

Three new species of *Campsicnemus* from Kaua‘i, Hawaiian Islands (Diptera: Dolichopodidae)¹

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Abstract. Three new species of *Campsicnemus* found on the Hawaiian Island of Kaua‘i, *C. alakai*, **n. sp.**, *C. arakakii*, **n. sp.**, and *C. brunnifemur*, **n. sp.**, are described and illustrated. To date, 32 species of *Campsicnemus* are now known from the island and 193 are now known overall from the Hawaiian Islands, which harbors an incredible 63% of the world fauna of 304 species.

INTRODUCTION

The *Campsicnemus* from Kaua‘i were last reviewed in Evenhuis (2003), who tabulated some 26 species from the island. Since then, an additional three species have been described from Kaua‘i (Evenhuis, 2007, 2019). Additional material has been examined in this study and reveals yet another three new species: *C. alakai*, **n. sp.**, *C. arakakii*, **n. sp.**, and *C. brunnifemur*, **n. sp.**, which are here described and illustrated. To date, 32 species of *Campsicnemus* are now known from the island and 193 are now known overall from the Hawaiian Islands, which harbors an incredible 63% of the world fauna of 304 species.

MATERIAL AND METHODS

Material derives from collections made by Robert Peck and Karl Magnacca and are deposited in the Bishop Museum, Honolulu, Hawai‘i, USA (BPBM). Morphological terminology and abbreviations follow Evenhuis (2016). Confocal images were accomplished by using a Leica M165C stereo dissecting scope via the Leica Microsystems LAS Multifocus software (v. 5.0.2) and using Zerene Stacker® software (v. 1.04) (Zerene Systems, LLC, Richmond, Washington, USA) to align and stack-focus each final image.

Abbreviations used:

I, II, III =	fore, mid, and hind leg
C =	coxa
F =	femur
T =	tibia
MSSC =	male secondary sexual characters
ac =	acrostichal setae
dc =	dorsocentral setae
hm =	postpronotal setae
np =	notopleural setae
oc =	ocellar setae
pa =	post alar setae
ph =	posthumeral setae
sa =	supra-alar setae
sc =	scutellar setae
t =	tarsus
t1–5 =	tarsomeres 1 to 5
vt =	vertical setae

TAXONOMY*Campsicnemus* Haliday

Campsicnemus Haliday in Walker, 1851: 187. Type species: *Dolichopus scambus* Fallén, 1823, by validation of I.C.Z.N. (1958: 351). *Nomen protectum* (see Evenhuis, 2003: 3).

Campsicnemus alakai Evenhuis, new species

(Figs. 1–2)

Types. *Holotype* ♂ (BPMMENT 0000081276) from HAWAIIAN ISLANDS: **Kauaʻi:** Alakaʻi Swamp, Puaiohi Field Camp, 22.07999°N, 159.546896°W, 6 Feb–27 Mar 2006, R. Peck, Malaise trap #1. *Holotype* (in fluid) in BPBM.

Diagnosis. Using the key in Evenhuis (2003) this species runs to the Kauaʻi species *Campsicnemus kuku* Evenhuis based on both species having a small barb-like process at the base of the midtibia, but can be easily separated from it by the antennal flagellomere length being 1.5× its greatest width (flagellomere length subequal to width in *C. kuku*).

Description. Male. Body length: 3.5 mm. Wing length: 4.0 mm.

Head. Shining black; oc and vt black, about one-half length of antennal arista; face black, gray tomentose, constricted at middle, eyes not holoptic, separated below antennae for width of 4 ommatidia; palp small, dark brown; proboscis brown, slightly extending below eye in lateral view; antennae dark brown; postpedicel conical with blunt apex, length about 1.5× greatest width; arista slightly longer than head height.

Thorax. Dorsum of mesoscutum and scutellum black; pleura dark brown; thoracic setae long, strong, black: 3 dc; 2 np; 1 ph; 1 pa; 1 sc; ac absent; halter stem and knob yellowish brown.

Legs (Figs 1–2). CI yellowish, with 4 short curved setae and white hair apically, numerous; CII and CIII yellowish brown; femora and TiI yellowish brown, unmodified, without MSSC; TiII and TiIII yellowish brown with dark brown apex; FII (Fig. 1) with small patch of long strong black setae subapically (MSSC); TiII (Fig. 2) with small barb basomesally (Fig 2) bearing thick short setae, remainder of TiII with hairs along mesal surface becoming longer toward apex (MSSC); IIt₁ and remainder of tarsi without MSSC.

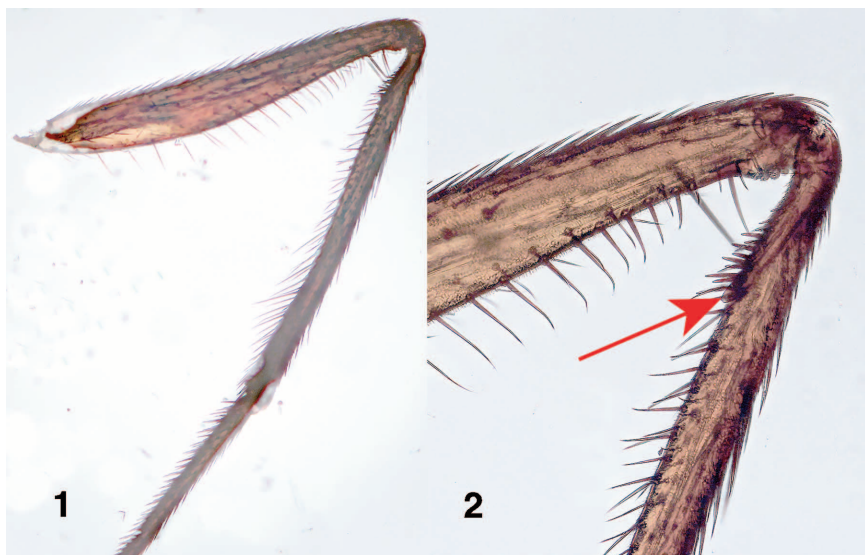
Wing. Smoky brown hyaline, with typical venation for *Campsicnemus*.

Abdomen. Tergites dark brown, each tergite with short stiff curved black hairs dorsally; sternites brown. Hypopygium yellowish brown, not dissected.

Female. Unknown.

Etymology. The specific name derives from the type locality.

Remarks. The photo of the barb (Fig. 2) seems to show a blunt apex from the angle photographed, but it is distinctly a barb or thorn-like process, much the same as *C. kuku* and related species.



Figures 1-2. *Campsicnemus alakai*, n. sp. 1. mid femur, tibia, and basitarsus; 2. detail of base of mid tibia showing tiny barb (arrow).

***Campsicnemus arakakii* Evenhuis, new species**

(Fig. 3)

Types. *Holotype* ♂ (BPBMENT 0000081277) and 7♂, 3♀ paratypes from HAWAIIAN ISLANDS: **Kaua'i:** Alaka'i Swamp, Puaiohi Field Camp, 22.07999°N, 159.546896°W, 6 Feb–27 Mar 2006, R. Peck, Malaise trap #1. Holotype and paratypes (in fluid) in BPBM.

Diagnosis. Using the key in Evenhuis (2003) this species runs to the Kaua'i species *Campsicnemus spuh* Evenhuis based on having a predominantly yellow mesonotum with vittae and non-flattened tarsomeres, but can be separated from it by the mid basitarsus lacking an apical spur (spur present in *C. spuh*) and the mid tibiae being slightly flared (not so in *C. spuh*).

Description. Male. Body length: 1.9–2.2 mm. Wing length: 1.8–2.0 mm.

Head. Shining black; oc and vt black, about one-half length of antennal arista; face constricted at middle, eyes holoptic, contiguous below antennae for length of 3 ommatidia; palp small, dark brown; proboscis yellowish white, slightly extending below eye in lateral view; antennae yellowish; postpedicel yellowish, conical with blunt brown apex, length about 3× greatest width; arista length two-thirds head height.

Thorax. Dorsum of mesoscutum and scutellum yellowish to yellowish brown, paler laterally, with pair of thin admedian brown vittae extending posterior to just above prescutellar area, these vittae in association with dc, additionally a thin medial stripe dorsally not quite reaching prescutellar area; prescutellar area contrastingly brown; upper pleura concolorous with mesoscutum except lower pleura white, katatergite dark brown; thoracic setae long, strong, black: 4 dc; 2 np; 2 ph; 1 pa; 1 sc; 5 ac; halter stem and knob yellowish.



Figure 3. *Campsicnemus arakakii*, n. sp., mid tibia and basitarsus (mesal surface on right).

Legs. CI, CIII white, CI with 4 strong white setae apically, numerous smaller curved stiff setae; CII brownish yellow; remainder of legs white; foreleg and hindleg unmodified, without MSSC; FII with 12 stiff hairs along ventral surface (MSSC), other femora unmodified with no MSSC; TiII (Fig. 3), thin, slightly flared apically, with row of stiff pointed setae mesally on basal half, remainder of mesal hairs long and decumbent to apex (MSSC); one strong setae subapically on lateral surface (MSSC); IIt₁ and remainder of tarsi without MSSC.

Wing. Subhyaline, with typical venation for *Campsicnemus*.

Abdomen. Tergites brown, each tergite with short stiff curved black hairs dorsally; sternites white. Hypopygium yellowish, not dissected.

Female. As in male except legs normally shaped; oviscapt with pair of darkly sclerotized bifid spatulate spines and white hairs.

Etymology. The specific name honors my good friend and long-time colleague, Keith Arakaki in honor of his 50 years of service to the Bishop Museum.

Campsicnemus brunnifemur Evenhuis, **new species**

(Fig. 4)

Types. *Holotype* ♂ (BPBMENT 0000081278) and 2♀ *paratypes* from HAWAIIAN ISLANDS: **Kaua'i:** Koke'e Site B, 1,000 m, 22.117°N, 159.670°W, 22 Apr 2021, K. Magnacca, K042204-01, on ground. *Holotype* (in fluid) in BPBM.

Diagnosis. Using the key in Evenhuis (2003) this species runs to the Kaua'i species *Campsicnemus manaka* Evenhuis in both having the mid tibiae brown and without short, erect, truncate setae mesally and the mid basitarsus without long hairs, but can be separated from it by the mid tibiae having long downcurved or decumbent hairs mesally along the entire surface (mid tibiae with five strong erect setae on apicomeral two-thirds, but otherwise without long decumbent hairs mesally in *C. manaka*), mid femur with three stiff setae at apex (these setae lacking in *C. manaka*) and the fore coxa being white (brown in *C. manaka*).

Description. Male. Body length: 1.8 mm. Wing length: 2.0 mm.

Head. Shining black; oc and vt black, about one-half length of antennal arista; face constricted at middle, eyes holoptic, contiguous below antennae for length of 2 ommatidia; palp small, dark brown; proboscis dark brown, slightly extending below eye in lateral view; antennae dark brown; postpedicel conical with pointed apex, length about 3.5× greatest width; arista length subequal to head height.

Thorax. Dorsum of mesoscutum, scutellum, and pleura dark brown; thoracic setae long, strong, black: 3 dc; 2 np; 1 ph; 1 pa; 1 sc; ac absent; halter stem and knob white.

Legs. CI white, with 4 strong white setae apically, numerous smaller curved stiff setae; CII and CIII dark brown; FIHI brown, yellow at extreme apex; remainder of legs pale yellow; foreleg and hindleg unmodified, without MSSC; midleg (Fig. 4) with FII with three minute setae ventromedially, small patch of three strong curved setae at extreme apex and three long curved hairs basally (MSSC); TiII (Fig. 4) with row of setae along mesal surface, setae becoming longer and more decumbent toward apex (MSSC), lateral surface with 2 very strong, long black setae medially (MSSC) mixed with rows of much short finer decumbent hairs; IIt₁ and remainder of tarsi without MSSC.



Figure 4. *Campsicnemus brunnifemur*, n. sp., mid femur, tibia, and basitarsus.

Wing. Subhyaline, with typical venation for *Campsicnemus*.

Abdomen. Tergites dark brown, each tergite with short stiff curved black hairs dorsally; sternites dark brown. Hypopygium dark brown, not dissected.

Female. As in male except for lack of MSSC.

Etymology. The specific name derives from the Latin *brunni*- [= brown] + *femur*; referring to the brown hind femur.

Remarks. Both *Campsicnemus manaka* and *C. brunrifemur* were collected at Koke'e and are similar to each other in some characters, but differ considerably in other characters that I am confident in treating it as a separate species.

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