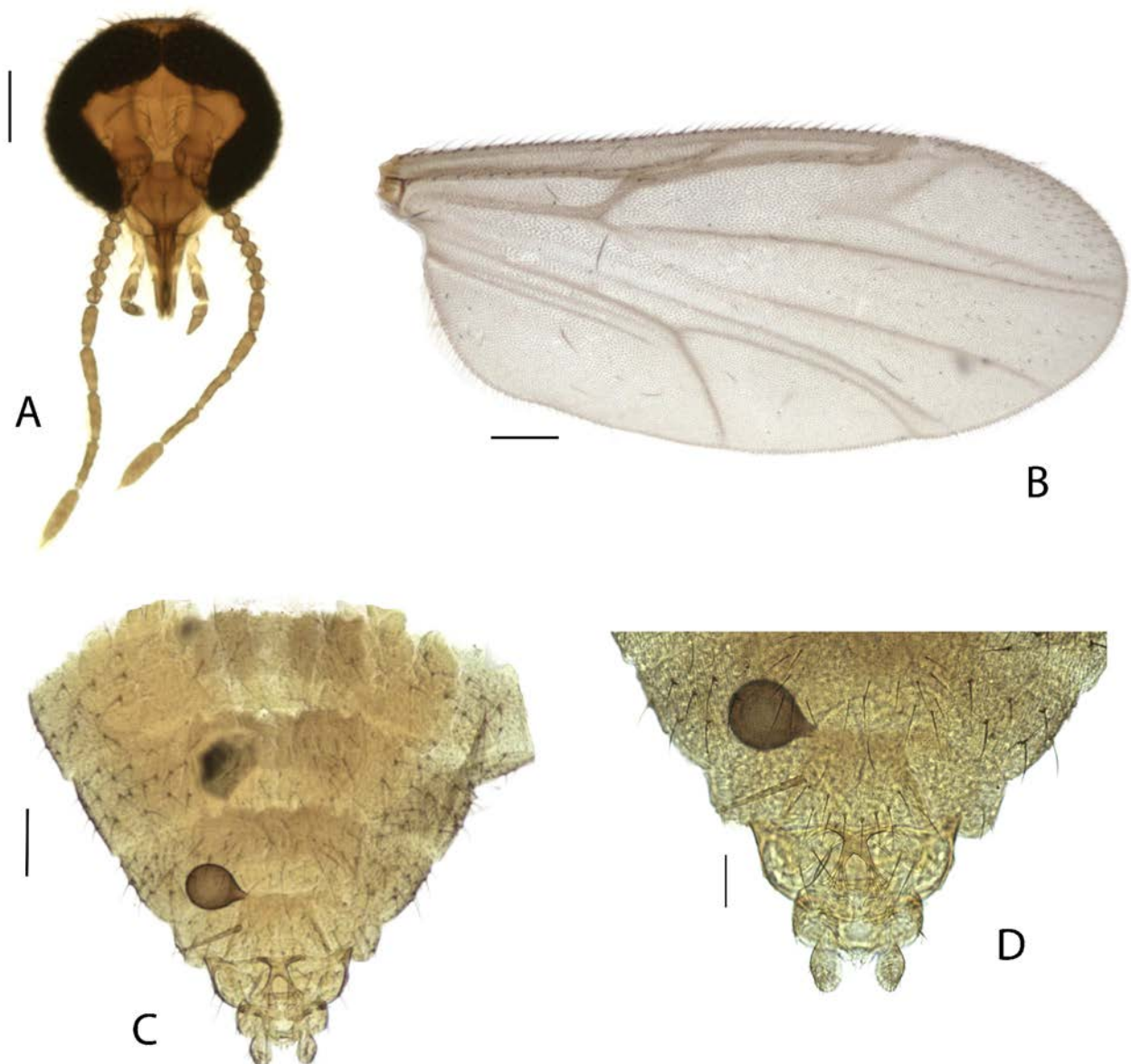
**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: small and light brown species, scutum without pattern of pigmentation. Female: with a bifid tuft of slender, nearly straight processes arising from the posteromesal common stem of posterior margin of sternite 7; sternite 8 broad, expanded laterally and with 2–3 pairs of setae, membrane with a pair of lateral tufts of posteriorly directed spines. Male: posterior margin of sternite 9 with 11–12 setae in two rows; gonocoxite stout; anterodorsal lobes apparently short, and aedeagus triangular, slightly shorter than its basal breadth, with basal arch slightly concave, basal arms nearly straight and directed laterally, and lateral margins tapering to blunt, spinose tip.

**Description of female.** Head (Fig. 7A). Light brown. Eyes abutting for length of three ommatidia. Antenna

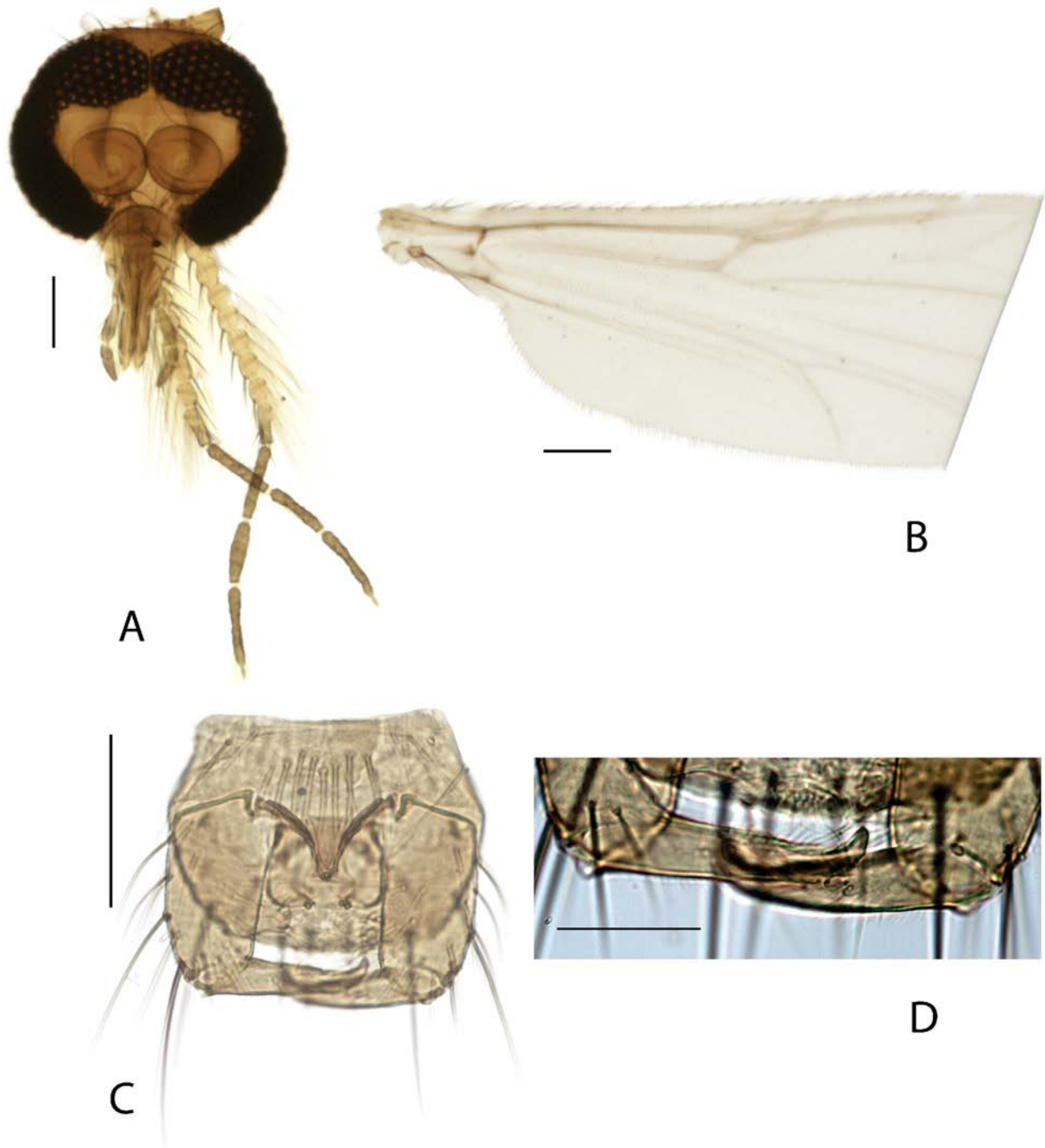
with pedicel and flagellum dark brown; proportions of flagellomeres as shown in Figs. 7A, 9A; flagellomere 13 with apical nipple not constricted basally; AR 1.37–1.82 (1.60, n = 2). Palpus (Figs. 7A, 9B) brown; segment 3 with small deep sensory pit opening shortly beyond midlength; segments 4, 5 separated, broadly contacting, its combined length equal to segment 3; segment 5 conical; PR 2.18–2.40 (2.29, n = 2); head width / mouthparts length 2.20–2.25 (2.23, n = 2). Mandible with 18 minute teeth at extreme apex.

Thorax. Uniformly light brown; scutellum with 4 stout setae. Legs uniformly light brown; apex of hind tibia with 7–9 spines; foreleg TR 3.33–3.67 (3.50, n = 2), midleg TR 3.29–3.43 (3.36, n = 2), hind leg TR 3.00–3.12 (3.06, n = 2). Wing (Fig. 7B) membrane infuscated, with macrotrichia in cell  $r_3$ , in one row at distal 1/3 of cell  $m_1$ ; radial cells with narrow lumen, second nearly three X longer than first; wing length 1.02–1.08 (1.05, n = 2) mm; breadth 0.46–0.48 (0.47, n = 2) mm; CR 0.70–0.71 (0.70, n = 2). Halter brown.

Abdomen (Fig. 7C). Tergites uniformly brown. Genital armature (Figs. 7D, 9C): sternite 7 trapezoidal, with cuticular extensions represented by posteromesal common short, 0.5 X longer than broad stem, from which arises bifid tuft of slender, nearly straight processes (one additional, mesal, posteriorly directed process in paratype); sternite 8 broad, expanded laterally, with 2–3 pairs of setae, membrane with pair of lateral tufts of posteriorly directed spines; subgenital plate well developed, with greatly expanded basal arms. Spermatheca (Figs. 7C–D, 9C) ovoid with short neck, measuring 76–94 (85, n = 2) by 60–68 (64, n = 2)  $\mu\text{m}$ . Cercus yellowish brown.



**FIGURE 7.** *Atrichopogon arti* n. sp. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.



**FIGURE 8.** *Atrichopogon arti* n. sp. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

Male. As for female, with following differences:

Head. Antenna (Figs. 8A, 9D) with plume setae sparse, flagellomeres 2–8 fused; 10–13 darker; AR 1.06–1.14 (1.10, n = 4). Palpus brown (Figs. 8A, 9E); PR 3.00–3.50 (3.21, n = 4). Head width / mouthparts length 2.32–2.79 (2.47, n = 4).

Thorax. Legs light brown, foreleg TR 3.43–3.57 (3.46, n = 4), midleg TR 3.12–3.37 (3.31, n = 4), hind leg TR 2.60–2.80 (2.67, n = 4). Wing (Fig. 8B) with second radial cell 2.5 X longer than first, lumen narrow; wing length 1.04–1.06 (1.05, n = 4) mm; breadth 0.40 (n = 4) mm; CR 0.63–0.65 (0.64, n = 4).

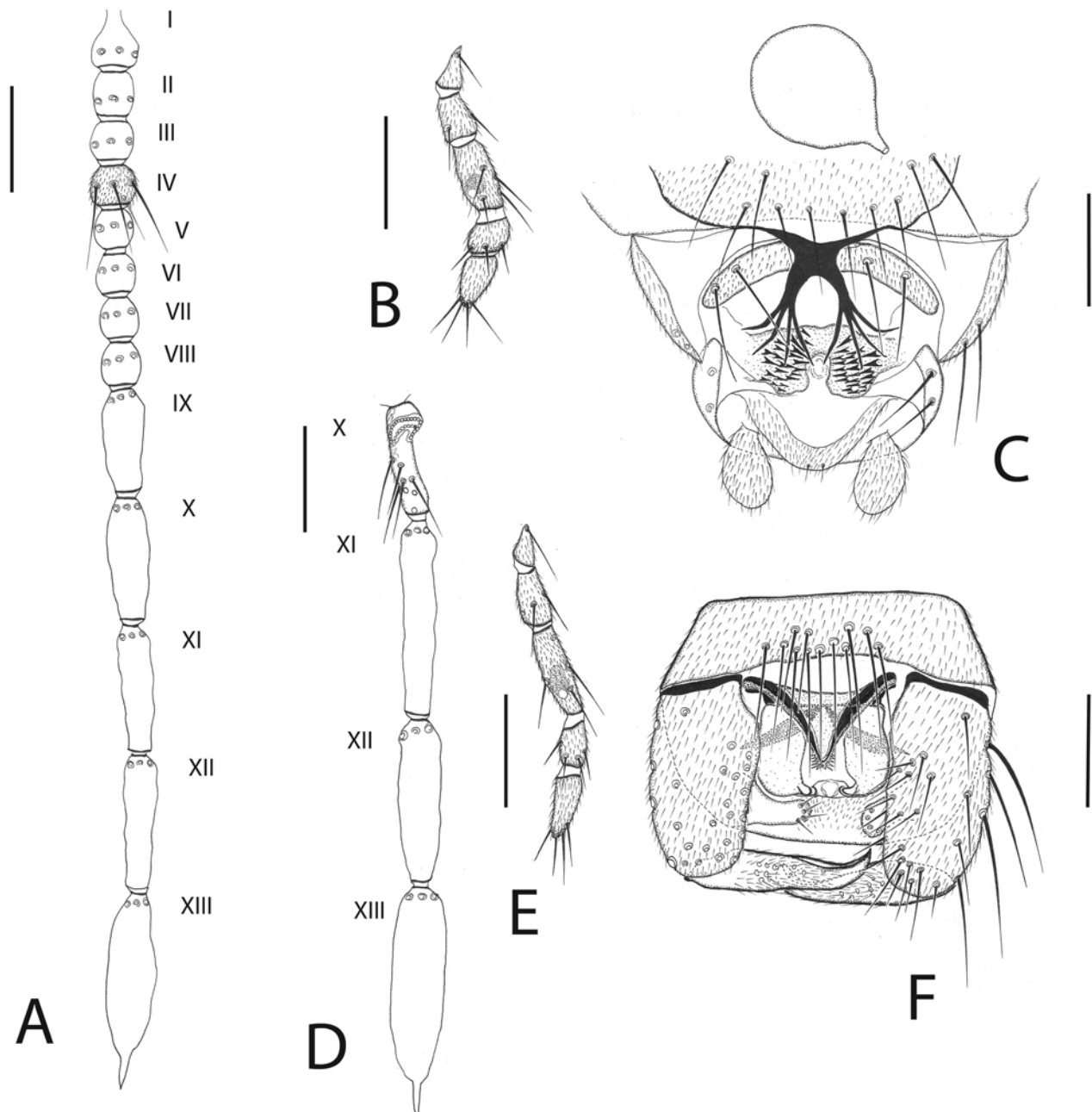
Abdomen. Uniformly yellowish brown. Genitalia (Figs. 8C, 9F): tergite 9 extending to 3/4 length of gonocoxite, posterior margin almost straight; sternite 9 narrow, posterior margin slightly excavated with 11–12



setae in two rows. Gonocoxite stout, two X longer than its breadth at midlength; gonostylus (Fig. 8D) nearly as long as gonocoxite, nearly straight, tapering distally, recurved at extreme tip. Gonocoxal apodemes reduced. Parameres stout, lightly sclerotized, 0.75 X longer than their basal breadth; lateral margins slightly convex; distal margin broad, straight, with two submesal, short, slender, lightly sclerotized, mesally directed processes; anterodorsal lobes short, barely visible. Aedeagus triangular, slightly shorter than its basal breadth; basal arch slightly concave, extending to 3/4 of total length; basal arms heavily sclerotized, nearly straight, directed laterally; lateral margins tapering to blunt, spinose tip.

**Distribution.** Colombia, known only from the type locality (Fig. 46).

**Types.** Holotype male, Colombia, Antioquia, Tamesis, 1150 m, VI-1990, J.G. Hurtado (MLPA); allotype female, same data except VII-1990. Paratypes, 3 males, 1 female, as follows; same data as holotype, 2 males; same data as allotype, 1 male, 1 female (CAIM).



**FIGURE 9.** *Atrichopogon arti* n. sp. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

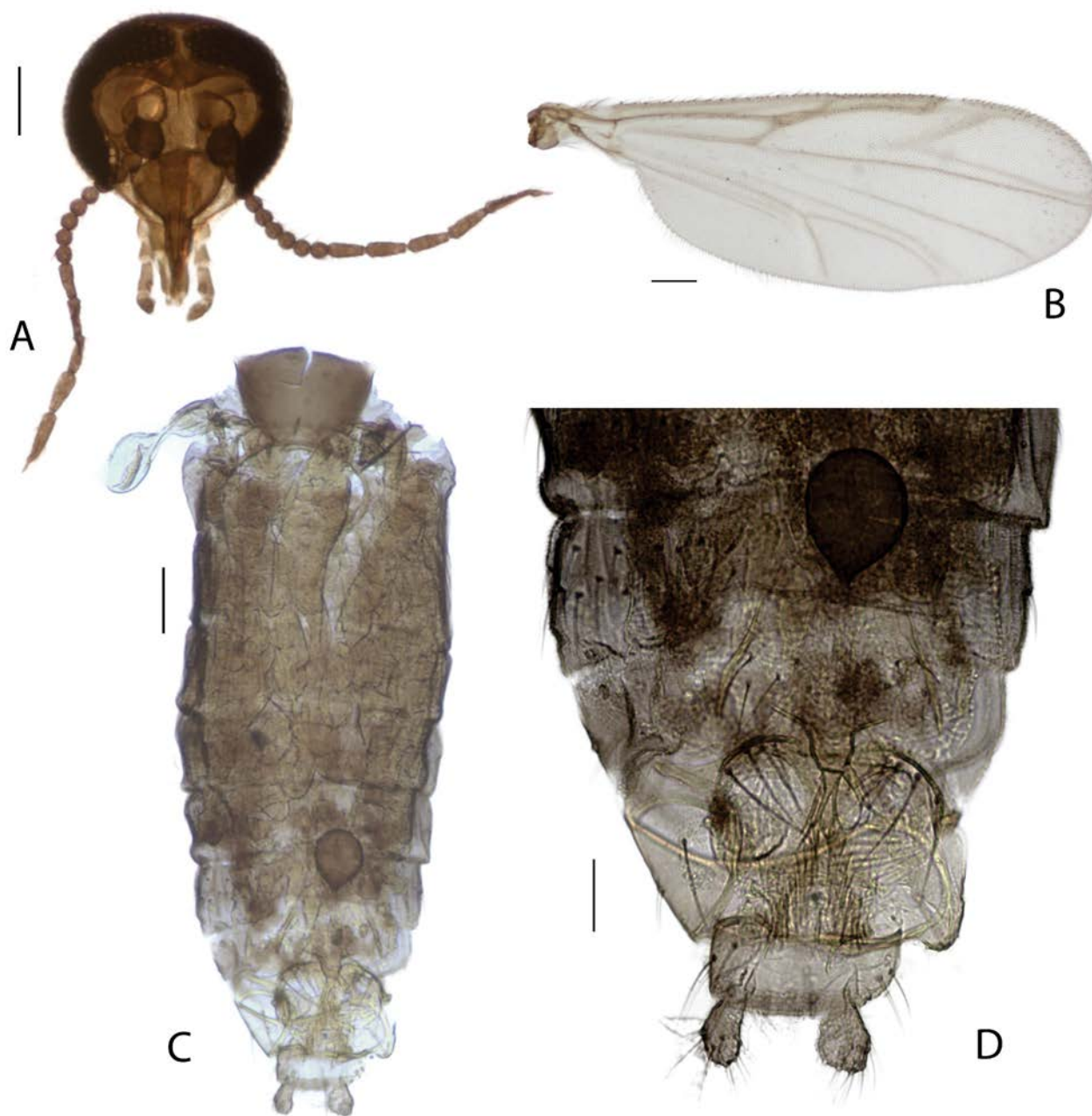
**Etymology.** This species is named after our good friend Dr. Art Borkent, in recognition of his important contributions to our understanding of systematic of extant and extinct ceratopogonids of the World.

**Taxonomic discussion.** Males and females were collected at the same locality and date. This new species is very similar to *A. glaber* and *A. javieri* **n. sp.** Characters to distinguish the three species may be found in the key and in the discussions under the descriptions of the above mentioned species.

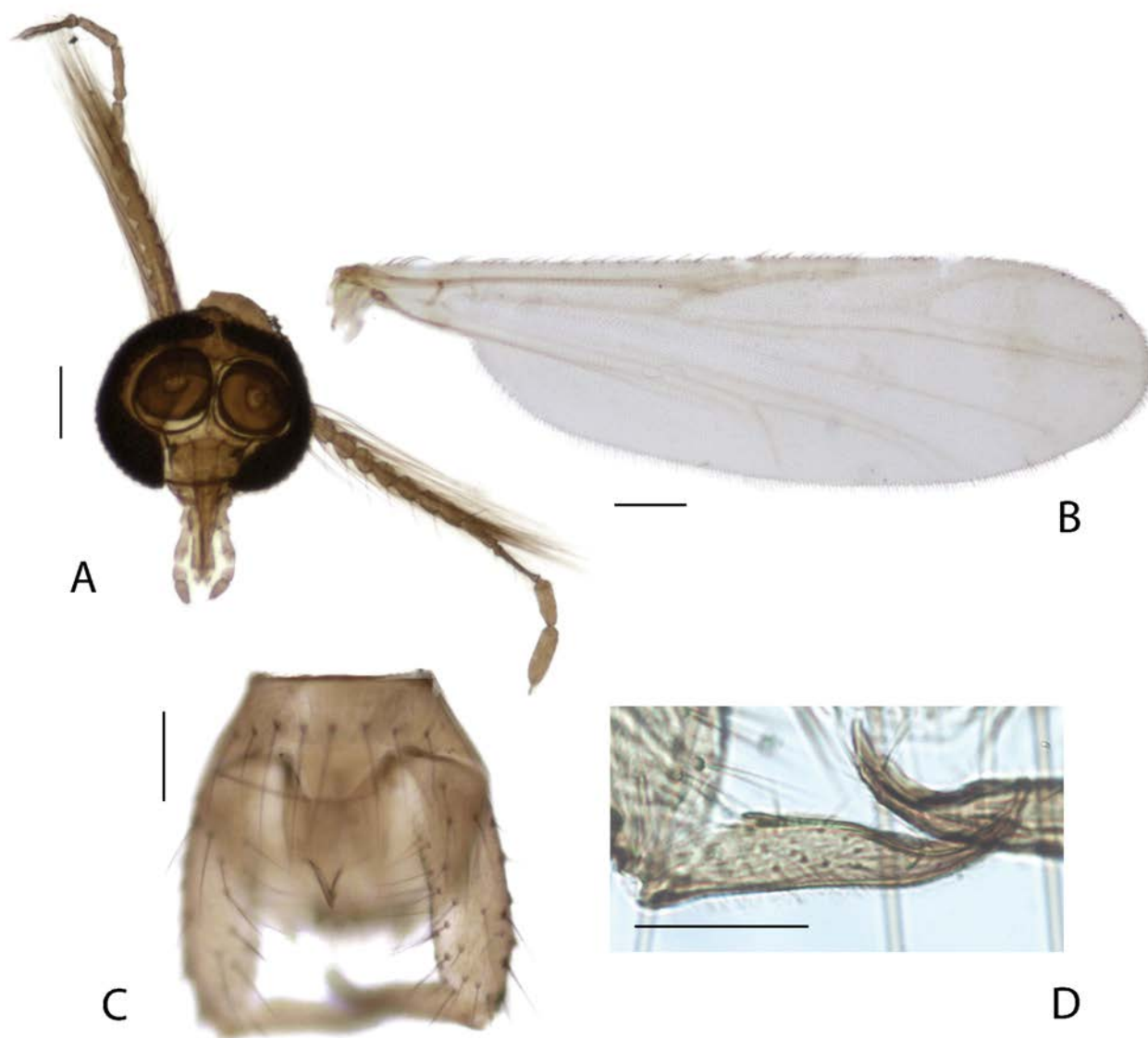
***Atrichopogon domizii* Spinelli**

(Figs. 10–12, 46)

*Atrichopogon domizii* Spinelli, 1982: 201 (male, female; Argentina); Borkent & Wirth, 1997: 23 (in World catalog); Borkent & Spinelli, 2000: 10 (in catalog species south of USA); Borkent & Spinelli, 2007: 45 (in Neotropical catalog); Borkent, 2015: 20 (in online World catalog).



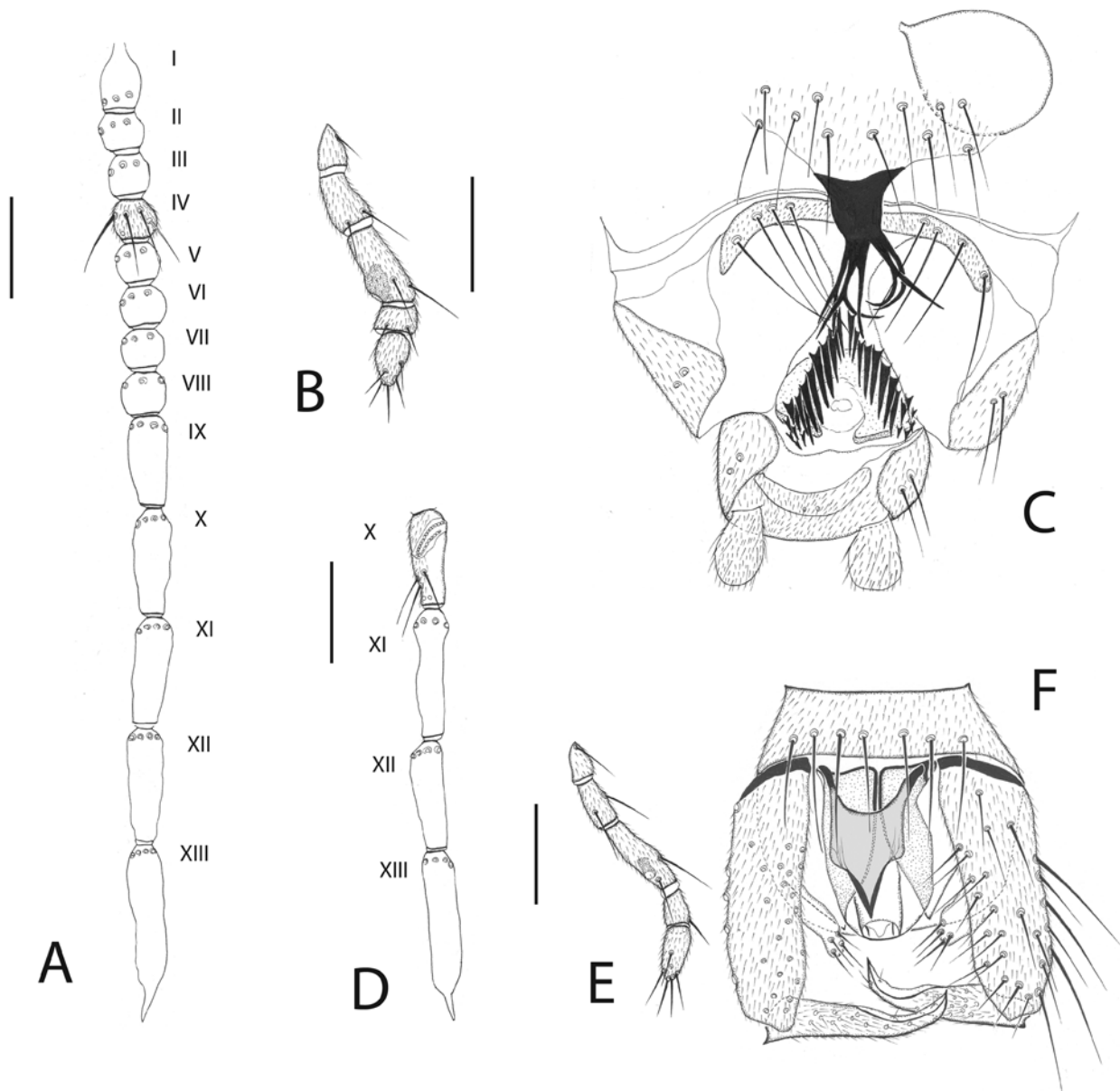
**FIGURE 10.** *Atrichopogon domizii* Spinelli. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.



**FIGURE 11.** *Atrichopogon domizii* Spinelli. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: scutum dark brown with pale markings forming the usual pattern. Female: with a bifid tuft of straight and elongate processes branched at tip, arising from the posteromesal common stem of posterior margin of sternite 7; sternite 8 stripe-like with 3–4 pairs of setae, membrane with V-shaped fringe of posteriorly directed spines. Male: gonocoxite elongate; anterodorsal lobes of parameres extending to 4/5 of length of parameres main body, and aedeagus subtriangular, 1.2 X longer than its basal breadth, with basal arch concave, basal arms short, recurved and directed anterolaterally, and lateral margins gently tapering to pointed tip at 2/3 of total length.

**Redescription of female.** Head (Fig. 10A). Dark brown. Eyes abutting for length of two-three ommatidia. Antenna with pedicel and flagellum dark brown (flagellum paler in the holotype due to treatment with KOH); proportions of flagellomeres as shown in Figs. 10A, 12A; flagellomere 13 with apical nipple slightly constricted basally; AR 1.70–1.79 (1.75, n = 4). Palpus (Figs. 10A, 12B) brown; segment 3 slender, with small deep sensory pit opening shortly beyond midlength; segments 4, 5 separated, broadly contacting, its combined length equal to segment 3; segment 5 conical; PR 2.18–2.78 (2.53, n = 4); head width / mouthparts length 2.21–2.47 (2.35, n = 4). Mandible with 10–12 minute teeth at extreme apex.



**FIGURE 12.** *Atrichopogon domizii* Spinelli. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

Thorax. Dark brown. Scutum with pale markings forming usual pattern; scutellum slightly paler, with 4 strong setae. Legs brown, distal 1/2 of femora slightly darker; apex of hind tibia with 7–8 spines; foreleg TR 3.00–3.57 (3.25, n = 4), midleg TR 2.87–3.37 (3.13, n = 4), hind leg TR 2.40–2.80 (2.62, n = 4). Wing (Fig. 10B) membrane slightly infuscated, with few macrotrichia marginally in cells  $r_3$ ,  $m_1$ ; first radial cell obliterated, second with very narrow lumen, nearly three X longer than first; wing length 0.96–1.12 (1.04, n = 4) mm; breadth 0.40–0.46 (0.42, n = 4) mm; CR 0.67–0.68 (0.67, n = 4). Halter whitish.

Abdomen (Fig. 10C). Uniformly brown, except tip paler. Genital armature (Figs. 10D, 12C): sternite 7 trapezoidal, with cuticular extensions represented by posteromesal common, as long as broad stem, from which arises bifid tuft of 3–4 straight processes, each one branched at tip; sternite 8 stripe-like with 3–4 pairs of setae, membrane with V-shaped fringe of stout, posteriorly directed spines; subgenital plate well developed, with expanded basal arms. Spermatheca (Figs. 10C–D, 12C) ovoid with short, slender neck, measuring 92–96 (93, n = 4) by 52–70 (62, n = 4)  $\mu\text{m}$ . Cercus brown.

Male. As for female, with following differences:

Head. Antenna (Figs. 11A, 12D) with plume setae sparse, flagellomeres 2–8 fused; AR 0.93–0.96 (0.95, n = 2).

Palpus brown (Figs. 11A, 12E); PR 2.60–2.89 (2.74, n = 2). Head width / mouthparts length 2.05–2.35 (2.20, n = 2).

Thorax. Legs brown, foreleg TR 3.43–3.57 (3.50, n = 2), midleg TR 3.25–3.43 (3.34, n = 2), hind leg TR 2.60–2.67 (2.63, n = 5). Wing (Fig. 11B) with both radial cells with narrow lumen, second radial cell 1.5 X longer than first; wing length 1.04–1.08 (1.06, n = 5) mm; breadth 0.32–0.34 (0.33, n = 2) mm; CR 0.56 (n = 2).

Abdomen. Brown. Genitalia (Figs. 11C, 12F): tergite 9 extending to 3/4 length of gonocoxite, posterior margin rounded; sternite 9 narrow, posterior margin with broad, shallow excavation, with single row of 5–7 setae. Gonocoxite elongate, 3.2 X longer than its breadth at midlength; gonostylus (Fig. 11D) spoon-shaped, 0.7 length of gonocoxite, nearly straight, distal 1/3 deeply excavated. Gonocoxal apodemes reduced. Parameres stout, lightly sclerotized, 1.3 X longer than their basal breadth; lateral margins subparallel; distal margin broad, rounded, with two submesal, short, slender, lightly sclerotized, posteriorly directed processes; anterodorsal lobes hyaline, elongate, extending to 4/5 of length of parameres main body, tip pointed. Aedeagus subtriangular, 1.2 X longer than its basal breadth; basal arch concave, extending to 1/3 of total length; basal arms short, heavily sclerotized, recurved, directed anterolaterally; lateral margins gently tapering to pointed tip at 2/3 of aedeagus length.

**Distribution.** Argentina (Buenos Aires province) (Fig. 46).

**Type material.** Holotype female, Argentina, Buenos Aires, Partido de Berisso, Los Talas, 12-I-1980, G.R. Spinelli, Shannon light trap; allotype male, same data except 14-I-1980. Paratypes, 8 males, 13 females, as follows: same data as holotype except 22-X-1979, 2 males, 1 female; 3-XII-1979, 1 female; 22-I-1980, 2 males, 4 females; 11-II-1980, 2 males, 1 female; 10-III-1980, 1 female; 22-IV-1980, 2 males, 4 females; 5-V-1980, 1 female (MLPA, examined).

**Other specimens examined.** Argentina, Buenos Aires, Estación Otamendi, INTA Delta, 30-X/1-XI-1996, P. Marino, 2 females, Malaise trap (MLPA).

**Taxonomic discussion.** Males and females were collected at the same locality and date in the type locality. This species is very similar to *A. altivolans* from Mexico. Characters to distinguish both species may be found in the key and in the discussion under the description of the latter species.

### *Atrichopogon echinodes* Macfie

(Figs. 13, 46)

*Atrichopogon echinodes* Macfie, 1939: 194 (female; Brazil); Wirth, 1974: 14 (in catalog species south of USA); Borkent & Wirth, 1997: 23 (in World catalog); Borkent & Spinelli, 2000: 10 (in catalog species south of USA); Borkent & Spinelli, 2007: 45 (in Neotropical catalog); Borkent, 2015: 20 (in online World catalog).

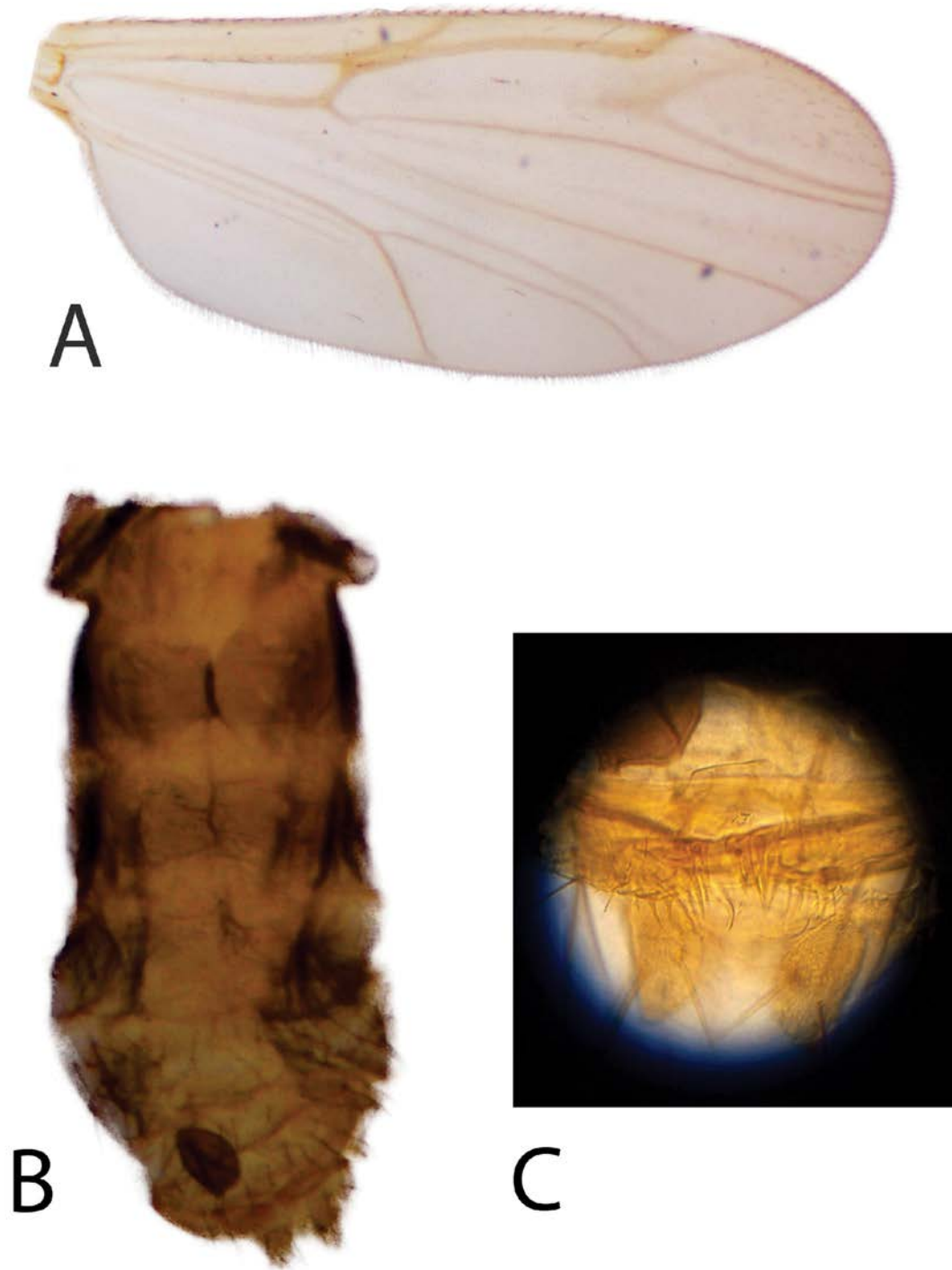
Notes on female holotype. Head dark brown, eyes abutting by short distance (approximately two ommatidia); pedicel and flagellomeres dark brown, flagellomeres 1–8 slightly longer than broad; palpus dark brown, segment 5 conical. Thorax with scutum yellowish brown with pale markings forming the usual pattern; scutellum yellowish brown with 4 strong setae. Legs yellowish brown, tarsomeres 3–5 infuscated. Wing (Fig. 13A) with membrane slightly infuscated, bearing macrotrichia distally in cells  $r_3$  and  $m_1$ ; first radial cell with narrow lumen, second radial cell with broad lumen, approximately five X longer than first. Halter brownish. Abdomen (Fig. 13B) light brown except pleurae of segments 2–7 darker, tip yellowish; genital armature (Fig. 13C) restricted to V-shaped fringe of stout, posteriorly directed spines on membrane of sternite 8. Spermatheca (Fig. 13B) ovoid with short neck.

Male. Unknown.

**Distribution.** Brazil (Santa Catarina), known only from the type locality (Fig. 46).

**Type material.** Holotype female, Brazil, Santa Catarina, Nova Teutonia, 2-VIII-1938, F. Plaumann (BMNH, examined).

**Taxonomic discussion.** The female genital armature of this species is restricted to the V-shaped fringe of stout, posteriorly directed spines on the sternite 8 membrane. The lacking of posteromesal cuticular extensions of the sternite 7 is only shared with *A. aridus* and *A. pectinatus* in the Neotropical fauna. However *A. echinodes* differs from both species by the scutum and legs yellowish brown and the abdomen light brown with pleurae of segments 2–7 darker and yellowish tip (abdomen uniformly heavily dark brown in *A. aridus* and *A. pectinatus*) and by the brownish halter (whitish in *A. aridus* and *A. pectinatus*).

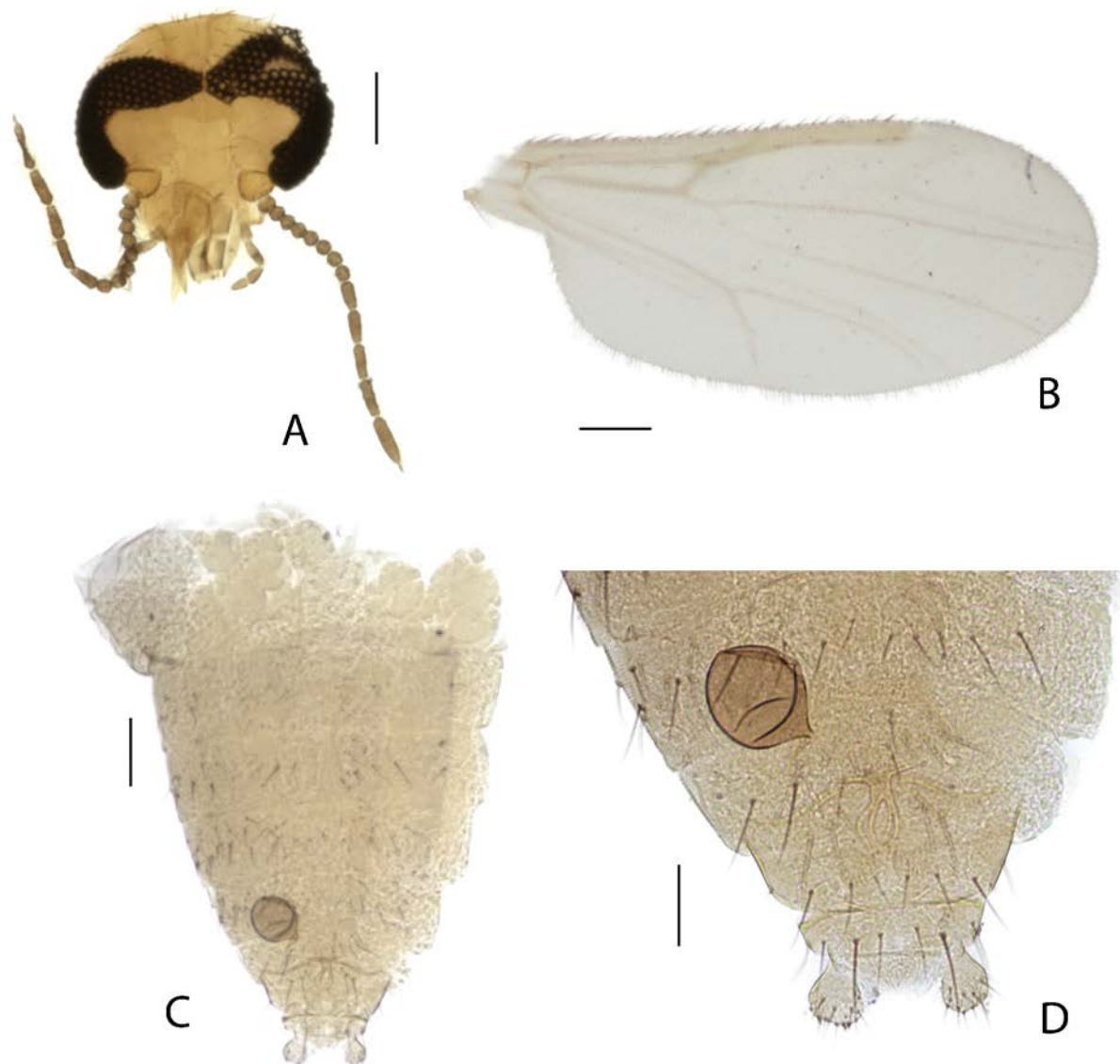


**FIGURE 13.** *Atrichopogon echinoides* Macfie. Female, A. wing. B. abdomen, ventral view. C. abdomen, detail of genital armature, ventral view.

***Atrichopogon glaber* Macfie**

(Figs. 14–16, 47)

*Atrichopogon glaber* Macfie, 1935: 50 (female; Brazil); Macfie, 1938: 162 (male; Trinidad); Macfie, 1953: 97 (Costa Rica); Wirth, 1956b: 243 (Brazil, Costa Rica); Wirth, 1974: 14 (in catalog species south of USA); Borkent & Wirth, 1997: 24 (in World catalog); Borkent & Spinelli, 2000: 11 (in catalog species south of USA); Borkent & Spinelli, 2007: 45 (in Neotropical catalog); Borkent, 2015: 21 (in online World catalog).



**FIGURE 14.** *Atrichopogon glaber* Macfie. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.

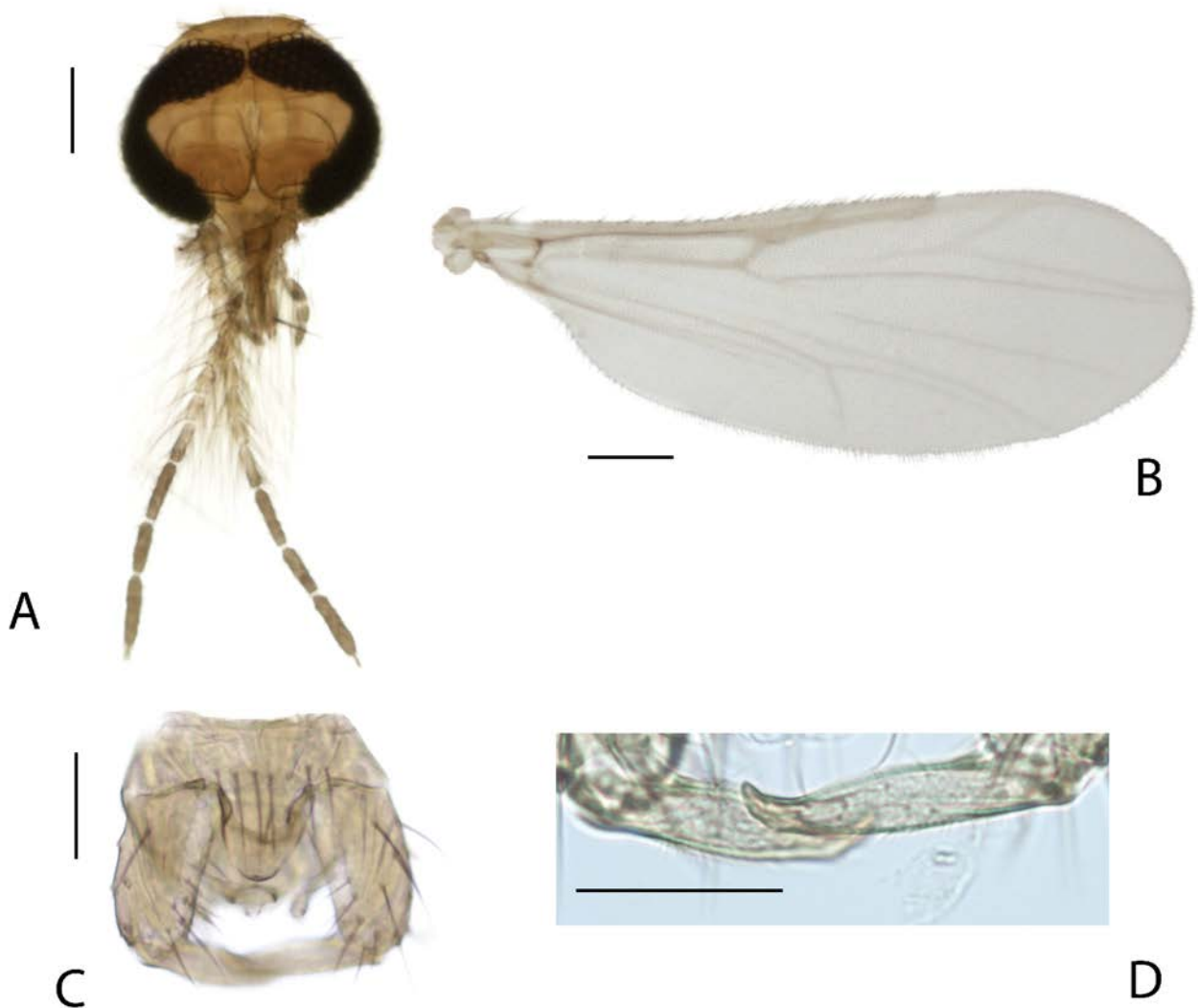
**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: small and yellowish species, scutum with markings forming the usual pattern. Female: wing membrane without macrotrichia, radial cells obliterated; with a bifid tuft slender and curved processes arising from the posteromesal common stem of posterior margin of sternite 7; sternite 8 broad, with 3 pairs of strong setae, membrane with V-shaped fringe of posteriorly directed spines. Male: posterior margin of sternite 9 with a single row of 7–8 setae; gonocoxite stout; anterodorsal lobes of parameres apparently short, and aedeagus subtriangular, slightly longer than its basal breadth, with basal arch concave, basal arms recurved and directed laterally, and lateral margins gently tapering to broad, blunt tip.

**Redescription of female.** Head (Fig. 14A). Yellowish. Eyes abutting for length of two ommatidia. Antenna with pedicel yellowish brown, flagellum dark brown; proportions of flagellomeres as shown in Figs. 14A, 16A; flagellomere 13 with apical nipple constricted basally; AR 1.46–1.71 (1.62, n = 6). Palpus (Figs. 14A, 16B) brown; segment 3 slender, with small deep sensory pit opening shortly beyond midlength; segments 4, 5 separated, broadly contacting, its combined length slightly longer than segment 3; segment 5 slender, conical; PR 2.29–2.75 (2.50, n = 5); head width / mouthparts length 1.89–2.35 (2.09, n = 6). Mandible with 12–13 minute teeth at extreme apex.

Thorax. Yellowish. Scutum with markings forming usual pattern; scutellum yellowish brown, with 4 strong setae. Legs uniformly pale yellowish brown; apex of hind tibia with 7–9 spines; foreleg TR 3.00–3.50 (3.22, n = 6),

midleg TR 2.57–3.00 (2.83, n = 6), hind leg TR 2.43–2.71 (2.55, n = 6). Wing (Fig. 14B) membrane slightly infuscated, without macrotrichia; radial cells obliterated, second nearly three X longer than first; wing length 0.70–0.90 (0.83, n = 6) mm; breadth 0.33–0.42 (0.38, n = 6) mm; CR 0.66–0.68 (0.67, n = 6). Halter light brown.

Abdomen (Fig. 14C). Tergites uniformly yellowish brown. Genital armature (Figs. 14D, 16C): sternite 7 trapezoidal, with cuticular extensions represented by posteromesal common short, 1.3 X broader than long stem, from which arises bifid tuft of slender, curved processes; sternite 8 broad, with 3 pairs of setae, membrane with V-shaped fringe of posteriorly directed slender spines; subgenital plate well developed, with slightly expanded basal arms. Spermatheca (Figs. 14 C–D, 16C) ovoid, with short, slender neck, measuring 70–86 (75, n = 5) by 46–64 (54, n = 6)  $\mu\text{m}$ . Cercus yellowish brown.



**FIGURE 15.** *Atrichopogon glaber* Macfie. Male. A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

Male. As for female, with following differences:

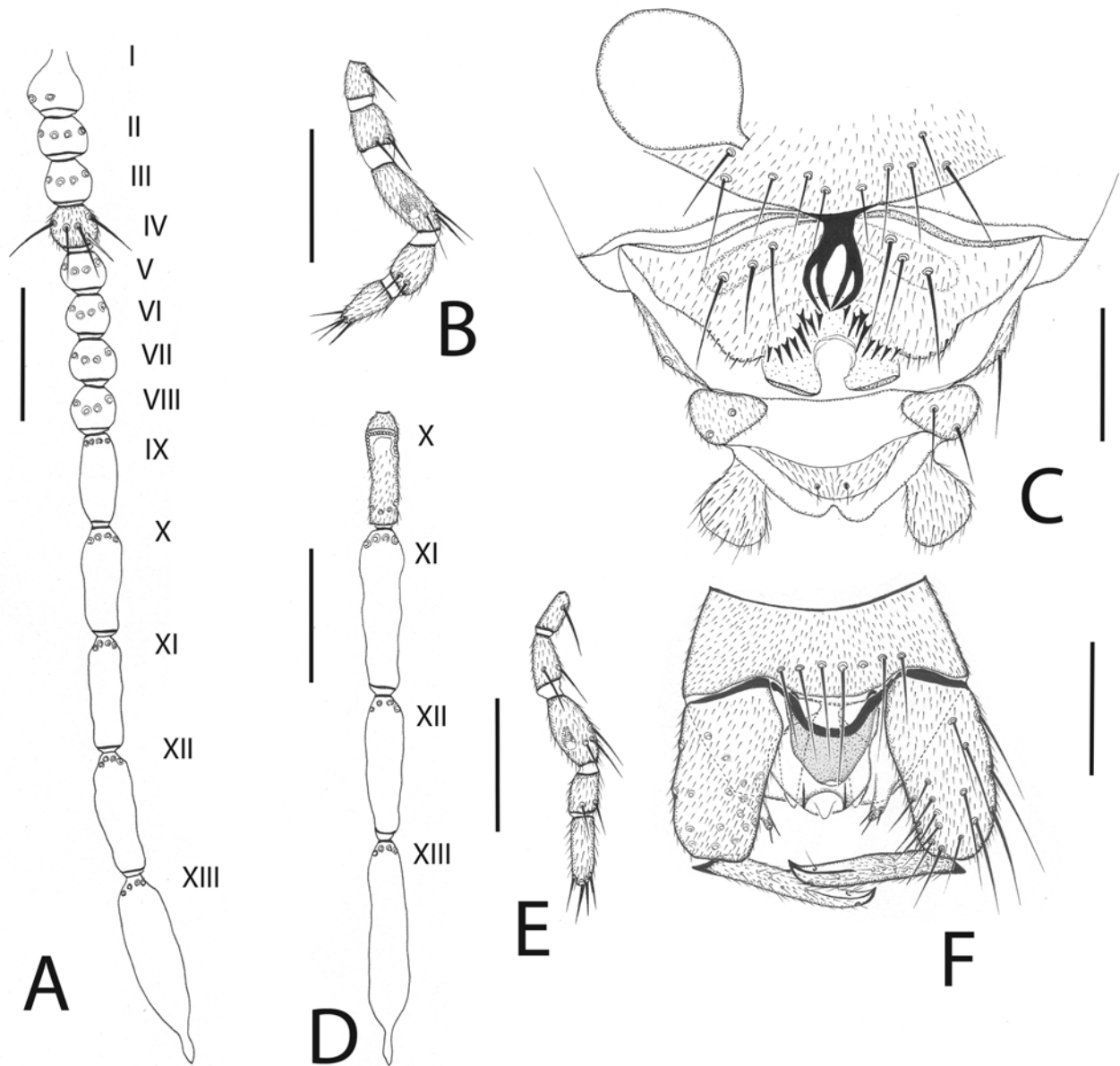
Head. Antenna (Figs. 15A, 16D) with plume setae sparse, flagellomeres 2–8 fused, flagellomeres 10–13 darker; AR 0.92–0.97 (0.95, n = 3). Palpus (Figs. 15A, 16E) yellowish brown; PR 2.86–3.43 (3.10, n = 3). Head width / mouthparts length 2.22–2.35 (2.29, n = 2).

Thorax. Legs yellowish brown, foreleg TR 3.17–3.40 (3.26, n = 3), midleg TR 2.83–3.00 (2.94, n = 3), hind leg TR 2.71–2.75 (2.73, n = 3). Wing (Fig. 15B) with second radial cell with very narrow lumen, 1.5 X longer than first; wing length 0.80–0.98 (0.89, n = 2) mm; breadth 0.32–0.34 (0.33, n = 2) mm; CR 0.59–0.62 (0.61, n = 2).

Abdomen. Uniformly yellowish. Genitalia (Figs. 15C, 16F): tergite 9 short, extending to 1/2–3/4 length of gonocoxite, posterior margin straight; sternite 9 narrow, posterior margin apparently straight with single row of 7–



8 setae. Gonocoxite moderately stout, 2.2 X longer than its breadth at midlength; gonostylus (Fig. 15D) nearly as long as gonocoxite, nearly straight, tapering distally, recurved at extreme tip. Gonocoxal apodemes reduced. Parameres stout, sclerotized, nearly as long as their basal breadth; lateral margins slightly convex; distal margin broad, straight, with two submesal, short, slender, lightly sclerotized, posteromesally directed processes; anterodorsal lobes barely visible, apparently short. Aedeagus subtriangular, stout, slightly longer than its basal breadth; basal arch concave, extending to 1/2–3/4 of total length; basal arms heavily sclerotized, recurved, directed laterally; lateral margins gently tapering to broad, blunt tip.



**FIGURE 16.** *Atrichopogon glaber* Macfie. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bar 0.064 mm.

**Distribution.** Costa Rica, Trinidad, Grenada, Colombia, Brazil (Pará, Maranhão, Rondonia), Argentina (Misiones and Buenos Aires provinces) (Fig. 47).

**Type material.** Lectotype female, here designated: Brazil, Maranhão, Tutoia, 27-IV-1934, E.M. Lourie (BMNH).

**Other specimens examined.** Costa Rica, Cairo, 18-III-1953, H.E. Warmke, 1 male (MLPA).

Colombia, Antioquía, Tamesis, 1150 m, VI-1990, J.G. Hurtado, 1 male, 1 female (MLPA).

Grenada, W.I., Mirabeau, Agr. Sta., 30-I-1990, J. Telesford, 2 females, black light trap (USNM).

Brazil, Rondonia, 62 km SW Ariquemes, vic. Rancho Grande, 1-V-1992, U. Schmitz, 1 male, UVLT (USNM); same data except 25-IX-1992, 1 female.

Argentina, Misiones, Posadas, club San Francisco, 4-IX-2008, H. Walantus, 1 female, CDC light trap (MLPA); Buenos Aires prov., Los Talas (JAD 1645/1), 20-XI-1984, J. Downes, 1 female, net (CNCI).

**Taxonomic discussion.** Males and females were collected at the same locality and date in Antioquia, Colombia.

*Atrichopogon glaber* is very similar to *A. javieri* **n. sp.** and *A. arti* **n. sp.** The females can be easily distinguished from both species by the yellowish brown pedicel, the scutum with pattern of pigmentation, the wing membrane devoid of macrotrichia, and both radial cells obliterated. The females of *A. javieri* also differs from *A. glaber* by the processes arising from the posteromesal stem of sternite 7 arranged in a comb manner, and the ones of *A. arti* by the mandible armed with 18 teeth. The males of *A. javieri* and *A. arti* are easily distinguished from *A. glaber* by the sternite 9 bearing a double row of 9–12 setae, and by the triangular aedeagus.

These are the first records of *A. glaber* from Grenada, Colombia and Argentina.

Macfie (1935) examined two females of this species from the same locality. We were unable to examine the remaining syntype in the BMNH.

### ***Atrichopogon gordonii* Macfie**

(Figs. 17–19, 47)

*Atrichopogon gordonii* Macfie, 1938: 164 (female; Trinidad); Macfie, 1939: 193 (Brazil, Santa Catarina); Macfie, 1953: 97 (Costa Rica); Wirth, 1974: 14 (in catalog species south of USA); Borkent & Wirth, 1997: 24 (in World catalog); Borkent & Spinelli, 2000: 11 (in catalog species south of USA); Borkent & Spinelli, 2007: 45 (in Neotropical catalog); Borkent, 2015: 21 (in online World catalog).

*Atrichopogon fimbriatus* Macfie, 1939: 194 (as variety of *gordonii*; female; Brazil, Santa Catarina); Wirth, 1974: 14 (in catalog species south of USA); Borkent & Wirth, 1997: 23 (in World catalog); Borkent & Spinelli, 2000: 11 (in catalog species south of USA); Borkent & Spinelli, 2007: 45 (in Neotropical catalog); Borkent, 2015: 21 (in online World catalog). **NEW SYNONYMY.**

*Atrichopogon insigniventris*: Macfie, 1937: 2 (male, female; misident.; Trinidad)

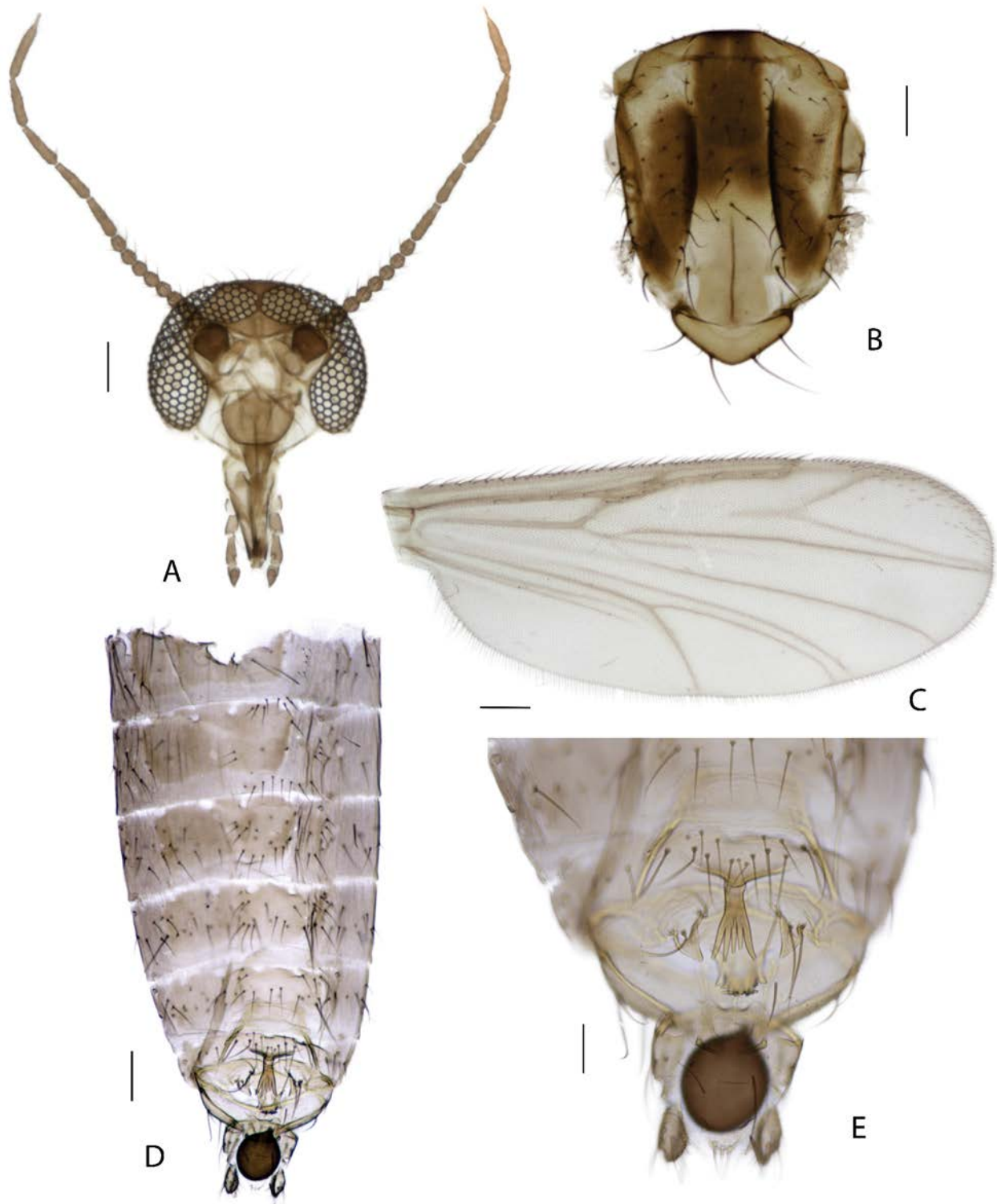
**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: light brown species, scutum with pale markings forming the usual pattern. Female: sternite 8 broad and expanded posterolaterally in the manner of a pair of triangular, tooth-like, sclerotized projections bearing 3 setae, membrane with transversal row of elongate anteriorly directed, finger-like processes, and large spermatheca. Male: posterior margin of sternite 9 with single row of 5–6 setae; gonocoxite elongate, gonocoxal apodemes U-shaped; parameres with a pair of admedian, heavily sclerotized rods extending to distal margin; anterodorsal lobes extending to midlength of parameres main body, tip blunt, and aedeagus stout, slightly shorter than basal breadth, with basal arch high and nearly straight, basal arms nearly straight and directed anteriorly, and lateral margins abruptly tapering to blunt, crenulate tip.

**Redescription of female.** Head (Fig. 17A). Light brown. Eyes abutting for length of 2.5 ommatidia. Antenna with flagellum dark brown, pedicel slightly darker; proportions of flagellomeres as shown in Figs. 17A, 19A; flagellomere 13 with apical nipple not constricted basally; AR 1.58–2.00 (1.73, n = 6). Palpus (Figs. 17A, 19B) dark brown; segment 3 slender, with small deep sensory pit opening on distal 1/3; segments 4, 5 closely appressed, its combined length slightly longer than segment 3; segment 5 conical; PR 2.20–2.70 (2.38, n = 8); head width / mouthparts length 1.60–2.10 (1.96, n = 5). Mandible with 6–8 minute teeth at extreme apex.

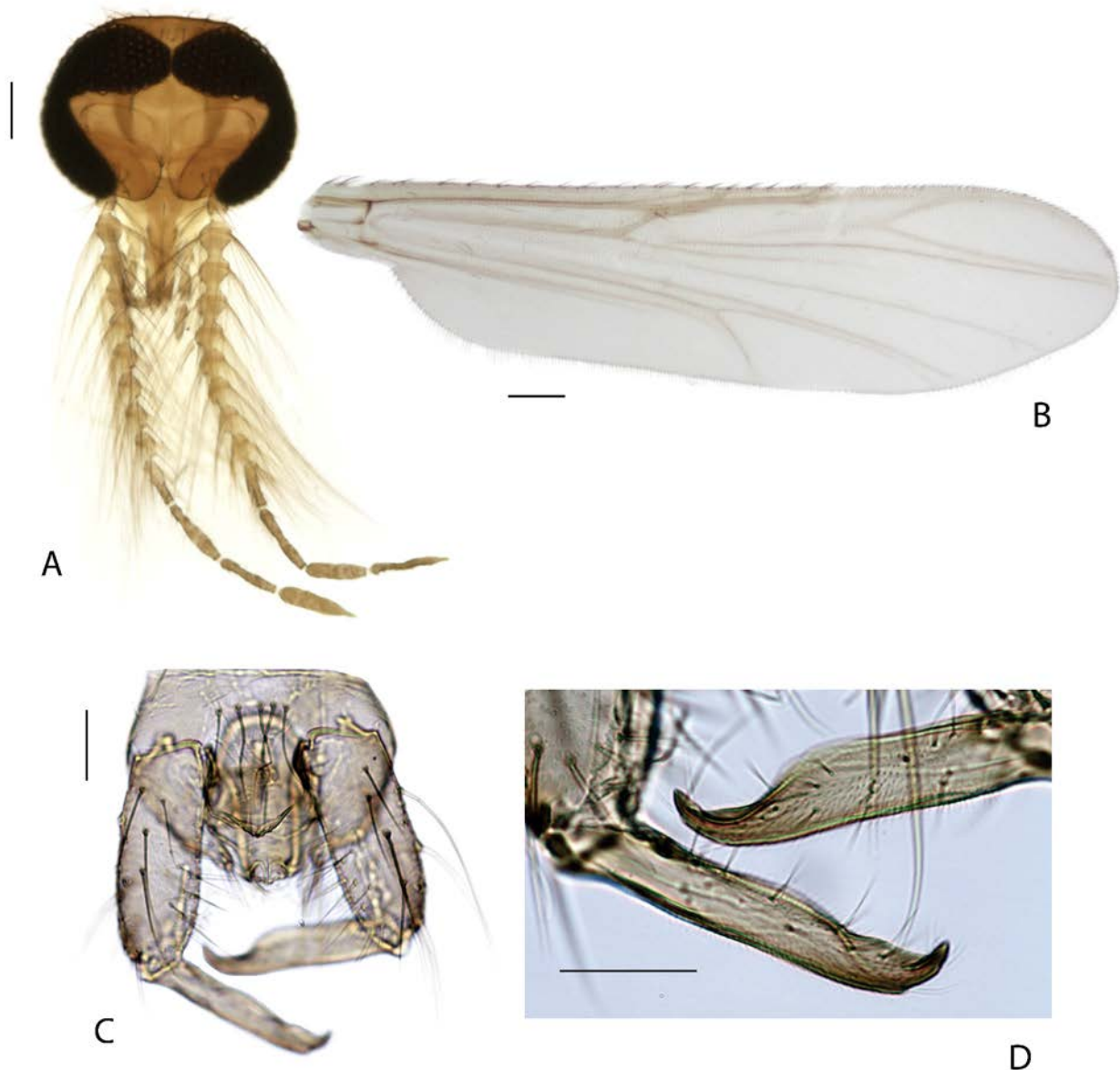
Thorax. Light brown. Scutum with paler markings forming pattern as shown in Fig. 17B; scutellum light brown, with 4 strong setae (Fig. 17B); postscutellum dark brown. Legs uniformly brown, distal 2/3 of femora darker in some specimens; apex of hind tibia with 8–9 spines; foreleg TR 3.42–3.70 (3.60, n = 6), midleg TR 3.35–4.00 (3.55, n = 6), hind leg TR 2.73–3.00 (2.93, n = 6). Wing (Fig. 17C) membrane infuscated, with macrotrichia marginally in cell  $r_3$ , a few in cell  $m_1$ ; first radial almost obliterated, second radial cell with narrow lumen, nearly 2.5 X longer than first; wing length 1.23–1.35 (1.26, n = 6) mm; breadth 0.50–0.56 (0.53, n = 6) mm; CR 0.66–0.69 (0.67, n = 6). Halter brownish.

Abdomen (Fig. 17D). Tergites uniformly brown. Genital armature (Figs. 17E, 19C): sternite 7 trapezoidal, cuticular extensions represented by posteromesal common, 1.5 X longer than broad stem, from which arises comb

of 5–7 stout, elongate, nearly straight processes; sternite 8 broad, with anterior margin convex, notched mesally, expanded posterolaterally in the manner of triangular, tooth-like, sclerotized projections bearing 3 setae, membrane with transversal row of elongate anteriorly directed, finger-like processes; subgenital plate well developed, with expanded basal arms. Spermatheca (Figs. 17D–E, 19C) large, subspherical to ovoid with short neck, measuring 113–128 (121, n = 4) by 89–93 (90, n = 4)  $\mu\text{m}$ . Cercus brown.



**FIGURE 17.** *Atrichopogon gordonii* Macfie. Female, A. head, frontal view. B. thorax, dorsal view. C. wing. D. abdomen, ventral view. E. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C, D=0.1 mm; E=0.05 mm.



**FIGURE 18.** *Atrichopogon gordonii* Macfie. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bar A, B=0.1 mm; C, D=0.05 mm.

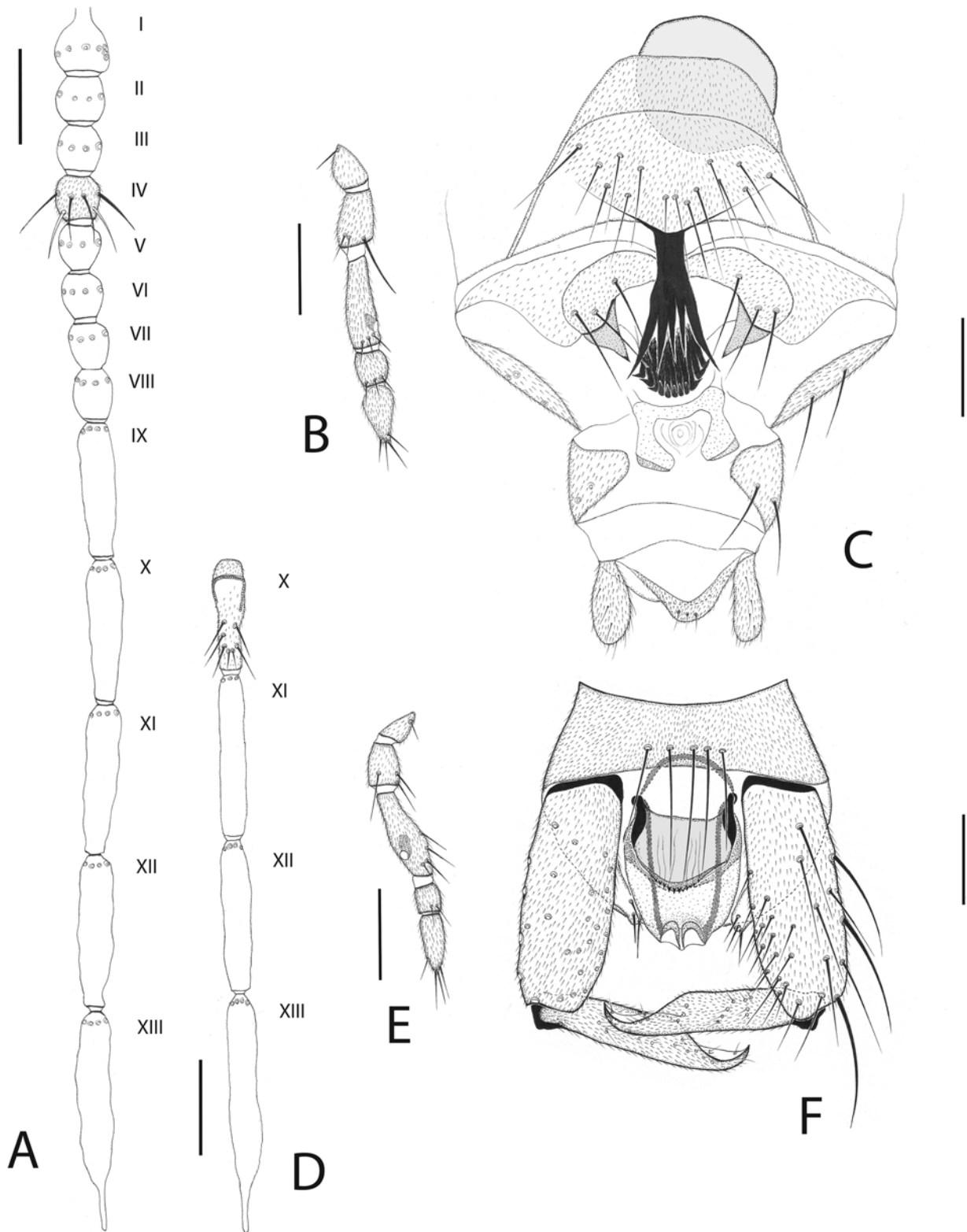
Male. As for female, with following differences:

Head. Antenna (Figs. 18A, 19D) with plume setae well-developed, flagellomeres 2–8 fused; AR 0.85–0.96 (0.89, n = 4). Palpus (Figs. 18A, 19E) brown; PR 2.89–3.43 (3.04, n = 5). Head width / mouthparts length 2.05–2.40 (2.29, n = 4).

Thorax. Legs brown, foreleg TR 3.12–4.00 (3.53, n = 5), midleg TR 3.61–4.00 (3.73, n = 5), hind leg TR 2.65–3.09 (2.96, n = 5). Wing (Fig. 18B) with second radial cell 1.8 X longer than first, lumen very narrow; wing length 1.38–1.50 (1.43, n = 5) mm; breadth 0.38–0.47 (0.42, n = 5) mm; CR 0.59–0.62 (0.61, n = 5).

Abdomen. Uniformly brown. Genitalia (Figs. 18C, 19F): tergite 9 short, extending to gonocoxite midlength, posterior margin straight; sternite 9 narrow, posterior margin nearly straight with single row of 5–6 setae. Gonocoxite elongate, 2.8 X longer than its breadth at midlength; gonostylus (Fig. 18D) spoon-shaped, nearly as long as gonocoxite, nearly straight, distal 1/3 deeply excavated. Gonocoxal apodemes well developed, U-shaped. Parameres stout, sclerotized, slightly longer than their basal breadth, expanded laterally at midportion, then gradually tapering to somewhat rounded distal margin; pair of admedian, heavily sclerotized rods extending to distal margin, from which arises pair of slender, recurved, posteriorly directed processes; anterodorsal lobes

hyaline, short, extending to midlength of parameres main body, tip blunt. Aedeagus stout, slightly shorter than its basal breadth; basal arch nearly straight, extending to 1/4 of total length; basal arms heavily sclerotized, nearly straight, directed anteriorly; lateral margins abruptly tapering to blunt, crenulate tip.



**FIGURE 19.** *Atrichopogon gordonii* Macfie. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

**Distribution.** Costa Rica, Trinidad, Brazil (Rondonia, Bahia, Santa Catarina), Argentina (Misiones province) (Fig. 47).

**Type material.** Holotype female of *A. gordonii*, Trinidad, St. Augustine, 29-VIII-1936, A.M. Adamson (BMNH, examined).

Holotype female of *A. fimbriatus*, Brazil, Santa Catarina, Nova Teutonia, 6-XI-1936, F. Plaumann (BMNH, examined).

**Other specimens examined.** Brazil, Rondonia, 62 km SE Ariquemes, vic. Rancho Grande, 20-VII-1992, U. Schmitz, 1 female, UVLT (USNM); same data except 12-IX-1992, 1 male, 2 females (USNM); 26-IX-1992, 1 male (MLPA); 1-X-1992, 1 male (CAIM); Bahia, Itaguape, Fazenda Almirante, 25-I-1991, J.A. Winder, 2 females, emergence trap (USNM); same data except 28-I-1991, 1 female (MLPA); 26-VIII-1992, 1 male (MLPA); 4-IX-1992, 1 male, 1 female (CAIM); 7-IX-1992, 1 male (USNM); 18-IX-1992, 1 female (USNM); Santa Catarina, Nova Teutonia, IX-1961, F. Plaumann, 1 male (USNM).

Argentina, Misiones, Paranay, 14-IV-2007, H. Walantus, 1 male, 1 female, CDC light trap (MLPA).

**Taxonomic discussion.** Males and females were collected at the same locality and date in Rondonia and Bahia, Brazil, and in Misiones, Argentina.

Macfie (1953) recorded the species from Costa Rica on the basis of 3 males and 73 females. However, he did not describe the male, being the one herein provided its first detailed description.

The synonymy of *A. fimbriatus* under *A. gordonii* is based on the examination of the types of both species. No significant differences could be observed.

The males of *A. gordonii* are very similar to *A. insigniventris* by virtue of the elongate gonocoxite, parameres with elongate admedian pair and distal rods, stout aedeagus with pointed tip, and gonostylus nearly as long as gonocoxite. However, in *A. insigniventris* the sternite 9 bears 10 setae, and the aedeagus is longer than broad. The females are also similar, but the sternite 8 of *A. insigniventris* is not expanded posterolaterally as a pair of triangular projections, and its membrane only exhibits a dense pilosity anterolaterally to gonopore, lacking a transversal row of anteriorly directed finger-like processes.

This is the first record of *A. gordonii* from Argentina.

### ***Atrichopogon harrisi* Macfie**

(Figs. 20, 47)

*Atrichopogon harrisi* Macfie, 1938: 163 (female; Trinidad); Wirth, 1974: 14 (in catalog species south of USA); Borkent & Wirth, 1997: 24 (in World catalog); Borkent & Spinelli, 2000: 11 (in catalog species south of USA); Borkent & Spinelli, 2007: 45 (in Neotropical catalog); Borkent, 2015: 22 (in online World catalog).

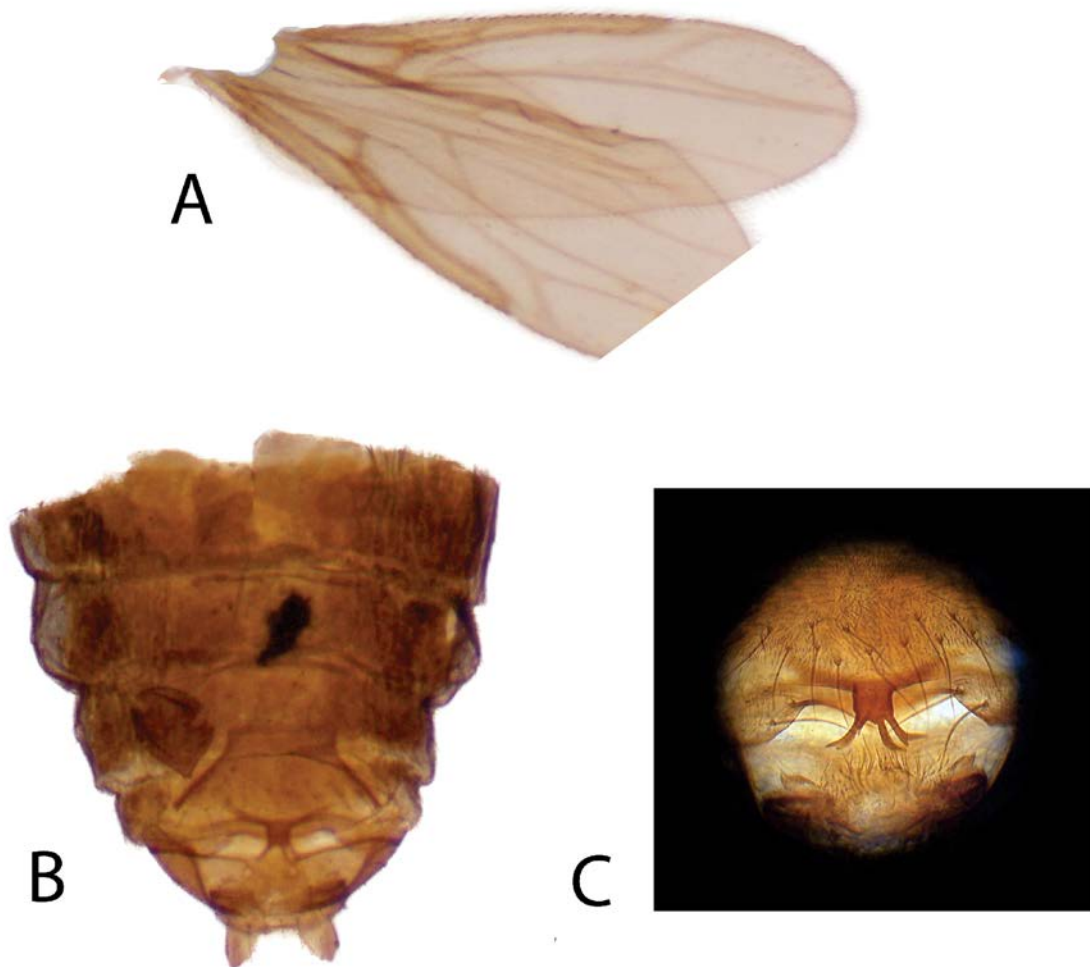
Notes on female holotype. Head dark brown, eyes abutting by 2.5 ommatidia; pedicel and flagellomeres dark brown, flagellomeres 1–5 slightly broader than long, 6–8 slightly elongated than preceding ones; palpus dark brown, segment 5 with blunt tip. Thorax heavily dark brown, including scutellum; number of scutellar setae not determined; paratergite with one stout seta. Legs uniformly dark brown. Wing (Fig. 20A) with membrane slightly infuscated, bearing few macrotrichia distally in cells  $r_3$  and  $m_1$ ; radial cells with broad, well visible lumen, second radial cell approximately three X longer than first. Halter dark brown. Abdomen (Fig. 20B) dark brown; sternite 7 trapezoidal, posterior margin with cuticular extensions represented by short common stem from which arises 3 short, irregular processes, each one bifid at tip; sternite 8 broad, expanded laterally with 2 pairs of setae, membrane with group of posteriorly directed slender spines (Fig. 20C). Spermatheca (Figs. 20B) ovoid with short neck.

Male. Unknown.

**Distribution.** Trinidad, known only from the type locality (Fig. 47).

**Type material.** Holotype female, Trinidad, St. Augustine, 29-VIII-1938, A.M. Adamson (BMNH, examined).

**Taxonomic discussion.** This species resembles *A. sanctaeclarae* and *A. sergioi* n. sp. by virtue of the uniformly heavily dark brown coloration, and by the cuticular extensions of the sternite 7 represented by a common stem from which arises a comb of nearly straight processes. However, in *A. sanctaeclarae* the wing is devoid of macrotrichia, and in *A. sergioi* the paratergite has 2 additional small setae, the lumen of the first radial cell is minute, the halter is whitish, the processes arise from the common stem of the posterior margin of sternite 7 are pointed, not bifid, and the sternite 8 bears 5–6 pairs of setae.



**FIGURE 20.** *Atrichopogon harrisi* Macfie. Female, A. wing. B. abdomen, ventral view. C. abdomen, detail of genital armature, ventral view.

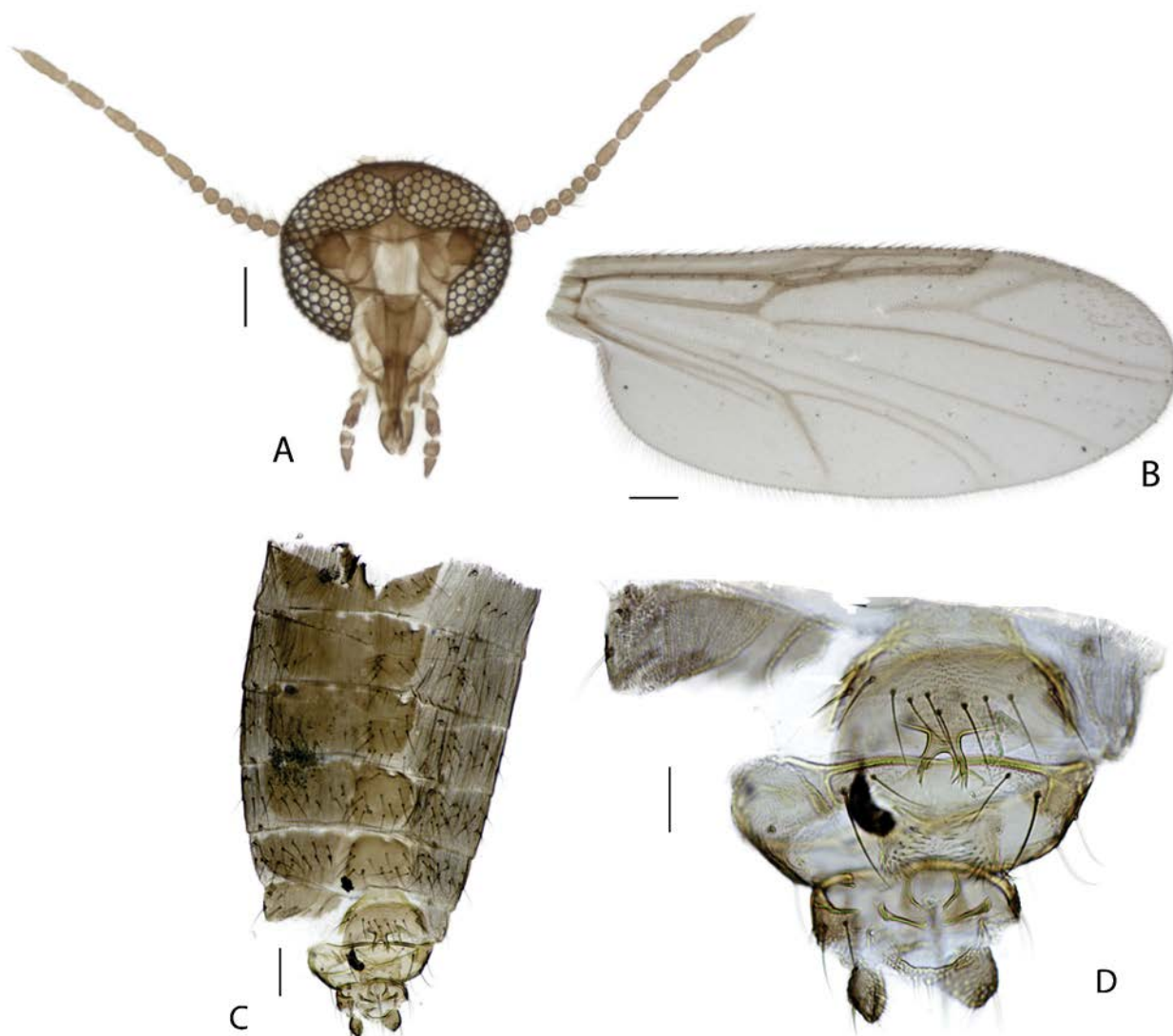
**Remarks.** Macfie (1953) recorded one damaged female from Costa Rica as “*Atrichopogon* sp. probably *harrisi* Macfie”. Because of Macfie’s doubt and the fact that this specimen was not examined during this investigation, we prefer to restrict the distribution of this species to the type locality in Trinidad.

***Atrichopogon insigniventris* Macfie**

(Figs. 21–23, 48)

*Atrichopogon insigniventris* Macfie, 1935: 51 (female; Brazil); Macfie, 1938: 162 (Trinidad); Wirth, 1974: 15 (in catalog species south of USA); Borkent & Wirth, 1997: 25 (in World catalog); Borkent & Spinelli, 2000: 11 (in catalog species south of USA); Borkent & Spinelli, 2007: 46 (in Neotropical catalog); Borkent, 2015: 22 (in online World catalog).

**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: dark brown species, scutum with pale markings forming the usual pattern. Female: sternite 8 broad, expanded laterally with 2 pairs of setae, membrane with a dense pilosity anterolaterally to gonopore. Male: posterior margin of sternite 9 with single row of 10 setae; gonocoxite elongate, gonocoxal apodemes U-shaped; parameres with a pair of admedian, heavily sclerotized rods extending to distal margin; anterodorsal lobes extending to midlength of parameres main body, tip blunt, and aedeagus stout, slightly longer than its basal breadth, with basal arch high and nearly straight, basal arms directed anteriorly, and lateral margins gently tapering to somewhat pointed, crenulate tip.



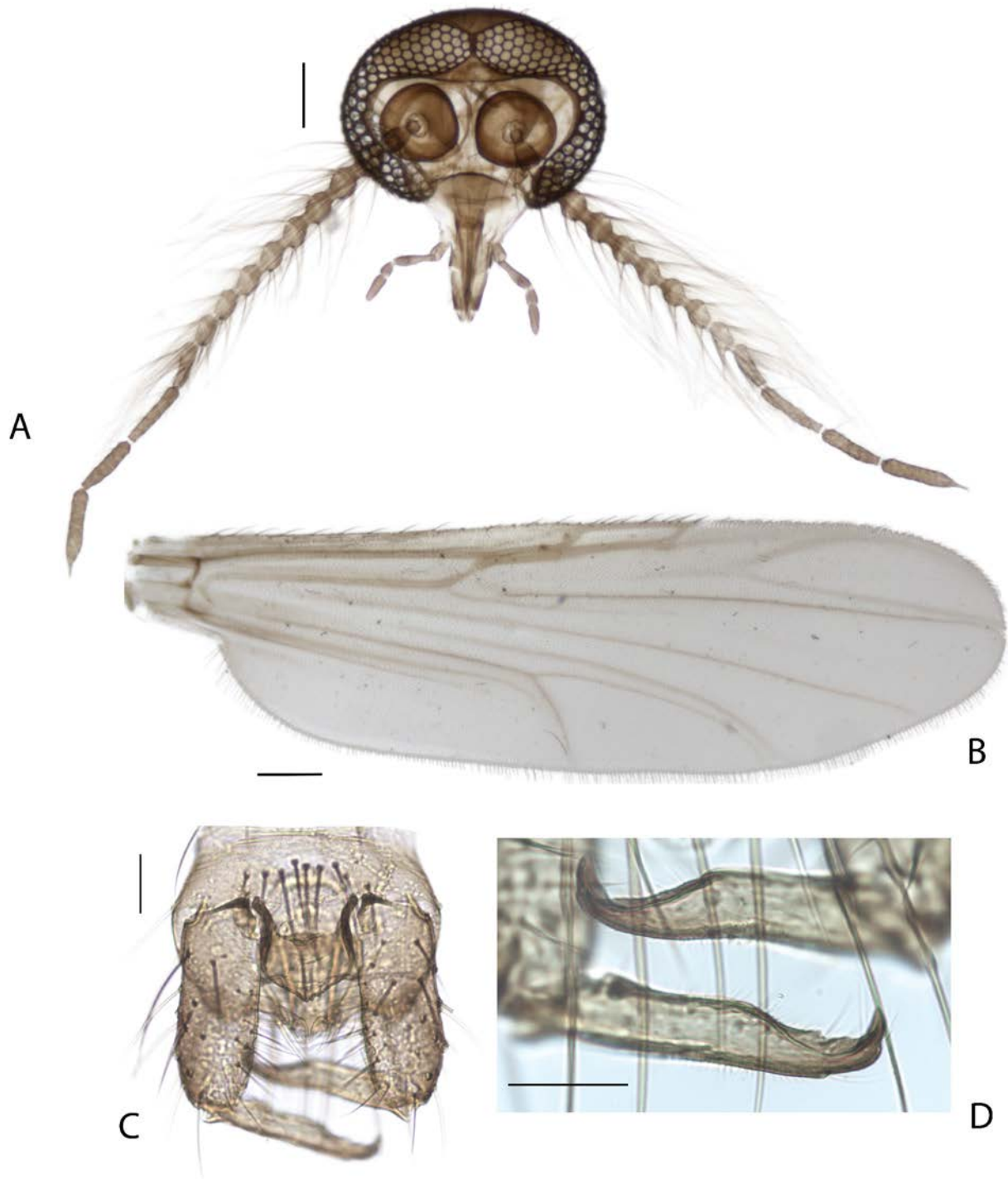
**FIGURE 21.** *Atrichopogon insigniventris* Macfie. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.

**Redescription of female.** Head (Fig. 21A). Dark brown. Eyes abutting for length of 2.5 ommatidia. Antenna with pedicel and flagellum dark brown; proportions of flagellomeres as shown in Figs. 21A, 23A; flagellomere 13 with apical nipple not constricted basally; AR 1.58. Palpus (Figs. 21A, 23B) dark brown; segment 3 subcylindrical, slightly swollen distally, with small deep sensory pit opening on distal 1/2; segments 4, 5 clearly separated, their combined length slightly longer than segment 3; segment 5 conical; PR 2.00; head width / mouthparts length 1.93. Mandible with 16 minute teeth.

Thorax. Dark brown. Scutum with paler markings forming usual pattern; scutellum light brown, with 4 strong setae; postscutellum dark brown. Legs uniformly brown; apex of hind tibia with 9 spines; foreleg TR 3.50, midleg TR 3.00, hind leg TR 3.12. Wing (Fig. 21B) with macrotrichia in cell  $r_3$ , a few in cell  $m_1$ , one or 2 in cell  $m_2$ ; first radial cells with narrow lumen, second radial cell three X longer than first, lumen broader; wing length 1.23 mm; breadth 0.53 mm; CR 0.69. Halter brownish.

Abdomen (Fig. 21C). Tergites uniformly brown. Genital armature (Figs. 21D, 23C): sternite 7 trapezoidal, with cuticular extensions represented by posteromesal common short, 0.5 X longer than broad stem, from which arises bifid tuft of short, curved processes, each process bifid at tip; sternite 8 broad, expanded laterally with 2 pairs of setae, membrane densely pilose anterolaterally to gonopore; subgenital plate well developed, with expanded basal arms, lateral arms heavily sclerotized. Spermatheca (Figs. 21C–D) large, not measured (collapsed in the available specimen). Cercus brown.





**FIGURE 22.** *Atrichopogon insigniventris* Macfie. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D= 0.05 mm.

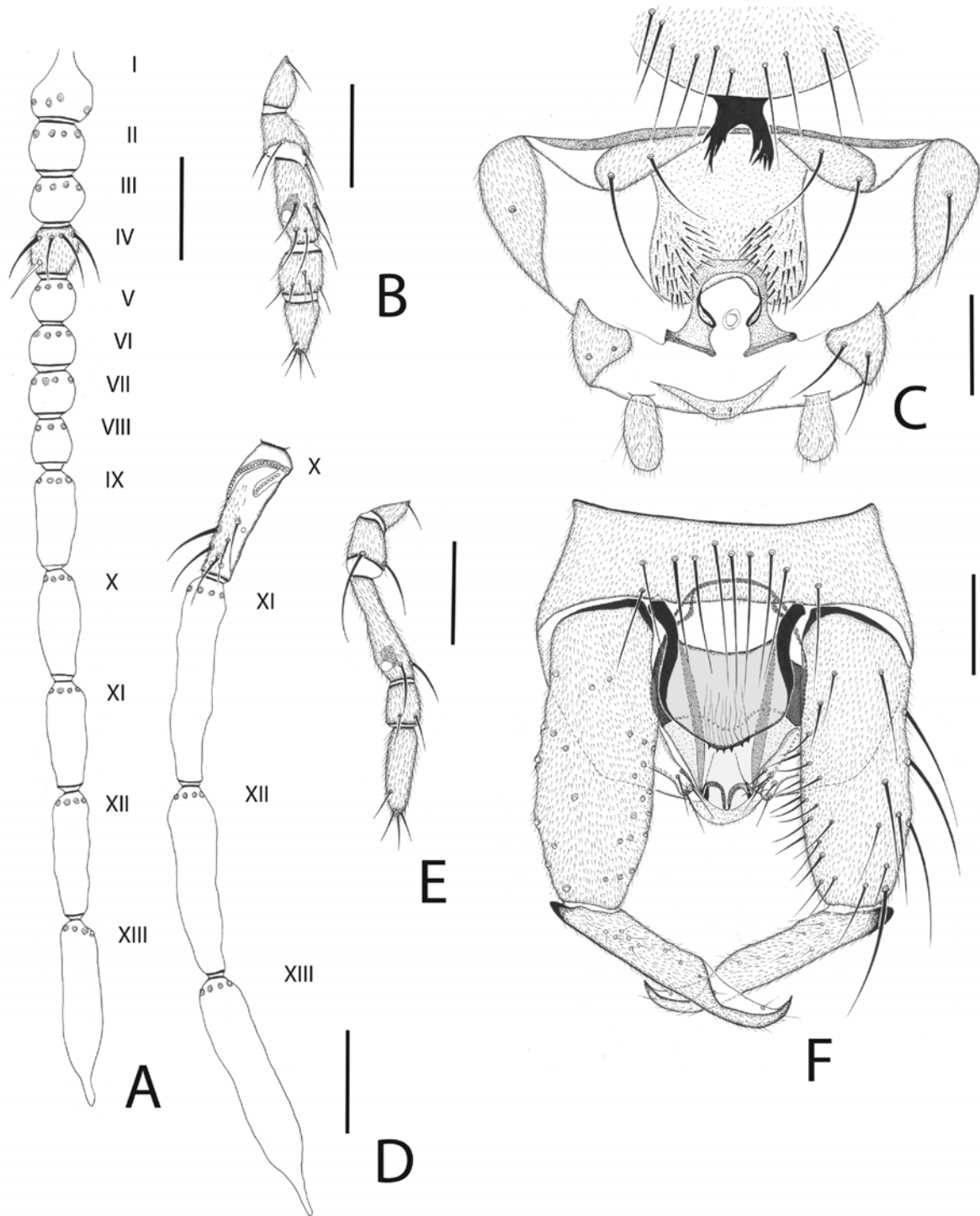
Male. As for female, with following differences:

Head. Antenna (Figs. 22A, 23D) with plume setae well-developed, flagellomeres 2–8 fused; AR 0.89. Palpus (Figs. 22A, 23E) brown; PR 3.30. Head width / mouthparts length 2.35.

Thorax. Legs brown, foreleg TR 3.65, midleg TR 3.45, hind leg TR 2.80. Wing (Fig. 22B) with first radial almost obliterated, second radial cell 1.8 X longer than first, lumen broad; wing length 1.42 mm; breadth 0.44 mm; CR 0.61.

Abdomen. Uniformly brown. Genitalia (Figs. 22C, 23F): tergite 9 short, extending to gonocoxite midlength, posterior margin straight; sternite 9 narrow, posterior margin straight with single row of 8 setae, two additional lateral setae posterior to row. Gonocoxite elongate, 2.8 X longer than its breadth at midlength; gonostylus (Fig.

22D) spoon-shaped, nearly as long as gonocoxite, nearly straight, distal 1/3 deeply excavated. Gonocoxal apodemes well developed, U-shaped. Parameres stout, lightly sclerotized, slightly longer than their basal breadth, expanded laterally at midportion, then abruptly tapering to nearly straight distal margin; pair of admedian heavily sclerotized rods extending to distal margin, from which arises pair of slender, recurved, posteriorly directed processes; anterodorsal lobes hyaline, short, extending to midlength of parameres main body, tip blunt. Aedeagus stout, 1.1 X longer than its basal breadth; basal arch nearly straight, extending to 1/5 of total length; basal arms heavily sclerotized, slightly recurved, directed anteriorly; lateral margins heavily sclerotized, gently tapering to somewhat pointed, crenulate tip.



**FIGURE 23.** *Atrichopogon insigniventris* Macfie. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

**Distribution.** Brazil (Maranhão), Trinidad, Argentina (Misiones province) (Fig. 48).

**Type material.** Lectotype female, here designated: Brazil, Maranhão, Tutoia, 27-IV-1934, E.M. Lourie (BMNH, slide mounted in Canada balsam).

**Other specimens examined.** Argentina, Misiones, Posadas, club San Francisco, 4-IX-2008, H. Walantus, 1 female, CDC light trap (MLPA); Puerto Iguazú, arroyo Mbocay, 21-VIII-2008, H. Walantus, CDC light trap (MLPA), 1 male; Reserva Esmeralda, 15-XII-2011, D. Aquino, 1 male, yellow trap (MLPA).

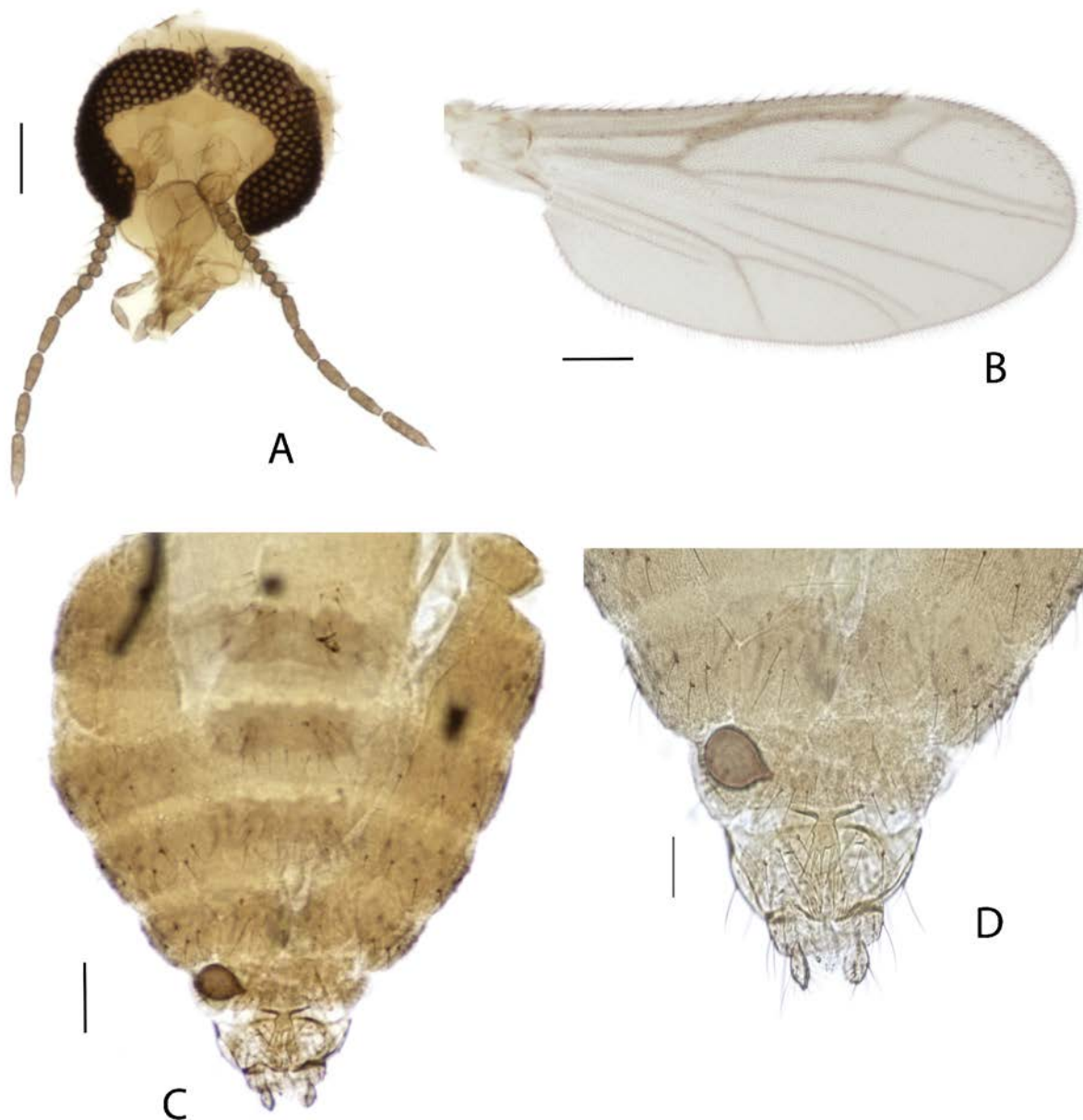
**Taxonomic discussion.** Characters to distinguish this species from *A. gordonii* may be found in the key and in the discussion under the description of the latter species.

This is the first record of *A. insigniventris* from Argentina.

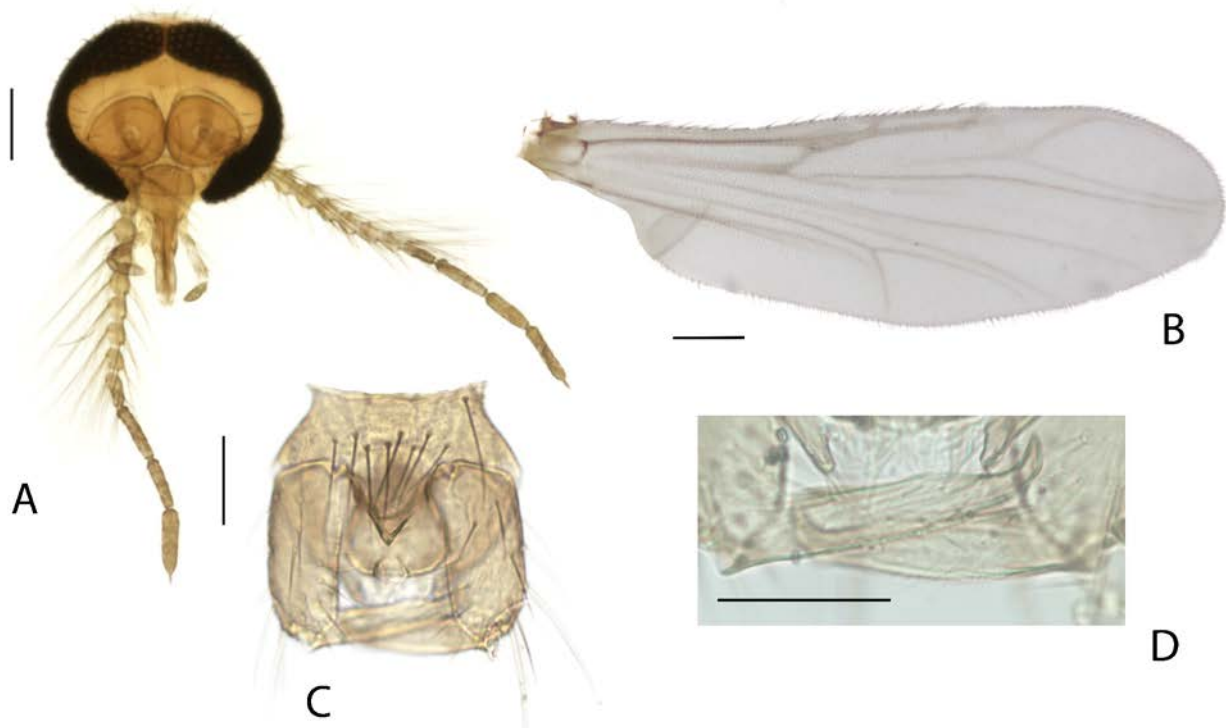
Macfie (1935) examined two females of this species from the same locality. We were unable to examine the remaining cotype in the BMNH.

***Atrichopogon javieri* n. sp.**

(Figs. 24–26, 47)



**FIGURE 24.** *Atrichopogon javieri* n. sp. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.



**FIGURE 25.** *Atrichopogon javieri* n. sp. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: small and yellowish brown species, scutum without pattern of pigmentation. Female: with a comb of 5–6 elongate, straight processes arising from the posteromesal common stem of posterior margin of sternite 7; sternite 8 broad, with 3–4 pairs of setae, membrane with V-shaped fringe of posteriorly directed spines. Male: posterior margin of sternite 9 with 8–10 setae in two rows; gonocoxite stout; anterodorsal lobes of parameres elongate, extending to 3/4 length of parameres main body, and aedeagus triangular, as long as its basal breadth, with basal arch concave, basal arms recurved and directed posterolaterally, and lateral margins gently tapering to pointed tip.

**Description of female.** Head (Fig. 24A). Yellowish, clypeus yellowish brown. Eyes abutting for length of three ommatidia. Antenna with pedicel yellowish, flagellum dark brown; proportions of flagellomeres as shown in Figs. 24A, 26A; flagellomere 13 with apical nipple not constricted basally; AR 1.69–2.01 (1.89, n = 4). Palpus (Figs. 24A, 26B) brown; segment 3 slender, with small deep sensory pit opening shortly beyond midlength; segments 4, 5 separated, broadly contacting, its combined length equal to segment 3; segment 5 conical; PR 1.60–3.00 (2.36, n = 5); head width / mouthparts length 2.15–2.75 (2.37, n = 4). Mandible with 12–13 minute teeth at extreme apex.

Thorax. Uniformly yellowish brown; scutellum with 4 strong setae. Legs uniformly pale yellowish brown; apex of hind tibia with 7–9 spines; foreleg TR 3.33–3.83 (3.67, n = 5), midleg TR 3.00–3.57 (3.30, n = 5), hind leg TR 3.00 (n = 5). Wing (Fig. 24B) membrane infuscated, with few macrotrichia marginally in cell  $r_3$ ; first radial cell obliterated, second radial cell nearly three X longer than first, lumen very narrow; wing length 0.82–1.00 (0.87, n = 5) mm; breadth 0.34–0.46 (0.38, n = 5) mm; CR 0.68–0.70 (0.69, n = 5). Halter brown.

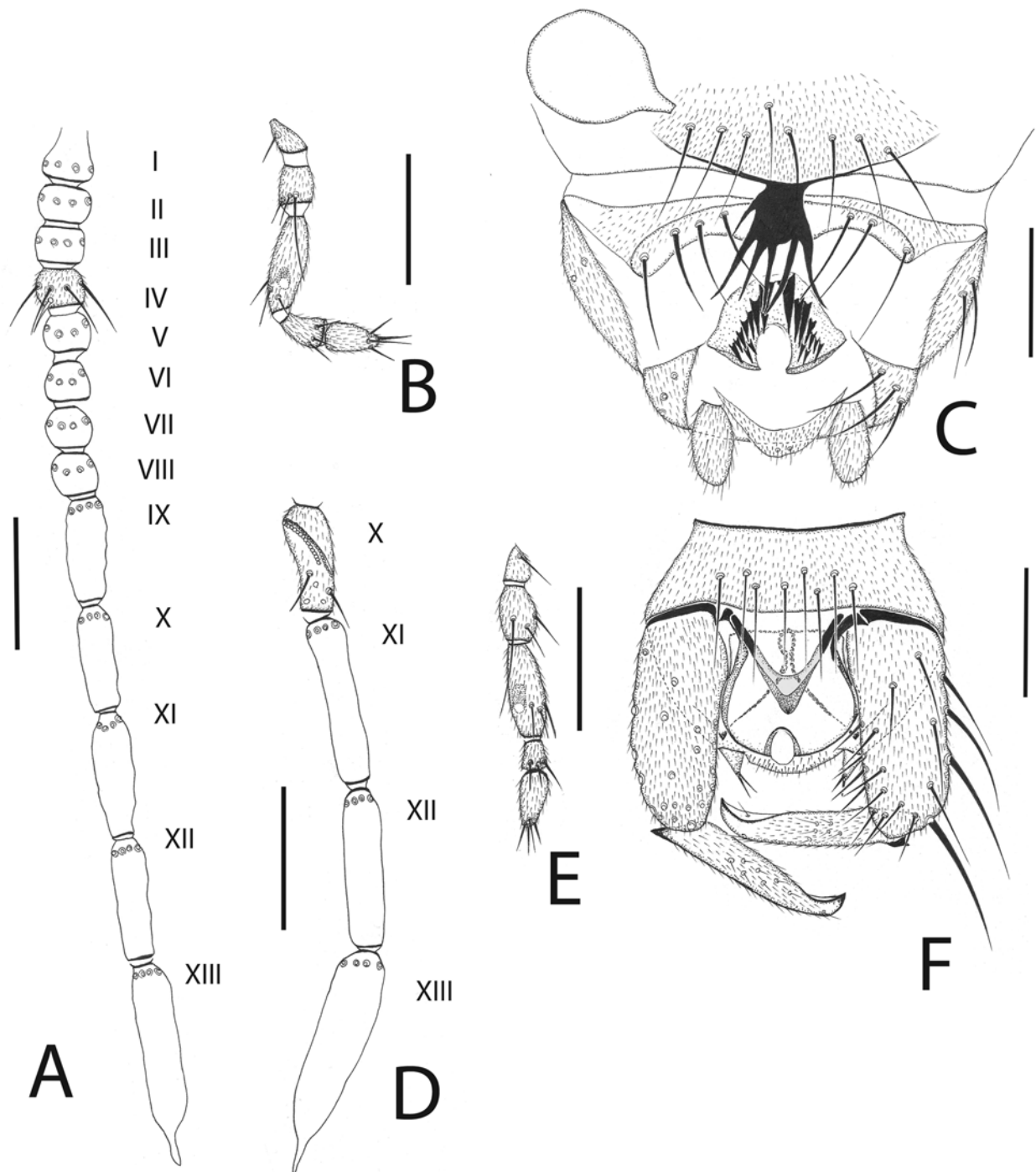
Abdomen (Fig. 24C). Tergites uniformly brown. Genital armature (Figs. 24D, 26C): sternite 7 trapezoidal, with cuticular extensions represented by posteromesal common short, as long as broad stem, from which arises comb of 5–6 elongate, straight processes; sternite 8 broad, with 3–4 pairs of setae, membrane with V-shaped fringe of stout, posteriorly directed spines; subgenital plate well developed, with slightly expanded basal arms. Spermatheca (Figs. 24C–D, 26C) ovoid with short neck, measuring 68–82 (73, n = 5) by 50–60 (56, n = 5)  $\mu\text{m}$ . Cercus yellowish brown.

Male. As for female, with following differences:

Head. Antenna (Figs. 25A, 26D) with plume setae sparse, flagellomeres 2–8 fused, 10–13 darker; AR 1.00–

1.05 (1.02, n = 3). Palpus (Figs. 25A, 26E) yellowish brown; PR 2.67–2.78 (2.74, n = 3). Head width / mouthparts length 2.33–2.50 (2.41, n = 3).

Thorax. Legs yellowish brown, foreleg TR 3.83–4.00 (3.89, n = 3), midleg TR 3.43 (n = 3), hind leg TR 2.89–3.12 (2.97, n = 3). Wing (Fig. 25B) with second radial cell 1.9 X longer than first, lumen narrow; wing length 0.92 (n = 3) mm; breadth 0.30–0.32 (0.31, n = 3) mm; CR 0.61–0.63 (0.61, n = 3).



**FIGURE 26.** *Atrichopogon javieri* n. sp. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

Abdomen. Uniformly yellowish brown. Genitalia (Figs. 25C, 26F): tergite 9 short, extending to 1/2–3/4 length of gonocoxite, posterior margin straight; sternite 9 narrow, posterior margin apparently straight with 8–10 setae in two rows. Gonocoxite stout, 2.5 X longer than its breadth at midlength; gonostylus (Fig. 25D) nearly as long as gonocoxite, nearly straight, tapering distally, recurved at extreme tip. Gonocoxal apodemes reduced. Parameres

stout, sclerotized, nearly as long as their basal breadth; lateral margins slightly convex; distal margin broad, rounded, with two submesal, short, slender, lightly sclerotized, mesally directed processes; anterodorsal lobes elongate, extending to 3/4 length of parameres main body, tip pointed. Aedeagus triangular, as long as its basal breadth; basal arch concave, extending to 2/3 of total length; basal arms heavily sclerotized, recurved, directed posterolaterally; lateral margins tapering to pointed tip.

**Distribution.** Grenada, St. Vincent, Colombia, Brazil (Pará) (Fig. 47).

**Types.** Holotype male, allotype female, St. Vincent, W.I., Hermitage Fo. Ctge., 11/13-X-1991, R.E. Woodruff, black light trap (USNM). Paratypes, 2 males, 4 females, as follows: same data as holotype, 1 male, 2 females (1 male, 1 female in MLPA, 1 female in CAIM).

Grenada, W.I., Mirabeau, Agr. Sta., 30-I-1990, J. Telesford, 1 female, black light trap (USNM).

Colombia, Antioquia, Tamesis, 1150 m, X-1990, J.G. Hurtado, 1 female (MLPA).

Brazil, Pará, Belem, VIII-1951, H.E. Warmke, 1 female, stigmas of *Hevea brasiliensis* (USNM).

**Etymology.** This species is named after our good friend Dr. Javier Muzón, Odonata specialist at the Instituto de Limnología “Dr. Raúl A. Ringuelet” (ILPLA), La Plata, Argentina.

**Taxonomic discussion.** Males and females were collected at the same locality and date in St. Vincent.

The males of this species are very similar to *A. arti* n. sp. by virtue of the scutum lacking pattern of pigmentation, the triangular aedeagus and the sternite 9 bearing a double row of 9–12 setae, but *A. arti* differs by the spinose tip of the aedeagus. The females of *A. arti* can be distinguished from *A. javieri* n. sp. by the mandible armed with 18 teeth and the processes arising from the posteromesal common stem of sternite 7 arranged in a bifid tuft.

Characters to distinguish this new species from *A. glaber* may be found in the key and in the discussion under the description of the latter species.

### *Atrichopogon longirostris* n. sp.

(Figs. 27–29, 48)

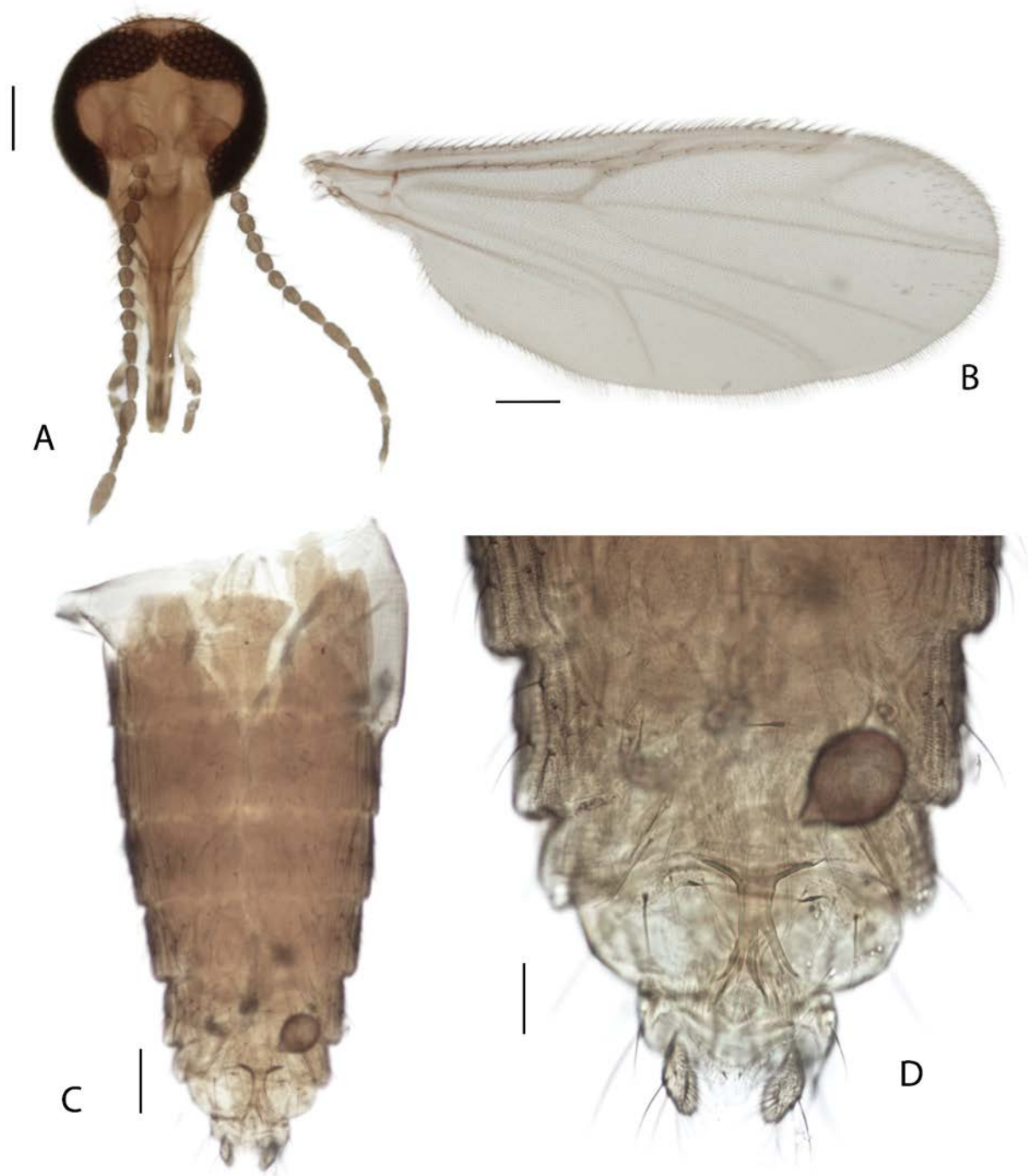
**Diagnosis.** Female: only Neotropical species of *Atrichopogon* (*Psilokempia*) with proboscis greatly elongate. Male: only Neotropical species of *Atrichopogon* (*Psilokempia*) with posterior margin of sternite 9 slightly notched mesally; gonocoxite elongate; gonostylus recurved at extreme tip; anterodorsal lobes of parameres elongate; aedeagus 0.5 X longer than its basal breadth, with basal arch concave, basal arms nearly straight, directed anteriorly, and lateral margins gently tapering to broad, blunt tip.

**Description of female.** Head (Fig. 27A). Light brown. Eyes abutting for length of 2.5 ommatidia. Antenna with pedicel light brown, flagellum brown; proportions of flagellomeres as shown in Figs. 27A, 29A; flagellomere 13 with apical nipple, slightly constricted basally; AR 1.20–1.21 (1.21, n = 2). Palpus (Figs. 27A, 29B) brown; segment 3 with large, deep sensory pit opening subapically; segments 4, 5 separated, its combined length slightly longer than segment 3; segment 5 conical; PR 2.31–2.58 (2.45, n = 2); proboscis greatly elongate (Fig. 27A), head width / mouthparts length 0.91–1.05 (0.98, n = 2). Mandible ending approximately at 2/3 of proboscis length, with 11 small teeth at extreme apex.

Thorax. Light brown. Scutum with pale markings forming usual pattern; scutellum light brown, with 4 strong setae; postscutellum dark brown. Paratergite with one additional small seta. Legs uniformly light brown; apex of hind tibia with 7–8 spines; foreleg TR 3.33–3.71 (3.52, n = 2), midleg TR 3.75–3.87 (3.81, n = 2), hind leg TR 3.00–3.10 (3.05, n = 2). Wing (Fig. 27B) membrane slightly infuscated, with macrotrichia distally in cell  $r_3$ , a few in cell  $m_1$ ; first radial almost obliterated, second radial cell with narrow lumen, nearly 2.5 X longer than first; wing length 1.08 (n = 2) mm; breadth 0.48 (n = 2) mm; CR 0.72 (n = 2). Halter whitish.

Abdomen (Fig. 27C). Light brown. Genital armature (Figs. 27D, 29C): posterior margin of sternite 7 with cuticular extensions represented by posteromesal common, elongate, 1.6 X longer than broad stem from which arises comb of 6 elongate, gently curved processes; sternite 8 with anterior margin slightly convex, slightly expanded laterally with 3 pairs of setae, membrane with somewhat V-shaped fringe of spines, anterior spines directed anteriorly, posterior ones directed posteriorly; subgenital plate not visible in the available specimens. Spermatheca (Figs. 27C–D, 29C) ovoid to subspherical with short neck, measuring 86–92 (89, n = 2) by 66 (n = 2)  $\mu$ m. Cercus brown.

Male. As for female, with following differences:



**FIGURE 27.** *Atrichopogon longirostris* n. sp. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.

Head. Antenna (Figs. 28A, 29D) with plume setae well-developed, flagellomeres 2–10 fused; AR 0.86. Palpus (Figs. 28A, 29E) brown; PR 2.50. Head width / mouthparts length 1.81.

Thorax. Foreleg TR 3.71, midleg TR 4.00, hind leg TR 3.56. Wing (Fig. 28B) with second radial cell 2.1 X longer than first, lumen narrow; wing length 1.10 mm; breadth 0.38 mm; CR 0.65.

Abdomen. Uniformly brown. Genitalia (Figs. 28C, 29F): tergite 9 short, extending to 2/3 length of gonocoxite, posterior margin slightly notched mesally; sternite 9 narrow, posterior margin barely visible with single row of 7 setae. Gonocoxite elongate, 2.9 X longer than its breadth at midlength; gonostylus (Fig. 28D) nearly as long as gonocoxite, nearly straight, recurved at extreme tip. Gonocoxal apodemes reduced. Parameres stout, lightly sclerotized, 1.2 X longer than their basal breadth; lateral margins subparallel; distal margin broadly rounded, with

pair of mesal, recurved, slender, posteroventrally directed processes; anterodorsal lobes elongate, extending to distal margin of parameres main body. Aedeagus short, 0.5 X longer than its basal breadth; basal arch concave, extending to aedeagus midlength; basal arms heavily sclerotized, nearly straight, directed anteriorly; lateral margins gently tapering to broad, blunt tip.

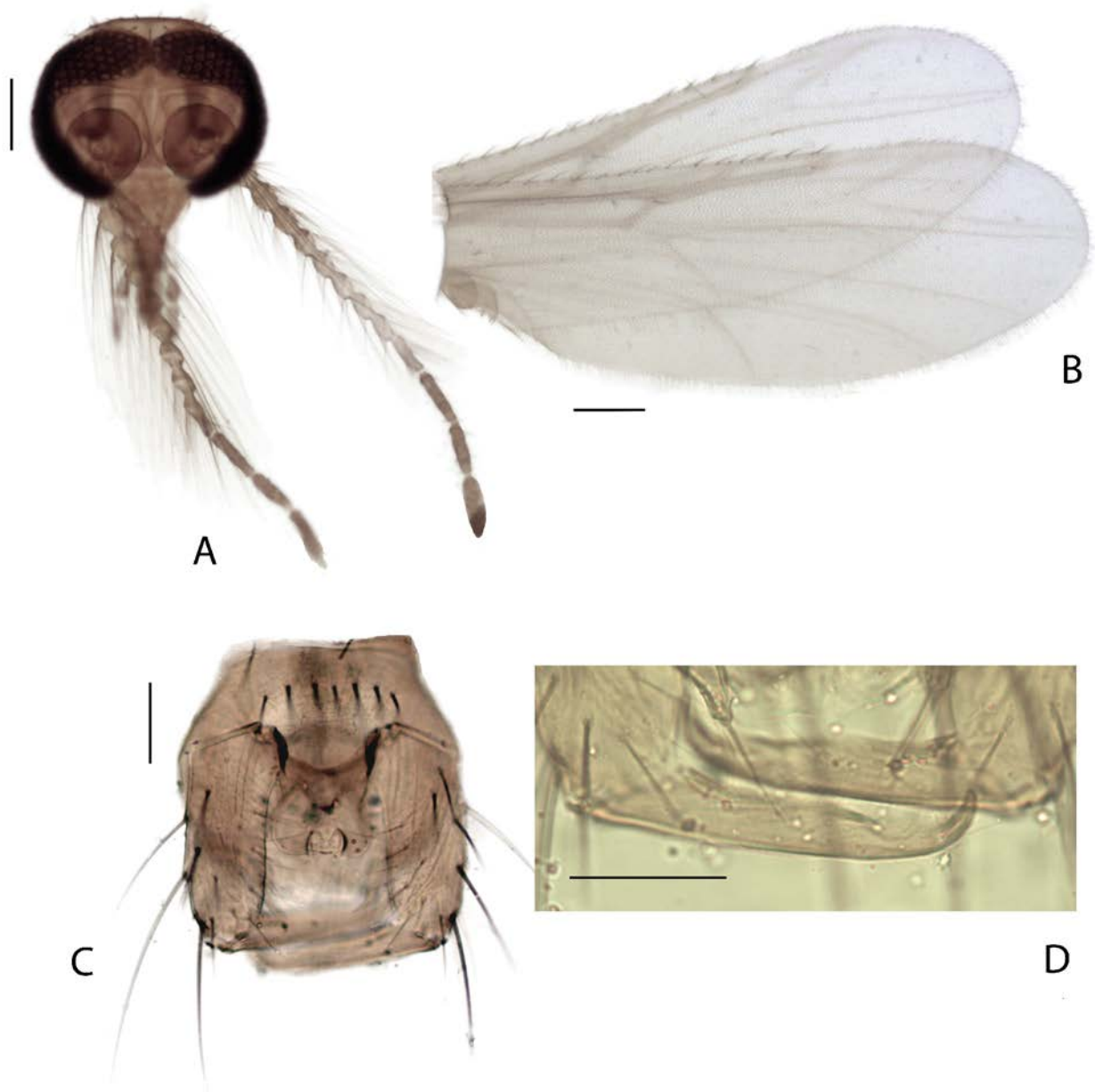
**Distribution.** Grenada, known only from the type locality (Fig. 48).

**Types.** Holotype male, allotype female, Grenada, Mirabeau Agr. Sta., 30-I-1990, J. Telesford, black light trap (USNM). Paratype female, same data (MLPA).

**Etymology.** The name *longirostris* refers to the greatly elongate female proboscis.

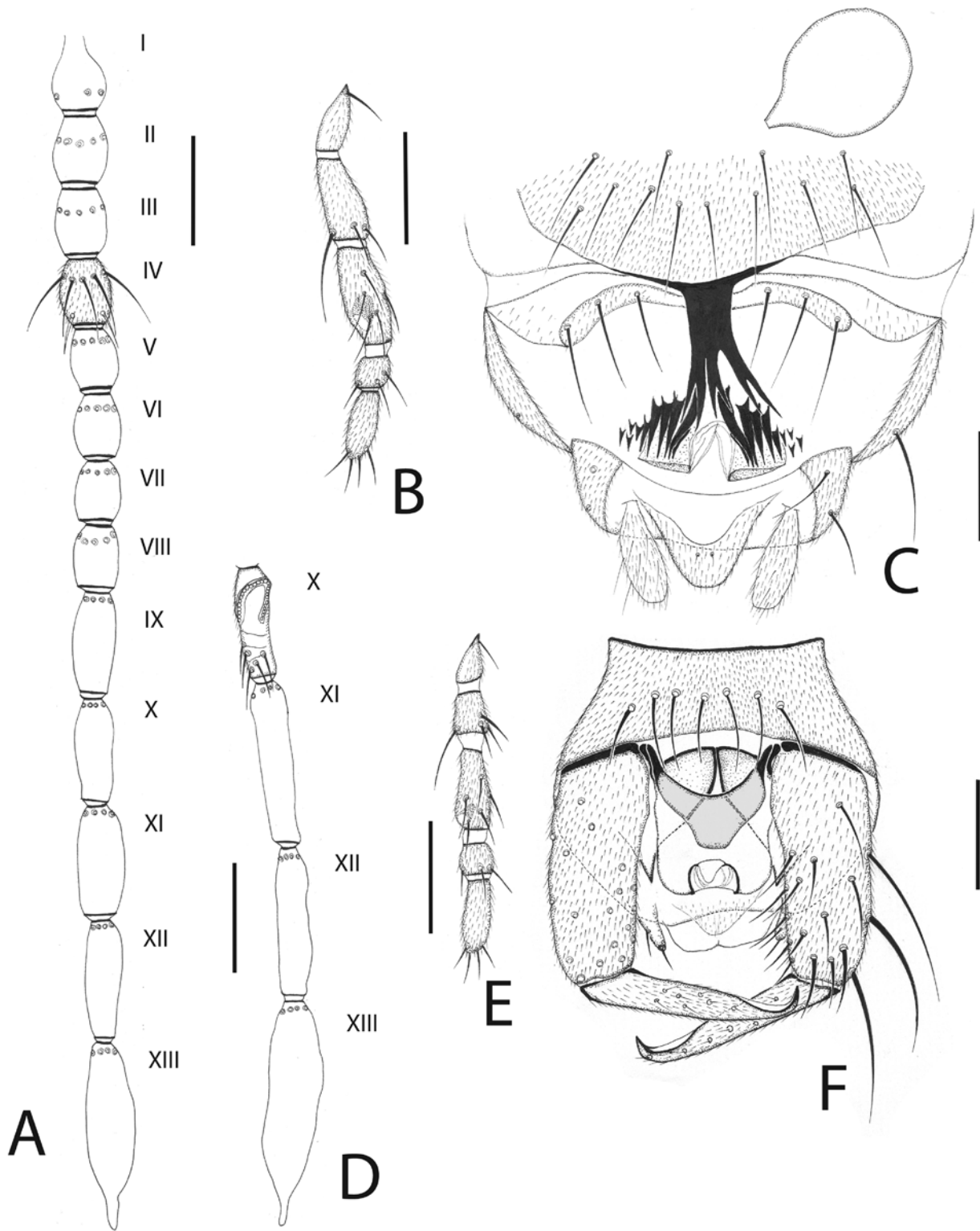
**Taxonomic discussion.** Males and females were collected at the same locality and date.

The greatly elongated proboscis with the mandible ending approximately at 2/3 of proboscis length readily distinguish the females of this new species from other Neotropical species of the subgenus. The males are very similar to *A. altivolans*, but in the latter species the posterior margin of the sternite 9 is rounded, the gonostylus is spoon-shaped, and the aedeagus is distinctly longer and slender.



**FIGURE 28.** *Atrichopogon longirostris* n. sp. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.



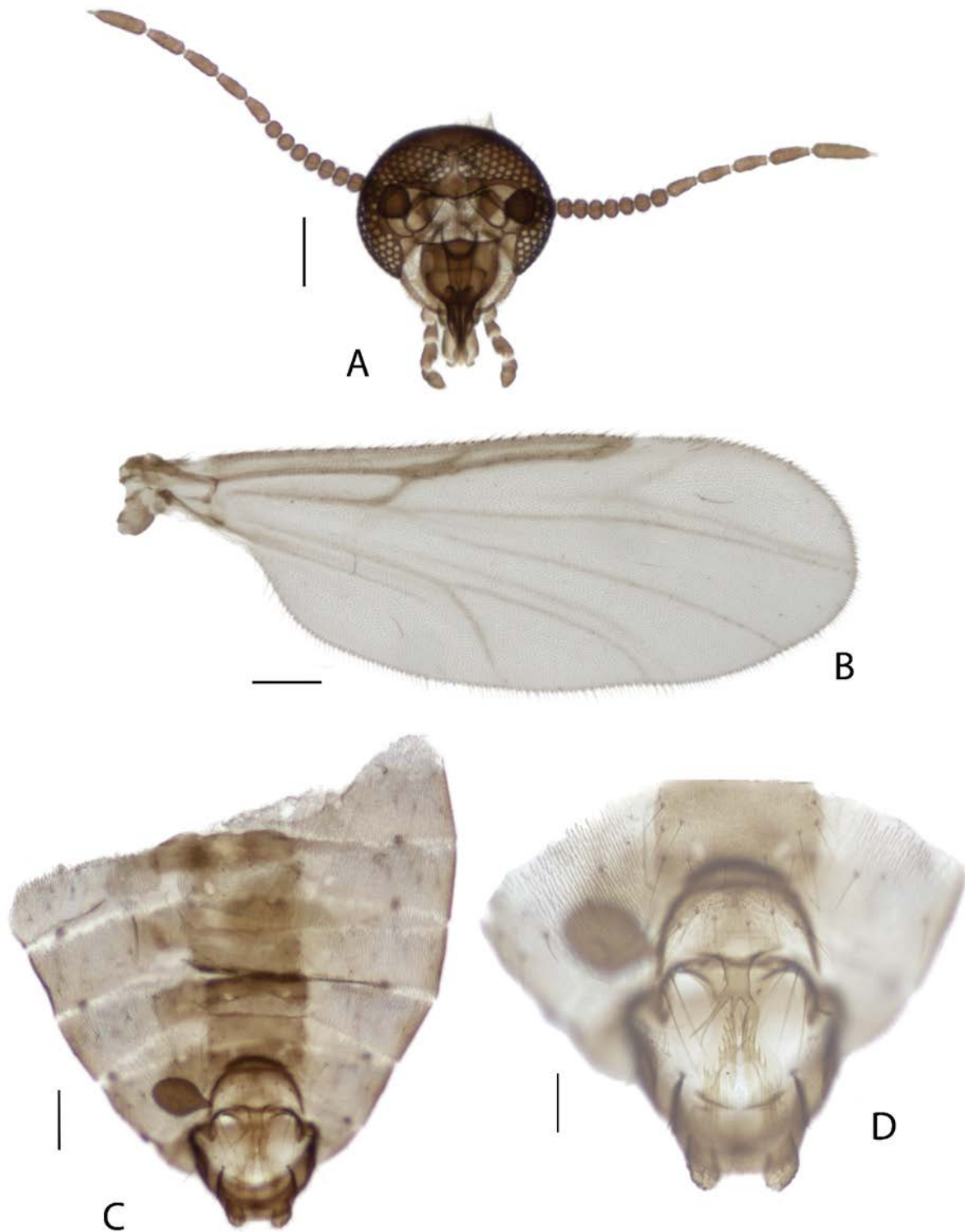


**FIGURE 29.** *Atrichopogon longirostris* n. sp. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

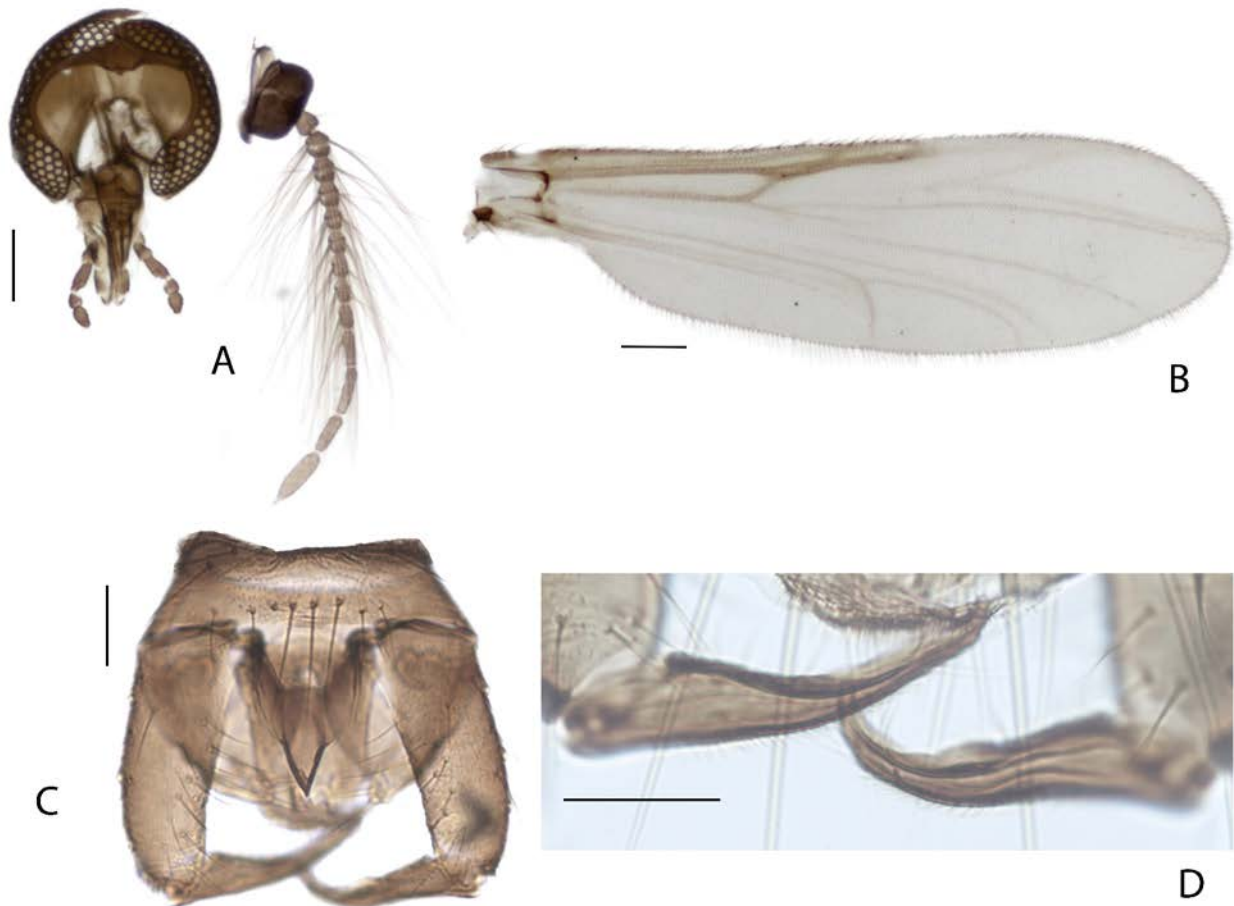
***Atrichopogon nahuelbutensis* n. sp.**  
(Figs. 30–32, 48)

**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters:

heavily dark brown species, scutum without pattern of pigmentation. Female: with a bifid tuft of slender, elongate, mostly bifid at tip processes arising from the posteromesal common stem of posterior margin of sternite 7; sternite 8 stripe-like, with 3 setae, membrane with V-shaped fringe of posteriorly directed spines. Male: gonocoxite elongate; distal 1/2 of gonostylus deeply excavated; parameres with lateral margins subparallel, gently tapering distally to blunt tip, with a pair of distal, admedian, short rods; anterodorsal lobes elongate; aedeagus with basal arch nearly straight, basal arms recurved and directed laterally, and lateral margins heavily sclerotized and abruptly tapering to pointed tip.



**FIGURE 30.** *Atrichopogon nahuelbutensis* n. sp. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.



**FIGURE 31.** *Atrichopogon nahuelbutensis* n. sp. Male, A. head, frontal view, and antenna. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

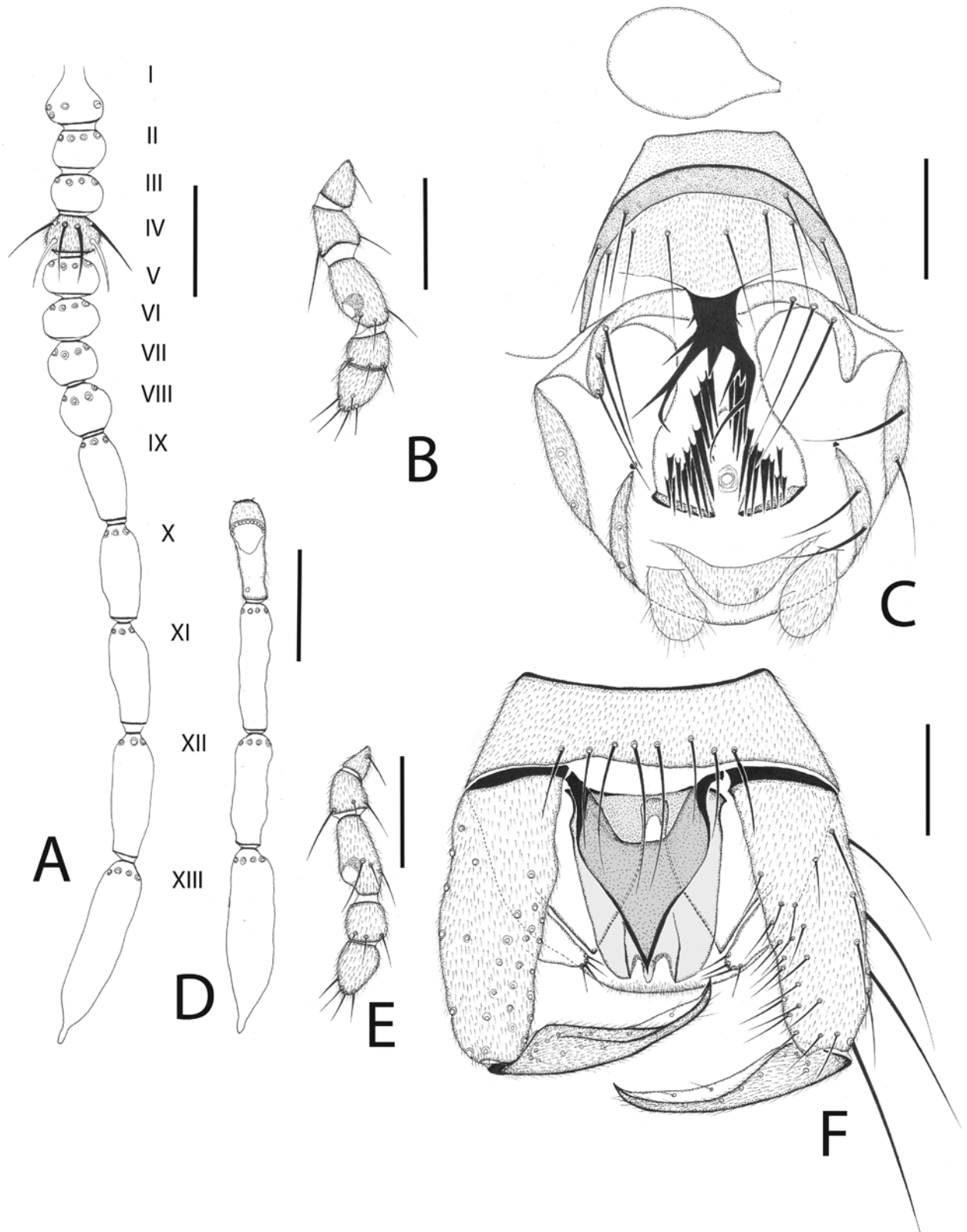
**Description of female.** Head (Fig. 30A). Heavily dark brown. Eyes abutting for length of 2.5 ommatidia. Antenna with flagellum dark brown, pedicel slightly darker; proportions of flagellomeres as shown in Figs. 30A, 32A; flagellomere 13 with apical nipple slightly constricted basally; AR 1.75. Palpus (Figs. 30A, 32B) dark brown; segment 3 stout, with sensory pit opening on distal 1/3; segments 4, 5 closely appressed, its combined length longer than segment 3; segment 5 conical; PR 1.92. Head width / mouthparts length 2.21. Mandible with 9 minute teeth at extreme apex.

Thorax. Heavily dark brown. Scutum with pair of dorsocentral pale stripes, each one anteriorly and posteriorly expanded; scutellum with 4 strong setae. Legs uniformly dark brown; apex of hind tibia with 7–9 spines; foreleg TR 3.14, midleg TR 2.75, hind leg TR 2.50. Wing (Fig. 30B) membrane slightly infuscated, with few macrotrichia near the very apical portion of cell  $r_3$ , distal 1/2 of cell  $m_1$ ; first radial cell with minute lumen, second radial cell nearly 4 X longer than first, lumen narrow; wing length 1.08 mm; breadth 0.42 mm; CR 0.63. Halter whitish.

Abdomen (Fig. 30C). Tergites uniformly brown. Genital armature (Figs. 30D, 32C): sternite 7 with anterior margin convex, posterior margin with cuticular extensions represented by posteromesal common, 1.2 X longer than broad stem from which arises bifid tuft of slender, elongate processes mostly bifid at tip, with additional pointed, mesal, straight, posteriorly directed process; sternite 8 stripe-like, with 3 pairs of setae, membrane with V-shaped fringe of posteriorly directed, moderately stout spines; subgenital plate well developed, with slender basal arms. Spermatheca (Figs. 30C–D, 32C) ovoid with moderately long neck, measuring 106 by 62  $\mu\text{m}$ , neck 16  $\mu\text{m}$ . Cercus dark brown.

Male. As for female, with following differences:

Head. Antenna (Figs. 31A, 32D) with plume setae well-developed, flagellomeres 2–8 fused; AR 0.90 ( $n = 2$ ). Palpus (Figs. 31A, 32E) brown, PR 2.70–2.80 (2.75,  $n = 2$ ). Head width / mouthparts length 2.10–2.15 (2.12,  $n = 2$ ).



**FIGURE 32.** *Atrichopogon nahuelbutensis* n. sp. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

Thorax. Legs brown, foreleg TR 3.00–3.12 (3.06, n = 2), midleg TR 2.78 (n = 2), hind leg TR 2.70 (n = 2). Wing (Fig. 31B) with first radial cell obliterated, second radial cell 1.5 X longer than first, lumen very narrow; wing length 1.10 (n = 2) mm; breadth 0.34–0.36 (0.35, n = 2) mm; CR 0.53–0.55 (0.54, n = 2).

Abdomen. Tergites uniformly brown. Genitalia (Figs. 31C, 32F): tergite 9 short, extending to 3/4 length of gonocoxite, posterior margin rounded; sternite 9 narrow, posterior margin nearly straight with single row of 8 setae. Gonocoxite elongate, 2.9 X longer than its breadth at midlength; gonostylus (Fig. 31D) spoon-shaped, 0.75 length of gonocoxite, swollen at base, apical 1/2 excavated, tip pointed. Gonocoxal apodemes reduced. Parameres stout, lightly sclerotized, two X longer than their basal breadth; lateral margins subparallel, gently tapering distally to blunt tip; pair of distal, admedian, short rods, from which arises pair of short, recurved, lightly sclerotized processes not produced beyond distal margin of parameres main body; anterodorsal lobes sclerotized, elongate, extending to 4/5 length of parameres main body, tip pointed. Aedeagus subtriangular, stout; basal arch nearly straight, extending to 1/3 of total length; basal arms heavily sclerotized, recurved, directed laterally; lateral margins heavily sclerotized, abruptly tapering to pointed tip.

**Distribution.** Chile, known only from the type locality (Fig. 48).

**Type material.** Holotype male, Chile, Nahuelbuta National Park (JAD 1680/1), 24-XII-1984, J. Downes, net (CNCI); allotype female, same data except (JAD 1681/4), 25-XII-1984. Paratype male, same data as allotype (MLPA).

**Etymology.** The name refers to the type locality.

**Taxonomic discussion.** Males and females were collected at the same locality and date.

This species resembles *A. sergioi* n. sp. However, among other differences *A. sergioi* is a distinctly larger species, the gonostylus is recurved at the extreme tip, and the lateral margins of the aedeagus are abruptly recurved mesally at 3/4 of total length, and then abruptly recurved distally to stout distal 1/4, with broad and straight apex. The females of *A. sergioi* mainly differs by the cuticular extensions of sternite 7 represented by a common stem from which arises a comb of 3–9 nearly straight processes.

### *Atrichopogon pectinatus* Macfie

(Figs. 33–35, 48)

*Atrichopogon pectinatus* Macfie, 1939: 195 (female; Brazil); Wirth, 1974: 15 (in catalog species south of USA); Borkent & Wirth, 1997: 27 (in World catalog); Borkent & Spinelli, 2000: 11 (in catalog species south of USA); Borkent & Spinelli, 2007: 46 (in Neotropical catalog); Borkent, 2015: 25 (in online World catalog).

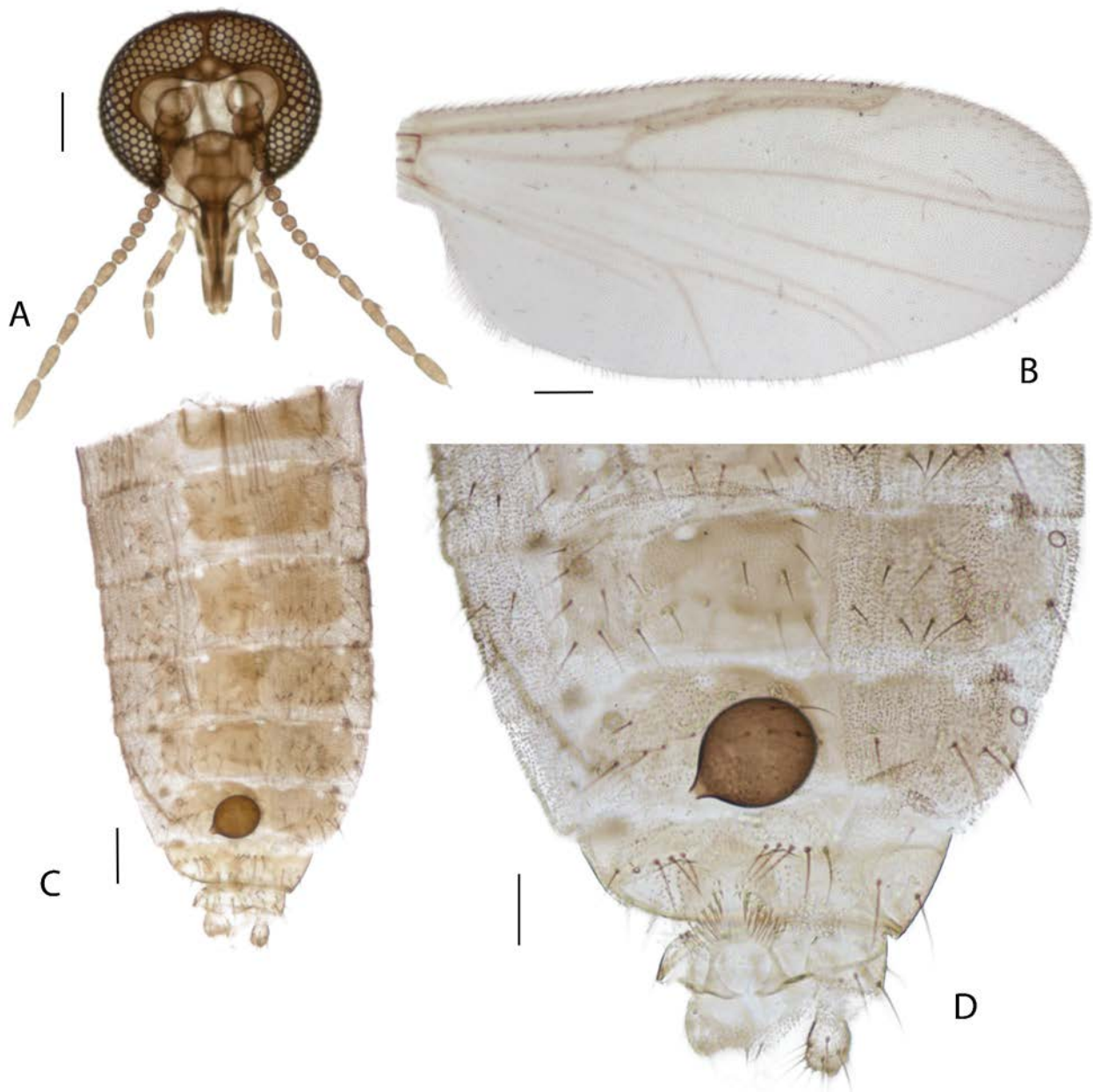
**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: dark brown species, scutum without pattern of pigmentation. Female: palpal segment 5 with blunt tip, mandible with 14–15 teeth; posterior portion of sternite 7 without cuticular extensions, sternite 8 broad with 4–5 pairs of setae and membrane with V-shaped fringe of posteriorly directed spines. Male: gonocoxite stout; distal 1/4 of gonostylus gently excavated; lateral margins of parameres folded ventrally; anterodorsal lobes short, extending to midlength of parameres main body, and basal arms of aedeagus reduced.

**Redescription of female.** Head (Fig. 33A). Dark brown. Eyes abutting for length of three ommatidia. Antenna with pedicel and flagellum dark brown; proportions of flagellomeres as shown in Figs. 33A, 35A; flagellomere 13 with apical nipple constricted basally; AR 1.50–1.52 (1.51, n = 2). Palpus (Figs. 33A, 35B) dark brown; segment 3 slender, with deep sensory pit opening on distal 1/2; segments 4, 5 separated, its combined length longer than segment 3; segment 5 with blunt tip; PR 3.25–3.33 (3.29, n = 2). Head width / mouthparts length 1.67–1.85 (1.76, n = 2). Mandible with 14–15 teeth.

Thorax. Uniformly dark brown; scutellum with 4 strong setae. Legs uniformly dark brown; apex of hind tibia with 9 spines; foreleg TR 3.03–3.13 (3.08, n = 2), midleg TR 2.93–3.05 (2.99, n = 2), hind leg TR 2.82–2.88 (2.85, n = 2). Wing (Fig. 33B) with few macrotrichia near the very apical portion of cells  $r_3$ ,  $m_1$ ; first radial cell almost obliterated, second radial cell nearly four X longer than first, with very narrow lumen; wing length 1.12–1.22 (1.17, n = 2) mm; breadth 0.50–0.54 (0.52, n = 2) mm; CR 0.71 (n = 2). Halter whitish.

Abdomen (Fig. 33C). Tergites uniformly brown. Genital armature (Figs. 33D, 35C): sternite 7 subquadrangular, posterior margin without cuticular extensions; sternite 8 broad, with 4–5 pairs of setae, membrane with V-shaped fringe of posteriorly directed slender spines (Fig. 35C); subgenital plate well developed, with slender basal arms. Spermatheca (Figs. 33C–D, 35C) ovoid with short neck, measuring 96–100 (98, n = 2) by 71–75 (73, n = 2)  $\mu$ m. Cercus brown.

Male. As for female, with following differences:

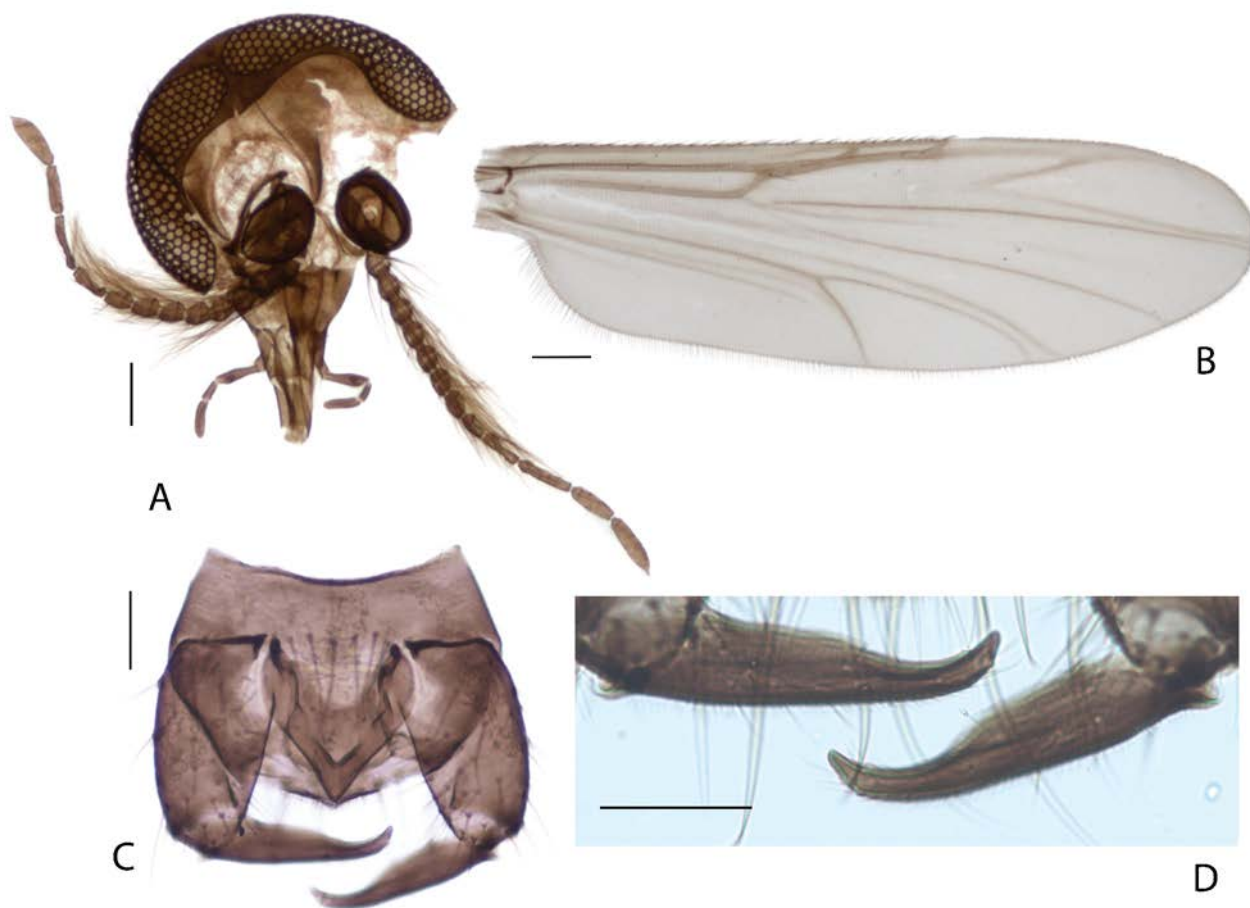


**FIGURE 33.** *Atrichopogon pectinatus* Macfie. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.

Head. Antenna (Figs. 34A, 35D) with plume setae well-developed, flagellomeres 2–6 fused; AR 0.80–0.86 (0.83,  $n = 2$ ). Palpus (Figs. 34A, 35E) brown, PR 3.51 (3.41–3.61,  $n = 2$ ). Head width / mouthparts not measured.

Thorax. Legs brown, foreleg TR 3.25–3.37 (3.31,  $n = 2$ ), midleg TR 3.10–3.24 (3.17,  $n = 2$ ), hind leg TR 2.83–3.05 (3.94,  $n = 2$ ). Wing (Fig. 34B) with first radial cell obliterated, second radial cell with narrow lumen, as long as first; wing length 1.18–1.34 (1.26,  $n = 2$ ) mm; breadth 0.39–0.43 (0.41,  $n = 2$ ) mm; CR 0.58–0.60 (0.59,  $n = 2$ ).

Abdomen. Tergites uniformly brown. Genitalia (Figs. 34C, 35F): tergite 9 short, extending to  $3/4$  length of gonocoxite, posterior margin somewhat rounded; sternite 9 narrow, posterior margin slightly convex with single row of 6–8 setae. Gonocoxite stout, 1.85 X longer than its breadth at midlength; gonostylus (Fig. 34D) nearly as long as gonocoxite, swollen at base, nearly straight, distal  $1/4$  gently excavated. Gonocoxal apodemes reduced. Parameres stout, sclerotized, 1.2 X longer than their basal breadth, lateral margins folded ventrally, tapering to blunt tip; anterodorsal lobes hyaline, short, extending to midlength of parameres main body, tip pointed. Aedeagus heavily sclerotized, triangular; basal arch deeply concave, extending to  $2/5$  of total length; basal arms reduced; lateral margins tapering to conical, blunt tip.



**FIGURE 34.** *Atrichopogon pectinatus* Macfie. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

**Distribution.** Guadeloupe, Brazil (Santa Catarina), Argentina (Misiones and Corrientes provinces) (Fig. 48).

**Type material.** Lectotype female, here designated: Brazil, Santa Catarina, Nova Teutonia, 15-VII-1937, F. Plaumann (BMNH).

**Other specimens examined.** Guadeloupe, Basse Terre, Bois Mahler, 9-IX-2011, M.C. Thomas—R.H. Turnbow, 1 male, black light trap (FSCA).

Argentina, Misiones, arroyo Cuñapirú, 18/19-V-1997, J. Williams, 2 males, Malaise trap (MLPA); Corrientes, Colonia Pellegrini, 5-XI-1998, P. Marino, 1 female, sweep net (MLPA); Estancia San Nicolás (casco), 28° 07' 41,0" S–57° 26' 03,5", 16-IX-2009, G. Spinelli, 1 female, at light (MLPA).

**Taxonomic discussion.** This species is very similar to *A. aridus*. Characters to distinguish both species may be found in the key and in the discussion under the description of the latter species.

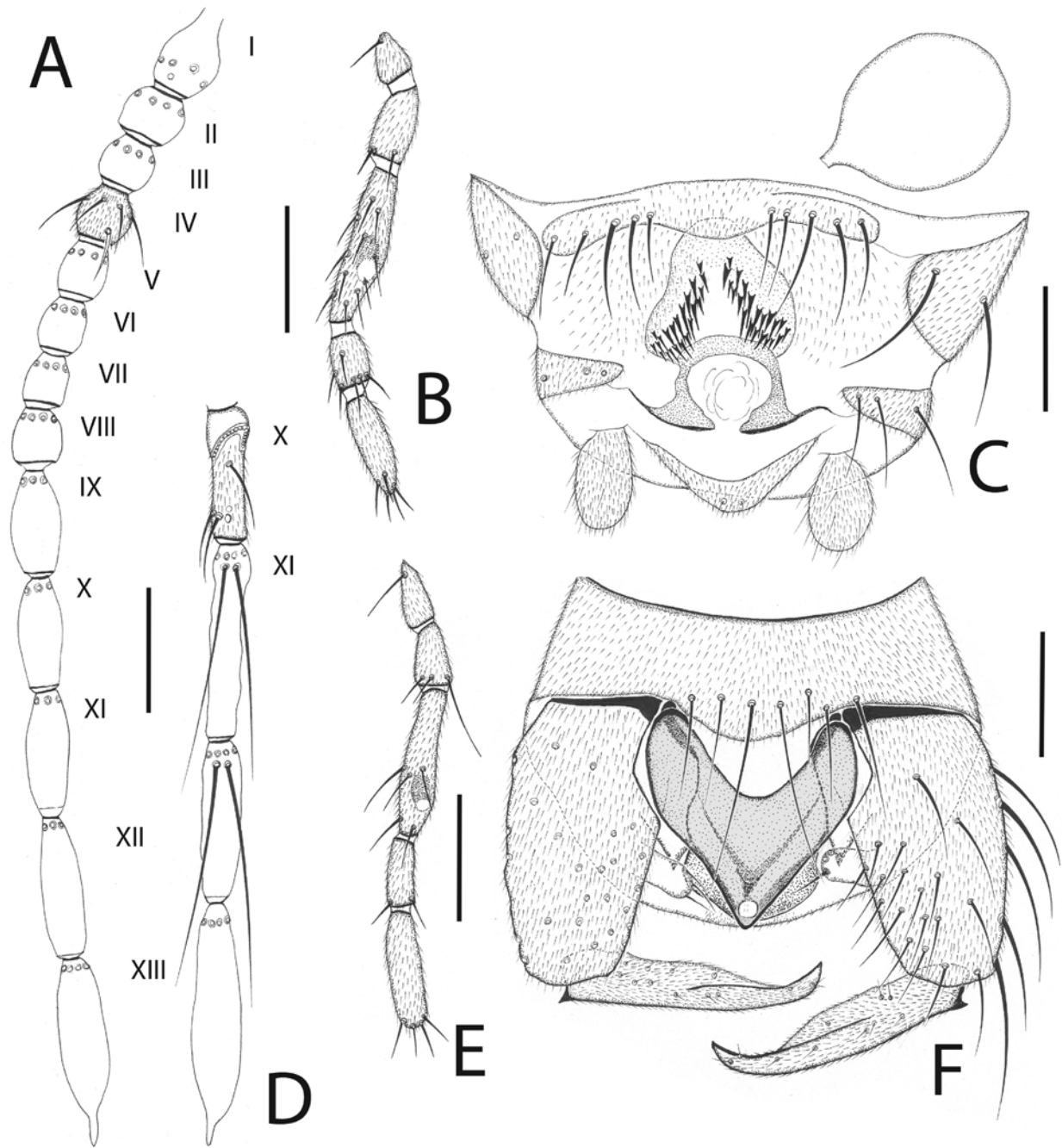
This is the first description of the male of *A. pectinatus* and the first record of the species from Guadeloupe and from Argentina.

Macfie (1939) examined three females of this species from the same locality. We were unable to examine the remaining two syntypes in the BMNH.

### *Atrichopogon penicillatus* Delècolle & Rieb

(Figs. 36–38, 49)

*Atrichopogon penicillatus* Delècolle & Rieb, 1994: 274 (female; Guadeloupe); Borkent & Wirth, 1997: 27 (in World catalog); Borkent & Spinelli, 2000: 12 (in catalog species south of USA); Borkent & Spinelli, 2007: 46 (in Neotropical catalog); Borkent, 2015: 25 (in online World catalog).



**FIGURE 35.** *Atrichopogon pectinatus* Macfie. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

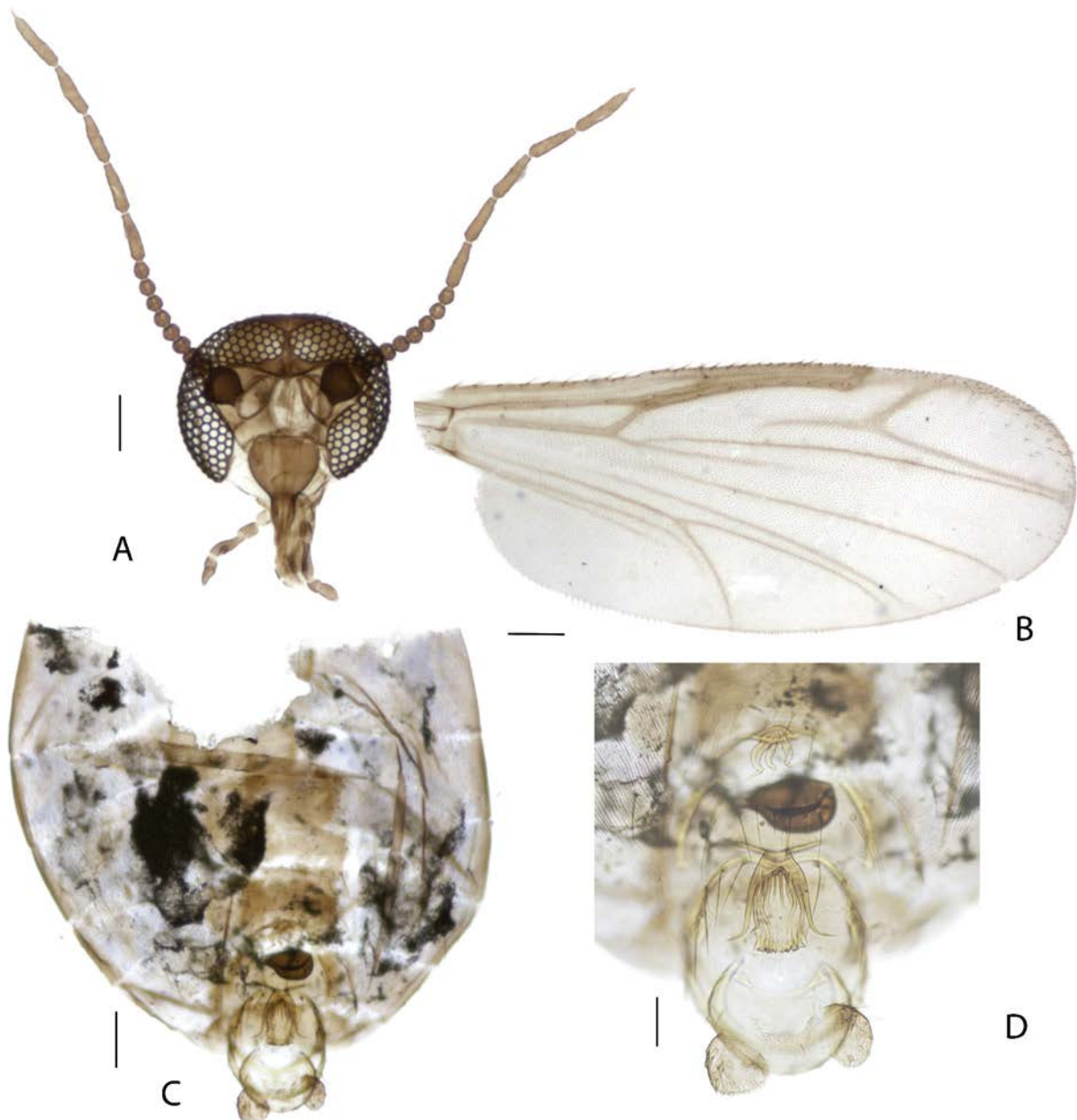
**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the scutellum bearing 2 stout setae.

**Redescription of female.** Head (Fig. 36A). Light brown. Eyes abutting for length of 2.5 ommatidia. Antenna with pedicel and flagellum dark brown (flagellomere 1 pale in holotype); proportions of flagellomeres as shown in Figs. 36A, 38A; flagellomere 13 with apical nipple not constricted basally; AR 2.06–2.23 (2.18, n = 6). Palpus (Fig. 36A) dark brown; segment 3 slender, with small deep sensory pit opening on distal 1/3; segments 4, 5 closely appressed, its combined length slightly longer than segment 3; segment 5 conical; PR 2.80–3.11 (2.93, n = 6); head width / mouthparts length 1.87–2.50 (2.24, n = 6). Mandible with 8–9 minute teeth at extreme apex.

Thorax. Light brown. Scutum with dark markings forming usual pattern; scutellum light brown, with 2 strong setae; postscutellum dark brown. Paratergite with one additional small seta. Legs brown, basal 1/2 of femora paler; apex of hind tibia with 7–8 spines; foreleg TR 3.43–3.75 (3.53, n = 6), midleg TR 3.25–3.62 (3.39, n = 6), hind leg



TR 2.73–2.92 (2.82, n = 6). Wing (Fig. 36B) membrane infuscated, with macrotrichia marginally in cell  $r_3$ , a few in cell  $m_1$ ; first radial almost obliterated, second radial cell nearly two X longer than first, lumen narrow; wing length 0.92–1.16 (1.02, n = 6) mm; breadth 0.40–0.50 (0.43, n = 6) mm; CR 0.64–0.67 (0.65, n = 6). Halter brownish.



**FIGURE 36.** *Atrichopogon penicillatus* Delècolle & Rieb. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.

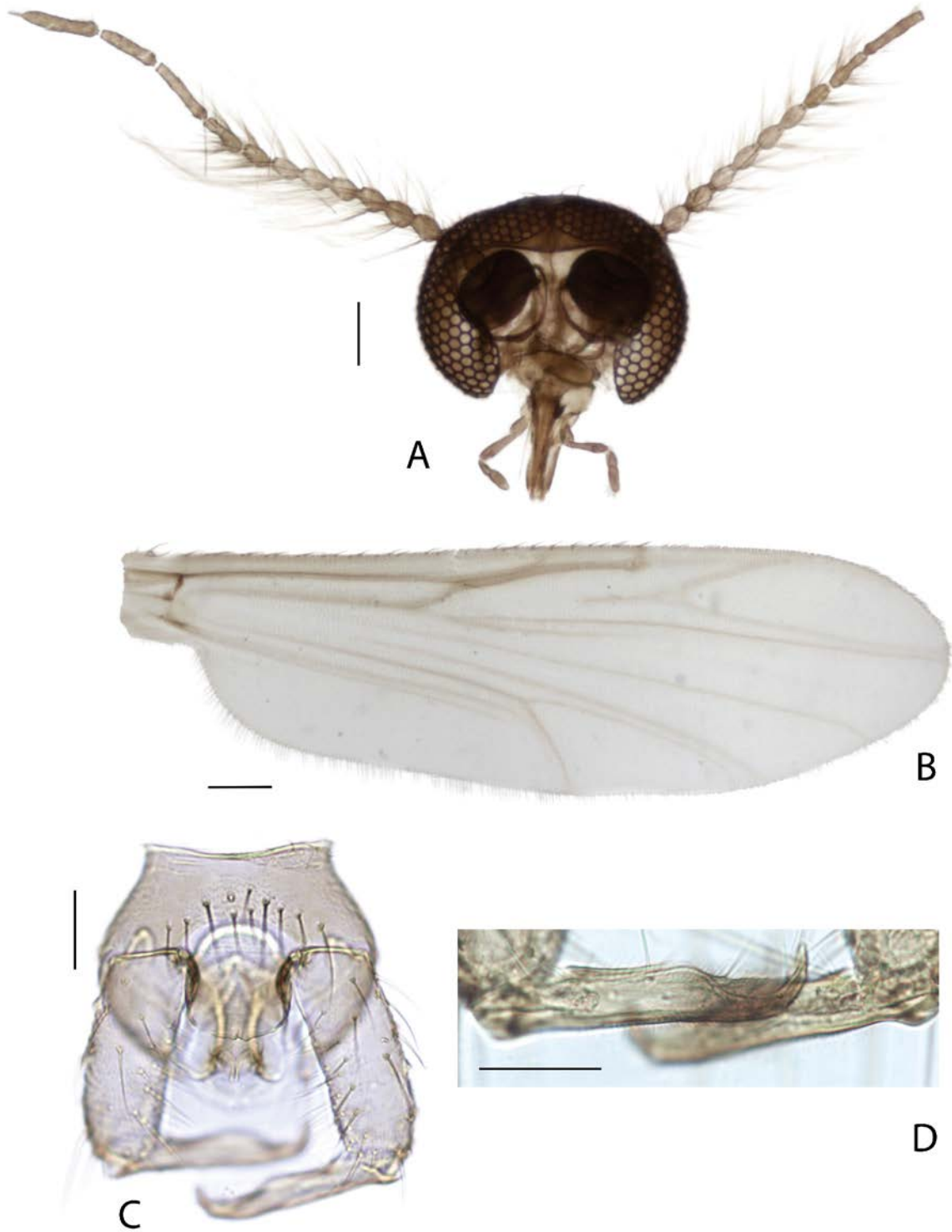
Abdomen (Fig. 36C). Tergites uniformly brown, tip paler. Genital armature (Figs. 36D, 38C): Sternite 6 with cuticular extensions; sternite 7 trapezoidal, cuticular extensions represented by posteromesal common, nearly as long as broad stem, from which arises bifid tuft of 3–5 stout, elongate processes, each one curved laterally at tip; sternite 8 stripe-like, with anterior margin convex, slightly notched mesally, slightly expanded laterally with 3–4 pairs of setae, membrane with transversal row of elongate, anteriorly directed finger-like processes; Spermatheca (Figs. 36C–D, 38C) ovoid with short neck, measuring 74–88 (82, n = 6) by 58–66 (62, n = 4)  $\mu\text{m}$ . Cercus brown.

Male. As for female, with following differences:

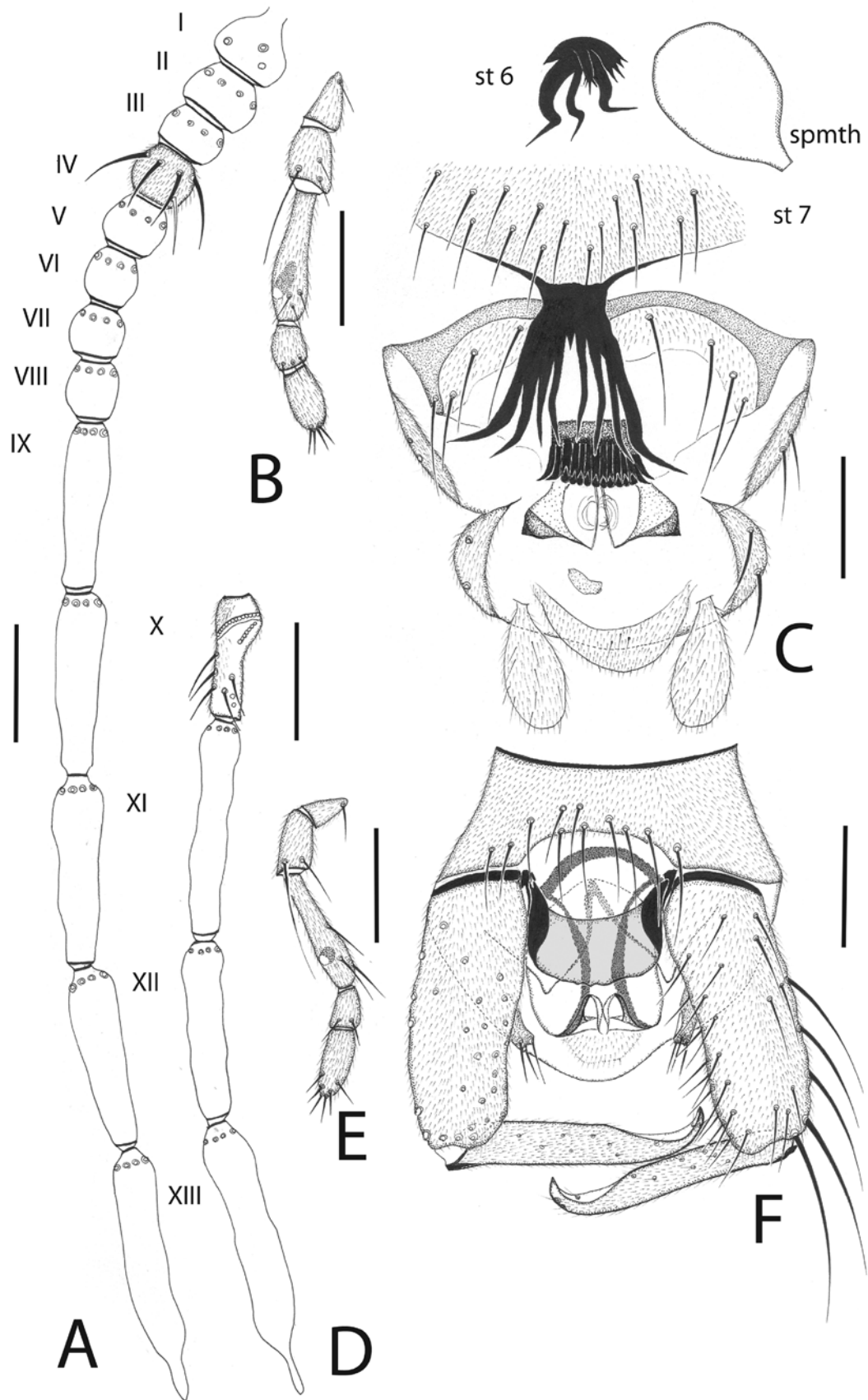
Head. Antenna (Figs. 37A, 38D) with plume setae well-developed, flagellomeres 2–8 fused; AR 0.98–1.02

(1.00, n = 5). Palpus (Figs. 37A, 38E) brown; PR 3.00–3.89 (3.49, n = 5). Head width / mouthparts length 2.09–2.55 (2.32, n = 5).

Thorax. Legs brown, foreleg TR 3.33–3.75 (3.57, n = 5), midleg TR 3.40–3.78 (3.55, n = 5), hind leg TR 2.91–3.08 (2.97, n = 5). Wing (Fig. 37B) with first radial cell obliterated, second radial cell 1.8 X longer than first, lumen very narrow; wing length 1.04–1.26 (1.13, n = 5) mm; breadth 0.34–0.40 (0.36, n = 5) mm; CR 0.58–0.60 (0.59, n = 5).



**FIGURE 37.** *Atrichopogon penicillatus* Delècolle & Rieb. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.



**FIGURE 38.** *Atrichopogon penicillatus* Delècolle & Rieb. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm. Legends: (C): spermatheca (spmth), sternite 6 (st 6), sternite 7 (st 7).

Abdomen. Uniformly brown. Genitalia (Figs. 37C, 38F): tergite 9 short, extending to gonocoxite midlength, posterior margin somewhat rounded; sternite 9 narrow, posterior margin concave with one or two rows of 5–11 setae. Gonocoxite elongate, 2.8 X longer than its breadth at midlength; gonostylus (Fig. 37D) spoon-shaped, nearly as long as gonocoxite, nearly straight, distal 1/3 deeply excavated. Gonocoxal apodemes well developed, U-shaped. Parameres stout, hyaline; lateral margins slightly convex at midportion, gently tapering distally; distal margin broadly notched; pair of admedian sclerotized rods extending to distal margin, from which arises pair of slender, recurved, posteromesally directed processes; anterodorsal lobes hyaline, short, extending to 3/4 length of parameres main body, tip pointed. Aedeagus stout, 0.75 X longer than its basal breadth; basal arch slightly concave, extending to 2/5 of total length; basal arms heavily sclerotized, slightly recurved, directed posterolaterally; lateral margins short; distal margin as broad as basal breadth, finely crenulate mesally.

**Distribution.** Mexico, Guadeloupe, St. Vincent, Grenada, St. Lucia (Fig. 49).

**Type material.** Holotype female, Guadeloupe, Petit Bourg, 23-III-1993, P. Koenig (Musée Zoologique de Strasbourg, not examined).

**Other specimens examined.** Mexico, Morelos Temixco, Tetlama, 28-X-2008, 1 male, 1 female, M.A.V. Marquez—Monroy, Malaise trap (CAIM).

Guadeloupe, Basse Terre, Pigeon, 9-IX-2011, M.C. Thomas—R.H. Turnbow, 3 males, black light trap (FSCA).

St. Vincent, St. George, Rick's Apts., Cane Hall, 25-IX-1991, R.E. Woodruff, 1 male, 1 female, black light trap (MLPA); same data except 2-X-1991, 1 female (USNM); Hermitage For. Ctge, 11/13-X-1991, R.E. Woodruff, 1 male, 1 female, black light trap (USNM).

Grenada, St. Georges Parish Botanical Garden, 6-II-1990, J. Telesford, 1 female, Malaise trap (USNM); St. Andrews Parish, Balthasar River, 3 mi S Grenville, 25-II-1990, R.E. Woodruff, 1 male, 1 female, black light trap (USNM).

St. Lucia, Union Agr. Sta., 8-IX-1988, R.E. Woodruff—Mathuresi, 1 male, UVLT (USNM).

**Taxonomic discussion.** Males and females were collected at the same locality and date in Mexico, St. Vincent and Grenada.

*Atrichopogon penicillatus* is the only Neotropical species of the subgenus with the scutellum light brown bearing two stout setae.

With regard to genital characters, this species is very similar to *A. gordonii*. The males of the latter species has lightly sclerotized parameres with distal margin somewhat rounded, the anterodorsal lobes extend to midlength of parameres main body, and the aedeagus is slightly shorter than its basal breadth, with basal arch nearly straight, extending to 1/4 of total length. The females of *A. gordonii* differ from *A. penicillatus* by the cuticular extensions of sternite 7 represented by a posteromesal common stem from which arises a comb of 5–6 nearly straight processes, the sternite 8 broad and expanded posterolaterally in the manner of triangular, tooth-like projections bearing 3 setae, and the large, subspherical to ovoid spermatheca.

This is the first description of the male of *A. penicillatus* and the first records of the species from Mexico, St. Vincent, Grenada and St. Lucia.

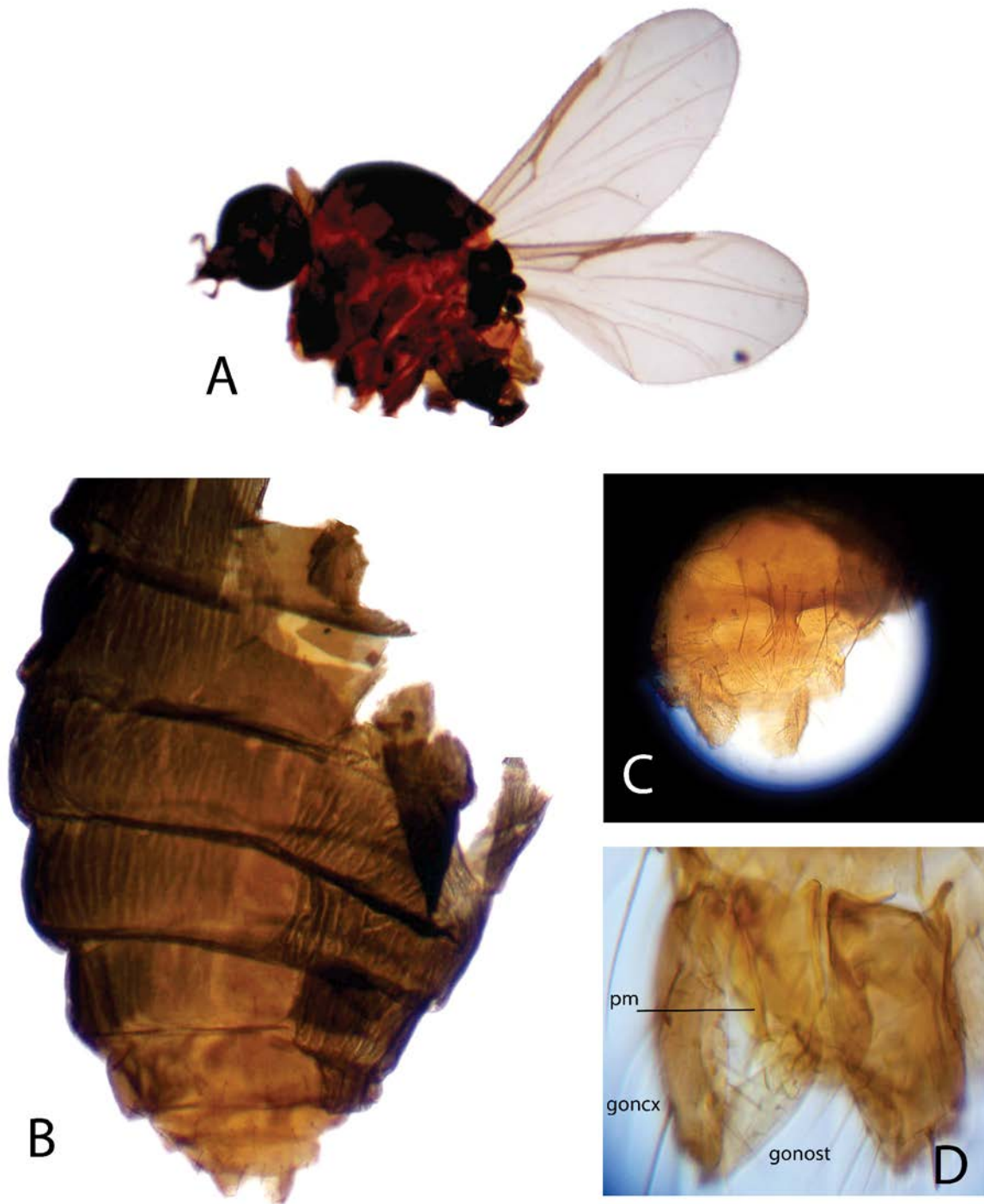
### ***Atrichopogon sanctaeclarae* Macfie**

(Figs. 39, 49)

*Atrichopogon sanctaeclarae* Macfie, 1949: 114 (male, female; Mexico); Wirth, 1974: 16 (in catalog species south of USA); Borkent & Wirth, 1997: 27 (in World catalog); Borkent & Spinelli, 2000: 12 (in catalog species south of USA); Borkent & Spinelli, 2007: 47 (in Neotropical catalog); Borkent, 2015: 26 (in online World catalog).

Notes on types. Female: head dark brown (Fig. 39A); eyes abutting for length of three ommatidia; pedicel dark brown; palpus dark brown, segments 4, 5 closely appressed, its combined length slightly longer than segment 3, segment 5 conical. Thorax heavily dark brown, including scutellum (Fig. 39A), the latter with 4 strong setae; paratergite with one stout seta. Legs dark brown, femur of hind leg slightly darker. Wing (Fig. 39A) with membrane slightly infuscated, without macrotrichia; first radial cell obliterated, second radial cell with very narrow lumen, nearly three X longer than first; wing length 1.20 mm. Halter pale. Abdomen (Fig. 39B) with tergites uniformly brown, tip of abdomen paler; a comb of 9 elongate and straight processes arising from the posteromesal common stem of posterior margin of sternite 7 (Fig. 39C). Spermatheca (Fig. 39B) ovoid. Male: the examination of

the holotype reveals that the genitalia is badly mounted (Fig. 39D), not in position to be described. Moreover, the description of the male provided by Macfie in the original description (Macfie, 1949) is very brief. It does not provide relevant information and it is not accompanied by illustrations.



**FIGURE 39.** *Atrichopogon santaeclearae* Macfie. Female, A–C, Male, D. A. head, thorax and wing, lateral view. B. abdomen, ventral view. C. abdomen, detail of genital armature, ventral view. D. genitalia, ventral view. Legends: (D): gonocoxite (goncx), gonostylus (gonost), paramere (pm).

**Distribution.** Mexico, known only from the type locality (Fig. 49).

**Type material.** Holotype male, Mexico, Chiapas, Puerto de Ocos, Guatemala border, near Hacienda Santa Clara, 19-XI-1932, A. Dampf (BMNH, examined). Paratypes, same date as holotype, 2 males, 2 females (one female examined).

**Taxonomic discussion.** Males and females were collected at the same locality and date at the type locality.

*Atrichopogon sanctaeclarae* is a heavily dark brown species. The females are characterized by the wing membrane devoid of macrotrichia, and are very similar to *A. sergioi* and *A. harrisi* by virtue of the cuticular extensions of the sternite 7 arranged in a comb arising from a common stem. However, *A. sergioi* is a larger species (wing length 1.74–1.80 mm), the palpal segments 4 and 5 are separated and the segment 5 has blunt tip, the paratergite bears 2 additional small setae, the lumen of the second radial cell is broader, the anterior margin of the sternite 7 is convex, and the sternite 8 is broad with 4–6 pairs of setae. Characters to distinguish *A. sanctaeclarae* from *A. harrisi* may be found in the key and in the discussion under the description of the latter species.

For the reasons given above (“Notes on types”) is not possible to provide the male diagnosis of *A. sanctaeclarae* and to compare it with other Neotropical species of the subgenus.

### ***Atrichopogon sergioi* n. sp.**

(Figs. 40–42, 49)

**Diagnosis.** Only Neotropical species of *Atrichopogon* (*Psilokempia*) with the following combination of characters: heavily dark brown species, scutum without pattern of pigmentation. Female: with a comb of 6 slender, elongate and pointed processes arising from the posteromesal common stem of posterior margin of sternite 7; sternite 8 broad, with 4–6 setae, membrane with V-shaped fringe of posteriorly directed spines. Male: tergite 9 short; gonocoxite elongate; gonostylus recurved at extreme tip; parameres stout, with a pair of distal, admedian, moderately elongate rods; anterodorsal lobes elongate with blunt tip; aedeagus with basal arch slightly concave, basal arms directed anterolaterally, lateral margins abruptly recurved mesally at 3/4 of aedeagus length, then abruptly recurved distally to stout distal 1/4, with broad straight apex.

**Description of female.** Head (Fig. 40A). Heavily dark brown. Eyes abutting for length of three ommatidia. Antenna with pedicel and flagellum dark brown; proportions of flagellomeres as shown in Figs. 40A, 42A; flagellomere 13 with apical nipple, constricted basally; AR 1.74–1.82 (1.78, n = 2). Palpus (Figs. 40A, 42B) dark brown; segment 3 slender, with deep sensory pit opening on distal 1/3; segments 4, 5 separated, its combined length longer than segment 3; segment 5 with blunt tip; PR 2.40–2.50 (2.45, n = 2). Head width / mouthparts length 1.76–1.82 (1.79, n = 2). Mandible with 12 minute teeth.

Thorax. Heavily dark brown. Scutum without pattern of pigmentation; scutellum with 4 strong setae. Paratergite with 2 additional small setae. Legs heavily dark brown, tarsi slightly paler; apex of hind tibia with 7–9 spines; foreleg TR 3.30–3.56 (3.43, n = 2), midleg TR 3.20–3.27 (3.24, n = 2), hind leg TR 3.08–3.25 (3.17, n = 2). Wing (Fig. 40B) membrane slightly infuscated, with few macrotrichia near the very apical portion of cells  $r_3$ ,  $m_1$ ; first radial cell with minute lumen, second radial cell with broad lumen, nearly three X longer than first; wing length 1.74–1.80 (1.77, n = 2) mm; breadth 0.72–0.76 (0.74, n = 2) mm; CR 0.69–0.71 (0.70, n = 2). Halter whitish.

Abdomen (Fig. 40C). Tergites uniformly brown. Genital armature (Figs. 40D, 42C): sternite 7 subquadrangular, anterior margin convex, posterior margin with cuticular extensions represented by posteromesal common, 1.3 X longer than broad stem from which arises comb of 5–6 slender, elongate, nearly straight, pointed processes; sternite 8 broad, anterior margin slightly convex, with 4–6 pairs setae, membrane with V-shaped fringe of posteriorly directed slender spines (Fig. 42C); subgenital plate well developed with slender basal arms. Spermatheca (Figs. 40C–D, 42C) ovoid with short neck, measuring 78–116 (100, n = 2)  $\mu\text{m}$  by 66–68 (67, n = 2)  $\mu\text{m}$ . Cercus dark brown.

Male. As for female, with following differences:

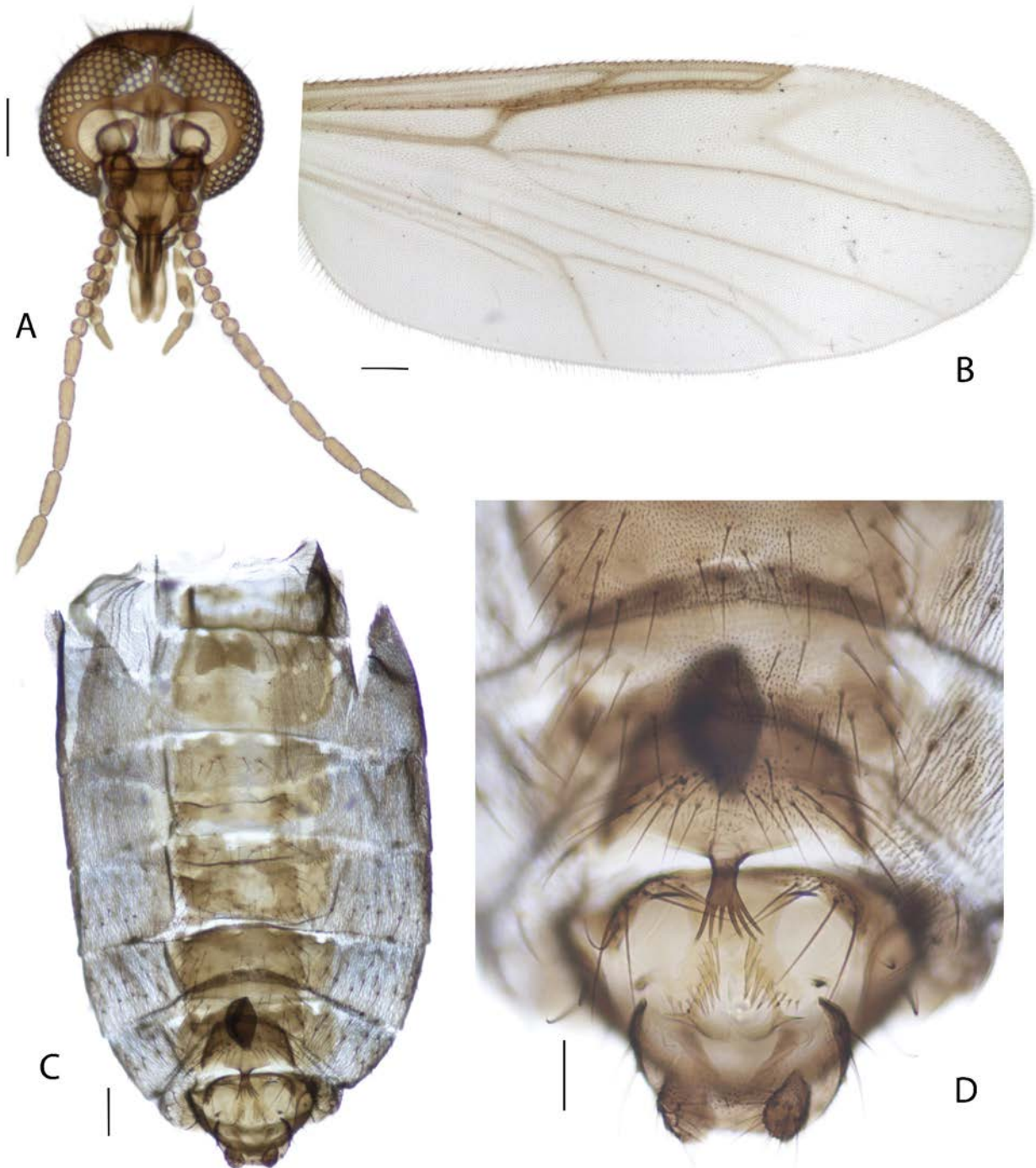
Head. Antenna (Figs. 41A, 42D) with plume setae well-developed, flagellomeres 2–8 fused; AR 0.95. Palpus (Figs. 41A, 42E) brown; PR 2.77–3.17 (2.97, n = 2). Head width / mouthparts length 1.59–1.71 (1.65, n = 2).

Thorax. Legs brown, foreleg TR 3.67–3.78 (3.72, n = 2), midleg TR 3.20–3.40 (3.30, n = 2), hind leg TR 3.00–3.08 (3.04, n = 2). Wing (Fig. 41B) with first radial cell almost obliterated, second radial cell two X longer than first, lumen broad; wing length 1.68–1.78 (1.73, n = 2) mm; breadth 0.52–0.60 (0.56, n = 2) mm; CR 0.61 (n = 2).

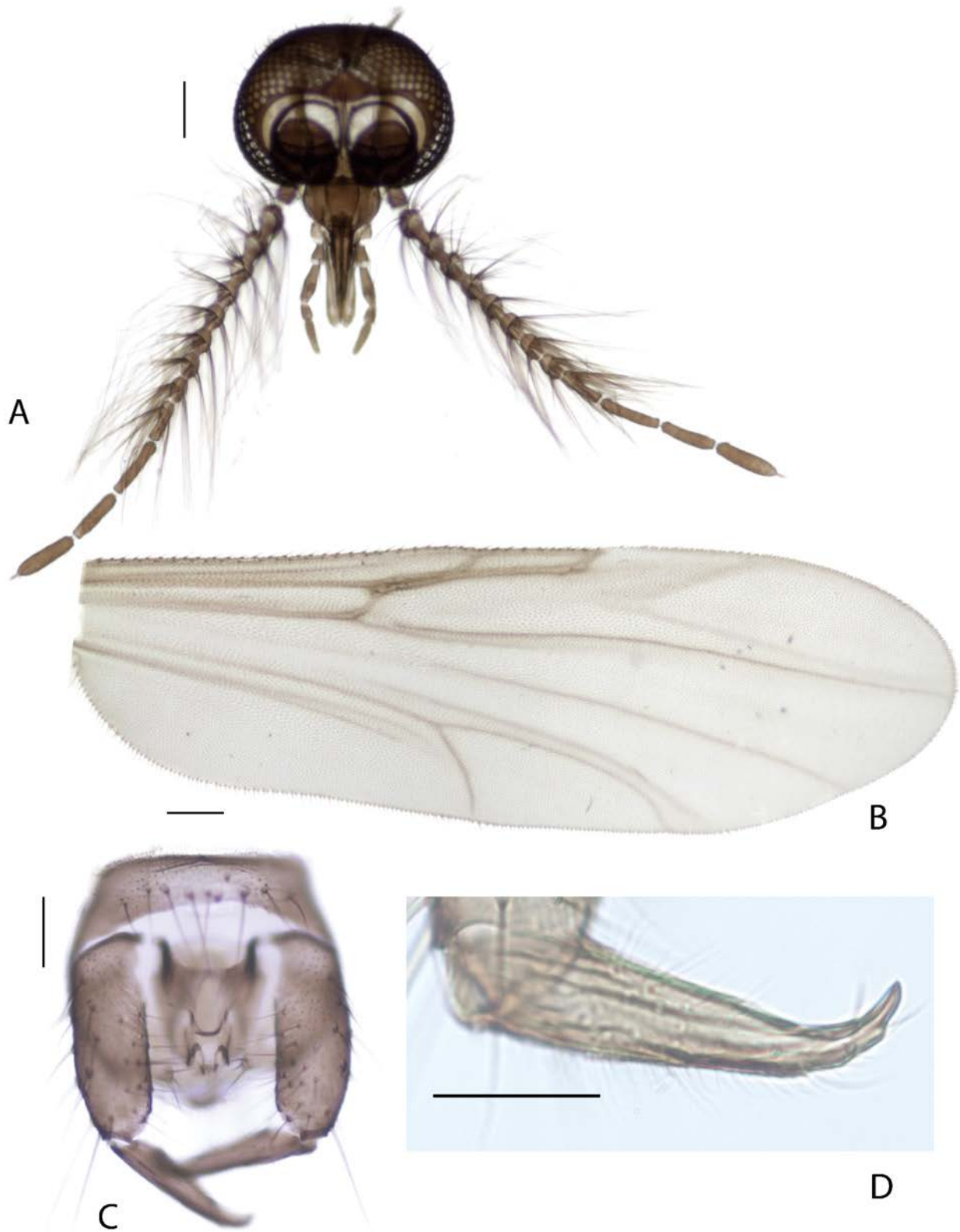
Abdomen. Tergites uniformly brown. Genitalia (Figs. 41C, 42F): tergite 9 short, extending to 3/4 length of gonocoxite, posterior margin straight; sternite 9 narrow, posterior margin slightly excavated with single row of 9 setae, single additional seta anterior to row. Gonocoxite elongate, 2.9 X longer than its breadth at midlength; gonostylus (Fig. 41D) slender, 0.8 length of gonocoxite, nearly straight, recurved at extreme tip. Gonocoxal

apodemes reduced. Parameres stout, lightly sclerotized; lateral margins gently tapering distally to straight tip; pair of distal, admedian, moderately elongate rods, from which arises pair of short, recurved, lightly sclerotized, posteriorly directed processes produced beyond distal margin of parameres main body by short distance; anterodorsal lobes hyaline, elongate, extending to distal margin of parameres main body, tip blunt. Aedeagus stout; basal arch slightly concave, extending to 1/3 of total length; basal arms heavily sclerotized, suparallel, directed anterolaterally; lateral margins abruptly recurved mesally at 3/4 of aedeagus length, then abruptly recurved distally to stout distal 1/4, apex broad, straight.

**Distribution.** Mexico, known only from the type locality (Fig. 49).

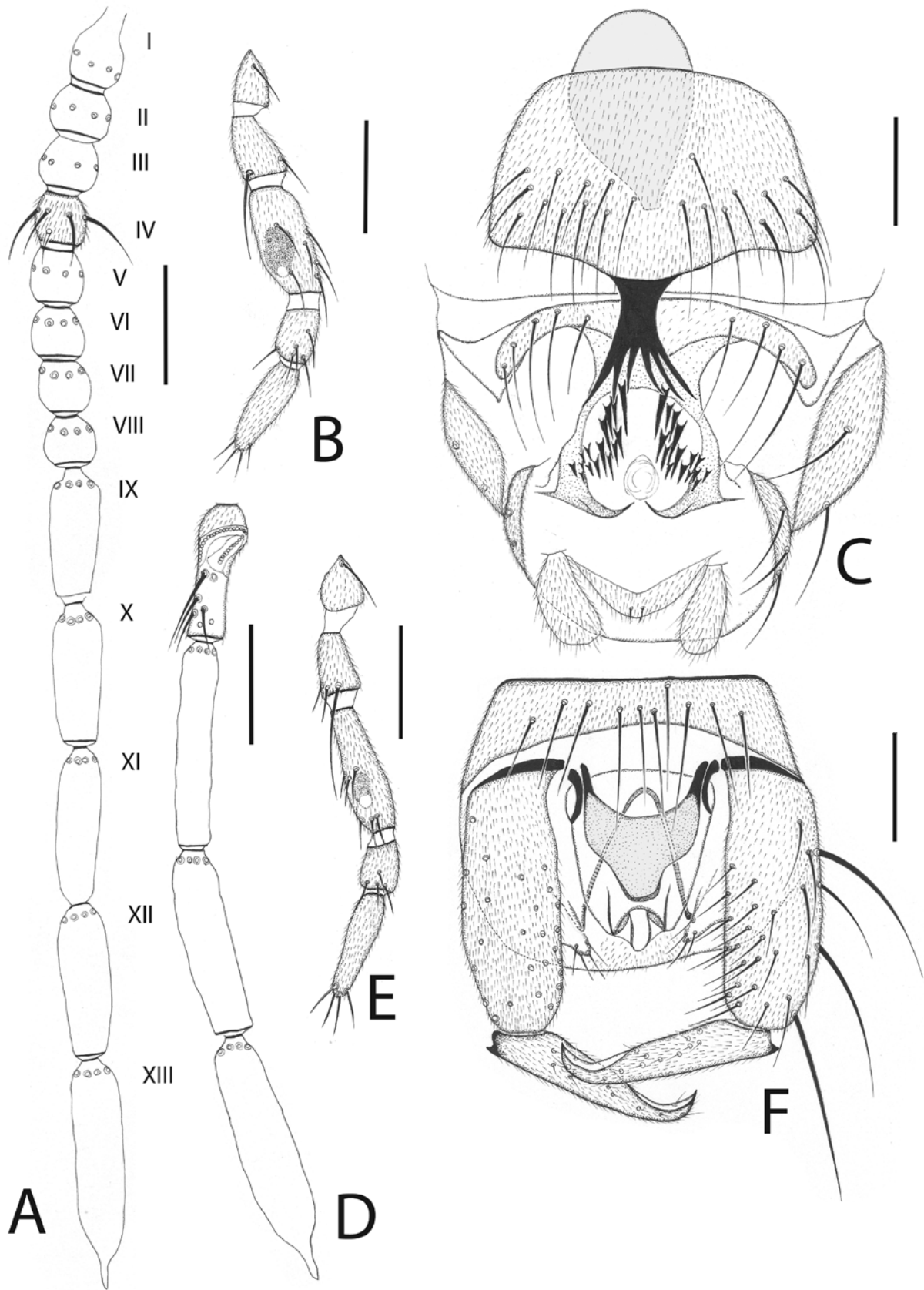


**FIGURE 40.** *Atrichopogon sergioi* n. sp. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.



**FIGURE 41.** *Atrichopogon sergioi* n. sp. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.





**FIGURE 42.** *Atrichopogon sergioi* n. sp. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.

**Type material.** Holotype male, allotype female, Mexico, boundaries between Estados Mexico and Morelos, Parque Nacional Lagunas de Zempoala, 30/31-VII-2005, M. Breidenbaugh—H. Huerta, Malaise trap (CAIM). Paratypes, same data as holotype, 1 male, 1 female (CAIM).

**Etymology.** This species is named after Dr. Sergio Ibáñez-Bernal, in recognition of his important contributions to the knowledge of Mexican Entomology.

**Taxonomic discussion.** Males and females were collected at the same locality and date.

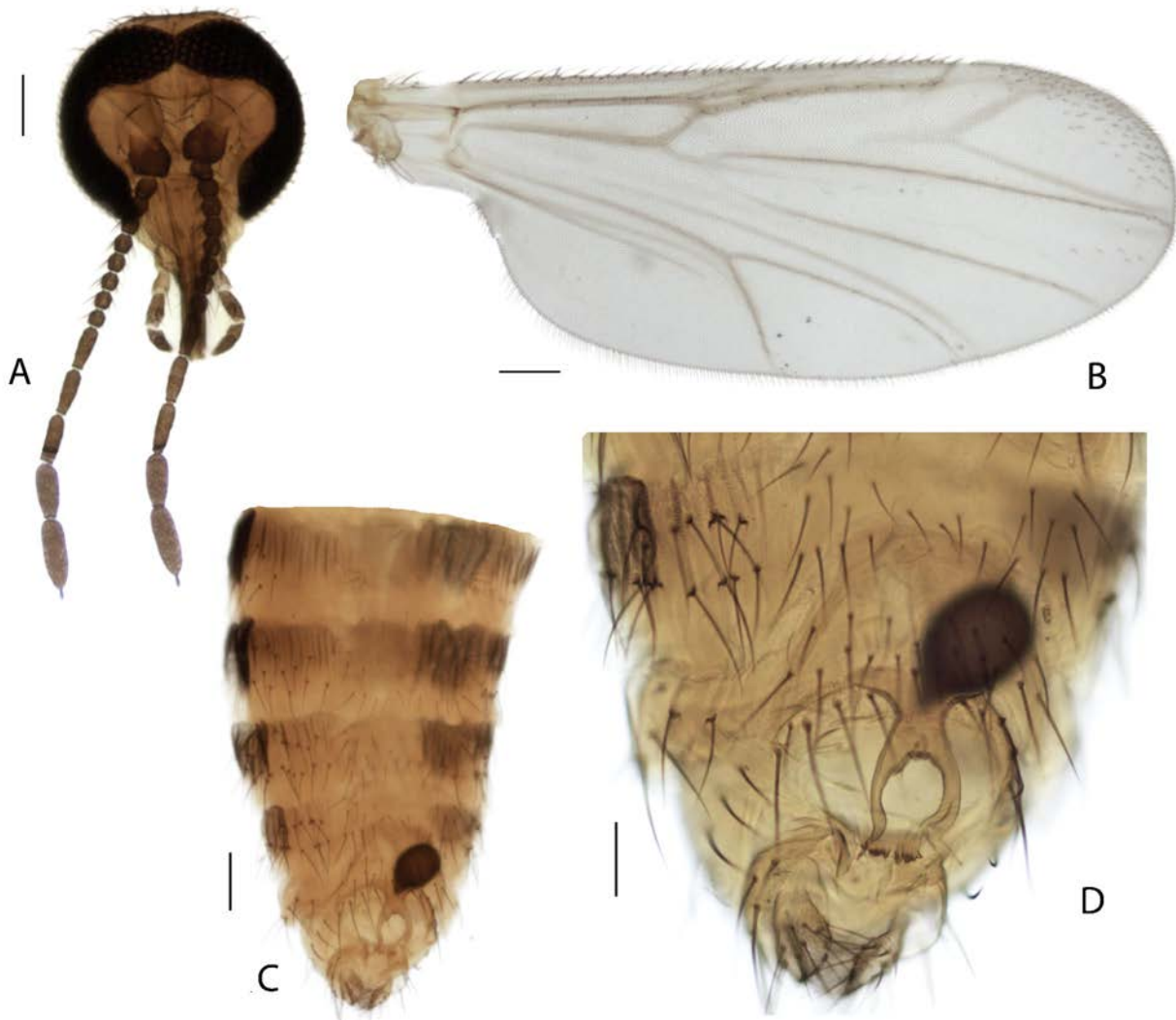
*Atrichopogon sergioi* n. sp. resembles *A. harrisi* and *A. sanctaeclarae* by virtue of the uniformly heavily dark brown coloration and by the cuticular extensions of the sternite 7 represented by a common stem from which arises a comb of nearly straight processes. Characters to distinguish the three species may be found in the key and in the discussions under the descriptions of *A. harrisi* and *A. sanctaeclarae*.

This species is also similar to *A. nahuelbutensis*, from which it can be distinguished by the characters founded in the key and in the discussion under the description of the latter species.

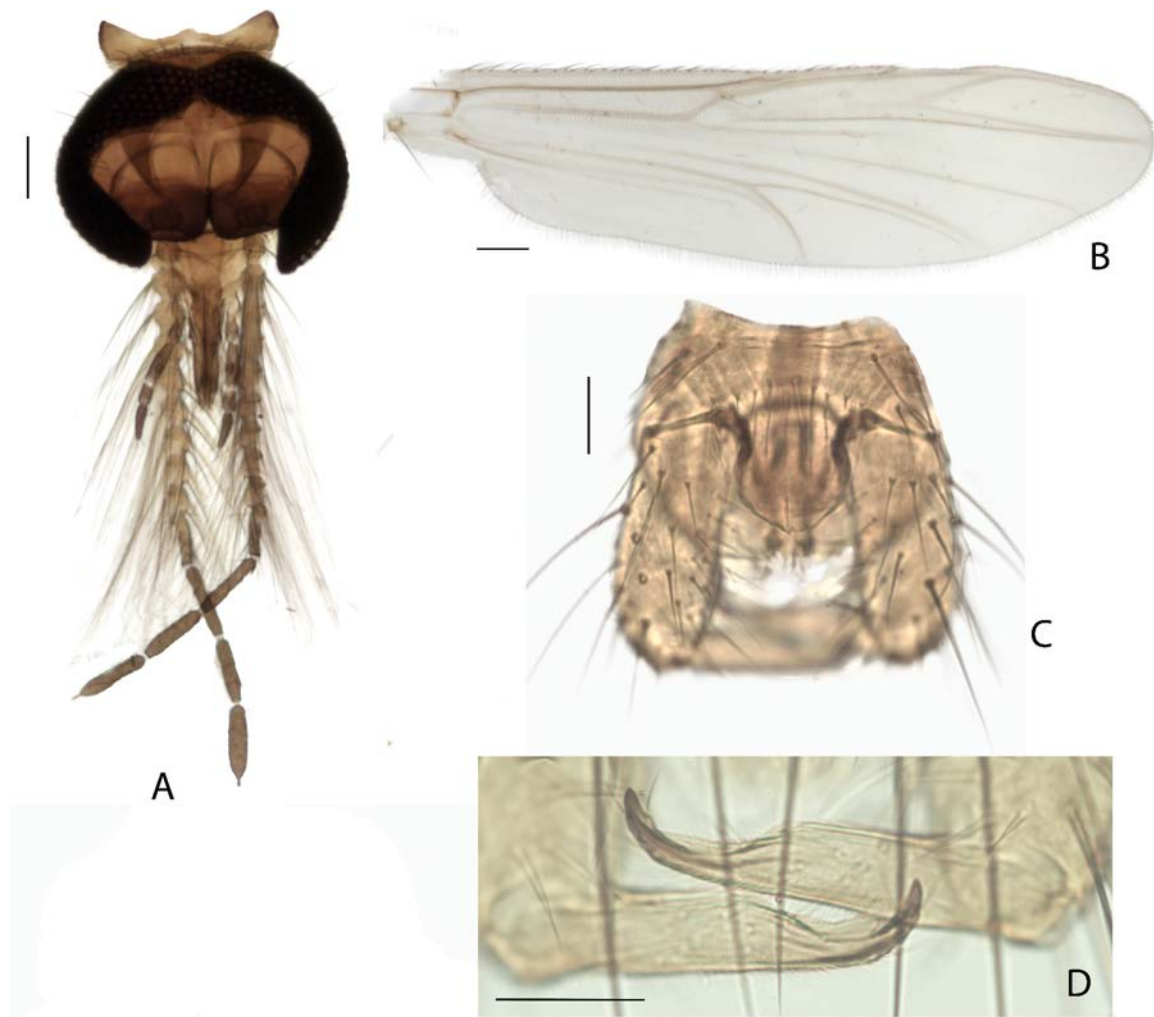
***Atrichopogon woodruffi* n. sp.**

(Figs. 43–45, 49)

**Diagnosis.** Female: only Neotropical species of *Atrichopogon* (*Psilokempia*) with legs light brown with knees heavily dark, and pleurae of abdominal segments 2–7 heavily dark.



**FIGURE 43.** *Atrichopogon woodruffi* n. sp. Female, A. head, frontal view. B. wing. C. abdomen, ventral view. D. abdomen, detail of genital armature, ventral view. Scale bars: A, B, C=0.1 mm; D=0.05 mm.

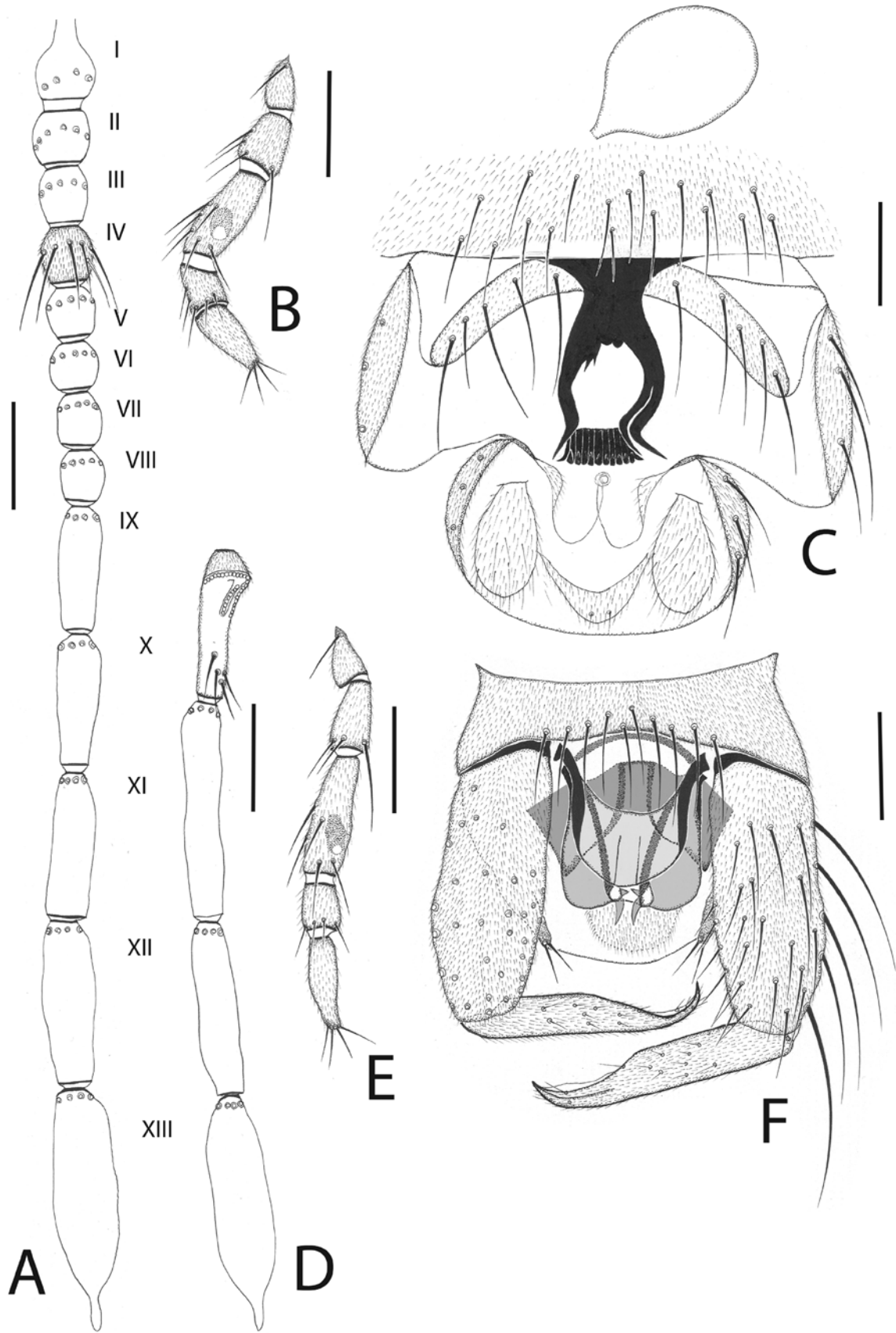


**FIGURE 44.** *Atrichopogon woodruffi* n. sp. Male, A. head, frontal view. B. wing. C. genitalia, ventral view. D. gonostyle, lateral view. Scale bars: A, B=0.1 mm; C, D=0.05 mm.

**Description of female.** Head (Fig. 43A). Light brown. Eyes abutting for length of 3.5 ommatidia. Antenna with pedicel and flagellum dark brown; proportions of flagellomeres as shown in Figs. 43A, 45A; flagellomere 13 with apical nipple constricted basally; AR 1.70–1.85 (1.76, n = 2). Palpus (Figs. 43A, 45B) dark brown; segment 3 with small deep sensory pit opening at midlength; segments 4, 5 closely appressed, its combined length slightly longer than segment 3; segment 5 conical; PR 2.00–2.31 (2.15, n = 2); head width / mouthparts length 1.66 (n = 2). Mandible with 7–8 small teeth at extreme apex.

Thorax. Light brown. Scutum with dark markings forming usual pattern; scutellum light brown, with 4 strong setae; postscutellum dark brown. Paratergite with additional small seta in one specimen. Legs light brown, mid, hind femora darker distally, knees heavily dark, tarsomeres progressively infuscated; apex of hind tibia with 7–9 spines; foreleg TR 3.37–4.12 (3.75, n = 2), midleg TR 3.00–3.50 (3.25, n = 2), hind leg TR 2.90–3.08 (2.99, n = 2). Wing (Fig. 43B) membrane slightly infuscated, with macrotrichia distally in cell  $r_3$ , a few in cell  $m_1$ ; first radial with very narrow lumen, second radial cell nearly 2.5 X longer than first, lumen narrow; wing length 1.16–1.24 (1.20, n = 2) mm; breadth 0.50–0.54 (0.52, n = 2) mm; CR 0.69 (n = 2). Halter whitish.

Abdomen (Fig. 43C). Light brown, pleurae of segments 2–7 heavily dark. Genital armature (Figs. 43D, 45C): sternite 7 trapezoidal, cuticular extensions represented by posteromesal common, 1.5 X longer than broad stem from which arises bifid tuft of 1–2 elongate, convex processes abruptly curved posterolaterally at tip; sternite 8 with anterior margin heavily convex, slightly expanded laterally with 4 pairs of setae, membrane with transversal row of elongate, anteriorly directed finger-like processes; subgenital plate not visible in the available specimens. Spermatheca (Figs. 43C–D, 45C) ovoid with short neck, heavily sclerotized, measuring 98–106 (102, n = 2) by 60–68 (64, n = 2)  $\mu\text{m}$ . Cercus light brown.



**FIGURE 45.** *Atrichopogon woodruffi* n. sp. Female, A–C, Male, D–F. A, D, flagellomeres (I–XIII), lateral view. B, E, palpus, lateral view. C, F, genitalia, ventral view. Scale bars: 0.064 mm.



FIGURE 46. Distribution of *Atrichopogon altivolans* (⊙), *A. aridus* (★), *A. arti* (▲), *A. domizii* (○) and *A. echinoides* (◇).



FIGURE 47. Distribution of *Atrichopogon glaber* (⊙), *A. gordoni* (★), *A. javieri* (▲) and *A. harrisi* (○).



**FIGURE 48.** Distribution of *Atrichopogon insigniventris* (⊙), *A. longirostris* (★), *A. nahuelbutensis* (▲) and *A. pectinatus* (○).



**FIGURE 49.** Distribution of *Atrichopogon penicillatus* (⊙), *A. santaclarae* (★), *A. sergioi* (▲) and *A. woodruffi* (○).

Male. As for female, with following differences:

Head. Antenna (Figs. 44A, 45D) with plume setae well-developed, flagellomeres 2–8 fused, 10–13 deeply darker than 1–9; AR 1.00–1.03 (1.02, n = 3). Palpus (Figs. 44A, 45E) brown; PR 3.00–3.45 (3.18, n = 3). Head width / mouthparts length 1.77–2.00 (1.89, n = 2).

Thorax. Foreleg TR 3.40–3.60 (3.50, n = 3), midleg TR 3.17–3.36 (3.27, n = 3), hind leg TR 2.92–3.08 (3.00, n = 3). Wing (Fig. 44B) with first radial with very narrow lumen, second radial cell 2.4 X longer than first, lumen narrow; wing length 1.36–1.40 (1.38, n = 3) mm; breadth 0.42–0.44 (0.43, n = 3) mm; CR 0.62–0.63 (0.63, n = 3).

Abdomen. Uniformly brown. Genitalia (Figs. 44C, 45F): tergite 9 short, extending to gonocoxite midlength, posterior margin straight; sternite 9 narrow, posterior margin barely visible with 10–12 setae in one or 2 rows. Gonocoxite elongate, 2.9 X longer than its breadth at midlength; gonostylus (Fig. 44D) spoon-shaped, 0.8 length of gonocoxite, nearly straight, distal 1/3 deeply excavated. Gonocoxal apodemes well developed, U-shaped. Parameres stout, hyaline, 1.2 X longer than their basal breadth; lateral margins convex; distal margin rounded, as broad as basal breadth; pair of admedian sclerotized rods extending to distal margin, from which arises pair of slender, recurved, posteriorly directed processes; anterodorsal lobes hyaline, short, extending to midlength of parameres main body, tip blunt. Aedeagus stout, slightly shorter than its basal breadth; basal arch slightly concave, extending to 3/5 of total length; basal arms heavily sclerotized, nearly straight, directed anteriorly; lateral margins gently tapering to broad, finely crenulate tip.

**Distribution.** Dominican Republic, known only from the type locality (Fig. 49).

**Types.** Holotype male, allotype female, Dominican Rep., Barahona prov. Nr Pilipinas, Larimar Mine, 26-VI/7-VII-1992, R.E. Woodruff, black light trap (USNM). Paratypes, 2 males, 1 female, as follows: same data except 1 male, 1 female (MLPA); 1 male (USNM).

**Etymology.** This species is named after Dr. R. E. Woodruff, Coleoptera specialist, in recognition of his continuous interest in collecting ceratopogonids.

**Taxonomic discussion.** Males and females were collected at the same locality and date.

The light brown legs with knees heavily dark, and the pleurae of the abdominal segments 2–7 heavily dark readily distinguish this new species from other Neotropical species of the subgenus, except *A. echinodes*, a species known only from females. However, *A. echinodes* is easily distinguished from this new species by the genital armature restricted to a V-shaped fringe of stout, posteriorly directed spines on the sternite 8.

The males of *A. woodruffi* n. sp. resembles *A. gordonii*, but in the latter species the posterior margin of sternite 9 bears a single row of 5–6 setae, the parameres are sclerotized, and the basal arch of the aedeagus is nearly straight and extends to 1/4 of total length. The females of *A. gordonii* can be distinguished from *A. woodruffi* by the processes arising from the posteromesal common stem of sternite 7 arranged in a comb of 5–6 stout, elongate, nearly straight processes, the sternite 8 expanded posterolaterally in the manner of triangular, tooth-like, sclerotized projections, and by the largest subspherical to ovoid spermatheca.

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