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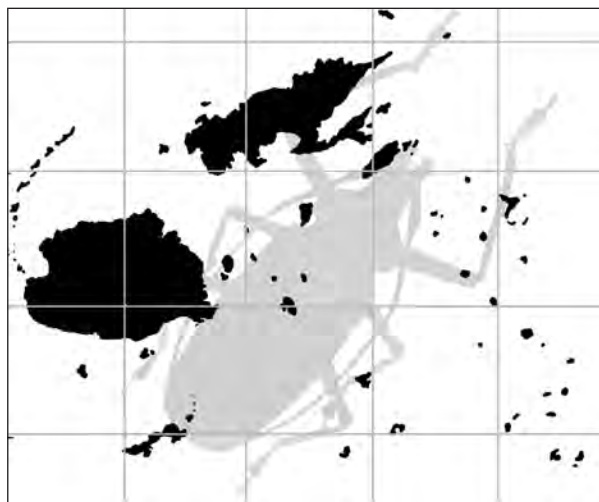
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FIJI ARTHROPODS III

NEAL L. EVENHUIS

AND

DANIEL J. BICKEL, EDITORS



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FIJI ARTHROPODS

Editors' Preface

We are pleased to present the third issue of *Fiji Arthropods*, a series offering rapid publication and devoted to studies of terrestrial arthropods of the Fiji Group and nearby Pacific archipelagos. Most papers in this series will be the results of collecting and research on the Fijian fauna deriving from the NSF-funded "Terrestrial Arthropods of Fiji" project. Five co-PIs and 18 specialists (see *Fiji Arthropods I*, p. 18) form the core team of scientists who have agreed to publish new taxa that result from collecting during this survey. However, as space allows, we welcome papers from any scientist who is currently working on arthropod taxonomy in Fiji.

This second issue contains results of discoveries of new species of Diptera in the family Tipulidae (Evenhuis), and a complete checklist of the ants of Fiji (Wetterer & Ward). Manuscripts are currently in press or in preparation on Anisopodidae, Saldidae, Lauxaniidae, Pipunculidae, Rhagionidae, Keroplatidae, Mycetophilidae, Tabanidae, Muscidae, and Asilidae and will appear in future issues.

The editors thank the Government of Fiji (especially the Ministries of Environment and Forestry), the National Science Foundation (DEB 0425970), and the Schlinger Foundation for their support of this project. Types of new species deriving from this study and voucher specimens will be deposited in the Fiji National Insect Collection, Suva.

All papers in this series are available free of charge as pdf files downloadable from the following url:

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We encourage interested authors to contact us before submitting papers.

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The genus *Holorusia* Loew (Diptera: Tipulidae) in Fiji^{1,2}

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Abstract: The genus *Holorusia* in Fiji is reviewed and a key to species is given. The known species from Fiji are described and illustrated, including four new species: *Holorusia damuda*, **n. sp.**, *H. mamare*, **n. sp.**, *H. picturata*, **n. sp.**, and *H. schlingeri*, **n. sp.** One species, *H. vitiana* Alexander is synonymized with *H. fijiensis* (Alexander), **n. syn.** A total of eight species are now known to occur in the Fiji islands.

INTRODUCTION

The Tipulidae of Fiji are represented by only one genus, *Holorusia* Loew (see Evenhuis, 2005 for a preliminary list of Fiji tipuloids). Species originally described in the genus *Ctenacroscelis* Enderlein have been transferred to *Holorusia* in Vane-Wright (1967). Their relatively large size makes *Holorusia* easy to spot in collection of Fiji tipuloids. The only species similar in size in Fiji is *Libnotes colossus* Alexander, only known from Matuku Island. No previous work has synthesized our knowledge of the genus in Fiji. Alexander described all the previously known species in separate papers (1921, 1924, 1978). In his last paper (1978), he provided illustrations of the wing venation and hypopygia of some species but not all. In this paper, I summarize the knowledge of *Holorusia* in Fiji based on examination of the types of all previously described species and provide an illustrated key to the species.

Extensive Malaise trapping throughout many Fijian islands since 2002 has captured dozens of specimens of *Holorusia*, revealing four new species described below. The genus is found in relative abundance on the larger islands of Viti Levu, Vanua Levu, and Kadavu, relatively uncommon on Taveuni, and has not yet been found on any of the smaller islands in the Lau group or elsewhere.

MATERIAL AND METHODS

The material examined in this study derives primarily from specimens collected under the auspices of the NSF-funded "Fiji Arthropods Survey" and the Schlinger Foundation-funded Fiji Biodiversity of Arthropods study, primary types of which will be deposited in the Fiji National Insect Collection, Suva (FNIC). Other specimens derive from the Bishop Museum, Honolulu (BPBM). Types of previously described species were borrowed from the United States National Museum of Natural History, Washington, DC (USNM) and the Natural History Museum, London (BMNH).

Descriptive terminology follows McAlpine (1981) and Young (1999) with genitalic terminology following Alexander (1978). Due to the confusing nature of previous and modern wing vein and cell terminology, a schematic illustration of the apical portion of the wing for *Holorusia* is given with veins and cells labeled (Fig. 1), which forms the basis for the terminology used herein.

1. Contribution No. 2006-002 to the NSF-Fiji Arthropod Survey.

2. Contribution No. 2006-003 to the Pacific Biological Survey.

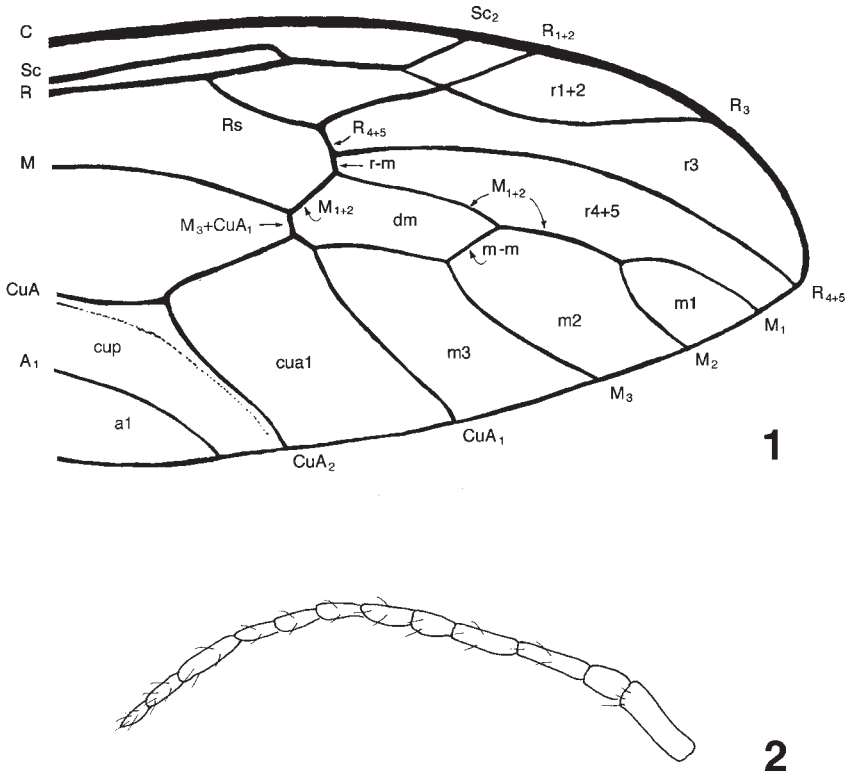


Figure 1. Generalized illustration of the apical portion of a *Holorusia* wing showing vein and cell terminology used in this paper. **Figure 2.** *Holorusia fijiensis* (Alexander) left antenna, lateral view.

SYSTEMATICS

Vane-Wright (1967) discussed salient characters that were useful in classifying and identifying taxa of *Holorusia* and related genera. As a result of examination of numerous specimens in this study, I here give a brief discussion of the characters that have been found useful in identification and may prove useful in potential phylogenetic studies.

Head. Although useful in distinguishing some species of the genus in other parts of the world, the shape of the antennal flagellomeres does not appear to have any specific differences in the Fijian taxa. All appear as in Fig. 2. The coloration of the scape and pedicel differs in some species, but do not appear to be of phylogenetic significance.

Thorax. The pleural patterning or dark and light coloration may prove useful in determining species groups. The relatively small assemblage of taxa from Fiji appear to fall into distinct groupings based on whether they have horizontal stripes (*fijiensis*), vertical stripes (*picturata*), predominantly brown (*mamare*), or predominantly yellowish with some brown areas ventrally on lower pleural sclerites (*damuda*, *degeneri*, *lepida*, *schlingeri*, *walkeriana*).



Figure 3. *Holorusia* heads, dorsal view. **a.** *H. schlingeri*, n. sp.; **b.** *H. fijiensis* (Alexander).

Legs. Fijian taxa appear to fall into two groups based on the presence (*fijiensis*, *mamare*) or absence (*damuda*, *degeneri*, *lepida*, *schlingeri*, *walkeriana*) of a subterminal yellow band on an otherwise dark brown apical femoral coloration.

Wing. All Fijian taxa have an effaced area near the distal third of the wing. This is shown by whitish veins and sometimes whitish or pale coloration in the midst of otherwise smoky or infuscated cell coloration. In addition, a slight bulge in the costa at the level of effaced area in the distal portion of the wing may be noticed in some species (e.g., Figs. 13, 17, 18). Infuscation is always present in the stigma and on basal portion of vein CuA_1 , and may be present at the junctions of other veins in the distal half of the wing, although the intensity of darkness or paleness of this infuscation is highly variable within the genus but appears to be consistent within species. The width of the opening of cell cup at the wing margin can be used to group taxa, but may not be of phylogenetic significance (e.g., a wide opening (wider than cell $r4+5$) easily groups large, generally yellowish species [*lepida* and *schlingeri*], but also includes the smaller, heavily brown-patterned *picturata*). The length of the petiole at the base of cell $m1$ (= vein M_{1+2} at base of this cell) can be used to group taxa; having a petiole shorter than cell $m1$ groups the same taxa that have a yellow subterminal band on the femora (*fijiensis*, *mamare*).

Male hypopygia. The shape of the ninth tergite and the inner and outer gonostyli are useful in species identifications but may not be of phylogenetic value as shapes and sizes do not seem to conform to discrete species groupings.

Ovipositor. Other than size differences extremely long for the large yellowish species (*lepida* and *schlingeri*) and much shorter for the smaller more brown species (cf. Figs. 20a and 20b), there appear to be few characters of phylogenetic significance or taxonomic value.

KEY TO SPECIES OF *HOLORUSIA* LOEW OF FIJI

1. Wing with extensive brown infuscation pattern (Figs. 10, 17); cell r4+5 infuscated brown, with only small hyaline streak near m-m crossvein **picturata** Evenhuis, **n. sp.**
- . Wing not as extensively patterned; cell r4+5 without infuscation, if present, then either pale smoky or as part of cloud of brown at base of cell 2
2. Cell cup at wing margin wider than cell m3 (Figs. 15, 18); large (usually yellowish) flies (wing length usually more than 23 mm) 3
- . Cell cup at wing margin narrower than cell m3 (e.g., Fig. 12); smaller brownish flies (wing length usually less than 20 mm) 4
3. Wing cells cup, a1, and anal lobe with distinct but pale brownish clouds of infuscation (Fig. 9); vein CuA₂ with distinct infuscation to wing margin; outer gonostyle subellipsoid-rectangular, without apical sclerotization **lepida** Alexander
- . Wing without distinct brown infuscation in cells cup, a1, and anal lobe (Fig. 11); vein CuA₂ with infuscation restricted to junction of CuA₁ and CuA₂; outer gonostyle subrectangular, slightly constricted medially, with dark sclerotization apically **schlingeri** Evenhuis, **n. sp.**
4. Femora apex black to dark brown, with contrasting pale yellow band subapically; petiole of vein M₁₊₂ subequal in length to cell m1 5
- . Femora without contrasting pale band subapically (although femoral tips may be darker than remainder of femora in some specimens); petiole of vein M₁₊₂ longer than cell m 6
5. Vein Rs with brown infuscation basally; rostrum yellowish laterally; male genitalia with outer gonostylus very thin, U-shaped (Fig. 30c) **mamare** Evenhuis, **n. sp.**
- . Vein Rs without infuscation basally; rostrum brown to dark brown laterally; outer gonostylus subtriangular (Fig. 27c) **fijiensis** Alexander
6. Vein M₃+CuA₁ shorter than r-m crossvein (Fig. 13); wing infuscation generally yellowish **degeneri** Alexander
- . Vein M₃+CuA₁ as long or longer than r-m crossvein (e.g. Figs. 12, 19); wing infuscation yellowish brown to dark brown 7
7. Stigma pale brown; antenna reddish yellow in color; male tergite IX subquadrate (Fig. 33b) **walkeriana** Alexander
- . Stigma brown; antenna yellowish; male tergite IX hemispherical (Fig. 26a) **damuda** Evenhuis, **n. sp.**

Holorusia damuda Evenhuis, new species

(Figs. 8, 12, 20b, 21, 26)

Diagnosis. *Holorusia damuda* appears closest to *H. walkeriana*, but can be separated from it by the distinct brown stigma and other infuscation of the wing (the stigma and other wing infuscation pale brown in *H. walkeriana*) as well as the hemispherical shape of the ninth male tergite (this tergite subquadrate in *H. walkeriana*).

Description. Lengths: Body: 16.0–18.5 mm; wing: 17.1–19.4 mm. **Male.** *Head.* Rostrum yellowish orange, brown laterally; nasus distinct, yellowish orange, black at extreme tip, subequal in length to second flagellomere. Occiput yellowish orange, golden brown pruinose laterally, with short sparse yellowish hairs. Palpi brown with yellow bases and apices. Antenna 12-segmented, with first and second flagellomere yellowish, remainder of antennal segments yellowish brown; apicalmost flagellomere longer than penultimate one.

Thorax. Pronotum brown dorsally and dorsolaterally, yellow ventrolaterally. Prescutum brownish with three dark brown stripes; median stripe extending almost to transverse suture, with grayish brown median vitta; lateral pair shorter, extending from just posterior to pseudosutural fovea to transverse suture. Scutum grayish pruinose with paired brown spots, anterior pair almost black. Scutellum dark brown basally, brown pruinose apically. Pleura predominantly yellowish pruinose, with dark brown stripe from proepimeron to laterotergite, gray pruinose patches on anepisternum and anepimeron; katapisternum and meron brown ventrally. Metatergite grayish brown pruinose, dark brown posteroventrally. Halter with stem and knob yellowish brown.

Legs. Coxae brown, gray pruinose, yellow haired; fore trochanter shining reddish brown; mid and hind trochanters pale brown pruinose. Remainder of legs yellowish becoming darker brown on tarsal segments II–V.

Wing (Fig. 12). Pale yellowish brown; veins brown; stigma brown. Effaced areas of veins and associated cells include: end of Sc, apical half of Rs, crossveins r-m and m-m; vein at base of cell m2. Brown infuscation in cells sc and cup and along basal portion of vein CuA₁. Petiole of cell m1 (vein M₁₊₂ at base of cell m1) longer than cell m1. Cell cup narrowly open in wing margin.

Abdomen. Tergites I–VI reddish brown, with whitish posterior transverse band on segments II–V; tergites VII–IX dark brown. Sternites slightly paler reddish brown than tergites.

Male hypopygium (Fig. 26). Tergite IX hemispherical, slightly emarginate medially, posterolateral angles rounded. Outer gonostyle broad basally, tapering sharply mesally to blunt apex, finely hirsute, pale hairs throughout, longer hairs basally. Inner gonostyle with beaklike apical portion, a few minute hairs subapicodorsally, arm slender, lateral surface from beak to middle of arm with three strong reddish ridges, base swollen with black hairs.

Female. As in male except: with terminalia as in Figs. 20b, 21. Tergites VIII–IX dark brown. Sternite VIII brownish yellow, length about 1.5 times width, bilobed and deeply emarginate medially, each lobe sharply rounded; hypovalve shining yellowish brown with some dark coloration medially.

Types. Holotype ♂ from FIJI: **Viti Levu:** Koroyanitu EcoPark, 1 km E Abaca Village, Savuione trail, 800 m, 5–18 Oct 2004, Malaise, L. Tuimereke. *Paratypes:* FIJI: **Viti Levu:** 3 ♂, 2 km E Navai Village, Mt. Tomanivi, 700 m, 23 Sep–6 Nov 2004, Malaise, E. Namatalau; 1 ♀, Koroyanitu EcoPark, 1 km E Abaca Village, Savuione Trail, 800 m, 25 Oct–5 Nov 2002, Malaise, L. Tuimereke (FBA003010). Holotype to be deposited in FNIC. Paratypes in FNIC and BPBM.

Etymology. The species epithet derives from the Fijian *damuda* = “reddish, brownish”, referring to the general brownish coloration of wing and body patterning.

Distribution. Known only from northwestern and north central Viti Levu.



Figures 4–5. *Holorusia* heads and thoraces, lateral view. 4. *H. fijiensis* (Alexander). 5. *H. lepida* (Alexander), holotype.



Figures 6–7. *Holorusia* heads and thoraces, lateral view. 6. *H. mamare*, n. sp. 7. *H. picturata*, n. sp.

Holorusia degeneri Alexander

(Figs. 13, 27)

Holorusia degeneri Alexander, 1978: 103. Oosterbroek, 1989: 56. Evenhuis, 2005: 28

Alexander (1978) described this species based on eight specimens collected by the botanist Otto Degener at his lantern in Nadele (originally spelled as "Nandala") west of Nadarivatu on Viti Levu while he was pressing plants in his bungalow near the Fish Hatchery there (Degener, 1949).

Male genitalia (Fig. 27) [some structures redrawn from holotype slide]: Tergite IX subhemispherical, deeply emarginate medially. Inner gonostyle with beaklike apical portion slightly less than half length of entire gonostyle, sharply pointed apically, dorsal surface with reddish ridges. Outer gonostyle subtriangular with broadly rounded lateral and mesal projections [Note: the illustration in Alexander (1978) has the orientation of this structure inadvertently flipped from the actual as it was drawn from a slide preparation that flipped the structure].

Material Examined. *Types:* Holotype ♂ and paratype ♀ (pinned together) FIJI: **Viti Levu:** Nandala [= Nadele], 24 Mar 1941, O. Degener (both in USNM). *Other material:* FIJI: **Viti Levu:** 1 ♀, Veilasele Track, 3.2 km E Navai Village, 1020 m, 18 Oct–28 Nov 2004, 17°37'27"S, 178°00'33"E, Malaise, E. Namatalau (FNIC); 1 ♂, 0.5 km N. Abaca Village, 800 m, 29 Nov–13 Dec 2004, 17°40'S, 177°33'E, Malaise, L. Tuimereke (BPBM).

Remarks. Degener (1949) gave details on his collection of this species:

"Though professionally interested in plants and concentrating upon their collection and study, I am attracted as a hobby to most remaining phases of Natural History. I always carried a "cyanide bottle" with me or had one within reach. When strange insects flew into my lantern at night while I was working on my plants, I caught, killed and preserved them. As my friend Dr. C.P. Alexander of the University of Massachusetts was particularly interested in Tipulidae, or crane-flies, I paid particular attention to these two-winged, long-legged insects. I placed them in dry paper packets, labeled them as to locality and date, and then mailed them to him in Postum containers with odd accumulations of dead tree crickets, wasps, flies, etc. They reached him at his study in Amherst usually in good condition."

Distribution. Known only from north central and northwestern Viti Levu.

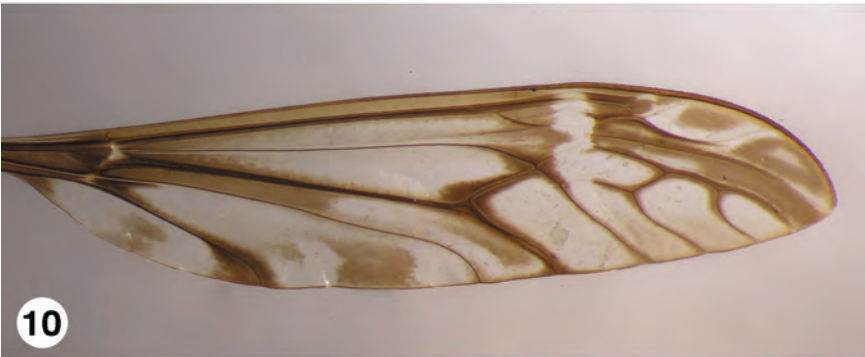
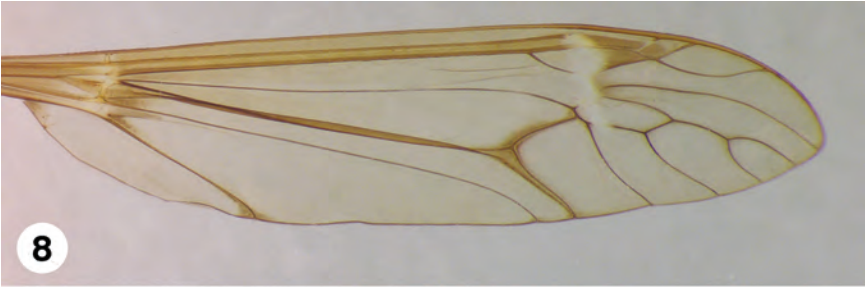
Holorusia fijiensis Alexander

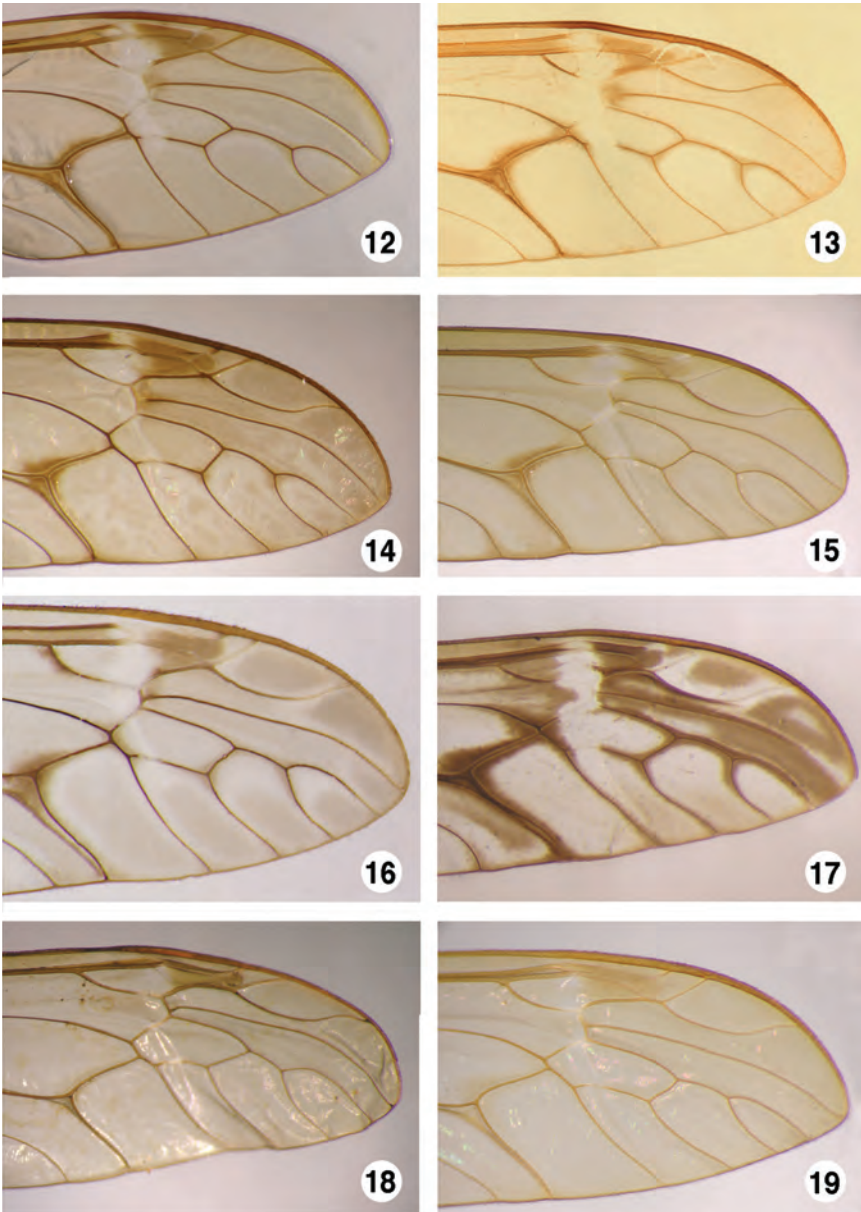
(Figs. 2, 3b, 4, 14, 22, 28)

Ctenacroscelis fijiensis Alexander, 1921: 562.*Holorusia fijiensis* (Alexander). Vane-Wright, 1967: 537; Oosterbroek, 1989: 56. Evenhuis, 2005: 28.*Holorusia vitiana* Alexander, 1978: 104; Oosterbroek, 1989: 56. Evenhuis, 2005: 28. **N. syn.**

Numerous specimens of this species have been examined in this study showing it to be widely distributed throughout Fiji (viz., Viti Levu, Kadavu, Lakeba, Gau, Vanua Levu, and Taveuni). It is easily distinguished from most other Fijian *Holorusia* species by the

Figures 8–11. *Holorusia* wings. **8.** *H. damuda*, n. sp. **9.** *H. lepida* (Alexander). **10.** *H. picturata*, n. sp. **11.** *H. schlingeri*, n. sp.





Figures 12–19. *Holorusia* wing tips. 12. *H. damuda*, n. sp. 13. *H. degeneri* Alexander. 14. *H. fijien-sis* (Alexander). 15. *H. lepida* (Alexander). 16. *H. mamare*, n. sp. 17. *H. picturata*, n. sp. 18. *H. schlingeri*, n. sp. 19. *H. walkeriana* (Alexander), holotype.

horizontal striping pattern on the pleura (Fig. 4) (no other Fijian species has this type of striping pattern). It is also distinguished by the dark brown occiput and dorsum of the head. *Holorusia picturata* also has this characteristic but can be separated from *H. fijiensis* by the heavily dark brown wing pattern (more modest wing patterning in *H. fijiensis*). Examination of the types of both species and comparison with the specimens examined during this study show that the type female of *H. fijiensis* is a pale variant (possibly teneral) of *H. vitiana*. Both species have a characteristic yellow subterminal band on the femora, but the contrast between it and the more typical dark blackish brown tip of the femora is not as distinct in the type female of *H. fijiensis*. Although Alexander (1978) said that the male genitalia of the two were different, an examination of numerous specimens shows that the differences he illustrated were actually very slight (tergite IX) or fall within a normal range of variation for this widespread species (shape of outer gonostylus). I conclude here that the male hypopygia of both are conspecific; therefore, I synonymize the two names.

Male hypopygium (Fig. 28). Tergite IX subquadrate, with slightly concave posterior margin, emarginate medially, posterolateral corners acute, but rounded. inner gonostyle with beaklike portion about half length of entire gonostyle, with minute hairs on dorsoapical surface, dorsal surface with reddish brown ridges. outer gonostyle ellipsoid with protruding mesal portion; apical and mesal projections minutely haired.

Female terminalia (Fig. 22). Entirely dark brown. Sternite VIII subquadrate, length subequal to width, bilobed apically with each lobe broadly rounded. Hypo valve unicolorous.

Material Examined. *Types:* Holotype ♀ of *fijiensis*: FIJI: **Vanua Levu**: Labasa, Oct 1914, R. Veitch (BMNH). Holotype ♂ of *vitiana*: FIJI: **Viti Levu**: Nadele, 24 Mar 1941, Otto Degener, at light (USNM). *Other material examined:* Numerous specimens from the following islands: Gau (**new record**), Kadavu (**new record**), Lakeba (**new record**), Taveuni (**new record**), Vanua Levu, and Viti Levu. Representative specimens in FNIC, BPBM, and USNM.

Remarks: *Holorusia fijiensis* was originally described based on a single female collected from Labasa on Vanua Levu (incorrectly spelled as “Labaea” [based on an incorrect transcription of the handwritten label]) in October 1914 by R. Veitch. The male genitalia were illustrated by Alexander (1978) from subsequently collected material. *Holorusia vitiana* was described based on a single male collected by Otto Degener in Nadele (originally spelled as “Nandala”). Representative specimens deposited in FNIC, BPBM, and USNM.

Distribution. Widespread throughout Fiji (Viti Levu, Vanua, Levu, Gau, Kadavu, Lakeba, Taveuni).

Holorusia lepida Alexander

(Figs. 5, 9, 15, 23, 29)

Ctenacroscelis lepida Alexander, 1924: 45.

Holorusia lepida (Alexander). Vane-Wright, 1967: 537; Oosterbroek, 1989: 56. Evenhuis, 2005: 28.

This species was described based on a single male and female collected at Loloti on Viti Levu on 19 Dec 1920 by W. Greenwood. The male genitalia are here redescribed based on examination of the type and additional specimens collected during this survey.

Male hypopygium (Fig. 29). Tergite IX subquadrate with concave posterior margin, narrowly and deeply emarginate medially, apical corners knoblike, truncate and rounded apically. inner gonos-

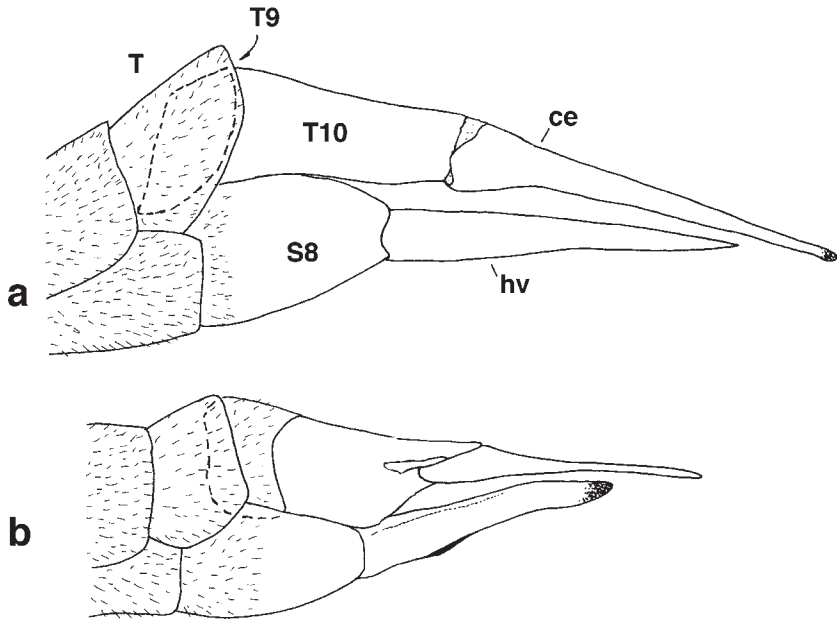


Figure 20. *Holorusia* female terminalia. **a.** *H. schlingeri*, n. sp.; **b.** *H. damuda*, n. sp. Abbreviations: ce = cercus; hv = hypovalve; S8 = sternite VIII; T8 = tergite VIII; T9 = tergite IX; T10 = tergite X.

tyl with beaklike apical portion slightly less than half entire length of gonostyle, with minute hairs dorsoapically, longer hairs along thin rod and on mesal surface basally. outer gonostyle

Female terminalia (Fig. 23). Sternite VIII subquadrate, shiny brown on apical three-fourths, bilobed with shallow cleft medially, posterodorsal corners slightly produced, knoblike; hypovalve shiny yellow to yellowish brown with dark medial coloration, tips darkly sclerotized.

Material Examined. *Types:* Holotype ♂ and allotype ♀ FIJI: **Viti Levu:** Loloti, 19 Dec 1920, W. Greenwood (BMNH). *Other material examined:* FIJI: **Viti Levu:** 1♂, Koroyanitu EcoPark, Savuione Trail, 1 km E Abaca Village, 800 m, 28 Aug–6 Sep 2004, 17°40'S, 177°33'E, Malaise, L. Tuimereke, (FNIC); 1♀, same data except: 20 Sep–5 Oct 2004 (FNIC); 1♀, same data except: 21 Oct–18 Nov 2004, [FBA 49605]; 1♀, 2.0 km SW Vaturu Dam, 700 m, 7–19 Aug 2004, 17°44'41"S, 177°39'54"E, Malaise, A. Namaqa. **Vanua Levu** (new island record): 1♂, Wainibeqa, 4 km NW of Kilaka Village, 150 m, 9–20 Dec 2004, 16°48'21.5"S, 178°59'23.8"E, Malaise P. Manueli (BPBM).

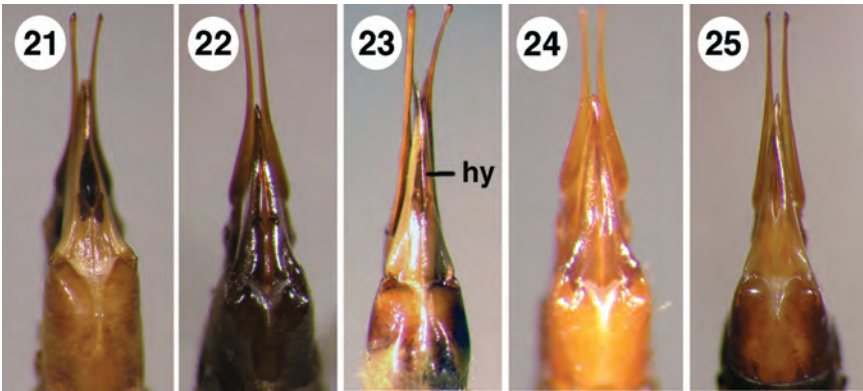
Remarks. Representative specimens deposited in FNIC, BPBM, and USNM.

Distribution. Found on Viti Levu and Vanua Levu islands.

Holorusia mamare Evenhuis, new species

(Figs. 6, 16, 24, 30)

Diagnosis. *Holorusia mamare* fits in the group of species with a yellow subterminal band on the femora, but is easily distinguished from them by the generally brownish pleura



Figures 21–25. *Holorusia* female terminalia, ventral view, showing hypovalve and shape of sternite VIII. **21.** *H. damuda*, n. sp. **22.** *H. fijiensis* (Alexander). **23.** *H. lepida* (Alexander). **24.** *H. mamare*, n. sp. **25.** *H. schlingeri*, n. sp.

(with stripes in the other species) and the unusually thin and U-shaped outer gonostyle of the male hypopygium.

Description. Lengths: Body: 17.8–18.4 mm; wing: 18.0–20.2 mm. **Male.** *Head.* Rostrum brown; nasus distinct, brown, subequal in length to first flagellomere. Occiput brown, yellow along posterior margin of eyes, scattered silvery pruinose, with short sparse black hairs. Palpi brown. Antenna 12-segmented, brown; apicalmost flagellomere subequal in length to penultimate one.

Thorax. Pronotum brown. Prescutum brownish with three vaguely apparent brown stripes; median stripe extending almost to transverse suture. Scutum grayish pruinose. Scutellum dark brown. Pleura (Fig. 6) predominantly brownish, yellowish on posterior sclerites. Metatergite grayish brown pruinose, dark brown dorsally. Halter with stem brown, knob yellowish brown.

Legs. Coxae brown basally, yellow apically, gray pruinose, yellow haired; trochanters brown. Femora yellowish brown basally, with subapical band of yellow, dark brown apically. Remainder of legs yellowish becoming darker brown on tarsal segments II–V.

Wing (Fig. 16). Pale yellowish brown; veins brown; stigma brown. Effaced areas of veins and associated cells include: end of Sc, apical third of Rs, crossveins r-m and m-m; vein at base of cell m2. Brown infuscation in cells sc and cup and along basal portion of vein CuA1. Petiole of cell m1 (vein M_{1+2} at base of cell m1) shorter than cell m1. Cell cup narrowly open in wing margin, narrower than opening at wing margin of cell m3.

Abdomen. Tergites I–VIII reddish brown, with whitish posterior transverse band on segments III–V; tergites IX dark brown. Sternites yellow.

Male hypopygium (Fig. 30). Tergite IX subrectangular with deeply concave posterior margin, concavity with deep medial cleft, posterolateral corners acute, rounded. Inner gonostyle with large beaklike apical portion, a few minute hairs subapicodorsally, arm slender with prominent flange near middle of dorsal surface, dorsal surface from beak to middle of arm with three strong reddish ridges. Outer gonostyle U-shaped, thin, finely hirsute, pale hairs throughout.

Female. As in male except: with terminalia as in Fig. 24. Tergites VIII–IX dark brown. Sternite VIII brownish yellow, length about 1.5 times width, bilobed and deeply emarginate medially, each lobe sharply rounded; hypovalve shining yellowish brown with some dark coloration medially.

Types. Holotype ♂ from FIJI: **Taveuni:** Mt. Koronibuabua, 3.2 km NW Lavena Village, 235

m, 16°51'17"S, 179°53'29.9"W, 4–19 Nov 2003, Malaise, B. Soroalau, (FBA046594). *Paratypes*: FIJI: **Taveuni**: 1 ♂, topotypic, collected with holotype (FBA046611) (BPBM); 1 ♀, Devo Peak, 5.6 km SE Tavuki Village, 1187 m, 16°50'35.7"S, 179°57'56.7"W, 3–10 Jan 2003, Malaise, E. Ratu, (FBA058168) (FNIC). Holotype to be deposited in FNIC. Paratypes in FNIC and BPBM

Etymology. The species epithet derives from the Fijian *mamare* = thin, referring to the thin U-shape of the outer gonostyle of the male hypopygium.

Distribution: Known only from Taveuni.

Holorusia picturata Evenhuis, new species

(Figs. 7, 10, 17, 31)

Diagnosis. *Holorusia picturata* can be separated from the other Fijian species in *Holorusia* by the extensive brown infuscation of the wing. Specifically, cell r3 is almost completely infuscated and brown color is present in cells r3, r4+5, and cup (these cells predominantly hyaline in other Fijian species).

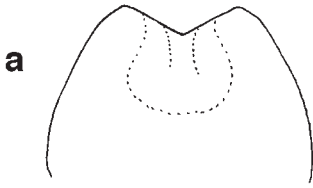
Description. Lengths: Body: 16.8–18.4 mm; wing: 17.5–20.0 mm. **Male.** *Head.* Rostrum and nasus yellowish brown dorsally, rostrum brown laterally, darkest near eye; nasus distinct, subequal in length to second flagellomere. Black spot on frons at base of antenna. Occiput yellowish brown with short sparse black hairs. Palpi brown. Antenna 12-segmented, yellowish; apicalmost flagellomere slightly longer than penultimate segment.

Thorax. Pronotum yellowish, white pruinose dorsally, with brown band laterally, extending posteriorly along lateral prescutal area to prealar area, brown band thickest dorsally just posterior to pseudofoveal suture. Prescutum olive gray pruinose with 2 pairs of dark gray stripes; admedian stripe tapering caudally, extending almost to transverse suture; lateral pair shorter, extending from pseudo-sutural fovea to transverse suture. Scutum olive gray pruinose with paired brown spots, anterior pair darkest. Scutellum brownish gray pruinose. Pleura (Fig. 7) predominantly whitish yellow pruinose with dark brown pattern; anepisternum with brown on posterior half; anepimeron with brown color medially on sclerite surrounded by pruinescence; katapisternum and meron brown ventrally. Metatergite grayish brown pruinose, dark brown posteroventrally. Halter with stem brown, knob yellowish brown.

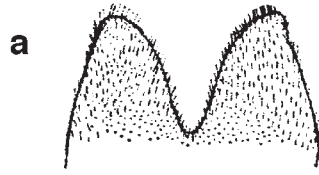
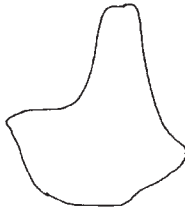
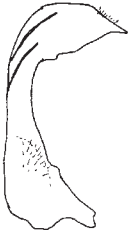
Legs. Coxae and trochanters brown pruinose, pale haired. femora brown with broad yellow sub-terminal band. tibiae yellow at extreme base. Remainder of legs brown.

Wing (Figs. 10, 17). Subhyaline with extensive brown infuscation pattern; veins brown; cell cup widely open in wing margin, wider than width of cell r4+5 at wing margin; stigma distinct, brown; infuscated brown in following cells: base of wing (with yellowish to whitish area at base of vein R near arculus); base of cup; all of sc; at extreme base and apex in anal lobe with paler spot medially; extreme base of a1 with large squarish paler spot distally at wing margin; basal half of cup with paler streak subapically from deflexion of basal portion of vein CuA₁ to wing margin; almost all of r4+5 with subhyaline streak near apex of cell dm; medially in r1+2 and r3; basally in r3 with small brown-

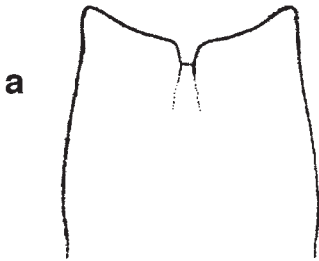
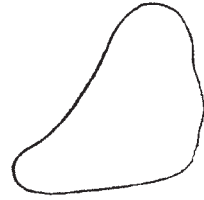
Figures 26–29. *Holorusia*, male genitalia. **26.** *H. damuda*, n. sp. **a.** tergite IX; **b.** inner gonostyle; **c.** outer gonostyle. **27.** *H. degeneri* Alexander. **a.** tergite IX (redrawn from Alexander, 1978); **b.** inner gonostyle; **c.** outer gonostyle. **28.** *H. fijiensis* (Alexander). **a.** tergite IX (redrawn from Alexander, 1978); **b.** inner gonostyle; **c.** outer gonostyle. **29.** *H. lepida* (Alexander). **a.** tergite IX; **b.** inner gonostyle (redrawn from Alexander, 1978); **c.** outer gonostyle.



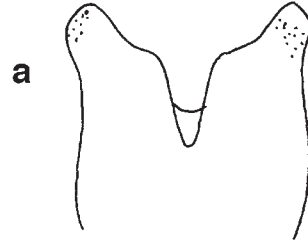
26



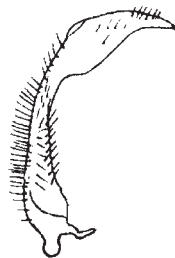
27



28



29



ish area medially; all veins from level of basal portion of vein CuA_1 distally suffused with dark brown except R_{1+2} and distal half of R_3 and distal fourth of R_{4+5} .

Abdomen. Tergites I–II brown dorsally, with brownish subterminal transverse band; tergites II–VI pale brown with dark brown posteriorly; tergites VII–VIII yellowish brown dorsally, brown posteriorly. Tergite IX dark brown with yellow tips to posterolateral corners. Sternites I–VI brown; sternites VII–VIII dark brown.

Male hypopygium (Figs. 31). Tergite IX black, subquadrate, emarginate medially, posterolateral angles rounded. Outer gonostyle ellipsoid, finely hirsute, pale hairs throughout, longer hairs basally. Inner gonostyle with beaklike apical portion, arm slender, base swollen with black hairs.

Female. Unknown.

Types. Holotype ♂ (FBA5011565) and 2♂ paratypes (FBA501157–501158) from FIJI: **Viti Levu:** Koroyanitu Eco Park, 0.5 km N Abaca Village, 800 m, 29 Nov–13 Dec 2004, 17°40'S 177°33'E, Malaise, L. Tuimereke. (FNIC). Holotype to be deposited in FNIC. Paratypes in BPBM and FNIC.

Etymology. The specific epithet derives from the Latin *picturatus* = “painted, embroidered”; referring to the well-marked dark pattern on the wing.

Holorusia schlingeri Evenhuis, new species

(Figs. 3a, 11, 18, 20a, 25, 32)

Diagnosis. *Holorusia schlingeri* fits in the species group with those species that are large-sized, yellowish, and have the cell *cua1* widely open in the wing margin. It can be separated from the only other species in that group, *H. lepida*, by the hyaline cells *cua2*, *a1*, and anal lobe (these cells with cloudy infuscations in *H. lepida*). The male hypopygium has the outer gonostyle subrectangular and darkly sclerotized apically (it is subellipsoid and not darkly sclerotized apically in *H. lepida*).

Description. Lengths: Body: 22.4–24.5 mm. Wing: 24.5–25.5 mm. **Male.** **Head** (Fig. 3a). Rostrum and nasus yellowish orange; nasus distinct, subequal in length to second flagellomere. Occiput pale yellowish orange with short sparse yellowish hairs. Palpi yellowish. Antenna 12-segmented, with first and second flagellomere yellowish brown, remainder of antennal segments yellowish orange; apicalmost flagellomere with very short, nib-like apex.

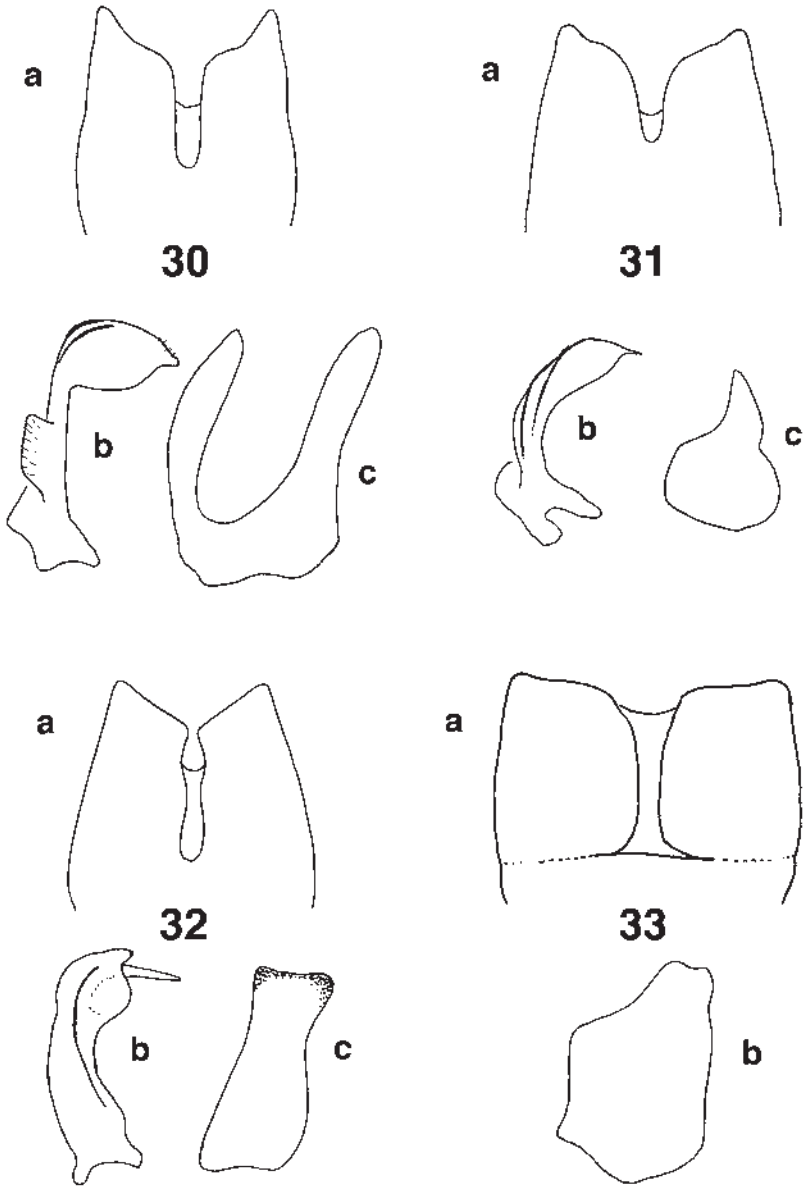
Thorax. Pronotum yellowish with brown band laterally. Prescutum yellowish orange with 2 pairs of brown stripes; admedian stripe tapering caudally, extending almost to transverse suture; lateral pair shorter, extending from pseudosutural fovea to transverse suture. Scutum yellowish orange with paired brown spots. Scutellum yellowish brown. Pleura predominantly yellowish orange; anepimeron with dark brown area medially and ventrally; katapisternum and meron with dark brown ventrally. Metatergite dark brown with yellowish brown anterior corners. Halter with stem shining yellowish, knob dark brown.

Legs. Coxae and trochanters predominantly yellow; fore coxa with brown basally; hind coxa with brown along anterobasal surface. Remainder of legs yellowish becoming darker toward tarsi.

Wing (Figs. 11, 18). Subhyaline, pale yellowish; veins yellowish brown; stigma indistinct, pale brown. Vein *Sc* distinct, yellowish brown. Cell *c* infuscated yellowish brown; basal portion of vein CuA_1 infuscated faintly yellowish brown. Cell *cup* widely open in wing margin, wider than cell r_{4+5} . Vein *Rs* and veins at base of cell *dm* and cell *m3* effaced and whitish in color.

Abdomen. Tergites yellowish orange. Sternites yellowish brown to yellowish orange, paler, than on tergites; sternite IX dark brown with yellowish orange posterior border.

Male hypopygium (Fig. 32). Tergite IX subquadrate, deeply emarginate medially, posterolater-



Figures 30–33. *Holorusia*, male genitalia. **30.** *H. mamare*, n. sp. **a.** tergite IX; **b.** inner gonostyle; **c.** outer gonostyle. **31.** *H. picturata*, n. sp. **a.** tergite IX; **b.** inner gonostyle; **c.** outer gonostyle. **32.** *H. schlingeri*, n. sp. **a.** tergite IX; **b.** inner gonostyle; **c.** outer gonostyle. **33.** *H. walkeriana* (Alexander), holotype. **a.** tergite IX; **b.** outer gonostyle.

al angles truncate. Inner gonostyle swollen apically with long, thin, tapering apical rod, arm relatively broad, base slightly swollen with black hairs. Outer gonostyle subrectangular, darkly sclerotized apically, finely hirsute, pale hairs throughout.

Female. As in male except: coloration is paler than in males; halter knob yellowish; terminalia (Fig. 25) with sternite VIII shiny brown, dark brown laterally, bilobed apically, each lobe rounded; hypovalve shiny brown, undifferentiated.

Variation. The admedian thoracic stripes can be coalesced and appear as a single median stripe in some specimens. Some specimens may have brown on the posterior borders of some abdominal segments.

Types. Holotype ♂ (BPBM 16,590) from FIJI: **Viti Levu:** Nadarivatu, Oct 1937, J.M. Valentine. The specimen carries a label "*Ctenacroscelis walkeriana*" determined by C.P. Alexander. **Paratypes:** Fiji: **Viti Levu:** 1♂, 2♀, 3.8 km N Veisari Settlement, logging road to Waiwudava, 300 m, 18°04'45"S, 178°21'45"E, 25 Apr–25 May 2003, Malaise, M. Tokota'a (FBA055302–055304); 1♂, 1.8 km E Navai Village, Mt. Tomanivi, 700 m, 9–30 Aug 2004, Malaise, E. Namatalau (FBA501153); 3♂, Koroyanitu EcoPark, Savuione Trail, 1 km E Abaca Village, 800 m, 2–16 Nov 2004, 17°40'S, 177°33'E, Malaise, L. Tuimereke, (FBA501155) (FNIC); 1♂, Koroyanitu EcoPark, Savuione Trail, 1 km E Abaca Village, 800 m, 16–29 Nov 2004, 17°40'S, 177°33'E, Malaise, L. Tuimereke, (FBA501154) (FNIC). Holotype in BPBM. Paratypes in FNIC, USNM, and BPBM.

Etymology. The species is named in honor of Dr. Evert I. Schlinger, for his efforts in increasing the knowledge of Fiji arthropod biodiversity.

Distribution. Known only from Viti Levu.

Holorusia walkeriana Alexander

(Figs. 19, 33)

Ctenacroscelis walkerianus Alexander, 1924: 47.

Holorusia walkeriana (Alexander). Vane-Wright, 1967: 537; Oosterbroek, 1989: 56. Evenhuis, 2005: 28.

This species was originally described based on a single male specimen (not female as incorrectly cited by Alexander (1978)) collected at Lautoka near Mt. Evans (Koroyanitu) on 4 April 1920. No further specimens of this species have yet been collected despite extensive Malaise trapping in the same general area for over two years.

Male hypopygium [unique type specimen not dissected] (Fig. 33): Tergite IX almost square with shallow indentation posteriorly and deep cleft on posteromedial surface making segment appear almost bifid, distal corners slightly pointed. Outer gonostyle subhexagonal with extended and blunt lateral lobe.

Material Examined. *Types:* Holotype ♂ FIJI: **Viti Levu:** Lautoka, Mt. Evans [= Koroyanitu], 4 Apr 1920, W. Greenwood (BMNH).

Distribution. Only known from the type male from northwestern Viti Levu.

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Checklist of the Ants of Fiji (Hymenoptera: Formicidae)¹

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Abstract. We present a checklist of the ants of Fiji that includes 138 currently valid species and subspecies: 91 Fijian endemics, 22 wide-ranging Pacific natives, and 25 exotics. We collected five exotic ant species not previously reported from Fiji: *Platythyrea parallela* (F. Smith), *Monomorium destructor* (Jerdon), *Monomorium sechellense* Emery, *Tetramorium lanuginosum* (Mayr), and *Cardiocondyla obscurior* Wheeler. The native Fijian fauna appears to descend from migrants from the Papuan and the Western Melanesian region. There has been subsequent radiation in several genera, particularly *Camponotus*, *Cerapachys*, *Leptogenys*, *Lordomyrma*, *Pheidole*, and *Strumigenys*. There is one endemic genus, *Poecilomyrma*. The native fauna predominates in intact forest; exotic species are most common in disturbed ecosystems, including towns, villages, and agricultural areas. The ever-increasing number of invasive ant species in Fiji has potential long-term impacts for the conservation of the unique biota of Fiji.

INTRODUCTION

In Oceania, the ancestors of most species came from the west, carried by prevailing currents from Australia, New Guinea, and Southeast Asia (Wilson 1961; Carlquist 1965). The observed pattern of a steady decline in the number of genera and species found on islands as one moves from west to east across Oceania points to a dispersal mechanism whereby islands geographically closer to the source region have received more colonists than islands farther from the source region (Carlquist 1965). For example, the islands of Melanesia in western Oceania have a rich native ant fauna with many endemic species (Wilson 1961; Wilson & Taylor 1967). In contrast, the smaller and more distant islands of eastern Micronesia and Polynesia have a depauperate native ant fauna. In fact, Wilson & Taylor (1967) concluded that “prior to the coming of man, few if any native [ant] species ranged east of New Zealand, Rotuma, Samoa, and Tonga.”

From the mid 1800s to the early 1900s, several authors (primarily Mayr, Emery, Forel, and Santschi) described much of the ant fauna of Oceania based on specimens accumulated from many sources. Towards the end of this period, Mann (1919, 1921) conducted major ant surveys in Fiji and the Solomon Islands. Wheeler (1935) summarized the knowledge in his checklist of the ants of Oceania.

1. Contribution No. 2006-003 to the NSF-Fiji Arthropod Survey.

In the 1950s and 1960s the ant fauna of the Pacific region was again the subject of attention. Wilson revised the subfamily Ponerinae (Wilson 1958a, 1958b, 1959a, 1959b) of Melanesia and used this group of ants to examine biogeographical patterns of dispersal and speciation. Wilson (1959c) further used the ant fauna of Melanesia to illustrate patterns of adaptive radiation, dispersal and taxon cycling. Wilson & Taylor (1967) provided an identification guide and summary of the Polynesian fauna that remains the major reference and identification guide for Polynesian ants.

Recently, there has been a new surge of interest in the ant fauna of the Pacific region (e.g., Dlussky 1993, 1994; Terayama *et al.* 1994; Morrison 1996a, 1996b, 1997; Wetterer 1997a, b, 1998, 2002, in press; Collingwood & van Harten 2001; Wetterer & Vargo 2003; Lester & Tavite 2004). Much of the renewed interest concerns the distribution and impact of invasive ant species, primarily in Polynesia and Micronesia, both of which are regions with a very limited endemic ant fauna. In Melanesia, which has a very diverse endemic ant fauna, most recent research has concerned the impact of the invasive Neotropical little fire ant, *Wasmannia auropunctata*, in New Caledonia (e.g., Jourdan 1997; Jourdan *et al.* 2001, 2002; LeBreton *et al.* 2003, 2005). In the present paper, we provide a comprehensive checklist of ants recorded from Fiji, the eastern limit of the Melanesian region.

Fiji has been at the margins of much of the Pacific ant work (Wilson 1958a, 1958b, 1959a, 1959b; Wilson & Hunt 1967; Dlussky 1994). However, there has not been a comprehensive overview of the Fijian ant fauna since Mann (1921, 1925). The ant species list from Fiji in Mann (1921, 1925) and Wheeler (1935) are now outdated as a result of numerous changes in nomenclature and descriptions of many additional species. In the present paper, we summarise the literature on the ant fauna of Fiji, assess the archipelago's species composition in relation to neighboring island groups, examine biogeographical affinities and species radiations within Fiji, and compile the distribution records of all known exotic ant species in Fiji.

METHODS

We compiled past records of Fijian ants from published literature. Due to the large number of Fijian islands, and the difficulty of reaching many of these, ant collections have generally concentrated on the most accessible islands, particularly the largest island, Viti Levu. Wetterer examined exotic ant species from Fiji in the collections at the Natural History Museum in London (BMNH), the Smithsonian Institution's National Museum of Natural History (USNM), and Harvard University's Museum of Comparative Zoology (MCZ). We obtained specimen records from the Australia National Insect Collection (ANIC) in the Global Biodiversity Information Facility database (see www.gbif.net/portal/index.jsp). Ward obtained information on specimens in the New Zealand Arthropod Collection (NZAC).

We collected ants in Fiji primarily by visual search and breaking open logs. Wetterer collected ants for 11 days in Fiji between 6 and 23 July 1997, primarily on Viti Levu, but with short trips to three small satellite islands: two resorts (Nananu-i-Ra, Toberua) and one a wildlife refuge (Mabualau). On Viti Levu, Wetterer collected in Suva, Ellington Wharf, Nadarivatu tree plantation, Navai Forestry Camp, Udu, Wailoa Power Station, Colo-i-Suva Forest Park, Waivaka, and Waisoi Forest Camp.

Ward collected ants in Fiji from 18 June – 30 July 2004 from throughout Viti Levu. Ward collected in urban and industrial areas (Suva, Tavua, Ba, Lautoka, Vuda Point,

Table 1. The taxonomic composition of endemic and native species in Fiji

Subfamily	Genera	Species/subspecies	% species total
Myrmicinae	17	51	45.13
Formicinae	3	29	25.66
Ponerinae	5	15	13.27
Dolichoderinae	5	8	7.08
Cerapachyinae	1	7	6.19
Proceratiinae	1	2	1.77
Ectatomminae	1	1	0.88

Nadi, Denerau Island, Sigatoka, Lami, and Pacific Harbour), rural areas (Navai village, Ellington wharf, Bukuya Rd-Inland Nadi, Rewa Delta, Korotogo beach, Lomolomo Guns, Momi Guns Rd., Nadarivatu, Koronivia Research Station, Rakiraki, Sigatoka Valley, Natadola beach, Vatia Point wharf, Vatukonia mine, Vaturu Dam Rd, Inland Rakiraki, Kula EcoPark), plantation forests (Galoa Mahogany forest, Lololo Pine forest, Nadarivatu forest, Colo-i-Suva Forest Park), and native forests (Mt. Korobaba, Mt. Victoria, Abaca Park, Koro'o Ridge, Vatia Point, Namosi Highland Rd. and the Sigatoka Sand Dunes).

RESULTS AND DISCUSSION

Species Richness and Composition

We found records for one 138 species and subspecies from Fiji (Appendix). Ninety one taxa (66%) are Fijian endemic (restricted to Fiji only), 22 taxa (16%) are native or regional endemics, and 25 taxa (18%) are exotic. The endemic and native taxa (113) are represented by 33 genera and seven subfamilies (Table 1). Although Fiji has many more endemic species than Polynesian islands, there is a strong correlation between the number of endemic and native species and the island area for Pacific islands (Log – log plot, $y = 0.43x + 0.13$, $R^2 = 0.91$, Table 2). There is also a good correlation between the number of endemic and native species and the island area for the five largest islands (Log – log plot, $y = 0.23x + 0.85$, $R^2 = 0.72$). Although many native species are widespread among the island groups of Fiji, a large proportion of endemics are recorded from only one island group. For example, 65 (71%) of Fijian endemics are restricted to only one island group, suggesting high levels of speciation has occurred within island groups, as well as the overall Fijian archipelago.

Biogeographical Origins and Diversification of Native Species

Wilson (1959c) extensively summarised the biogeographical origins and dispersal patterns of Ponerine ants throughout Melanesia. Based on Wilson's interpretations, Papua New Guinea is seen as the centre of origin for the native Fijian ant fauna. This is in concordance with other arthropod taxa (Evenhuis & Bickel 2005). Ancient stocks of ants dispersed into Papua New Guinea from the Oriental region, and to a lesser extent from Australia, then some stocks dispersed from Papua New Guinea outward into Melanesia in a unidirectional flow. Wilson (1959c) describes this as a classic 'filter-effect' with islands

Table 2. Number of ant species from Fiji and surrounding Pacific island groups

Island Group	Land area (km ²)	Species			Total
		Endemic	Native	Exotic	
Tuvalu	25	0	4	8	12
Niue	259	0	17	16	33
Wallis & Futuna	274	0	21	16	37
Tonga	699	10	21	22	53
Samoa	3132	15	27	25	67
Vanuatu	12189	11	30	18	59
Fiji	18272	91	22	25	138
New Caledonia	18576	72	20	18	110
Solomon Islands	27556	121	38	20	179

closest to Papua New Guinea receiving a higher proportion of dispersing stocks, with a diminishing effect outward across Melanesia and ultimately to Fiji.

Bolton (1995a) provides a taxonomic and zoogeographical census of the ant taxa, from which this filter-effect can be illustrated. Of the approximately 126 genera in the Indo-Australian region, only 33 (26%) have naturally reached Fiji. Of particular note is the absence of army ants from Fiji, including Aenictinae, Dorylinae and Leptanillinae. Wheeler (1935) comments on the lack of army ants in Oceania and suggests that their absence is because army ants have large bodied queens, and they need workers to assist the queen in establishing a new colony. Such characteristics are not favourable for long distance dispersal across oceans. However, Fiji is also missing several genera (*Crematogaster*, *Pseudolasius*, *Myopias*, and *Myrmoteras*) found in the Indo-Australian region that are very species-rich (Bolton 1995a). Interestingly, *Polyrhachis rotumana*, the only representative of this very common genus in the Indo-Australian region, is found on the island of Rotuma, to the far north of the main Fijian islands, but appears not to present on the main Fijian islands.

Although few stocks dispersed outwards from Papua New Guinea, there has been subsequent radiation in Fiji, particularly within several genera: *Camponotus* (Formicinae); *Cerapachys* (Cerapachyinae); *Leptogenys* (Ponerinae); and *Pheidole*, *Strumigenys* and *Lordomyrma* (Myrmicinae) (Mann 1921, Wheeler 1935). The Myrmicinae fauna contributes >40% of the native and endemic fauna, with *Strumigenys* (14 species), *Pheidole* (10 species) the most diverse. These two genera also make a significant contribution to the diversity in the Indo-Australian region. For example, Fiji has 29% of all described species of *Strumigenys*, and 10% of all described species of *Pheidole* in the Indo-Australian region (data in Bolton 1995a). Additionally there are six endemic species of *Lordomyrma* in Fiji, of only 16 described species in the genus worldwide (Bolton 1995a).

Wilson (1958a) considered the extensive radiation within the genus *Leptogenys* as remarkable for such a small land mass. He suggests that this radiation is possibly due to less competitive pressure from the relatively depauperate endemic ponerine-myrmicine fauna in Fiji. There are five genera, and only 15 native or endemic species of Ponerinae in Fiji, although the number of species is likely to increase with further intensive sampling of forest litter. Fiji also has a particularly diverse fauna of Cerapachyinae, represented by seven species in the genus *Cerapachys* (Wilson 1959b). The diversity of both *Leptogenys*

and *Cerapachys* may perhaps be attributed to the lack of army ants in Fiji. Both *Leptogenys* and *Cerapachys* show the army ant behaviour of group raiding and are predators of other ants, albeit less sophisticated than true army ants (Hölldobler & Wilson 1990, Fisher 1997). Fisher (1997) has recently suggested the absence of army ants in Madagascar has spurred the diversification of Cerapachyinae.

Another reason for the success of *Cerapachys* in Fiji could be related to their ability to nest in plant cavities, this has been suggested to greatly assist in the 'rafting' of colonies across ocean currents (Wheeler 1935; Fisher 1997). The inclination to nest in plant cavities may have also contributed to the diversity of *Camponotus* in Fiji. *Camponotus* is the most species rich genus in Fiji and contributes 25 of 29 (86%) species of the native and endemic Formicidae. Fiji also has 16% of all described species of *Camponotus* in the Indo-Australian region (data in Bolton 1995a).

Published Records

Mayr (1866, 1870) reported ten ant species from Fiji, all collected on Ovalau; *Camponotus cristatus* Mayr, *Colobopsis dentatus* Mayr (= *Camponotus dentatus* (Mayr)), *Camponotus laminatus* Mayr, *Colobopsis oceanicus* Mayr (= *Camponotus oceanicus* (Mayr)), *Colobopsis carinatus* Mayr (= *Camponotus polynesianus* Emery), *Colobopsis rufifrons* (F. Smith) (= *Camponotus rufifrons* (F. Smith)), *Camponotus schmeltzii* Mayr, *Leptothorax nuda* Mayr (= *Cardiocondyla nuda* (Mayr)), *Odontomachus angulatus* Mayr, and *Pheidole oceanica* Mayr. Mayr (1870) listed nine of the above species in Fiji, adding one more record, *Plagirolepis gracilipes* F. Smith (= *Anoplolepis gracilipes* (F. Smith)), and omitting two, *C. nuda* and *P. oceanica*.

Mann (1920, 1921) collected ants in Fiji for ten months in 1915–1916, and Mann (1925) reported ants collected by D. Stoner. In total, Mann (1920, 1921, 1925) reported 96 ant taxa including subspecies and varieties, most of them new descriptions. These included all those reported by Mayr (1866, 1870) except *C. rufifrons* plus the following: *Adelomyrmex hirsutus* Mann, *Anochetus graeffei* Mayr, *Plagirolepis longipes* (Jerdon) (= *A. gracilipes*), *Camponotus cristatus nagasau* Mann, *Camponotus cristatus sadina* Mann, *Camponotus maculatus pallidus* F. Smith (= *Camponotus chloroticus* Emery), *Camponotus janus* Mann (= *Camponotus janussus* Bolton), *Camponotus laminatus levuanus* Mann, *Camponotus lauensis* Mann, *Camponotus maafui* Mann, *Camponotus maudella* Mann, *Camponotus maudella seemanni* Mann, *Camponotus mayriella* Mann (= *C. polynesianus*), *Camponotus schmeltzii kadi* Mann, *Camponotus schmeltzii loloma* Mann, *Camponotus schmeltzii trotteri* Mann, *Camponotus vitiensis* Mann, *Cerapachys cryptus* Mann, *Cerapachys cryptus fuscior* Mann (= *Cerapachys fuscior* Mann), *Cerapachys majusculus* Mann, *Cerapachys vitiensis* Mann, *Cerapachys vitiensis sculpturatus* Mann (= *Cerapachys sculpturatus* Mann), *Rhopalothrix elegans* Mann (= *Eurhopalothrix emeryi* (Forel)), *Wheeleripone aterrima* Mann (= *Gnamptogenys aterrima* (Mann)), *Ponera biroi rugosa* Mann (= *Hypoponera eutrepta* (Wilson)), *Ponera monticola* Mann (= *Hypoconera monticola* (Mann)), *Ponera turaga* Mann (= *Hypoconera turaga* (Mann)), *Ponera vitiensis* Mann (= *Hypoconera vitiensis* (Mann)), *Iridomyrmex anceps ignobilis* Mann, *Leptogenys foveopunctata* Mann, *Leptogenys fugax* Mann, *Leptogenys humiliata* Mann, *Leptogenys letilae* Mann, *Leptogenys navua* Mann, *Leptogenys vitiensis* Mann, *Rogeria rugosa* Mann (= *Lordomyrma rugosa* (Mann)), *Rogeria tortuosa stoneri* Mann (= *Lordomyrma tortuosa stoneri* (Mann)), *Rogeria striatella* Mann (= *Lordomyrma striatella* (Mann)), *Rogeria tortuosa* Mann (= *Lordomyrma tortuosa* (Mann)), *Rogeria tortuosa levifrons* Mann (=

Lordomyrma tortuosa levifrons (Mann), *Rogeria tortuosa polita* Mann (= *Lordomyrma tortuosa polita* (Mann)), *Monomorium floricole* (Jerdon), *Monomorium pharaonis* (Linnaeus.), *Monomorium vitiensis* Mann (= *Monomorium vitiense* Mann), *Archaeomyrmex cacabau* Mann (= *Myrmecina cacabau* (Mann)), *Iridomyrmex sororis* Mann (= *Ochetellus sororis* (Mann)), *Odontomachus haematoda* (Linnaeus) (= *Odontomachus simillimus* (F. Smith)), *Euponera stigma quadridentata* (F. Smith) (= *Pachycondyla stigma* (Fabricius)), *Prenolepis bourbonica bengalensis* Forel (= *Paratrechina bourbonica* (Forel)), *Prenolepis longicornis* (Latreille) (= *Paratrechina longicornis* (Latreille)), *Prenolepis oceanica* (Mann) (= *Paratrechina oceanica* (Mann)), *Prenolepis vividula* (Nylander) (= *Paratrechina vaga* (Nylander)), *Prenolepis vitiensis* (Mann) (= *Paratrechina vitiensis* (Mann)), *Pheidole caldwelli* Mann, *Pheidole colaensis* Mann, *Pheidole knowlesi* Mann, *Pheidole knowlesi extensa* Mann, *Pheidole megacephala* (Fabricius), *Pheidole onifera* Mann, *Pheidole roosevelti* Mann, *Pheidole umbonata* Mayr, *Pheidole vatu* Mann, *Pheidole wilsoni* Mann, *Iridomyrmex nagasau* Mann (= *Philidris nagasau* (Mann)), *Iridomyrmex nagasau agnatus* Mann (= *Philidris nagasau agnatus* (Mann)), *Iridomyrmex nagasau alticola* Mann (= *Philidris nagasau alticola* (Mann)), *Plagiolepis foreli* Mann (= *Plagiolepis alluaudi* Emery), *Poecilomyrma senirewae* Mann, *Poecilomyrma senirewae myrmecodiae* Mann, *Ponera colaensis* Mann, *Pristomyrmex mandibularis* Mann, *Proceratium relictum* Mann, *Strumigenys vitiensis* Mann (= *Pyramica membranifera* (Emery)), *Rogeria stigmatica sublevinodis* Emery (= *Rogeria sublevinodis* Emery), *Solenopsis cleptes vitiensis* Mann, (= *Solenopsis papuana* Emery), *Strumigenys godeffroyi* Mayr, *Strumigenys jepsoni* Mann, *Strumigenys nidifex* Mann, *Strumigenys scelestus* Mann, *Strumigenys wheeleri* Mann (= *Strumigenys tumida* Bolton), *Tapinoma melanocephalum* (Fabricius), *Technomyrmex albipes vitiensis* Mann (= *Technomyrmex albipes* (F. Smith)), *Triglyphothrix pacifica* Mann (= *Tetramorium manni* Bolton), *Tetramorium pacificum wilsoni* Mann (= *Tetramorium insolens* (F. Smith)), *Tetramorium guineense* (Fabricius) (= *Tetramorium bicarinatum* (Nylander)), *Tetramorium pacificum* Mayr, *Tetramorium simillimum* (Nylander) (= *Tetramorium simillimum* (F. Smith)), and *Tetramorium tonganum* Mayr. Mann (1921) also described the only endemic genus, *Poecilomyrma*.

Since Mann (1920, 1921, 1925) a number of authors have recorded additional species from Fiji. Stitz (1925) described *Odontomachus politus* Stitz (= *O. angulatus*) from Fiji. Santschi (1928) reported on ants collected in Fiji's Lau group by EH Bryan Jr. in 1924, describing two new taxa, *Tetramorium scrobiferum liogaster* Santschi (= *Romblonella scrobifera liogaster* (Santschi)) and *Camponotus bryani* Santschi, and listing in 22 other forms: *P. monticola* (= *H. monticola*), *P. colaensis* (= *H. colaensis*), *O. haematoda* (= *O. simillimum*), *C. nuda*, *M. floricole*, *P. megacephala*, *T. guineense* (= *T. bicarinatum*), *T. guineense macra* (= *T. insolens*), *T. pacificum*, *T. simillimum insulare* Santschi (= *T. simillimum*), *S. godeffroyi*, *I. sorosis* (= *O. sorosis*), *I. nagasau* (= *P. nagasau*), *T. albipes rufescens* Santschi (= *T. albipes*), *T. albipes vitiensis* Santschi (= *T. albipes*), *T. melanocephalum*, *A. longipes* (= *A. gracilipes*), *P. longicornis*, *P. vaga crassipilis* (= *P. vaga*), *C. irritans chloroticus samoensis* (= *C. chloroticus*), *C. laminatus*, and *C. lauensis*.

Tothill *et al.* (1930) mentioned observations of *P. megacephala*, *P. vividula* (= *P. vaga*), *T. melanocephalum*, *T. guineense* (= *T. bicarinatum*), and *T. albipes vitiensis* (= *T. albipes*) in Fiji. Tothill *et al.* (1930), in considering methods to control the coconut moth, *Levuana iridescens*, considered introducing the weaver ant *Oecophylla smaragdina* to Fiji. "The Levuana Committee was not particularly anxious to introduce this ant to Fiji on account of its bite. However, the bite is not nearly as painful as that of the so-called Buli ant in Fiji, and it was decided to find out as an initial step whether the ant would feed upon

Levuana larvae” However, it appears that there were no attempts to introduce *Oecophylla smaragdina* to Fiji.

Wheeler (1934) described three new *Camponotus*, *C. dentatus humeralis* Wheeler, *C. manni* Wheeler, and *C. manni umbratilis* Wheeler, based on material originally collected by Mann in 1915–1916. Wheeler’s (1935) checklist included all previously reported ant taxa from Fiji except *C. polynesticus* and *L. tortuosa stoneri*, omitted apparently by mistake. Wheeler’s (1935) also listed *Pheidole oceanica nigriscapa* Santschi (= *Pheidole fervens* F. Smith) from Viti Levu. Taylor (1937) recounted *M. floricole* in Fiji attacking the larvae, pupae, and adults of the coconut leaf-mining beetle. Donisthorpe (1946) described the queen, male, and soldier of *C. vitiensis* from Fiji based on specimens collected by Lever. Smith (1953) described a new endemic species, *Romblonella vitiensis* M. Smith from Wakaya island, in the Ovalau group based on specimens collected by Bryan in 1924.

In his revisions of the ant fauna from Melanesia, Wilson (1958) raised *Ponera biroi rugosa* Mann to full species status as *Ponera eutrepta* (= *Hypoponera eutrepta* (Wilson)), and also listed *P. colaensis*, *H. monticola*, *H. turaga*, and *H. vitiensis* in Fiji. Wilson (1959b) described *Cerapachys lindrothi* Wilson and *Cerapachys zimmermani* Wilson from Fiji, and also listed *C. crypta* (= *C. cryptus*), *C. fuscior*, *C. majuscula*, *C. sculpturata*, and *C. vitiensis*.

Wilson & Taylor (1967) described three new species from Fiji: *Camponotus rotumanus* Wilson & Taylor, *Polyrhachis rotumana* Wilson & Taylor, and *Strumigenys mailei* Wilson & Taylor. Wilson & Taylor (1967) also published the first records from Fiji of *Oligomyrmex atomus* Emery (collected by Taylor in 1962) and *Tapinoma minutum* Mayr. Wilson & Taylor (1967) wrote that they had seen the first records of *Iridomyrmex anceps* (Roger) from Fiji, collected in 1956, though Mann (1921) reported *I. anceps ignobilis*. Wilson & Taylor (1967) synonymized *T. guineense* (= *T. bicarinatum*) with *T. guineense macra* (= *T. insolens*), though they are now considered separate species. Finally, Wilson & Taylor (1967) mentioned in passing a number of ant species in Fiji: *A. longipes* (= *A. gracilipes*), *C. bryani*, *C. chloroticus*, *C. dentatus*, *P. vaga*, *P. fervens*, *P. oceanica*, *P. umbonata*, *P. aluaudi*, *Trichoscapa membranifera* (Emery) (= *P. membranifera*), *R. sublevinodis*, and *S. papuana*, *T. pacificum*, and *P. megacephala*.

Wilson & Hunt (1967) listed 88 ant species from Fiji, including the earliest published record of *Hypoconerops punctatissima* (Roger). Wilson & Hunt (1967) omitted all subspecific designations used by earlier authors, truncating the subspecific designation of *R. scrobifera liogastefor* to *Romblonella scrobifera* (Emery) and *Ponera biroi rugosa* (= *H. eutrepta*) to *Ponera rugosa* (= *Diacamma rugosum*). Wilson & Hunt (1967) listed *L. tortuosa stoneri* as *L. stoneri* (as did Dlussky 1994, but not Bolton 1995a). Wilson & Hunt (1967) did not include *C. rotumanus* and *P. rotumana* in their checklist, presumably considering Rotuma as separate from Fiji. Finally, Wilson & Hunt (1967) omitted *C. lauensis*, *T. insolens*, and *C. fuscior*, taxa of which Wilson & Taylor (1967) had raised to full species.

Taylor (1967) described *Ponera manni* Taylor from Fiji based on specimens he collected in 1962, and also listed *P. colaensis*. Bolton (1977) listed Fijian records for *T. insolens*, *T. bicarinatum*, *T. simillimum*, *T. pacificum*, *Tetramorium tenuicrinis* (Emery), and *T. tonganum*. Bolton (1987) listed Fijian records for *M. floricole* and *M. pharoanis*. Taylor (1980a) described *Eurhopalothrix insidiatrix* from Fiji based on Mann specimens and also listed *E. emeryi*. Taylor (1980b) briefly reports on collections of *Myrmecina cacabau* from forest litter at Nadarivatu by G. Kuschel.

Dlussky (1993) listed several dacetine ant species from Fiji: *T. membranifera* (= *P. membranifera*), *S. godeffroyi*, *S. mailei*, *S. jepsoni*, *S. nidifex*, *S. scelestus* (= *S. scelesta*),

S. wheeleri (= *S. tumida*), and described *Strumigenys chernovi* Dlussky. Dlussky (1994) listed 93 ant species from Fiji based published records as well as specimens of 20 species collected by YI Chernov in 1977 and 12 species collected by G.M. Dlussky in 1980. The Chernov specimens included the first Fijian records of six species: *Cardiocondyla emeryi* Forel, *Hypoponera opaciceps* (Mayr), *Paratrechina chernovi* Dlussky, *Paratrechina minutula* (Forel), *Strumigenys ursulus* Dlussky, and *Vollenhovia denticulata* Emery. Like Wilson & Hunt (1967), Dlussky (1994) omitted all subspecific designations, thus listing *R. scrobifera* instead of *R. scrobifera liogaster* and omitting *T. insolens*. Dlussky (1994) also omitted *Ca. bryani*, *Ca. dentatus*, *Ce. fuscior*, and *E. emeryi*, apparently by mistake. Dlussky (1994) erroneously listed that *S. rogeri* had been reported in Fiji by Wilson & Taylor (1967).

Recently, Waterhouse (1997) noted the presence of the invasive tropical fire ant, *Solenopsis geminata*. Bolton (2000) included 16 dacetine species from Fiji: *Strumigenys basiliska* Bolton, *S. chernovi*, *Strumigenys daithma* Bolton, *Strumigenys ekasura* Bolton, *Strumigenys frivola* Bolton, *S. jepsoni*, *S. nidifex*, *Strumigenys panaulax* Bolton, *Strumigenys praefecta* Bolton, *S. scelestia*, *Strumigenys sulcata* Bolton, *S. tumida*, *S. godffroyi*, *S. mailei*, *Strumigenys rogeri* Emery, *Pyramica membranifera* and *P. trauma* Bolton. Finally, Baroni Urbani & de Andrade (2003) described *Proceratium oceanicum* from from Viti Levu.

There are several additional ant species with erroneous records from Fiji. Nishida & Evenhuis (2000) noted the presence of the highly invasive *Wasmannia auropunctata* from Fiji, but this was an error, and should have referred to its presence in Vanuatu. *Tetramorium guineense*, of African origin, has often been recorded from the Pacific (Wilson & Taylor 1967) but these records consist of a mix of the exotic *T. bicarinatum* and the Pacific native *T. insolens* (Wetterer & Vargo 2003). Mann (1921) listed *Prenolepis* (= *Paratrechina*) *vididula*, but Wilson & Taylor (1967) found these specimens were *Paratrechina vaga*. Wilson & Hunt (1967) list *Romblonella scrobiferum* from Fiji, but we believe this was meant to represent the subspecies *R. scrobifera liogaster* described by Santschi (1928) as *Tetramorium scrobifera liogaster*. Wetterer & Vargo (2003) list *Rogeria stigmatica* from Fiji on the basis of notes from Wilson & Taylor (1967). However, Wilson & Taylor (1967) actually refer to *R. stigmatica sublevinodis* (= *R. sublevinodis*), and stated it is widespread in Fiji. There is one record of the Argentine ant, *Linepithema humile*, being intercepted at in New Zealand in a shipment from Fiji (Ward, unpub. data), but we can find no evidence that it has become established in Fiji.

In our checklist, we omitted two new species (*Paratrechina chernovi*, *Strumigenys ursulus*) from Dlussky (1994) because we could find no published descriptions. Dlussky (1994) synonymized five Fijian endemic species with other taxa with broader distributions: *H. eutrepta* = *Hypoponera opaciceps* (Mayr), *H. vitiensis* = *Hypoponera confinis* (Roger), *M. vitiense* = *Monomorium talpa* Emery, *P. oceanica* = *Paratrechina minutula* (Forel), and *P. vitiensis* = *P. vaga*. Although all these synonymies were plausible, we view them as tentative, deserving review. The records of *Hypoponera confinis* (Roger), and *Monomorium talpa* Emery (= *M. australicum* Forel) were based only on these synonymies and not apparently based on viewing any specimens from Fiji, because only Mann's records are listed, so we have omitted these records.

New records. Both authors collected numerous ant species in Fiji, including a number of previously unreported and/or undescribed native species (e.g., the first record of *Prionopelta* from Fiji), and well as new specimens of some rare endemic species (e.g., several

complete *Poecilomyrma* colonies with the first recorded males from this genus). Evaluation of these specimens, however, will require additional work. Here, we present site record data only for exotic ant species.

Exotic Species

Twenty five exotic species from 14 genera are recorded from Fiji (Appendix). Four genera have no native or endemic relatives from Fiji. Exotic species are predominantly from Myrmicinae (14 spp., 56%), with less representation from other subfamilies; Formicinae (5 spp., 20%), Ponerinae (5 spp., 20%) and Dolichoderinae (1 spp., 4%). Many of these species were present and were already widespread when Mann (1921) completed the first survey of Fiji. Furthermore, many of these exotic species are also widely distributed throughout the Pacific (Wilson & Taylor 1967; Wetterer 2002, 2005, in press; Wetterer & Vargo 2003).

We collected five exotic ant species not previously reported from Fiji: *Platythyrea parallela* (F. Smith), *Monomorium destructor* (Jerdon), *Monomorium sechellense* Emery, *Tetramorium lanuginosum* (Mayr), and *Cardiocondyla obscurior* Wheeler.

Exotic species are found predominantly in disturbed habitats, and particularly areas associated with humans (Wilson & Taylor 1967; Morrison 1998; Wetterer 2002). Preliminary analyses from Ward's 2004 survey on Viti Levu indicate that exotic species are very common in disturbed habitats. Over 92% and 86% of the species found in urban (n = 41) and rural (n = 92) sites respectively, are exotic. In semi-native habitats (n = 24) the proportion of exotics is 35% indicating exotics have not invaded native vegetation to the same degree as disturbed habitats.

Sites records for exotic ant species in Fiji. For museum records, we list information (when available) in the following order: collection date; collector; museum repository; published record of the specimen. Abbreviation for major collectors: WM = WM Mann (collected 1915–1916), EB = EH Bryan Jr (collected 1924; published in Santschi 1928), DS = D Stoner (published in Mann 1925), NK = NLH Krauss (collected 1949–1976), YC = YI Chernov (collected 1977; published in Dlussky 1994), JW = JK Wetterer (collected 1997), DW = DF Ward (collected 2004, with East-South decimal degrees, held at the NZAC). BMHN = the Natural History Museum, London; LACM = Museum of Natural History of Los Angeles County, Los Angeles; USNM = National Museum of Natural History, Washington, D.C., MCZ = Museum of Comparative Zoology, Cambridge, Massachusetts; NZAC = New Zealand Arthropod Collection; ANIC = Australian National Insect Collection, Canberra.

1. *Anoplolepis gracilipes* (F. Smith)

KADAVU: Vunisea (WM; LACM; Mann 1920; Mann 1921), Matasawalevu (WM; USNM).

LAU: Munia (WM; USNM; Mann 1920), Kabara (WM; USNM; Mann 1920), Lakeba (Mann 1920), Ono Lua (= Ono-i-Lau) (WM; MCZ), Magokai (= Mago) (1921; HS Evans; BMNH), Vanua Balavu; Loma Loma (1921; HS Evans; BMNH), Cikobia-i-lau (EB), Tuvutua (= Tuvutha?) (EB), Mago (EB), Namuka (EB), Makuluva Is (DS), Aiuwa (EB), Oneata (EB).

OVALAU: no site data (Mayr 1876).

ROTUMA: Saluaka (1938; H St. John; Wilson & Taylor 1967), Paho (1938; H St. John; Wilson & Taylor 1967), Solkope (1938; H St. John; Wilson & Taylor 1967).

TAVEUNI: Somosomo (WM; USNM; Mann 1920), Waiyevo (1972; NK; USNM).

VANUA LEVU: Labasa (WM; MCZ), Suene (= Sueni) (WM; MCZ), Galoa I; North tip (gbif database; ANIC), Savusavu (gbif database; ANIC), Kontiki; 19 km E Savusavu (gbif database; ANIC).

VITI LEVU: Saiaro (Mann 1920), Suva (WM; USNM), Nausori (WM; USNM), Suva (EB), Suva (A Agassiz; MCZ), Lautoka (1919; Greenwood & Evans; BMNH), Makaluva (DS), Suva (DS), Nukulau (DS), Lami (1951; NK; MCZ), Nadi (1974; NK; USNM), Lami (1976; NK; USNM), Lagalevu (gbif database; ANIC), Nananu-i-Ra (JW), Ellington Wharf (JW), Colo-i-Suva Forest Park (JW). DW collected from: Bukuya Rd 177.55 -17.80, 177.69 -17.77, 177.65 -17.80, Colo-i-Suva Forest Park 178.47 -18.05, Colonial Plaza-Nadi 177.43 -17.77, Garden of the Sleeping Giant 177.47 -17.70, Kings Rd to Tavua 178.00 -17.38, Kings Rd to Rakiraki 178.55 -17.87, Korotogo Beach 177.54 -18.17, Lami Industrial 178.40 -18.10, Lautoka Port 177.45 -17.60, Lololo Forest 177.55 -17.58, Lololo-Vakabuli Rd 177.53 -17.59, Momi Guns Rd 177.30 -17.90, Mt Korobaba 178.38 -18.08, Nadarivatu Rd to Tavua 177.95 -17.55, Natadola beach 177.32 -18.09, Newtown Beach 177.42 -17.77, Queens Rd 177.63 -18.18, Queens Rd to Sigatoka 177.32 -17.95, Rewa Delta 178.60 -17.97, Royal Palm Rd-Lautoka 177.42 -17.62, Sigatoka 177.52 -18.10, Sigatoka Sand Dunes 177.48 -18.17, Sigatoka Valley-Naliko Rd 177.55 -18.17, Uciwai Landing 177.28 -17.95, Vatia Point 177.82 -17.39, Vatia Point Rd Junction 177.80 -17.40, Vatia Point Wharf 177.75 -17.39, Vatukonia Rd-Vatukonia Mine 177.85 -17.49, Volivoli Rd-Ellington Wharf 178.18 -17.32.

UNKNOWN LOCALES: Vanua Sami (= Vanua Masi?) (EB), Lesma (WM; MCZ, probably Lasema (Vanua Levu)), Marova L. (WM; MCZ) (= Marovo Lagoon; Solomons Islands?), Sakela (WM; MCZ), Wainganitu (WM; MCZ).

Note: Mann (1921) wrote that this species was “abundant throughout the islands, especially in the cultivated districts,” but mentioned only one specific site, Vunisea. Widespread Asian native; exotic to Fiji.

2. *Cardiocondyla emeryi* Forel

VITI LEVU: DW collected from: Abaca Village 177.53 -17.67, Bukuya Rd 177.72 -17.75, Denerau Island 177.37 -17.77, Kings Rd to Rakiraki 178.33 -17.68, Koronivia Farm 178.52 -18.04, Korotogo Beach 177.54 -18.17, Lami Cement Works 178.38 -18.11, Lewa Rd-Nadarivatu 177.95 -17.57, Lololo Forest HQ Picnic ground 177.57 -17.57, North of Navai Village 177.97 -17.62, Queen Elizabeth Drive-Suva 178.43 -18.15, Queens Rd 177.63 -18.18, Rewa Delta 178.59 -18.05, USP Campus 178.43 -18.15, Vatia Point Wharf 177.75 -17.39, Vatukonia Town-Vatukonia Mine 177.84 -17.50, Vaturu Dam 177.59 -17.75, 177.55 -17.74, Volivoli Rd-Ellington Wharf 178.18 -17.32, Vuda Point Marina 177.38 -17.67.

UNKNOWN LOCALES: no site data (YC).

3. *Cardiocondyla obscurior* Wheeler

VITI LEVU: Suva (JW).

4. *Hypoconera gleadowi* (Forel)

VITI LEVU: Nadarivatu (WM; Wilson 1958b).

5. *Hypoconera opaciceps* (Mayr)

UNKNOWN: no site data (YC).

Note: Dlussky (1994) synonymized the Fijian endemic *H. eutrepta* with *H. opaciceps*. All records may be *H. opaciceps*, but it is possible that the old records are *H. eutrepta* and only the new records of Chernov are *H. opaciceps*.

6. *Hypoponera punctatissima* (Roger)

UNKNOWN: no site data (Wilson & Hunt 1967).

7. *Monomorium destructor* (Jerdon)

VITI LEVU: Lautoka Park 177.45 -17.60 (DW), Marine Drive – Lautoka 177.45 -17.60 (DW).

8. *Monomorium floricole* (Jerdon)

LAU: Cicia (WM; USNM; Mann 1921), Vanua Masi (EB), Vakai (EB).

OVALAU: Levuka (WM; Mann 1921).

TAVEUNI: Somosomo (WM; USNM), Waiyeve (1923; HS Evans; BMNH; Bolton 1987), Una (1933; RW Paine; BMNH).

VANUA LEVU: Lasema (WM; USNM; Mann 1921).

VITI LEVU: Nadarivatu (WM; USNM; Mann 1921), Waiyanitu (WM; Mann 1921), Nausori (WM; USNM; Mann 1921), Nausori (1921; R Veitch; BMNH), Nananu-i-Ra (JW). DW collected from: Bukuya Rd 1 177.72 -17.75, 177.55 -17.80, Denerau Island 177.38 -17.78, Galoa plantation 177.83 -18.20, Garden of the Sleeping Giant 177.47 -17.70, Kula EcoPark 177.55 -18.17, Lautoka Park 177.45 -17.60, Lololo Forest HQ Picnic ground 177.57 -17.57, Lomolomo Guns 177.42 -17.68, Naviti Hotel 177.55 -18.17, Newtown Beach 177.42 -17.77, Ran Lakhani Park-Suva 178.44 -18.12, Rarawai Mill-Ba 177.68 -17.55, Rewa Delta 178.59 -18.05, Rewa Delta-Saweni Rd 178.45 -18.03, Thurston Gardens-Suva 178.42 -18.15, Vatukonia Town-Vatukonia Mine 177.84 -17.50, Vuda Point Junction 177.38 -17.67, Warrick Hotel 177.73 -18.22.

UNKNOWN LOCALES: Nabavatu (= Nataviatu?) (1934; THC Taylor; BMNH; Bolton 1987), Kalana (WM; USNM); no site data (YC).

9. *Monomorium pharaonis* (L.)

VITI LEVU: Nausori (WM; Mann 1921), Suva (RA Lever; Bolton 1987), DW collected from: Tavua Hotel 177.85 -17.43, Nadarivatu Rd to Tavua 177.95 -17.55.

Note: Mann (1921) wrote that this species was “common in cane-fields,” but mentioned only one specific site. This species is typically most common inside houses.

10. *Monomorium sechellense* Emery

VITI LEVU: Savura Creek, (1976; P. Maddison; NZAC), DW collected from: Bukuya Rd 177.70-17.75, Lewa Rd-Nadarivatu 177.95 -17.57.

LAU: Moce (1977; J.S. Dugdale; NZAC).

11. *Pachycondyla stigma* (Fabricius)

VANUA LEVU: Lasema (WM; Mann 1921; Wilson 1958).

VITI LEVU: Waiyanitu (WM; Mann 1921), Waisoi Forest Camp in log (JW), Udu, by forest waterfall; in log (JW), Naiva Forestry Camp; in log (JW).

12. *Paratrechina bourbonica* (Forel)

OVALAU: Levuka (WM; USNM; Mann 1921).

TAVEUNI: Somo Somo (WM; USNM; Mann 1921).

VANUA LEVU: Lasema (WM; Mann 1921), Wainunu (WM; Mann 1921), Waisu (Mann; USNM).

VITI LEVU: Tai Levu Coast (WM; Mann 1920), Koro Vatu (WM; Mann 1920; 1921), Nadarivatu (WM; USNM; Mann 1921), Suva (WM; USNM; Mann 1921), Waiyanitu (WM; Mann 1921), Nananu-i-Ra (JW), Nadarivatu (JW), Waisoi Forest Camp nr Namosi (JW), Suva (JW), Naiva Forestry Camp (JW), Udu (JW). DW collected from: Galoa plantation 177.83 -18.20, Lami Fishing Wharf 178.39 -18.10, Namosi Highland Road 178.17 -18.10.

UNKNOWN LOCALES: Maiyanita (WM; USNM), no site data (YC).

Note: Mann (1921) wrote that this species was “exceedingly abundant throughout the larger islands.”

13. *Paratrechina longicornis* (Latreille)

LAU: Vekai (WM; Mann 1921), Yangaga Cluster (EB), Oneata (EB).

VANUA LEVU: Lasema (1924?; WM; USNM).

VITI LEVU: Dravuni (WM; USNM), Nausori (1920; HS Evans; BMNH), Nananu-i-Ra (JW), Ellington Wharf (JW), Mabualau I. (JW), Suva; by hotel (JW), Suva; near USP campus (JW). DW collected from: Denerau Island 177.37 -17.77, Ellington Wharf 178.22 -17.33, Flagstaff Park-Suva 178.43 -18.13, Garden of the Sleeping Giant 177.47 -17.70, Karvika St-Tavua 177.85 -17.44, Kings Rd junction-Tavua to Navai 178.88 -17.43, Kings Rd to Rakiraki 178.54 -17.84, Kings Wharf-Suva 178.42 -18.13, Koronivia Farm 178.52 -18.04, Korotogo Beach 177.54 -18.17, Kula EcoPark 177.55 -18.17, Lami Industrial 178.40 -18.10, Laucala Industrial Park, Suva 178.47 -18.12, Lautoka Park 177.45 -17.60, Lololo Forest HQ Picnic ground 177.57 -17.57, Lomolomo Guns 177.42 -17.68, Marine Drive-Lautoka 177.45 -17.60, Mavoia Rd-Suva 178.43 -18.12, Natadola beach 177.32 -18.10, Naviti Hotel 177.55 -18.17, Cemetery-Suva 178.43 -18.12, Newtown Hostels 177.42 -17.75, Queens Wharf Rd-Lautoka 177.45 -17.60, Rakiraki Hotel 178.25 -17.37, Ran Lakkan Park-Suva 178.44 -18.12, Rarawai Mill-Ba 177.68 -17.55, Rewa Delta 178.57 -18.07, 178.52 -18.02, Sigatoka 177.50 -18.13, Sigatoka Sand Dunes 177.47 -18.15, City Market-Suva 178.42 -18.12, Thurston Gardens-Suva 178.42 -18.15, Queen Elizabeth Drive-Suva 178.43 -18.15, USP Campus 178.43 -18.15, Vatia Point 177.82 -17.39, Vatukonia Rd-Vatukonia Mine 177.85 -17.47, Vuda Point Marina 177.38 -17.67, Warrick Hotel 177.73 -18.22.

UNKNOWN LOCALES: Navatu-i-lom (EB), Ofurua (EB), no site data (GM Dlussky; Dlussky 1994).

Note: Mann (1921) wrote that this species was “Abundant in all localities visited,” but mentioned only one specific site.

14. *Paratrechina vaga* (Nylander)

KADAVU: Vanua Ava (WM; Mann 1921).

LAU: Munia (WM; Mann 1921), Tuvuca (WM; Mann 1921), Vanua Mbalavu; Loma Loma (WM; Mann 1921).

OVALAU: Levuka (WM; Mann 1921).

TAVEUNI: Somo Somo (WM; Mann 1921), Nagasau (WM; Mann 1921).

VANUA LEVU: Lasema (WM; Mann 1921), Wainunu (WM; Mann 1921), Suene (Sueni) (WM; Mann 1921).

VITI LEVU: Nadarivatu (WM; Mann 1921), Waiyanitu (WM; Mann 1921), Koro Vatu (WM; Mann 1921), Nausori (WM; Mann 1921), Tai Levu (WM; Mann 1921), Waivaka; forest (JW); Waisoi Forest Camp (JW); Suva, near USP campus; on tree by beach (JW), Nadarivatu tree plantation (JW), Udu, by forest waterfall and by road (JW), Naiva Forestry Camp (JW), Colo-i-Suva Forest Park (JW). DW collected from: Bukuya Rd 177.57 -17.80, 177.70 -17.75, Colo-i-suva Forest Park (Lower Pools) 178.47 -18.05, 178.45 -18.05, Denerau Marina 177.37 -17.77, Ellington Wharf 178.22 -17.33, Ellington Wharf Rd Junction 178.20 -17.34, Galoa 177.83 -18.20, Karvika St-Tavua 177.85 -17.44, Kings Rd to Rakiraki 178.25 -17.37, 178.49 -17.79, 178.35 -17.68, 178.33 -17.68, 178.28 -17.65, Kings Rd to Tavua 177.87 -17.43, Koronivia Farm 178.52 -18.04, Kula EcoPark 177.55 -18.17, Lami Industrial 178.40 -18.10, Lautoka Port 177.45 -17.60, Lololo Forest 177.54 -17.58, Mt Korobaba 178.38 -18.08, Nadarivatu Rd to Tavua 177.95 -17.55, Namosi Highland Road 178.17 -18.10, 178.20 -18.12, 178.22 -18.14,

Naviti Hotel 177.55 -18.17, Newtown Beach 177.42 -17.77, North of Navai Village 177.97 -17.62, Queens Rd 177.63 -18.18, Rakiraki Hotel 178.25 -17.37, Rewa Delta 178.60 -17.97, 178.54 -18.03, Sigatoka 177.54 -17.97, Sigatoka Sand Dunes 177.47 -18.15, Sigatoka Valley-Naliko Rd 177.55 -18.15, South of Navai Village (Junction to Dam) 177.98 -17.65, Suva 178.43 -18.12, 178.43 -18.15, USP Campus 178.43 -18.15, Vatukonia Rd- Vatukonia Mine 177.85 -17.49, Vaturu Dam 177.59 -17.75, Warrick Hotel 177.73 -18.22.

UNKNOWN LOCALES: no site data (Tothill *et al.* (1930), no site data (YC).

Note: Mann (1921) listed this species as *Paratrechina vividula*.

15. *Pheidole fervens* Smith

VITI LEVU: Suva; city waterfront (JW), Suva; near USP campus; on mangrove (JW), Suva, by hotel; cliff face, Nadarivatu tree plantation (JW), Mabualau (JW), Waisoi Forest Camp (JW). DW collected from: Ba 177.70 -17.54, Bukuya Rd 177.69 -17.77, Colo-i-suva Forest Park HQ 178.45 -18.05, Flagstaff Park-Suva 178.43 -18.13, Navai Village 177.98 -17.62, Kings Rd to Rakiraki 178.49 -17.79, Koronivia Farm 178.52 -18.04, Lewa Rd-Nadarivatu 177.95 -17.57, Lololo Forest 177.54 -17.58, Nadarivatu Forest HQ 177.95 -17.55, Nadarivatu Rd to Tavua 177.95 -17.55, Namosi Highland Road 178.17 -18.10, 178.22 -18.14, North of Navai Village 177.97 -17.62, Suva 178.44 -18.15, Queens Rd to Sigatoka 177.32 -17.95, Raintree Lodge 178.45 -18.05, Rewa Delta 178.59 -18.05, 178.54 -18.03, 178.52 -18.02, Sigatoka Valley-Naliko Rd 177.55 -18.17, Thurston Gardens-Suva 178.42 -18.15, Vatukonia Town-Vatukonia Mine 177.84 -17.50, Vaturu Dam 177.59 -17.75, Warrick Hotel 177.73 -18.22.

UNKNOWN LOCALES: no site data (Wilson & Hunt 1967), no site data (YC).

16. *Pheidole megacephala* (Fabricius)

ROTUMA: Melisa (1938; H St. John; MCZ; Wilson & Taylor 1967).

VANUA LEVU: Labasa (WM; MCZ).

LAU: Wailangilala Is.,(EB), Yathata Is. (EB).

OVALAU: no site data (EB).

VITI LEVU: Suva (DS), Nadroga Sigatoka R. (1921; HS Evans & L Louse; BMNH), Nadi (EB), Karolevu (1976; P Maddison; BMNH), Waisoi Forest Camp nr Namosi (JW), Toberua (JW), Suva; city waterfron; base of coconut tree (JW), Suva; hotel yard (JW). DW collected from: Bukuya Rd 177.72 -17.75, City Market-Suva 178.42 -18.12, Ellington Wharf 178.22 -17.33, Ellington Wharf Rd Junction 178.20 -17.34, Kings Rd-Tavua 178.07 -17.37, Koronivia Station 178.52 -18.04, Koro'o Ridge Track 177.93 -17.57, Korotogo Beach 177.54 -18.17, Lami Fishing Wharf 178.39 -18.10, Lami Industrial 178.40 -18.10, Lower USP Campus-Suva 178.45 -18.14, Laucala Industrial Park-Suva 178.47 -18.12, Naria Rd-Rakiraki 178.17 -17.35, Natadola beach 177.32 -18.10, Naviti Hotel 177.55 -18.17, Newtown Hostels 177.42 -17.75, Queens Wharf Rd-Lautoka 177.45 -17.60, Sigatoka Sand Dunes 177.47 -18.15, Suva Industrial 178.42 -18.12, Swaeni Beach-Lautoka 177.38 -17.64, USP Campus 178.43 -18.15.

Note: Mann (1925) wrote that he accidentally omitted this species from his 1921 paper, "but on the larger islands, especially in cultivated districts, it is one of the commonest ants."

17. *Plagiolepis alluaudi* Emery

VITI LEVU: Suva (WM; Mann 1921; Wilson & Taylor 1967), Suva (1949 & 1950; NK; Wilson & Taylor 1967), Waisoi Forest Camp; inside epiphyte (JW).

Note: Mann (1921) described this as a new species, *Plagiolepis foreli*, but Smith (1958) synonymized *P. foreli* with *P. alluaudi*.

18. *Platythyrea parallela* (F. Smith)

VITI LEVU: DW collected from: Koronivia Farm 178.52 -18.04, Sigatoka Sand Dunes 177.47 -18.15, Thurston Gardens – Suva 178.42 -18.15.

19. *Pyramica membranifera* (Emery)

KADAVU: Mt Korogatule nr Matasawalevu (Monteith; Bolton 2000).

LAU: Lakeba (WM; Mann 1921).

VANUA LEVU: Lasema (WM; Mann 1921; Bolton 2000).

VITI LEVU: Saiaro (WM; Mann 1921).

20. *Solenopsis geminata* (Fabricius)

VITI LEVU: Ellington Wharf; on cliff face (JW), Nananu-i-Ra; by beach; around hotel; and interior forest (JW), Nadarivatu; tree plantation (JW), Legalega Research Station-Nadi (NZAC). DW collected from: Bukuya Rd 177.57 -17.80, 177.70 -17.75, 177.67 -17.78, 177.65 -17.80, Colonial Plaza-Nadi 177.43 -17.77, Denerau Island 177.37 -17.77, Ellington Wharf Rd Junction 178.20 -17.34, Garden of the Sleeping Giant 177.47 -17.70, Kings Rd to Tavua 178.02 -17.37, Kings Rd junction-Tavua to Navai 178.88 -17.43, Koro'o Ridge Track, Korotogo Beach 177.54 -18.17, Lewa Rd-Nadarivatu 177.95 -17.57, Lololo Forest 177.55 -17.58, Marine Drive-Lautoka 177.45 -17.60, Navai village 178.00 -17.65, Nadarivatu Rd to Tavua 177.95 -17.55, Natadola Beach 177.32 -18.09, Naviti Hotel 177.55 -18.17, Newtown Hostels 177.42 -17.75, Rarawai Mill-Ba 177.68 -17.55, Sigatoka Sand Dunes 177.47 -18.15, Sigatoka Valley-Naliko Rd 177.55 -18.17, Vatia Point Rd Junction 177.80 -17.40, Vatia Point Wharf 177.75 -17.39, Vatukonia Rd-Vatukonia Mine 177.85 -17.47, Vatusesiyasani Rd-Rakiraki 178.14 -17.38, Volivoli Rd-Ellington Wharf 178.20 -17.32, Vuda Point Junction 177.38 -17.67, Warrick Hotel 177.73 -18.22.

UNKNOWN LOCALES: no site data (Waterhouse 1997).

21. *Strumigenys rogeri* Emery

VANUA LEVU: Kontiki; 19 km E Savusavu (Monteith & Cook; Bolton 2000).

VITI LEVU: Colo-i-Suva Forest Park (Monteith; Bolton 2000), 7km NW Korovisolou (Monteith; Bolton 2000), Udu, by forest waterfall, under and in log (JW). DW collected from: Colo-i-suva Forest Park (Upper Pools) 178.47 -18.05, Koronivia Farm 178.52 -18.04.

KADAVU: Lagalevu (Monteith; Bolton 2000).

UNKNOWN LOCALES: Navai Viti (Taylor; Bolton 2000), (Brown 1948).

22. *Tapinoma melanocephalum* (Fabricius)

KADAVU: no site data (Mann 1921).

LAU: Vekai (WM; Mann 1921), Kimbobo (EB), Vanua Mbalavu (EB), Mango (EB), Navitu-i-lona (= Navatu?) (EB), Vaku (EB), Valangilala (EB).

OVALAU: no site data (Mann 1921), Lovoni (1953; AC Smith; USNM), Levuka (1975; NK; USNM).

TAVEUNI: Nagasau (WM; USNM).

VITI LEVU: Nukulau (DS), Nasese (1926; Tothill *et al.* 1930), Suva (1926; CT McNamara; MCZ), Nasese (1926; RW Paine; MCZ), Thalo-i-Suva (= Colo-i-Suva) (1950; NK; MCZ), Lami (1976; NK; USNM), Nananu-i-Ra (JW), Viti Levu, Ellington Wharf (JW), Nadarivatu; tree plantation (JW), Waisoi Forest Camp nr Namosi (JW), Waivaka (JW), Udu (JW), Naiva Forestry Camp (JW), Suva (JW). DW collected from: Abaca Park 177.53 -17.67, Bukuya Rd 177.72 -17.75, 177.69 -17.77, 177.65 -17.81, Colo-i-suva Forest Park (Upper Pools) 178.47 -18.05, Denerau Rd 177.38 -17.78, Galoa 177.83 -18.20, Garden of the Sleeping Giant 177.47

-17.70, Navai Village 177.98 -17.62, Karvika St-Tavua 177.85 -17.44, Kings Rd-Tavua 178.02 -17.37, 178.88 -17.43, Kings Rd to Rakiraki 178.55 -17.87, 178.54 -17.84, 178.43 -17.77, 178.37 -17.70, 178.35 -17.68, 178.33 -17.68, Kings Wharf-Suva 178.42 -18.13, Koronivia Research Station 178.52 -18.04, Koro'o Ridge Track 177.93 -17.57, 177.95 -17.57, Korotogo Beach 177.54 -18.17, Kula EcoPark 177.55 -18.17, Lami Cement Works 178.38 -18.11, Lami Fishing Wharf 178.39 -18.10, Lower USP Campus-Suva 178.45 -18.14, Lautoka Park 177.45 -17.60, Lewa Rd-Nadarivatu 177.95 -17.57, Lololo Forest HQ Picnic ground 177.57 -17.57, Marine Drive-Lautoka 177.45 -17.60, Mt Korobaba 178.39 -18.08, Nadarivatu Forest HQ 177.95 -17.55, Nadarivatu Rd to Tavua 177.95 -17.55, 177.94 -17.62, Namosi Highland Road 178.17 -18.10, 178.20 -18.12, 178.22 -18.14, Naria Road-Rakiraki 178.17 -17.35, Natadola beach 177.32 -18.10, Naviti Hotel 177.55 -18.17, Cemetary-Suva 178.43 -18.12, Newtown Hostels 177.42 -17.75, North of Navai Village 177.97-17.62, Pacific Harbour 178.07 -18.25, Raintree Lodge 178.45 -18.05, Rakiraki Hotel 178.25 -17.37, Ran Lakhani Park -Suva 178.44 -18.12, Rarawai Mill-Ba 177.68 -17.55, Rewa Delta-Saweni Rd 178.40 -18.00, 178.45 -18.03, Sigatoka Sand Dunes 177.47 -18.15, Sigatoka Valley-Naliko Rd 177.55 -18.17, 177.57 -18.13, USP Campus 178.43 -18.15, Vatia Point 177.82 -17.39, Vatia Point Wharf 177.75 -17.39, Vatukonia Rd-Vatukonia Mine 177.85 -17.49, Vaturu Dam 177.59 -17.75, Volivoli Rd-Ellington Wharf 178.18 -17.32, Vuda Point Marina 177.38 -17.67, Warrick Hotel 177.73 -18.22, Yadra Cattle Ranch Rd 177.95 -17.43.

UNKNOWN LOCALES: no site data (GM Dlussky; Dlussky 1994).

Note: Mann (1921) wrote that this species was “throughout the islands” and “in practically every locality visited,” but mentioned only one specific site.

23. *Tetramorium bicarinatum* (Nylander)

KADAVU: no site data (Mann 1921).

LAU: Vanua Balava (WM; Mann 1921); Lomaloma (Bolton 1977), Kimbombo (EB; as *T. guineense*), Vanua (EB; as *T. guineense*); Vanua Balava (HS Evans; Bolton 1977).

OVALAU: Levuka (WM; USNM).

TAVEUNI: Somosomo (Mann 1921).

VANUA LEVU: Labasa (WM; USNM), Suene (Sueni) (Mann; USNM; Bolton 1977).

VITI LEVU: Nadarivatu (Mann; USNM; Bolton 1977), Nasoqo (= Nasonggo) (Mann; USNM; Bolton 1977), Nadi (1974; NK; USNM), Lami (1976; NK; USNM), Suva (HW Simmonds; BMNH; Bolton 1977), Suva (WM Wheeler; Bolton 1977), no site data (NK; Bolton 1977), Mabualau (JW), Suva (DL Stoner; USNM), Naiva Forestry Camp (JW), Nadarivatu; tree plantation (JW), Suva; near USP campus; on tree by beach (JW). DW collected from: Denerau Island 177.37 -17.77, Galoa plantation 177.83 -18.20, Garden of the Sleeping Giant 177.47 -17.70, Kings Rd to Rakiraki 178.54 -17.84, 178.49 -17.79, Koronivia Research Farm 178.52 -18.04, Korotogo Beach 177.54 -18.17, Kula EcoPark 177.55 -18.17, Lami Industrial 178.40 -18.10, Lautoka Park 177.45 -17.60, Lololo Forest 177.54 -17.58, Mt Korobaba 178.38 -18.08, Namosi Highland Rd 178.17 -18.10, 178.20 -18.12, 178.22 -18.14, Naria Rd-Rakiraki 178.17 -17.35, Pacific Harbour 178.07 -18.25, Suva 178.43 -18.15, Rakiraki Hotel 178.25 -17.37, Rewa Delta 178.60 -17.97, 178.57 -18.07, 178.59 -18.05, USP Campus 178.43 -18.15, Vatia Point 177.82 -17.39, Vatukonia Town-Vatukonia Mine 177.84 -17.50, Vaturu Dam 177.58 -17.75, 177.59 -17.75, 177.58 -17.75, Vatusesiyasani Rd-Rakiraki 178.14 -17.38, Warrick Hotel 177.73 -18.22.

UNKNOWN LOCALES: Lakela (WM; USNM), Ongea (WM; USNM), Nausori (1921; R Veitch; BMNH; Bolton 1977), Vivia (1922; Stoner; USNM).

Note: Mann (1921) wrote that this species was “throughout the islands, most commonly in cultivated districts,” but mentioned no specific sites.

24. *Tetramorium lanuginosum* Mayr

VITI LEVU: DW collected from: Kings Rd to Rakiraki 178.54 -17.84, Vuda Point Junction 177.38, -17.67, Yadra Cattle Ranch Rd 177.95, -17.43.

25. *Tetramorium similimum* (F. Smith)

LAU: Tuvutha (= Tuvuca) (EB), Avea (EB), Latei Tonga (EB).

VITI LEVU: Makaluva (DS), no site data (WL Brown; Bolton 1977); Suva (JW), Nananu-i-Ra (JW), Mabualau (JW). DW collected from: Ba township 177.73 -17.45, Colonial Plaza-Nadi 177.43 -17.77, Denerau Island 177.37 -17.77, Denerau Marina 177.37 -17.77, Flagstaff Park-Suva 178.43 -18.13, Kings Rd to Rakiraki 178.25 -17.37, Kings Wharf-Suva 178.42 -18.13, Koronivia Station 178.52 -18.04, Korotogo Beach 177.54 -18.17, Kula EcoPark 177.55 -18.17, Lautoka Park 177.45 -17.60, Lololo Forest 177.54 -17.58, Newtown Hostels 177.42 -17.75, Pacific Harbour 178.07 -18.25, Queen Elizabeth Drive-Suva 178.44 -18.15, Rakiraki Hotel 178.25 -17.37, Sigatoka Sand Dunes 177.47 -18.15, Sigatoka Valley 177.55 -18.15, USP Campus 178.43 -18.15, Vatia Point 177.82 -17.39, Vatukonia Mine 177.84 -17.50, Yadra Cattle Ranch Rd 177.95 -17.43.

TAVEUNI: Somosomo (WM; Mann 1921).

CONCLUSIONS

Although collections have been made on several major islands over a >100 year period, the knowledge of the Fijian ant diversity, distribution and ecology is still largely rudimentary. Future collecting efforts on unsurveyed islands are likely to uncover many undescribed species and broaden the known distribution of many described species. The endemic fauna largely inhabits forests, with exotic species common in towns, rural villages, and agricultural and disturbed ecosystems. Threats to the ant diversity of Fiji include habitat loss through deforestation (Evenhuis & Bickel 2005) and invasive ant species. Two major invasive species of future concern are *Wasmannia auropunctata* and *Solenopsis invicta*, which have not yet arrived in Fiji. Invasive ant species will have long-term detrimental impacts for the conservation of a unique island biota.

As further sampling is undertaken and the fauna is examined in greater detail, many new species and additional locality records of known species will be revealed. Of particular interest are the Yasawa's, a western island group which to our knowledge remains unsurveyed. The highland forests of Viti Levu, Vanua Levu, and particularly Taveuni are also of great interest as they represent some of the last remaining near-pristine forests of Fiji. Intensive sampling of litter habitats will likely reveal many new taxa, in similar a vein to what has recently occurred in Madagascar (Fisher 1997).

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APPENDIX

Checklist of ant taxa recorded from different parts of Fiji. F = unknown locality in Fiji; V = Viti Levu; v = Vanua Levu; K = Kadavu; T = Taveuni; O = Ovalau; L = Lau group; R = Rotuma.

Taxon	F	V	v	K	T	O	L	R
Endemic								
<i>Camponotus bryani</i> Santschi 1928: 72		V						
<i>Camponotus cristatus</i> Mayr 1866: 489		V				O		
<i>Camponotus cristatus nagasau</i> Mann 1921: 482					T			
<i>Camponotus cristatus sadinus</i> Mann 1921: 482		V	v		T			
<i>Camponotus dentatus</i> (Mayr) 1866: 492		V	v	K	T	O		
<i>Camponotus dentatus humeralis</i> Wheeler 1934: 416		V						
<i>Camponotus janussus</i> Bolton 1995b: 106				K				
<i>Camponotus laminatus levuanus</i> Mann 1921: 479			v					
<i>Camponotus laminatus</i> Mayr 1866: 489		V	v	K		O	L	
<i>Camponotus lauensis</i> Mann 1921: 488							L	
<i>Camponotus maafui</i> Mann 1921: 482			v					
<i>Camponotus manni umbratilis</i> Wheeler 1934: 420		V						
<i>Camponotus manni</i> Wheeler 1934: 418					T			
<i>Camponotus maudella</i> Mann 1921: 496		V			T			
<i>Camponotus maudella seemanni</i> Mann 1921: 498		V						
<i>Camponotus oceanicus</i> (Mayr) 1870: 943						O		
<i>Camponotus polynesianus</i> Emery 1896: 374		V	v			O		
<i>Camponotus rotumanus</i> Wilson & Taylor 1967: 98								R
<i>Camponotus schmeltzi kadi</i> Mann 1921: 485			v					
<i>Camponotus schmeltzi loloma</i> Mann 1921: 486							L	
<i>Camponotus schmeltzi</i> Mayr 1866: 490		V				O		
<i>Camponotus schmeltzi trotteri</i> Mann 1921: 486					T			
<i>Camponotus vitiensis</i> Mann 1921: 490		V						
<i>Cerapachys cryptus</i> Mann 1921: 408		V						
<i>Cerapachys fuscior</i> Mann 1921: 410					T			
<i>Cerapachys lindrothi</i> Wilson 1959b: 52		V						
<i>Cerapachys majusculus</i> Mann 1921: 408		V						
<i>Cerapachys sculpturatus</i> Mann 1921: 407		V						
<i>Cerapachys vitiensis</i> Mann 1921: 406			v					
<i>Cerapachys zimmermani</i> Wilson 1959b: 54		V						
<i>Eurhopalothrix emeryi</i> (Forel) 1912: 58		V	v			O		
<i>Eurhopalothrix insidiatrix</i> Taylor 1980: 238		V	v			O		
<i>Gnamptogenys aterrima</i> (Mann) 1921: 411		V	v	K	T			
<i>Hypoponera eutrepta</i> (Wilson) 1958: 344		V						
<i>Hypoponera monticola</i> (Mann) 1921: 418		V				O	L	
<i>Hypoponera turaga</i> (Mann) 1921: 416		V		K	T			
<i>Hypoponera vitiensis</i> (Mann) 1921: 414		V						
<i>Iridomyrmex anceps ignobilis</i> Mann 1921: 472		V						
<i>Leptogenys foveopunctata</i> Mann 1921: 421			v					

Taxon	F	V	v	K	T	O	L	R
Endemic (continued)								
<i>Leptogenys fugax</i> Mann 1921: 422		V						
<i>Leptogenys humiliata</i> Mann 1921: 421		V						
<i>Leptogenys letilae</i> Mann 1921: 419		V						
<i>Leptogenys navua</i> Mann 1921: 423		V						
<i>Leptogenys vitiensis</i> Mann 1921: 424		V						
<i>Lordomyrma rugosa</i> (Mann) 1921: 455		V						
<i>Lordomyrma striatella</i> (Mann) 1921: 454		V		K				
<i>Lordomyrma tortuosa</i> (Mann) 1921: 452			v			O		
<i>Lordomyrma tortuosa levifrons</i> (Mann) 1921: 453		V						
<i>Lordomyrma tortuosa polita</i> (Mann) 1921: 453		V						
<i>Lordomyrma tortuosa stoneri</i> (Mann) 1925: 5		V						
<i>Monomorium vitiense</i> Mann 1921: 444					T			
<i>Myrmecina cacabau</i> (Mann) 1921: 449		V						
<i>Ochetellus sororis</i> (Mann) 1921: 469		V					L	
<i>Odontomachus angulatus</i> Mayr 1866: 500		V				O		
<i>Paratrechina oceanica</i> (Mann) 1921: 476		V						
<i>Paratrechina vitiensis</i> (Mann) 1921: 474				K				
<i>Pheidole caldwelli</i> Mann 1921: 434		V						
<i>Pheidole colaensis</i> Mann 1921: 441		V						
<i>Pheidole knowlesi extensa</i> Mann 1921: 438		V						
<i>Pheidole knowlesi</i> Mann 1921: 436			v					
<i>Pheidole onifera</i> Mann 1921: 427		V			T	O		
<i>Pheidole roosevelti</i> Mann 1921: 438		V				O		
<i>Pheidole vatu</i> Mann 1921: 431		V						
<i>Pheidole wilsoni</i> Mann 1921: 433				K				
<i>Philidris nagasau agnata</i> (Mann) 1921: 472			v					
<i>Philidris nagasau alticola</i> (Mann) 1921: 472					T			
<i>Philidris nagasau</i> (Mann) 1921: 470					T		L	
<i>Poecilomyrma senirewae</i> Mann 1921: 446		V						
<i>Poecilomyrmasenirewae myrmecodiae</i> Mann 1921: 448		V						
<i>Polyrhachis rotumana</i> Wilson & Taylor 1967: 99								R
<i>Ponera colaensis</i> Mann 1921: 417		V					L	
<i>Ponera manni</i> Taylor 1967: 86		V						
<i>Pristomyrmex mandibularis</i> Mann 1921: 444		V			T	O		
<i>Proceratium oceanicum</i> de Andrade 2003: 310		V						
<i>Proceratium relictum</i> Mann 1921: 413					T			
<i>Pyramica trauma</i> Bolton 2000: 408				K				
<i>Romblonella scrobifera liogaster</i> (Santschi) 1928: 69							L	
<i>Romblonella vitiensis</i> Smith 1953: 79							O	
<i>Strumigenys basiliska</i> Bolton 2000: 750		V						
<i>Strumigenys chernovi</i> Dlussky 1993: 57		V	v	K				
<i>Strumigenys daithma</i> Bolton 2000: 756		V						
<i>Strumigenys ekasura</i> Bolton 2000: 807			v					
<i>Strumigenys frivola</i> Bolton 2000: 817		V						
<i>Strumigenys jepsoni</i> Mann 1921: 462			v					

Taxon	F	V	v	K	T	O	L	R
Endemic (continued)								
<i>Strumigenys nidifex</i> Mann 1921: 464		V	v	K				
<i>Strumigenys panaulax</i> Bolton 2000: 811			v					
<i>Strumigenys praefecta</i> Bolton 2000: 826		V			T			
<i>Strumigenys scelestia</i> Mann 1921: 463					T			
<i>Strumigenys sulcata</i> Bolton 2000: 828		V	v					
<i>Strumigenys tumida</i> (Bolton) 2000: 830		V	v					
<i>Tetramorium manni</i> Bolton 1985: 247		V						
Native								
<i>Adelomyrmex hirsutus</i> Mann 1921: 458			v					
<i>Anochetus graeffei</i> Mayr 1870: 961		V	v	K	T			
<i>Camponotus chloroticus</i> Emery 1897: 574		V	v	K		O	L	R
<i>Camponotus rufifrons</i> (F. Smith) 1860: 95						O		
<i>Cardiocondyla nuda</i> (Mayr) 1866: 508		V	v			O	L	
<i>Iridomyrmex anceps</i> (Roger) 1863: 164		V						
<i>Odontomachus simillimus</i> Smith 1858: 80		V	v	K	T	O	L	R
<i>Oligomyrmex atomus</i> Emery 1900: 328	F							
<i>Paratrechina minutula</i> (Forel) 1901: 25	F							
<i>Pheidole oceanica</i> Mayr 1866: 510		V	v	K	T	O	L	R
<i>Pheidole umbonata</i> Mayr 1870: 978		V	v	K	T	O	L	
<i>Rogeria sublevinodis</i> Emery 1914: 415		V	v	K	T	O	L	
<i>Solenopsis papuana</i> Emery 1900: 330		V						
<i>Strumigenys godeffroyi</i> Mayr 1866: 516		V	v	K	T		L	
<i>Strumigenys mailei</i> Wilson & Taylor 1967: 38		V	v	K				
<i>Tapinoma minutum</i> Mayr 1862: 703	F	V						
<i>Technomyrmex albipes</i> (F. Smith) 1861: 38		V	v	K	T	O	L	
<i>Tetramorium insolens</i> (F. Smith) 1861: 47		V	v	K	T		L	
<i>Tetramorium pacificum</i> Mayr 1870: 976		V	v	K	T	O	L	R
<i>Tetramorium tenuicrine</i> (Emery) 1914: 416		V						
<i>Tetramorium tonganum</i> Mayr 1870: 976		V	v		T			
<i>Vollenhovia denticulata</i> Emery 1914: 405	F							
Exotic								
<i>Anoplolepis gracilipes</i> (F. Smith) 1857: 55		V	v	K	T	O	L	R
<i>Cardiocondyla emeryi</i> Forel 1881: 5	F	V						
<i>Cardiocondyla obscurior</i> Wheeler 1929: 44		V						
<i>Hypoponera gleadowi</i> (Forel) 1895: 60		V						
<i>Hypoponera opaciceps</i> (Mayr) 1887: 536	F							
<i>Hypoponera punctatissima</i> (Roger) 1859: 246	F							
<i>Monomorium destructor</i> (Jerdon) 1851: 105		V						
<i>Monomorium floricole</i> (Jerdon) 1851: 107		V	v		T	O	L	
<i>Monomorium pharaonis</i> (Linnaeus) 1758: 580		V						
<i>Monomorium sechellense</i> Emery 1894: 69		V						
<i>Pachycondyla stigma</i> (Fabricius) 1804: 400		V	v					
<i>Paratrechina bourbonica</i> (Forel) 1886: 210		V	v		T	O		

Taxon	F	V	v	K	T	O	L	R
Exotic (continued)								
<i>Paratrechina longicornis</i> (Latreille) 1802: 11		V	v	K	T	O	L	
<i>Paratrechina vaga</i> (Forel) 1901: 26		V	v	K	T	O	L	
<i>Pheidole fervens</i> Smith 1858: 176		V						
<i>Pheidole megacephala</i> (Fabricius) 1793: 361		V	v	K	T	O	L	R
<i>Plagiolepis alluaudi</i> Emery 1894: 71		V						
<i>Platythyrea parallela</i> (F. Smith) 1859: 143		V						
<i>Pyramica membranifera</i> (Emery) 1869: 24		V	v	K			L	
<i>Solenopsis geminata</i> (Fabricius) 1804: 423	F	V						
<i>Strumigenys rogeri</i> Emery 1890: 68		V	v	K				
<i>Tapinoma melanocephalum</i> (Fabricius) 1793: 353		V	v	K	T	O	L	
<i>Tetramorium bicarinatum</i> (Nylander) 1846: 1061		V	v	K	T	O	L	
<i>Tetramorium lanuginosum</i> Mayr 1870: 976		V						
<i>Tetramorium simillimum</i> (F. Smith) 1851: 118		V			T		L	

FIJI ARTHROPODS III
(edited by N.L. Evenhuis & D.J. Bickel)

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