



## Two new peculiar species of Neotropical *Brachypogon* Kieffer (Diptera: Ceratopogonidae)

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### Abstract

*Brachypogon biradialis* from southern Argentina and Chile and *Brachypogon tico* from Costa Rica, are described and illustrated from female specimens. They are provisionally placed in the genus *Brachypogon* although not exactly fitting in any of the already recognized subgenera of this genus.

**Key words:** *Brachypogon*, new species, Neotropical region, taxonomy

### Resumen

Sobre la base de ejemplares hembra, se describen e ilustran a *Brachypogon biradialis* del sur de la Argentina y Chile y *Brachypogon tico* de Costa Rica. Ellas se ubican provisionalmente en el género *Brachypogon*, a pesar de no ajustarse exactamente a ninguno de los subgéneros que actualmente se reconocen.

### Introduction

The genus *Brachypogon* Kieffer includes small to minute predaceous midges. Immatures are aquatic and semiaquatic and are found in mud or wet sand on the margins of ponds and streams or in fens and bogs (Spinelli & Marino, 2008). The genus is placed in the tribe Ceratopogonini of the subfamily Ceratopogoninae (Borkent & Spinelli, 2007), and three subgenera are currently recognized (Borkent, 2013). Two of them are widespread, *Brachypogon* Kieffer s. str. with 113 species (including five Miocene or Eocene fossils) and *Isohelea* Kieffer with 86 species (including five Miocene or Eocene fossils); the third subgenus, *Sarissohelea* Debenham is presently known as five species from Indonesia, Solomon Islands, Papua New Guinea and Western Samoa. There are another three from the Canary Islands which are unplaced because they are poorly known.

During our study of the ceratopogonids from southern Argentina and Chile and Costa Rica, two species tentatively identified as members of *Brachypogon* were found, although not exactly fitting in any of the recognized subgenera. The purpose of this contribution is to describe and illustrate these two peculiar species.

### Material and methods

Specimens are deposited in the following collections:

CNCI Canadian National collection of Insects, Ottawa, Ontario, Canada.

MLP Museo de La Plata, La Plata, Argentina.  
INBC Instituto Nacional de Biodiversidad, Santo Domingo de Heredia, Heredia, Costa Rica.

Specimens from CNCI and INBC were slide mounted in Canada balsam using the technique described by Borkent & Spinelli (2007) and the one from the MLP using the technique of Wirth & Marston (1968). They were examined and measured using a binocular compound microscope Leica DM1000, and photographed with a Leica digital camera coupled to the compound microscope.

Terms for structures follow those used in the Manual of Central American Diptera (Brown et al., 2009). The JAD numbers on some specimens refer to the collecting notes made by J.A. Downes and housed in the CNCI.

## Taxonomy

### *Brachypogon biradialis* n. sp.

(Figs. 1–7, 16)

**Diagnosis.** Female: only species of *Brachypogon* with the wing exhibiting two elongate radial cells with narrow lumen and cell  $r_3$  with a forked intercalary vein. Male: unknown.

**Description.** Female. Head (Fig. 1) dark brown. Eyes with interfacetal spicules, broadly separated medially. Clypeus with 4–5 pairs of lateral setae. Antenna moniliform; scape with two setae; flagellum entirely dark brown, with 13 flagellomeres; flagellomeres 1–3 slightly broader than long, 4–8 as long as broad, 9–13 slightly longer than broad, AR 0.74–0.80 (0.77, n=4); flagellomere 1 with 1–3 apical sensilla coeloconica. Palpus paler than flagellum; segment 3 short, swollen, with subapical, deep sensory pit; fourth segment with 2 setae; PR 0.92–1.21 (1.10, n=4). Mandible with 5 apical teeth, preceded by 2–3 minute denticles.

Thorax (Fig. 2). Uniformly dark brown. Scutellum with six setae; katepisternum with one slender seta (Fig. 3). Legs entirely dark brown; hind tibial comb with 9 spines; foreleg TR 2.96–3.23 (3.06, n=4), midleg TR 2.30–3.00 (2.72, n=4), hind leg TR 2.14–2.33 (2.26, n=4); tarsomeres 4 subcylindrical; tarsal claws with short internal basal teeth, unequal and longer in foreleg (Fig. 4), small and equal in mid-, hind legs. Wing (Fig. 5) length 0.79–0.89 (0.83, n=4) mm, width 0.37–0.40 (0.38, n=4) mm, CR 0.58 (n=4); two elongate radial cells with narrow lumen, first one slightly longer than second; radial veins thick; costa,  $R_1$ ,  $R_3$  with black, stout setae;  $r_3$  with forked intercalary vein; distal portion of  $M_2$  visible; membrane infuscated, with marginal macrotrichia in  $r_3$ ,  $m_1$ ,  $m_2$  in holotype, more abundant and also few in  $cua_1$  in paratypes. Halter whitish.

Abdomen (Fig. 6). Dark brown. Sternite 8 entire, with broadly V-shaped posteromedian excavation; sternite 9 divided medially, each portion deeply excavated caudomedially; sternite 10 with 2 pairs of setae, anterior pair minute, posterior pair elongate, slender. Two ovoid spermatheca (Fig. 7), both with short, broad neck; unequal in length, measuring 50–56 (53, n=4) by 42–47 (44, n=4)  $\mu\text{m}$ , and 45–52 (48, n=4) by 33–45 (40, n=4)  $\mu\text{m}$ ; rudimentary third spermatheca present.

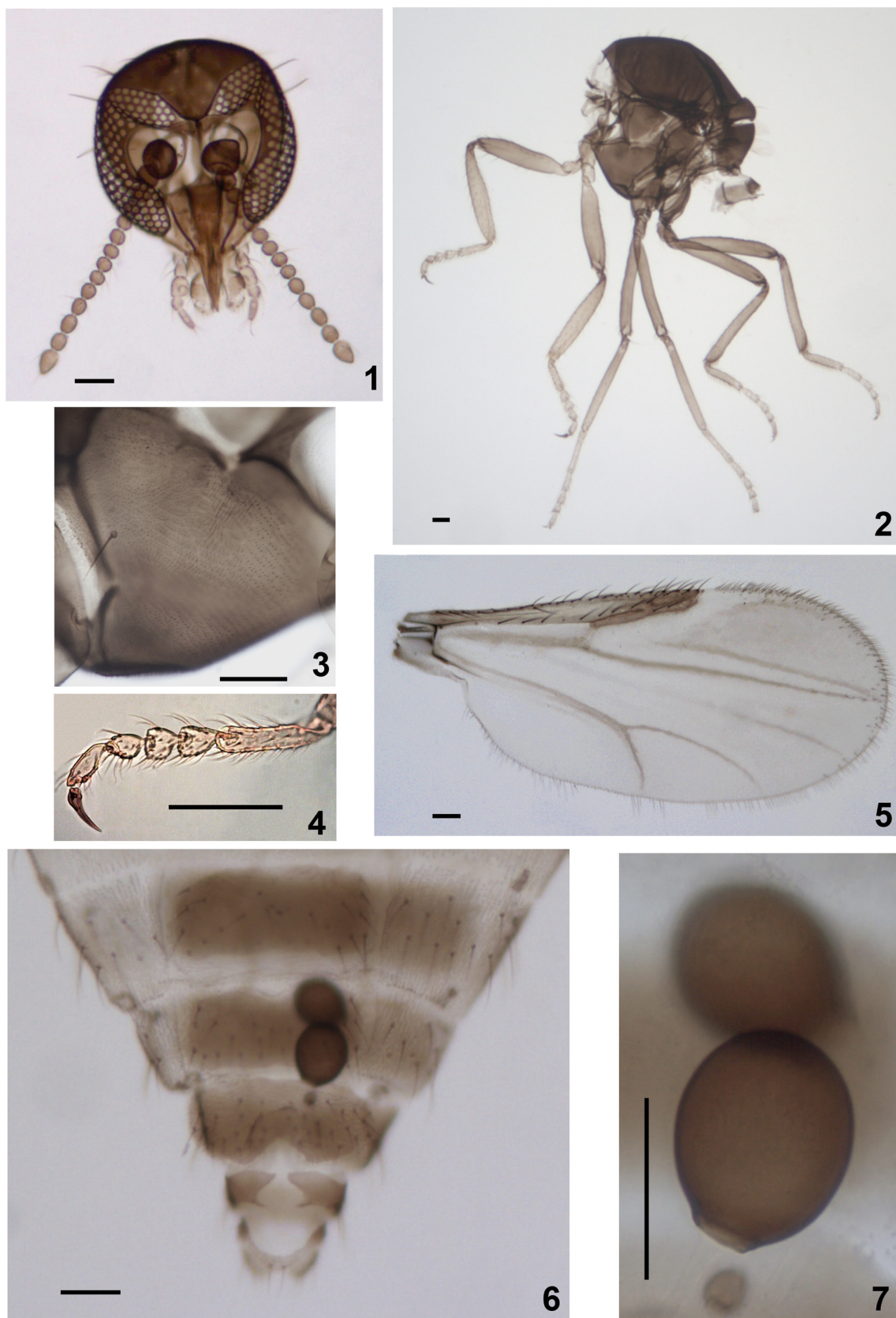
Male. Unknown.

**Distribution.** Subantarctic Chile (approximately 38 °S), Argentina (Somuncurá plateau, in Río Negro province) (Fig. 16). The paratype from 34 km S. Collipulli was collected near a stream in a woodland setting and that from Conguillo National Park was collected from an *Araucaria/Nothofagus* forest.

**Taxonomic discussion.** The wing of this species resembles those of species of *Borkenthelea* Spinelli & Grogan, except for the presence of a forked intercalary vein in cell  $r_3$ . However, *Borkenthelea* spp. differs by having eyes contiguous medially, flagellomeres elongated and the katepisternum devoid of setae.

**Type material.** Holotype female, labeled “Argentina, Río Negro, Chipauquil (puesto policial), 40°57'41.1”S, 66°38'20.8”W, 481m, 4-XII-2006, G. Spinelli, aerial net” (MLP). Paratypes, 3 females from Chile, as follows: 34 km S Collipulli, 23-XII-1984, J.A. Downes, JAD 1678/1/18 (CNCI); nr. Nahuelbuta, 24-XII-1984, J.A. Downes, JAD 1680/1/5 (CNCI); Conguillo National Park, 1150 m, 4/5-II-1988, L. Masner, Malaise trap, CD 896 (CNCI).

Derivation of specific epithet. The name *biradialis* (two radials) refers to the two distinctive narrow radial cells of this species.



**FIGURES 1–7.** *Brachypogon biradialis* n. sp., female. 1—head, in anterior view; 2—thorax, in lateral view; 3—katepisternum, in lateral view; 4—foretarsus, in anterior view; 5—wing; 6—abdominal segments 6–10, in ventral view; 7—spermathecae, in ventral view.



***Brachypogon tico* n. sp.**

(Figs. 8–15, 17)

**Diagnosis.** Female: only species of *Brachypogon* with the wing exhibiting a single radial cell with a broad lumen. Male: unknown.

**Description.** Female. Head (Fig. 8) dark brown. Eyes with interfacetal spicules, abutting medially for length of two ommatidia (Fig. 9). Clypeus with two pairs of lateral setae. Antennal scape with 7–8 setae; pedicel dark brown, flagellum entirely pale brown, with 13 flagellomeres; flagellomeres 2–8 almost as long as broad, 9–13 elongate, approximately two X longer than broad, AR 1.03; flagellomere 1 with five apical sensilla coeloconica (Fig. 10). Palpus (Fig. 11) brown, third segment stout, with subapical, shallow sensory pit; fourth segment with one seta; PR 1.85. Mandible with 9 apical teeth.

Thorax (Fig. 12). Uniformly dark brown. Scutellum with four setae, katapisternum with two slender setae. Legs dark brown, mid-, hind tibia with subbasal pale rings, tarsi paler except tarsomere 1 of hind leg; hind tibial comb with 8 spines; foreleg TR 2.00, midleg TR 2.32, hind leg TR 2.38; tarsomeres 4 subcylindrical; tarsal claws with internal basal teeth, unequal and longer in foreleg (Fig. 13), equal and short in mid-, hind legs. Wing (Fig. 14) length 0.67 mm, width 0.33 mm, CR 0.78; membrane hyaline; one radial cell with broad lumen; radial veins, M thick, pale brown; costa with row of setae, most arranged in pairs, basal half of  $R_1$  with 4 setae,  $R_2$  with minute seta,  $R_3$  with 2 setae, one minute on its midlength, subapical one elongate;  $M_2$  not visible. Halter brown.

Abdomen (Fig. 15). Dark brown. Sternite 8 divided medially, each half of sternite 9 deeply excavated posteromedially; sternite 10 with 2 pairs of setae, anterior pair minute, posterior pair elongate, slender. One ovoid spermatheca with well developed neck, measuring 65 by 46  $\mu\text{m}$ .

Male. Unknown.

**Distribution.** Costa Rica, known only from the type-locality (Fig. 17).

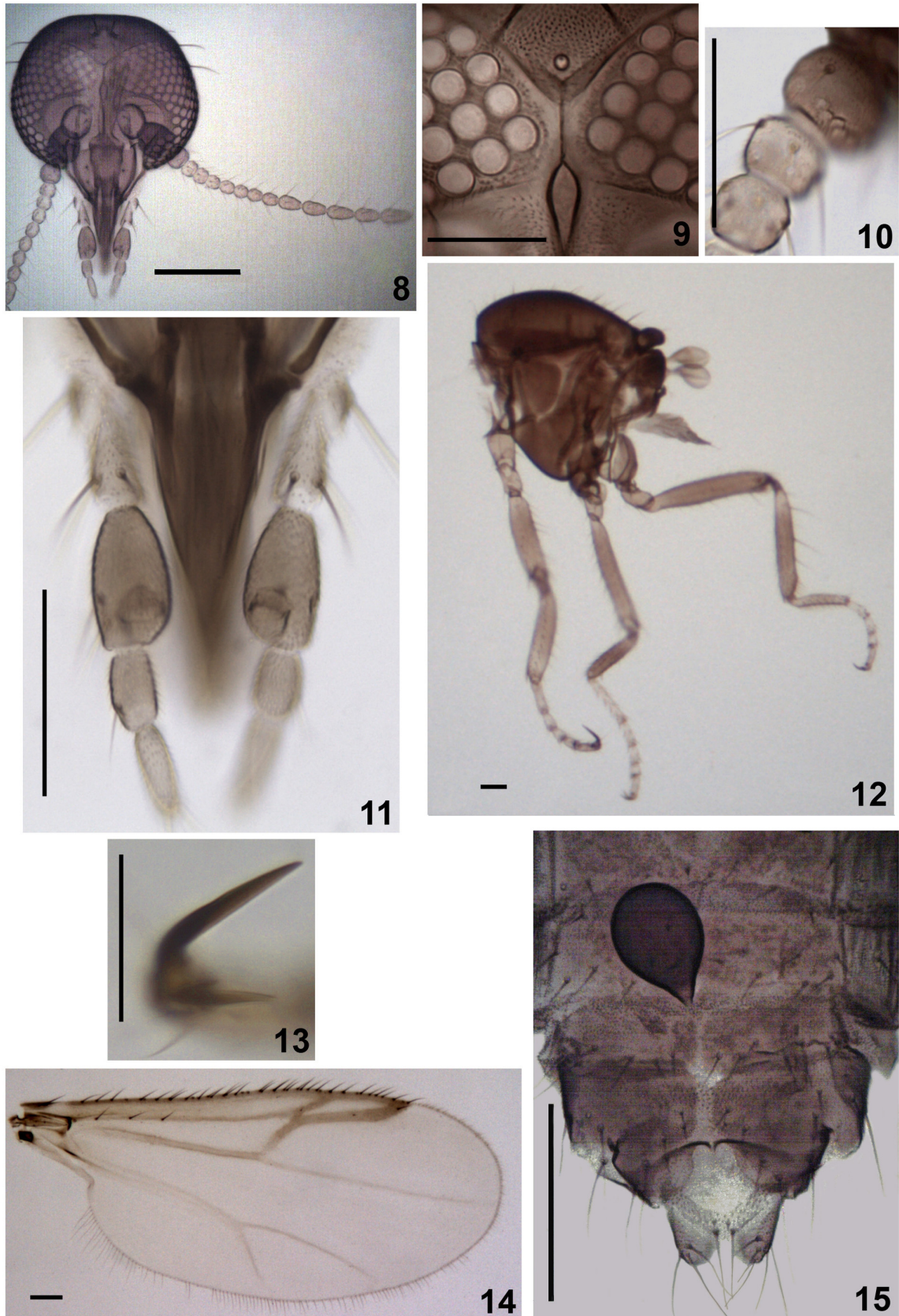
**Taxonomic discussion.** The wing with one well developed radial cell with broad lumen is enough to distinguish this new species from all congeners worldwide.

**Type material.** Holotype female, labeled “Costa Rica, Prov. Alajuela, San Carlos, Boca Tapada, Laguna Lagarto Lodge, 50–100m, 23-VI/23-VII-2004, B. Hernández, Malaise, LN 296095 516714, # 77931” (INBC).

Derivation of specific epithet. A reference to the nickname given to the inhabitants of Costa Rica.

**Conclusions**

The two new species herein described are provisionally included in *Brachypogon*, one of the few genera of the tribe Ceratopogonini with the katapisternum bearing one or more setae (and a synapomorphy of this group of genera). Neither fits into any of the three subgenera as presently understood. The generic diagnosis provided by Wirth & Grogan (1988), as well as those of the subgenera *Brachypogon* (*Brachypogon*) and *Brachypogon* (*Isohelea*) by the same authors and the subgenus *Brachypogon* (*Sarissohelea*) by Debenham (1991) clearly indicate that some characters are highly variable, e.g., eyes contiguous or separate medially; presence of 11–13 flagellomeres; 0–2 distal setae in the fourth palpal segment; female claws small to moderately long, subequal to unequal, usually with basal inner teeth, and often also with basal outer teeth; fourth tarsomeres cylindrical, subcylindrical or cordiform; wing with radial cells often completely obsolete or varying from a single complete first or second radial cell or with both present (but reduced); wing membrane with or without macrotrichia; vein  $M_2$  absent or present and with an obsolete base, 1 or 2 spermathecae. On the other hand, a few characters are present in all species of the genus, e.g., the flagellomere 1 with distal sensilla coeloconica, palpus 5-segmented, and katapisternum with one or two setae. Three other New World genera have setae on the katapisternum: *Ceratoculicoides* Wirth & Ratanaworabhan, easily recognized by the anepisternum with at least one seta on its posterior margin and the presence of a distinctive patch of short sensilla situated in shallow pits on the scutum (Huerta & Borkent, 2005); *Nannohelea* Grogan & Wirth, with the palpus 3-segmented and flagellomere 1 without sensilla coeloconica (Wirth & Grogan, 1988); and *Rhynchohelea* Wirth & Blanton, characterized by the female labium stout, truncate, and bearing apical hook-like structures and a wing with both radial cells not formed and a short costa (male unknown) (Wirth & Grogan, 1988). Moreover, the females of these three genera have the tarsal claws lacking basal inner teeth.



**FIGURES 8–15.** *Brachypogon tico* n. sp., female. 8—head, in anterior view; 9—eyes, ventromesal view; 10—flagellomeres 1–3; 11—proboscis, in anterior view; 12—thorax, in lateral view; 13—tarsal claws of foreleg, on ventral view; 14—wing; 15—abdominal segments 5–10, showing spermatheca, in ventral view.



FIGURE 16. Distribution map of *Brachypogon biradialis* sp. n.

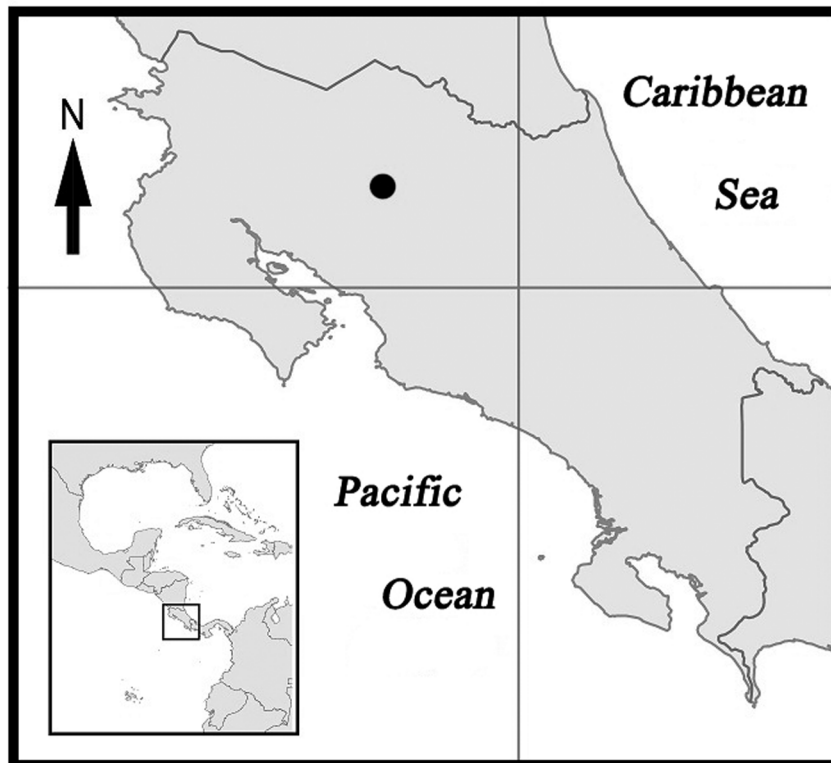


FIGURE 17. Distribution map of *Brachypogon tico* sp. n.



The only other genus of Ceratopogonini worldwide with katepisternal setae is *Sinhalohelea* Grogan and Borkent (1992) from Sri Lanka. The female of this genus has a single, long, narrow radial cell, differing from either of the two new species described here.

Considering that the two new species of *Brachypogon* described here are represented only by females, we are reluctant to propose new genera for them, although both exhibit important differences in the configuration of the radial cells with respect to other species of *Brachypogon* and other Ceratopogonini with katepisternal setae.

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