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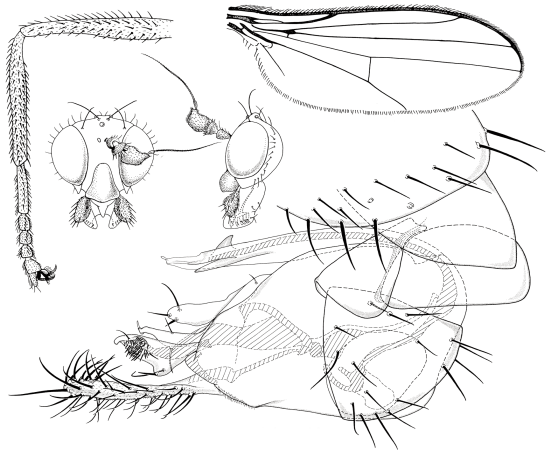

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Cover illustration: *Nggela crepidaria* Bickel, n. sp. from the Solomon Islands. Illustration by Hannah Finlay.

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Nggela (Diptera: Dolichopodidae), a new genus from the Solomon Islands

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Abstract. A new genus and species, *Nggela crepidaria* (Diptera: Dolichopodidae), are described from the Solomon Islands. The genus has the unusual character of a dorsal cuticular projection on tarsomere 5 of all legs in both sexes. The suite of characters found on the genus suggests it does not belong in any established subfamily, and it is regarded as *incertae sedis* within the Dolichopodidae.

Keywords. Diptera, Dolichopodidae, Solomon Islands, *Nggela,* new genus.

INTRODUCTION

The Solomon Islands comprise a double chain of rugged high islands in the tectonically active south-western Pacific region. The climate is humid tropical and the islands are largely covered by rainforest (Mueller-Dombois & Fosberg 1998). This archipelago arose during the Paleogene as a result of interactions between the Australian Plate and the Ontong Java Plateau, a large mass of basalt and sediment on the Pacific Plate. The complex geological history of the region involves reversed plate subduction with associated uplift and volcanism, all leading to a number of distinct geological provinces within the Solomon Islands themselves (see Craig *et al.* 2006, Hall 2002, Hill & Hall 2003, and Polhemus 1996).

The Diptera fauna of the Solomon Islands is very poorly known, and apart from a few groups of economic importance, taxonomic knowledge of many families comprises scattered descriptions of mostly lowland species. However, islands in the archipelago can reach elevations above 2,000 m, suggesting the presence of a rich but undocumented fauna (Bickel 2009).

The new species treated here was discovered while sorting Solomon Island Dolichopodidae collections housed at the Bishop Museum, Honolulu. Although small, yellowish, and rather nondescript at first glance, its suite of characters warrant the establishment of a new monotypic genus *incertae sedis,* outside the current dolichopodid subfamily structure.

MATERIAL AND METHODS

The specimens in this study are housed at the Bishop Museum, Honolulu (BPBM). Photographs were made with a Leica M205A photomontage system. In describing the hypopygium, ‘dorsal’ and ‘ventral’ refer to morphological position prior to genitalic rota-

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tion and flexion. Thus, in the lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom is dorsal. Morphological terminology follows McAlpine (1981) and Cumming *et al.* (1995). 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 m-cu crossvein/ distal section CuA. 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: I, II, III: pro-, meso-, metathoracic legs; C, coxa; T, tibia; F, femur; MSSC, male secondary sexual character(s), those non-genitalic characters found only on the male body; ac, acrostichal setae; ad, anterodorsal; av, anteroventral; dc, dorsocentral setae; dv, dorsoventral; hm, postpronotal setae; npl, notopleural setae; pa, postalar setae; pd, posterodorsal; pm, presutural supra-alar setae; ppl, proepisternal setae; pv, posteroventral; sa, postsutural supra-alar setae; sr, presutural intra-alar setae; t, tarsus; t_{1-5}, tarsomeres 1 to 5.

TAXONOMY

Nggela Bickel, n. gen.

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Type species: *Nggela crepidaria* Bickel n. sp., here designated.

Etymology. The generic name *Nggela* is an indigenous place name given to Nggela Island where the species was collected. The gender is feminine. [For pronunciation of the name *Nggela*, *ngg-* is pronounced like the 'ng' in finger, and *-ela* is like the name 'Ella']

Diagnosis. Genus *Nggela* (based on a single species, and characters cited are considered to be of generic importance):

Head: subcircular in anterior view, but wider than high; dorsal postcranium convex; face and clypeus wide in both sexes, and clypeus distinctly tectiform and roof-like over oral cavity; eye facets uniform in size; palp enlarged and subovate; scape with fine non-socketed dorsal hairs; male postpedicel large, subrectangular (smaller and subtriangular in female), and arista dorsal.

Thorax: posterior mesonotum not depressed or flattened; ac as irregular uniseriate row; lateral scutellar seta absent.

Legs: all femora longer than their adjacent tibiae; all femora bare of major setae, tibia I bare of major setae; tibiae II and III with only short setae; tarsomere 5 on all legs of both sexes with rounded dorsal cuticular projection that extends beyond base of claws.

Wing: membrane hyaline, veins R_{4+5} and M subparallel, only slightly diverging beyond crossvein dm-cu; vein M straight beyond dm-cu crossvein, without flexion or *bosse alaire.*

Abdomen: male postabdomen distinctly pedunculate with hypopygium fully exserted (Figs. 1a, 1f); segment 7 with well-developed tergite and sternite; epandrium large and ovoid; hypandrium forming elongate cover over phallus; epandrial lobe well developed, with short setae; surstylus divided into two arms, cercus elongate, digitiform.

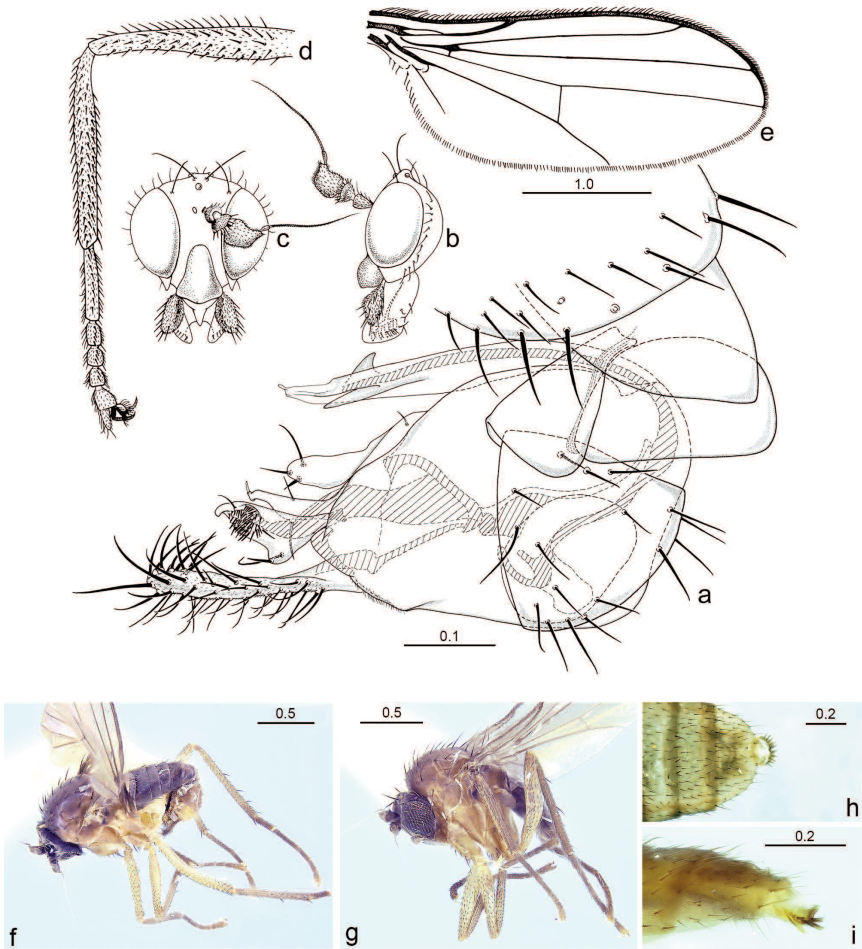

Figure 1. *Nggela crepidaria* n. sp. **a**. male postabdomen, left lateral; **b**. male head, left lateral; **c**. male head, anterior; **d**. male leg I, posterior; **e**. male wing, dorsal; **f**. male habitus, left lateral; **g**. female habitus, left lateral; **h**. female oviscapt, dorsal; **i**. female oviscapt, left lateral. Legend: cer, cercus; dsur, dorsal surstylus; el, epandrial lobe; epan, epandrium; hyp, hypandrium; st 7, sternite 7; st 8, sternite 8; t_5, tarsomere 5; tg 6, tergite 6; tg 7, tergite 7; vsur, ventral surstylus.

Nggela crepidaria **Bickel**, **n**. **sp**.

(Figs. 1a–i)

lsid:zoobank.org:act:F351F405-9C9A-400E-A496-95899788F1E7

Type material. **SOLOMON ISLANDS:** Holotype ♂ (BPBMENT 2008013741), paratypes 5♀, Florida Group, Nggela I, Haleta, 200–250 m, 10 Oct 1964, Malaise trap, R. Straatmann; paratypes: 4♂, 8♀, same but 0–100 m, 6 Oct 1964; 1♀, 250 m, 12 Oct 1964 (BPBM).

Description. **Male**. (Figs. 1a–f). Body length: 1.7 mm; wing length and width: 1.9 × 0.6 mm.

Head (Figs. 1b, 1c): subcircular in anterior view, wider than high; dorsal postcranium convex; setae black; postorbitals forming single row, and ventral postcranium without field of setae; vertex and frons dark brown with some paler brownish pruinosity; pairs of strong vertical and diverging ocellar setae present; pair of short postvertical setae on dorsal postcranium; upper face dark brown and covered with grey pruinosity; face and clypeus wide, and clypeus distinctly tectiform and rooflike over oral cavity; eye facets rather large but uniform in size, and with tiny pale hairs between the facets; palp dark brown, enlarged and subovate, with short vestiture; proboscis dark brown; antenna inserted about one-third distance from vertex; antenna brown, scape with fine non-socketed dorsal hairs, and subequal in length to pedicel; pedicel with coronal of short setae; postpedicel large, subrectangular with up-curved dorsoapical apex (MSSC); arista dorsal subapical and shorter than head height.

Thorax: mesonotum broad, dull brown, sub-shining with little pruinosity; scutellum and pleura mostly yellowish; posterior mesonotum not flattened; all setae black; ac as irregular uniseriate row of 6 short setae; 6 dc present, only slightly decreasing in size anteriorly; 1 strong pa, 2 sa, 2 sr, 1 strong hm, 1 pm, 2 npl; proepisternum without strong setae; median scutellar seta strong, lateral scutellar seta absent.

Legs: coxae, trochanters, femora, and tibiae dull yellow, and tarsi mostly brownish; CI with short black anterior setae, with longer distolateral setae; CII with some short black anterolateral setae; CIII with black lateral seta near ½; all tarsomeres with only short vestiture; all It_5 with two strong claws and associated pulvilli, and with rounded dorsal cuticular projection extending beyond base of claws; I (Fig. 1d): 2.8; 2.3; 0.8/ 0.3/ 0.2/ 0.2/ 0.4; FI and TI with only short brown vestiture, no major setae; II: 3.2; 2.9; 1.3/ 0.7/ 0.5/ 0.3/ 0.4; FII bare of major setae; TII with short black ad-pd setal pairs at 1/3 and ½, and with circlet of preapical dorsal, ad, pv, and av setae; III: 3.8; 3.4; 0 .6/ 1.0/ 0.7/ 0.6/ 0.4; FIII bare of major setae; TIII with short ad setae at ¼ and 5/8, and row of dorsals at 1/4 (weak), 2/5, 5/8, 4/5, and subapically, and with short subapical ventral; circlet of strong dorsal, ad, av, and pv setae.

Wing (Fig. 1e): membrane hyaline, vein R_{2+3} ending in costa near 4/5; R_{4+5} and M subparallel, only slightly diverging beyond crossvein dm-cu; vein M straight beyond dm-cu crossvein, without flexion (*bosse alaire*) and joining margin at wing apex; CuAx ratio: 0.6; anal angle absent; lower calypter brown with fan of black setae; halter yellow with infuscated club.

Abdomen: tergites 1–7 brown, sub-shining, covered with short brown vestiture, with longer setae near tergal margins; male postabdomen distinctly pedunculate with hypopygium fully exserted (Figs. 1 a, 1f); segment 7 with large well-developed tergite and sternite, and bare of major setae; sternite 8 yellowish, large and ovate, with short brownish setae, and forming cap over left lateral hypopygial foramen; hypopygium (Figs 1a, f) yellowish with dark brown hypandrium and cercus; epandrium large and ovoid; short seta present along basal epandrial margin; hypandrium forming elongate cover over phallus, and with subapical triangular projection on the ventral surface; epandrial lobe well developed, digitiform, with short setae distally; surstylus divided into two arms, ventral surstylar arm rod-like, with subapical excavation and short apical seta, with dorsal surstylar arm distally expanded and clavate, with hair field and setae as figured; cercus elongate, digitiform with abundant yellowish setae.

Female (Figs. 1g–i)**.** Similar to male and as noted: face also wide; postpedicel smaller and subtriangular with dorsal arista; thorax similar; leg coloration, relative podomere ratios and setation similar, and tarsomere 5 on all legs also with rounded dorsal cuticular projection extending beyond base of claws; abdomen dark brown, covered with short black vestiture, tergite 10 (Figs 1h, i), forming oviscapt, divided into two acanthophorites, each bearing 5 short flatten setae or dornen.

Remarks. *Nggela crepidaria* is known only from lowland rainforest habitat on Nggela Island in the Florida Group, Solomon Islands. Also see "Discussion" below.

Etymology. The specific epithet *crepidaria* is from Latin meaning "of shoes", in reference to the shoe-like dorsal cuticular projection found on tarsomere 5 of all legs in both sexes.

DISCUSSION

The genus *Nggela* displays morphological features that require further discussion.

1. *Tarsomere 5 with dorsal cuticular projection*. A short cuticular projection arises dorsoapically on tarsomere 5 and extends beyond the pulvilli and the base of the recurved claws. This projection occurs on all legs of both sexes (Figs 1 d, f, & g). I have not seen a similar structure in the Dolichopodidae and its function is unknown. It is a possible autapomorphy for the genus.
2. *All femora longer than their adjacent tibiae*. In the majority of dolichopodid genera, tibiae II and III are distinctly longer than their adjacent femora. In leg I, the situation is variable with femur I slightly longer or shorter than tibia I, or with the two podomeres subequal in length. This is apart from various modifications found on male legs only (MSSC), where a male tibia can be greatly longer or shorter than its adjacent femur, while the female maintains a conservative facies.
3. *Leg setation.* The genus *Nggela* has weakly developed leg setation. All femora and tibia I are bare of major seta, and tibiae II and III have only short setae only.
4. *Clypeus tectiform, and face wide on both sexes*. The tectiform or protruding roof-like clypeus occurs variously in the Dolichopodidae, sometimes only in females in some Sympycninae, or both sexes in some genera of Hydrophorinae and Dolichopodinae. In genera with a tectiform clypeus in both sexes, such as *Nggela,* the face and clypeus are also wide, without a narrowed male face.

The genus *Nggela* cannot be placed within any of the established subfamilies of Dolichopodidae. In many respects, its enlarged exserted hypopygium is similar to that found in some genera of the Dolichopodinae [e.g., compare Fig. 1a and 1f with the hypopygia of the genus *Argyrochlamys* Lamb, figs. 6 & 7 in Brooks (2005)], but *Nggela* lacks both socketed dorsal seta on the antennal scape, lacks a strong anterior preapical seta on femora II and III, both diagnostic characters for the subfamily. There are also some similarities with the genus *Urodolichus* Lamb [see Grichanov *et al*. (2016)], with both genera lacking anterior preapical setae on FII and FIII, and both with an exserted hypopygium. However, in *Urodolichus* vein M beyond the dm-cu crossvein is distinctly bent, the postpedicel is very short, tibia III is longer than femur III, and the postcranium is concave. Overall it is best to regard *Nggela* as a genus *incertae sedis* within the Dolichopodidae.

Since *Nggela* is known from a single locale in the Solomon Islands, any wider biogeographical context cannot be ascertained for the genus. It could have affinities to a Papuan source region [as demonstrated for the Solomon Islands Simuliidae by Craig *et al.* (2006)], or it might have other western Pacific affinities, especially in light of the region's complex geological history.

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