

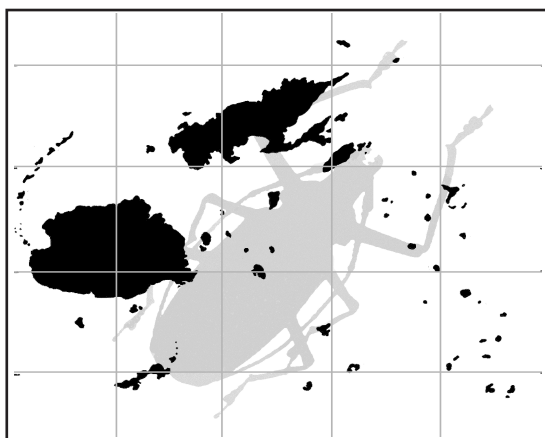
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Fiji ARTHROPODS (NEW SERIES). I.

NEAL L. EVENHUIS & DANIEL J. BICKEL, EDITORS



BISHOP MUSEUM PRESS
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A new species of *Dolichocephala* Macquart from Fiji (Diptera: Empididae)

BRADLEY J. SINCLAIR

*Canadian National Collection of Insects & Canadian Food Inspection Agency, OPL-Entomology,
K.W. Neatby Bldg., C.E.F., 960 Carling Ave., Ottawa, ON, Canada K1A 0C6
email: bradley.sinclair@inspection.gc.ca*

During the Fiji Arthropod Survey, the genus *Dolichocephala* Macquart was readily collected, resulting in more than 1,000 specimens from four islands. The bulk of this material consisted of two species, *D. ciwatikina* Sinclair & Evenhuis and *D. walutikina* Sinclair & Evenhuis (Sinclair & Evenhuis 2005). While sorting through some remaining undetermined specimens, a third new species was discovered and is herein described and illustrated. Specimens are deposited in the Bishop Museum, Honolulu (BPBM) and Canadian National Collection of Insects, Ottawa (CNC).

Dolichocephala evenhuisi, new species (Figs. 1–3)

Diagnosis. The wing of this species with eight spots is patterned identical to *D. walutikina*, but can be distinguished on the basis of the very long ventral setae on the fore femur, nearly three times longer than width of femur, clasping cercus with long, slender, divergent apical processes and phallus with narrow, weakly sclerotized apical cap and broad shaft.

Description. Male. Head. Slender, tapered ventrally. Face dark brown with greyish-blue pruinescence. Frons pale brown medially with greyish blue pruinescence laterally. Vertex and occiput dark brown, concolorous with ocellar triangle. Ocellar triangle with pair of strong upturned setae.

Thorax. Scutum brown with faint dark stripe beneath acrostichal and dorsocentral rows; medial stripe ending at prescutellar depression; lateral stripes faintly extended to scutellum. Scutellum concolorous with scutum. Postpronotum, pleural ridge and pleura yellow to yellowish brown. Several very minute acrostichal setulae anterior to first dorsocentral setae; 4 dorsocentral setae; 1 postpronotal seta; 1 presutural supra-alar seta; 1 notopleural seta; 1 postalar seta; 1 pair scutellar setae. Laterotergite with several pale setulae.

Legs. Yellowish-brown, concolorous with pleura, somewhat darker on tarsi. Fore femur with preapical anterior comb; biserial row of long, slender pale setae beneath, length of setae nearly 3 times width of femur (Fig. 1). Mid femur with posteroventral row of setae, similar to fore femur; hind femur with shorter posteroventral setae.

Wing (length 2.0–2.1 mm). Narrow; infuscate; single, long basal costal seta present; R_4 and R_5 divergent apically; R_4 with auxiliary cross-vein to R_{2+3} ; 8 irrorations (Fig. 1)



Figs. 1–2. *Dolichocephala evenhuisi* n. sp. **1.** habitus, lateral view; scale bar = 0.5 mm. **2.** male terminalia, lateral view; scale bar = 0.1 mm.

(white rounded spots) clearly separated and distinct: 2 spots each in cells r_{2+3} and dm; 1 spot each in cells r_4 , m_1 , m_2 and apex of r_5 . Posterior margin of cell dm straight. Halter with dark knob.

Abdomen. Yellowish, slightly darker medially on tergites. **Terminalia** (Figs. 2, 3). Hypandrium cone-shaped, with 2–3 lateral setae in vertical row. Phallus broad, arched, broadly articulated to hypandrium; distiphallus with thinly sclerotized cap, apex bifid, slender forks extending as membranous lobes; lateral wing-like lobes below cap, perpendicular to shaft. Epandrium oval with several posterior setae. Cercal plate with macrosetae confined to upper margin. Clasping cercus with broad base and widely divergent apical processes; posterior process slender with series of strong, inner apical setae; anterior process slender, slightly arched medially, terminating with short, broad spine-like seta. Lobe of subepandrial sclerite extended beyond epandrium between clasping cerci. Surstylus arched, with broad base; apex with pair of long setae.

Female. Unknown.

Type material. **Holotype** ♂, labelled: “FIJI: Taveuni, Cakaudrove Prov., / Takukui Village, Mt. Devo, 892m / 31.VII–14.VIII.2004, Malaise 4, / coll. E. Schlinger, M. Tokota’a / 16.837°S, 179.973°W, FBA 113328” (BPBM). **Paratypes:** **FIJI. Taveuni:** 5.5 km SE Tavuki, MT, rainforest, 30 Jun–14 Jul 2004, -16.843, 179.966, 1188 m, E. Schlinger, M. Tokota’a (FBA 070304, 070297–298, 070303, 070309) (5♂); same data as holotype except, 14–31 Jul 2004 (FBA 151614, 151615) (2♂). **Vanua Levu:** 6 km NW Kilaka, 15–28 Jun 2004, 146 m, Batiqere Range, MT, 16.8153°S, 178.9864°E, E. Schlinger, M. Tokota’a (FBA 072315, 072316) (2♂); same data except, 3–15 Jun 2004, 113 m, 16.7317°S, 178.9997°E (FBA 069223) (1♂); Kilaka, FJ-58E, 24 Jun–21 Jul 2004, 98 m, MT, 16°48’412”S, 178°59’290”E, M.E. Irwin, E. Schlinger, M. Tokota’a (FBA 028296) (1♂).

Etymology. This species is named after Neal L. Evenhuis who invited me to join this survey and encouraged my studies of the Fiji empidoidea.

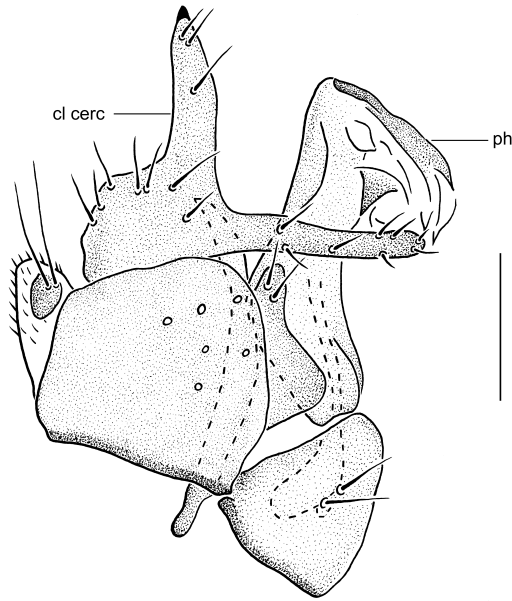


Fig. 3. Male terminalia of *Dolichocephala evenhuisi* n. sp., lateral view; scale bar = 0.1 mm. Abbreviations: cl cerc – clasper; ph – phallus.

KEY TO THE FIJIAN SPECIES OF *DOLICHOCEPHALA*

1. Face light brown lacking greyish pruinescence. Frons with large light brown area between antennae and posterior ocelli, area extends to eye margins. Wing with nine spots, proximal spot in cell dm lengthened into broad streak; spot posterior to cell dm *ciwatikina* Sinclair & Evenhuis
- Face dark brown with greyish pruinescence. Frons with small light brown spot between antennae and anterior ocellus. Wing (Fig. 1) with eight round spots, proximal spot in cell dm not lengthened, lacking spot posterior to cell dm ... 2
2. Fore femur with long ventral setae, slightly longer than width of femur. Clasper with stout apical processes; anterior process stout, strongly curved medially; posterior process narrower than anterior process, curved medially. Phallus with narrow shaft and strongly sclerotized, broad apical cap
 *walutikina* Sinclair & Evenhuis
- Fore femur with very long ventral setae, nearly three times longer than width of femur (Fig. 1). Clasper with long, slender apical processes; anterior process straight, only slightly curved medially; posterior process curved medially with series of strong inner apical setae. Phallus with broad shaft and weakly sclerotized, narrow apical cap (Figs. 2, 3) *evenhuisi*, n. sp.

ACKNOWLEDGMENTS

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LITERATURE CITED

Sinclair, B.J. & N.L. Evenhuis. 2005. Two new species of *Dolichocephala* Macquart from Fiji (Diptera: Empididae: Clinocerinae). *Fiji Arthropods II. Bishop Museum Occasional Papers* **84**: 3–11.

lsid:zoobank.org:pub:BB26C9AE-57CE-4AB8-9B37-757834F8FE64

***Korotongo*, a new genus from Fiji, Tonga and Samoa, and a new species of *Phacaspis* Meuffels & Grootaert from Micronesia (Diptera: Dolichopodidae)**

DANIEL J. BICKEL¹ 

Australian Museum, 6 College Street, Sydney NSW 2010, Australia; email: danb@austmus.gov.au

Abstract. A new monotypic genus, *Korotongo pacifica* is described from specimens collected in Fiji, Tonga and American Samoa, and is provisionally referred to the subfamily Peloropeodinae. As well *Phacaspis palauensis* is newly described from the Micronesian island groups of Palau and Yap. *Phacaspis* Meuffels and Grootaert is known from the Australasian and Oriental regions. Both genera are associated with marine littoral and mangrove habitats.

INTRODUCTION

This paper describes a new genus, *Korotongo* Known from Fiji, Tonga and American Samoa and a new species in the genus *Phacaspis* Meuffels and Grootaert, which is known from the Australasian and the Oriental regions. Both genera appear to be associated with marine littoral habitats and mangroves.

MATERIAL AND METHODS

Repositories of material in this study are referred to by the following acronyms: (AMS), Australian Museum, Sydney; (BPBM), Bishop Museum, Honolulu; (NZAC), New Zealand Arthropod Collection, Auckland; (USNM), National Museum of Natural History, Smithsonian Institution, Washington, D.C.

Photographs were made with a Leica M205A photomontage system. In describing the hypopygium, or male genital capsule, ‘dorsal’ and ‘ventral’ refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom is dorsal. Morphological terminology follows Cumming & Wood (2017). Measurements were made on representative dry specimens. Body length of males is measured from the base of the antennae to the tip of the seventh abdominal segment. The CuAx ratio is the length of the dm-m crossvein/ distal section M_4 . The position of features on elongate structures such as leg segments is given as a fraction of the total length, starting from the base. The relative lengths of the podomeres are representative ratios and not measurements and are given for each leg in the following formula and punctuation: trochanter + femur; tibia; tarsomere 1/ 2/ 3/ 4/ 5. The following abbreviations and terms are used: MSSC - Male secondary sexual character(s), the non-genitalic character(s) found only on male body; I, II, III: pro-, meso-, metathoracic legs; C, coxa; T, tibia; F, femur; ac, acrostichal setae; ad, anterodorsal; av, anteroventral; dc, dorsocentral setae; dv, dorsoventral; t, tarsus; t_{1-5} , tarsomeres 1 to 5; CuAx ratio is the length of dm-m crossvein over distal vein R_4 .

1. Research Affiliate, Bernice Pauahi Bishop Museum, 1525 Bernice Street, Honolulu, Hawai‘i 96817-2704, USA.

SYSTEMATICS

Genus *Korotongo* Bickel, new genus

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(Fig. 1a–e)

Type species. *Korotongo pacifica* Bickel **new species**, here designated.

Etymology. *Korotongo* is an indigenous place name on Viti Levu where the type series was collected, and the gender is feminine.

Diagnosis. Genus *Korotongo* (this generic diagnosis is based on a single species and emphasizes characters considered to be of generic importance). Body length about 1.8 mm; wing length about 2.0. *Head* (Fig 1b). Subcircular in anterior view; dorsal postcranium flat; both sexes with face and clypeus wide and protruding, with facial-clypeal suture marked by distinct ridge and decumbent clypeus; scape bare, pedicel projecting into socket-like base of postpedicel, in both median and lateral view; postpedicel with subapical invagination encircling segment.

Thorax. Posterior mesonotum distinctly flattened; ac irregularly uniseriate; 5 strong dc present; proepisternum bare; lateral scutellar setae absent.

Legs. TI with short dorsal setae; FII and FIII both with strong anterior preapical seta, but without posterior preapical seta; TII with very strong anterior seta at $\frac{1}{4}$ (in both sexes).

Wing. R_{4+5} and M_1 subparallel; vein M_1 with flexion or *bosse alaire*; CuAx ratio: 0.2.

Abdomen. Male segment 7 well-developed and forming peduncle; hypopygium (Fig. 1d, e); epandrium short subrectangular; epandrial lobe elongate, with short apical seta and longer seta at mid-length; surstylus elongate subrectangular, and apically incurved and pointed; cercus elongate digitiform. Female oviscapt (Fig. 1c) relatively narrow subtriangular, tergite 9+10 divided into two acanthophorites, each bearing three blunt spines.

Morphological notes

Korotongo has a number of morphological features that require further discussion.

1. *Postpedicel enclosing the pedicel.* In both sexes of *Korotongo* the antennal pedicel has a conus protruding into a socket-like postpedicel, visible in both lateral and median views (Fig 1b). This encapsulation of the conus by the postpedicel is characteristic of several genera in the Sympycninae, but in these cases, the enclosure is visible only in the median view, the lateral view showing the pedicel truncate with the postpedicel: 1) the cosmopolitan genus *Syntormon* Loew; 2) the predominately Nearctic genus *Parasyntormon* Wheeler; and 3) the monotypic North African genus *Ceratopos* Vaillant. The genus *Minjerribah* Bickel (Hydrophorinae), genus *Tenuopus* Curran (Tenuopodinae) and the incertae sedis genus *Dactylonotus* Parent also have the conus of the pedicel protruding medially into a socket-like postpedicel, although in *Dactylonotus* the socket is more dorsally positioned.

2. *Postpedicel with subapical invagination.* In both sexes of *Korotongo* the antennal postpedicel has a subapical invagination which encircles the segment and almost covering the base of the arista (Fig. 1b). I have not encountered this modification of the postpedicel on other dolichopodid taxa.

3. *Protruding clypeus.* In *Korotongo* (Fig. 1b), both sexes have the face and clypeus wider than the width of the antennal bases and protruding, with the facial-clypeal suture marked by distinct ridge and a decumbent clypeus. Many other dolichopodids have a tectiform or

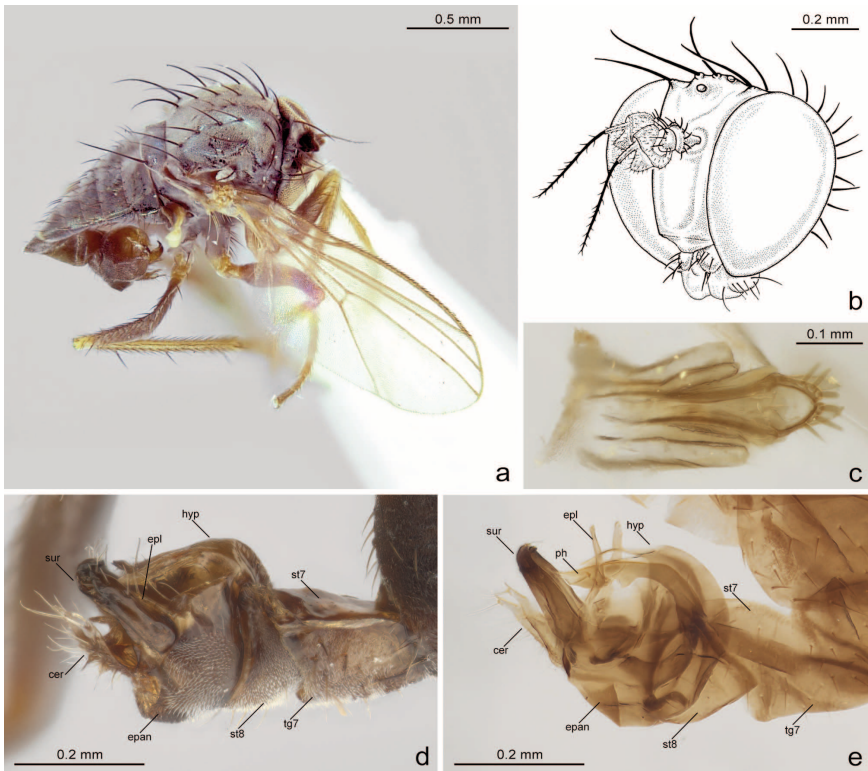


Figure 1. *Korotongo pacifica* n. sp. **a.** male habitus, right dorsal; **b.** male head, left anterior; **c.** female oviscapt, dorsal; **d.** male postabdomen, left lateral; **e.** male postabdomen, cleared, left lateral. Legend: cer, cercus; epan, epandrium; epl, epandrial lobe; hyp, hypandrium; ph, phallus; st, sternite; sur, surstylus; tg, tergite.

protruding roof-like clypeus (many females of the subfamily Sympycninae, and both sexes of many Hydrophorinae and some genera of Dolichopodinae) but the clypeus is projected outwards and not decumbent as in *Korotongo*.

4. *Absence of strong MSSC.* Apart from the male postabdomen, there are few evident male secondary sexual characters in *Korotongo pacifica*. The strong anterior seta at $\frac{1}{4}$ on tibia II (the kind of character that possibly might occur as a MSSC in some dolichopodid taxa), is found on both sexes of *Korotongo pacifica*.

Subfamilial placement

Korotongo shares a number of character states with the subfamily Peloroepodinae, including anterior preapical setae on femora II and III, a flattened posterior mesonotum, and an enlarged pedunculate hypopygium (see summary in Yang *et al.* 2006). However, the subfamily is poorly defined and comprises a number of disparate genera with a wide range of hypopygial morphology, so the placement of this genus in the Peloroepodinae should be regarded as provisional.

Korotongo pacifica Bickel new species

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(Fig. 1a–e)

Description. Male (Fig. 1a). Body length: 1.7–1.8 mm; wing: 2.1×0.7 mm.

Head (Fig. 1b). Subcircular in anterior view, but slightly wider than high, and rather narrow in lateral view; postcranium flat, not concave; vertex, frons and face dark brown and covered with dense grey pruinosity; setae black; postoculars forming single row of short black setae from vertex until about one-quarter from eye base, and with only fine hairs ventrad; pair of postvertical setae on dorsal postcranium; pairs of strong vertical and diverging ocellar setae present; face and clypeus wider than width of antennal bases and protruding, with facial-clypeal suture marked by distinct ridge and decumbent clypeus; eye facets uniform with tiny hairs between facets; palp ovate with grey pruinosity; proboscis dark brown and rather short; antenna dark brown; scape bare, pedicel with corona of short black setae, and projecting into socket-like base of postpedicel, evident in both median and lateral view postpedicel lobate and rounded, with apparent subapical invagination encircling segment, and with dorsal depression from which arista arises; arista shorter than head height.

Thorax. Entirely dark brown with metallic green reflections, with dusting of grey pruinosity; setae black; posterior mesonotum distinctly flattened; ac comprising 6 irregularly uniseriate setae (*i.e.*, not in single straight line); 5 strong dc present, slightly decreasing in size anteriorly; 1 strong postalar, only 1 postsutural supra-alar, 1 presutural intra-alar, 2 notopleural, 1 presutural supra-alar, and 1 weak postpronotal setae present; proepisternum bare; median scutellar setae strong, lateral scutellar setae absent.

Legs. Coxae basally dark brown with some grey pruinosity, but distal coxae, trochanters and femoral bases yellow; femora mostly brown but distal sixth yellow; tibiae and tarsi mostly yellow but distal tarsomeres infuscated; CI and CII with short black anterolateral vestiture; CIII with strong black lateral seta at $2/5$; legs covered with short black vestiture, and stronger setae as noted; I: 2.6; 2.2; 1.0/ 0.7/ 0.5/ 0.5/ 0.4; FI bare; TI with short dorsal setae at $1/3$, $2/3$, and subapically; tarsus I unmodified; II: 2.6; 2.7; 1.7/ 0.6/ 0.5/ 0.4/ 0.3; FII with strong anterior preapical seta, but without posterior preapical seta; TII with very strong anterior seta at $1/4$, short ad-pd setal pair at $1/4$, short ad-pd setal pair at $1/2$, and with subapical circlet of pd, ad, av, and pv setae; tarsus II unmodified; III: 2.5; 3.2; 0.6/ 1.0/ 0.7/ 0.4/ 0.4; FIII with strong anterior seta at $4/5$, but without posterior preapical seta; TIII with strong offset ad and dorsal setae at $1/4$ and $1/2$ and ad seta at $7/8$; tarsus III unmodified.

Wing. Relatively elongate; membrane hyaline; R_{2+3} ending in costa near $9/10$; R_{4+5} and M_1 diverging from base, but closely parallel beyond dm-cu crossvein, with R_{4+5} joining costa anteriorly of apex and M_1 joining at apex; vein M_1 with flexion or *bosse alaire* just beyond join with dm-cu; CuAx ratio: 0.2; anal angle absent; lower calypter yellow with fan of pale yellow; halter pale yellow.

Abdomen: Tergites 1–6 mostly dull metallic green with grey pruinosity; vestiture mostly short dark brown setae, but with some longer marginal setae on tergite 1; segment 7 well-developed and forming peduncle, with tergite 7 hemi-cylindrical and sternite 7 reduced to narrow strip; sternite 8 forming cap over left lateral hypopygial foramen, and with weak yellowish setae; hypopygium (Fig. 1d, e) dark brown with brown cercus; epandrium short subrectangular; hypandrium forming hood over basal epandrium; epandrial lobe elongate, with short apical seta and longer seta at midlength, and arising from ventral surface of epandrium [*cf.*,

epandrial lobe lying along ventral epandrium (Fig. 1d) and epandrial lobe projecting outwards (Fig. 1e)]; surstylus well sclerotized, elongate subrectangular, and apically incurved and pointed; cercus elongate digitiform with abundant yellowish setae.

Female. Similar to male except as noted: face and clypeus slightly wider; head and thoracic setation similar; leg setation similar (including very strong anterior seta on TII) but major female setae more strongly developed than on male; oviscapt (Fig. 1c) relatively narrow subtriangular, tergite 9+10 divided into two acanthophorites, each bearing three blunt spines.

Types. Holotype, ♂, paratypes, 21 ♂, 7 ♀, FIJI: **Viti Levu:** Korotongo [~3.0 km SE Sigatoka], 0–100 m, Mar 1974, N.H.L. Krauss (USNM, 2 ♂, 1 ♀ paratypes each deposited BPBM, AMS).

Additional material. AMERICAN SAMOA: 1 ♂, **Tutuila:** Taputimu, 13 Oct 1944, N.R. Spencer (BPBM). FIJI: **Viti Levu:** 1 ♂, Naqara I, 18°10'59"S 178°15'56"E, 0–10m, coastal littoral vegetation, 21 Jan 2005, D. Bickel (AMS); 1 ♂, Laucala Bay, nr. Suva, 14 Oct 1975, in building, S. Vosabeci (NZAC). TONGA: 2 ♂, **Vavau I:** Neifu, Feb 1956, Jan 1980, N.H.L. Krauss (BPBM).

Remarks. *Korotongo pacifica* s known from lowland and coastal habitats, including littoral vegetation on the Fijian island of Viti Levu, Tonga and American Samoa. Apart from the male postabdomen, this species has few strong or distinctive male secondary sexual characters. Also see Remarks, above.

Etymology. This species is named *pacifica* for the Pacific Island groups of Fiji, Tonga, and Samoa, where the species was collected.

Genus *PHACASPIS* Meuffels & Grootaert

Phacaspis Meuffels and Grootaert, 1988: 312.

Type species: *Phacaspis petiolata* Meuffels & Grootaert, 1988.

Remarks. Meuffels and Grootaert (1988) described the genus *Phacaspis* to include two species, *P. petiolata* and *P. ornata*, both from Papua New Guinea. Later, Grootaert and Meuffels (2001) described a third species, *P. mitis* from Thailand, and extended the range of *P. petiolata* from New Guinea to Thailand. A new species, *P. palauensis*, is described from Micronesia. All species are known from mangrove habitats.

Phacaspis is defined by the clypeus arising about midway along head height, with the facial-clypeal suture marked by a distinct ridge, and laterally widened, almost trapezoidal in shape (similar to Fig. 2b); mesonotum slightly flattened posteriorly; ac absent; and only 3 or 4 strong dc. The three previously described species and the new species treated below can be divided into two distinct groups:

- 1) *Phacaspis petiolata* and *P. mitis*, both with an ovate epandrium, digitiform surstylus and simple unbranched cercus.
- 2) *Phacaspis ornata* and *P. palauensis*, both with epandrium short subrectangular; hypandrium forming short, inflated hood over base of epandrium, ventral surstylus sclerotized and elongate, and cercus pale yellow and elongate with abundant pale yellow setae.

Phacaspis palauensis Bickel n. sp.

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(Fig. 2a–c)

Description. Male: length 1.4–1.5 mm; wing: 1.3×0.4 mm.

Head. Ovate, higher than wide in anterior view; postcranium flat; frons dark metallic blue-green, with a dusting of grey purinosity; postoculars forming single row of short white setae from vertex until about one-quarter from the base of eye; pair of converging postvertical setae on dorsal postcranium, not in line with postocular setae; pairs of strong vertical and diverging ocellar setae present; face very short, and wider than width of antennal bases; clypeus arising about midway along head height (or greatly extended basally), with facial-clypeal suture marked by distinct ridge, and laterally widened, almost trapezoidal in shape, and slightly tapering distally (similar to Fig. 2b) and covered with silvery pruinosity; eye with anteroventral facet enlarged, with tiny hairs between facets; palp and proboscis brownish; scape and pedicel yellow, postpedicel dark brown; postpedicel short subtriangular with dorsal arista; arista as shorter than head height.

Thorax. Dark brown with metallic green reflections, with dusting of grey pruinosity; pleura dark brown; posterior mesonotum only weakly flattened; ac absent; 3 strong dc present; 1 strong postalar, only 1 postsutural supra-alar, 1 presutural intra-alar, 2 notopleural, 1 presutural supra-alar, and 1 weak postpronotal setae present; proepisternum bare; median scutellar setae strong, lateral scutellar setae absent.

Legs. CI pale yellow, CII and CIII dark brown; trochanters and remainder of legs pale yellow; leg setae brownish; CI with some anterolateral setae; CIII with lateral seta near $\frac{1}{2}$; I: 2.0; 1.7; 0.8/ 0.3/ 0.4/ 0.4/ 0.3; FI ventrally with weak spaced hairs and longer subapical av and pv seta; TI gradually becoming ventrally swollen on basal three fifths, and decreasing distally (MSSC); II: 2.3; 2.2; 0.9/ 0.5/ 0.3/ 0.2/ 0.3; FII near midlength with 3–4 short ventral setae (MSSC), and in distal quarter with row of 4 anterior setae, with penultimate seta much stronger and equivalent to anterior preapical seta, and with short preapical pv seta; TII with short vestiture and with pd seta at $\frac{1}{3}$ and with strong anterior seta near $\frac{1}{2}$; III: 2.7; 2.3; 0.5; 0.7/ 0.9/ 0.4/ 0.3/ 0.4; FIII near mid-length with row of 6–7 short black av setae (MSSC), and with short anterior preapical seta and weaker posterior preapical seta; TIII with strong anterior seta near $\frac{2}{5}$ (MSSC) and at $\frac{5}{6}$ with basally directed ventral seta and at $\frac{7}{8}$ with slightly distally projecting ventral seta at $\frac{7}{8}$ (MSSC).

Wing. Membrane hyaline; R_{2+3} ending in costa near $\frac{3}{4}$; R_{4+5} and M_1 diverging from base, but parallel beyond dm-cu crossvein, with slight flexion of R_{4+5} before joining costa anteriorly of apex, and M_1 joining at apex; vein M_1 without evident flexion or *bosse alaire*; CuAx ratio: 0.3; anal angle absent; lower calypter yellow with fan of pale yellow; halter pale yellow.

Abdomen. Mostly dark brown with short brownish vestiture and tapering distally; segment 7 well-developed and forming peduncle; hypopygium (Fig. 2c); epandrium short subrectangular; hypandrium forming short almost inflated hood over base of epandrium; ventral surstylus well sclerotized, elongate, and lobate; dorsal surstylus pale yellow projection with 3–4 long apical setae; cercus pale yellow, elongate and strongly recurved and S-shaped, with abundant pale yellow setae.

Female: similar to male, except as noted: clypeus wider (Fig. 2b); thorax and legs coloration and setation similar, except TI unmodified, FII with row of av setae; TII also with strong anterior seta near $\frac{1}{2}$; FIII ventrally bare; TIII with short ad seta at $\frac{1}{5}$, but without strong anterior seta and modified ventral setae.



Figure 2. *Phacaspis palauensis* n. sp. **a.** male habitus, left lateral; **b.** female head, anterior; **c.** male postabdomen, left lateral.

Types. PALAU: Holotype, ♂, paratypes, 3♀, **Oreor** (= Koror): limestone ridge, 21 Jan 1948, mangrove swamp, Pacific Ent. Survey of Micronesia, H.S. Dybas (USNM); paratype ♂, Koror I., mangroves 24 Apr 1957, C.W. Sabrosky (USNM); paratype ♂, **Babelthaupt**, Melekeiok, 23 May 1957,

C.W. Sabrosky (USNM). **Additional material.** FEDERATED STATES OF MICRONESIA: 1♂, **Yap Group:** Yap I, Weloy, 15 Jun 1957, C.W. Sabrosky (USNM).

Remarks. *Phacaspis palauensis* is known from the Micronesian archipelagos of Palau and Yap, and where indicated, from mangrove habitat. This species is close to the widespread *P. ornata* Meuffels and Grootaert, which ranges from Papua New Guinea to Thailand and also inhabits mangroves. Male of both species have a white elongate cercus and tibia I ventrally swollen, but *P. palauensis* (Fig. 2c) has a lobate ventral surstylus and strongly recurved elongate cercus, while *P. ornata* (figs 5, 6 in Meuffels & Grootaert 1988) has the ventral surstylus narrow and bladeliike and the cercus elongate and almost flagelliform.

Etymology. The specific epithet *palauensis* is from Latin, meaning “of” or “from” Palau.

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Shamshevia hannahae, a striking new species and biogeographical anomaly from Fiji (Diptera: Dolichopodidae: Diaphorinae)

DANIEL J. BICKEL 

Australian Museum, 1 William Street, Sydney NSW 2010, Australia; email: Dan.Bickel@austmus.gov.au

Abstract. *Shamshevia hannahae* (Diptera: Dolichopodidae: Diaphorinae) is newly described from the islands of Viti Levu and Kadavu in the Fiji Group. It is characterised by a halberd-shaped postpedicel in both sexes (larger in males), an enlarged silvery male palp, and two projecting setae on sternite 8. The distinctive hypopygial structure and elongate male postpedicel place the species in *Shamshevia*, which is otherwise known from Namibia, United Arab Emirates, Israel and Goa. The genus *Shamshevia* Grichanov, 2012 is regarded as a senior synonym of *Arabshamshevia* Naglis, 2014, **n. syn.**, with the resulting new combinations: *Shamshevia ajbanensis* (Naglis), **n. comb.**, and *Shamshevia negevensis* (Grichanov), **n. comb.**

INTRODUCTION

The Fijian fauna of the family Dolichopodidae has proven to be very rich, the direct result of long-running Malaise traps set throughout the archipelago, part of the joint NSF-Schlinger Foundation sponsored Fiji Terrestrial Arthropod Survey (Evenhuis & Bickel 2005). Some of these taxa have proven to be generic endemics or biogeographically unusual taxa.

This paper describes a new species of *Shamshevia* Grichanov whose males have an elongate halberd-shaped postpedicel and enlarged silvery palps. The genus otherwise is only known from Namibia, United Arab Emirates, Israel and Goa.

MATERIAL AND METHODS

This study is based on material housed in the Bishop Museum, Honolulu (BPBM). Photographs were made with a Leica M205A photomontage system. In describing the hypopygium, or male genital capsule, 'dorsal' and 'ventral' refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom is dorsal. Morphological terminology follows Cumming & Wood (2017). Measurements were made on representative dry specimens. Body length of males is measured from the base of the antennae to the tip of the seventh abdominal segment. The CuAx ratio is the length of the dm-m crossvein/ distal section M₄. The position of features on elongate structures such as leg segments is given as a fraction of the total length, starting from the base. The relative lengths of the podomeres are representative ratios and not measurements and are given for each leg in the following formula and punctuation: trochanter + femur; tibia; tarsomere 1/ 2/ 3/ 4/ 5. The following abbreviations and terms are used: MSSC - Male secondary sexual character(s), the non-genitalic character(s) found only on male body; I, II, III: pro-, meso-,

1. Research Affiliate, Bernice Pauahi Bishop Museum, 1525 Bernice Street, Honolulu, Hawai'i 96817-2704, USA.

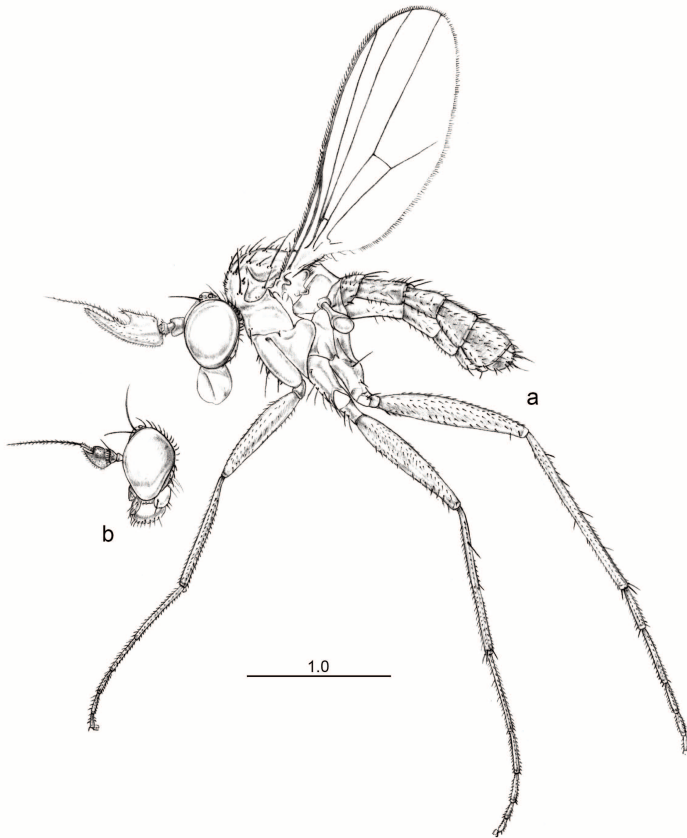


Fig. 1. *Shamshevia hannahae* n. sp.: a. male habitus, left lateral; b. female head, left lateral.

metathoracic legs; C, coxa; T, tibia; F, femur; ac, acrostichal setae; ad, anterodorsal; av, anteroventral; dc, dorsocentral setae; dv, dorsoventral; hm, postpronotal setae; t, tarsus; t_{1-5} , tarsomeres 1 to 5; CuAx ratio is the length of dm-m crossvein over distal vein R_4 .

SYSTEMATICS

Genus *SHAMSHEVIA* Grichanov

Shamshevia Grichanov, 2012a: 558. Type species: *Shamshevia hoanibensis* Grichanov, 2012, orig. des.

Arabshamshevia Naglis, 2014: 726. Type species: *Arabshamshevia ajbanensis* Naglis, 2014, orig. des., n. syn.

Generic synonymy. Grichanov (2012a) described the genus *Shamshevia* based on a species collected in Namibia, while Naglis (2014) described *Arabshamshevia* based on a species collected in the United Arab Emirates. The two genera are very close except acrostichal setae are present in *Shamshevia* but totally absent in *Arabshamshevia*. Grichanov (2016) discussed this matter in detail and even stated, “Therefore, the two genera may be regarded as possible synonyms.” However, he did not formally place them in synonymy. With respect, I feel the two genera should be regarded as synonyms, as the loss of acrostichal setae by itself does not constitute strong evidence for generic separation when so many other characters are similar among the two genera. The absence of acrostichal setae is a loss character, possibly of significance for defining species groups.

Diagnosis: Body length 1.8–2.6 mm; face and clypeus wide, slightly convergent ventrally; eyes well separated; scape subtriangular, with short pointed ventral projection; male postpedicel strongly elongate, often bladelike or subtriangular, swollen at base, laterally flattened and tapering distally; arista bare; ac present as short pairs or absent; 5 pairs of dc; legs mostly bare of major setae; vein M complete, joining costa anteriorly of wing apex; crossvein dm–cu weak, located variously, but frequently near wing base; sternite 8 sometimes 2 strong posterior projecting setae; epandrium subcircular; epandrial lobe elongate, subrectangular with 2 strong projecting distal setae; surstylus with projecting, almost clavate ventral arm with distal setulae, and shorter curved dorsal surstylar arm with 2 short apical setae; postgonite elongate and curved, almost hook-like; cercus short; oviscapt with fused epiproct bearing 5 pairs of blade-like acanthophorites.

Genus *Shamshevia* Grichanov, included species:

ajbanensis (Naglis), 2014: 726. (*Arabshamshevia*), **n. comb.**, United Arab Emirates.

hannahae Bickel, **n. sp.** Fiji.

hoanibensis Grichanov, 2012a: 561. Namibia.

negevensis (Grichanov), 2016: 94. (*Arabshamshevia*), **n. comb.**, Israel.

reshchikovi Grichanov, 2012b: 65. Goa.

Remarks. The genus *Shamshevia* has an unusual distribution and range of ecological associations. Four of the species are known from the western part of the Old World, southern Africa, the Indian Peninsula and arid lands north of the Arabian Sea, while the new species *S. hannahae* is from the Fiji islands some 12,000 km to the east. The Fijian occurrence is noteworthy as the genus is unknown from the intervening eastern Oriental and Australasian regions. So it remains a disjunct, possibly the result of extinction in the intervening area. In addition, the ecological habitats of the five species are varied. Three are from arid regions: *Shamshevia ajbanensis* (United Arab Emirates, al-Ajban), *S. hoanibensis*, (Namibia, Skeleton Coast), and *S. negevensis* (Israel, Negev Desert). By contrast, *S. reshchikovi* (Goa, Indian Peninsula) is from tropical monsoonal habitat, while *S. hannahae* (Fiji) is from moist tropical lowland rainforest.

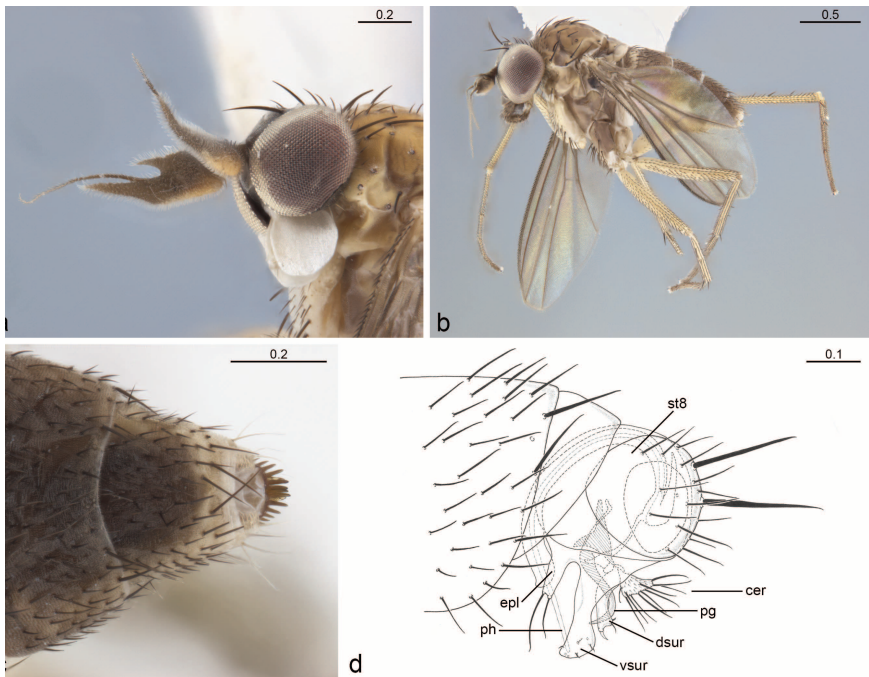


Fig. 2. *Shamshevia hannahae* n. sp.: a. male head, left anterior; b. female habitus, left lateral; c. female oviscapt, dorsal; d. male postabdomen, left lateral. Legend: cer, cercus; d.sur, dorsal surstylus; epl, epandrial lobe; pg, postgonite; ph, phallus; st8, sternite 8; v.sur, ventral surstylus.

***Shamshevia hannahae* Bickel n. sp.**

lsid:zoobank.org:act:C03AC54B-37D1-45A0-9D19-A05382ADCA72

(Figs 1a, b, 2a–d)

Description. Male. Body length 1.9–2.0 mm; wing: 1.9×0.7 mm.

Head (Fig. 2a). Head wider than high in anterior view; frons dark dull metallic blue-green with grey pruinosity; pair of strong divergent ocellar setae with tiny post-ocellar setae; pair of strong convergent and proclinate vertical setae; pair of postvertical setae, around a third of the length verticals; postocular setae short, dorsally black and ventrally whitish; face and clypeus as wide as antennal bases, not noticeably narrowed, with yellowish pruinosity; eyes with anteroventral facets enlarged; palp greatly enlarged, without external setae, almost circular and covered with reflective silvery pruinosity (MSSC); proboscis yellowish, hidden between palps; scape and pedicel dark brown; pedicel with subapical corona of short setae with strong dorsal seta; postpedicel yellow basoventrally, distally brown, covered with short pubescence and strongly modified: halberd-shaped, longer than head height, and with wide base which continues ventrally as tapering bladeliike projection, and dorsally as sharp triangular point, between which is U-shaped excavation (MSSC); arista pubescent, arising near base of U-shaped excavation and as long as antenna; ventral postcranium with fine yellowish setae.

Thorax. Almost entirely dull yellow except brownish ac band with expands laterally across posterior mesonotal slope, and pleura brown, although yellowish on some specimens; scutellum with brown basal hemi-circle and yellow margin; setae black; ac present as 6–7 short irregular setal pairs; 5 dc present, four strong setae and with weak but distinct dc seta anterior of posteriormost pair; 1 postalar, 2 postsutural supra-alar, 1 presutural intra-alar, 2 notopleural, 1 presutural supra-alar, and 1 weak postpronotal setae present; upper proepisternum bare without evidence of seta, proepisternum with black seta above coxa I; median scutellar setae strong, lateral scutellar setae absent.

Legs. CII mostly brown; CI and CIII yellow and remainder of legs yellow, with only distalmost tarsomeres infuscated; setae black; CI with three strong lateral setae, at $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{7}{8}$, and with some short additional setae (e.g., Figs 1a, 2b), CII short anterior setae and strong distolateral seta; CIII with strong lateral seta at $\frac{1}{3}$; claws and pulvilli short; legs mostly bare of major setae except where noted; I: 2.9; 2.8; 1.7/ 1.0/ 0.7/ 0.4/ 0.3; FI with short subapical pv seta; tarsus I unmodified; II: 3.2; 3.3; 1.8/ 0.7/ 0.6/ 0.4/ 0.3; TII with strong ad seta at $\frac{1}{4}$ and subapical corona of short ad, av, ventral and pv setae; III: 4.0; 4.2; 0.9/ 1.3/ 0.7/ 0.4/ 0.3; TIII with ad seta at $\frac{1}{5}$ and with dorsal row of 5 short, spaced setae.

Wing. Hyaline; veins R_{4+5} and M_1 subparallel beyond crossvein dm-m, with vein M_1 joining costa just behind wing apex; CuAx ratio: 0.4; lower calypter yellow with 3 strong black setae; halter yellow with slightly infuscated club.

Abdomen. Cylindrical, tergites 1–5 brown, but sometimes yellow laterally and tergites 4–5 yellow ventrally; tergites covered with short black setae and tergite 1 only with 6 strong black marginal setae; sternites yellow; postabdomen (Fig. 2d) including hypopygium yellow; sternite 8 ovate covering left lateral hypopygial foramen, with 2 strong black posterior projecting setae; epandrium subcircular; hypandrium forming short hood over phallus; epandrial lobe elongate, subrectangular with 2 strong projecting distal setae; surstylus with projecting, almost clavate ventral arm with distal setulae, and shorter curved dorsal surstylar arm with 2 short apical setae; postgonite elongate and curved, almost hook-like; cercus short, distally expanded subtriangular and numerous projecting elongate marginal setae.

Female (Figs 1b, 2b–c). Similar to male except as noted: head more ovate in lateral view; face broad, as wide as antennal bases, and covered with yellowish pruinosity; facets uniform; postpedicel also halberd shaped, but much smaller and without dorsal point (Fig. 1b); leg colouration, relative podomere ratios, and setation (including setation of coxa I) similar; oviscapt (Fig. 2c) with sternite 8 enlarged and epiproct fused bearing 5 pairs of blade-like acanthophorites.

Types. Holotype ♂, FIJI: **Viti Levu:** *Naitasiri Province:* 4 km WSW Colo-i-Suva Village, Mt. Nakobalevu, lowland wet forest, [-18.055, 178.424], 372 m, 17 Mar–9 Apr 2003, Malaise trap: M03, Timoci (FBA 143700); paratypes, 2♂, same but 24 Apr–12 May 2004 (FBA_065302, 065311); paratypes 2♀, same but [-18.056, 178.422], 325 m, 14 Jul–28 Jul 2003 & 25 Feb–17 Mar 2003, Malaise trap: M02, (FBA 094799, 102318) (all BPBM).

Other (non-type) material. FIJI: **Kadavu:** *Kadavu Province:* 1♂, Solodamu Village, coastal limestone forest, [-19.067, 178.117], 128 m, 25 Aug–23 Oct 2003, Malaise trap: M01, M.E. Irwin, E.I. Schlinger, M. Tokota'a (FBA_010413, 14901); 1♀, 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary, coastal limestone forest, [-19.078, 178.121], 60 m, 23 Oct–19 Dec 2003, Malaise trap: M02, S. Lau (FBA_131907, 14901). **Viti Levu:** *Rewa Province:* 1♀, 4 km NW Lami Town, Mt Korobaba, lowland wet forest, [-18.102, 178.383], 400 m, 15 Nov–1 Dec 2004, Malaise trap: M03, K. Koto (FBA 503962). *Vuda Province:* 1♂, Koroyanitu EcoPark, Mt Evans Range, 1 km E Abaca

Village, Kokabula Trail, disturbed mid-elevation moist forest, [-17.667, 177.55], 800 m, 22 Apr–6 May 2003, Malaise trap: M01, L. Tuimereke (FBA_174922) (all BPBM).

Remarks. *Shamshevia hannahae* is known from Malaise traps set in rainforest sites on the islands of Viti Levu and Kadavu, Fiji. Males have enlarged silvery pruinose palps and a striking halberd-shaped antennal postpedicel (Figs 1a, 2b), both of which are diagnostic for this species. The strongly modified male postpedicel appears smaller and less-modified in females (Fig. 2b), without the cuticular point dorsad of the arista. Also of note are the two long posterior setae on sternite 8 (Fig. 2d), sometimes broken off specimens.

Shamshevia hannahae has the dm-m crossvein near the mid-wing and the CuAx ratio about 0.4, while in its four congeners, the dm-m crossvein is close to the base of the wing, with CuAx ratio < 0.2. Also *S. hannahae* has two projecting setae on sternite 8, which are not clearly seen on the other *Shamshevia* species, although these setae are easily broken off.

Etymology. *Shamshevia hannahae* is named in honour of Hannah Mathews (*née* Finlay) for her superb pen and ink illustrations composed over the years for my Diptera manuscripts, two of which (Figs 1 and 2d) are presented here.

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Renato Capellari provided many helpful insights into diaphorine taxonomy and commented on an earlier draft of this manuscript. Igor Grichanov provided a pdf and other information. I thank Neal Evenhuis and Keith Arakaki (BPBM) for information, hospitality and loan of specimens. Hannah Mathews drew Figures 1 and 2d, John Martin took the automontage photographs, and Natalie Tees constructed the plates in Photoshop. This research was supported by the National Science Foundation project “Terrestrial Arthropod Survey of Fiji” (DEB0425790) and the Schlinger Foundation. The Government of Fiji is thanked for its support of the project.

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