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A new species of the predaceous midge genus *Brachypogon* Kieffer from the Neotropical Region and first description of the female of *Brachypogon (Isohelea) cuacuahuitlus* Huerta & Borkent (Diptera: Ceratopogonidae)

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Abstract

The predaceous midge genus *Brachypogon* Kieffer is presently known in Mexico by *Brachypogon (Brachypogon) fuscivenosus* (Lutz, 1914), *B. (B.) bimaculatus* Spinelli & Grogan, 1998, *B. (B.) woodruffi* Spinelli & Grogan, 1998 and *B. (Isohelea) cuacuahuitlus* Huerta & Borkent, 2005. In this contribution a new species, *Brachypogon (Brachypogon) ginue*, is described and illustrated from a male specimen collected in Tlanchinol, State of Hidalgo, Mexico. This new species belongs to the *impar* species group. The first description of the female of *Brachypogon (Isohelea) cuacuahuitlus* Huerta & Borkent is also provided.

Key words: Diptera, Ceratopogonidae, Mexico, *Brachypogon*, new species, Neotropical region

Introduction

The predaceous midge genus *Brachypogon* Kieffer, worldwide in distribution, is currently known by 200 extant species (Borkent, 2015). Borkent & Grogan (2009) listed six species of *Brachypogon* in the Nearctic region, with an additional new species and records from Alabama and Florida (Swanson & Grogan, 2011). Borkent & Spinelli (2007) listed 25 species in the Neotropics, with 18 species included in the subgenus *Brachypogon* Kieffer (s. st.) and 7 species in the subgenus *Isohelea* Kieffer, and Grogan *et al.* (2013) provided new records for the islands of the Guadeloupe archipelago. Finally, two more species were tentatively identified as members of *Brachypogon s. st.*, although not exactly fitting in any of the recognized subgenera (Spinelli *et al.* 2013).

Otherwise, the genus is poorly known in Mexico, with only four recorded species: *Brachypogon (Brachypogon) fuscivenosus* (Lutz, 1914), *B. (B.) bimaculatus* Spinelli & Grogan, 1998, *B. (B.) woodruffi* Spinelli & Grogan, 1998 and *B. (Isohelea) cuacuahuitlus* Huerta & Borkent, 2005. In this paper we describe a new species of the subgenus *Brachypogon (Brachypogon)*, providing as well the first description of the female of *Brachypogon (Isohelea) cuacuahuitlus*.

Material and methods

All specimens were preserved in 70% ethanol and subsequently cleared, dissected and mounted on microscope slides by the techniques described by Borkent & Spinelli (2007) except for the specimens mounting with Euparal. Illustrations were prepared with the aid of a drawing tube attached to a compound microscope. Morphological terms are those in the Manual of Central American Diptera (Brown *et al.* 2009, Borkent *et al.* 2009).

The type material was deposited in the Collection of Arthropods with Medical Importance, Mexico City (CAIM).

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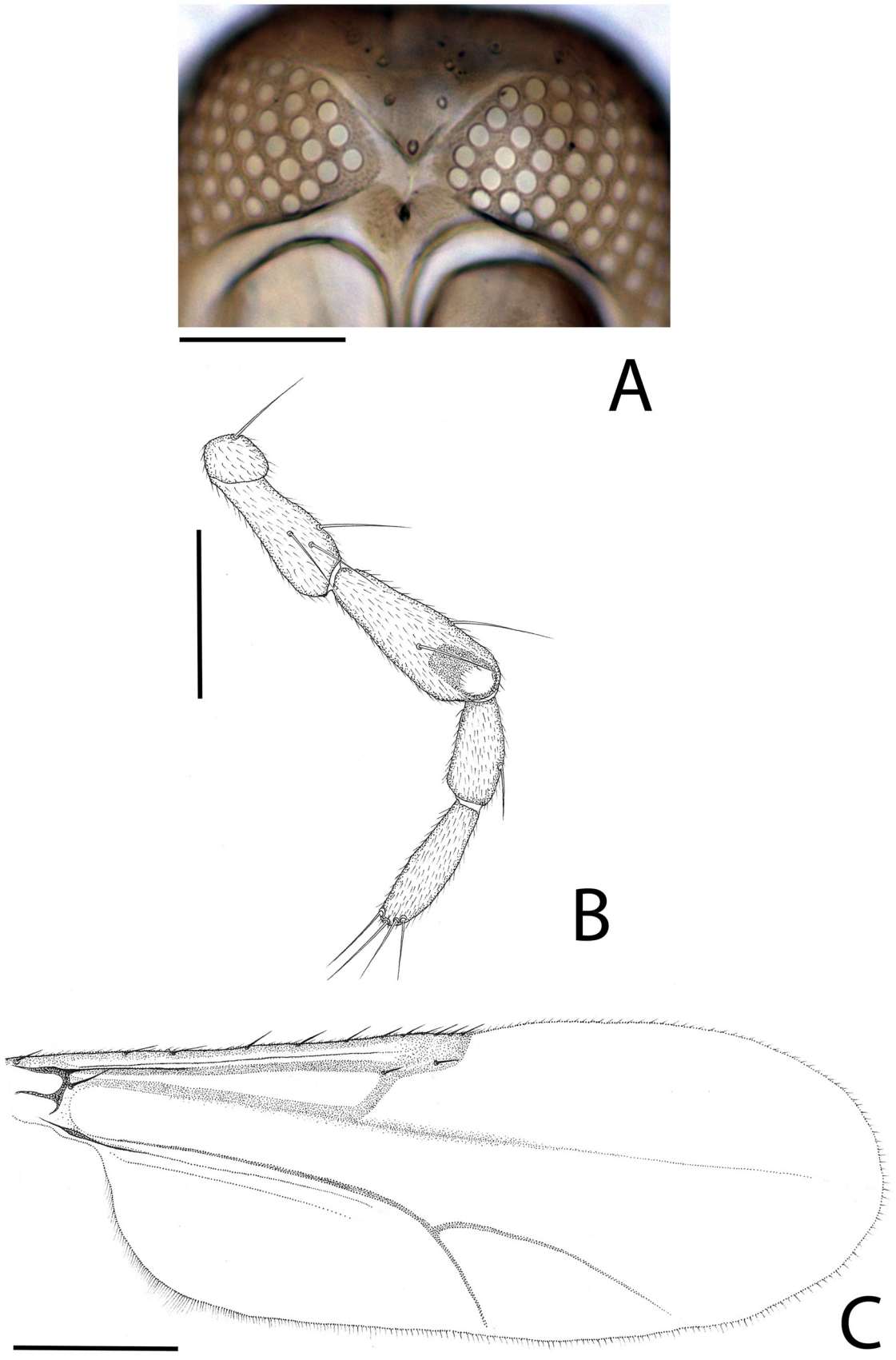

FIGURE 1. Male. Head. *Brachypogon (Brachypogon) ginue* **n. sp.** A. Head, eyes separation, frontal view. B. Palpus, lateral view. C. Wing. Scale bar: A=0.05, B= 0.04 mm, C=0.16 mm.

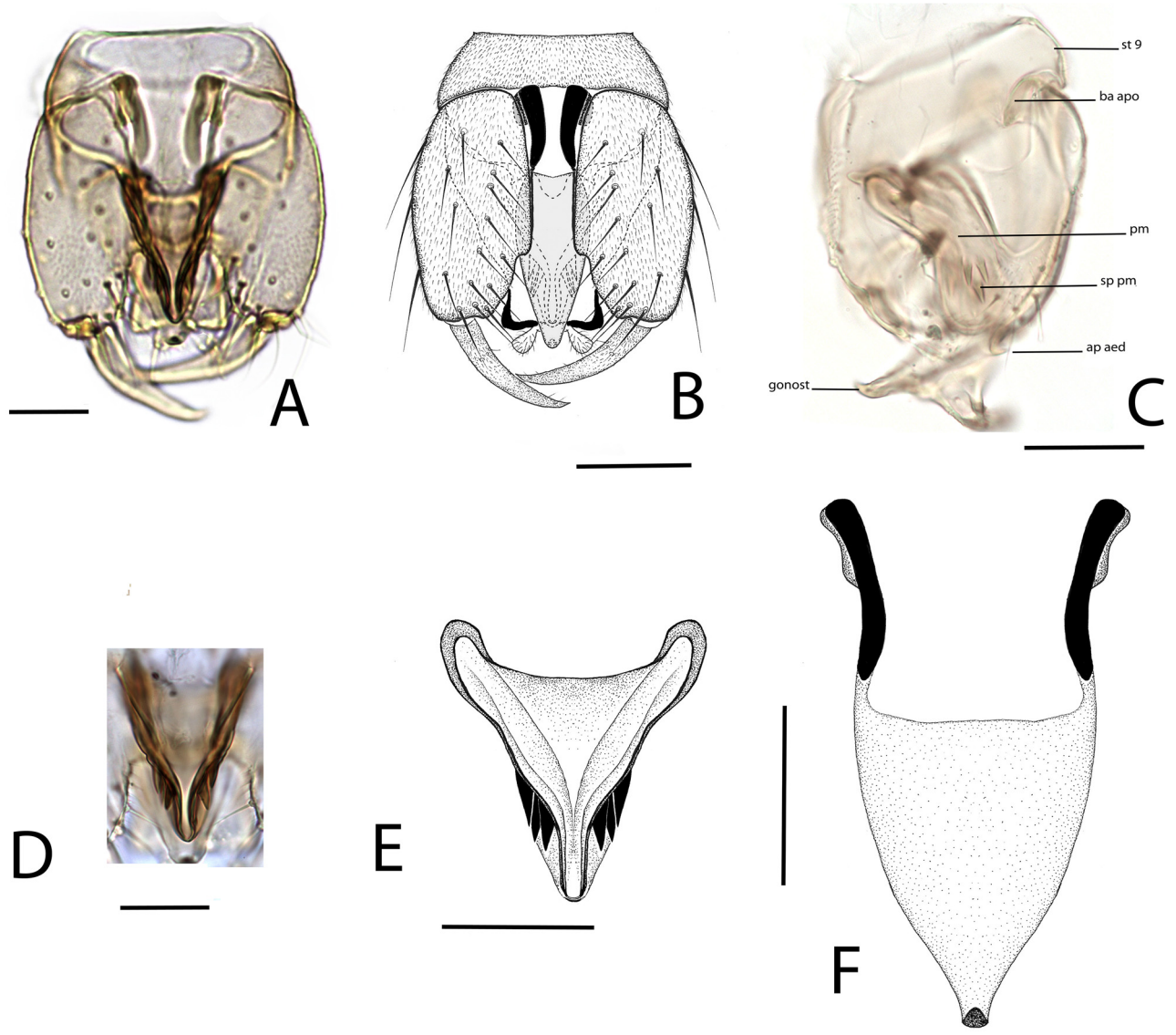

FIGURE 2. Male genitalia, *Brachypogon (Brachypogon) ginue* **n. sp.** A, B (ventral view); C (lateral view); D, E, paramere (ventral view), F, aedeagus (ventral view). Scale bar: A= 0.1 mm, B=0.064 mm, C=0.05 mm, D= 0.025 mm, E, F= 0.04 mm. Legends: apex of aedeagus (ap aed), basal apodeme (ba apo), gonostylus (gonost), paramere (pm), spines of paramere (sp pm), sternite 9 (st 9).

Taxonomy

***Brachypogon (Brachypogon) ginue* new species**
(Figs 1–2, 5)

Diagnosis. Male: Only Neotropical species of *Brachypogon (Brachypogon*) with the paramere bearing three subapical, stout, sclerotized spines. Female unknown.

Description. Male. Head (Fig. 1A) dark brown. Eyes with numerous interfacetal spicules, broadly separated medially. Antennal flagellum with dense plume, brown; flagellomere 1 with three apical sensilla coeloconica; flagellomeres 2–11 indistinctly separated; flagellomeres 11–13 longer than preceeding flagellomeres; AR 0.75. Palpus (Fig. 1B) pale brown; third segment slender, shorter than 4+5, with broad, deep, subapical sensory pit; palpal ratio 2.70. Mouthparts small, clypeus with two subbasal, two apical setae.

Thorax. Uniformly dark brown. Scutum sparsely covered with minute setae. Scutellum with four setae, two mesal, two lateral; katepisternum with one slender seta. Legs entirely dark brown; hind tibial comb with 8 spines,

two short spurs. Foreleg TR 1.75, midleg TR 1.96, hindleg TR 1.75; tarsomeres 4 subcylindrical; tarsal claws small, equal in all legs.

Wing (Fig. 1C) length 0.85 mm, width 0.34 mm, CR 0.47. Membrane hyaline, without marginal macrotrichia in r3, stigma and anterior veins pale brown; radial cells obsolete; costa with 2 basal setae and row of 12 marginal setae, radius with 1 seta immediately distal to basal arculus, and 1 at tip of stigma; r-m crossvein oblique; M_2 absent; veins M1, CuA1, CuA2 obsolete at wing margin. Halter whitish.

Abdomen. Dark brown. Genitalia (Fig. 2): Tergite 9 broad, tapering gradually, apex truncated, proctiger large, quadrate, weakly sclerotized, with anterior margin notched; sternite 9 narrow, rectangular, about 5 times as broad as long, posterior margin transverse. Gonocoxite moderately long, stout, 1.8X longer than width, narrowed at 3/4 of total length; gonostylus slender, 0.62 as long as gonocoxite, slightly curved, tip pointed. Paramere (Figs 2A–E) triangular, sclerotized, anterior margin broad, U-shaped, tapering, with three subapical, stout, sclerotized spines, apex pointed extending to level of posterior margin of segment 10. Aedeagus (Fig. 2A,B, F) hyaline, triangular, basal apodeme abruptly bent ventrally, lateral arms slightly curved, heavily sclerotized to the level of basal arch, basal arch nearly straight, extending to 0.4 of total length, distal portion stout, triangular, produced beyond the distal level of gonocoxites by a short distance, narrow apex folded.

Female. Unknown.

Taxonomic discussion. This new species belongs to the *impar* group, typically with unadorned wing and vein M2 absent. This new species keys out to couplet 24 in Spinelli & Grogan (1998), where *B. insularis* Spinelli & Grogan from Cuba and *B. ecuadorensis* Spinelli & Grogan from Belize to Ecuador and northern Brazil are recognized. However, in these two species the gonocoxite is not narrowed at ¾ of its total length, the aedeagus exhibits conspicuous longitudinal wrinkles and the paramere lack the subapical sclerotized spines.

Type material. Holotype male, MEXICO, Hidalgo, Tlanchinol, km 3.5 carretera Tlanchinol-Apantlazol, bosque mesofilo de montaña, 20°59´16´´ N, 98°´39´36´´W, Altura 1540 msnm, 3–6-July-1997, Malaise trap, Coll. Blackaller, J., Pérez, A., Sánchez, B., (CAIM). Paratype, 1 male, same data of holotype.

Etymology. This name is derived from the Otomi language, from the State of Hidalgo. Ginue literally means "fly".

Distribution. Mexico, known only from the type locality (Fig. 5).

Brachypogon (Isohelea) cuacuahuitlus Huerta & Borkent
(Figs 3–5)

Brachypogon (Isohelea) cuacuahuitlus Huerta & Borkent, 2005. *Folia Entomológica Mexicana*, 44 (Supl. 1):115 (male, figs: palpus, antenna, wing, male genitalia, aedeagus). Borkent & Spinelli, 2007:79 (in Catalog of the Ceratopogonidae of the Neotropical Region); Borkent, 2015:118 (in online World catalog of biting midges).

Description. Female. Head dark brown. Eyes with interfacetal spicules, abutting medially for length of 4–5 ommatidia (Fig. 3A). Clypeus with three pairs of lateral setae. Scape with two setae; pedicel dark brown, flagellum entirely pale brown, with 13 flagellomeres (Fig. 3B); flagellomeres 2–8 almost as long as broad, 9–13 elongate, approximately two X longer than broad, AR 1.09; flagellomere 1 with five apical sensilla coeloconica. Palpus (Fig. 3C) brown, third segment stout, with subapical, shallow sensory pit; fourth segment with one seta; PR 1.33. Mandible with 9–10 apical teeth.

Thorax. Uniformly dark brown. Scutellum with four setae, katepisternum with one slender seta. Legs brown, tarsi paler; hind tibial comb with 6 spines; foreleg TR 2.2, midleg TR 2.1, hind leg TR 2.5; tarsomeres 4 subcylindrical; tarsal claws with internal basal teeth, unequal and longer in foreleg, equal and short in mid-, hind legs. Wing (Fig. 4A) length 0.73 mm, width 0.32 mm, CR 0.61; membrane slightly infuscated; macrotrichia present in margin of cells r3, m1, m2, cua1 and anal; two radial cells, each with very narrow lumen; radial veins, M thick, pale brown; costa with row of 23 marginal setae, base of R_1 with 4 setae, R_3 with 2 setae, M_2 not visible. Halter pale brown.

Abdomen (Fig. 4B). Dark brown. Sternite 8 separated medially, each portion stout, quadrangular; sternite 9 sinuate; sternite 10 triangular with one pair of setae. Two ovoid spermathecae (Fig. 4C) with well-developed necks, measuring 0.05 X 0.042 mm and 0.042 X 0.037 mm.

Distribution. Mexico (Jalisco, Biology Station of Chamela) (Fig. 5).

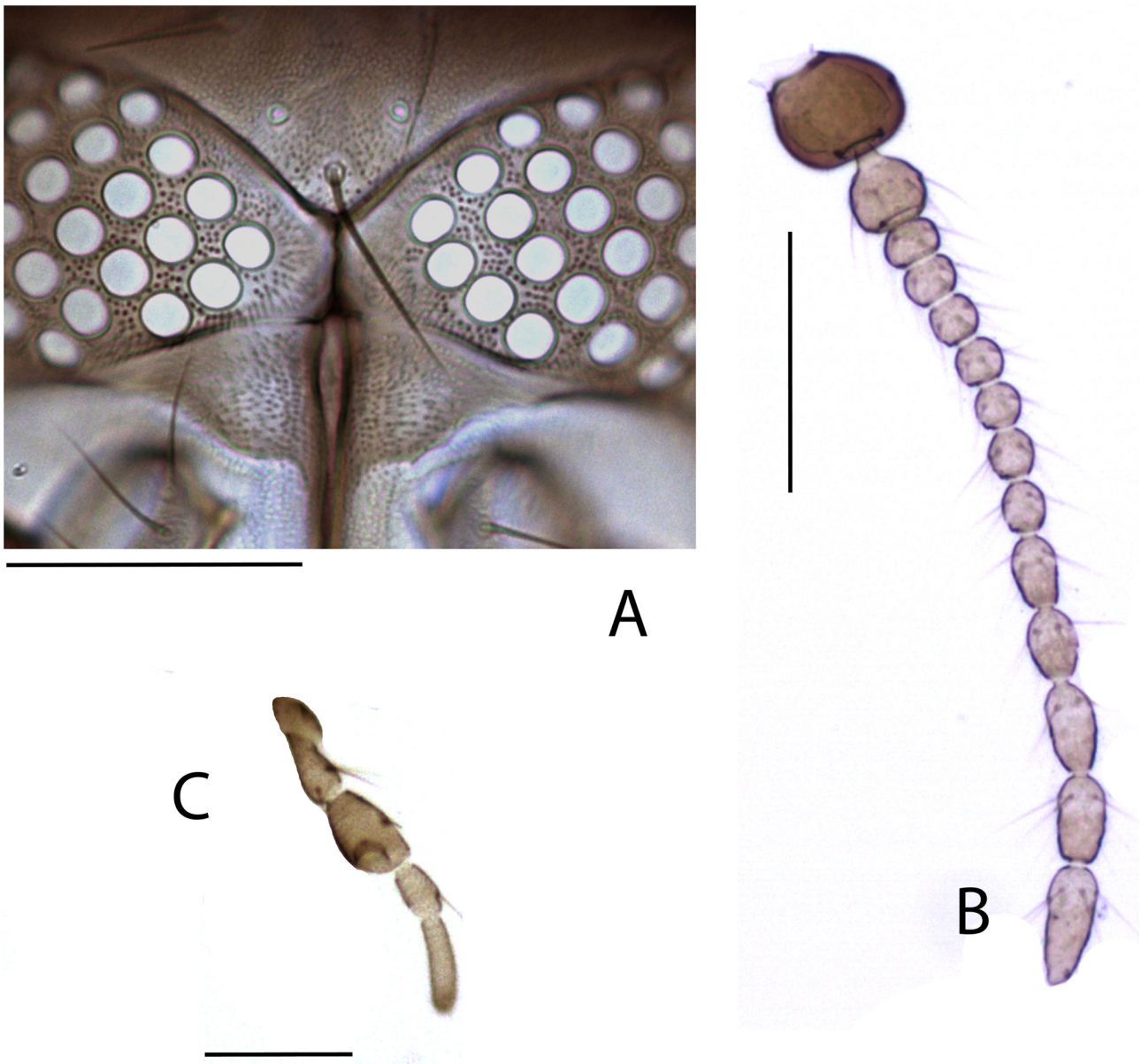

FIGURE 3. Female. Head. *Brachypogon (Isohelea) cuacuahuitlus* Huerta &Borkent. A. Head, eyes separation, frontal view. B. Antennal flagellomeres, lateral view. C. Palpus, lateral view. Scale bar: A=0.05, B, C= 0.1 mm.

Taxonomic discussion. Females and males were collected in the same date and locality. This species keys out to couplet 6 in Spinelli & Cazorla (2004), where *B. wirthi* Spinelli (1990) from northwestern Argentina and *B. pallidipennis* Spinelli & Grogan (1994) from Honduras are recognized. However, in *B. wirthi* the stigma is yellowish and the spermathecae are equal-sized, and in *B. pallidipennis* all tarsal claws are unequal-sized, the second radial cell is minute and the spermathecae necks are deeply oblique.

Material examined. 8 females, 5 males. (Slide mounted), Mexico, Jalisco, Station Biological of Chamela, 19°29′54′′ N, 105°02′41′′W, 5–7 july-1993, Malaise Trap, Coll. Wharton & Sharkey.

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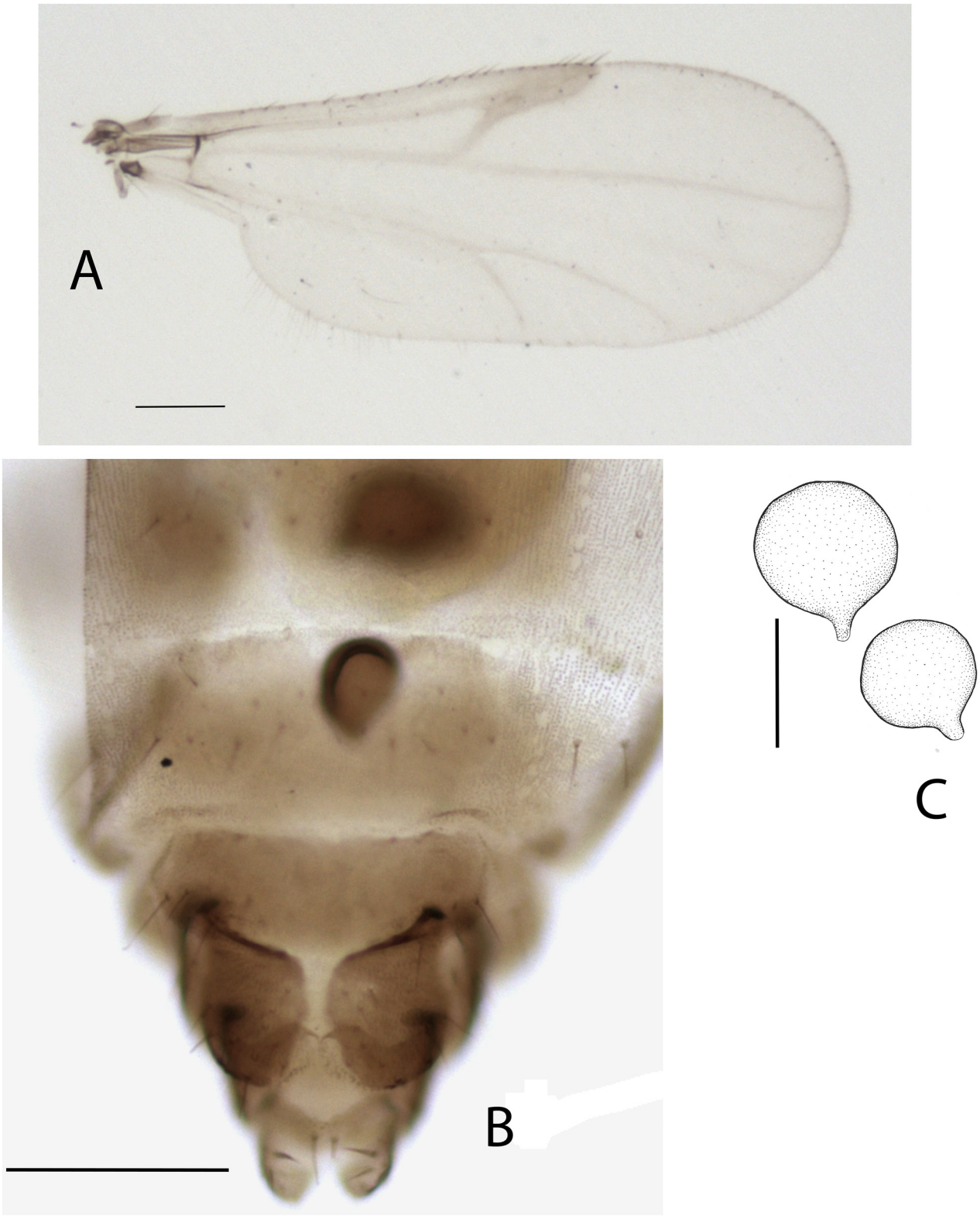

FIGURE 4. Female. *Brachypogon (Isohelea) cuacuahuitlus* Huerta & Borkent. A. Wing. B. Last abdominal segments (ventral view), C. Spermathecae. Scale bar: A, B= 0.1 mm, C=0.04 mm.

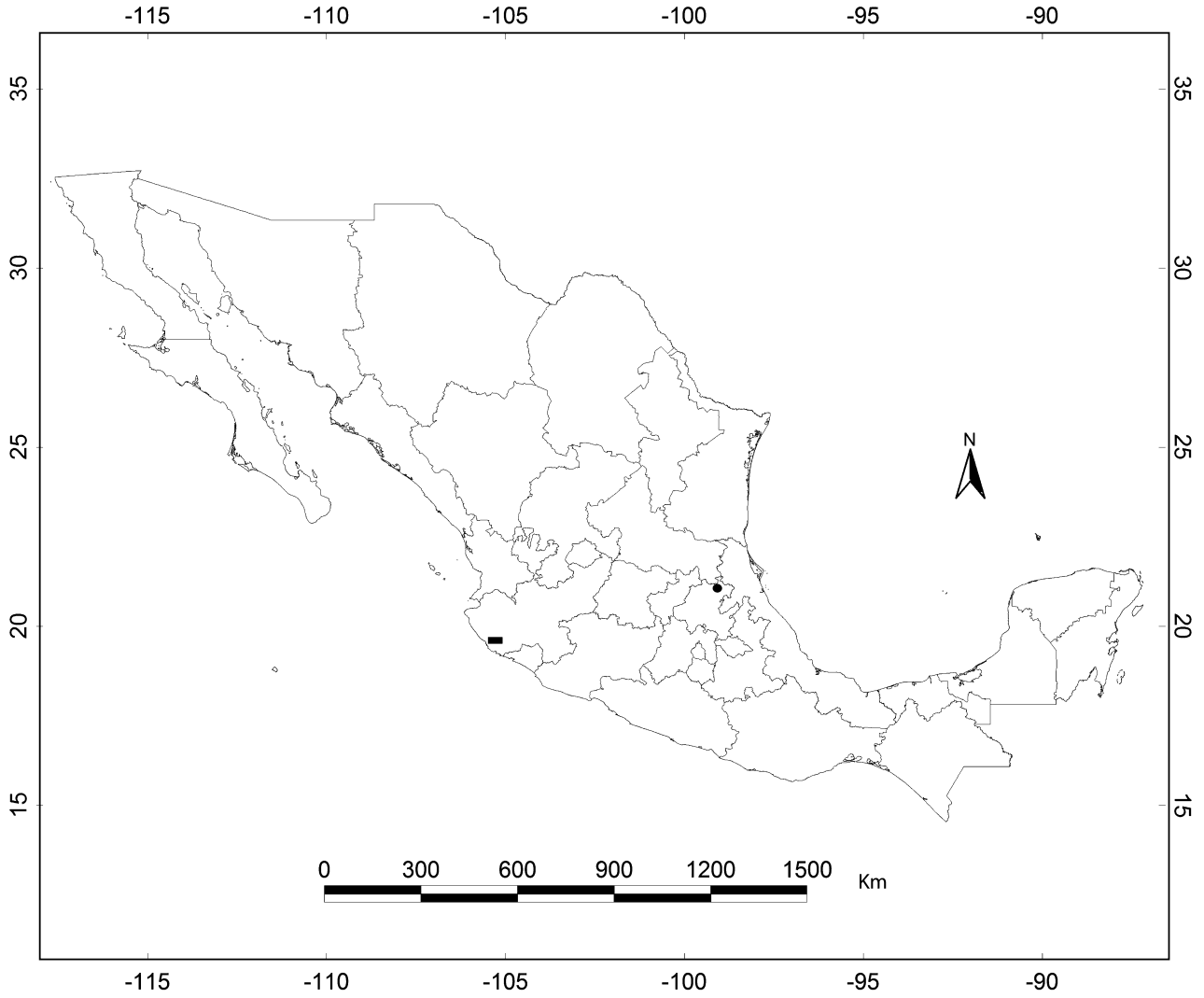

FIGURE 5. Distribution of *Brachypogon (Brachypogon) ginue* **sp. nov.** (black circle)*, Brachypogon (Isohelea) cuacuahuitlus* Huerta & Borkent (black rectangle).

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