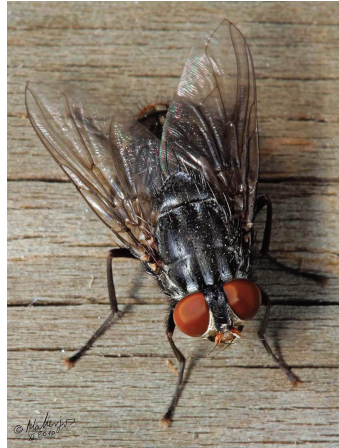


# BISHOP MUSEUM BULLETINS IN ENTOMOLOGY

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## The Muscidae (Diptera) of the Fiji Islands

Adrian C. Pont &  
Marcia S. Couri



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Cover: *Synthesiomia nudiseta* (Wulp). Photo: José Marin (Maherjos)

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### Abstract

Since Bezzi's (1928) review of the Diptera Brachycera of the Fiji Islands, few additional muscid species have been described or recorded from the islands. Pont (1989) recorded 27 muscids from Fiji (including two doubtful records). Recent material was collected by the Fiji Bioinventory of Arthropods (FBA), a two-year survey of arthropods occurring in the Fiji Islands and using various trapping methods. The project was part of the Fiji Terrestrial Arthropod (FTA) survey that was awarded a grant from the National Science Foundation (NSF) to inventory the insects and spiders of the Fiji Islands. Between September 2002 and May 2004, the FBA project was funded by the Schlinger Foundation. The authors received the material sorted by family and have prepared and identified about 2,000 specimens. Fijian muscids from other collections were added to the material examined. A total number of 44 species in 18 genera were studied, 39 recognized as member of the Fijian fauna, including 16 endemics. Seven new species are described: *Coenosia fijiensis* Pont & Couri, **sp. nov.**; *Limnophora penicillata* Pont & Couri, **sp. nov.**; *Limnophora shinonagai* Pont & Couri, **sp. nov.**; *Parvisquama curvicerca* Pont & Couri, **sp. nov.**; *Parvisquama femorata* Pont & Couri, **sp. nov.**; *Parvisquama longicerca* Pont & Couri, **sp. nov.**; and *Parvisquama longiseta* Pont & Couri, **sp. nov.** The following species were newly recorded from the Fiji Islands: *Atherigona bidens* Hennig, *Atherigona matema* Curran, *Atherigona oryzae* Malloch, *Lispe bengalensis* (Robineau-Desvoidy) and *Lispe pectinipes* Becker. The genus



*Coenosia* Meigen is newly recorded from the Fiji Islands. *Dichaetomyia taveuniana* Pont & Evenhuis is newly recorded from Vanua Levu.

**Key words.** descriptions, new species, new records, taxonomy, morphology

## INTRODUCTION

The Fijian Archipelago is one of the most faunistically unusual areas in the entire Pacific region. Scientific expeditions have visited Fiji since the first European sighting in 1643 by Abel Tasman, but there is little current comprehensive information published on the arthropod fauna of the islands. The NSF-Fiji Terrestrial Arthropod Survey aims to provide a more complete knowledge of the arthropod fauna of the Fijian Islands. A summary and overview of the NSF-funded project was given by Evenhuis & Bickel (2005), who also summarized previous surveys of the islands. The Fiji Arthropod Survey homepage (<http://hbs.bishop-museum.org/fiji/>) gives a list of recent publications on the Fijian fauna.

The muscoids from the Fiji Islands were first monographed by Bezzi (1928), who recorded eleven previously known species and described eight new ones. In the same year, Malloch (1928a, 1928b) also described some new species from the Fiji Islands. Emden (1942) studied the Fijian *Coenosia*, recording seven species and assigning some of Bezzi's species to different genera. Almost thirty years later, Pont (1970b) gave notes on the location of the types of Bezzi's species, and a new species was described by Vockeroth (1972). All muscid records were summarised by Pont (1989), and his catalogue has served as the basis for the present paper. Pont recorded 27 species, two of them as doubtful records: *Lispe tentaculata* (De Geer) and *Haematobia irritans* (Linnaeus). More recently, Pont & Evenhuis (2006) described a new species of *Dichaetomyia* Malloch, and Pont (2006) published a key to the genera of the Muscoidea (Diptera) recorded from the Fiji Islands. A summary of Fiji muscid taxa over the years is given in Table 1.

## MATERIAL AND METHODS

The project management plan for the NSF-Fiji Terrestrial Arthropod Survey, including the collecting sites, collecting protocol and collecting techniques, was described by Evenhuis & Bickel (2005). Most of the Muscidae were collected by Malaise traps placed in different ecosystems on the different islands. The material was processed and sorted to family by local parataxonomists. About 2,000 specimens of Muscidae have been pinned, labelled and identified. This material is listed under "FAS" in the "Material examined" section below. In addition, material from other institutions has also been examined and is listed under "Other material examined". The following acronyms are used for institutions where this material is located:

ANIC	Australian National Insect Collection, CSIRO, Canberra, Australia
BMNH	the Natural History Museum, London, UK
BPBM	Bernice P. Bishop Museum, Honolulu, Hawai'i, US
CAS	California Academy of Sciences, San Francisco, USA
CNC	Canadian National Collection, Ottawa, Canada
HNHM	Hungarian Natural History Museum, Budapest, Hungary
IPP	Institut Pasteur, Paris, France
LSL	Linnean Society of London, UK
MCSNM	Museo Civico di Storia Naturale, Milan, Italy
MNHNP	Muséum National d'Histoire Naturelle, Paris, France
MNRJ	Museu Nacional, Rio de Janeiro, Brazil
NBCL	Naturalis Biodiversity Centre, Leiden. The Netherlands

**Table 1. Genera and species of Muscidae (Diptera) recorded from Fiji Islands.**  
(nr = new record)

Muscidae Species	Bezzi 1928	Pont 1989	Pont 2006	Present Study
<b>ATHERIGONINAE</b>				
<i>Atherigona bidens</i> Hennig	—	—	—	x (nr)
<i>Atherigona hendersoni</i> Malloch	—	x	x	x
<i>Atherigona matema</i> Curran	—	—	—	x (nr)
<i>Atherigona orientalis</i> Schiner	x <sup>1</sup>	x	x	x
<i>Atherigona oryzae</i> Malloch	—	—	x	x
<i>Atherigona poecilopoda</i> Bezzi	x	x	x	x
<i>Atherigona splendens</i> Bezzi**	x	x	x	x
<b>MUSCINAE</b>				
<b>MUSCINI</b>				
<i>Mesembrina meridiana</i> (Linnaeus)	—	x <sup>9</sup>	x	—
<i>Musca domestica</i> Linnaeus	x	x	x	x
<i>Musca vetustissima</i> Walker	—	x	x	x
<i>Neomyia greenwoodi</i> (Bezzi)**	x <sup>2</sup>	x	x	x
<i>Neomyia simmondsi</i> (Bezzi) **	x <sup>3</sup>	x	x	x
<b>STOMOXYINI</b>				
<i>Haematobia exigua</i> Meijere	—	—	x <sup>9</sup>	—
<i>Haematobia irritans</i> (Linnaeus)	—	x	x <sup>9</sup>	—
<i>Stomoxys calcitrans</i> (Linnaeus)	x	x	x	x
<i>Stomoxys indicus</i> Picard	x <sup>4</sup>	x	x	x
<b>AZELIINAE</b>				
<b>AZELIINI</b>				
<i>Hydrotaea spinigera</i> (Stein)	x <sup>5</sup>	x	x	x
<b>REINWARDTIINI</b>				
<i>Muscina stabulans</i> (Fallén)	—	x	x	x
<i>Passeromyia indecora</i> (Walker)	—	x	x	x
<i>Passeromyia veitchi</i> Bezzi**	x	x	x	x
<i>Synthesiomyia nudiseta</i> (Wulp)	x	x	x <sup>10</sup>	x
<b>PHAONIINAE</b>				
<b>DICHAETOMYIINI</b>				
<i>Dichaetomyia elegans</i> Malloch**	x <sup>6</sup>	x	x	x
<i>Dichaetomyia taveuniana</i> Pont & Evenhuis**	—	—	x (not named)	x
<i>Dichaetomyia vicaria</i> (Walker)	x <sup>7</sup>	x	x	x
<b>MYDAEINAE</b>				
<i>Myospila effeminata</i> Vockeroth **	—	x	x	x
<b>COENOSIINAE</b>				
<b>LIMNOPHORINI</b>				
<i>Limnophora mesolissa</i> Bezzi	x	x	x	x
<i>Limnophora penicillata</i> Pont & Couri, sp. nov.**	—	—	—	x
<i>Limnophora shinonagai</i> Pont & Couri, sp. nov.**	—	—	—	x
<i>Lispe assimilis</i> Wiedemann	x	x	—	x
<i>Lispe bengalensis</i> (Robineau-Desvoidy)	—	—	—	x (nr)
<i>Lispe pectinipes</i> Becker	—	—	—	x (nr)
<i>Lispe tentaculata</i> (De Geer)	—	x <sup>9</sup>	—	—
<i>Lispe</i> sp. indet. male	—	—	x <sup>11</sup>	x <sup>11</sup>
<i>Lispe</i> sp. indet. female	—	—	—	x <sup>11</sup>

Table 1 (continued).

Muscidae Species	Bezzi 1928	Pont 1989	Pont 2006	Present Study
COENOSIINAE (continued)				
COENOSIINI				
<i>Coenosia fijiensis</i> Pont & Couri, sp. nov.**	—	—	—	X
<i>Orchisia costata</i> (Meigen)	X	X	X	X
<i>Parvisquama curvicerca</i> Pont & Couri, sp. nov.**	—	—	—	X
<i>Parvisquama dolichocera</i> (Bezzi) **	X	X	X	X
<i>Parvisquama femorata</i> Pont & Couri, sp. nov.**	—	—	—	X
<i>Parvisquama longicerca</i> Pont & Couri, sp. nov.**	—	—	—	X
<i>Parvisquama longiseta</i> Pont & Couri, sp. nov.**	—	—	—	X
<i>Parvisquama tripuncta</i> (Malloch)**	X <sup>8</sup>	X	X	X
<i>Pygophora ctenophora</i> (Bezzi)**	X	X	X	X
<i>Pygophora</i> sp. indet. male	—	—	—	— <sup>12</sup>
<sup>1</sup> as <i>Atherigona excisa</i>				
<sup>2</sup> as <i>Orthellia greenwoodi</i>				
<sup>3</sup> as <i>Orthellia simmondsi</i>				
<sup>4</sup> as <i>Stomoxys limbata</i>				
<sup>5</sup> as <i>Ophyra nigra</i>				
<sup>6</sup> as <i>Dichaetomyia rufa</i>				
<sup>7</sup> as <i>Dichaetomyia prodigiosa</i>				
<sup>8</sup> as <i>Coenosia microlepis</i> (pp)				
<sup>9</sup> probably not a member of Fijian fauna (see text)				
<sup>10</sup> probably failed to establish on a permanent basis				
<sup>11</sup> specific identities not yet established				
<sup>12</sup> probably extinct				
** endemic				

NMW	Naturhistorisches Museum, Vienna, Austria
NRS	Naturhistoriska Riksmuseet, Stockholm, Sweden
NSMT	National Science Museum, Tokyo, Japan
OUMNH	Oxford University Museum of Natural History, Oxford, UK
USNM	National Museum of Natural History, Washington, USA
ZMHU	Zoologisches Museum der Humboldt-Universität, Berlin, Germany
ZMUC	Danish Museum of Natural History, Copenhagen, Denmark
ZSZMH	Zoologisches Institut und Zoologisches Museum, Hamburg, Germany

Of the material collected by the NSF project (FAS – Fiji Arthropod Survey), the types of the new species are deposited in the Bernice P. Bishop Museum, Honolulu (BPBM). The remaining FAS material is temporarily held in the Bishop Museum, pending deposition in Fiji, but some specimens have been retained by the authors in the Museu Nacional, Rio de Janeiro, Brazil (MNRJ) and the Natural History Museum, London, UK (BMNH), as indicated in the material examined.

For each recorded genus, a diagnosis and comments are given, and for each recorded species, a diagnosis, a description where appropriate together with genitalia illustrations, a list of all the material examined, comments (when pertinent), distribution and biological data are also given. Dissected terminalia have been placed in glycerine in microvials pinned with the respective specimen.

The morphological terminology follows McAlpine (1981) in the main, and for the special characters of *Atherigona*, such as the trifoliate process, we follow Pont (1986b) and Pont & Magpayo (1995). “Postpedicel” is used for “antennal flagellomere”, following

Stuckenberg (1999). Data on the regional distribution of the species are taken mainly from Pont (1989). The key for the identification of Fijian muscid genera and species is modified from Pont (2006).

### SYSTEMATICS

#### KEY TO THE FIJIAN GENERA AND SPECIES OF MUSCIDAE

1. Anepimeron partly setulose ..... **2**
- Anepimeron bare ..... **19**
2. Proboscis adapted for piercing: elongate, strongly sclerotised and non-retractile, tapering from a broad base to a slender apex and with labella atrophied ..... **3**
- Proboscis not adapted for piercing: moderately or weakly sclerotised and retracted into head, not tapering strongly to apex, and with labella well-developed and often fleshy ..... **6**
3. Palpus about one-third as long as labium. Meron and disc of proepisternal depression setulose. Notopleuron with numerous setulae in addition to the two setae ..... **4**
- Palpus about three-quarters as long as labium. Meron and disc of proepisternal depression bare. Notopleuron without setulae ..... **5**
4. Tergites 3 and 4 each with black hind-marginal bands. Tibiae and tarsi mostly yellow, at most hind tibia rather brown. Setulae on ventral surface of vein  $R_{4+5}$  extending almost as far as cross-vein r-m or even beyond. Frons narrower in both sexes, its width at middle 1/7 to 1/9 (males) or 1/3 (females) of greatest head-width .....  
     ..... *Stomoxys indicus* Picard
- Tergites 3 and 4 each with a pair of paramedian oval black spots. Legs black, tibiae narrowly yellow at base. Setulae on ventral surface of vein  $R_{4+5}$  usually confined to base. Frons broader in both sexes, its width at middle 1/4 (male) or almost 1/2 (female) of greatest head-width ..... *Stomoxys calcitrans* (Linnaeus)
5. Convergent frontal setae fewer in number, 8–10 pairs. Palpus yellow. Male: thoracic hairs and setae shorter, for example acrostichal hairs with few exceptions much shorter than length of postpedicel; hairs on dorsal surface of hind tarsomeres 2 and 3 considerably longer than the width of the tarsomeres ..... *Haematobia exigua* Meijere
- Convergent frontal setae more numerous, 11–13 pairs. Palpus usually brown. Male: thoracic hairs and setae longer, for example acrostichal hairs fully equal to length of postpedicel; hairs on dorsal surface of hind tarsomeres 2 and 3 not longer than the width of the tarsomeres ..... *Haematobia irritans* (Linnaeus)
6. Lower calypter broad, truncate posteriorly, its posterior margin following scutellar margin before diverging away ..... **7**
- Lower calypter narrow, tongue-like, its posterior margin at right-angles to scutellum right from its base ..... **11**
7. Large coal-black species with deep yellow wing-base, body-length at least 11 mm. Anterior katepisternal seta absent. Base of vein  $R_{4+5}$  bare .....  
     ..... *Mesembrina meridiana* (Linnaeus)
- Differently coloured and smaller species, body-length rarely even 9 mm. Anterior katepisternal seta present. Base of vein  $R_{4+5}$  setulose at least on ventral surface ..... **8**
8. Not metallic green species. Supra-squamal ridge bare. Greater ampulla, subcostal sclerite and face bare. Mid tibia without a posteroventral seta ..... **9**
- Metallic green, blue or violet species. Supra-squamal ridge setulose along its entire length. Greater ampulla, subcostal sclerite and face above mouth-edge setulose. Mid tibia with a strong posteroventral seta beyond middle ..... **10**

9. Scutum with 4 undusted black vittae, the vittae separate and not fused either before or after suture. Sternite 1 setulose. Proepisternal depression setulose. Male: syntergite 1+2 yellow, at most with a brown median vitta. Female: tergites at least partly yellow; fronto-orbital plates usually yellowish grey pruinose ... *Musca domestica* Linnaeus
- Scutum with the two undusted black vittae on each side separated before suture but fused into a single vitta behind suture, the scutum thus appearing bivittate after suture. Sternite 1 bare. Proepisternal depression bare. Male: syntergite 1+2 entirely black. Female: tergites entirely dark; fronto-orbital plates white to greyish white pruinose  
..... *Musca vetustissima* Walker
10. Palpus and antenna yellow. Legs mostly though often indefinitely yellow. Body violet. Parafacial, face and gena golden pruinose. Abdominal tergite 5 silvery dusted and contrasting with the rest of the abdomen ..... *Neomyia simmondsi* (Bezzi)
- Palpus and antenna dark. Legs wholly dark. Body bright green to blue-green. Parafacial and face silvery grey pruinose, gena brown. Abdominal tergite 5 usually undusted and not contrasting with the rest of the abdomen ..... *Neomyia greenwoodi* (Bezzi)
11. Parafacial with one or more irregular rows of fine hairs for most or all of its length. Palpus moderately to strongly broadened in apical part. Vein R<sub>4+5</sub> wholly bare. Prosternum bare. Male frons about one-third of head width ..... 12
- Parafacial bare. Palpus slender or very slightly broadened in apical part. Vein R<sub>4+5</sub> setulose at least on ventral surface. Prosternum setulose. Male frons at most one-sixth of head-width ..... 16
12. 1 strong presutural dorsocentral seta. Fore tibia with a submedian posterior seta; hind tibia without a posterodorsal seta. Male: hind tibia with 2 anteroventral setae, and with a row of 6 fine, erect, posteroventral setae on apical half, longer than tibial depth; mid femur on apical fifth with a comb of dense, short, stout posteroventral setulae .....  
..... *Lispe pectinipes* Becker
- 1–2 short weak presutural dorsocentral setae. Fore tibia without a submedian posterior seta except for *L. assimilis* which also has hind tibia with a posterodorsal seta. Male: hind tibia with 1 anteroventral and without posteroventrals; mid femur without such a comb of posteroventral setulae ..... 13
13. Fore tibia with a submedian posterior seta. Hind tibia with 1 posterodorsal. Vein M rather curved forward towards vein R<sub>4+5</sub> in its apical part. Hind femur with 2 anteroventrals, one just after middle and one before apex, and without posteroventrals .....  
..... *Lispe assimilis* Wiedemann
- Fore tibia without a submedian posterior seta. Hind tibia without posterodorsal. Vein M not curved forward towards vein R<sub>4+5</sub>, running straight to the wing margin. Hind femur without anteroventral setae except at apex, but if present (*L. bengalensis*) then posteroventral setae also present ..... 14
14. Palpus brown. Hind tibia with a posteroventral apical seta. All femora in apical half with rows of anteroventral and posteroventral spinules. Tergite 5 entirely light grey dusted .....  
..... *Lispe bengalensis* (Robineau-Desvoidy)
- Palpus yellow. Hind tibia without a posteroventral apical seta. Femora without ventral spinules ..... 15
15. Meron bare above hind coxa. 3 strong postsutural dorsocentral setae. 1 postsutural intraalar. Male: hind tarsomere 1 strongly expanded posteriorly to form a flap .....  
..... *Lispe* sp. indet., male
- Meron with a few setulae above hind coxa. 2 strong and 2 weak postsutural dorsocentral setae. 2 postsutural intraalars. Female: tergites 3 and 4 almost wholly dark brown, with a little yellowish grey dust along mid-line and laterally on hind margins .....  
..... *Lispe* sp. indet. female

16. Tegula dark brown. Ground-colour of abdomen dark. Femora black ..... *Dichaetomyia* sp. A  
 [1 female in very poor condition and too poor to assign to species-group; it could be mislabelled.]
- Tegula yellow. Ground-colour of abdomen yellow. Femora yellow ..... 17
17. Scutum wholly yellow, without dark vittae. Pleura yellow. Scutellum bare on lateral and ventral surfaces. 4 postsutural dorsocentral setae. Palpus brown. Wing clear. Male: mid and hind legs simple, not modified in shape or bristling ..... *Dichaetomyia vicaria* (Walker)
- Scutum yellow, with a pair of broad black vittae running from neck posteriorly on to basal lateral angle of scutellum. Pleura mostly dark. Scutellum with dark setulae on lateral and ventral surfaces. 3 postsutural dorsocentral setae. Palpus yellow. Fore-margin of wing conspicuously darkened between tips of veins  $R_1$  and  $R_{2+3}$ . Male: mid and hind legs with striking modifications in shape and bristling (see Bezzi, 1928: fig. 52 on p. 178, as *prodigiosa*) ..... 18
18. Central part of scutum, between the broad black paramedian vittae, orange-yellow in ground-colour. Wing tinged with orange in basal half, conspicuously dark smoky in apical half. Male: mid femur with the long fine posterior to posteroventral setae continued from base almost to apex of femur, mid tarsus with the posterior hairs on tarsomeres 1 and 2 curled at tips; hind femur with the anterodorsal row of setae complete, with the anterior row of setae becoming longer and more anteroventral in apical half and the 4–5 short anteroventrals after the last strong seta curved downwards as normal; hind femur on posteroventral surface with the median group of short setae consisting of 7 setae in a single row; hind tibia with the dorsal to anterodorsal hairs that cover the whole length longer and denser, and the anterodorsal hairs on tarsomere 1 long and fine, longer than the tarsal depth, apical half of hind tibia and tarsomere 1 also with long posterodorsal hairs; ventral process at middle of hind tibia with the spoon-shaped piece shorter and broader, and the inner piece shorter and square-ended ..... *Dichaetomyia elegans* Malloch
- Central part of scutum, between the broad black paramedian vittae, black in ground-colour. Wing uniformly dark smoky. Male: mid femur with the long fine posterior to posteroventral setae confined to basal two-fifths of femur; mid tarsus with the posterior hairs on tarsomeres 1 and 2 curled along their whole lengths; hind femur with the anterodorsal row absent, the anterodorsal to anteroventral surfaces in basal half covered with dense setae and setulae, the 6 short anteroventrals after the last strong seta upcurved, not downcurved; hind femur on posteroventral surface with the median group of short setae consisting of 12 setae, more extensive and not uniserial; hind tibia with the dorsal to anterodorsal hairs that cover the whole length shorter and sparser, and the anterodorsal hairs on tarsomere 1 inconspicuous and not as long as tarsal depth, apical half on hind tibia and tarsomere 1 without any posterodorsal hairs; ventral process at middle of hind tibia with the spoon-shaped piece longer and narrower, and the inner piece longer and smoothly rounded at tip ..... *Dichaetomyia taveuniana* Pont & Evenhuis
19. Node at base of vein  $R_{4+5}$  with 1 or more setulae on dorsal as well as ventral surfaces ... 20
- Node at base of vein  $R_{4+5}$  bare on dorsal surface, bare or setulose on ventral surface ... 25
20. Lower calypter broad, truncate posteriorly, its posterior margin following scutellar margin before diverging away. Several pairs of presutural and postsutural acrostichal setae present. Meron with a few setulae above hind coxa and, sometimes, below spiracle. Female: frontal vitta with many setulae and a pair of crossed setae ..... 21
- Lower calypter narrow, tongue-like, its posterior margin at right-angles to scutellum right from its base. Without acrostichal setae except for 1 pair before scutellum. Meron entirely bare. Female: frontal vitta bare ..... 22

21. Post-alar wall bare. Eye bare. Abdomen very thinly dusted, appearing matt black in dorsal view. 1 intraalar seta. Palpus black. Scutum with brownish grey to golden-grey dust and with conspicuous vittae ..... *Passeromyia veitchi* Bezzi
- Post-alar wall with a tuft of setulae. Eye densely haired. Abdomen densely blue dusted. 3, rarely 2, intraalar setae. Palpus yellow, rarely brown. Scutum with dense ash-grey or blue-grey dust and very weak vittae ..... *Passeromyia indecora* (Walker)
22. Prosternum bare. Mid femur with an anterior preapical seta. Hind tibia with a dorsal and an anterodorsal preapical seta. Prealar seta short but distinct. Arista long-plumose. Body, antenna, palpus and legs yellow ..... *Myospila effeminata* Vockeroth
- Prosternum setulose. Mid femur without an anterior preapical seta. Hind tibia with only the dorsal preapical seta, the anterodorsal absent. Prealar seta wholly absent. Arista at most short-plumose. Body, antenna, palpus and legs black ..... 23
23. Knob of halteres black. 3 strong postsutural dorsocentral setae. Presutural acrostichal setulae in 2 rows. Scutellum in posterior view brown dusted. Male: frons broad, about 1/3 of head width. Very small species ..... *Limnophora penicillata* Pont & Couri, **sp. nov.**
- Knob of halteres yellow. 4 postsutural dorsocentral setae. Presutural acrostichal setulae in 4 rows. Scutellum in posterior view matt black ..... 24
24. Combined arisal hairs less than half width of postpedicel. Dust on abdominal tergites light grey. Calypters with brown borders. All postsutural dorsocentrals strong. Male: frons narrow, not much broader than width of postpedicel .....  
..... *Limnophora shinonagai* Pont & Couri, **sp. nov.**
- Combined arisal hairs equal to width of postpedicel. Dust on abdominal tergites yellowish or brownish grey. Calypters wholly creamy white. Anterior 2 pairs of postsutural dorsocentrals weak, much shorter than the others. Male: frons broad, one-third of head-width ..... *Limnophora mesolissa* Bezzi
25. Prosternum setulose. Scutellum with numerous setulae on sides and at ventral angle. Vein M curved forward towards vein  $R_{4+5}$  in apical part so that cell  $r_{4+5}$  is very narrow at tip. Body colour dark, except for the orange tergite 5 ..... *Synthesiomyia nudiseta* (Wulp)
- Prosternum bare. Scutellum bare on sides and at ventral angle (except *Muscina*, which has femora mainly dark and scutellum dark with a yellow tip). Vein M straight ... 26
26. Head subquadrate in lateral view, with the antenna long and inserted just below level of upper eye-margin. Presutural dorsocentral setae short and weak, hardly distinguishable from the ground-setulae. Fore femur with 0–2 posteroventral setae, situated near apex ... *Atherigona* Rondani ..... 27
- Head variable in shape, but never subquadrate, and antenna inserted well below level of upper eye-margin. Presutural dorsocentral setae distinct and strong, longer than the ground-setulae. Fore femur with a complete row of posteroventral setae ..... 33
27. Presutural acrostichal setulae in 4–6 rows at suture. Cross-vein r-m placed at or beyond middle of cell dm. Basal lateral scutellar setula at least 1/3 length of subbasal lateral seta. Male: fore femur with a preapical dorsal excavation (Fig. 15); hypopygial prominence and trifoliate process absent (Fig. 14). Female: tergite 8 without a pair of small anterior platelets (Fig. 18) ..... 28
- Presutural acrostichal setulae in 2–3 rows at suture. Cross-vein r-m placed basad of middle of cell dm. Basal lateral scutellar setula at most ¼ length of subbasal lateral seta. Male: fore femur without a preapical dorsal excavation; hypopygial prominence and trifoliate process present (Figs 2–5). Female: tergite 8 with a pair of small anterior platelets (Fig. 22) ..... 30



28. Hind femur with a preapical dorsal seta. Dark vittae on scutum usually weak. Ground-colour of pleura mostly black. Frontal vitta yellow to orange. Male: hind femur and tibia without a ventral keel; abdominal tergite 3 not extended ventrally ..... *Atherigona orientalis* Schiner
- Hind femur without a preapical dorsal seta. Dark vittae on scutum broad, distinct and well-marked. Frontal vitta dark brown. Ground-colour of pleura mainly yellow. Male: hind femur and hind tibia each with a ventral keel; abdominal tergite 3 extended ventrally (Fig. 14) ..... 29
29. Wing clear. Male: palpus yellow to brown ..... *Atherigona poecilopoda* Bezzi
- Wing with a dark cloud at tip between veins  $R_{2+3}$  and M. Male: palpus brown ..... *Atherigona hendersoni* Malloch
30. Occiput and fronto-orbital plate shining black. Male: hypopygial prominence and trifoliate process as in Figs 19–21, the trifoliate process extremely flattened ..... *Atherigona splendens* Bezzi
- Occiput and fronto-orbital plate pruinose. Male: hypopygial prominence and trifoliate plate different ..... 31
31. Male: fore tarsomeres 3 and 4 with some distinct erect hairs along dorsal and anterodorsal surfaces, some of them longer than length of the tarsomere on which they are situated; hypopygial prominence and trifoliate process as in Figs 2–5 ..... *Atherigona bidens* Hennig
- Male: fore tarsomeres simple, without long hairs ..... 32
32. Male: subcosta with a dark smudge at tip; hypopygial prominence and trifoliate process as in Figs 10–13 ..... *Atherigona oryzae* Malloch
- Male: subcosta clear, without a dark smudge at tip; hypopygial prominence and trifoliate plate as in Figs 6–9 ..... *Atherigona matema* Curran
33. Katepisternal setae not arranged in an equilateral triangle, the anterior one further separated from the posterior 1–3. Lower proepimeral seta directed upwards ..... 34
- Katepisternal setae arranged in an equilateral triangle, the lower one equidistant from the upper two. Lower proepimeral seta directed forwards and downwards ..... 35
34. Subcosta very close to vein  $R_1$  for most of its length, diverging from it only near apex of subcosta, its course sinuous rather than smooth. Vein M curved forward towards vein  $R_{4+5}$  in apical part. Arista plumose. Tip of scutellum and tibiae yellow. Posterior margin of eye not concave below ..... *Muscina stabulans* (Fallén)
- Subcosta diverging from vein  $R_1$  at a point very close to the base of both veins, running in a smooth curve to costa. Vein M running straight to the wing margin. Arista pubescent. Body and legs dark. Posterior margin of eye concave below ..... *Hydrotaea spinigera* (Stein)
35. Head with only one pair of reclinate orbital setae. Hind tibia with 1 anterodorsal seta. 1 presutural dorsocentral seta ..... *Coenosia fijiensis* Pont & Couri, **sp. nov.**
- Head with 2 pairs of reclinate orbital setae. Hind tibia with 2 anterodorsal setae. 1 or 2 presutural dorsocentral setae ..... 36
36. Mid tibia with 2 submedian posterior setae. Frontal triangle small and confined to the area of the ocelli, not nearly reaching lunule. Fore tibia with a strong submedian posteroventral seta. Arista very long plumose on basal half and bare on apical half, the longest hairs twice width of postpedicel ..... 37
- Mid tibia with 1 submedian posterior seta. Frontal triangle large or at least long and narrow, more or less reaching lunule. Fore tibia without a posteroventral seta. Arista shorter plumose, the longest hairs equal to width of postpedicel and continued evenly to tip of arista ..... 38



37. Mid femur with 2 preapical posterior setae. Frons with 2 pairs of frontal setae, both strong, and fronto-orbital plate bare. Male: tergite 4 with a long patch of short dense curled setulae on sides; hind femur with 2 anteroventral and 2 posteroventral setae in basal quarter, both very long and strong ..... *Pygophora ctenophora* Bezzi
- Mid femur with 1 preapical posterior seta. Frons with 4 pairs of frontal setae, 2 strong and 2 weak, and fronto-orbital plate outside the frontal setae with short proclinate setulae. Male: tergite 4 without a patch of setulae; hind femur with only a few short fine posteroventral setae in basal half ..... *Pygophora* sp.
38. Lower calypter normal in size, projecting beyond upper one. Scutellum with the basal setae absent. Wing milky white along posterior and apical margins, brown along anterior margin, and elsewhere pale smoky brown. Hind tibia with only 1 short submedian posterodorsal seta ..... *Orchisia costata* (Meigen)
- Lower calypter reduced, linear, not projecting beyond upper one. Basal scutellar seta half as long as apical one. Wing completely clear. Hind tibia with 2 posterodorsal setae ..... 39
39. Palpus dark brown ..... 40
- Palpus yellow ..... 41
40. Mid femur with short, decumbent hairs along posteroventral edge, as on disc. Male: mid coxa without any particularly long setae; abdomen yellowish, dark spots on tergites 4 and 5 longer, only a little separated from fore- and hind-margins of the tergites. Female: tergites 3 and 4 with the dark median vitta and lateral spots broader and bolder, each spot and vitta much broader than the yellow space separating them; male sternite 5 without long setae on margin ..... *Parvisquama dolichocera* Bezzi
- Mid femur with a comb-like series of strong setae in apical third of posteroventral surface. Male: mid coxa with strong setae on ventral surface; syntergite 1+2 yellowish, tergites 3 and 4 with grey pollinosity, yellow only on the apical margin, tergite 5 with no yellow marks; tergites 3 and 4 with lateral and median brown clouds, tergite 5 with two round lateral clouds; male sternite 5 with long setae on margin ..... *Parvisquama longiseta* Pont & Couri, **sp. nov.**
41. Mid femur with 4–5 short stout spinules in apical sixth of posteroventral surface; male surstylus shorter than height of epandrium .....  
..... *Parvisquama femorata* Pont & Couri, **sp. nov.**
- Mid femur with more than 5 spinules on posteroventral surface; male surstylus as long as or much longer than height of epandrium ..... 42
42. Male: mid coxa on lower anterior edge with several stout setae; cercal plate as long as height of epandrium ..... *Parvisquama tripuncta* (Malloch)
- Male: mid coxa at lower anterior edge without any particularly long setae; cercal plate more than twice as long as height of epandrium ..... 43
43. Abdomen largely yellow, almost without grey pollinosity especially in females and with brown marks; male cercal plate sinuous in lateral view .....  
..... *Parvisquama curvicerca* Pont & Couri, **sp. nov.**
- Abdomen yellow with grey pollinosity on tergites 4 and 5 and with brown marks; male cercal plate not sinuous in lateral view, curved inwards at apex .....  
..... *Parvisquama longicerca* Pont & Couri, **sp. nov.**

A total number of 44 species, 39 recognized as members of Fijian fauna and distributed in 18 genera, were studied, including 16 endemics (41%). Seven new species are described; four species and one genus are newly recorded from from the Fiji Islands.

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**Atherigoninae****Genus *Atherigona* Rondani**

*Atherigona* Rondani, 1856: 97. Type species: *Anthomyia varia* Meigen, 1826, by original designation.

**Diagnosis.** *Atherigona* can be easily distinguished from all other muscid flies by the characteristically angular head, with long face and antennal postpedicel; arista bare; one pair of reclinate orbital setae; palpus strongly differentiated between the two sexes and between the two subgenera *Atherigona* s.str. and *Acritochaeta* Grimshaw (Fig. 1, a-c); dorsocentral setae reduced; katapisternals 1+2; hind tibia without calcar; wing veins bare; males of sg. *Atherigona* with a hypopygial prominence (Figs 2–3) and a trifoliate process (Fig. 4–5); females with (sg. *Atherigona*) or without (sg. *Acritochaeta*) a pair of small anterior plates on tergite 8 of the ovipositor. Small flies, uniform in general appearance and structure; general colour grey or yellowish grey, with very short setae on scutum and legs.

**Comments.** Seven species are known to occur: *A. orientalis* Schiner, throughout the Old and New World tropics and subtropics; *A. oryzae* Malloch and *A. bidens* Hennig, mainly Indo-Australasian in distribution; *A. matema* Curran, a Melanesian species; *A. hendersoni* Malloch, a Pacific species; *A. poecilopoda* Bezzi and *A. splendens* Bezzi are endemic to Fiji.

**1. *Atherigona (Atherigona) bidens* Hennig, new record**  
(Figs 2–5)

*Atherigona tridens* Malloch, ssp. *bidens* Hennig, 1952: 67. Holotype male, Flores Island, Endeh, in SDEI [seen].

*Atherigona bidens*; Davies & Reddy, 1981: 35; Pont, 1986b: 37, figs 148–164; Pont, 1989: 681; Pont & Magpayo, 1995: 54, figs 126–148, 635–638.

**Male**

**Head.** All setae and setulae black. Ground-colour mainly dark beneath the pruinosity, only yellow on parafacial, face and gena; frontal plate dark brown, reddish towards lunule in immature specimens. Occiput and ocellar tubercle grey pruinose; fronto-orbital plate, parafacial, face and gena light grey pruinose. 4–5 pairs of moderate inclinate frontal setae. Scape and pedicel mainly brown on disc; postpedicel dark brown, red at most at extreme base; arista brown. Parafacial at lunule a little over 1/2 width of postpedicel. Palpus yellow, dull or brown at extreme base. Prementum dark brown, glossy.

**Thorax.** Ground-colour of thorax dark, postpronotal lobes and proepisternal area slightly paler beneath dusting; scutellum dark. Prosternum dark brown, shining. Scutum densely grey dusted, tinged with yellowish behind, with traces of 3 dark vittae running through the dorsocentral and acrostichal rows, the acrostichal vitta broadest. Postpronotal lobes and pleura yellowish white dusted. Scutellum grey dusted. 1 strong and 1–2 weak proepimeral setulae. Disc of scutellum with 6–11 setulae.

**Legs.** Coxae and trochanters yellow. Fore femur wholly yellow. Fore tibia mainly yellow, darkened on apical 1/4. Fore tarsus brown. Mid and hind legs yellow, the tarsus dull. Fore tibia without setae except at apex. Fore tarsus along anterodorsal and dorsal surfaces with quite long fine hairs at tip of tarsomere 2 and on tarsomeres 3–4, some of which are longer than length of the segments on which they are situated.

**Wing.** Clear. Calypters creamy white. Knob of halteres creamy white.

**Abdomen.** Ground-colour yellow. Syntergite 1+2 unmarked; tergite 3 with 2 oval spots, occupying 1/4–1/3 of tergal length, and with or without a very faint partial median vitta; tergite 4 with 2 small oval spots, 1/4–1/3 of tergal length, and a partial median vitta; tergite 5 unmarked. Tergites grey to yellowish grey dusted: syntergite 1+2 dusted posteriorly and medially; tergites 3 and 4 dusted except on the dark markings; tergite 5 thinly dusted.

Terminalia. As in Figs 2–5. Hypopygial prominence yellow; consisting of 2 large, forwardly-directed tubercles and, on posterior part of stalk, with 2 small protuberances (Figs 2, 3). Trifoliate process with the stalk short, three times length of a lateral plate; stalk at base and tip, shoulders and basal half of lateral plates yellow, rest of process light brown to dark brown (Figs 4, 5).

Measurements. Length of body, 3.0 mm. Length of wing, 2.5 mm.

#### Female

Not known from Fiji. Described by Pont (1986b) and Pont & Magpayo (1995).

**Material examined.** **Fiji:** **Viti Levu:** Lautoka, Mar 1976, N.L.H. Krauss, 2♂ (BPBM); 0–50 m, Mar 1976, N.L.H. Krauss, 2♂, 7♀ (USNM); Tavua, 50–150 m, Feb 1971, N.L.H. Krauss, 1♂ (BPBM).

**Comments.** New record for Fiji.

**Distribution.** Nepal, India, Taiwan, Philippines, Flores, Papua New Guinea, Australia, Norfolk Island.

**Biological data.** It has been reared from several species of Gramineae (Davies & Reddy, 1981; Pont & Magpayo, 1995).

### 2. *Atherigona (Acritochaeta) hendersoni* Malloch

*Atherigona hendersoni* Malloch, 1923: 184. Holotype male, Henderson Island, in BMNH [seen].

*Atherigona hendersoni*; Hardy, 1981: 72–73, fig. 25; Pont, 1989: 681.

**Diagnosis.** Very similar to *Atherigona poecilopoda* Bezzi, and distinguished primarily by the faint dark cloud at the apex of the wing between the tips of veins  $R_{2+3}$  and M, visible in both sexes. Male palpus brown (yellow in *A. poecilopoda*).

#### Male

Head. All setae and setulae black. Ground-colour mainly dark beneath the pruinosity, only parafacial, gena, face and lowest occiput yellow; frontal plate wholly dark. Occiput light-grey pruinose; fronto-orbital plate yellowish white pruinose; parafacial and gena white, slightly tinged with yellowish. 5–7 pairs of moderate inclinate frontal setae. Antenna black. Arista brown. Parafacial at lunule only 1/3 width of postpedicel. Palpus brown; rather long, and with apical ventral pubescence relatively short and pale. Prementum dark brown, subshining.

Thorax. Ground-colour of scutum black, postpronotal lobe, pleura and most of scutellum yellow. Prosternum brownish yellow. Scutum grey to yellowish grey dusted, with 3 narrow but distinct dark vittae running along the acrostichal and dorsocentral lines from neck almost to scutellum, the acrostichal vitta continuing and expanding on scutellar disc. Postpronotal lobe yellowish white dusted, pleura pale golden dusted. Scutellum in posterior view with yellowish white dust. Presutural acrostichal setulae in 4 rows at suture, with a bare strip separating these rows from another row of setulae and the dorsocentral rows. 1 strong and 4–5 weak proepimeral setulae. Basal scutellar setula 1/2 as long as sub-basal lateral seta. Disc of scutellum with 22–27 setulae.

Legs. Wholly yellow, including tarsi. Fore femur with a strong preapical dorsal excavation; with 3–4 posterodorsal setae near base, and before apex with 2 posteroventrals. Fore tibia without setae except at apex. Fore tarsus not modified in shape, and with only the usual clothing-setulae. Mid femur with 1 preapical posterior setae. Hind femur without a dorsal preapical seta. Hind femur and tibia each with a distinct ventral keel.

Wing. Clear, but with a distinct but diffuse darkening at the tip between veins  $R_{2+3}$  and M. Cross-vein r-m at or slightly basad of middle of discal cell. Calypters creamy, the lower one sometimes yellow. Knob of halteres white.

Abdomen. Ground-colour mostly yellow. Tergites 3–5 each with a pair of round dark paramedian spots. In posterior view, tergites white to yellowish white dusted except on the spots. Tergite 3 produced ventrally and with sparse golden setulae along lower edge.

Measurements. Length of body, 3.5 mm. Length of wing, 3.0 mm.

### Female

Much darker, and differing from the male as follows:

Head. Ground-colour dark but frontal plate more orange below. Pruinosity on fronto-orbital plate, parafacial, face, gena and occiput whitish grey. Palpus dark brown, weakly swollen apicad.

Thorax. Mostly black in ground-colour, postpronotal lobe and scutellar margin yellow. Pleura light grey dusted.

Legs. Coxae and trochanters yellow. Fore femur black, yellow at base and at tip; fore tibia yellow, but apical third dark. Mid and hind femora and tibiae obscurely yellow, hind tibia brown in apical half. All tarsi brown to black. Fore femur unmodified, with a short row of posterodorsal setae, and 1 strong and a few short posteroventrals before apex. Hind femur and tibia without keel.

Wing. Lower calypter pale yellow.

Abdomen. Ground-colour mostly dark, with variable amounts of yellow on basal segments; tergites 3–5 each with a pair of dark subtriangular to oval spots and with a narrow brown median vitta. The dark areas on tergites 3–5, except for the dark spots and median vitta, with dense grey to yellowish grey dust.

Measurements. Length of body, 3.0–3.5 mm. Length of wing, 2.5–3.0 mm.

**Material examined** (FAS): **FIJI**: **Vanua Levu**: Bua Prov., Batiqere Range, 6 km NW Kilaka Village, 98 m, 26 Jun–21 Jul 2004, 15.807° S, 178.991° E, Malaise 5, Schlinger, Tokota'a, FBA 141829 (♂). Other material: **FIJI**: bred from decaying fruit, no date, Compère, 2♀ (USNM); **Viti Levu**: Koronivia Research Station, coconut, 1 Mar 1963, C.M. Yoshimoto, 1♂ (BPBM); Suva, 23 Sep 1920, H.W. Simmonds, 1♀ (BMNH).

**Comments.** First recorded from Fiji by Pont (1989). There is a description with illustrations of the male terminalia, wing and fore femur in Hardy (1981).

**Distribution.** Fiji, Hawaiian Is, Henderson I., Pitcairn Is, Tonga, Western Samoa.

**Biological data.** Adults were attracted to baits of rotten organic matter, and adults were reared from rotting stems and bark of various trees and shrubs in Hawai'i (Hardy, 1981: 72).

### 3. *Atherigona (Atherigona) matema* Curran, new record

(Figs 6–9)

*Atherigona matema* Curran, 1936: 56. Holotype male, Santa Cruz Group, Matema Island, in CAS [seen].  
*Atherigona matema* Curran; Pont, 1986b: 27, figs 85–92; Pont, 1989: 681; Pont, 1991: 180.

### Male

Head. All setae and setulae black. Ground-colour mainly yellow beneath the pruinosity, only the occiput and upper frons dark; frontal vitta wholly dark. Occiput grey pruinose. Ocellar tubercle and most of fronto-orbital plate light grey pruinose; lower fronto-orbital plate, parafacial, face and gena yellowish pruinose, almost pale golden. 4–5 pairs of moderate inclinate frontal setae. Scape and pedicel reddish, darkened on disc, postpedicel black. Arista, dark brown. Parafacial at lunule a little over 1/2 width of postpedicel. Palpus entirely yellow. Prementum dark brown.

Thorax. Ground-colour of scutum mainly dark, postpronotal lobe, notopleuron, supraalar area and postalar lobe yellow; pleura wholly yellow, scutellum dark. Prosternum dark brown. Scutum yellowish grey dusted, grey at neck, with traces of 3 narrow dark vittae running from neck almost to scutellum through the acrostichal and dorsocentral rows, the acrostichal vitta broader than the dorsocentral ones. Postpronotal lobe and notopleuron yellowish white, the

pleura golden pollinose. Scutellum yellowish grey dusted on the darkened part. Ground-setulae all black. 1 strong and 1 weak proepimeral setulae. Disc of scutellum with 9–10 setulae.

Legs. Coxae and trochanters yellow. Fore femur yellow, apical third dark. Fore tibia yellow on basal half, otherwise dark. Fore tarsus dark, the apical 2 tarsomeres dull yellow. Mid and hind femora, tibiae and tarsi yellow. Fore tibia without setae except at apex. Fore tarsus not modified in shape, and with only the usual clothing-setulae.

Wing. Clear. Calypters creamy. Haltere creamy white.

Abdomen. Ground-colour yellow. Tergites 1+2 and 5 without dark markings; tergites 3 and 4 each with a pair of elongate-quadrate dark brown spots, occupying 1/3 of tergal length. Tergites in extreme posterior view with a little yellowish white dust: on the hind margin of syntergite 1+2, between the dark spots on tergites 3 and 4, and on most of tergite 5.

Terminalia. Hypopygial prominence yellow, small, knob-like, not expanded laterally, more or less rounded dorsally (Figs 6,7). Trifoliolate process with the stalk moderate, 4 times as long as the lateral plate; stalk and base of shoulder brown, rest of shoulder and process black (Figs 8–9).

Measurements. Length of body, 2.5 mm. Length of wing, 2.0 mm.

#### Female

Differs from the male as follows.

Head. Palpus brown in basal half (3 females) or wholly brown (1 female).

Thorax. Dark vittae on scutum very distinct. Scutellum with 6–8 discal setulae, 2 of which are twice as long as the others.

Legs. Fore femur black, yellow at base. Fore tibia black, yellow at base or on basal 1/6. Fore tarsi black. Hind tibia brownish.

Abdomen. Syntergite 1+2 without spots; tergites 3–5 each with a pair of large quadrate dark spots occupying well over half of tergal length, and with a narrow less distinct median vitta. Dusting yellowish white to yellowish grey, on hind-margin of syntergite 1+2 and on tergites 3–5 except for the dark spots.

Measurements. Length of body, 2.5–3.0 mm. Length of wing, 2.5–3.0 mm.

**Material examined.** **FIJI:** Taveuni: Waiyevo, 0–100 m, Jan 1972, N.L.H. Krauss, 1♂, 4♀ (BPBM).

**Comments.** New record for Fiji. This male is darker than Melanesian *A. matema* that we have seen, but appears to be this species which has a characteristic hypopygial prominence. In Melanesian males of *A. matema*, the frontal vitta is red to orange below, the basal part of postpedicel is reddish, and fore femur is wholly yellow.

**Distribution.** Solomon Islands, Australia, Fiji.

**Biological data:** Nothing is known.

#### 4. *Atherigona (Acritochaeta) orientalis* Schiner

*Atherigona orientalis* Schiner, 1868: 295. Holotype female, Nicobar Is: Tellingenschong, in NMW [Pont, 1986b: 18].

*Coenosia excisa* Thomson, 1869: 560. Lectotype male, Cocos-Keeling Is, in NRS [designation by Pont, 1986b: 18].

*Atherigona trilineata* Stein, 1900: 157. Syntypes females, Papua New Guinea: Friedrich-Wilhelm-Hafen [= Madang], not found in ZMHU and presumed lost [Pont, 1969a: 89].

*Acritochaeta pulvinata* Grimshaw, 1901: 42. Lectotype male, Hawai'i I: Ola'ua, in BMNH [designation by Pont, 1986b: 18].

*Atherigona pulvinata*; Aldrich, 1921: 94.

*Atherigona excisa*; Bezzi, 1928: 171; Greenwood, 1929: 352; Lever, 1944c: 77; Lever, 1965: 154.

*Atherigona excisa* var. *trilineata*; Bezzi, 1928: 171; Emden, 1942: 95.

*Atherigona orientalis*; Hennig, 1961: 500; Hinckley, 1963: 31; Pont, 1973a: 59–62; Pont, 1986b: 18; Pont, 1989: 681; Pont in Cahill, 1992: 53–54; Pont & Magpayo, 1995: 21–23, figs 11–12, 526–531.

*Atherigona excisa* ssp. *trilineata*; Lever, 1965: 154.

**Diagnosis.** Presutural acrostichal setulae in 4–5 rows, and male without hypopygial prominence or trifoliate process. Differing from the other two species of sg. *Acritochaeta* by the presence of a dorsal preapical seta on hind femur, frontal vitta yellow or reddish, at least above lunule, scutum with the dark vittae indistinct, pleura black in ground-colour, male without a ventral keel on hind femur and tibia.

**Material examined (FAS):** **FIJI: Kadavu:** Solodamu, 25 Aug–23 Oct 2003, FJ-41D Malaise in coastal limestone forest, M. Irwin, E. Schlinger, M. Tokota'a, 178°07' E, 19°04' S, 128 m, FBA 000654 (♀), FBA 000662 (♀); 0.25 km SW, Moanakaka Bird Sanctuary, 50 m, 23 Oct–19 Dec 2003, Malaise 2, Schlinger, Tokota'a, 19.078° S, 178.123° E, FBA 130403 (♀), FBA 116750 (♀); 0.25 km SW Solodamu Village, 50 m, 7 Mar–11 Apr 2004, Malaise 3, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 111.722 (♂), FBA 169345 (♀); 2 May–28 Jul 2004, FBA 172475 (♀), FBA 172500 (♂); Kadavu prov., 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary [19.078, 178.121], 50 m, 9–15 Feb 2004, Malaise, Schlinger, Tokota'a, FJKV41a\_M04\_04, FBA 090132 (♀), FBA 090133 (♂), FBA 090134 (♀), FBA 111730 (♀); 23 Oct–19 Dec 2003, Malaise 4, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 116659 (♀), FBA 116656 (♀), FBA 116739 (♀); 7 Mar–11 Apr 2004, Malaise 3, Schlinger, Tokota'a, FBA 111728 (♀), FBA 111715 (♂), FBA 111707 (♂), FBA 111703 (♀); Malaise 4, Schlinger, Tokota'a, FBA 159368 (♀), FBA 159367 (♀), FBA 159369 (♀), FBA (♀); 19°04'39" S, 178°07'15.6" E, 50 m, 19 Dec 2003–18 Jan 2004, Malaise, Schlinger, Tokota'a, FJKV41a\_M04\_15, FBA 087201 (♀), FBA 087202 (♀), FBA 087204 (♀), FBA 087205 (♀), FBA (♀); Solodamu, 25 Aug–23 Oct 2003, FJ-41D Malaise in coastal limestone forest, M. Irwin, E. Schlinger, M. Tokota'a, 178°07' E, 19°04' S, 128 m, FBA 000688 (♂), FBA 000703 (♀). **Taveuni:** Cakaudrove Prov., 3.2 km NW Lavena Village, Mt. Koronibuabua, 219 m, 4 Jan–11 Mar 2004, Malaise 4, Schlinger, Tokota'a, 15.855° S, 179.889° W, FBA 124105 (♀), FBA 123152 (♀), FBA 124102 (♀), FBA 124104 (♀), FBA 124098 (♀), FBA 124107 (♂), FBA 093882 (♀); 217 m, 25 Mar–9 Apr 2004, Malaise 3, FBA 145260 (♀); 234 m, 24 Oct 2003–4 Jan 2004, Malaise 2, 15.855° S, 179.891° W, FBA 169953 (♀), FBA 169955 (♀); 11–26 Mar 2004, FBA 093883 (♂), FBA 093880 (♂), FBA 093881 (♂); 5.6 km SE Tavuki Village, Devo Peak [15.843, 179.955], 1187 m, Malaise trap, 3–10 Jan 2003, E.I. Schlinger, M. Tokota'a, FJTA8a\_M01\_012, FBA 090043 (♀); 14–21 Nov 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.841° S, 179.955° W, FBA 129595 (♀); 20–27 Dec 2002, Malaise 1, FBA 144823 (♀); 235 m, 24 Oct–4 Nov 2003 [15.855, 179.892], Schlinger, Tokota'a, Malaise, FJTA52d M01\_03, FBA 090137 (♀); Soqulu House in Soqulu estate, 140 m, 21 Nov–13 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.833° S, 180° W, FBA 125280 (♀). **Vanua Levu:** Bua Prov., Batiqere Range, 5 km NW Kilaka Village, 51 m, 3–10 Jun 2004, Malaise 3, Schlinger, Tokota'a, 15.811° S, 178.988° E, FBA 114980 (♀); Macuata Prov., Dogotuki, 2.5 km E of Nasavu River [15.256, 179.783], 105 to 226 m, Malaise trap, 7 Jul 2003, Schlinger, Tokota'a, FJVN91\_M01\_01, FBA 090231 (♂); 0.4 km S Rokosalase Village [15.532, 179.019], 118 m, 23 Apr–8 May 2004, Malaise, Schlinger, Tokota'a, FJVN57c\_M02\_03, FBA 090138 (♀); 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 141842 (♀); **Viti Levu:** Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, 17–29 Apr 2004 [18.1594, 177.4847], E.I. Schlinger, M. Tokota'a, Malaise, FJVL6b\_M02\_20, FBA 089947 (♀); [18.1594, 177.4947], 23 Sep–8 Oct 2002, E.I. Schlinger, Tokota'a, FJVL6b\_M03\_01, FBA 089716 (♂); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 26 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118801 (♀), FBA 118787 (♀), FBA 118770 (♂), FBA 118797 (♀); 13–27 Feb 2003, FBA 140470 (♀), FBA 140471 (♀); Naitasiri Prov., 1.8 km E Navai Village, 700 m, old trail to Mt. Tomaniivi, 7–26 Jan 2004, Malaise 4, Schlinger, Tokota'a, 17.621° S, 177.998° E, FBA 120005 (♀); 3.8 km N Veisari Settlement, logging road to Waivudawa, 12 Dec 2002–3 Jan 2003, 30 m, Malaise 2, Schlinger, Tokota'a, 18.079° S, 178.363° E, FBA 103570 (♀); 4 km WSW Colo-i-Suva Village, Mt. Nakobalevu, 372 m, 17 Mar–9 Apr 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 143383 (♂); Vuda Prov., Koroyanitu Nat. Park, 1 km E Abaca Village, 800 m, 22 Mar–6 May 2003, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 100318 (♂), FBA 174726 (♂), FBA 174725 (♀), FBA 174727 (♂), FBA 174743 (♀), FBA 174776 (♀), FBA 174776 (♀), FBA 174770 (♀), FBA (♀), FBA (♀), FBA (♀), FBA (♂); 7–12 Oct 2002, FJVL01\_M01\_02, FBA 081911 (♀), FBA 081912 (♀), FBA 081913 (♀); Savuione Trail, 17°40' S, 177°35' E, 12–19 Nov 2002, Malaise, Schlinger, Tokota'a, FJVL01\_M01\_07, FBA 083984 (♀); 19–26 Oct 2002, FJVL01\_M01\_04, FBA 088533 (♀); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 25 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118798 (♀), FBA 118750 (♀), FBA 118773 (♀); 1034 m, 17–20 Nov 2003, Malaise trap, PABITRA Wabu Baseline Survey, D. Veikori, E.E. Claridge [17.583, 178.083], FJVL12\_M01\_01, FBA 090250; Savuione Trail, FJ-1, Malaise in montane forest, 21 Sep–7 Oct 2002, M. Irwin, E. Schlinger, M. Tokota'a, 17.40° S, 177.33° E, 450 m, FBA 002594 (♀), FBA 002592 (♀), FBA 002589 (♀); Naitasiri Prov., 3.8 km N Veisari Settlement, logging road to Waivudawa, 12 Dec



2002–3 Jan 2003, 300 m, Malaise 2, Schlinger, Tokota'a, 18.079° S, 178.363° E, FBA 103559 (♂); 4 km Colo-i-Suva Village, Mt. Nakobalevu, 372 m, 17 Mar–9 Apr 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 143380 (♀); 1.5 km SW Vaturu Dam, 550 m, 2–14 Aug 2004, Malaise 1, E. Schlinger, M. Tokota'a, 17.754° S, 177.665° E, FBA 175456 (♂), FBA 175461 (♂), FBA 175462 (♂). Other material examined. **Fiji: Kadavu:** in house, 30 May 1929, R.A. Gibbons, 1♀ (ANIC); Kaivala, 29 Apr 1941, N.L.H. Krauss, 1♂ (BPBM); Wai Salima, 30 Apr 1941, N.L.H. Krauss, 1♂ (BPBM). **Lau:** Vanua Masi, 5 Sep 1924, E.H. Bryan, 1♂ (BPBM). **Moala:** 10 Jul 1924, E.H. Bryan, 1♂ (BPBM). **Ovalau:** Mdrimba, 0–200 m, 30 Mar 1969, N.L.H. Krauss, 1♂ (BPBM); Levuka, 0–100 m, Nov 1975, N.L.H. Krauss, 1♂, 2♀ (BPBM). **Viti Levu:** Lautoka, rotting cotton bolls, 3 Jul 1924, H.W. Simmonds, 1♀ (BMNH) (Bezzi 1928); Natova, 1 Jul 1917, R. Veitch, 1♀ (BMNH); Nausori, Oct 1920, R. Veitch, 1♂ (BMNH) (Bezzi 1928, as var. *trilineata*); Rewa, 20 Oct 1939, R.A. Lever, 1♂ and 1♀ with puparia (BMNH); Suva, 23 Sep 1920, H.W. Simmonds, 1♀ (BMNH) (Bezzi 1928, as var. *trilineata*); Suva, bred from rotting banana containing larvae of *Nacoleia octasema*, 13 Dec 1924, H.W. Simmonds, 2♀ (BMNH) (Bezzi 1928, as var. *trilineata*); Suva, May 1951, N.L.H. Krauss, 4♂, 3♀ (BPBM); Nandi, 6–7 Dec 1958 (C.R. Joyce), 1♀ (BPBM); Nandi, Mar 1956, N.L.H. Krauss, 1♂, 1♀ (BPBM); Nandi, 0–20 m, 1 Feb 1978, N.L.H. Krauss, 2♂ (BPBM); Nandi, 0–50 m, Mar 1980, N.L.H. Krauss, 1♂ (BPBM); Nandi, 50–150 m, Sep 1970, N.L.H. Krauss, 1♀ (BPBM); Nandi, 0–100 m, 5 Mar 1974, N.L.H. Krauss, 1♂ (USNM); Nandi, 0–50 m, 11 Nov 1980, N.L.H. Krauss, 1♂ (BPBM); Nandi, 0–100 m, 5 Jun 1973, N.L.H. Krauss, 1♀ (USNM); Nandi, 0–50 m, Mar 1981, N.L.H. Krauss, 1♀ (BPBM); Nadi, 12 Jun 1913, J.F. Illingworth, 1♀ (USNM); Koronivia Research Station, 1 Mar 1963, C.M. Yoshimoto, 1♂, 1♀ (BPBM); Raki Raki, 0–100 m, Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Vunidawa, 1920, C.E. Pemberton, 1♀ (BPBM). Nacaoncarn [?], 20 Oct 1939, R.A. Lever, 1♂ with puparium (BMNH).

**Comments.** First recorded from Fiji by Aldrich (1921). Fijian material was also listed by Pont (in Cahill, 1991: 53–54).

**Distribution.** Widespread through the Pacific, including American Samoa, Belau, Bonin Is, Easter I., French Polynesia, Guam, Hawaiian Is, Johnston Atoll, Kiribati, Marcus I, Marshall Is, Micronesia, Nicobar Is, Niue, Northern Marianas, Palmyra Atoll, Tonga, Vanuatu, Volcano Is, Wake Is., Western Samoa; pantropical, Old World and New World.

**Biological data.** Reared in Fiji from diseased or rotting cotton bolls (Bezzi 1928; Greenwood 1929), oranges (Bezzi 1928), rotting banana containing larvae of *Nacoleia octasema* (Bezzi 1928), and bat guano in caves (Lever 1944c, 1965). A list of hosts in Fiji is given by Hinckley (1963): *Brassica oleracea*, *Citrus* sp., *Gossypium* sp., *Musa* sp., and *Zea mays*. The biology is discussed in detail for Guam by Bohart & Gressitt (1951: 111), and a recent summary is given by Pont (1973a). The species is a minor public health hazard.

### 5. *Atherigona (Atherigona) oryzae* Malloch, new record

(Figs 10–13)

*Atherigona oryzae* Malloch, 1925b: 117. Holotype male, India: Tamil Nadu, Coimbatore, in USNM [seen]. *Atherigona oryzae*; Snyder, 1965: 252; Pont, 1973a: 47–51, fig. 13; Pont, 1986b: 442, figs 201–214; Pont, 1989: 682; Pont & Magpayo, 1995: 60–64, figs 211–243, 658–663.

#### Male

Head. Setae and setulae black. Ground-colour black beneath the pruinosity, except on parafacial, face and gena; frontal vitta dark brown, occiput and ocellar tubercle grey pruinose; fronto-orbital plate, parafacial, face and gena light grey pruinose. 4 pairs of moderate inclinate frontal setae. Scape and pedicel reddish, partly darkened on disc; postpedicel dark brown. Arista brown, paler near base. Palpus yellow, sometimes dull or brown at base. Prementum dark brown, glossy.

Thorax. Ground-colour of scutum dark; postpronotal lobes yellow; pleura yellow anteriorly, darker posteriorly; scutellum dark. Prosternum brown, shining. Scutum densely grey to yellowish grey dusted, with very faint traces of 3 dark vittae through the acrostichal and dorsocentral rows. Postpronotal lobes and pleura yellowish white dusted. Scutellum grey to

yellowish grey dusted. 1 strong and 1 weak proepimeral setulae. Disc of scutellum with 6–14 setulae.

Legs. Coxae and trochanters yellow. Fore femur yellow, darkened on apical 1/3. Fore tibia yellow, darkened on apical 3/5. Fore tarsus dark, the apical 1–2 or 3 tarsomeres pale. Mid and hind legs yellow. Fore tibia without setae except at apex. Fore tarsus not modified in shape, and with only the usual clothing-setulae.

Wing. Clear except for a conspicuous dark smudge at the tip of subcosta. Calypters yellowish, the lower one usually quite deep, even rather smoky. Knob of halteres creamy white.

Abdomen. Ground-colour yellow. Tergites 1+2 and 5 unmarked; tergite 3 with a pair of elongate-triangular or -quadrate spots, occupying 1/2 to 1/3 of tergal length, and with or without a partial median vitta; tergite 4 with a pair of oval spots, 1/3 of tergal length. Tergites yellowish grey dusted: syntergite 1+2 dusted medially, laterally and on hind margin; tergites 3 and 4 wholly dusted except on the dark markings; tergite 5 thinly dusted.

Terminalia. As in Figs 10–13. Hypopygial prominence large and bifurcate (Figs 10–11), trifoliate process with the stalk long, just over 4 times as long as the lateral plate, and strikingly expanded around middle (Fig. 12); stalk and shoulder brown; lateral plates dark brown; median piece pale, membranous (Figs 12–13).

Measurements. Length of body, 3.0–3.5 mm. Length of wing, 2.5–3.0 mm.

### Female

Differs from the male as follows.

Head. Antenna usually darker, only tip of pedicel reddish. Palpus yellow, dark on up to basal 1/2, but sometimes wholly brown; with dark setulae.

Legs. Coxae and trochanters yellow; mid and hind femora and tibiae yellow, their tarsi dull yellow to brown. Fore femur mainly dark, yellow at tip and on basal 1/3–1/4. Fore tibia mainly dark, yellow on basal 1/4–1/2. Fore tarsus dark brown.

Wing. Clear. Calypters creamy white, lower one sometimes deeper yellow as in male.

Abdomen. Ground-colour yellow. Dark markings rather variable: tergites 1+2 to 5 with a weak or strong partial median vitta; tergite 3 with 2 spots, small, weak, 1/5 of tergal length, or strong, triangular, 1/2–1/3 of tergal length; tergite 4 with 2 triangular spots, 1/3–2/3 of tergal length, and fore margin sometimes darkened; tergite 5 with 2 small spots, and fore margin sometimes darkened. Tergites yellowish to golden-white dusted on the hind-margin and sides of syntergite 1+2, and on all of tergites 3–5 except for the dark spots.

Ovipositor. Sternite 6 as wide as long, or very slightly longer than wide, or even up to 1½ times as wide as long.

Measurements. Length of body, 3.0–3.5 mm. Length of wing, 2.5–3.0 mm.

**Material examined** (FAS): **Fiji**: **Viti Levu**: Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m Malaise trap [18.1594, 177.4847], 5–17 Apr 2004, Schlinger, Tokota'a, FJVL6b\_M02\_19, FBA 089815 (♂), FBA 089802 (♂), FBA 089798 (♂), FBA 089786 (♂), FBA 089803 (♂), FBA 089809 (♂), FBA 089813 (♂), FBA 089785 (♀), FBA 089797 (♀), FBA 089794 (♀), FBA 089795 (♀), FBA 089811 (♀). Other material examined: **Fiji**: **Moala**: 13 Jul 1924, E.H. Bryan, 1♂ (BPBM). **Viti Levu**: Lautoka, Mar 1976, N.L.H. Krauss, 1♂ (BPBM); Nandi, 0–100 m, 5 Jun 1973, N.L.H. Krauss, 1♂ (USNM).

**Distribution.** Widespread throughout the Oriental and Australasian/Oceanian regions. In the Pacific known from Belau, Lord Howe I., New Caledonia, Tonga, Vanuatu, Volcano Is., Western Samoa and Fiji (new record).

**Biological data.** The species is an important pest of rice, and its biology was discussed in detail by Pont (1973a). A full list of the wild and cultivated Gramineae hosts is given in Pont & Magpayo (1995: 62).



**6. *Atherigona (Acritochaeta) poecilopoda* Bezzi**  
(Figs 14–15)

*Atherigona poecilopoda* Bezzi, 1928: 172. Lectotype male, Fiji: Suva, in BMNH [designation by Pont, 1970b: 422].

*Atherigona poecilopoda*; Greenwood, 1929: 352; Lever, 1938a: 23; Greenwood, 1940: 218; Emden, 1942: 95; Hinckley, 1963: 31; Pont, 1989: 682.

**Diagnosis.** Very similar to *Atherigona hendersoni* Malloch, and distinguished primarily by the clear wing in both sexes. Male palpus yellow (brown in *A. hendersoni*).

**Male**

**Head.** All setae and setulae black. Ground-colour mainly dark beneath the pruinosity, only parafacial, gena, face and lowest occiput yellow; frontal plate wholly dark. Occiput light-grey pruinose; fronto-orbital plate yellowish white pruinose, slightly brownish along inner margin; parafacial and gena white, slightly tinged with yellowish. 5–7 pairs of moderate inclinate frontal setae. Antenna black, tip of pedicel orange. Arista dark, yellow on basal half. Parafacial at lunule only 1/3 width of postpedicel. Palpus yellow to orange; rather long, and with apical ventral pubescence relatively short and golden. Prementum dark brown, subshining.

**Thorax.** Ground-colour of scutum black, postpronotal lobe, pleura and most of scutellum yellow. Prosternum brownish yellow. Scutum yellowish grey dusted, with 3 narrow but distinct dark vittae running along the acrostichal and dorsocentral lines from neck almost to scutellum, the acrostichal vitta continuing and expanding on scutellar disc. Postpronotal lobe yellowish white dusted, pleura pale golden dusted. Scutellum in posterior view with yellowish white dust. Presutural acrostichal setulae in 6 rows at suture, occupying all the space between the dorsocentral rows. 1 strong and 4–5 weak proepimeral setulae. Basal scutellar setula 1/2 as long as sub-basal lateral seta. Disc of scutellum with 22–27 setulae.

**Legs.** Wholly yellow, tarsi yellow to brown. Fore femur with a strong preapical dorsal excavation; with 1–2 posterodorsal setae near base, and before apex with 2 posteroventrals. Fore tibia without setae except at apex. Fore tarsus not modified in shape, and with only the usual clothing-setulae. Mid femur with 1 preapical posterior seta. Hind femur without a dorsal preapical seta. Hind femur and tibia each with a distinct ventral keel.

**Wing.** Clear. Cross-vein *r-m* slightly beyond middle of discal cell. Calypters creamy, the lower one sometimes yellow. Knob of halteres white.

**Abdomen.** Ground-colour yellow on syntergite 1+2 and part of tergite 3, the rest of the tergites black. Tergites 3–5 each with a pair of round dark paramedian spots. In posterior view, tergites white to yellowish white dusted on the dark areas. Tergite 3 produced ventrally (Fig. 14) and with dense golden setulae along lower edge.

**Terminalia.** Figs 16–17.

**Measurements.** Length of body, 3.5 mm. Length of wing, 3.0 mm.

**Female**

Much darker, and differing from the male as follows:

**Head.** Ground-colour dark but frontal plate more orange below. Pruinosity on fronto-orbital plate, parafacial, face, gena and occiput whitish grey, inner margin of fronto-orbital plate brown. Palpus dark brown, filiform.

**Thorax.** As in male.

**Legs.** Coxae and trochanters yellow. Fore femur black, yellow at base and at tip; fore tibia yellow, but apical third dark. Mid and hind femora and tibiae yellow. All tarsi brown to black. Fore femur unmodified, with a short row of posterodorsal setae, and 1 strong and a few short posteroventrals before apex. Hind femur and tibia without keel.

**Wing.** Lower calypter pale yellow.

Abdomen. Ground-colour mostly dark, with variable amounts of yellow on basal segments; tergites 3–5 each with a pair of dark subtriangular to oval spots and with a narrow brown median vitta. The dark areas on tergites 3–5, except for the dark spots and median vitta, with dense grey to yellowish grey dust.

Measurements. Length of body, 3.5 mm. Length of wing, 3.0 mm.

**Material examined** (FAS). **FIJI: Kadavu:** 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary, 50 m, 23 Oct–19 Dec 2003, Malaise 4, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 115665 (♀), FBA 111702 (♀), FBA 1165746 (♀), FBA 115747 (♀), FBA 115654 (♀), FBA 115554 (♀), FBA 116722 (♀), FBA 115653 (♀), FBA 115657 (♀), FBA 115563 (♀), FBA 111745 (♀), FBA 130404 (♀), FBA 130405 (♀), FBA 130406 (♀), FBA 115551 (♀), FBA 116719 (♀), FBA 116720 (♀), FBA 116737 (♀), FBA 115658 (♂); Solodamu, 25 Aug–23 Oct 2003, FJ–41D, Malaise in coastal limestone forest, M. Irwin, E. Schlinger, M. Tokota'a, 178°07' E, 19°04' S, 128 m, FBA 000697 (♀), FBA 000669 (♀), FBA 000666 (♀), FBA 000660 (♀), FBA 000661 (♀), FBA 000674 (♀), FBA 000673 (♀), FBA 000677 (♀), FBA 000693 (♀), FBA 000659 (♀), FBA 000668 (♂), FBA 000653 (♂). **Taveuni:** Cakaudrove Prov., 3.2 km NW Lavena Village, Mt. Koronibuabua [15.955, 179.891], 235 m, Malaise, 24 Oct–4 Nov 2003, E.I. Schlinger, M. Tokota'a, FJTA52d\_M01\_03, FBA 090136 (♀); [15.855, 179.891], 234 m, FBA 093861 (♀); 5.3 km SE Tavuki Village, Mt. Devo [15.841, 179.958], 1054 m, Malaise trap, 10–17 Oct 2002, E.I. Schlinger, M. Tokota'a, FJTA9c\_M03\_03, FBA 090999 (♀), FBA 090082 (♀); 5.6 km SE Tavuki Village, Devo Peak [15.843, 179.955], 1187 m, Malaise 1, 14–21 Nov 2002, E.I. Schlinger, M. Tokota'a, FBA 110329 (♀), FBA 110331 (♀); Soqulu House in Soqulu Estate, 140 m, 13–20 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.833° S, 180° W, FBA 120350 (♀). **Vanua Levu:** Bua Prov., Batiqere Range, 6 km NW Kilaka Village, 98 m [15.807, 178.991], Malaise, 15–24 Jun 2004, Schlinger, Tokota'a, FJVN58b\_M05\_07, FBA 090216 (♀). **Viti Levu:** Namosi Prov., 2 km de Nabukavesi Village, Ocean Pacific Resort, 40 m, 26 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118794 (♀), FBA (♀), FBA (♀), FBA 116658 (♀); Sigatoka Sand Dunes Nat. Park, 0.8 km SSW Volivoli Village, 25 m, Malaise trap, 3–13 Dec 2003, E.I. Schlinger, Tokota'a, FJVL6a\_M04\_27, FBA 089932 (♀); 1.1 km SSW Volivoli Village, 55 m Malaise trap [18.1594, 177.4847], 5–17 Apr 2004, E.I. Schlinger, Tokota'a, FJVL6b\_M02\_19, FBA 089800 (♀), FBA 089808 (♀). Other material examined: **FIJI: Cuvu:** from fruit of [illegible], 23 Apr 1930, H. Phillips, 2♀ (BPBM). **Kadavu:** Kaivala, 29 Apr 1941 (—), 1♀ (BPBM). **Lau:** Vanua Masi, various dates 8 Jul–25 Sep 1924, E.H. Bryan, 11♀ (BPBM). **Moala:** 10 Jul 1924, E.H. Bryan, 1♀ (BPBM). **Ovalau:** Levuka, 0–200 m, Dec 1978, N.L.H. Krauss, 1♀ (BPBM). **Totuya:** Tovo, 19 Feb 1971, N.L.H. Krauss, 1♀ (BPBM). **Vanua Levu:** Savusavu, 0–100 m, Mar 1978, N.L.H. Krauss, 1♀ (BPBM). **Viti Levu:** Suva, “from rotting ivi [*Inocarpus fagifera*]”, 28 Dec 1922, H.W. Simmonds, W. Greenwood, lectotype ♂ and paralectotypes 3♀ (BMNH), paralectotype 1♀ (MCSNM), and 1♀ (BPBM); Suva, bred from rotten banana containing larvae of *H. octosoma*, 13 Dec 1924, H.W. Simmonds, 1♂, 1♀ (BMNH); Suva, 25 Mar 1934, H.W. Simmonds, 2♂, 1♀ (BMNH); Suva, bread fruit, 20 Jan 1943, R.A. Lever, 1♂ (BMNH); Mokani, ex *Barringtonia edulis*, 9 Apr 1963, R. Filipe, 4♂, 3♀ (BMNH); Koronivia, from rotten pod of *Erythrina lithosperma*, 10 Jul 1962 (—), 1♂ (BMNH); Koronivia Research Station, coconut, 1 Mar 1963, C.M. Yoshimoto, 10♂, 13♀ (BPBM), and 1♂, 2♀ (OUMNH); 25 km N Vatukarasa, 700 m, 9 Mar 1978, S. Shinonaga, 1♀ (BMNH); Savura Creek, ex cut stem of *Freycinetia* sp., 8–9 Nov 1982, R.A. Beaver, 1♂, 2♀ (OUMNH); same locality, ex fallen fruit of *Barringtonia edulis*, 17–19 Mar 1981, R.A. Beaver, 2♂, 3♀ (OUMNH); Korotongo, 0–100 m, Mar 1981, N.L.H. Krauss, 2♀ (BPBM); Nandi, 0–50 m, Apr 1981, N.L.H. Krauss, 1♀ (BPBM); Londoni, 50–150 m, 12 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Reki Reki, 18 km W of Suva, 28 Jul 1967, J. & M. Sedlacek, 1♀ (BPBM); Nadi, 10 Jun 1913, J.F. Illingworth, 1♀ (BPBM); Nadi, bred from shaddock [*Citrus maxima*], 29 Jun 1911, J.F. Illingworth, 1♀ (USNM); Nadi, 27 Jun 1913, J.F. Illingworth, 2♀ (USNM); Nausori, 12 Jul 1913, J.F. Illingworth, 1♀ (USNM). **Wakaya:** 19 Oct 1924, E.H. Bryan, 1♀ (BPBM).

**Comments:** Some males have the hind tibia strikingly bicoloured, yellowish white in basal half and black in the apical half, but this appears to be an artefact as most have the hind tibia clear yellow.

In the series of males from Koronivia, there are indications of faint darkening at the wing tip, and there is one male in which the darkening is very much more marked and which we have identified as *A. hendersoni*. It seems possible to us that *A. poecilopoda* and *A. hendersoni* are synonymous, as there appears to be no consistent difference between the males, but for the present we are maintaining them as distinct.

**Distribution.** Fiji. Other Pacific records given by Pont (1989) are based either on mis-identifications or on specimens misplaced in the BMNH collection.

**Biological data.** It has been reared on several occasions from the Tahitian chestnut, *Inocarpus edulis* (Greenwood, 1929, 1940; Lever, 1938a). A list of host plants is given by Hinckley (1963): *Artocarpus altilis*, *Datura* sp., *Erythrina lithosperma*, *Gossypium* sp., *Inocarpus fagifer*. We can add *Citrus maxima* to this list.

### 7. *Atherigona (Atherigona) splendens* Bezzi

(Figs 19–23)

*Atherigona splendens* Bezzi, 1928: 173. Lectotype male, Fiji: Suva, in BMNH [designation by Pont, 1970b: 423].

*Atherigona laeta*; Malloch, 1929b: 158; Pont, 1989: 681 [misidentification].

*Atherigona splendens*; Emden, 1942: 95; Pont, 1989: 682.

**Diagnosis.** Easily distinguished from the other Fijian species by the shining black occiput and fronto-orbital plate.

#### Male

**Head.** All setae and setulae black. Ground-colour black, only parafacial and gena yellow beneath the pruinosity; frontal vitta dark brown. Occiput on a broad band running alongside eye from vertex to lower eye margin, ocellar tubercle and fronto-orbital plate wholly shining black; parafacial and gena silvery white pruinose. 3–4 pairs of moderate inclinate frontal setae. Scape, pedicel and base of postpedicel orange to brown, rest of postpedicel dark brown. Arista yellow in basal half. Parafacial at lunule over half width of postpedicel. Palpus yellow, of unusual shape and length for a species of this subgenus (Fig. 1c). Prementum dark brown, shining.

**Thorax.** Ground-colour of scutum and scutellum black; postpronotal lobe, notopleuron and pleura yellow. Scutum thinly brown dusted, more grey laterally; dusting on postpronotal lobe and pleura yellowish white, almost pale golden; scutellum thinly brown dusted. Prosternum yellow, shining. Ground-setulae all black. 1 strong and 1–2 weak proepimeral setulae. Disc of scutellum with 6–7 setulae, lateral margins bare.

**Legs.** Coxae and trochanters yellow. Fore femur yellow. Fore tibia brown, yellow on basal third to half. Fore tarsus dark. Mid and hind legs yellow. Fore tibia without setae except at apex. Fore tarsus with setulae on the anterodorsal surface at the tip of tarsomere 3 and along tarsomeres 4 and 5, these much longer than depth of tarsomeres.

**Wing.** Clear. Upper calypter creamy; lower calypter mostly yellow to dull yellow. Knob of halteres yellowish white.

**Abdomen.** Ground-colour orange-yellow, with few dark markings though often darkened through post-mortem decay of the internal organs: syntergite 1+2 with a dark median vitta; tergite 3 with a median mark and with a pair of very small weak spots in posterior half; tergite 4 with a broad quadrate median mark occupying whole of tergal length; tergite 5 unmarked. Tergites subshining, with a little light grey dust.

**Terminalia.** As in Figs 19–21. Hypopygial prominence small, with two low diverging arms (Fig. 19). Trifoliate process (Fig. 21) with the stalk 3 times as long as a lateral plate; stalk and trifoliate process brown to dark brown; trifoliate process dorso-ventrally flattened, in lateral view blade-like (and therefore impossible and uninformative to draw).

Measurements. Body-length, 3.0–3.5 mm. Wing-length, 2.5–3.0 mm.

#### Female

Differs from the male as follows:

**Head.** Antenna black, at most articulation between pedicel and postpedicel orange. Palpus brown, slender, curved.

Legs. Coxae and trochanters yellow. Fore femur yellow, dark on apical third to quarter. Fore tibia black, narrowly yellow at base. Fore tarsus black, hind tarsus brown to dull yellow. Fore tarsus simple in structure and bristling.

Abdomen. Ground-colour orange-yellow, with a broad black median vitta running from the fore-margin of syntergite 1+2 to the hind-margin of tergite 5. Tergites subshining, with little visible dust.

Ovipositor. As in Figs 22–23. Sternite 6 twice as long as broad. Tergite 8 broadly divided longitudinally.

Measurements. Body-length, 3.0 mm. Wing-length, 2.5 mm.

**Material examined (FAS):** **Fiji: Kadavu:** 0.25 km SW, Solodamu Village, Moanakaka Bird Sanctuary, 60 m, 7 Mar–11 Apr 2004, Malaise 3, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 111704 (♂), FBA 111733 (♀), FBA 111711 (♀), FBA 111701 (♀), FBA 111723 (♀), FBA 111724 (♀), FBA 111725 (♀), FBA 111745 (♀), FBA 111721 (♀), FBA (♂), FBA (♀), FBA (♂), FBA 111744 (♂), FBA 111700 (♂); 18 Jan–1 Feb 2004, Malaise 4, FBA 132635 (♀), FBA 132663 (♀), FBA 132662 (♀), FBA 132636 (♂), FBA 132634 (♂), FBA 132641 (♀), FBA 132640 (♀), FBA 132651 (♀), FBA 132633 (♀), FBA 132632 (♂), FBA 132638 (♂), FBA 132639 (♀), FBA 132637 (♂), FBA 132644 (♀), FBA 132645 (♀), FBA 132643 (♀), FBA 132642 (♂), FBA 132647 (♂), FBA 132655 (♂), FBA 132654 (♂), FBA 132648 (♀), FBA 132649 (♀), FBA 132656 (♀), FBA 132650 (♀), FBA 132658 (♀), FBA 132652 (♀), FBA 132645 (♀), FBA 132653 (♀), FBA 132650 (♀), FBA 1326359 (♀); 2 May–28 Jul 2004, FBA 172501 (♀), 172478 (♀), 172475 (♀), 172480 (♀), 172483 (♀), 172494 (♀), 172498 (♀), 172485 (♀), 172497 (♀), 172499 (♀), 172495 (♀), 172496 (♀), 172487 (♀), 172486 (♀), 172493 (♂), 172484 (♂); 9–15 Feb 2003, Malaise 1, FBA 140030 (♀), FBA 140027 (♀), FBA 140028 (♀), FBA 140029 (♀), FBA 140031 (♀), FBA 140024 (♀), FBA 140023 (♀), FBA 140021 (♀), FBA 140025 (♀), FBA 140026 (♀), FBA 140022 (♀); 19 04 39° S, 07 16 6° E, 60 m, 11 Apr–2 May 2004, Malaise, Schlinger, Tokota'a, FJKV41a\_M01\_11, FBA 087703 (♂), FBA 087702 (♀), FBA 087704 (♀). **Taveuni:** Cakaudrove Prov., 5.6 km SE Tavuki Village, Devo Peak, 1187 m, 20–27 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.843° S, 179.955° W, FBA 144822 (♀), FBA 144819 (♀). **Vanua Levu:** Bua Prov., Batiqere Range, 5 km NW Kilaka Village, 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 181825 (♀); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4847], 14–22 Dec 2002, FJVL6b\_M02\_03, FBA 089870 (♀). **Viti Levu:** Naitasiri Prov., 2 km E Navai Village, old trail to Mt. Tomaniivi, 700 m, 26 Sep–11 Oct 2003, Malaise 3, Schlinger, Tokota'a, 17.621° S, 178° E, FBA 124605 (♂), FBA 124503 (♀), FBA 124619 (♂); Vuda prov. Koroyanitu Nat. Park, 1 km E Abaca Village, 800 m, 22 Apr–6 May 2003, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 100294 (♂), FBA 100295 (♂), FBA 100292 (♂), FBA 100325 (♂), FBA 100297 (♂), FBA (♂); 12–19 Nov 2002, Malaise, FJVL02\_M01\_07, FBA 086295 (♀), FBA 086304 (♀); 19–26 Nov 2002, Malaise 1, FBA 176139 (♂), FBA 176138 (♂), FBA 176137 (♂), FBA (♂), FBA (♂), FBA (♂), FBA (♂), FBA (♂), FBA (♂), FBA (♀), FBA (♀); Savuione Trail, 17 40° S, 177 33° E, 7–12 Oct 2002, Malaise, E.I. Schlinger, Tokota'a, FJVL01\_M01\_02, FBA 081914 (♀); 19–26 Oct 2002, FJVL01\_M01\_04, FBA 088535 (♂), FBA 088534 (♀), FBA 088517 (♀), FBA 088529 (♀), FBA 085276 (♀), FBA 085280 (♀), FBA 085283 (♀), FBA 085274 (♂), FBA 085277 (♀), FBA 085278 (♀), FBA 085279 (♀), FBA 085284 (♀), FBA 085285 (♀); FJVL02\_M01\_04, FBA 085296 (♀), FBA 085298 (♀), FBA 085295 (♀), FBA 085294 (♀), FBA 085288 (♂), FBA 085291 (♂), FBA 085273 (♂), FBA 085293 (♂), FBA 085297 (♀), FBA 085285 (♀), FBA 085287 (♀), FBA 085282 (♀), FBA 085289 (♀), FBA 085290 (♀); Savuione Trail, FJ–1, Malaise in montane forest, 21 Sep–7 Oct 2002, M. Irwin, E. Schlinger, M. Tokota'a, 17 40° S, 177 33° E, 450 m, FBA 002581 (♂), FBA 002582 (♂); 0.5 km N Abaca Village, 800 m, 12–19 Nov 2002, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 109080 (♀), FBA 109081 (♂), FBA 109089 (♀), FBA 109088 (♀), FBA 109078 (♀), FBA 109077 (♀), FBA 109086 (♀), FBA 109098 (♂), FBA 109097 (♀), FBA 109096 (♀), FBA 109099 (♀), FBA 109095 (♀), FBA 109100 (♂), FBA 109093 (♂), FBA 109092 (♀), FBA 109091 (♀), FBA 109090 (♀); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 26 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118795 (♂), FBA 118800 (♀), FBA 118785 (♀), FBA 118793 (♂), FBA 118777 (♀), FBA 118780 (♂). Other material examined: **Fiji: Kadavu:** Kaivala, 29 Apr 1941, N.L.H. Krauss, 1♂ (BPBM). **Matuku:** 4–6 Jul 1924, E.H. Bryan, 7♂, 8♀ (BPBM). **Vanua Mbalavu:** 23 Sep 1924, E.H. Bryan, 1♀ (BPBM). **Ovalau,** Levuka, 0–100 m, Nov 1975, N.L.H. Krauss, 2♀ (BPBM). **Vanua Levu:** Suva, 17 Sep 1920, H.W. Simmonds, lectotype ♂ and paralectotypes 1♂ and 1♀ (BMNH), and paralectotype 1♂ (MCSNM); Nandarivatu, 1100 m, 16–22 Aug 1979, S. & J. Peck, 1♀ (CNC); Savusavu, 0–100 m, Mar 1978, N.L.H. Krauss, 3♀ (BPBM); Buca Bay, 23 May 1921, Simmonds, 1♀ (USNM). **Viti Levu:** Suva, on mountain trail, 1 Feb 1933, C.H. Edmondson, 1♀ (BPBM); Navai, 700–

800 m, 10 Feb 1971, N.L.H. Krauss, 4♂, 1♀ (BPBM); Suva Bay, Pipe Trail, 22 Jul 1924, E.H. Bryan, 1♂ (BPBM); Yavu near Nandarivatu, 690 m, 4 Jul 1958, B. Malkin, 1♀ (BPBM); ridge W of Nandarivatu, 2600–3000 ft, beating shrubbery, 9 Sep 1938, E.C. Zimmerman, 1♀ (BPBM); Nandarivatu, light trap, 850 m, 8–13 Mar 1963, C.M. Yoshimoto, 1♀ (BPBM); Nausori Highlands, 500–600 m, 9 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Lami, 20–200 m, Mar 1976, N.L.H. Krauss, 1♀ (BPBM); 40 km W of Tavua, 28 Jul 1967, J. Sedlacek, 1♂ (BPBM). **Wakaya:** 17 Oct 1924, E.H. Bryan, 3♂, 5♀ (BPBM).

**Comments.** Pont (1989) erroneously listed both *A. laeta* (Wiedemann) and *A. splendens* from Fiji. *Atherigona laeta* is reliably known only from the Oriental region.

**Distribution.** Fiji, an endemic species.

**Biological data.** Nothing is known of the habits and biology.

## Muscinae

### Muscini

#### Genus *Mesembrina* Meigen

*Mesembrina* Meigen, 1826: ix, 10. Type species: *Musca meridiana* Linnaeus, 1758, by subsequent designation of Stephens in Richardson (1836: 116).

**Diagnosis.** *Mesembrina* can be recognised by its appearance: a large, coal-black fly with conspicuous yellow wing-base and calypters; eye bare or with sparse hairs; vein R<sub>4+5</sub> curved forwards at apex, the veins bare; scutellum with strong marginal setae.

**Comments.** The genus includes 11 species, all of which are restricted to temperate areas of the Holarctic. One species, *M. meridiana* (Linnaeus), introduced from Europe in 1932 for housefly control but not established.

#### 8. *Mesembrina meridiana* (Linnaeus)

*Musca meridiana* Linnaeus, 1758: 595. Holotype male, Europe, in LSL [Pont 1981: 170].

*Mesembrina meridiana*; Simmonds, 1932: 9; Dumbleton, 1957: 6; Bornemissza, 1968: 674; Pont, 1989: 677.

**Diagnosis.** A large species, 10–12 mm in length; general colour shining black.

**Material examined.** No *Mesembrina* was found among the material studied.

**Comments.** This introduction appears to have been unsuccessful as the species is no longer a member of the Fijian fauna.

**Distribution.** Not Australasian/Oceanian [unsuccessfully introduced to Fiji] (Pont 1989).

**Biological data.** The larvae of this conspicuous black species are voracious carnivores in cattle dung (see Skidmore 1985: 189), and so the species was introduced from England to Fiji in 1931 for housefly control (Simmonds 1932; Dumbleton 1957). However, it failed to become established (Bornemissza 1968).

#### Genus *Musca* Linnaeus

*Musca* Linnaeus, 1758: 589. Type species: *Musca domestica* Linnaeus, 1758, by subsequent designation of I.C.Z.N. (1925: 295) [Opinion 82].

**Diagnosis.** Can be recognised by the non-metallic body colour and the sharply-angled forward bend of vein M. Male holoptic; eye bare; arista enlarged on basal fourth, long-plumose;

presutural acrostichals not developed; dorsocentrals 2:4; katepisternals 1:2; anepimeron setulose; prosternum setulose; lower calypter broad, truncate posteriorly, extending under base of scutellum; mid tibia without ventral seta; vein M with an angular forward bend towards vein  $R_{4+5}$  in apical part.

**Comments.** Most larvae live in dung and are coprophagous, but a few live in a much wider range of substrates. *Musca domestica* is omnivorous and breeds in any substrate where there is a high rate of fermentation. Predominantly an Old World genus of some 63 species, with only three common species spreading into the Oceanian region: the bush fly (*M. vetustissima*), the dog dung fly (*M. sorbens*), and the house fly (*M. domestica*). In the Fiji Islands, two species are recorded, both introduced: *M. domestica* Linnaeus, the common house fly, cosmopolitan; *M. vetustissima* Walker, the Australian bush fly.

### 9. *Musca domestica* Linnaeus

*Musca domestica* Linnaeus, 1758: 596. Syntypes ?sex, Europe and America, not located and presumed destroyed, not in LSL [Pont, 1973b: 170, and 1981: 168].

*Musca oceanica* Le Guillou, 1842: 316. Lectotype male, Australia: Hobart, in MNHNP [designation by Pont, 1973b: 170].

*Musca australis* Macquart, 1843: 309 (152). [Junior primary homonym of *Musca australis* Gmelin, 1790.] Lectotype male, Australia: Hobart, in MNHNP [designation by Pont, 1967: 187].

*Musca vicina* Macquart, 1851: 226 (253). Syntypes 2 males and 1 female, America: Martinique, in MNHNP [Pont, 1973b: 169].

*Musca domestica*; Gräffe, 1866: 589; Bahr, 1914: 294–296; Jepson, 1915: 24–25; Jepson, 1917: 23; Veitch & Greenwood, 1921: 517; Veitch & Greenwood, 1924: 161; Veitch, 1925: 379; Simmonds, 1925: 85; Bezzi, 1928: 183; Simmonds, 1928: 12 ff; Greenwood, 1929: 352; Simmonds, 1929a: 35; Simmonds, 1929b: 46; Simmonds, 1929c: 46–47; Bryan, 1931: 403; Simmonds, 1932: 9; Simmonds, 1940a: 197; Simmonds, 1940b: 21; Baxter, 1940a: 66–70; Baxter, 1940b: 96–98; Lever, 1941: 47; Lever, 1943: 83; Lever, 1944b: 73; Lever, 1945b: 89; Lever, 1946: 23; James, 1947: 140; Laird, 1951: 19; West, 1951: 1–584; Dumbleton, 1957: 6, 12, 20, 22; Saccà & Rivosecchi, 1958: 1158; DeBach, 1962: 72; Hinckley, 1963: 18; Hennig, 1964a: 997–1008; Hennig, 1964b: 1009–1011; Bornemissza, 1968: 681; Swaine, 1971: 26, 310, 339, 356; Pont, 1973b: 168–179; Pont, 1989: 677.

*Musca domestica vicina*; Lever, 1938b: 15; Lever, 1944a: 49; Emden, 1965: 55; Rao, 1971: 21.

“Houseflies”; Simmonds, 1922: 24; Carment, 1922: 1–5; Simmonds, 1923a: 5; Simmonds, 1923b: 4; Lever, 1938c: 15; Anon, 1946: 111; Verrier, 1948: 87; O’Connor, 1950: 53–54.

**Diagnosis.** *Musca domestica* can be recognised by the presence of fine setulae on the proepisternal depression.

**Material examined** (FAS): **FIJI: Kadavu:** 0.25 km SW, Solodamu Village, 50 m, 7 Mar–11 Apr 2004, Malaise 3, Schlinger, Tokota’a, 19.078° S, 178.121° E, FBA 111699 (♂). **Taveuni:** Cakaudrove Prov., Tavuki Village, Mt. Devo, 892 m, 31 Jul–14 Aug 2004, Malaise 4, E.I. Schlinger, M. Tokota’a, 15.837° S, 179.973° W, FBA 113181 (♀). **Viti Levu:** Vuda Prov., Koroyanitu N.H.O., Savuione Trail, FJ–1, Malaise in montane forest, 21 Sep–7 Oct 2002, M. Irwin, E. Schlinger, M. Tokota’a, 17.40° S, 177.33° E, 450 m, FBA 002599 (♀). Other material examined: **FIJI:** no further data, R.A. Lever, 2♂, 2♀ (BMNH); no locality, ex horse manure, 4♂, 4♀ (USNM); no locality, 18 Apr 1954, H.W. Simmonds, 1♂ (BMNH); Delanavesi, cow dung, 1966, Dept. Agric., 3♀ (BMNH). **Kadavu:** no further data, R.A. Gibbons, 4♂, 4♀ (BMNH), & 33♂, 43♀ (ANIC); no locality, 7 Jun 1929, R.A. Gibbons, 1♂ (BMNH), 4♂, 1♀ (ANIC); in house, 30 May 1929, R.A. Gibbons, 1♂, 1♀ (BMNH), 4♂, 2♀ (ANIC); in house, 7 Jun 1929, R.A. Gibbons, 1♂, 1♀ (BMNH), 7♂, 2♀ (ANIC); no locality, 9 Jun 1929, R.A. Gibbons, 1♀ (ANIC); Wai Salima, 30 Apr 1941, N.L.H. Krauss, 1♀ (BPBM). **Lau:** Lakemba I., 2 & 3 Sep 1924, E.H. Bryan, 2♂, 1♀ (BPBM); Lakemba I., Tubou, 0–10 m, 11 Feb 1970, N.L.H. Krauss, 1♀ (BPBM); Tuvutha, 10 Sep 1924, E.H. Bryan, 16♂, 3♀ (BPBM), 1♂, 1♀ (BMNH); Avea, 22 Sep 1924, E.H. Bryan, 1♂, 1♀ (BPBM); Namuka, 13 Aug 1924, E.H. Bryan, 1♂, 2♀ (BPBM); Oneata, 16 Aug 1924, E.H. Bryan, 1♂ (BPBM); Vanua Vatu, 13 Sep 1924, E.H. Bryan, 1♀ (BPBM); Wangava, 27 Aug 1924, E.H. Bryan, 1♀ (BPBM). **Rotuma:** Soloroa, 200 ft, 11 Aug 1938, H. St. John, 1♂, 9♀ (BPBM); near Konga, 13 Aug 1938, H. St. John, 2♀ (BPBM); Melisa, Aug 1938, H. St. John, 1♀ (BPBM); Paho, 100–650 ft, 8 Aug 1938, H. St. John, 1♂, 2♀ (BPBM); Fapufa, 15 ft., 15 Aug 1938, H. St. John, 1♀ (BPBM). **Taveuni:** Sogula, house,



27 Jun 1938, R.A. Lever, 1♀ (USNM). **Thikombia**: 26 Sep 1924, E.H. Bryan, 5♀ (BPBM). **Totoya**: Tovo, 19 Feb 1971, N.L.H. Krauss, 2♂, 1♀ (BPBM). **Vanua Levu**: Nasese, cow dung, 9 Aug 1937, R.A. Lever, 1♂, 1♀ (USNM); Navakuru to Nakawanga, 7 Oct 1955, J.L. Gressitt, 2♂, 2♀ (BPBM); Urone, Liba [?] Lavu, seashore, 18 Aug 1938, Y. Kondo, 1♀ (BPBM). **Viti Levu**: Nadi, 12 Jun 1913, J.F. Illingworth, 1♀ (BPBM); Nasinu, chicken manure, 1966, Dept. Agric., 2♂ (BMNH); Natova, 17 Mar 1916, R. Veitch, 1♂, 1♀ (BMNH), and 17 Mar 1910, 1♀ (BMNH) (Bezzi 1928); Suva, bred from cow dung, 9 Jan 1927, H.W. Simmonds, 2♂, 2♀ (BMNH) (Bezzi 1928); Suva, ex cow dung, 22 May 1928, H.W. Simmonds, 6♂ (USNM); Suva, 13 Jan 1928, H.W. Simmonds, 5♂, 6♀ (BMNH); Suva, duck dung, 2 Mar 1945, R.A. Lever, 2♂ (USNM); Suva, Nov 1957, N.L.H. Krauss, 1♂ (BPBM); Suva Bay, 4 Jul 1925 (G.P. Wilder), 2♀ (BPBM); Vunidawa, 2 May 1941, N.L.H. Krauss, 3♂ (BPBM), and 4 May 1941, 1♀ (BPBM); Koronivia Research Station, coconut, 1 Mar 1963, C.M. Yoshimoto, 1♂, 3♀ (BPBM); Nandi, Mar 1956, N.L.H. Krauss, 1♀ (BPBM); Nandi, 24 Oct 1945, D.G. Hall, 1♀ (USNM); Nandi airport, 6 Dec 1958 C.R. Joyce, 1♂, 3♀ (BPBM); Nandi, 6–7 Dec 1958, C.R. Joyce, 3♂, 15♀ (BPBM); Lautoka, 0–50 m, Mar 1976, N.L.H. Krauss, 1♂ (USNM).

**Comments.** The species has been described, with illustrations of the male and female genitalia, by Pont (1973b: 168, figs 25, 30, 35, 40, 45, 59, 60). Some of the syntypes of *Musca australis* Macquart were from the Fiji Islands (“îles Viti”) and a variety was from Vanoo (Viti). Vanoo is actually a misreading of the label which says “Vavao” = Vava’u islands, Tonga group, equidistant from Tongatapu and Fiji (see Pont, 1967: 186). The syntypes of *Musca australis* are also the syntypes of *Musca oceanica*: see Pont (1973b: 170–171).

**Distribution.** This is the common house fly, a cosmopolitan species and probably present on Fiji since the first settlement by man. The earliest published record is by Gräffe (1866).

**Biological data.** In Fiji, it breeds mainly in cow dung, in the field (Simmonds 1940b; Lever 1944a) and in stable manure (Jepson 1915; Carment 1922). It has also been recorded as breeding in pig dung (Lever 1944a), excrement (Veitch & Greenwood 1921), compost (Verrier 1948), onions (Bezzi 1928), rotting *Vigna catjang* Walp. in *Linnaea* (Veitch & Greenwood 1924). Label data indicate the following additional media: chicken manure, horse manure, duck dung. A list of breeding media in Fiji was given by Bornemissza (1968). An account of its bionomics in Fiji was given by Baxter (1940a, 1940b).

Public health and medical aspects caused considerable concern in the early part of the 20th century in Fiji as elsewhere. The connection between houseflies and dysentery epidemics in Fiji was established by Bahr (1914). Simmonds (1940b) considered that outbreaks of houseflies were caused by breeding in cowpats in the field.

There was a sustained campaign for over half a century to reduce the numbers of houseflies in Fiji. DeBach (1962) judged this to be partially successful and that the housefly was more or less under control. Reviews of biocontrol projects using Coleoptera and Hymenoptera were reviewed by Simmonds (1940a) and Rao (1971). A list of predators and parasites was given by Hinckley (1963), and the introductions discussed by O’Connor (1950) and Dumbleton (1957).

Biocontrol agents for dung-breeding flies consist in the main of dung-feeding larval beetle competitors, beetle larvae that prey on fly immatures, ants which remove the fly immatures, hymenopterous parasitoids that attack pupae, and mites that feed on fly eggs and young larvae. A review of methods for the biocontrol of synanthropic flies was given by Patterson & Rutz (1986). In Fiji, the following biocontrol agents are discussed in the literature: Hymenoptera, parasitoids: *Melittobia indicum* Silvestri (Anon 1946); *Spalangia muscidarum* Richardson (Dumbleton 1957); *Spalangia nigroaenea* Curtis (Hinckley 1963); *Spalangia cameroni* Perkins, introduced from Hawai’i in 1928 (Simmonds 1929a) but effect negligible (Lever 1938b); *Spalangia* sp. (Simmonds 1922; originally recorded as *Polistes* sp. by Carment 1922), though Bouček (1963: 506) recorded only *Spalangia cameroni* from Fiji (from all hosts); *Pachycrepoideus dubius* Ashmead (Lever 1945b). Hymenoptera, ants: *Pheidole megacephala* Fabricius, introduced around 1910, and effective in reducing numbers of houseflies (Simmonds 1925; Veitch 1925; Hinckley 1963) though this was disputed by Bornemissza (1968).

Coleoptera, larval predators: *Platylister chinensis* Quensel, introduced from Java in 1938 (Simmonds 1940b; Lever 1941); *Hister chinensis* Quensel, introduced from Guam (Lever 1938c); *Copris incertus* var. *prociduus* Say, introduced 1929 and established (Simmonds 1929b). Diptera, larval predator: *Mesembrina meridiana* Linnaeus (Muscidae), introduced 1931 (Simmonds 1932), but not established [see above].

West's (1951) monograph provides considerable basic information on the structure, biology and control of the housefly (updated by the bibliography by West & Peters 1973). A more up-to-date review was given by Greenberg (1973). James (1947) dealt with its association with myiasis (the infestation of living animal tissue by fly maggots). Stoffolano (1970) listed the nematodes that cause disease in animals for which flies of the genus *Musca* are the vectors. Greenberg (1971) has reviewed all the organisms associated with *Musca domestica* (and other synanthropic flies). Other useful reviews of the housefly are by Hennig (1964a, 1964b) and, for Australia, by Pont (1973b).

The tropical form of the housefly, generally smaller than European examples and with paler abdomen and narrower frons, was frequently classified as *M. vicina* Macquart by authors in the 1920s to 1940s, either as a separate species or as a subspecies of *M. domestica*. However, this form has been shown to be a temperature-controlled phenotype of *M. domestica*, without separate genetic status.

### 10. *Musca vetustissima* Walker

*Musca vetustissima* Walker, 1849: 902. Holotype female, "New Holland" [Australia], in BMNH (Pont, 1973b: 148).

*Musca vetustissima*; Pont, 1973b: 147–160; Pont, 1989: 678.

**Diagnosis.** *Musca vetustissima* can be recognised by the characteristic pattern of dark vittae on the mesonotum, where the pair of dark vittae on each side coalesces behind the suture to form a single vitta.

The species has been described, with illustrations of the male and female genitalia, by Pont (1973b: 147, figs 23, 28, 33, 38, 43, 55, 56, 159).

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FIJI: Kadavu:** no locality, 7 Jun 1929, R.A. Gibbons, 1♀ (ANIC); in house, 30 May 1929, R.A. Gibbons, 1♂ (ANIC); Wai Salima, 30 Apr 1941, N.L.H. Krauss, 1♀ (BPBM). **Matuku:** 7 Jun 1924, E.H. Bryan, 1♂ (BPBM). **Ovalau:** Cape Horn, 0–20 m, 30 Dec 1969, N.L.H. Krauss, 1♂, 3♀ (BPBM); Levuka, 0–200 m, Dec 1969, N.L.H. Krauss, 1♂, 3♀ (BPBM); Levuka, 0–150 m, Mar 1969, 1♀ (BPBM); Levuka, 0–200 m, Feb 1972, 1♀ (BPBM); Levuka, 0–100 m, Nov 1975, 1♀ (BPBM); Waitovu, 0–20 m, 29 Mar 1969, N.L.H. Krauss, 1♀ (BPBM). **Rotuma:** Fapufa, 15 ft, 15 Aug 1938, H. St. John, 2♂, 5♀ (BPBM); Soloroa, 200 ft, 11 Aug 1938 H. St. John, 3♂, 19♀ (BPBM); Melisa, Aug 1938 H. St. John, 1♂, 1♀ (BPBM); Lulu Bay, 6 Aug 1938, H. St. John, 1♂, 9♀ (BPBM), 1♀ (BMNH); Paho, 100–650 ft, 8 Aug 1938, H. St. John, 1♂, 3♀ (BPBM); near Kongai, 13 Aug 1938, H. St. John, 4♀ (BPBM), and Aug 1938, 1♀ (BPBM); Oneata, 23 Aug 1938, H. St. John, 1♀ (BPBM); Jarua, 15 Aug 1938, H. St. John, 1♀ (BPBM); Tuakoi, 12 Aug 1938 H. St. John, 1♀ (BPBM); Jolmea, 13 Aug 1938, H. St. John, 5♀ (BPBM); Soluaka, 6 Aug 1938 H. St. John, 1♀ (BPBM). **Taveuni:** Waiyevo, 0–100 m, Jan 1972, N.L.H. Krauss, 2♂, 3♀ (BPBM). **Totoya:** Tovo, 19 Feb 1971, N.L.H. Krauss, 1♂, 1♀ (BPBM). **Vanua Levu:** Navakuru to Nakawanga, 7 Oct 1955, J.L. Gressitt, 2♂ (BPBM). **Viti Levu:** no locality, 1 Mar 1945, D.G. Hall, 1♀ (USNM); Nandi, 0–100 m, 5 Jun 1973, N.L.H. Krauss, 2♀ (USNM); Nandi airport, 6 Dec 1958, C.R. Joyce, 3♂, 6♀ (BPBM), 1♂ (BMNH); Nandi, 6–7 Dec 1958, C.R. Joyce, 7♂, 24♀ (BPBM), 1♂, 2♀ (BMNH); Nandi, Feb 1945, D.G. Hall, 2♀ (USNM), 1 Mar 1945, 1♀ (USNM), and 24 Oct 1945, 1♂, 1♀ (USNM); Suva, 5 Dec 1958, C.R. Joyce, 3♂, 3♀ (BPBM); Suva, 23 Apr 1938, R.A. Lever, 1♂ (BMNH); Suva, 24 Oct 1945, D.G. Hall, 1♀ (USNM); Colo-i-Suva, 3–6 Mar 1963, C.M. Yoshimoto, 2♂, 5♀ (BPBM); Vunidawa, 2 May 1941, N.L.H. Krauss, 1♀ (BPBM); Koronivia Research Station, 1 Mar 1963 C.M. Yoshimoto, 1♀ (BPBM); Raki-Raki, Jan 1955, N.L.H. Krauss, 1♀ (BPBM); Londoni, 50–150 m, 12 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Navai, 800–900 m, 3 Apr 1973, N.L.H. Krauss, 1♀ (BPBM); Tavua, 7 Mar 1963, C.M. Yoshimoto, 1♀ (BPBM); Tavua, 50–150 m, Feb 1971,



N.L.H. Krauss, 1♀ (BPBM); Lami, 0–200 m, Mar 1981, N.L.H. Krauss, 1♀ (BPBM); Nausori Highlands, 500–600 m, 9 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Lautoka, 0–50 m, Mar 1976, N.L.H. Krauss, 2♀ (BPBM).

**Comments.** This is the bush fly, an important pest species in Australia and apparently widespread in the Pacific. It is long-established in Fiji, but apparently does not reach the pest proportions that it does elsewhere. The earliest Fijian specimen that we have seen was collected in 1924, but, curiously, the species was not noted by Bezzi (1928).

**Distribution.** Originally described from “New Holland”; widespread in Indonesia and Australia to the Hawaiian Is., Micronesia, Tuvalu.

**Biological data.** The primary larval food appears to be cow dung, though the faeces of other mammals are used under certain circumstances (see Pont 1973b; Hughes *et al.* 1972). A campaign to control or manage the bush fly has been waged in Australia for over 50 years.

Paterson & Norris (1970) recognised three species in the *Musca sorbens*-complex (i.e. *M. sorbens* of earlier authors). What appears to be conspecific with the “broad-frons” African species (*M. sorbens*) is known from the Papuan subregion and the Pacific (e.g. Hawai‘i). The “narrow-frons” Australian species (*M. vetustissima*) is widespread in the Pacific, and in places can be the sole member of the complex through competitive exclusion of *M. sorbens* (see Legner 1976). We have no evidence for the occurrence of any species of the *sorbens*-complex other than *M. vetustissima* on the islands of the Fiji group. The male frons/head ratio matches well the range of the Australian bush fly (see Fig. 24): it is slightly broader than in most bush flies, but consistently and considerably narrower than in *M. sorbens*. The number of proclinate parafrenal setulae is somewhat variable, sometimes as low as 8 or 9 but generally between 12 and 17.

### Genus *Neomyia* Walker

*Neomyia* Walker, 1859b: 138 (as a subgenus of *Musca* Linnaeus). Type species: *Musca* (*Neomyia*) *gavisa* Walker, 1859b, by monotypy.

*Orthellia* Robineau-Desvoidy, 1863: 837. Type species: *Orthellia rectinervis* Robineau-Desvoidy, 1863 [= *Lucilia viridescens* Robineau-Desvoidy, 1830], by subsequent designation of Townsend (1916: 8).

**Diagnosis.** Metallic green to blue or violet flies; eye bare; arista plumose; suprasquamal ridge setulose; postalar ridge with fine setulae on posterior half; prosternum setulose; greater ampulla with setulae; lower calypter broad, truncate posteriorly, of the *Musca*-type; anepimeron setulose, katapisternals usually 1+3; vein M strongly curved forward towards vein R<sub>4+5</sub> before apex; subcostal sclerite with short setulae; distiphallus with strong spinules.

**Comments.** *Neomyia* is the only muscid genus on Fiji with metallic green to blue species. There are some 80 species of *Neomyia*, found mainly in the Old World tropics. One species has been introduced into the New World and into Hawai‘i.

The two species dealt with here are both endemic to Fiji. They agree with the generic descriptions given by Pont (1973b: 189–190) and Nihei & Carvalho (2009: 17), but the following features should be noted: 2 short presutural dorsocentral setae; anterior anepisternal seta present; posterior spiracle large; katatergite with long dark setulae; anatergite bare; hind tibia with the calcar absent (sometimes present in male *N. greenwoodi*), and with anterodorsal preapical well developed; basicosta black; wing-membrane entirely covered with microtrichiae; costa bare ventrally after tip of subcosta; vein M without a dip after bend. Both species differ from the widespread and common *N. timorensis* (Robineau-Desvoidy) by the absence of the hind tibial calcar and by the long setulae on the katatergite.

It is difficult to discern the relationships of these two species. The general features are those of the group of Oriental species that includes *N. timorensis* (Robineau-Desvoidy), *N. rufitarsis* (Stein), *N. steini* (Aubertin), and *N. cuprea* (Shinonaga & Tumrasvin), but these features are probably all plesiomorphous in the genus (e.g. 2 presutural dorsocentral setae, wing-membrane wholly haired, scutum dusted anteriorly). They do not show any obvious affinity with the group of Papua New Guinea species described by Shinonaga & Kano (1983), which are characterised by the apomorphic feature of a single strong presutural dorsocentral seta. The presence of strong setulae on the katatergite is apomorphic and is found only in these two species. The species were not included in the cladistic analysis of the Muscini by Nihei & Carvalho (2007). Geographically too they are isolated: the genus does not otherwise occur east of the Solomon Islands except for Hawai'i (one species, introduced from North America).

The larvae live almost exclusively in bovine dung and are strictly coprophagous.

Two species in Fiji Is, both endemic: *N. simmondsi* (Bezzi) and *N. greenwoodi* (Bezzi).

### 11. *Neomyia greenwoodi* (Bezzi)

(Figs 25–31)

*Orthellia greenwoodi* Bezzi, 1928: 181. Holotype female, Fiji: Lautoka Mts, in BMNH [Pont 1970b: 420]. *Neomyia greenwoodi*; Pont, 1989: 679.

**Diagnosis.** *Neomyia greenwoodi* can be distinguished by the dark brown antenna, palpus and legs. The colour tends to be bright green or blue green; the scutum is less dusted and the wing less smoky than in *N. simmondsi*; it is also on average a slightly smaller and narrower species.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **Fiji:** **Taveuni:** Samosomo, 0–200 m, Jan 1972, N.L.H. Krauss, 1♀ (BPBM). **Vanua Levu:** Navakuru to Nakawanga, 7 Oct 1955, J.L. Gressitt, 1♀ (BPBM). **Viti Levu:** Lautoka, mountains, 2 Jan 1920 W. Greenwood, holotype ♀ (BMNH); Mt. Victoria, 1000 m, 4–6 Mar 1978, H. Kurahashi, S. Shinonaga, 2♂, 2♀ (BMNH); Mt. Victoria, 600–1000 m, 30 Jul 1967, J. & M. Sedlacek, 1♀ (BPBM); Wanavavu, 2 Nov 1924, 1♀ (BMNH); 40 km E of Nadi, 26 Jul 1967, J. & M. Sedlacek, 1♂ (BPBM); Rewa, Mar 1906, F. Muir, 1♀ (BPBM); Lami, 1920, C.E. Pemberton, 1♀ (BPBM); Lami, 0–200 m, Jan 1979, N.L.H. Krauss, 1♀ (BPBM); Lami, Feb 1977, N.L.H. Krauss, 1♂ (BPBM), 1♂ (BMNH); Lami, Mar 1951, N.L.H. Krauss, 2♂, 4♀ (BPBM); Lami, May 1951, N.L.H. Krauss, 1♀ (BPBM); Korovou, Tailevu, Aug 1937, J.M. Valentine, 1♂ (BPBM); Colo-i-Suva, 3–6 Mar 1963, C.M. Yoshimoto, 3♀ (BPBM); Colo-i-Suva, 29 & 30 Jun 1924, E.H. Bryan, 2♀ (BPBM); Tholo-i-Suva, Mar 1951, N.L.H. Krauss, 1♀ (BPBM); Tholo-i-Suva, Sep 1950, N.L.H. Krauss, 1♀ (BPBM); Navai, 700–800 m, 10 Feb 1971, N.L.H. Krauss, 2♀ (BPBM); Savura Creek, Malaise trap, 26–31 Aug 1981, R.A. Beaver, 1♀ (OUMNH); Nausori Highlands, 450–500 m, 9 Oct 1971, N.L.H. Krauss, 1♀ (BPBM); Nandarivatu, 850 m, 8–13 Mar 1963, C.M. Yoshimoto, 1♂, 5♀ (BPBM); Nandarivatu, 1100 m, 16–22 Aug 1979, S. & J. Peck, 1♀ (CNC); 10 km N Galoa, 300 m, 1 Sep 1978, S. & J. Peck, 1♀ (CNC).

**Comments.** The original description is still adequate for the general features and appearance of this species. The male and female genitalia are illustrated in Figs 25–31; the ovipositor in this species (and in *N. simmondsi*) is unusually long. The aedeagus has a most remarkable development at the tip of the distiphallus: the membraneous juxta and field of spines (cf. Fig. 34 of *N. simmondsi*) are reduced, and the distiphallus is enlarged to form two rather flat, expanded, posteriorly-directed lobes. The dorsum of the ovipositor, between tergites 8 and 9, has a narrow pilose band; the spinules on the intersegmental membrane are smaller than in *N. simmondsi*.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

**12. *Neomyia simmondsi* (Bezzi)**  
(Figs 32–36)

*Orthellia simmondsi* Bezzi, 1928: 180. Lectotype male, Fiji: Ovalau, in BMNH [designation by Pont, 1970b: 423].

*Orthellia simmondsi*; Malloch 1929a: 264; Lee *et al.* 1956: 334.

*Neomyia simmondsi*; Pont 1989: 679.

**Diagnosis.** *Neomyia simmondsi* can be distinguished by the yellow antenna and palpus and the mainly yellow legs. The body-colour is violet to violet-blue; the scutum is rather densely grey dusted anteriorly, and the wings, especially in the male, are decidedly smoky; it is on average rather larger and broader than *N. greenwoodi*.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **Fiji:** “Ba, Fiji”, Jan 1906, F. Muir, 1♀ (BPBM). **Ovalau:** no locality, 22 Oct 1921, H.W. Simmonds, lectotype ♂ and paralectotype 1♀ (BMNH); no locality or collector, 23 Oct 1921, 1♀ “cotype” (USNM); no locality, 7 Dec 1921, H.W. Simmonds, 1♂ (USNM); Levuka, 0–200 m, Dec 1969, N.L.H. Krauss, 2♂, 4♀ (BPBM); Levuka, 11 May 1928, T.D.A. Cockerell, 1♀ (BMNH); Tholo-i-suva, 15 Nov 1970, H.S. Robinson, 1♂ (BMNH). **Viti Levu:** no data, Mus. Godeffroy, 1♂, 1♀ (USNM) (Malloch 1929a); Lautoka Mountains, 2 Jan 1920, W. Greenwood, paralectotype 1♀ (MCSNM); Lautoka, Mar 1976, N.L.H. Krauss, 1♀ (BPBM); Savura Creek, Malaise trap, 22–27 May 1981, R.A. Beaver, 1♂ (OUMNH); same locality, 11–15 Aug 1981, 1♀, and 18–22 Oct 1981, 1♀ (both OUMNH); 70 km W of Suva, 0–200 m, 2 Mar 1978, S. Shinonaga, 1♂ (BMNH); Mt. Victoria, 1000 m, 4–6 Mar 1978, S. Shinonaga, H. Shima, H. Kurahashi, 2♂, 3♀ (BMNH); Colo-i-Suva, 28 Jun 1924, E.H. Bryan, 1♀ (BPBM); Colo-i-Suva, 3–6 Mar 1963, C.M. Yoshimoto, 1♂, 3♀ (BPBM); Tholo-i-suva, Oct 1950, N.L.H. Krauss, 1♂, 1♀ (BPBM); Nandarivatu, 850 m, 8–13 Mar 1963, C.M. Yoshimoto, 2♂, 2♀ (BPBM); Nandaravatu, 1100 m, 16–22 Aug 1979, S. & J. Peck, 1♀ (CNC); Navai, 700–800 m, 10 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); 2–10 km S Nandarivatu, 600–700 m, 4 Aug 1979, G.M. Nishida, 4♀ (BPBM).

**Comments.** The original description is still adequate for the general features and appearance of this species. The male and female genitalia are illustrated in Figs 32–36; the male sternite 5 is as in *N. greenwoodi*, except that the hind-margin is more obviously straight. The ovipositor is even longer than in *N. greenwoodi*: it is almost 4 times as long as tergite 5; segment 6 itself (only the membranous posterior half is shown in the figure) is almost twice as long as segment 5.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

### Stomoxyini

#### Genus *Haematobia* Le Peletier & Audinet-Serville

*Haematobia* Le Peletier & Audinet-Serville in Latreille *et al.*, 1828: 499. Type species: *Conops irritans* Linnaeus, 1758, by subsequent designation of Westwood (1840: 140), validated by I.C.Z.N. (1974: 157). [Opinion 1008].

**Diagnosis.** General coloration dark greyish, with yellowish tinge and often yellow setae; head 1.25 times as wide as high; arista plumose only on dorsal surface; palpus spatulate, a little narrowed on basal quarter to half, grooved inside, reaching tip of haustellum when the proboscis is flexed; prosternum setulose; proepisternal depression and postalar wall bare; prealar seta barely differentiated or vestigial; lower calypter about twice as long as upper one; vein A<sub>1</sub> long.

**Comments.** This group of biting flies can be recognised by the short piercing proboscis and relatively long palpus. Vein M is gently inclined towards vein R<sub>4+5</sub> in its apical section.

*Haematobia* is widespread in the Old World and contains 7 species. Two species are serious pests of cattle, *H. exigua* Meijere (“buffalo fly”) and *H. irritans* (Linnaeus) (“horn fly”). Both species are recorded from Fiji, but it is improbable that both species actually occur there. We have seen no material of this genus from Fiji. In the *Catalog of Australasian and Oceanian Diptera* (Pont 1989: 680), *H. irritans* was mentioned from Fiji with a query but *H. exigua* was not listed.

Allegedly two species: *H. exigua* Meijere, the buffalo fly, widespread Indo-Australasian; *H. irritans* (Linnaeus), the horn fly, Palearctic and introduced into the New World.

### 13. *Haematobia exigua* Meijere

*Haematobia exigua* Meijere in Schat, 1903: 17. Lectotype female, Java: Pasoeroean, in NBCL [designation by Pont 1970a: 86].

*Lyperosia exigua*; Lever 1945a: 87; Bouček 1963: 506; Pont 1973b: 265–273; Zumpt 1973: 74.

*Haematobia exigua*; Pont 1989: 680.

**Diagnosis.** The male of *H. exigua* can be easily recognised by the yellowish palpus and the longer erect curled posterodorsal setulae on tarsomeres 2 and 3 of the hind leg that are much longer than the tarsal depth.

**Material examined** (FAS). No specimen was found among the Fiji Arthropod Survey material. No material from Fiji is in the BMNH or in any of our other sources of material; in fact, nothing east of the Solomons, PNG and Australia. Handschin (1933) did not mention *H. exigua* from Fiji by name, nor was it recorded in the standard works of Emden (1965) and Zumpt (1973). The only mention we have found is in Bouček (1963: 506), who listed the parasitoid hymenopteran *Spalangia cameroni* Perkins from *H. exigua* from Fiji and the Solomon Islands.

**Comments.** We do not believe that this species is present on Fiji, though it may very well be introduced and become established via the cattle trade at some time in the future.

**Distribution:** Australia, Bismarck Archipelago, Marianas, Micronesia (including Belau), New Guinea, Solomon Is, East Asia and Oriental region; Seychelles.

**Biological data.** The buffalo fly is a serious pest of cattle. The adults bite cattle, and the larvae live in fresh droppings. Reviews of the species are given by Pont (1973b) and Zumpt (1973).

According to Lever (1945a), the predatory beetle *Pachylister chinensis* Quensel was sent to Taveuni (and Australia) as a predator against buffalo fly. Bouček (1963) recorded *Spalangia cameroni* Perkins as a parasitoid of this species in Fiji.

### 14. *Haematobia irritans* (Linnaeus)

*Conops irritans* Linnaeus, 1758: 604. Lectotype male, Sweden, in LSL [designation by Pont, 1981: 169].

*Lyperosia irritans*; Handschin, 1933: 463; Bouček, 1963: 506.

*Haematobia irritans*; Zumpt, 1973: 73; Pont, 1989: 680.

**Diagnosis.** The male of *H. irritans* can be easily recognised by the dark brown palpus and the shorter erect posterodorsal setulae on tarsomeres 2 and 3 of the hind leg that are hardly as long as the tarsal depth.

**Material examined.** No specimen was found among material studied.

**Comments.** *Haematobia irritans* was mentioned from Fiji by Handschin (1933) and its parasitoid *Spalangia cameroni* Perkins in Fiji by Bouček (1963). We have seen no material of this species from Fiji. We do not believe that this species is now present on Fiji, though it may very well be introduced and become established via the cattle trade at some time in the future.

**Distribution.** ?Fiji, Hawai'i; Nearctic, Neotropical and Palaearctic regions.

**Biological data.** The horn fly is also a serious pest of cattle, the adults biting cattle and the larvae living in fresh droppings. A detailed review of the species is given by Zumpt (1973).

### Genus *Stomoxys* Geoffroy

*Stomoxys* Geoffroy, 1762: 449, 538. Type species: *Conops calcitrans* Linnaeus, 1758, by subsequent designation of I.C.Z.N. (1957: 85) [Opinion 441].

**Diagnosis.** This group of biting flies can be recognised immediately by the long piercing proboscis and short yellow palpus. General colour brownish grey to yellowish brown; head slightly wider than high, at vertex about one-fourth of head width in male and well over one-third in female; arista plumose; palpus slender and short, subcylindrical, and less than half as long as the elongated and non-retractile piercing proboscis; postpedicel about 2.5 times as long as pedicel; prosternum and proepisternal depression setulose; prealar seta absent; anterior katepisternal absent. Vein M curved forward towards vein  $R_{4+5}$  in its apical section.

**Comments.** The larvae are usually found in mammalian excrement, but *S. calcitrans* breeds more widely, for example in grass clippings or vegetable compost where there is a high degree of bacterial fermentation. Adults are obligate blood suckers and have a proboscis adapted for piercing skin.

*Stomoxys* is widespread in the Old World, with 19 species of which one (*S. calcitrans*) is cosmopolitan. As biting flies, they are easily spread with man, cattle and horses.

Two species recorded from Fiji: *S. calcitrans* (Linnaeus), cosmopolitan; *S. indicus* Picard, an Oriental species.

### 15. *Stomoxys calcitrans* Linnaeus

*Conops calcitrans* Linnaeus, 1758: 604. Lectotype female, probably Sweden, in LSL [designation by Pont, 1981: 168].

*Stomoxys calcitrans*; Summers, 1912: 196; Veitch & Greenwood, 1921: 517; Bezzi, 1928: 184; Simmonds, 1928: 15–16; Greenwood, 1929: 352; Bryan, 1931: 403; Lever, 1946: 23; James, 1947: 133; Hinckley, 1963: 110–111; Bouček, 1963: 507; Hennig, 1964b: 1039; Bornemissza, 1968: 681; Swaine, 1971: 297; Pont, 1973b: 259–264; Zumpt, 1973: 101; Munro, 1978: 92; Pont, 1989: 680.

**Diagnosis.** *Stomoxys calcitrans* can be distinguished from *S. indicus* by the pattern of dark spots on the abdomen (see key), and the broader male and female frons. The tibiae and tarsi are mainly dark; the body dusting tends to be more sandy grey, and the pruinosity on the fronto-orbital plates more yellowish or even brownish grey.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FIJI: Viti Levu:** Suva, 26 Jan 1927, H.W. Simmonds, 1♀ (BMNH) (Bezzi 1928); Ravawai, 2 Nov 1915, R. Veitch, 3♂, 1♀ (BMNH) (Bezzi 1928); Nadi, 0–100 m, Mar 1976, N.L.H. Krauss, 1♀ (BPBM); Suva Bay, 16 Jul 1923, O.H. Swezey, 1♀ (BPBM); Nausori, Apr 1951, N.L.H. Krauss, 1♀ (BPBM); Nadi, 12 Jun 1913, J.F. Illingworth, 1♂, 1♀ (BPBM), 1♀ (BMNH); Nadi, 28 Jun 1913, J.F. Illingworth, 1♂ (BPBM); Nadi, 29 Jun 1913, J.F. Illingworth, 1♂, 1♀ (BPBM); Nadi, 20 Aug 1913, J.F. Illingworth, 1♂ (BPBM); Nadi, 24 Aug 1913, J.F. Illingworth, 1♀ (BPBM).

**Comments.** The species has been described, with illustrations of the male and female genitalia, by Pont (1973: 259, figs. 142, 145–149, 155–156, 170). First recorded from Fiji by Summers (1912).

**Distribution.** Widespread through the Pacific region; cosmopolitan.

**Biological data.** Adults attack man and horses (Veitch & Greenwood 1921; Hinckley 1963; Munro 1978). Larvae breed mainly in heaps of decaying grass cuttings (Greenwood 1929), including stable sweepings of urine-soaked straw. A list of breeding media in Fiji was given by Bornemissza (1968), and the fly was reviewed in Fiji by Swaine (1971).

Adults are responsible for the transmission of habronemiasis in horses. Greenberg (1971) listed the associated organisms. Biocontrol agents in Fiji include the hymenopterous parasitoids *Spalangia* sp. (Simmonds 1928) and *Spalangia cameroni* Perkins (Bouček 1963), and the ant predator of eggs and larvae, *Pheidole megacephala* Fabricius (Simmonds 1928).

General reviews were given by Hennig (1964b), Pont (1973b) and Zumpt (1973). Its biology and relationship to disease transmission were discussed by Greenberg (1973).

### 16. *Stomoxys indicus* Picard

*Stomoxys indica* Picard, 1908: 20. Syntypes 2♂ and 1♀, India: Calcutta, in IPP [seen].

*Stomoxys limbata* Austen, 1909: 292. Syntypes ♂, India: Calcutta & Port Canning, in BMNH.

*Stomoxys limbata*; Bezzi, 1928: 185; Malloch, 1929b: 175.

*Stomoxys indica*; Hinckley, 1963: 110, 111; Hennig, 1964b: 1044; Emden, 1965: 161; Zumpt, 1973: 118; Munro, 1978: 92.

*Stomoxys indicus*; Pont, 1989: 680.

**Diagnosis.** *Stomoxys indicus* can be distinguished from *S. calcitrans* by the pattern of dark bands on the abdomen (see key), and the narrower male and female frons. The tibiae and tarsi are mainly yellow; the body dusting tends to be browner, especially in the male, and the pruinosity on the fronto-orbital plates is grey.

**Material examined** (FAS): **FIJI: Taveuni:** Cakaudrove Prov., 5.6 km SE Tavuki Village, Devo Peak [15.843, 179955], 1187 m, Malaise trap, 14–21 Nov 2002, E.I. Schlinger, M. Tokota'a, FJTA8a\_M01\_07, FBA 089976 (♀). **Viti Levu:** Vuda Prov. Koroyanitu Nat. Park, 1 km E Abaca Village, 800 m, 22 Apr–6 May 2003, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 100305 (♀), FBA 100308 (♀), FBA 174714 (♀), FBA 174724 (♀), FBA 174715 (♀), FBA 174710 (♀), FBA 174707 (♀), FBA 174709 (♀), FBA 174705 (♀); 19–26 Nov 2002, FBA 176155 (♂), FBA 176149 (♂), FBA 176150 (♂), FBA 176151 (♂), FBA 176146 (♂), FBA 176148 (♂), FBA 176145 (♂), FBA 176168 (♂), FBA 176154 (♂), FBA 176153 (♂), FBA 176143 (♂), FBA (♂), FBA (♂), FBA (♂), FBA 176144 (♀), FBA 176152 (♀), FBA 176147 (♀), FBA 176141 (♀), FBA 176165 (♀), FBA 174779 (♀), FBA 174780 (♀), FBA 174781 (♀), FBA 174777 (♀); Koroyanitu N.H.O., Savuione Trail, FJ–1, Malaise in montane forest, 21 Sep–7 Oct 2002, M. Irwin, E. Schlinger, M. Tokota'a, 17.40° S, 177.33° E, 450 m, FBA 002591 (♀), FBA 002595 (♀), FBA 002596 (♀), FBA 002600 (♀); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4847], 15 Dec 2003–13 Mar 2004, Schlinger, Tokota'a, FJVL6b\_M02\_17, FBA 089892 (♀), FBA 089894 (♀); 17–29 Apr 2004, FJVL6b\_M02\_20, FBA 089937 (♀), FBA 089938 (♀), FBA 089939 (♀), FBA 089940 (♀), FBA 089941 (♀), FBA 089943 (♀), FBA 089945 (♀); 6–17 Apr 2004, FJVL6b\_M02\_19, FBA 089806 (♀), FBA 089812 (♀), FBA 089805 (♂), 14–22 Dec 2002, FJVL6b\_M02\_03, FBA 089816 (♀); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 26 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118752 (♂); Naitasiri Prov., 3.2 km E Navai Village, Veilaselase Track, 1020 m, 19 Apr–14 May 2004, Malaise 2, Schlinger, Tokota'a, 17.624° S, 178.009° E, FBA 155270 (♀). Other material examined. **FIJI: Taveuni:** Samosomo, 0–200 m, Jan 1972, N.L.H. Krauss, 1♂ (BPBM); Waiyevo, 0–100 m, Jan 1972, N.L.H. Krauss, 1♂, 1♀ (BPBM). **Vanua Levu:** Savusavu, 0–100 m, Mar 1978, N.L.H. Krauss, 1♀ (BPBM). **Viti Levu:** Dobui Levu, sweeping young rice, 15 Jun 1948, B.A. O'Connor, 1♂ (BMNH); Navua, 26 Jun, D. Stoner, 1♀ (USNM); Walu Bay, 13 Jun, D. Stoner, 1♂ (USNM); Suva, 22 Oct 1988, R.A. Beaver, 1♂ (OUMNH); Suva, swept waste ground, 20 Nov 1988, R.A. Beaver, 2♂ (OUMNH); trail Yayu-Nandrau, 27–29 Jun 1958, B. Malkin, 1♂ (BPBM); Nandi, 0–50 m, Apr 1981, N.L.H. Krauss, 1♂ (BPBM); Tavua, 7 Mar 1963, C.M. Yoshimoto, 1♀ (BPBM); 40 km E of Nadi, 26 Jul 1967, J. & M. Sedlacek, 1♀ (BPBM); Yeidanu, 6 May 1919, R. Veitch, 1♂ (BMNH) (Bezzi 1928).

**Comments.** The species has been described, and the male and female genitalia illustrated, by Zumpt (1973: 118, figs 82–84).

**Distribution.** Fiji, ?Samoa; Oriental Region.



**Biological data.** On Fiji, adults are recorded biting man (Hinckley 1963) and horses (Munro 1978). They are also known to bite cattle. The larvae live in cattle and horse dung.

### Azeliinae

#### Azeliini

#### Genus *Hydrotaea* Robineau-Desvoidy

*Hydrotaea* Robineau-Desvoidy, 1830: 509. Type species: *Musca meteorica* Linnaeus, 1758, by subsequent designation of Curtis (1839: plate 768).

**Diagnosis.** Male holoptic; eye bare; general colour usually black or bluish black, rarely metallic; arista very short pubescent; gena with a strong upcurved seta; female with crossed interfrontal seta; dorsocentrals 2+4; notopleuron covered with setulae, the two setae similar in size; anepimeron bare; katapisternals 1+1; some males with fore femur on ventral surface with a preapical excavation with 2 toothed processes and fore tibia flattened along basal half or two-thirds of ventral surface; M straight; distiphallus with apical part of juxta spinulose; ovipositor long, with narrow tergites.

**Comments.** The larvae are facultative to obligate carnivores and live in a wide range of decaying organic substances where there is a high rate of bacterial fermentation. They prey on other insect larvae in the substrate, mainly Diptera larvae. Adult females of some species are sweat-flies.

*Hydrotaea spinigera* (Stein), a widespread Old World tropical filth fly, is the only species known from Fiji. However, two other species may very well be introduced in the future: *Hydrotaea aenescens* (Wiedemann), a tropical and subtropical filth fly introduced from the New World to the Old World, and *H. chalcogaster* (Wiedemann), with an Old World tropical distribution similar to that of *H. spinigera*.

#### 17. *Hydrotaea spinigera* (Stein)

*Ophyra spinigera* Stein, 1910: 555. Holotype male, Malaysia: Singapore, now destroyed, formerly in HNHM [Pont 1973b: 238].

*Ophyra spinigera*; Pont, 1973b: 238.

*Hydrotaea spinigera*; Pont, 1989: 677.

*Ophyra nigra* of authors, not Wiedemann [misidentifications]; Bezzi, 1928: 176; Greenwood, 1929: 352; Bryan, 1931: 403.

**Diagnosis.** This species can be recognised by the entirely black palpus and tarsi, and the concave posterior eye-margin below.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **Fiji:** Taveuni: 9 Nov & 9 Dec 1921, H.W. Simmonds, 2♂ (BMNH) (Bezzi 1928). **Viti Levu:** Suva, ex offal, 12 Apr 1924, H.W. Simmonds, 2♀ (BMNH) (Bezzi 1928).

**Comments.** Reared in Fiji from offal (Bezzi 1928; Greenwood 1929). The adult was fully described by Pont (1973b: 238–242).

**Distribution.** Australia, Belau, Fiji, Guam, Indonesia (Maluku), Micronesia, Bismarck Archipelago, PNG, Solomon Is, Vanuatu, Samoa; East Asia and Oriental Region.

**Biological data.** Summary of biology and parasites in Pont (1973b) and Skidmore (1985: 115–117).

### Reinwardtiini

#### Genus *Muscina* Robineau-Desvoidy

*Muscina* Robineau-Desvoidy, 1830: 406. Type-species: *Musca stabulans* Fallén, 1817, by subsequent designation of Coquillett (1910: 571).

**Diagnosis.** Male holoptic, eye bare; arista plumose with hairs on basal three-fourths and bare on the apical fourth; interfrontal setae present in female; anterior postsutural intraalar seta placed behind level of supraalar seta; presutural acrostichals developed; prealar seta short, but distinct; anepimeron bare; meron setulose; wing with apical section of vein M slightly curved forward, veins bare; calcar strong, submedian; sternite 1 setulose.

**Comments.** Only *M. stabulans* has been recorded from the Fiji Is.

#### 18. *Muscina stabulans* (Fallén)

*Musca stabulans* Fallén, 1817: 252. Lectotype male, Sweden: probably Skåne province, in NRS [designation by Pont, 1984: 294].

*Muscina stabulans*; Lever, 1940: 18; Emden, 1965: 216; Pont, 1989: 675.

**Diagnosis.** As for the genus. The palpus, tip of scutellum and tibiae are yellow.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined: **Fiji: Taveuni:** Waiyevo, 0–100 m, Jan 1972, N.L.H. Krauss, 1♀ (USNM); **Viti Levu:** Suva, introduced in potatoes from [New] Ireland, 7 Jun 1939, R.A. Lever, 1♂, 1♀ (BMNH).

**Comments.** Stated to be absent from Fiji by Malloch (1929b), but subsequently recorded by Lever (1940) from puparia found in potatoes imported from New Ireland.

**Distribution.** Sweden, widespread Australia, Fiji, Hawaiian Is, Lord Howe I., New Caledonia, New Zealand (Auckland I.), Norfolk I., Bismarck Archipelago, Vanuatu; cosmopolitan.

**Biological data.** *Muscina stabulans* is an important controller of fly populations, but the larvae can also prey on other insect larvae such as those of Lepidoptera. They prey heavily on *Musca domestica*, drastically reducing its populations (Skidmore 1985).

#### Genus *Passeromyia* Rodhain & Villeneuve

*Passeromyia* Rodhain & Villeneuve, 1915: 592. Type species: *Muscina heterochaeta* Villeneuve, 1915, by monotypy.

**Diagnosis.** Frons dichoptic in both sexes, broader in female; arista short, with the dorsal plumes longer and sparser than the ventral ones; dorsocentral setae 2+4; prealar seta present; post-alar wall setulose or bare; katapisternals 1+2; metathoracic spiracle large, with no setae on margins; hind tibia with a short calcar.

**Comments.** Two species in the Fiji Islands, their larvae parasitic on nestling birds: *P. indecora* (Walker), otherwise known only from Australia, and *P. veitchi* Bezzi, endemic (Pont 1974).

#### 19. *Passeromyia indecora* (Walker)

*Morellia indecora* Walker, 1858: 215. Holotype female, Australia: New South Wales, in BMNH [Pont, 1974: 358].

*Passeromyia indecora*; Pont, 1974: 358; Pont, 1989: 676.

**Diagnosis.** This is the only species with yellow palpus and hairy eye. A complete description was given by Pont (1974: 358–363).



**Material examined** (FAS). No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FJI: Viti Levu:** Colo-i-Suva, Malaise trap, 3–6 Mar 1963, C.M. Yoshimoto, 1♀ (BPBM) (Pont 1974).

**Comments.** Known from Fiji only from the above female which was recorded by Pont (1974: 361).

**Distribution.** Australia, Fiji

**Biological data.** The haematophagous larvae are subcutaneous parasites of nestlings, but if the nestling dies the larvae are capable of feeding on the carcass until ready to pupate.

### 20. *Passeromyia veitchi* Bezzi

*Passeromyia veitchi* Bezzi, 1928: 183. Holotype female, FJI: Natova, in BMNH [Pont, 1970b: 423].  
*Passeromyia veitchi*; Pont, 1970b: 423; Pont, 1974: 365; Pont, 1989: 676.

**Diagnosis.** This is the only species of the genus to have the wing membrane entirely covered with microtrichia, without bare patches; also eye bare, frons dark brown, ocellar seta short and strong, antenna with pedicel reddish and postpedicel dark brown, one intraalar seta, wing broadly yellow at base.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FJI: Viti Levu:** Natova, 1916, R. Veitch, holotype ♀ (BMNH).

**Comments.** The holotype is still the only known specimen, and it was redescribed by Pont (1974: 365–366). The species is endemic to Fiji.

**Distribution.** Fiji.

**Biological data.** The larvae must be associated with birds, either as endo- or ectoparasites or as scavengers in the nests. It is possible that the species is extinct.

### Genus *Synthesiomyia* Brauer & Bergenstamm

*Synthesiomyia* Brauer & Bergenstamm, 1893: 96, 110, 178. Type species: *Synthesiomyia brasiliiana* Brauer & Bergenstamm, 1893 [= *Cyrtoneura nudiseta* Wulp, 1883], by original designation.

**Diagnosis.** Eye bare; arista with very short hairs; presutural acrostichal setae not differentiated; prealar seta strong; katepimeron and anepimeron bare; dorsocentrals 2+4; katepisternals 1+2; wing veins bare; vein M strongly curved forward apically; lower calypter very enlarged; sternite 1 setulose.

**Comments.** One species: *Synthesiomyia nudiseta* (Wulp), a widespread filth fly in the Old and New World tropics and subtropics.

### 21. *Synthesiomyia nudiseta* (Wulp)

*Cyrtoneura nudiseta* Wulp, 1883: 42. Holotype female, Argentina, NBCL [reported as missing by Pont (1970a) but subsequently found].

*Synthesiomyia brasiliiana* Brauer & Bergenstamm, 1893: 96, 110. Syntypes 6 females, Brazil, in NMW [seen].

*Synthesiomyia nudiseta*; Bezzi, 1928: 179; Bryan, 1931: 403; Emden, 1965: 192; Pont, 1989: 676.

*Synthesiomyia brasiliensis* [sic]; Simmonds, 1928: 17.

**Diagnosis.** Easily distinguished by the reddish orange antenna, bare arista, and reddish orange tip of abdominal tergite 5.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FIJI: Viti Levu:** Lautoka, 15 Mar 1921, R. Veitch, 1♂ (BMNH) (Bezzi 1928); Cuvu, Feb 1918, R. Veitch, 1♂, 1♀ (BMNH); Nadi, 1914, D.S. North, 1♂ (BMNH) (Bezzi 1928); Nadi, 12 Jun 1913, J.F. Illingworth, 1♂ (BPBM).

**Comments.** As this species has not been collected in Fiji for a century, it seems likely that it was introduced from time to time through commercial traffic but failed to establish on a permanent basis.

**Distribution.** Australia, Bonin Is, Easter I., Fiji, French Polynesia (Marquesas, Society Is.), Guam, Hawaiian Is, Lord Howe I., Norfolk I., PNG, Samoa, Tonga, Vanuatu, Wake I.; pan-tropical.

**Biological data.** *Synthesiomyia nudiseta* is a synanthropic species and has importance in forensic entomology. The larva was described by Skidmore (1985: 62–64). Larvae live in many kinds of decaying organic matter, especially mammalian corpses, where they feed semi-carnivorously.

### Phaoniinae

#### Dichaetomyiini

#### Genus *Dichaetomyia* Malloch

*Dichaetomyia* Malloch, 1921: 163. Type species: *Dichaetomyia polita* Malloch, 1921 [preocc., = *Dichaetomyia emdeni* Pont, 1969], by original designation.

**Diagnosis.** *Dichaetomyia* can be recognised by the row of dark setulae along the lower margin of the posterior thoracic spiracle, together with the setulose prosternum and anepimeron. Eyes of male narrowly separated by the diameter of anterior ocellus or more; eyes in female widely separated; proclinate orbital and crossed interfrontal setae absent; arista long-plumose; dorsocentrals 2+2, 3 or 4; prealar seta present; postalar wall with sparse hairs or bare; vein M only slightly curved forwards before apex; hind tibia with a well developed anterodorsal preapical in addition to dorsal one, calcar absent.

**Comments.** There are some 224 species, found throughout the Old World tropics. Of the three species on Fiji, two (*D. elegans* Malloch, *D. taveuniana* Pont & Evenhuis) are endemic but clearly belong to a group of species centered on the Papuan subregion and with a few plesiomorphous representatives in the Oriental Region (*armata*-group: see Pont 1969b: 211); the other (*D. vicaria* (Walker)) is widely distributed in the Malesian area and Australia, and has reached many island groups in the Pacific.

#### 22. *Dichaetomyia elegans* Malloch

(Figs 37–42)

*Dichaetomyia elegans* Malloch, 1928a: 468 [April]. Holotype female, FIJI: Suva, in BMNH [Lee *et al.*, 1956: 315; also seen].

*Dichaetomyia prodigiosa* Bezzi, 1928: 176 [June]. Lectotype male, FIJI: Cuvu, in BMNH [designation by Pont, 1970b: 422].

*Dichaetomyia elegans*; Hinckley, 1963: 17; Pont, 1989: 683.

**Diagnosis.** See key. Male terminalia as in Figs 37–40. Female ovipositor as in Figs 41–42.

**Material examined** (FAS): **FIJI: Kadavu:** 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary, 60 m, 28 May–11 Jun 2003, Malaise 4, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 135140 (♂). **Taveuni:** Cakaudrove prov., 5.6 km SE Tavuki Village, Devo Peak, Malaise trap [15.843, 179.955], 3–10 Jan 2003, 1187 m, Schlinger, Tokota'a, FJTA8a\_M01\_12, FBA 089994 (♂); 1188 m, 30 Jun–14 Aug

2003, Schlinger, Tokota'a, FJTA8b\_M01\_02, FBA 089971 (♀), FBA 089958 (♀); 1064 m, 14–21 Nov 2002, Malaise 1, Schlinger, Tokota'a, 16.843° S, 179.955° W, FBA 129708 (♀), FBA 129709 (♀), FBA 128320 (♀); 5.3 km SE Tavuki Village, Mt. Devo, Malaise 3, E.I. Schlinger, M. Tokota'a, 15.841° S, 179.958° W, FBA 098365 (♂); 31 Jul 2003–14 Mar 2004, Malaise 3, FBA 107682 (♂); 30 Jun–14 Aug 2004, Malaise 3, E.I. Schlinger, M. Tokota'a, FBA 148838 (♀); 2–10 Oct 2002, Malaise 3, FBA 108205 (♀); 31 Oct–14 Nov 2002, FJTAc\_M03\_05, FBA 089169 (♀), FBA 089170 (♀); Mt. Devo, 734 m, Malaise trap [15.831, 179.98]; W Devo Peak Tower, Malaise trap in rain forest, 31 Oct–21 Nov 2002, FJ-8, M Irwin, E. Schlinger, M. Tokota'a, 179.58° E, 15.51° S, 1200, FBA 002576 (♂), FBA 002577 (♀), FBA 002596 (♀); 13–20 Dec 2002, Malaise 1, FBA 120384 (♀); 217 m, 26 Mar–9 Apr 2004, Malaise 3, Schlinger, Tokota'a, 15.855° S, 179.89° E, FBA 145258 (♂), FBA 145251 (♂); **Viti Levu**: Naitasiri Prov., 4 km WSW Colo-i-Suva Village, Mt. Nakobalevu, 325 m, 17 Mar–9 Apr 2003, Malaise 2, Schlinger, Tokota'a, 18.056° S, 178.422° E, FBA 097761 (♀); 372 m, 25 Feb–17 Mar 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 101581 (♂), FBA 094298 (♀), FBA 094303 (♀), FBA 094301 (♀), FBA 094302 (♀), FBA 094304 (♀), FBA 101591 (♂), FBA 101590 (♀), FBA 101580 (♀), FBA 101585 (♀), FBA 101576 (♂), FBA 101577 (♂), FBA 101589 (♂); 4–14 Nov 2003, FBA 096345 (♂), FBA 095315 (♂), FBA 095318 (♂), FBA 095320 (♂), FBA 095317 (♂), FBA 094465 (♀), FBA 094462 (♂), FBA 094450 (♀), FBA 094453 (♀), FBA 094454 (♂), FBA 094451 (♂), FBA 101208 (♂); 145 m, 28 Jun–21 Jul 2004, Malaise 1, Schlinger, Tokota'a, 15.815° S, 178.986° E, FBA 103568 (♂), FBA 103567 (♀); 1.8 km E Navai Village, 700 m, old trail to Mt. Tomaniivi, 7–26 Jan 2004, Malaise 4, Schlinger, Tokota'a, 17.621° S, 177.998° E, FBA 120015 (♀), FBA 120016 (♀), FBA 120008 (♂); 9–20 Dec 2003, FBA 157455 (♀), FBA 157469 (♀), FBA 157460 (♀), FBA 157467 (♂), FBA 157465 (♂), FBA 157459 (♂), FBA 157470 (♂), FBA 157468 (♂); 17.621° S, 177.998° E, FBA 167464 (♀), FBA 167463 (♀), FBA 167457 (♀), FBA 167461 (♀), FBA 167458 (♀), FBA 167462 (♀); 1034 m, 17–20 Nov 2003, Malaise trap, PABITRA, Wabu Baseline Survey, D. Veikori, E.E. Claridge [17.583, 178.083], FJVL12\_M01\_01, FBA 090244 (♀); 2 km E Navai Village, old trail to Mt. Tomaniivi, 700 m, 26 Sep–11 Oct 2003, Malaise 3, Schlinger, Tokota'a, 17.621° S, 178° E, FBA 124608 (♂), FBA 124609 (♀), FBA 124610 (♂); 3.2 km E Navai Village, Veilaselase Track, 1020 m, 26 Jan–13 Feb 2004, Malaise 1, Schlinger, Tokota'a, 17.624° S, 178.000° E, FBA 122514 (♂), FBA 122510 (♀), FBA 122513 (♀), FBA 122504 (♂); 1020 m, 19 Apr–14 May 2004, FBA 155267 (♂), FBA 155264 (♂); 8–24 Nov 2003, FBA 155835 (♂), FBA 155842 (♀), FBA 155836 (♀), FBA 155837 (♀); 3.5 km N Veisari Settlement, logging road to Waivudawa, 14 Feb–8 Mar 2003, Malaise 3, E. Schlinger, M. Tokota'a, 18.068° S, 178.357° E, FBA 138490 (♂), FBA 138491 (♂), FBA 138492 (♂), FBA 138494 (♂), FBA 138495 (♂), FBA 138496 (♀), FBA 138480 (♀), FBA 138498 (♀), FBA 138500 (♂); 372 m, 17 Mar–9 Apr 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 143374 (♂), FBA 143375 (♀), FBA 143376 (♂); Vuda Prov., Koroyanitu Eco Park, 0.5 km N Abaca Village, 800 m, 12–19 Nov 2002, Malaise 1, Schlinger, Tokota'a, 17.567° S, 177.55° E, FBA 109084 (♂); 1 km E Abaca Village, Koroyanitu Nat. Park, 800 m, Savuione Trail, 17.40° S, 177.33° E, 26 Oct–5 Nov 2002, Malaise 1, Schlinger, Tokota'a, FBA 083524 (♀), FBA 083522 (♀), FBA 083327 (♀), FBA 083525 (♀), FBA 083526 (♂); 7–12 Oct 2002, FJVL01\_M01\_02, FBA 081905 (♂), FBA 081096 (♂), FBA 081907 (♀), FBA 081908 (♀); 19–26 Oct 2002, FJVL01\_M01\_04, FBA 088536 (♂), FBA 088513 (♀), FBA 085268 (♂), FBA 088514 (♂); 22 Apr–6 May 2003, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 174795 (♂), FBA 174704 (♀), FBA 174598 (♀), FBA 174702 (♀), FBA 174700 (♀), FBA 174701 (♀), FBA 174723 (♀), FBA 1747171 (♀), FBA 174792 (♀), FBA 174798 (♀), FBA 174793 (♀), FBA 174791 (♀), FBA 174795 (♀), FBA 174797 (♀), FBA 174703 (♀), FBA 174794 (♀), FBA 174699 (♀), FBA 174719 (♀), FBA 174746 (♀), FBA 174755 (♀), FBA 174747 (♂), FBA 174745 (♀), FBA 174745 (♀), FBA 174756 (♀), FBA 174749 (♀), FBA 174744 (♀), FBA 174751 (♀), FBA 174752 (♀), FBA 174753 (♀), FBA 174748 (♀), FBA 174757 (♀), FBA 174750 (♀), FBA 174754 (♀), FBA 174764 (♀); 12–19 Nov 2002, Malaise, Schlinger, Tokota'a, FJVL01\_M01\_07, FBA 083988 (♀), FBA 083987 (♀); 1.5 km SW Vaturu Dam, 550 m, 2–14 Jul 2004, Malaise 1, E.I. Schlinger, M. Tokota'a, 17.744° S, 177.575° E, FBA 135859 (♂), FBA 135877 (♂), FBA 135860 (♂), FBA 135876 (♂), FBA 135861 (♀), FBA 135875 (♂), FBA 135873 (♂), FBA 135874 (♂); 1.0 km SW Vaturu Dam, 550 m, Malaise 3, E.I. Schlinger, M. Tokota'a, 17.754° S, 177.665° E, FBA 175451 (♀), FBA 175448 (♀), FBA 175447 (♀), FBA 175445 (♀), FBA 175446 (♀), FBA 175450 (♀), FBA 175449 (♀), FBA 175454 (♀), FBA 175473 (♀), FBA 175452 (♀), FBA 175453 (♀); Rewa Prov., 4 km NW Lami Town, Mt. Korobaba, 400 m, Malaise trap [18.102, 178.383], 14–22 Jun 2004, Schlinger, Tokota'a, FJVL61b\_M01\_00, FBA 090222 (♂), FBA 090221 (♂), FBA 090223 (♂), FBA 090220 (♂); 13 Dec 2003–14 Jun 2004, Malaise 2, Schlinger, Tokota'a, 15.811° S, 178.988° E, FBA 114656 (♂), FBA 114666 (♀), FBA 114658 (♀), FBA 114657 (♀), FBA 114659 (♀). **Vanua Levu**: Macuata Prov., 0.6 km S Rokosalase Village [16.533, 179.019], 180 m, 22 May–8 Jun 2004, Malaise, Schlinger, Tokota'a, FJVN57c\_M05\_05, FBA 090145 (♀); 0.4 km S Rokosalase Village [16.532, 179.019], 118 m, 23 Apr–8 May 2004, Malaise, Schlinger, Tokota'a, FJVN57c\_M05\_03, FBA 090143 (♂), FBA 090142 (♂), FBA

090141 (♂), FBA 090140 (♂), FBA 090139 (♂); Macuata Prov., Dogotuki, 2.5 km E of Nasavu River [16.252, 179.783], 106–226 m, Malaise trap, 7 Jul 2003, Schlinger, Tokota'a, FJVN91\_M01\_01 FBA 090234 (♂), FBA 090233 (♂); 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 141807 (♂), FBA 141808 (♂), FBA 141809 (♂), FBA 141810 (♂), FBA 141811 (♂), FBA 141812 (♂), FBA 141813 (♂), FBA 141814 (♂), FBA 141815 (♂), FBA 141816 (♂), FBA 141817 (♀); 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 181840 (♂). Other material examined. **Fiji: Ovalau:** Levuka, May 1921, H.W. Simmonds, paralectotype 1♀ of *prodigiosa* (BMNH); Andubangda, 900–1500 ft, 18 July 1938, E.C. Zimmerman, 1♂, 1♀ (BPBM); Wainiloka, 28–30 Sep 1937, J.M. Valentine, 1♀ (BPBM); Levuka, 0–200 m, Dec 1969, N.L.H. Krauss, 1♀ (BPBM). **Vanua Levu:** Sarusavu, Savudrodro Dam, 10 Feb 1971, G.S. Robinson, 1♀ (BMNH); trans-insular road, above summit, Malaise trap, 500–550 m, 6–9 Oct 1979, S.N. Lal, G.A. & S.L. Samuelson, 1♂ (BPBM). **Viti Levu:** no locality, Mus. Godeffroy, no. 17249, 1♂, 1♀ (USNM); Cuvu, 28 Aug 1916, R. Veitch, lectotype ♂ of *prodigiosa* and 1♂ (BMNH); Cuvu, R. Veitch, paralectotype ♀ of *prodigiosa* (MCSNM); 1st Falls, Mt. Evans, 23 Feb 1919, W. Greenwood, paralectotype 1♀ of *prodigiosa* (BMNH); Rewa, Nov 1905, F. Muir, 1♂, 1♀ (BPBM); Suva, 1955, H.W. Simmonds, 1♀ (BMNH); Suva, 20 Dec 1910, P.H. Bahr, holotype ♀ of *elegans* (BMNH); Suva, 22 May 1987, R.A. Beaver, 1♂ (OUMNH); Suva, 30 June 1922, D. Stoner, 1♂, 1♀ (USNM); Mt. Victoria, 1000 m, 4–6 Mar 1978, S. Shinonaga, H. Shima, 11♂, 2♀ (BMNH); Mt. Victoria, trail from Navai, 660–900 m, 2 Jul 1958, B. Malkin, 1♀ (BPBM); 700 m, 25 km N Vatukarasa, 9 Mar 1978, S. Shinonaga, 6♂, 1♀ (BMNH); Nausori Hld, 500 m, 7–8 Mar 1978, S. Shinonaga, 2♂, 3♀ (BMNH); Nausori Highlands, 500–700 m, Nov 1976, N.L.H. Krauss, 1♂, 1♀ (BPBM); 70 km W of Suva, 0–200 m, 2 Mar 1978, H. Kurahashi, 1♂, 1♀ (BMNH); Savura Creek, 15 Jul 1981, R.A. Beaver, 2♀ (OUMNH); Nandarivatu, 2 Mar 1973, N.L.H. Krauss, 1♂, 3♀ (BMNH), 2♂, 3♀ (USNM); Matawailevu, 3–11 Aug 1937, H. St. John, 1♀ (BPBM); Nandarivatu, Oct 1937, J.M. Valentine, 2♂ (BPBM); Nandarivatu, 2700 ft, 10 Sep 1938, E.C. Zimmerman, 1♀ (BPBM); Nandarivatu, at light, 3 Sep 1938, E.C. Zimmerman, 1♂ (BPBM); Nandarivatu, 850–950 m, 2 Apr 1973, N.L.H. Krauss, 2♂, 9♀ (BPBM); Nandarivatu, 850 m, 8–13 Mar 1963, C.M. Yoshimoto, 2♂ (BPBM); Nandarivatu, 18 Aug 1925, W.H. Ford, 1♂ (BPBM); Lami, May 1951, N.L.H. Krauss, 1♂, 2♀ (BPBM); Lami, Nov 1957, N.L.H. Krauss, 2♂ (BPBM); Lami, 0–200 m, Dec 1978 N.L.H. Krauss, 1♀ (BPBM); trail Tayu-Nandrau, 27–29 Jun 1958, B. Malkin, 1♀ (BPBM); 6 miles up Sigatoka valley, 6 Aug 1972, D.E. Hardy, 1♂ (BPBM); Monasavu Cloud Forest, 17°44'38"S, 178°03'10"E, 800 m, 26 Jun 2007, Mann & Slade, 1♂, 3♀ (OUMNH); Walau, May 1922, H.W. Simmonds, paralectotypes of *prodigiosa* 1♂ (MCSNM), and 1♀ (BMNH).

**Comments.** *Dichaetomyia elegans* (and *D. taveuniana*) can be distinguished from *D. vicaria* by the two very broad dark vittae on the scutum and by the abundant setulae all down the lateral margins of the scutellum. It is a much larger and more elongate species than *D. vicaria*. In the male, the mid and hind legs have special modifications consisting of tubercles, protuberances, setae and hairs. The original descriptions of *D. elegans* and *D. prodigiosa* are still adequate for the general features and appearance of this species, and there are excellent figures of the male mid and hind legs (Bezzi 1928: fig. 52, as *prodigiosa*). The appearance of this species is particularly striking because the two broad black vittae on the scutum and scutellum are matt while the yellow area between them is covered with dense yellowish white dust. The male and female genitalia are illustrated in Figs 37–42.

*Dichaetomyia elegans* belongs to the *armata*-group (see Pont 1969b: 211), which includes some 10 described species (and several still undescribed species) mostly from Melanesia.

This striking species (together with *D. taveuniana*) is in a mimicry group together with the lauxaniid *Sapromyza acrotoma* Bezzi and the calliphorid *Melinda elegans* Kurahashi.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology. It has been recorded as prey of the crabronid wasp *Rhopalum* [now *Neodasyproctus*] *veitchii* (Turner) (Hinckley 1963).

### 23. *Dichaetomyia taveuniana* Pont & Evenhuis

*Dichaetomyia taveuniana* Pont & Evenhuis, 2006: 5. Holotype male, Fiji, Taveuni: Devo Peak, 5.3 km SE Tavuki Village, 1064 m, 28 Jan–11 Feb 2005, 16°50'27.4"S, 179°59'4.1"W, Malaise, P. Vodo (FBA 515573–515654), in BPBM.

**Diagnosis.** See key.

**Material examined (FAS): FIJI: Taveuni:** Cakaudrove Prov., 5.6 km SE Tavuki Village, Devo Peak, 1187 m, Malaise trap [15.843, 179.955], 3–10 Jan 2003, E.I. Schlinger, Tokota'a, FJTA8a\_M01\_12, FBA 090022 (♀), FBA 090019 (♂), FBA 090047 (♂), FBA 090020 (♂), FBA 090019 (♂), FBA 090048 (♂), FBA 090028 (♂), FBA 090025 (♂), FBA 090027 (♂), FBA 090045 (♀), FBA 090023 (♂), FBA 090024 (♂), FBA 090029 (♂), FBA 090030 (♂), FBA 090037 (♂), FBA 090038 (♂), FBA 090031 (♂), FBA 090039 (♀), FBA 090017 (♀), FBA 090016 (♂), FBA 090036 (♂), FBA 090015 (♂), FBA 090014 (♂), FBA 090013 (♂), FBA 090012 (♂), FBA 090042 (♀), FBA 090011 (♀), FBA 090001 (♀), FBA 089988 (♀), FBA 089992 (♀), FBA 089993 (♂), FBA 089997 (♂), FBA 089995 (♀), FBA 089996 (♀), FBA 089994 (♂), FBA 089990 (♀), FBA 089989 (♀), FBA 089987 (♂); 892 m, 14–31 Jul 2003, Malaise 4, E.I. Schlinger, M. Tokota'a, 15.837° S, 179.973° W, FBA 151633 (♂), FBA 151634 (♂); 1188 m, 30 Jun–14 Aug 2003, E.I. Schlinger, Tokota'a, FJTA8b\_M01\_02, FBA 089971 (♀), FBA 089958 (♀), FBA 089965 (♀), FBA 089964 (♀), FBA 089963 (♀), FBA 089962 (♀), FBA 089972 (♀), FBA 089973 (♀), FBA 089960 (♀), FBA 089959 (♂), FBA 089961 (♂), FBA 152696 (♂), FBA 152695 (♂), FBA 152698 (♂), FBA 152694 (♂); 1187 m, 31 Oct–14 Nov 2002, E.I. Schlinger, Tokota'a, FJTABA\_M01\_05, FBA 089644 (♀); 1187 m, 20–27 Dec 2002, Malaise, E.I. Schlinger, M. Tokota'a, 15.843° S, 179.966° W, FBA 144824 (♀), FBA 144825 (♂); 1187 m, 21 Nov–13 Dec 2002, Malaise, E.I. Schlinger, M. Tokota'a, 15.843° S, 179.966° W, FBA 149525 (♂), FBA 149527 (♀), FBA 149625 (♂), FBA 149528 (♂), FBA 149524 (♀); 1187 m, 30 Jun–14 Aug 2004, Malaise, E.I. Schlinger, M. Tokota'a, 15.843° S, 179.966° W, FBA 150803 (♂), FBA 150800 (♂), FBA 152700 (♂), FBA 150797 (♀), FBA 150802 (♀), FBA 150798 (♀), FBA 150799 (♀), FBA 150804 (♂), FBA 150807 (♂), FBA 150806 (♀), FBA 150801 (♀); 1064 m, 31 Oct–14 Nov 2002, Malaise 3, Schlinger, M. Tokota'a, 15.841° S, 179.968° W, FBA 149264 (♀), FBA 149265 (♀); 14–21 Nov 2002, Malaise 1, E.I. Schlinger, Tokota'a, 16.843° S, 179.955° W, FBA 129708 (♀), FBA 129709 (♀), FBA 128323 (♀), FBA 128324 (♀), FBA 128330 (♀), FBA 128320 (♀), FBA 126415 (♂); 5.3 km SE Tavuki Village, Mt. Devo, Malaise trap [15.841, 179.958], 1054 m, 14–21 Nov 2003, E.I. Schlinger, Tokota'a, FJTA9c\_M03\_07, FBA 090052 (♂), FBA 090051 (♂), FBA 090057 (♀), FBA 090050 (♂), FBA 090058 (♀), FBA 090049 (♀); 10–17 Oct 2002, E.I. Schlinger, Tokota'a, FJTA9c\_M03\_03, FBA 090098 (♀); 17–24 Oct 2002, Malaise 3, E.I. Schlinger, M. Tokota'a, 15.841° S, 179.958° W, FBA 098365 (♂); 24–31 Oct 2002, FBA 105793 (♂), FBA 105794 (♀); 31 Dec 2003–14 Mar 2004, Malaise 3, FBA 107679 (♂), FBA 107677 (♀), FBA 107680 (♀), FBA 107681 (♀), FBA 107678 (♀), FBA 107676 (♂), FBA 107675 (♀); 30 Jun–14 Jul 2004, Malaise 3, E.I. Schlinger, M. Tokota'a, FBA 148828 (♀), FBA 148838 (♀), FBA 148833 (♂), FBA 148837 (♀), FBA 148826 (♂), FBA 153872 (♀), FBA 148835 (♂), FBA 148827 (♂), FBA 148829 (♀); 2–10 Oct 2002, Malaise 3, FBA 108208 (♂), FBA 108205 (♀); 31 Dec 2003–14 Mar 2004, FBA 108207 (♂); 27 Dec 2002–3 Jan 2003, Malaise 3, E.I. Schlinger, M. Tokota'a, FBA 146262 (♂), FBA 145265 (♀); 3–20 Dec 2002, Malaise 3, E.I. Schlinger, M. Tokota'a, FBA 153873 (♀), FBA 153874 (♀), FBA 153875 (♀), FBA 153876 (♀); Mt. Devo, 734 m, Malaise trap [15.831, 179.98], 14 Jul 2004, E.I. Schlinger, Tokota'a, FJTA9a\_M05\_02, FBA 090115 (♀); 892 m, 31 Jul–14 Aug 2004, Malaise 4, E.I. Schlinger, M. Tokota'a, 15.837° S, 179.973° W, FBA 098997 (♀), FBA 098995 (♂), FBA 098996 (♀), FBA 113183 (♀), FBA 113184 (♀), FBA 113176 (♂); Devo Peak Tower, Malaise trap in rain forest, 31 Oct–21 Nov 2002, FJ–8, M. Irwin, E. Schlinger, M. Tokota'a, 179.58° E, 15.51° S, 1200, FBA 002596 (♀); Soqulu House in Soqulu Estate, 140 m, 14–21 Nov 2002, Malaise 4, E.I. Schlinger, M. Tokota'a, 16.833° S, 180° W, FBA 099880 (♀); 13–20 Dec 2002, Malaise 1, FBA 120384 (♀); 3.2 km NW Lavena Village, Mt. Koronibuabua, 234 m, 11–13 Mar 2004, Malaise 2, Schlinger, Tokota'a, 15.855° S, 179.891° W, FBA 093862 (♂), FBA 093863 (♂), FBA 093854 (♀), FBA 093865 (♀); 24 Oct 2003–Apr 2004, FBA 159958 (♀), FBA 159959 (♀), FBA 159957 (♂), FBA 159956 (♂), FBA 159954 (♂), FBA 159960 (♂); 219 m, 4 Jan–11 Mar 2004, Malaise 4, Schlinger, Tokota'a, 15.855° S, 179.889° W, FBA 124105 (♂); 217 m, 1–24 Feb 2004, Malaise 3, Schlinger, Tokota'a, 15.855° S, 179.8° W, FBA 127508 (♂), FBA 127507 (♂), FBA 127506 (♂), FBA 127505 (♂), FBA 127503 (♂), FBA 127502 (♂), FBA 127509 (♀); 217 m, 24 Oct–4 Nov 2003, Malaise 3, Schlinger, Tokota'a, 15.855° S, 179.89° W, FBA 153688 (♂), FBA 153689 (♀), FBA 153690 (♀); 229 m, 27 Sep–10 Oct 2003, Malaise 5, Schlinger, Tokota'a, 15.856° S, 179.889° W, FBA 153311 (♂), FBA 153313 (♀), FBA 153302 (♂), FBA 153301 (♂), FBA 153303 (♂), FBA 153304 (♂), FBA 153308 (♂), FBA 153312 (♂), FBA 153307



(♂), FBA 153309 (♂), FBA 153310 (♂), FBA 153306 (♂), FBA 153305 (♂). **Vanua Levu:** Bua Prov., Batiqere Range, 6 km NW Kilaka Village, 113 m [16.732, 179], Malaise, 15–28 Jun 2004, Schlinger, Tokota'a, FJVN58d\_M01\_07, FBA 090210 (♀), FBA 090209 (♂), FBA 090208 (♂), FBA 09210 (♀), FBA 090207 (♂), FBA 090206 (♂), FBA 090204 (♂), FBA 090205 (♂); 146 m [15.815, 178.986], 15–28 Jun 2004, Malaise, Schlinger, Tokota'a, FJVN58d\_M01\_07, FBA 090158 (♀), FBA 090160 (♂), FBA 090155 (♀), FBA 090154 (♀), FBA 090151 (♀), FBA 090176 (♀), FBA 090174 (♂), FBA 090173 (♂), FBA 090198 (♂), FBA 090193 (♂), FBA 090192 (♂), FBA 090191 (♂), FBA 090190 (♂), FBA 090175 (♂), FBA 090189 (♀), FBA 090185 (♀), FBA 090158 (♀), FBA 090184 (♂), FBA 090183 (♂), FBA 0901823 (♂), FBA 090181 (♂), FBA 090180 (♂), FBA 090179 (♂), FBA 090187 (♂), FBA 090186 (♂), FBA 090178 (♂), FBA 090177 (♂), FBA 090169 (♂), FBA 090170 (♂), FBA 090171 (♀), FBA 090172 (♂); 6 m [16.807, 178.991], Malaise, 15–24 Jun 2004, Schlinger, Tokota'a, FJVN58b\_M05\_07, FBA 090213 (♀), FBA 090214 (♂), FBA 090215 (♀), FBA 090211 (♂); 146 m, 28 Jun–21 Jul 2004, Malaise 1, Schlinger, Tokota'a, 168.15° S, 178.986° E, FBA 104939 (♂), FBA 104943 (♀), FBA 104942 (♀), FBA 104955 (♂), FBA 104948 (♂), FBA 104947 (♂), FBA 104951 (♂); Macuata Prov., Dogotuki, 98 m [15.807, 178.991], Malaise, 15–24 Jun 2004, Schlinger, Tokota'a, FJVN58b\_M05\_07, FBA 090212 (♀); 98 m, 3–10 Jun 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 093859 (♂), FBA 093873 (♂), FBA 093876 (♀), FBA 093877 (♂); 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 181840 (♂); 145 m, 28 Jun–21 Jul 2004, Malaise 1, Schlinger, Tokota'a, 15.815° S, 178.985° E, FBA 104953 (♂), FBA 104952 (♂), FBA 104941 (♂), FBA 104940 (♂), FBA 104950 (♂), FBA 104949 (♂), FBA 104944 (♂), FBA 104945 (♂); 51 m, 3–10 Jun 2004, Malaise 3, Schlinger, Tokota'a, 15.811° S, 178.988° E, FBA 114977 (♂), FBA 114995 (♀), FBA 114978 (♂), FBA 114982 (♂), FBA 114983 (♂), FBA 114979 (♂), FBA 114997 (♀), FBA 114992 (♀), FBA 114998 (♂), FBA 115003 (♀), FBA 115002 (♀), FBA 114980 (♂), FBA 114995 (♂), FBA 114991 (♂), FBA 114985 (♂), FBA 114990 (♂), FBA 114378 (♂), FBA 114377 (♀), FBA 114378 (♀), FBA 114375 (♀), FBA 114393 (♂), FBA 114383 (♀), FBA 114412 (♀), FBA 114395 (♀), FBA 114396 (♂), FBA 114397 (♂), FBA 114398 (♂), FBA 114399 (♂), FBA 114400 (♀), FBA 114393 (♂), FBA 114401 (♂), FBA 114379 (♂), FBA 114380 (♂), FBA 114381 (♂), FBA 114382 (♂), FBA 114384 (♂), FBA 114402 (♀), FBA 114403 (♀), FBA 114404 (♀), FBA 114394 (♂), FBA 114390 (♂), FBA 114385 (♂), FBA 114387 (♀), FBA 114389 (♂), FBA 114391 (♂).

**Comment.** This striking species (together with *D. elegans*) is in a mimicry group together with the lauxaniid *Sapromyza acrotoma* Bezzi and the calliphorid *Melinda elegans* Kurahashi.

**Distribution.** Known only from Fiji; previously known only from Taveuni Island, and newly recorded here from Vanua Levu.

**Biological data.** Nothing is known of the habits and biology.

#### 24. *Dichaetomyia vicaria* Walker

*Aricia vicaria* Walker, 1859a: 130. Holotype female, Indonesia, Kai I., in BMNH [Pont 1966: 98].

*Spilogaster rufa* Stein, 1900: 132. Lectotype male, Papua New Guinea: Friedrich-Wilhelm-Hafen [= Madang], in ZMHU [designated by Pont 1969a: 88].

*Dichaetomyia rufa* Stein var. *personata* Bezzi, 1928: 176. Lectotype male, Fiji: Suva, in BMNH [designation by Pont 1969b: 242].

*Dichaetomyia rufa*; Malloch, 1925a: 326.

*Dichaetomyia rufa* var. *personata*; Malloch, 1929b: 171.

*Dichaetomyia vicaria*; Pont, 1969b: 242; Pont, 1989: 684.

**Diagnosis.** *Dichaetomyia vicaria* can be distinguished from *D. elegans* and *D. taveuniana* by the entirely yellow thorax and the absence of setulae on the lateral margins of the scutellum. It is a smaller stouter species than these two, and the male mid and hind legs have no special modifications.

**Material examined (FAS): FIJI: Kadavu:** 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary, 60 m, 23 Oct–19 Dec 2003, Malaise 4, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 116668 (♀), FBA 116613 (♀), FBA 116588 (♀), FBA 116587 (♀), FBA 116586 (♀), FBA 116585 (♀), FBA 116584 (♀), FBA 116583 (♀), FBA 116582 (♀), FBA 116603 (♀), FBA 116602 (♀), FBA 116601 (♀), FBA 116599



(♀), FBA 116597 (♀), FBA 116595 (♀), FBA 116593 (♀), FBA 116606 (♀), FBA 116605 (♀), FBA 116604 (♀), FBA 116594 (♀), FBA 116600 (♀), FBA 116598 (♀), FBA 116592 (♀), FBA 116591 (♀), FBA 116525 (♀), FBA 116595 (♀), FBA 116590 (♀), FBA 116524 (♀), FBA 116612 (♀), FBA 116615 (♀), FBA 116611 (♀), FBA 116617 (♀), FBA 116616 (♀), FBA 116609 (♀), FBA 116626 (♀), FBA 116614 (♀), FBA 116608 (♀), FBA 116607 (♀), FBA 116610 (♀), FBA 116618 (♀), FBA 116619 (♀), FBA 116620 (♀), FBA 116621 (♀), FBA 116622 (♀), FBA 116623 (♀), FBA 116650 (♀), FBA 116648 (♀), FBA 116633 (♀), FBA 116632 (♀), FBA 116631 (♀), FBA 116630 (♀), FBA 116647 (♀), FBA 116629 (♀), FBA 116628 (♀), FBA 116642 (♀), FBA 116751 (♀), FBA 116589 (♀), FBA 116635 (♀), FBA 116634 (♀), FBA 116636 (♀), FBA 116641 (♀), FBA 116640 (♀), FBA 116639 (♀), FBA 116638 (♀), FBA 116637 (♀), FBA 116627 (♀), FBA 116651 (♀), FBA 115549 (♀), FBA 115545 (♀), FBA 115544 (♀), FBA 115543 (♀), FBA 116562 (♀), FBA 116561 (♀), FBA 116559 (♀), FBA 116558 (♀), FBA 116553 (♀), FBA 116570 (♀), FBA 116556 (♀), FBA 116554 (♀), FBA 116552 (♀), FBA 116557 (♀), FBA 116555 (♀), FBA 116550 (♀), FBA 116563 (♀), FBA 116564 (♀), FBA 116565 (♀), FBA 116566 (♀), FBA 116567 (♀), FBA 116568 (♀), FBA 116648 (♀), FBA 116579 (♀), FBA 116572 (♀), FBA 116571 (♀), FBA 116574 (♀), FBA 116573 (♀), FBA 116575 (♂), FBA 116578 (♀), FBA 116581 (♀), FBA 116559 (♀), FBA 116576 (♀), FBA 116577 (♀), FBA 116707 (♂), FBA 116701 (♀), FBA 116705 (♀), FBA 116704 (♀), FBA 116709 (♀), FBA 116703 (♀), FBA 116711 (♀), FBA 116712 (♂), FBA 116724 (♀), FBA 116580 (♀), FBA 116710 (♂), FBA 116702 (♀), FBA 1166723 (♀), FBA 116660 (♀), FBA 130411 (♂), FBA 130410 (♀); 16 Jan–1 Feb 2004, FBA 132661 (♀); 2 May–28 Jul 2004, FBA 172475 (♀), FBA 172503 (♀), FBA 172502 (♀), FBA 172472 (♀), FBA 172474 (♀); 9–15 Feb 2003, FBA 140019 (♀), FBA 140033 (♀), FBA 140034 (♂), Malaise 2, 130400 (♀); 7 Mar–11 Apr 2004, Malaise 3, Schlinger, Tokota'a, 19.078°S, 178.121°E, FBA 111750 (♀), FBA 111747 (♂), FBA 111749 (♂), FBA 111737 (♀), FBA 111738 (♀), FBA 111727 (♀), FBA 111748 (♀), FBA 111736 (♀), FBA 111743 (♀), FBA 111752 (♀), FBA 111741 (♀), FBA 111739 (♀), FBA 111753 (♀), FBA 111719 (♂), FBA 111716 (♀), FBA 111735 (♂), FBA 111734 (♀), FBA 111705 (♀), FBA 111708 (♂), FBA 111717 (♂), FBA 111731 (♂), FBA 169348 (♀), FBA 169361 (♀), FBA 169358 (♀), FBA 169366 (♀), FBA 168347 (♂), FBA 169363 (♂), FBA 169362 (♂); Malaise 4, Schlinger, Tokota'a, 19.078°S, 178.121°E, FBA 169354 (♀), FBA 169350 (♀), FBA 169359 (♀), FBA 169349 (♀), FBA 169357 (♀); [19.078, 178.121], 9–16 Feb 2004, Malaise, E.I. Schlinger, Tokota'a, FJKV41a\_M04\_08, FBA 090123 (♂), FBA 090128 (♂), FBA 090130 (♂), FBA 090129 (♀), FBA 090124, 090122 (♂), FBA 159353 (♀), FBA 159354 (♀), FBA 159355 (♀), FBA 159351 (♀), FBA 159352 (♀), FBA 159350 (♀), FBA 159363 (♀), FBA 159343 (♀); 19 Dec 2003–18 Jan 2004, Malaise, Schlinger, Tokota'a, 19.04.39°S, 178.07.15°E, FJKV41a\_M04\_15, FBA 087197 (♀), FBA 087198 (♀), FBA 087208 (♀), FBA 087207 (♀), FBA 087200 (♀), FBA 087206 (♀), FBA 087197 (♀), FBA 087199 (♂); Solodamu, 25 Aug–23 Oct 2003, FJ41D Malaise in coastal limestone forest, M. Irwin, E. Schlinger, M. Tokota'a, 178.07°E, 19.04°S, 128 m, FBA 000670 (♀), FBA 000680 (♀), FBA 000684 (♀), FBA 000687 (♀), FBA 000667 (♀), FBA 000681 (♀), FBA 000685 (♀), FBA 000686 (♀), FBA 000678 (♀), FBA 000683 (♀). **Taveuni:** Cakaudrove Prov., Soqulu House in Soqulu estate, 140 m, 13–12 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 18.833°S, 180°W, FBA 12074 (♀), FBA 12075 (♀); 3.2 km NW Lavena Village, Mt. Koronibuabua, 235 m, 5–17 Jun 2004, Malaise 1, Schlinger, Tokota'a, 15.855°S, 179.892°W, FBA 123140 (♂), FBA 123148 (♀), FBA 123142 (♀), FBA 123141 (♀), FBA 123139 (♂), FBA 123138 (♀), FBA 123137 (♀), FBA 123131 (♂), FBA 123130 (♂), FBA 123129 (♀), FBA 123128 (♀), FBA 123127 (♀), FBA 123125 (♂), FBA 123126 (♀), FBA 123154 (♂), FBA 1123136 (♀), FBA 123135 (♂), FBA 123133 (♀), FBA 123132 (♀), FBA 1123121 (♀), FBA 123120 (♂), FBA 123124 (♂), FBA 123123 (♂), FBA 123134 (♀), FBA 123144 (♀), FBA 123153 (♀), FBA 123122 (♂), FBA 123145 (♀), FBA 123155 (♂), FBA 123156 (♂), FBA 123140 (♀), FBA 123151 (♀), FBA 123150 (♂), FBA 123147 (♀). **Viti Levu:** Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4847], 6–17 Apr 2004, E.I. Schlinger, Tokota'a, FJVL6b\_M02\_19, FBA 089772 (♂), FBA 089771 (♀), FBA 089770 (♀), FBA 089776 (♀), FBA 089760 (♀), FBA 089769 (♀), FBA 089768 (♀), FBA 089762 (♀), FBA 089767 (♂), FBA 089761 (♀), FBA 089764 (♂), FBA 789759 (♂), FBA 089765 (♀), FBA 089758 (♀), FBA 089757 (♀), FBA 089756 (♂), FBA 089755 (♂), FBA 089754 (♀), FBA 089775 (♀), FBA 089773 (♀), FBA 089776 (♂), FBA 089763 (♀), FBA 089774 (♀), FBA 089777 (♂), FBA 089778 (♀), FBA 089779 (♀), FBA 089780 (♂), FBA 089781 (♀), FBA 089783 (♀), FBA 089784 (♀), FBA 089788 (♀), FBA 089796 (♂), FBA 089789 (♀), FBA 089791 (♂), FBA 089790 (♀), FBA 089787 (♀); 15 Dec 2003–13 Jan 2004, FJVL6b\_M02\_17, FBA 089918 (♀), FBA 089888 (♀), FBA 089891 (♀), FBA 089898 (♂), FBA 089944 (♀), FBA 089872 (♀), FBA 089873 (♀), FBA 089874 (♀), FBA 089875 (♀), FBA 089876 (♀), FBA 089877 (♀), FBA 089878 (♀), FBA 089887 (♀), FBA 089886 (♀), FBA 089885 (♂), FBA 089879 (♀), FBA 089871 (♀), FBA 089883 (♀), FBA 089882 (♀), FBA 089881 (♀), FBA 089880 (♀), FBA 089911 (♀), FBA 089912 (♀), FBA 089920 (♂), FBA 089919 (♀), FBA 089910 (♀), FBA 089916 (♀), FBA 089909 (♀), FBA 089901 (♂), FBA 089897 (♀), FBA 089905 (♂), FBA 089899 (♀), FBA 089913 (♂), FBA 089914 (♀), FBA

089904 (♂), FBA 089906 (♀), FBA 089900 (♂), FBA 089907 (♀), FBA 089908 (♀), FBA 089915 (♀), FBA 089917 (♂), FBA 089893 (♂); 14–22 Dec 2002, FJVL6b\_M02\_03, FBA, 089819 (♂), FBA 089833 (♀), FBA 089826 (♀), FBA 089824 (♀), FBA 089825 (♀), FBA 089823 (♀), FBA 089822 (♀), FBA 089818 (♀), FBA 089821 (♀), FBA 089835 (♀), FBA 089831 (♀), FBA 089829 (♀), FBA 089828 (♂), FBA 089862 (♀), FBA 089834 (♀), FBA 089830 (♂), FBA 089827 (♀), FBA 089863 (♂), FBA 089861 (♂); 17–29 Apr 2004, E.I. Schlinger, Tokota'a, FJVL6b\_M02\_20, FBA 089942 (♀); 23 Sep–8 Oct 2002, FJVL6b\_M03\_01, FBA 089681 (♀), FBA 089692 (♀), FBA 089691 (♂), FBA 089690 (♂), FBA 089677 (♂), FBA 089680 (♀), FBA 089679 (♂), FBA 089678 (♀), FBA 089676 (♀), FBA 089689 (♂), FBA 089675 (♂), FBA 089674 (♂), FBA 089673 (♂), FBA 089672 (♂), FBA 089688 (♂), FBA 089687 (♂), FBA 089686 (♂), FBA 089685 (♂), FBA 089671 (♂), FBA 089684 (♂), FBA 089670 (♂), FBA 089683 (♂), FBA 089749 (♀), FBA 089736 (♀), FBA 089735 (♀), FBA 089748 (♀), FBA 089734 (♀), FBA 089746 (♀), FBA 089732 (♀), FBA 089730 (♀), FBA 089728 (♂), FBA 089742 (♂), FBA 089741 (♀), FBA 089745 (♂), FBA 089747 (♂), FBA 089743 (♂), FBA 089740 (♀), FBA 089739 (♂), FBA 089731 (♂), FBA 089751 (♂), FBA 089661 (♀), FBA 089665 (♀), FBA 089660 (♀), FBA 089666 (♀), FBA 089667 (♀), FBA 089662 (♀), FBA 089663 (♀), FBA 089744 (♀), FBA 08973 (♀), FBA 089750 (♀), FBA 089699 (♀), FBA 089700 (♂), FBA 089701 (♀), FBA 089702 (♀), FBA 089703 (♂), FBA 089668 (♀), FBA 089737 (♀), FBA 089698 (♂), FBA 089697 (♀), FBA 089696 (♂), FBA 089752 (♀), FBA 089753 (♀); 14–22 Dec 2002, FJ6B, 177.30° E, 18.10° S, 100 m, FBA 002574 (♀); 0.8 km SSW Volivoli Village, 25 m, Malaise trap [18.1667, 177.4851], 3–13 Dec 2003, E.I. Schlinger, Tokota'a, FJVL5a\_M04\_27, FBA 089925 (♀), FBA 089921 (♀), FBA 089922 (♀), FBA 089929 (♀), FBA 089928 (♀), FBA 089927 (♂), FBA 089926 (♀), FBA 089925 (♀), FBA 089924 (♂); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 26 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118746 (♂), FBA 118739 (♂), FBA 118730 (♀), FBA 118738 (♀), FBA 118737 (♀), FBA 118767 (♂), FBA 118741 (♀), FBA 118740 (♀), FBA 118742 (♂), FBA 118733 (♀), FBA 118736 (♀), FBA 118731 (♂), FBA 118727 (♀), FBA 118744 (♀), FBA 118747 (♀), FBA 118748 (♀), FBA 118759 (♂), FBA 118753 (♀), FBA 118754 (♀), FBA 118756 (♂), FBA 118758 (♀), FBA 118749 (♂), FBA 118725 (♂), FBA 118726 (♂), FBA 118734 (♂), FBA 118728 (♀), FBA 118743 (♀), FBA 118745 (♀), FBA 118764 (♀), FBA 118729 (♀), FBA 118732 (♂); Vuda Prov., Koroyanitu Eco Park, 1 km E Abaca Village, Koroyanitu Nat. Park, 800 m, 17.667° S, 177.55° E, 22 Apr–6 Jun 2003, Malaise 1, Schlinger, Tokota'a, FBA 174721 (♂). Other material examined. **Fiji**: no locality, Jun, D. Stoner, 3♂ (USNM). **Kadavu**: Wai Salima, 28 Apr 1941, N.L.H. Krauss, 1♀ (BPBM); 30 Apr 1941, 2♀ (BPBM). **Lai**: Mothe, 16 Aug 1924, E.H. Bryan, 1♀ (BPBM). **Lau**: Oneata, 19 Aug 1924, E.H. Bryan, 1♀ (BPBM); Vanua, Mbalavu, 24 Sep 1924, E.H. Bryan, 1♀ (BPBM); Mango, 18 Sep 1924, E.H. Bryan, 1♀ (BPBM); Kambara, 24 Aug 1924, E.H. Bryan, 2♀ (BPBM); Kambara, 25 Aug 1924, E.H. Bryan, 1♂, 4♀ (BPBM); Kambara, Naikeleyaga, 0–100 m, 22 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Ongea, 18 Jul 1924, E.H. Bryan, 1♀ (BPBM); Ongea, 31 Jul 1924, E.H. Bryan, 2♀ (BPBM); Thithia, 16 Sep 1924, E.H. Bryan, 1♀ (BPBM); Avea, 22 Sep 1924, E.H. Bryan, 1♀ (BPBM); Namuka, 12 Aug 1924, E.H. Bryan, 1♀ (BPBM); Komo, 21 Aug 1924, E.H. Bryan, 1♀ (BPBM); Tuvunasithi, 28 Aug 1924, E.H. Bryan, 1♀ (BPBM); Fulanga, 6 Aug 1924, E.H. Bryan, 1♀ (BPBM); Tuvutha, 10 Sep 1924, E.H. Bryan, 1♀ (BPBM); Tuvutha, 11 Sep 1924, E.H. Bryan, 1♀ (BPBM); **Vanua Mbalavu**: Nabavatu, 0–150 m, 15 Feb 1970, N.L.H. Krauss, 1♀ (BPBM); Loma Loma, 0–100 m, 14 Feb 1970, N.L.H. Krauss, 1♀ (BPBM). **Ovalau**: Wainiloka, 28–30 Sep 1937, J.M. Valentine, 5♀ (BPBM); Andubangda, 900–1500 ft, 18 Jul 1938, E.C. Zimmerman, 1♂, 1♀ (BPBM); Draiba trail, 600–800 ft, 8 Jul 1938, E.C. Zimmerman, 1♀ (BPBM); Levuka, 0–150 m, Mar 1969, N.L.H. Krauss, 3♂, 15♀ (BPBM), 1♂, 1♀ (BMNH); Levuka, 0–100 m, Nov 1975, N.L.H. Krauss, 1♀ (BPBM); Levuka, 0–200 m, Dec 1969, N.L.H. Krauss, 6♂, 1♀ (BPBM); Levuka, 0–200 m, Feb 1972, N.L.H. Krauss, 1♀ (BPBM); Levuka, 0–200 m, Dec 1978, N.L.H. Krauss, 1♀ (BPBM). **Taveuni**: Waiyevo, 0–100 m, Jan 1972, N.L.H. Krauss, 2♂, 2♀ (BPBM). **Totoya**: 16 Jul 1924, E.H. Bryan, 1♀ (BPBM); Tova, 19 Feb 1971, N.L.H. Krauss 1♀ (BPBM). **Vanua Levu**: Navakuru to Nakawanga, 7 Oct 1955, J.L. Gressitt, 1♀ (BPBM); Savusavu, 0–100 m, Mar 1978, N.L.H. Krauss, 3♂, 1♀ (BPBM), 2♂ (USNM). **Viti Levu**: Suva, 8 Sep 1920, H.W. Simmonds, lectotype ♂ of *personata* (BMNH); Natova, Nadi, Sep 1914, R. Veitch, paralectotype 1♀ of *personata* (BMNH); Natova, R. Veitch, paralectotype 1♂ of *personata* (MCSNM); Suva, 24 Mar 1924, H.W. Simmonds, 1♀ (BMNH) (Pont 1969b); Suva Bay, 9 Jun 1924, E.H. Bryan, 1♀ (BPBM); Lami, 1920 C.E. Pemberton, 1♀ (BPBM); Nandi, 6–7 Dec 1958, C.R. Joyce, 1♀ (BPBM); Nandi, Feb 1945 (no collector), 1♂, 1♀ (USNM); Nandarivatu, 2 Mar 1973, N.L.H. Krauss, 2♀ (BMNH); Raki Raki, Jan 1955, N.L.H. Krauss, 1♀ (BPBM). **Wakaya**: 17 Oct 1924, E.H. Bryan, 1♂, 2♀ (BPBM).

**Comments.** The species has been described, with illustrations of the male genitalia, by Pont (1969b: 242, figs. 1, 9, 11, 13, 72, 75, 78).

**Distribution.** *Dichaetomyia vicaria* is widely distributed from Sabah and the Philippines eastwards through Melanesia and into the Pacific (to Tokelau, Samoa, Niue). Previously recorded by Pont (1969b) from Ovalau, Taveuni, Kadavu. *D. vicaria* belongs to the *vicaria*-group (see Pont 1969b: 230), which includes some 14 species in the Oriental, Australian and Oceanian regions. It is the most widespread species of the group.

**Biological data.** Little is known of its habits, and nothing of the biology.

### Mydaeinae

#### Genus *Myospila* Rondani

*Myospila* Rondani, 1856: 91. Type species: *Musca mediatubunda* Fabricius, 1781, by original designation.

**Diagnosis.** Male dichoptic (in Fijian species); female frontal vitta without crossed setae; only 1 pair of reclinate orbitals in both sexes; arista plumose; intraalar 2; dorsocentrals 2+3 (in Fijian species); prealar minute; postalar ridge, suprasquamal ridge, prosternum, anepimeron and meron bare; katepisternals 1+2; posterior spiracle bare on margins; vein M hardly inclined forward towards vein R<sub>4+5</sub> before apex; vein R<sub>4+5</sub> with a few setulae at base on both wing surfaces; hind tibia without calcar; sternite 1 bare.

**Comments.** The larvae are obligate carnivores and live in mammal dung, rotting fruit and the diseased parts of plants. Only one species recorded from Fiji, *M. effeminata* Vockeroth, endemic (Vockeroth 1972).

#### 25. *Myospila effeminata* Vockeroth

*Myospila effeminata* Vockeroth, 1972: 109. Holotype male, FIJI: Viti Levu, Nandarivatu, in BPBM.

*Myospila effeminata*; Pont, 1989: 689.

**Diagnosis.** Delicate yellowish species; male frons nearly as broad as that of the female and with the same frontal bristling; antenna broad and long, reaching oral margin (Vockeroth, 1972, Fig. 101); palpus yellow; thorax yellow, disc of scutum dark medially in male, brownish yellow in female, with two broad grey vittae; legs yellow; ovipositor as in Fig. 126 of Vockeroth (1972).

**Material examined (FAS): FIJI: Kadavu:** 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary, 60 m, 23 Oct–19 Dec 2003, Malaise 4, Schlinger, Tokota'a, 19.078°S, 178.121°E, FBA 116657 (♀), FBA 130407 (♂); 29 May–13 Jun 2003, FBA 135031 (♀); 7 Mar–11 Apr 2004, FBA 159342 (♀), FBA 159370 (♀), FBA 159344 (♀), FBA 159356 (♀); Kadavu Prov., 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary [19.078, 178.121], 50 m, 9–15 Feb 2004, Malaise, Schlinger, Tokota'a, FJKV41a\_M04\_08, FBA 090125 (♂), FBA 090127 (♂); 25 Aug–23 Oct 2003, FBA 090135 (♂); Solodamu, 25 Aug–23 Oct 2003, FJ-41D, Malaise in coastal limestone forest, M. Irwin, E. Schlinger, M. Tokota'a, 178.07° E, 19.04° S, 128 m, FBA 000680 (♀), FBA 000676 (♀), FBA 0006820 (♀), FBA 000665 (♀), FBA 000672 (♀), FBA 000671 (♀), FBA 000698 (♀), FBA 000691 (♀), FBA 000702 (♂), FBA 000699 (♂), FBA 000700 (♂), FBA 000690 (♂), FBA 000675 (♂), FBA 000695 (♂), FBA 000701 (♂), FBA 000679 (♂). **Taveuni:** Cakaudrove Prov., 5.6 km SE Tavuki Village, Devo Peak [15.843, 179.955], 1187 m, Malaise trap, 3–10 Jan 2003, E.I. Schlinger, M. Tokota'a, FJTA8a\_M01\_012, FBA 0900413 (♀), FBA 090040 (♀); Devo Peak Tower, Malaise trap in rain forest, 31 Oct–21 Nov 2002, FJ-8, M. Irwin, E. Schlinger, M. Tokota'a, 179.58° E, 15.51° S, 1200 m, FBA 002575 (♀), FBA 002578 (♀). **Vanua Levu:** Bua Prov., Batiqere Range, 6 km NW Kilaka Village, 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 141841 (♀). **Viti Levu:** Vuda Prov. Koroyanitu Nat. Park, 1 km E Abaca Village, 800 m, 22 Apr–6 May 2003, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 174778 (♂), FBA 174768 (♂), FBA 174708 (♀), FBA 174713 (♀), FBA 174712 (♀), FBA 174705 (♀), FBA 174711 (♀), FBA 174718 (♀), FBA 174722 (♀), FBA 174720 (♀), FBA 174728 (♀), FBA 174736 (♀), FBA 174733 (♀), FBA 174732 (♀), FBA 174731 (♀), FBA 174735 (♀), FBA 174737 (♀), FBA 174730 (♀), FBA 100333 (♀), FBA 100319 (♀), FBA 100315 (♀), FBA 100331 (♀), FBA 100313 (♀), FBA 100328 (♀).

FBA 100329 (♀), FBA 100323 (♀), FBA 100327 (♀), FBA 100312 (♀), FBA 100310 (♀), FBA 100302 (♀), FBA 100311 (♀), FBA 100305 (♀), FBA 100322 (♀), FBA 100317 (♀), FBA 100309 (♀), FBA 100315 (♀), FBA 100324 (♀), FBA 100301 (♀), FBA 100303 (♀), FBA 100321 (♀), FBA 100332 (♀), FBA 100295 (♂), FBA 100330 (♂), FBA 100300 (♂), FBA 174738 (♂), FBA 100320 (♂), FBA 100326 (♂), FBA 100307 (♂), FBA 100293 (♂), FBA 174740 (♂), FBA 174739 (♂), FBA 174734 (♂), FBA 174742 (♂), FBA 174729 (♂), FBA 100314 (♂), FBA 174760 (♀), FBA 174765 (♀), FBA 174767 (♀), FBA 174766 (♀), FBA 174763 (♀), FBA 174762 (♀), FBA 174761 (♀), FBA 174759 (♀), FBA 174758 (♀), FBA 174783 (♀), FBA 174784 (♀), FBA 174782 (♀), 19–26 Nov 2002, FBA 176156 (♀), FBA 176157 (♀), FBA 176170 (♀), FBA 176169 (♀), FBA 176140 (♀), FBA 176164 (♀), FBA 176159 (♀), FBA 176161 (♀), FBA 176130 (♀), FBA 176171 (♀), FBA 176158 (♀), FBA 176162 (♀), FBA 176155 (♀), FBA 176160 (♀), FBA 176172 (♀), FBA 176129 (♀), FBA 176128 (♀), FBA 176131 (♀), FBA 176133 (♀), FBA 176134 (♀), FBA 176135 (♀), FBA 176136 (♀), FBA 176132 (♀), FBA 088525 (♀), FBA 085269 (♀), FBA 085270 (♀), FBA 085271 (♀), FBA 085275 (♀); 1 km E Abaca Village, Koroyanitu Nat. Park, 800 m, Kokabula Trail, 17.40° S, 177.33° E, 12–19 Nov 2002, Malaise, Schlinger, Tokota'a, FJVL02\_M01\_07, FBA 085300 (♀), FBA 085299 (♀), FBA 085298 (♀), FBA 0853010 (♀), FBA 085302 (♀), FBA 085303 (♀), FBA 085308 (♀), FBA 085306 (♀), FBA 085305 (♂); Savuione Trail, 17°40' S, 177°35' E, 26 Oct–5 Nov 2002, Malaise, Schlinger, Tokota'a, FJVL01\_M01\_05, FBA 083528 (♀), FBA 083523 (♀); 0.5 km N Abaca Village, 800 m, 12–19 Nov 2002, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 109082 (♀), FBA 109083 (♀), FBA 109079 (♀), FBA 109085 (♀), FBA 109075 (♀), FBA 109074 (♀), FBA 109076 (♀); Naitasiri Prov., 1.8 km E Navai Village, 700 m, old trail to Mt. Tomaniivi, 9–20 Dec 2003, Malaise 4, Schlinger, Tokota'a, 17.621° S, 177.998° E, FBA 157450 (♀), FBA 157449 (♀), FBA 157448 (♀), FBA 157451 (♀), FBA 157452 (♀), FBA 157456 (♀), FBA 157444 (♀), FBA 157447 (♀), FBA 157446 (♀), FBA 157445 (♀), FBA 157455 (♀), FBA 157453 (♀), FBA 157454 (♂); 3.2 km E Navai Village, Veilaselase Track, 1020 m, 26 Jan–13 Feb 2004, Malaise 1, Schlinger, Tokota'a, 17.624° S, 178.000° E, FBA 122505 (♀), FBA 122503 (♀), FBA 122522 (♀); 19 Apr–14 May 2004, FBA 155265 (♀), FBA 155268 (♀), FBA 155266 (♀); Naitasiri Prov., 1.8 km E Navai Village, old trail to Mt. Tomaniivi, 700 m, 7–26 Jan 2004, Malaise 4, Schlinger, Tokota'a, 17.621° S, 177.998° E, FBA 120010 (♀), FBA 120012 (♀), FBA 120014 (♀); 4 km WSW Colo-i-Suva Village, Mt. Nakobalevu, 325 m, 4–14 Nov 2003, Malaise 2, Schlinger, Tokota'a, 18.055° S, 178.422° E, FBA 140754 (♀); 372 m, 17 Mar–9 Apr 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 143378 (♀), FBA 143377 (♀), FBA 143379 (♀); 4–14 Nov 2003, FBA 096347 (♀), FBA 096346 (♀), FBA 096344 (♀); 25 Feb–17 Mar 2003, FBA 101578 (♀); 9–30 May 2003, FBA 094300 (♀), FBA 094297 (♀); Rewa Prov., 4 km NW Lami Town, Mt. Korobaba, 400 m, Malaise trap [18.102, 178.383], 14–22 Jun 2004, Schlinger, Tokota'a, FJVL61b\_M01\_00, FBA090224 (♀); 3.5 km N Veisari Settlement, logging road to Waivudawa, 14 Feb–8 Mar 2003, Malaise 3, E.I. Schlinger, M. Tokota'a, 18.068° S, 178.357° E, FBA 138499 (♀), FBA 138497 (♀); 3.8 km N Veisari Settlement, logging road to Waivudawa, 12 Dec 2002–3 Jan 2003, 300 m, Malaise 2, Schlinger, Tokota'a, 18.079° S, 178.363° E, FBA 177387 (♂); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 26 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118771 (♀); 5–22 Jun 2003, Malaise 2, FBA 108485 (♂); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4947], 23 Sep–8 Oct 2002, Schlinger, Tokota'a, FJVL6b\_M03\_01, FBA 089733 (♂); 1.5 km SW Vaturu Dam, 520 m, 2–14 Jul 2004, Malaise 3, E.I. Schlinger, M. Tokota'a, 17.754° S, 177.665° E, FBA 175469 (♀), FBA 175468 (♀), FBA 175467 (♀), FBA 175454 (♀), FBA 175470 (♀), FBA 175471 (♀). Other material examined.

**Fiji: Viti Levu:** Lami, 1920, C.E. Pemberton, 1 ♀ paratype (BPBM); Mt. Victoria, 1000 m, 4–6 Mar 1978, S. Shinonaga, 1 ♀ (BMNH); Navai, 700–800 m, 29 Sep 1970, N.L.H. Krauss, 1 ♀ (BPBM); Navai, 700–800 m, 10 Feb 1971, N.L.H. Krauss, 1 ♀ (BPBM); Korotonga, 0–100 m, Mar 1981, N.L.H. Krauss, 1 ♀ (BPBM).

**Comments.** Vockeroth (1972) gave a detailed discussion of the characters of the head structure, including the possible functional significance of a broad male frons and enlarged antenna among the Muscidae.

**Distribution.** Endemic to Fiji.

**Biological data.** Nothing is known of the habits and biology.

## Coenosiinae

## Limnophorini

Genus *Limnophora* Robineau-Desvoidy

*Limnophora* Robineau-Desvoidy, 1830: 517. Type-species: *Limnophora palustris* Robineau-Desvoidy, 1830 [= *Anthomyia maculosa* Meigen, 1926], by designation of Coquillett (1910: 561).

**Diagnosis.** Eye usually bare; prestomal teeth developed; prealar seta absent; lower propimeral seta upcurved; prosternum with lateral setulae; postsutural dorsocentral setae 3 or 4; vein M slightly curved forwards just before apex; wing with setulae at the base of vein  $R_{4+5}$  on dorsal and ventral surfaces; sternite 1 bare or with a few setulae; female ovipositor with segment 8 directed upwards and with small spicules; hypoproct elongated and with spinules.

**Comments.** The larvae are obligate carnivores. Many are aquatic and live in running water where they prey on oligochaetes and small insect larvae. Others are terrestrial and breed in dung or decaying organic matter. Adults are also carnivorous, taking other small soft-bodied insects as prey.

Three species seen from Fiji, of which *L. mesolissa* Bezzi is Australasian in distribution whilst the other two are endemic to Fiji.

26. *Limnophora mesolissa* Bezzi

(Figs 43–46)

*Limnophora* (*Pseudolimnophora*) *mesolissa* Bezzi, 1928: 175. Lectotype male, Fiji: Taveuni [designation by Pont 1970b: 420].

*Limnophora mesolissa*; Malloch, 1929c: 330; Bornemissza, 1968: 681; Pont, 1973c: 188; Pont, 1989: 692.

**Diagnosis.** *Limnophora mesolissa* is a very small species, and can be recognised by the yellow haltere, 4 postsutural dorsocentrals, and subplumose arista.

**Material examined** (FAS): **FIJI: Kadavu:** 0.25 km SW, Moanakaka Bird Sanctuary, 50 m, 7 Mar–11 Apr 2004, Malaise 3, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 111729 (♀), FBA 111720 (♀), FBA 111710 (♀), FBA 111751 (♀), FBA 111714 (♀), FBA 111732 (♀), FBA 111713 (♀), FBA 111705 (♀), FBA 111725 (♀), FBA 159343 (♀), FBA 111709 (♂), FBA 111740 (♂), FBA 111718 (♂); 23 Oct–19 Dec 2003, FBA 116749 (♀), FBA 115552 (♀), FBA 116738 (♂); 0.25 km SW, Solodamu Village, Moanakaka Bird Sanctuary, 60 m, 2 May–28 Jul 2004, Malaise 4, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 172477 (♀), FBA 172477 (♀), FBA 172488 (♂), FBA 172489 (♂); Solodamu, 25 Aug–23 Oct 2003, FJ–41D Malaise in coastal limestone forest, M. Irwin, E. Schlinger, M. Tokota'a, 178°07' E, 19°04' S, 128 m, FBA 000694 (♀), FBA 000696 (♀), FBA 000692 (♀). **Taveuni:** Cakaudrove Prov., Soqulu House in Soqulu Estate, 140 m, 21 Nov–13 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.833° S, 180° W, FBA 125279 (♀), 13–20 Dec 2002, FBA 120377 (♀), FBA 120376 (♀), FBA 120380 (♀), FBA 120379 (♀), FBA 120373 (♀), FBA 120372 (♀), FBA 120382 (♂), FBA 132059 (♂); 21 Nov–13 Dec 2002, FBA 125274 (♀), FBA 125275 (♀), FBA 125255 (♀), FBA 125270 (♀), FBA 125271 (♀), FBA 125265 (♂), FBA 125278 (♂); 5.6 km SE Tavuki Village, Devo Peak [15.843, 179.955], 1187 m, Malaise 1, 21 Nov–13 Dec 2002, E.I. Schlinger, M. Tokota'a, FBA 149531 (♀); 20–27 Dec 2002, FBA 144820 (♀), FBA 144821 (♀); 14–21 Nov 2002, FLTA8a\_M01\_07, FBA 089974 (♀), FBA 089975 (♀), FBA 089980 (♀), FBA 089981 (♀), FBA 089978 (♀), FBA 098979 (♀). **Vanua Levu:** Bua Prov., Batiqere Range, 6 km NW Kilaka Village, 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 141846 (♀), FBA 141845 (♀), FBA 141844 (♀), FBA 141843 (♀), FBA 141846 (♀), FBA 141821 (♀), FBA 141822 (♀), FBA 14182346 (♀). **Viti Levu:** 3.5 km N Veisari Settlement, logging road to Waivudawa, 14 Feb–8 Mar 2003, Malaise 3, E. Schlinger, M. Tokota'a, 18.068° S, 178.357° E, FBA 138502 (♀); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4947], 23 Sep–8 Oct 2002, Schlinger, Tokota'a, FJVL6b\_MO3\_O1, FBA 089709 (♀), FBA 089707 (♀), FBA 089712 (♀), FBA 089710 (♀), FBA 089708 (♀), FBA 089711 (♀); 15 Dec 2003–13



Mar 2004, FJVL6b\_MO2\_17, FBA 089895 (♀), FBA 089889 (♀); 6–17 Apr 2004, FJVL6b\_MO2\_19, FBA 089799 (♀), FBA 089810 (♀); 17–29 Apr 2004, FJVL6b\_MO2–20, FBA 089946 (♂), FBA 089936 (♂); 15 Dec 2003–13 Mar 2004, FJVL6b\_MO2\_17, FBA 089890 (♀); Naitasiri Prov., 1.8 km E Navai Village, 700 m, old trail to Mt. Tomaniivi, 7–26 Jan 2004, Malaise 4, Schlinger, Tokota'a, 17.621° S, 177.998° E, FBA 120007 (♀), FBA 120005 (♀), FBA 12002 (♀); 4.8 km N Veisari Settlement, logging road to Waivudawa, 300 m, 12 Dec 2002–3 Jan 2003, Malaise 1, Schlinger, Tokota'a, 18.075° S, 178.362° E, FBA 177402 (♂); 3.8 km N Veisari Settlement, logging road to Waivudawa, 300 m, Malaise 2, 18.079° S, 178.363° E, FBA 103582 (♀), FBA 103578 (♀), FBA 103571 (♀); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4947], 23 Sep–8 Oct 2002, Schlinger, Tokota'a, FJVL6b\_MO3\_O1, FBA 089716 (♂); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 26 Apr–5 May 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 118769 (♀), FBA 118774 (♀), FBA 118791 (♀), FBA 118799 (♀), FBA 118782 (♀), FBA 118792 (♀), FBA 118802 (♀), FBA 118789 (♀), FBA 118775 (♀), FBA 118776 (♀), FBA 118795 (♀), FBA 118779 (♀), FBA 118781 (♀), FBA 118778 (♀), FBA 118783 (♀), FBA 118784 (♀), FBA 118700 (♀), FBA 118772 (♀); Vuda Prov., Koroyanitu N.M.P., Savuione Trail, FJ–1, Malaise in montane forest, 21 Sep–7 Oct 2002, M. Irwin, E. Schlinger, M. Tokota'a, 17.40° S, 177.33° E, 450 m, FBA 002587 (♀), FBA 002590 (♀), FBA 002586 (♀); 1 km E Abaca Village, Koroyanitu Nat. Park, 800 m, Kokabula Trail, 17.40° S 177.33° E, 12–19 Nov 2002, Malaise, Schlinger, Tokota'a, FJVL02\_M01\_07, FBA 085294 (♀), FBA 083989 (♀), FBA 086307 (♀); 7–12 Oct 2002, FJVL01–M01–02, FBA 081917 (♂); 19–26 Oct 2002 FJVL02\_M01\_04, FBA 085272 (♀); 800 m, 22 Apr–6 May 2003, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 100304 (♀); 19–26 Nov 2002, Malaise 1, FBA 176167 (♀); Rewa Prov., 4 km NW Lami Town, Mt. Korobaba, 400 m, 13 Dec 2003–14 Jun 2004, Malaise 2, E. Schlinger, M. Tokota'a, 15.811° S, 178.988° E, FBA 114551 (♀); 1.5 km SW Vaturu Dam, 520 m, 2–14 Jul 2004, Malaise 3, E. Schlinger, M. Tokota'a, 17.754° S, 177.665° E, FBA 175452 (♀), FBA 175455 (♀). Other material examined: **Fiji Is:** Jun, D. Stoner, 1 ♀ (USNM); no locality, rice, 23 Nov 1965 (—), 1 ♂, 5 ♀ (BMNH). **Kadavu:** Wai Salima, 30 Apr 1941, N.L.H. Krauss, 1 ♂, 1 ♀ (BPBM). **Lau:** Mango, 1 mile S of Marona, 200 feet, 14 Aug 1938, E.C. Zimmerman, 3 ♀ (BPBM); Lakemba, Tubou, 0–50 m, 20 Feb 1971, N.L.H. Krauss, 1 ♂, 2 ♀ (BPBM); Lakemba, Tubou, 0–10 m, 11 Feb 1970, N.L.H. Krauss, 1 ♂ (BPBM); Cicia, Mabula, 0–10 m, 13 Feb 1970, N.L.H. Krauss, 1 ♀ (BPBM); Oneata, 17 & 18 Aug 1924, E.H. Bryan, 2 ♂ (BPBM); Thithia, 16 Sep 1924, E.H. Bryan, 1 ♂, 3 ♀ (BPBM); **Vanua Mbalavu:** Maulevu, 0–10 m, 14 Feb 1970, N.L.H. Krauss, 1 ♂, 1 ♀ (BPBM); Nabavatu, 0–150 m, 15 Feb 1970, N.L.H. Krauss, 1 ♀ (BPBM). **Malolo:** Walu Bay, 13 Jun, D. Stoner, 1 ♀ (USNM). **Matuku:** 7–8 Jul 1924, E.H. Bryan, 3 ♂, 1 ♀ (BPBM). **Ovalau:** Draiba Trail, along stream, 600–800 feet, 8 Jul 1938, E.C. Zimmerman, 1 ♀ (BPBM); Levuka, 0–200 m, Dec 1969, N.L.H. Krauss, 2 ♂, 5 ♀ (BPBM); Levuka, 0–150 m, Mar 1969, N.L.H. Krauss, 2 ♂ (BPBM); Levuka, 0–200 m, Feb 1972, N.L.H. Krauss, 1 ♂ (BPBM); Levuka, 0–200 m, Feb 1978, N.L.H. Krauss, 1 ♀ (BPBM); Lovoni Valley, 50–200 m, 27 Dec 1969, N.L.H. Krauss, 1 ♂, 1 ♀ (BPBM); Waitovu, 0–20 m, 29 Mar 1969, N.L.H. Krauss, 1 ♀ (BPBM). **Taveuni:** Dec 1921, H.W. Simmonds, lectotype ♂ and paralectotype 1 ♀ (BMNH); Waiyevo, 0–100 m, Jan 1972, N.L.H. Krauss, 12 ♂, 16 ♀ (BPBM); Mbouma, 0–50 m, 25 Jan 1972, N.L.H. Krauss, 3 ♂, 6 ♀ (BPBM). **Totovu:** Tovo, 19 Feb 1971, N.L.H. Krauss, 2 ♀ (BPBM). **Vanua Levu:** Savusavu, 0–100 m, Mar 1973, N.L.H. Krauss, 19 ♂, 20 ♀ (USNM), & 1 ♂ (BPBM); Savusavu, 0–100 m, Mar 1978, N.L.H. Krauss, 3 ♂, 2 ♀ (BPBM); Tabia (Thakaundrove), 0–2, 5 Oct 1979, S.N. Lal, G.A. & S.L. Samuelson, 1 ♂ (BPBM); Navakura to Nakawanga, 7 Oct 1955, J.L. Gressitt, 1 ♂ (BPBM); E of Lambasa, near Gelemumu, 6 Oct 1955, J.L. Gressitt, 1 ♂ (BPBM); Lambasa, 5 Oct 1955, J.L. Gressitt, 4 ♀ (BPBM); Lambasa, 0–100 m, Jan 1972, N.L.H. Krauss, 1 ♂ (BPBM). **Viti Levu:** no locality, Jun 1924, E.H. Bryan, 1 ♀ (BPBM); no locality, 1 Mar 1945, D.G. Hall, 1 ♀ (USNM); Nausori, Oct 1920, R. Veitch, paralectotype, 1 ♀ (BMNH); Nausori, Jan 1951, N.L.H. Krauss, 1 ♀ (BPBM); Nausori, May 1951, N.L.H. Krauss, 3 ♀ (BPBM); Nausori Highlands, 500–700 m, 26 Mar 1970, N.L.H. Krauss, 1 ♂ (BPBM); Nausori Highlands, 500–600 m, 9 Nov 1971, N.L.H. Krauss, 1 ♀ (BPBM); Nausori Highlands, 500–700 m, Nov 1976, N.L.H. Krauss, 1 ♀ (BPBM); Nausori Highlands, 450–500 m, 9 Oct 1971, N.L.H. Krauss, 1 ♀ (BPBM); Nandariatu, 2 Mar 1973, N.L.H. Krauss, 2 ♂, 1 ♀ (BMNH); Korotongo, Mar 1981, N.L.H. Krauss, 3 ♀ (BMNH); Korotongo, 0–100 m, Mar 1974, N.L.H. Krauss, 1 ♂, 3 ♀ (USNM); Suva, 0–200 m, 1 Mar 1978, S. Shinonaga, 1 ♀ (BMNH); Suva, Mar 1956, N.L.H. Krauss, 2 ♂ (BPBM); Suva, Jan 1951, N.L.H. Krauss, 4 ♀ (BPBM); Suva, May 1951, N.L.H. Krauss, 4 ♀ (BPBM); Suva, Nov 1957, N.L.H. Krauss, 1 ♀ (BPBM); Suva, 24 Oct 1945, D.G. Hall, 1 ♀ (USNM); Suva, 29 Jun, D. Stoner, 2 ♀ (USNM); Suva, Coli I., at light, 12 Jan 1953, Simmonds, 1 ♀ (BMNH); Suva, Coli I., 21 & 29 Jun 1924, E.H. Bryan, 1 ♂, 2 ♀ (BPBM); Suva, Coli I., 3–6 Mar 1963, C.M. Yoshimoto, 1 ♂, 2 ♀ (BPBM); Suva, Jul 1968, H.S. & G.S. Robinson, 1 ♂ (BMNH); Suva, 7 Feb 1928, H.W. Simmonds, 2 ♀ (BMNH); Mt. Victoria, 600–1000 m, 30 Jul 1967, J. & M. Sedlacek, 1 ♂, 2 ♀ (BPBM); Mt. Victoria, 1000 m, 4–6 Mar 1978, S. Shinonaga, 1 ♂ (BMNH); Lautoka, 13 Feb 1919, W. Greenwood, paralectotype 1 ♀ (BMNH); Lautoka, Mar 1955, N.L.H. Krauss,



1♂, 2♀ (BPBM); Cuvu, 10 Oct 1919, W. Greenwood, 1♀ (BMNH); Cuvu, 10 Oct 1919, W. Greenwood, 1♀ (BMNH); Cuvu, 23 Apr 1930, H. Phillips, 1♀ (BPBM); Nadi, 27 & 29 Jun 1913, J.F. Illingworth, 2♂, 3♀ (BPBM); Nadi, 1 Jul 1913, J.F. Illingworth, 1♂, 2♀ (BPBM); Nadi, 30 Jul 1967, J. & M. Sedlacek, 1♀ (BPBM); 40 km E of Nadi, 26 Jul 1967, J. & M. Sedlacek, 1♂ (BPBM); 70 km E of Nadi, 26 Jul 1967, J. & M. Sedlacek, 5♀ (BPBM); Nandarivatu, 30 Aug 1938 E.C. Zimmerman, 1♀ (BPBM); Nandarivatu, Jan 1955, N.L.H. Krauss, 1♀ (BPBM); Nandarivatu, May 1951, N.L.H. Krauss, 1♀ (BPBM); Nandarivatu, 850–950 m, 2 Apr 1973, N.L.H. Krauss, 2♂ (BPBM); Nandarivatu, 800–850 m, 7 Oct 1973, N.L.H. Krauss, 1♀ (BPBM); Korolevu I., 26 Jul 1967, J. & M. Sedlacek, 1♀ (BPBM); Koronivia Research Station, 1 Mar 1963, C.M. Yoshimoto, 6♂, 4♀ (BPBM); Nandi, 6–7 Dec 1958, C.R. Joyce, 1♀ (BPBM); Nandi, 0–100 m, Mar 1976, N.L.H. Krauss, 1♂ (BPBM); Nandi, 0–50 m, Nov 1978, N.L.H. Krauss, 1♂ (BPBM); Nandi, 0–100 m, 5 Apr 1973, N.L.H. Krauss, 2♂ (BPBM), & 2♂ (USNM); Nandi, 0–50 m, Mar 1980, N.L.H. Krauss, 1♂, 1♀ (BPBM); Nandi, 0–20 m, 1 Feb 1978, N.L.H. Krauss, 2♂ (BPBM); Nandi, 0–50 m, Mar 1981, N.L.H. Krauss, 2♀ (BPBM); Nandi, 0–100 m, Apr 1974, N.L.H. Krauss, 1♂, 1♀ (USNM); Natubakula, near Sigatoka, 19 Apr, N.L.H. Krauss, 5♂, 6♀ (BPBM); Tholo-i-Suva, Mar 1951, N.L.H. Krauss, 1♂, 1♀ (BPBM); Tholo-i-Suva, Apr 1951, N.L.H. Krauss, 1♀ (BPBM); Kalambu, near Suva, 16 Apr 1941, N.L.H. Krauss, 1♀ (BPBM); Vunidawa, 2–4 May 1941, N.L.H. Krauss, 1♂, 10♀ (BPBM); Lami, 6 May 1941, N.L.H. Krauss, 2♀ (BPBM); Mokani, Mar 1951, N.L.H. Krauss, 1♀ (BPBM); Naqali, Nov 1957, N.L.H. Krauss, 2♂, 5♀ (BPBM); Sigatoka, 17 Apr 1941, N.L.H. Krauss, 1♂ (BPBM); Nanduruloulou, May 1951, N.L.H. Krauss, 1♂, 2♀ (BPBM); Navai, Sep 1950, N.L.H. Krauss, 1♂ (BPBM); Navai, Jan 1951, N.L.H. Krauss, 3♂, 4♀ (BPBM); Navai, 800–900 m, 3 Apr 1973, N.L.H. Krauss, 1♂ (BPBM); Navai, 700–800 m, 10 Feb 1971, N.L.H. Krauss, 1♂, 5♀ (BPBM); Navai, 700–800 m, 29 Sep 1970, N.L.H. Krauss, 1♀ (BPBM); Tavua, Feb 1951, N.L.H. Krauss, 2♂, 2♀ (BPBM); Mbau, Apr 1951, N.L.H. Krauss, 1♂, 2♀ (BPBM); Lami, Mar 1951, N.L.H. Krauss, 4♀ (BPBM); Lami, May 1951, N.L.H. Krauss, 2♂, 3♀ (BPBM); Lami, Nov 1957, N.L.H. Krauss, 1♀ (BPBM); Lami, 0–200 m, Dec 1978, N.L.H. Krauss, 1♂, 1♀ (BPBM); Lami, 20–200 m, Mar 1976, N.L.H. Krauss, 1♀ (BPBM); near Lami, Apr 1951, N.L.H. Krauss, 3♀ (BPBM); Londoni, 50–150 m, 12 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Korolevu, 0–100 m, Mar 1973, N.L.H. Krauss, 1♀ (BPBM); Raki Raki, 0–100 m, Feb 1971, N.L.H. Krauss, 8♂, 4♀ (BPBM); Raki Raki, 0–50 m, 2 Apr 1973, N.L.H. Krauss, 1♂, 1♀ (BPBM); 8 km NE of Vunidawa, 200–300 m, 11 Feb 1971, N.L.H. Krauss, 1♀ (BPBM); Tilivaleva, 305–366 m, 25 Mar 1970, N.L.H. Krauss, 1♂, 2♀ (BPBM); Korotongo, 0–100 m, Mar 1981, N.L.H. Krauss, 2♂, 2♀ (BPBM); Korovou, Tailevu, 20–100 m, 12 Feb 1971, N.L.H. Krauss, 3♂, 3♀ (BPBM); Tamavua, 29 Jun, L. Stoner, 1♀ (USNM); Navua, 26 Jun, D. Stoner, 1♀ (USNM). **Wakaya**: 17 Oct 1924, E.H. Bryan, 1♀ (BPBM). Tahili, 24 Dec 1921, H.W. Simmonds, 1♀ (BMNH). Dobucheva, reared ex cow dung, 6 Jun 1966 (—), 2♂ (BMNH). Viviva, 15 Jun, D. & L. Stoner, 2♀ (USNM).

**Comments.** It is very close to the Oriental and Afrotropical *L. exigua* (Wiedemann), which it replaces in the Australasian and Oceanian region. There is an area of overlap between the two species in Papua New Guinea.

**Distribution.** American Samoa, Australia, Belau, French Polynesia, Guam, Indonesia (Maluku), Lord Howe I, Micronesia, New Caledonia, Northern Marianas, Bismarck Archipelago, PNG, Samoa, Solomon Is, Tonga, Vanuatu.

**Biological data.** In Fiji this species has been reared from cowpats and cow manure, horse droppings, poultry droppings and manure, and abattoir refuse; the larvae are probably predaceous (Bornemissza 1968).

### 27. *Limnophora penicillata* Pont & Couri, sp. nov.

(Figs 47–49)

**Diagnosis.** The male is easily recognised by the pencil of very long dense setae on cercal plate (Figs 48,49).

#### Male

Head. Ground-colour black. Eye bare. Frons broad, at middle of head 0.38 of head-width at this point, more or less parallel-sided from vertex to lunule. Ocellar strong, subequal to inner vertical; outer vertical a little shorter than this. Fronto-orbital plate wholly brown pruinose. Parafacial brownish yellow, almost golden. Ocellar triangle broad, velvety dark brown, reaching

lunule. Frontal vitta dark, almost completely suppressed by the frontal triangle. Face and gena brown pruinose, occiput brownish grey. Fronto-orbital plate narrow, at middle of frons a plate 0.11 width of frontal vitta. 2 pairs of inclinate frontal setae and 1 pair of reclinate orbital setae, with several short setulae outside them on fronto-orbital plate. Antenna black; postpedicel 2.4 times as long as wide and almost reaching mouth margin, rather angular at anterior tip. Arista short-pubescent, the longest individual hairs shorter than its basal width. Parafacial narrow, narrowing sharply below where it is not as wide as diameter of anterior ocellus, bare. Mouth edge behind level of profrons. Facial ridge with a few short setulae above vibrissa. Gena narrow, depth below lowest eye margin 0.1 of length of postpedicel; setae fine. Palpus black, slender. Prementum of proboscis glossy, black.

Thorax. Ground-colour black. Scutum and scutellum brown to brownish grey dusted, without vittae or pattern, sometimes with weak grey dust before scutellum; postpronotal lobe and notopleuron light grey. Pleura brown dusted. Prothoracic spiracle brown. Acrostichals 0+1, the single (prescutellar) pair weak, the presutural setulae in 2 rows. Dorsocentrals 2+3. Katepisternals 1+2, the anterior and lower ones very short and fine. Proepisternal depression, notopleuron (except for setae), anepimeron and meron bare. Scutellum with a few discal setulae; lateral margins and ventral surface bare.

Legs. Black. Fore femur with a complete row of fine uniform posteroventral setae. Fore tibia without submedian setae. Mid femur without ventral setae, the posteroventral ground-setulae short but erect; 0 anterior and 0 posterior preapical setae. Mid tibia without setae except at apex. Hind femur without ventral setae except for 1 strong anteroventral before apex. Hind tibia without setae except for very weak dorsal and anteroventral apical setae.

Wing. Clear, veins yellow. Basicosta black, tegula yellow. Costal spine minute. Veins bare except for costa and a few setulae on the node at the base of vein  $R_{4+5}$ . Cross-vein r-m slightly basad of the point where vein  $R_1$  enters costa. Cross-vein dm-cu almost straight. Veins  $R_{4+5}$  and  $M_1$  parallel at wing margin. Calypters white, margins creamy. Knob of haltere black.

Abdomen. Ground-colour black. Dark brown dusted, with whitish grey markings as follows: a median vitta on tergites 3–5, and each of these tergites with an inverted triangular patch in lateral anterior corner which extends a short distance on to sides of tergites. Tergites without strong setae, with a few lateral marginals on tergites 3 and 4 and a marginal row on tergite 5. Sternite 1 bare.

Terminalia. Figs 47–49. Characterised by the pencil of very long dense setae on cercal plate.

Measurements. Length of body, 2.5 mm. Length of wing, 2.5 mm.

## Female

Differs from the male as follows:

Head. Frons at middle 0.38 of head-width at this point. Ocellar triangle less velvety. At middle of frons a fronto-orbital plate 0.1 width of frontal vitta. Antennal postpedicel 2.4 times as long as wide. Depth below lowest eye-margin 0.11 of length of postpedicel.

Thorax. Scutum dark as in male, with a narrow grey median vitta and a pair of similar vittae, each placed just outside the dorsocentral rows, all three running along the whole length of scutum but not strongly marked.

Legs. Mid femur with 1 posterior preapical seta. Mid tibia with 2 posterior setae. Hind tibia with 1 anterodorsal and 1 anteroventral.

Abdomen. Markings as in male. Setae weak.

Ovipositor. Not examined.

Measurements. Length of body, 3.0 mm. Length of wing, 2.5 mm.

**Material examined.** Holotype ♂, **FIJI: Wakaya Island:** 17 Oct 1924, E.H. Bryan (BPBM). Paratypes 12♂, 14♀: **Wakaya:** same data as holotype, 2♂, 3♀ (BPBM). **Lau:** Thithia, 15 Sep 1924, E.H. Bryan, 1♂ (BPBM). **Matuku:** 7 Jul 1924, E.H. Bryan, 7♂, 9♀ (5♂, 7♀ BPBM, 1♂, 1♀ each BMNH & MNRJ); same data but 8 Jul 1924, 1♂ (BPBM). **Viti Levu:** Naqali, Nov 1957, N.L.H. Krauss, 1♀ (BPBM); Nausori Highlands, 500–700 m, Nov 1976, N.L.H. Krauss, 1♀ (BPBM). **Jakaya,** 12 Oct 1924, E.H. Bryan, 1♂ (BPBM).

**Etymology.** The name comes from the Latin word *penicillus* and refers to the pencil of very long dense setae on cercal plate of male terminalia.

**Distribution.** This species is endemic to the Fiji Islands.

**Biological data.** Nothing known.

**28. *Limnophora shinonagai* Pont & Couri, sp. nov.**

(Figs 50–52)

**Diagnosis.** *Limnophora shinonagai* can be recognised by the yellow haltere, 4 postsutural dorsocentrals, arista pubescent, lower calypter white with the outer part of disc smoky to brown and margins brown, and by the colour pattern of the scutum.

**Male**

**Head.** Ground-colour black. Eye bare. Frons narrow, at narrowest point a little over twice diameter of anterior ocellus. Ocellar short and hair-like. Fronto-orbital plate brown pruinose when viewed from in front, with some silvery pruinosity below; parafacial and lower occiput silvery white pruinose; gena light grey pruinose. At middle of frons, a fronto-orbital plate hardly as wide as diameter of anterior ocellus, but the plates separated throughout by a distinct frontal vitta. 7–10 pairs of fine inclinate frontal setae, decreasing in length above, and reaching as far as 1–2 pairs of proclinate setulae at level of anterior ocellus. Antenna black; postpedicel 2.8–3.0 times as long as wide, smoothly rounded at tip. Arista pubescent, the longest combined hairs half width of postpedicel. Parafacial narrow, at middle half as wide as width of postpedicel, bare. Mouth-edge behind level of profrons in lateral view. Depth below lowest eye-margin equal to width of postpedicel. Genal setae well developed. Palpus black, slender. Prementum of proboscis glossy, black.

**Thorax.** Ground-colour black. Scutum dark brown dusted with more thinly dusted but still weakly developed areas as follows: indications of a pair of paramedian presutural vittae; a patch around presutural intraalar and supraalar setae; and a pair of postsutural vittae between dorsocentrals and intraalars; with a thin brown dusted line along anterior edge of suture, from notopleuron to outer acrostichal row. Postpronotal lobe and notopleuron silvery-white dusted, and a similar coloured patch between between prescutellar dorsocentral and postalar callus. Pleura whitish grey. Prothoracic spiracle dirty whitish. Scutellum dark brown dusted, with a small spot of pale dust on each side at base, below the basal lateral and subbasal lateral setae. Acrostichals 0+1, the presutural setulae in 3–4 rows at suture. Dorsocentrals 2+4. Postsutural intraalar 1. Proepimeral seta with 3–4 additional short setulae. Katepisternals 1+1. Proepisternal depression, notopleuron (except for setae) and meron bare. Scutellum uniformly setulose on disc; lateral margins and ventral surface bare.

**Legs.** Black. Fore femur with a complete row of uniform posteroventral setae. Fore tibia without submedian setae. Mid femur without anteroventral setae, with 2–4 weak posteroventral setae in basal quarter, hardly equal to femoral depth; with several weak anterior setae in basal half, and a strong seta at middle; 0 anterior and 2 posterior preapical setae. Mid tibia with 2–3 posterior setae. Hind femur without ventral setae except for 3–4 anteroventrals in apical third, rarely with a short fine posteroventral near base. Hind tibia with 1 anterodorsal and 1 anteroventral seta; 1 dorsal preapical, anterodorsal preapical absent. Tarsomeres not modified.

**Wing.** Slightly smoky. Basicosta and tegula black. Costal spine inconspicuous. Veins bare except for costa and a few setulae on the node at the base of vein  $R_{4+5}$ . Cross-vein r-m slightly basad of the point where vein  $R_1$  enters costa. Cross-vein dm-cu weakly sinuous. Vein M curved slightly towards vein  $R_{4+5}$  in apical section. Calypters white, margins brown, lower one with the outer part of disc smoky to brown. Haltere yellow.

**Abdomen.** Ground-colour black. With silvery white dust, becoming brownish on the median line of each tergite, pregenital tergites and epandrium brown. Tergites with black markings as follows: syntergite 1+2 mostly black except on median line and at sides; tergites 3

and 4 each with a pair of large triangular spots, reaching from fore-margin to hind-margin and laterally to the side of each tergite; tergite 5 with a single large triangular spot, also reaching from fore-margin to hind-margin and laterally to sides of tergite. Setae on sides of tergites well developed and fine; tergite 4 with a lateral discal and 2 lateral marginal setae, tergite 5 with discal and marginal rows. Sternite 1 bare, rarely with a fine setula on each side.

Terminalia. Figs 50–52.

Measurements. Length of body, 4.5–5.0 mm. Length of wing, 4.0–4.5 mm.

### Female

Differs from the male as follows:

Head. Frons at level of anterior ocellus 0.32 of head-width at this point, broadening gradually from vertex to lunule. Outer vertical seta only slightly shorter than inner vertical. Ocellar triangle indistinct but reaching lunule. Ocellar setae long and strong. At middle of frons a fronto-orbital plate 0.14 width of frontal vitta. 5 pairs of inclinate frontal setae and 2 pairs of reclinate orbitals; fronto-orbital plate outside the setae with a row of short proclinate setulae. Postpedicel only twice as long as wide. Parafacial slightly wider, tapering below. Mouth-edge distinctly in front of profrons in lateral view. Depth below lowest eye-margin slightly greater than width of postpedicel.

Thorax. Pattern of scutum as in male. Anterior postsutural intraalar short but distinct.

Legs. Mid femur with the posteroventral setae very weak or absent. Mid tibia with 2 posterior setae. Hind femur usually with only 2–3 anteroventrals in apical half; posteroventrals absent.

Wing. Calypters with the margins only partly brown and disc of lower calypter with the darkened area reduced or indistinct.

Abdomen. The black spots of the male fused so that the tergites are black except for an inverted triangle of silvery white dust in anterior lateral corners of tergites 3 and 4; tergite 5 with the median black spot large, diamond or even pentagonal in shape and occupying most of disc.

Ovipositor. Not examined.

Measurements. Length of body, 5.0–5.5 mm. Length of wing, 4.5–5.0 mm.

**Material examined.** Holotype ♂, **Fiji: Viti Levu:** Mt. Victoria, 1000 m, 4–6 Mar 1978, S. Shinonaga (NSMT). Paratypes 52♂, 28♀: same data as holotype, 44♂, 26♀ (NSMT, with 2♂ and 1♀ each in BMNH, OUMNH, BPBM, CAS, MNRJ); same data but collector H. Shima, 8♂, 2♀ (NSMT).

**Etymology.** The species is dedicated to Dr Satoshi Shinonaga, for his great contribution to the knowledge of the Oriental and Melanesian muscid fauna.

**Distribution.** The species is endemic to Fiji, Viti Levu.

**Biological data.** Nothing known.

### Genus *Lispe* Latreille

*Lispe* Latreille, 1797: 169. Type-species: *Musca tentaculata* De Geer, 1776, by subsequent monotypy (Latreille, 1802: 462).

**Diagnosis.** Male dichoptic; palpus enlarged apically, spatulate; prestomal teeth strongly developed; head without interfrontal or proclinate orbital setae; parafacial setulose; dorsocentral setae 0–2+2–4; prealar seta absent; anepimeron setulose in centre; lower proepimeral seta upcurved; katapisternals 1+2; posterior spiracle with some strong setulae on posterior margin; sternite 1 setulose; male surstylus absent; female ovipositor with segment 8 directed upwards and with spinules, hypoproct elongated and with spines

**Comments.** The larvae are obligate carnivores, and live in wet sand or mud with a high organic content. Adults are voracious and aggressive predators, mainly of the immature stages of Culicidae and Chironomidae. Five species have been seen: *L. bengalensis* is known from the southern Palaearctic, Afrotropical, Oriental and Australasian/Oceanian regions; *L. assimilis* is known from the southern Palaearctic, Oriental and Australasian/Oceanian regions; *L. pectinipes* is insufficiently known but has a distribution similar to that of *L. assimilis*; two species, known respectively from one male and two females, remain undescribed and may represent endemic Fijian species. One species (*Lispe tentaculata* (De Geer)) has been erroneously recorded from Fiji and is deleted from the list of Fijian species.

### 29. *Lispe assimilis* Wiedemann

(Figs 53–55)

*Lispe assimilis* Wiedemann, 1824: 51. Lectotype male, “ex India orientali” [East Indies], in ZMUC [designation by Shinonaga & Pont, 1992: 720].

*Lispa* [sic] *assimilis*; Bezzi, 1928: 174.

*Lispe assimilis*; Pont, 1989: 692; Shinonaga & Pont, 1992: 718–719; Pont, 2019: 144–150.

**Diagnosis.** This species can be immediately recognised by the forward curvature of vein M towards vein R<sub>4+5</sub>. In addition, fore tibia has a submedian seta and hind tibia has a posterodorsal seta. Male terminalia as in Figs 53–55; male and female terminalia also illustrated in Pont (2019: figs 310–316).

**Material examined** (FAS): **FIJI: Kadavu:** 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary, 50 m, 7 Mar–11 May 2004, Malaise 3, Schlinger, Tokota’a, 19.078° S, 178.121° E, FBA 111742, 1♀ (BMNH). Other material examined. **FIJI: Viti Levu:** Natova, Apr 1918, R. Veitch, 1♀ (BMNH) (Bezzi 1928); Lautoka, 12 Feb 1919, W. Greenwood, 1♀ (BMNH) (Bezzi 1928); Namaka, 20 Aug 1943, R.A. Lever, 1♀ (BMNH); Nandi, 0–50 m, Mar 1981, N.L.H. Krauss, 1♂ (BPBM); Nandrau, 660 m, 28–29 Jun 1958, B. Malkin, 1♂ (BPBM); Nadi, 12 Mar 1978, S. Shinonaga, H. Kurahashi, 1♂, 1♀ (NSMT); 40 mi E of Nadi, 26 July 1967, J. & M. Sedlacek, 1♀ (BPBM).

**Comments.** These specimens all belong to *L. assimilis* rather than to the closely-related *L. pacifica* Shinonaga & Pont. The species was described by Pont (2019: 144–150).

**Distribution.** Bonin Is, Caroline Is, Fiji, New Caledonia, Vanuatu, Samoa, Tonga, French Polynesia (Society Is); Oriental, Australasian/Oceanian and southern. Palaearctic regions.

**Biological data.** Nothing is known of the habits and biology.

### 30. *Lispe bengalensis* (Robineau-Desvoidy), new record

(Figs 56–58)

*Limnophora bengalensis* Robineau-Desvoidy, 1830: 518. Holotype female, “Bengale” [India or Bangladesh], in MNHNP [seen].

*Lispe tetrastigma* Schiner; Hennig, 1960: 458.

*Lispe bengalensis*; Pont, 1989: 692; Pont, 2019: 215–221.

**Diagnosis.** The only Fijian species to have a brown palpus and an apical posteroventral seta on hind tibia. All femora with rows of anteroventral and posteroventral spinules in apical half. Male terminalia as in Figs 56–58; male and female terminalia illustrated in Pont (2019: figs 453–459).

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FIJI: Viti Levu:** Nadi, 12 Mar 1978, S. Shinonaga, H. Kurahashi, 1♂, 1♀ (NSMT), 1♂, 1♀ (BMNH); Nadi, 27 Jun 1913, J.F. Illingworth, 1♀ (USNM); Nadi, 12 Jun 1913, J.F. Illingworth, 1♀ (USNM); Nadi, 2 Aug 1913, J.F. Illingworth, 1♀ (USNM).

**Distribution.** Fiji, French Polynesia (Marquesas), Society Is, Australia; Oriental, Afrotropical and southern Palaearctic regions.

**Comments.** The species was described by Hennig (1960: 458–459, as *tetrastigma* Schiner), and by Pont (2019: 215–221).

**Biological data.** Adults have been reported in Ghana, West Africa, as preying on mosquitoes (Werner & Pont 2006: 94), but otherwise nothing is known of the life history and biology.

### 31. *Lispe pectinipes* Becker, new record

(Figs 59–60)

*Lispa pectinipes* Becker, 1903: 113. Lectotype ♂, Egypt, Cairo, in ZMHU [designation by Lyneborg, 1970: 43].

*Lispe pectinipes*; Hardy, 1981: 85; Pont, 1989: 693.

**Diagnosis.** This species can be immediately recognised by the presence of a single strong pair of presutural dorsocentral setae placed midway between suture and neck. In addition, fore tibia has a submedian posterior seta. The scutum has a very distinct broad dark median vitta that continues to the tip of scutellum and is flanked by a vitta on each side between the dorsocentral and intraalar rows. Abdominal tergites 1+2 to 5 each with a large median quadrate black mark which covers most of the dorsal surface on tergites 1+2 to 4. The male has mid femur with a comb of short dense posteroventral setulae in apical fifth, and hind tibia with a row of 6 fine erect posteroventral setae in apical half. Male terminalia as in Figs 59–60.

**Material examined (FAS): FIJI: Taveuni:** Cakaudrove Prov., Soqulu House in Soqulu Estate, 140 m, 21 Nov–13 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.833° S, 180° W, FBA 125277, 1♂ (BPBM).

**Comments.** Paterson (1953) found that Afrotropical *L. leucospila* consisted of several, previously confused species, and Lyneborg (1970) later showed that *Lispe pectinipes* and *Lispe leucospila* (Wiedemann, 1830) are distinct species. This was confirmed by Vikhrev (2011, 2014). *Lispe pectinipes* has been found to be widely but sparsely distributed, and Hawaiian specimens of the *Lispe leucospila* group also proved to belong to *L. pectinipes* (Hardy 1981). The species was described by Hardy (1981: 85–87) together with illustrations of the diagnostic characters and the male and female terminalia.

**Distribution.** Hawai'i; widely distributed in the southern Palaearctic, Afrotropical and Oriental regions, though its exact range is not completely known due to the earlier confusion with *L. leucospila*.

**Biological data.** Nothing is known of the habits and biology.

### 32. *Lispe tentaculata* (De Geer)

*Musca tentaculata* De Geer, 1776: 86. Sweden, Uppland, probably Lövsta district. Syntypes, ?sex, not in NRS, presumed destroyed [Persson *et al.* 1984: 93].

*Lispa* [sic] *tentaculata*; Malloch, 1929b: 153.

*Lispe tentaculata*; Pont, 1989: 693.

**Diagnosis.** Easily recognised in the male sex by a curious modification to the fore tarsomere 1 and in the female sex by the patch of dense pubescence on the posterior half of scutum, between the dorsocentral setae.

**Material examined.** No specimen was found among material studied.



**Comments.** Recorded from Viti Levu by Malloch (1929b), from one specimen in ZSZMH, which was probably destroyed in World War II. Malloch's record was quoted with a query by Pont (1989: 593), but it seems certain that it was a misidentification, perhaps of a female, or may even have been a mislabelled specimen.

**Distribution.** Holarctic region, also from Central America and north-west India.

### 33. *Lispe* sp. indet. male

**Diagnosis.** A single male with bare meron and hind tarsomere 1 expanded and flattened.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FJI: Lau:** Komo, 20 Aug 1924, E.H. Bryan, 1♂ (BPBM).

**Comments.** This male is in poor condition and cannot be identified with any known Australasian or Oceanian species. It may belong to an endemic Fijian species, but more and better material is needed.

**Biological data.** Nothing is known of the habits and biology.

### 34. *Lispe* sp. indet. female

**Diagnosis.** Two females with some short setulae on meron just above hind coxa, and mid femur with a strong anterior seta at middle and, just apicad of it, with another strong seta between anterior and anteroventral surfaces.

**Material examined** (FAS): No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FJI: Rotuma:** 17–27 Apr 1971, G.S. Robinson, 2♀ (BMNH).

**Comments.** These two females cannot be identified with any known Australasian or Oceanian species and may belong to an endemic Fijian species, but more material and males are needed. They are clearly related to *Lispe pumila* (Wiedemann) and *L. angustipalpis* Stein, both of which are known from the Oriental region and Australia (Pont 2019). Other species in this small group, which all have the characteristic pair of setae on mid femur and setulae in lower posterior corner of meron and, in the male, long fine bushy setae on posterior surface of fore coxa, include *L. isolata* Malloch (Samoa) and several undescribed species from Papua New Guinea and the Bismarck Archipelago.

**Biological data.** Nothing is known of the habits and biology.

## Coenosiini

### Genus *Coenosia* Meigen, new record

*Coenosia* Meigen, 1826: 210. Type-species: *Musca tigrina* Fabricius, 1775, by subsequent designation of Westwood (1840: 143) and confirmed by I.C.Z.N. (2015: 173) [Opinion 2360].

**Diagnosis.** Male dichoptic; one pair of reclinate orbital setae; frons parallel-sided, longer than wide; labella reduced, prestomal teeth well developed; prealar seta absent; lower proepimeral seta directed downwards; dorsocentrals 1+3 (rarely 2+3); anepimeron bare; katepisternals 1:1:1, arranged in an equilateral triangle; scutellum with both pairs of setae developed; lower calypter about 1.8 times as long as the upper one; hind femur with two preapical setae, one anterodorsal and one dorsal, the posterodorsal absent; hind tibia with one submedian anterodorsal seta and usually one anteroventral; median posterior or posterodorsal setae absent; sternite 1 bare; male hypandrium tubular; female ovipositor long and with many microtrichia.

**Comments.** Adults are probably all predatory on insects inhabiting the herb layer (Skidmore 1985). The larvae are obligate carnivores, living in soil, humus, leaf litter, or decaying vegetation. The biology is known for only a few species.

This is the first record of a true species of *Coenosia* from the Fiji Islands as Fijian species previously described in *Coenosia* or recorded as species of *Coenosia* belong to other genera.

### 35. *Coenosia fijiensis* Pont & Couri, sp. nov.

(Figs 61–63)

*Coenosia pumilis* [sic] Stein; Curran, 1929: 7 [misidentification].

**Diagnosis.** Easily recognised by the single pair of reclinate orbital setae; antenna, palpus and legs yellow in male; 1 proepisternal seta; 1 preapical posterior seta on mid femur; male with many setae on head, pleura and legs yellow, and tibiae without setae except for the apicals.

#### Male, female

**Head.** Ground-colour black but frons yellow beneath the pruinosity. Frons broad, just above lunule about 1/3 of maximum head-width (in frontal view). Eye bare. Fronto-orbital plate and frontal vitta silvery and without any line separating them (male), matt yellowish white from most angles with the fronto-orbital plate slightly greyer (female); parafacial, face, gena and lower occiput silvery pruinose, rest of occiput light grey. Fronto-orbital plate narrow, at middle about 1/5 to 1/6 of width of frontal vitta at this point. Ocellar tubercle grey, frontal triangle not visible. Setae white except for inner vertical and post-ocular setulae (male) or all black as usual (female). Upper post-ocular setulae in one row. Ocellar seta as long as (male) or longer than (female) orbital seta. 2 pairs of inclinate frontal setae and 1 reclinate orbital, the upper frontal closer to orbital than to lower frontal, these three short and pale in male, normal in length in female. Antenna yellow (male), or scape and pedicel orange and postpedicel black (female); postpedicel moderate, twice as long as pedicel in frontal view, falling short of mouth-edge by over half of its own length, the anterior tip produced into a point. Arista long, almost bare, the individual hairs not as long as its basal width. Parafacial moderate, at level of postpedicel insertion equal to width (male) or half width (female) of postpedicel. Vibrissal angle behind level of profrons; vibrissa minute and pale (male), or strong, black, crossed (female). Gena moderate, the depth below lowest eye-margin equal to length (male) or half length (female) of postpedicel. Mentum of proboscis dark brown, glossy. Palpus pale yellow (male) or dull yellow (female).

**Thorax.** Ground-colour black and entirely light grey dusted, almost silvery in male; scutum sometimes weakly tinged with yellow medially, without even traces of dark vittae. Acrostichal setulae in 2 rows. Dorsocentrals 1+3. Postpronotal lobes with setulae, none of them spinulose; inner seta short, fine, less than half length of outer seta. 2 postsutural intraalar. 1 proepisternal seta, this and the 2 proepimerals yellow in male. Katepisternals and anepisternals yellow in male. Scutellum with the usual apical and sub-basal lateral setae; disc with circa 4 setulae.

**Legs.** Yellow, only apical few tarsomeres on mid and hind legs brown, coxae partly darkened in female. All setae on coxae and trochanters yellow in male. Tarsomeres not expanded. Fore femur with the posteroventral row sparse, the setae yellow in male. Fore tibia with a strong submedian posterior seta in female, absent in male. Mid femur with 1 yellow posteroventral in basal half in male, and 2 short posteroventrals in basal half in female; a black anterior seta at basal third, and 0 anterior and 1 posterior preapical seta. Mid tibia without setae in male, with 1 anterodorsal and 1 anteroventral in female. Hind femur in male with 1 anteroventral, 1 posteroventral, 2 anterodorsals and 1 dorsal, all yellow and all in basal half; in female with an anterodorsal row, 1 preapical posterodorsal, 1 anteroventral in basal half and 2 in apical half, and 1 posteroventral at middle. Hind tibia in male without setae except for a tiny dorsal preapical; in female with the dorsal preapical strong, and also 1 anterodorsal and 1 anteroventral.

Wing. Clear, veins yellowish brown. Tegula and basicosta yellow. Veins bare, except for costa which is setulose to tip of vein  $R_{4+5}$ . Costal spine inconspicuous. Cross-vein r-m below the point where  $R_1$  enters costa; dm-cu straight. Calypters white, margins white; lower calypter long, projecting beyond upper one by almost length of upper one. Haltere yellow.

Abdomen. Ground-colour yellow on syntergite 1+2, tergite 3, and tergite 4 anteriorly in male, partly yellow on syntergite 1+2 and tergite 3 in female, otherwise black, or even wholly black in female; light grey dusted on the dark areas. Without dark spots or other markings. Tergites with a few weak setae, all yellow in male. Sternite 1 bare.

Terminalia. Male terminalia as in Figs 61–63.

Measurements. Length of body, 2.5 mm. Length of wing, 2.0 mm.

**Material examined** (FAS): Holotype ♂, **FJI: Viti Levu**: Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4847], 14–22 Dec 2002, E.I. Schlinger, M. Tokota'a, FJVL6b\_M02\_03, FBA 089842 (BPBM). Paratypes 4♂, 26♀: same data as holotype (BPBM except where stated), FBA 089855 (♀), FBA 089857 (♀) (BMNH), FBA 089856 (♀), FBA 089854 (♀), FBA 089853 (♀), FBA 089852 (♀), FBA 089851 (♀), FBA 089850 (♀), FBA 089849 (♀), FBA 089866 (♀), FBA 089865 (♀), FBA 089843 (♀), FBA 089844 (♀), FBA 089845 (♀), FBA 089836 (♀), FBA 089837 (♀), FBA 089864 (♀), FBA 089867 (♀), FBA 089868 (♂), FBA 089814 (♀), FBA 089839 (♂), FBA 089840 (♀), FBA 089841 (♀), FBA 089792 (♀), FBA 089793 (♀), FBA 089838 (♀), FBA 089848 (♂), FBA 089801 (♀), FBA 089807 (♀), FBA 089847 (♂) (BMNH). Other material examined (paratypes). **FJI: Cicia**: Mabula, 0–10 m, 13 Feb 1970, N.L.H. Krauss, 1♀ (BPBM). **Mothe**: 15 Aug 1924, E.H. Bryan, 1♀ (BPBM). **Yangasa Cluster**: Navutu-i-Loma, 8 Aug 1924, E.H. Bryan, 1♂ (BPBM).

**Comments.** *Coenosia fijiensis* is very similar to *C. pumilio* Stein from New Guinea (types seen), having 1 proepisternal seta, and, in the male, yellow antenna and palpus and tibiae without setae on the shaft. It differs from *pumilio* by having mid femur with 1 posterior preapical seta (2 in *pumilio*) and many of the setae on head, pleura and legs yellow (all black in *pumilio*).

**Etymology.** The species name refers to the place where the material was collected.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

### Genus *Orchisia* Rondani

*Orchisia* Rondani, 1877: 279. Type species: *Sapromyza costata* Meigen, 1826, by original designation.

**Diagnosis.** Head with two pairs of reclinate frontal setae; arista with hairs along its entire length; prestomal teeth developed; frontal triangle reaching lunule; dorsocentrals 1+3; prealar absent; katepisternals 1:1:1; scutellum with only the apical pair of setae strong; fore tibia without a median posterior seta; hind tibia with a very small submedian posterodorsal seta.

**Comments.** Biology unknown. Adults are assumed to be predaceous. One species: *O. costata* (Meigen), throughout warm regions of the Old World.

### 36. *Orchisia costata* (Meigen)

*Sapromyza costata* Meigen, 1826: 266. Holotype female, W Europe, in MNHNP (Pont 1986a: 218).

*Orchisia costata*; Bezzi, 1928: 170; Emden, 1942: 98; Snyder, 1965: 217; Pont, 1989: 697.

**Diagnosis.** With a very distinct wing pattern: wing with a brown elongate spot along the costal vein; scutellum with only the apical pair of setae.

**Material examined** (FAS). No specimen was found among the Fiji Arthropod Survey material. Other material examined. **FIJI: Lau:** 14 Aug 1924, E.H. Bryan, 1♀ (BPBM). **Matuku:** 5 Jul 1924, E.H. Bryan, 1♀ (BPBM). **Viti Levu:** Nausori, Oct 1920, R. Veitch, 1♀ (BMNH) (Bezzi 1928); Rewa, Nov 1905, F. Muir, 1♀ (BPBM); Rewa, Apr 1906, F. Muir, 1♂ (BPBM); Rewa, Mar 1905, F. Muir, 1♂ (BPBM).

**Distribution.** Australia, Belau, Bonin Is, Fiji, Micronesia, New Caledonia, Northern Marianas, Samoa; Afrotropical, Oriental and Palaearctic Regions.

**Biological data.** Nothing is known of the habits and biology.

### Genus *Parvisquama* Malloch

*Lispocephala* Pokorny, subgenus *Parvisquama* Malloch, 1935: 662. Type-species: *Lispocephala* (*Parvisquama*) *pahangensis* Malloch, 1935, by original designation.

**Diagnosis.** Small species, about 3.5 mm long; ocellar triangle long and narrow, reaching lunule; lower calypter reduced, linear; basal scutellar seta half as long as apical one; fore tibia without setae at middle; mid tibia with only one posterior seta; hind tibia with one median anterodorsal and posterodorsal setae, one supra-median anterodorsal and posterodorsal setae and one submedian anteroventral.

**Comments.** Previously only two species were known from Fiji, *P. tripuncta* (Malloch) and *P. dolichocera* (Bezzi), both endemic. The material examined included a large number of specimens of this genus. Four new species are here described and illustrated. They are very similar morphologically, so a complete description is made only for *P. femorata* sp. nov. and only the differentiating characters of the other new species are given. The main characters used to separate *Parvisquama* species are: colour of palpus, colour pattern of abdomen, series of anteroventral and posteroventral setae in the apical third or half of mid femur in males, and male terminalia. There is still a quantity of material to be examined, especially unidentified females, so that it appears that the Fiji *Parvisquama* fauna is much richer than suggested here.

#### 37. *Parvisquama curvicerca* Pont & Couri, sp. nov.

(Figs 64–68)

**Diagnosis.** Palpus yellow, brownish yellow in some females; antenna short, with scape brown and postpedicel largely yellowish, at least on inner surface, especially in males; males with apical third of posteroventral surface of mid femur with a row of about 8 similar setae (Fig. 64); anteroventral and posteroventral rows in the apical half of mid femur in female fine and similar, the ones on posteroventral surface a little longer, abdomen largely yellow, almost without grey pollinosity in females; males with tergites 4 and 5 with dark round lateral brown spots; females with tergites 3–5 with lateral brown spots and tergites 1+2–4 with a median brown area; male with cercal plate yellow and long, more than twice as long as height of epandrium (Fig. 65) and curved forward medially in lateral view (Fig. 66); ovipositor as in Figs 67–68.

**Material examined** (FAS): Holotype ♂, **FIJI: Vanua Levu:** Bua Prov., 5 km NW Kilaka Village, 145 m [15.815, 178.986], Malaise, 15–28 Jun 2004, Schlinger, Tokota'a, FJVN58d\_M01\_07, FBA 090194 (BPBM). Paratypes: **Vanua Levu:** Bua Prov., Batiqere Range, 5 km NW Kilaka Village, 98 m, 3–10 Jun 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 093870 (♀); 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 141849 (♀); 6 km NW Kilaka Village, 113 m [16.732, 179], Malaise, 15–28 Jun 2004, Schlinger, Tokota'a, FJVN58d\_M01\_07, FBA 090199 (♀); 145 m [15.815, 178.986], Malaise, 15–28 Jun 2004, Schlinger, Tokota'a, FJVN58d\_M01\_07, FBA 090195 (♂); 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 141850 (♀); Macuata prov., 0.4 km S Rokosalase Village [15.532, 179.019], 118 m, 23 Apr–8 May 2004, Malaise, Schlinger Tokota'a, FJVN57c\_MO2\_O3, FBA 090144 (♀); Macuata Prov., Dogotuki, 2.5 km E of Nasavu River [15.256, 179.783], 105–226 m, Malaise trap, 7 Jul 2003, Schlinger, Tokota'a, FJVN91\_M01\_01, FBA 090227 (♀),

FBA 090230 (♀). **Taveuni:** Cakaudrove Prov., Soqulu House in Soqulu estate, Malaise trap [15.833, 190], 140 m, 25 Sep–2 Oct 2002, E.I. Schlinger, M. Tokota'a, FJTA7a\_MO1\_01, FBA 089949 (♀), FBA 089952 (♀); 13–20 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.833° S, 180° W, FBA 120364 (♀), FBA 120370 (♀), FBA 120355 (♀); 21 Nov–13 Dec 2002, FBA 125269 (♀), FBA 125276 (♀); 3.2 km NW Lavena Village, Mt. Koronibuabua, 219 m, 4 Jan–11 Mar 2004, Malaise 4, Schlinger, Tokota'a, 15.855° S, 179.889° W, FBA 124101 (♀), FBA 124103 (♀), FBA 124099 (♀); 235 m, 3–17 Jun 2004, Malaise 1, Schlinger, Tokota'a, 15.855° S, 179.892° W, FBA 123143 (♀); 234 m, 13–11 Mar 2004, Malaise 2, Schlinger, Tokota'a, 15.855° S, 179.891° W, FBA 093858 (♀); 5.3 km SE Tavuki Village, Mt. Devo, 1054 m, 17–24 Oct 2002, Malaise 3, Schlinger, Tokota'a, 15.841° S, 179.958° W, FBA 095489 (♀), FBA 098358 (♀), FBA 098376 (♀), FBA 095490 (♀); 20–27 Dec 2002, Malaise 3, Schlinger, Tokota'a, 15.841° S, 179.958° W, FBA 128327 (♀); 10–17 Oct 2002, 1054 m, FJTA9c\_MO3\_03, FBA 090076 (♀); 892 m, 31 Jul–14 Aug 2004, Malaise 4, Schlinger, Tokota'a, 15.837° S, 179.973° W, FBA 113178 (♀); 5.6 km SE Tavuki Village, Devo Peak, 1187 m, 30 Jun–14 Aug 2004, Malaise 1, Schlinger, Tokota'a, 15.843° S, 179.955° W, FBA 150809 (♀); [15.843, 179.955], 3–10 Jan 2003, 1187 m, E.I. Schlinger, M. Tokota'a, FJTA8a\_MO1\_12, FBA 090035 (♀). **Viti Levu:** Naitasiri Prov., 3.8 km N Veisari Settlement, logging road to Waivudawa, 12 Dec 2002–3 Jan 2003, 300 m, Malaise 2, Schlinger, Tokota'a, 18.079° S, 178.363° E, FBA 103574 (♀), FBA 103580 (♀), FBA 103577 (♀), FBA 103576 (♀), FBA 103572 (♀), FBA 103573 (♀), FBA 103579 (♀), FBA 103575 (♀), FBA 103561 (♀); 3.2 km E Navai Village, Veilaselase Track, 1020 m, 26 Jan–13 Feb 2004, Malaise 1, Schlinger, Tokota'a, 17.624° S, 178.009° E, FBA 122531 (♀), FBA 122526 (♀); 4 km WSW Colo-i-Suva Village, Mt. Nakobalevu, 325 m, 25 Feb–17 Mar 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.422° E, FBA 101582 (♀), FBA 101587 (♀), FBA 101584 (♀), FBA 101583 (♀), FBA 101586 (♀); 14–28 Jul 2003, FBA 094455 (♀), FBA 095319 (♀); 372 m, 17 Mar–9 Apr 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 143388 (♀); 4–14 Nov 2003, FBA 096349 (♀); 3.5 km N Veisari Settlement, logging road to Waivudawa, 300 m, 25 Apr–25 May 2003, Malaise [18.079, 178.363], Schlinger, Tokota'a, FJVL10b\_MO2\_09, FBA 090237 (♀), FBA 090242 (♀), FBA 090239 (♀), FBA 090240 (♀); 14 Feb–8 Mar 2003, 300 m, Malaise 3, E. Schlinger, M. Tokota'a, 18.058° S, 178.367° E, FBA 138505 (♀), FBA 138504 (♀), FBA 138508 (♀), FBA 138511 (♀), FBA 138503 (♀); 1034 m, 17–20 Nov 2003, Malaise trap, PABITRA Wabu Baseline Survey, D Veikori, E E Claridge [17.583, 178.083], FJVL12\_MO1\_01, FBA 090248 (♀); 1.8 km E Navai Village, 700 m, old trail to Mt. Tomaniivi, 7–26 Jan 2004, Malaise 4, Schlinger, Tokota'a, 17.621° S, 177.998° E, FBA 119998 (♀); Vuda Prov., 1 km E Abaca Village, Koroyanitu Nat. Park, 800 m, Savuione Trail, 17.040° S, 177.33° E, 12–19 Nov 2002, Malaise, Schlinger, Tokota'a, FJVL01\_MO1\_07, FBA 083982 (♀); 19–26 Oct 2002, Malaise, Schlinger, Tokota'a, FJVL01\_MO1\_04, FBA 088520 (♀), FBA 088518 (♀), FBA 088519 (♀), FBA 088202 (♀); 26 Oct–5 Nov 2002, Malaise, Schlinger, Tokota'a, FJVL01\_MO1\_05, FBA 083534 (♀), FBA 083529 (♀), FBA 083530 (♀), FBA 083540 (♀); 7–12 Oct 2002, Malaise, Schlinger, Tokota'a, FJVL01\_MO1\_02, FBA 081921 (♀); 1 km SW Vaturu Dam, 620 m, 2–14 Jul 2004, Malaise 3, E. Schlinger, M. Tokota'a, 17.754° S, 177.665° E, FBA 175451 (♀); 1.5 km SW Vaturu Dam, 550 m, 2–14 Jul 2004, Malaise 1, E. Schlinger, M. Tokota'a, 17.744° S, 177.575° E, FBA 135868 (♀); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 5–22 Jun 2004, Malaise 1, Schlinger, Tokota'a, 18.171° S, 178.258° E, FBA 108484 (♀) (BMNH); Koroyanitu Nat. Park, 1 km E Abaca Village, 800 m, 22 Apr–6 May 2003, Malaise 1, Schlinger, Tokota'a, 17.667° S, 177.55° E, FBA 174741 (♀); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4947], 23 Sep–8 Oct 2002, Schlinger, Tokota'a, FJVL6b\_MO3\_O1, FBA 089706 (♀), FBA 089723 (♀), FBA 089714 (♂) (BMNH), FBA 089715 (♀), FBA 089726 (♀), FBA 089722 (♀), FBA 089693 (♂), FBA 089720 (♂). **Kadavu:** Kadavu prov., 0.25 km SW Solodamu Village, Moanakaka Bird Sanctuary, 50 m, 18 Jan–1 Feb 2004, Malaise 4, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 132631 (♀); 28 May–11 Jun 2003, Malaise 4, Schlinger, Tokota'a, 19.078° S, 178.121° E, FBA 135137 (♀), FBA 135138 (♀).

**Etymology.** The name refers to the curved cercal plate of the male terminalia.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

### 38. *Parvisquama dolichocera* (Bezzi)

(Figs 69–76)

*Coenosia dolichocera* Bezzi, 1928: 169. Holotype male, FIJI: Lautoka Mts, in BMNH [Pont 1970b: 419]. *Coenosia microlepis* Bezzi, 1928: 168. Lectotype female, FIJI, Taveuni, in BMNH [designation by Pont 1970b: 421].

*Lispocephala dolichocera*; Emden, 1942: 97.

*Parvisquama dolichocera*; Pont, 1970b: 419; Pont, 1989: 697.

**Diagnosis.** Palpus dark brown; postpedicel long, reaching mouth edge, broad and truncate at tip (Fig. 69); mid femur with series of fine and short anteroventral and posteroventral setae, similar on both surfaces (Fig. 70); abdomen yellowish; tergites 1+2–4 with a faint greyish brown median line; rounded brown spots on tergites 3–5 (those on tergite 3 faint in male); apex of abdomen as in Fig. 71; male terminalia yellow; cercal plate as long as height of epandrium; sternite 5, cercal plate and aedeagus as in Figs 72–76.

**Material examined (FAS): FIJI: Vanua Levu:** Bua Prov., Batiqere Range, 5 km NW Kilaka Village, 98 m, 28 Jun–21 Jul 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 141836 (♂), FBA 141832 (♂), FBA 141834 (♂); 3–10 Jun 2004, Malaise 3, Schlinger, Tokota'a, 15.811° S, 178.988° E, FBA 114405 (♂). **Taveuni:** Cakaudrove Prov., Soqulu House in Soqulu estate, 140 m, 13–20 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.833° S, 180° W, FBA 120383 (♂), FBA 120352 (♂), FBA 120355 (♂), FBA 125272 (♂), FBA 120351 (♂); 5.3 km SE Tavuki Village, Mt. Devo, 15 60 27.4° S, 179 58.1° W, 1054 m, 31 Oct–14 Nov 2002, Schlinger, Tokota'a, Malaise, FJTA9c\_M03\_06, FBA 089173 (♂). **Viti Levu:** Naitasiri Prov., 2 km E Navai Village, old trail to Mt. Tomaniivi, 700 m, 26 Sep–11 Oct 2003, Malaise 3, Schlinger, Tokota'a, 17.621° S, 178° E, FBA 124615 (♂), FBA 124531 (♂), FBA 124617 (♂), FBA 124626 (♂), FBA 124606 (♂), FBA 124521 (♂); Vuda Prov., 1.5 km SW Vaturu Dam, 550 m, 2–14 Jul 2004, Malaise 1, E. Schlinger, M. Tokota'a, 17.744° S, 177.575° E, FBA 135871 (♂); 1 mile SW Vaturu Dam, 520 m, 2–14 Jul 2004, Malaise 3, Schlinger, Tokota'a, 17.754° S, 177.665° E, FBA 175449 (♂). Other material examined. **FIJI: Viti Levu:** Lautoka Mountains, 11 Apr 1920, W. Greenwood, holotype ♂ of *dolichocera* (BMNH); Nandarivatu, 850–950 m, 2 Apr 1973, 6♂, 7♀, N.L.H. Krauss (BPBM); the same, but 2 Mar 1973, 5♂, 3♀ (USNM); Lami, 20–200 m, Mar 1974, 1♂, N.L.H. Krauss (BPBM); Nausori Highlands, 500–600 m 9 Feb 1971, 1♀, N.L.H. Krauss (BPBM); Mt. Victoria (now Mt. Tomaniivi), 600–1000 m, 30 Jul 1967, 1♀, J. & M. Sedlacek (BPBM). **Ovalau:** Levuka, 0–200 m, Dec 1969, 1♀, N.L.H. Krauss (BPBM). **Taveuni:** 21 Dec 1921, H.W. Simmonds, lectotype ♀ and paralectotype 1♀ of *microlepis* (Bezzi's "type male and female") (BMNH). **Vanua Levu:** Mt. Dalaikoro, summit area, 700–790 m, 10 Oct 1979, 1♀, S.N. Lal, G.A. & S.L. Samuelson (BPBM).

**Comments.** The long postpedicel easily separates this species from the others. As pointed out by Emden, Bezzi's type-series of male and female *P. microlepis* actually consists of females of two different species of *Parvisquama*. The lectotype and paralectotype females from Taveuni belong to *P. dolichocera* and the paralectotype female from Cuvu belongs to *P. tripuncta*.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

### 39. *Parvisquama femorata* Pont & Couri, sp. nov.

(Figs 77–80)

**Diagnosis.** Palpus yellow, brownish at base in some specimens; postpedicel short; males on posteroventral surface of mid femur with 4–5 short stout spinules in apical sixth (Fig. 77); hind femur with comb-like posteroventral setulae in apical half; surstylus shorter than height of epandrium, curved inwards at apex in lateral view; cercal plate and aedeagus as in Figs 78–79. Ovipositor and spermatheca as in Fig. 80.



## Description

### Male

General coloration. Occiput, fronto-orbital plate, parafacial, face, gena and ocellar triangle with silver pollinosity, frons dark brown; antenna and arista brown, sometimes apex of scape and base of postpedicel yellowish; palpus yellow, brownish at base in some specimens; thorax brown with opaque grey pollinosity; scutum with 3 very faint vittae along acrostichal and dorsocentral lines; haltere white, wing and calypters clear; legs yellow; abdomen with grey pollinosity on all tergites, with few yellow areas, only on apical margins of tergites 1+2–4; some males with yellow lateral areas on syntergite 1+2, tergites 3–5 with lateral dark brown clouds, those on tergite 5 round, and a median brown line. Male with surstylus yellow.

Head. Inner and outer vertical setae short; frontal row with 4 setae; postpedicel about 1.8 times the length of pedicel; arista with short hairs; vibrissa long, inserted at oral margin.

Thorax. Acrostichals in two irregular rows of setulae; dorsocentrals 1+3; intraalars 1+2; notopleurals 2, the anterior one longer; postpronotals 2, one long and one short; scutellum with one short subbasal seta and one very long apical, about 3 times the length of the subbasal, and with scattered setulae on disc; anepisternum with a row of 4 setae on upper half, the third one longer, and one seta an apex of lower half.

Legs. Fore femur with a well-spaced row of anteroventral and anterodorsal setae, the last one stronger. Fore tibia with a preapical seta on anteroventral, anterodorsal and dorsal surfaces. Mid femur with 1–3 anterior setae on middle third, a row of anteroventral setae in basal half, posteroventral surface with 4–5 short stout spinules in apical sixth (Fig. 72); one preapical posterior seta. Mid tibia with apical setae on dorsal, anteroventral, posteroventral and ventral surfaces, the last one long. Hind femur with an anterodorsal row of setae and one irregular row of anteroventrals, the middle 3 and the preapical stronger; with comb-like posteroventral setulae in apical half.

Abdomen. Tergites 1+2–5 each with a marginal row of fine setae; tergite 5 with a discal series of 4 setae.

Terminalia. Cercal plate curved inwards at apex in lateral view. Cercal plate and aedeagus as in Figs 73–74.

Measurement. Length of body, 2.8–3.5 mm.

### Female

Similar to the male, differing as follows: mid femur with the anteroventral and posteroventral row of setae in the apical half fine and similar in both surfaces. Ovipositor and spermathecae as in Fig. 75.

Measurement. Length of body, 2.6–3.5 mm.

**Material examined** (FAS): Holotype ♂, **FIJI: Vanua Levu**: Bua Prov., Batiqere Range, 5 km NW Kilaka Village, 145 m [16.815, 178.985], 15–28 June 2004, Malaise, Schlinger, Tokota'a, FJN58d\_MO1\_07, FBA 090150 (BPBM). Paratypes: **Vanua Levu**: Macuata Prov., Dogotuki, 2.5 km E of Nasavu River [15.256, 179.783], 105–226 m, Malaise trap, 7 Jul 2003, Schlinger, Tokota'a, FJVN91\_M01\_01, FBA 090229 (♂); Bua Prov., Batiqere Range, 5 km NW Kilaka Village, 145 m [16.815, 178.985], 15–28 Jun 2004, Malaise, Schlinger, Tokota'a, FJN58d\_MO1\_07, FBA 090161 (♂), FBA 090167 (♂), FBA 090152 (♂), FBA 090150 (♂), FBA 090156 (♀), FBA 090163 (♀), FBA 090162 (♀), FBA 090168 (♀), FBA 090166 (♀), FBA 090149 (♀), FBA 090164 (♀), FBA 090157 (♀), FBA 090200 (♀); 145 m, 28 Jun–21 Jul 2004, Malaise 1, Schlinger, Tokota'a, 15.815° S, 178.986° E, FBA 104930 (♀); 98 m, 3–10 Jun 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 093875 (♂), FBA 093867 (♀); 51 m, 3–10 Jun 2004, Malaise 3, Schlinger, Tokota'a, 15.811° S, 178.988° E, FBA 114409 (♀), FBA 114407 (♀), FBA 115001 (♀); 98 m [16.807, 178.991], Malaise, 15–24 Jun 2004, Schlinger, Tokota'a, FJVN58b\_MO5\_07, FBA 090219 (♀), FBA 090217 (♀). **Taveuni**: Cakaudrove Prov., 5.3 km SE Tavuki Village, Mt. Devo, 1064 m, 17–24 Oct 2002, Malaise 3, Schlinger, Tokota'a, 15.841° S, 179.968° W, FBA 108209 (♂), FBA 153864 (♂), FBA 147722 (♂), FBA 125402 (♂), FBA 147730 (♂), FBA 098363 (♀), FBA 095495 (♀), FBA 126401 (♀); 27 Dec 2002–3 Jan 2003, FBA 146267 (♂), FBA 146270 (♀); 30 Jun–31 Jul 2004, FBA 148832 (♀), FBA 148834 (♀), FBA 148831 (♀); 31 Jul–4 Aug 2004, FBA 107686 (♀), FBA 107687 (♀), FBA 107685 (♀); 20–27 Dec 2002, FBA 128347 (♀), FBA 128342 (♀), FBA 128349 (♀) (BMNH),

FBA 128346 (♀); 2–10 Oct 2002, FBA 108205 (♀); 3–20 Dec 2002, Malaise 3, Schlinger, M. Tokota'a, 15.841° S, 179.966° W, FBA 153871 (♂), FBA 145630 (♂), FBA 153861 (♀), FBA 153862 (♀), FBA 153859 (♀); 24–31 Oct 2002, FBA 147733 (♀), FBA 147728 (♀), FBA 147729 (♀), FBA 147731 (♀), FBA 105791 (♀); 1054 m, 10–17 Oct 2002, E.I. Schlinger, M. Tokota'a, FJTA9c\_MO3\_O3, FBA 090109 (♂), FBA 090091 (♂), FBA 090101 (♂), FBA 090088 (♂), FBA 090080 (♂), FBA 090096 (♂), FBA 090104 (♀), FBA 090083 (♀), FBA 090093 (♀), FBA 090074 (♀), FBA 090084 (♀), FBA 090085 (♀), FBA 090087 (♀), FBA 090100 (♀), FBA 090097 (♀); 14–21 Nov 2002, E.I. Schlinger, M. Tokota'a, FJTA9c\_MO3\_O7, FBA 090060 (♀), FBA 090061 (♀), FBA 090055 (♀), FBA 090056 (♀), FBA 090059 (♀), FBA 090062 (♀), FBA 090063 (♀), FBA 090054 (♀), FBA 090053 (♀), FBA 090058 (♀); 31 Oct–14 Nov 2002, E.I. Schlinger, M. Tokota'a, FJTA9c\_MO3\_O5, FBA 089174 (♀), FBA 089642 (♀); 892 m, 31 Jul–14 Aug 2004, Malaise 4, E.I. Schlinger, M. Tokota'a, 15.837° S, 179.973° W, FBA 113177 (♂), FBA 151630 (♀), FBA 113179 (♀), FBA 113180 (♀); 14–31 Jul 2004, FBA 151635 (♂), FBA 098998 (♀); 734 m, Malaise trap [15.831, 179.98], 14 Jul–14 Aug 2004, E.I. Schlinger, M. Tokota'a, FJTA9a\_MO5\_O2, FBA 090121 (♂); 5.5 km SE Tavuki Village, Devo Peak, Malaise trap [15.843, 179.955], 30 Jun–14 Jul 2004, 1188 m, Schlinger, Tokota'a, FJTA8b\_MO2\_O2, FBA 089958 (♂), FBA 089967 (♂), FBA 089956 (♂); 15.843° S, 179.955° W, FBA 152697 (♀); 1187 m, 14–21 Nov 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.843° S, 179.966° W, FBA 129688 (♂), FBA 129689 (♂), FBA 129699 (♂), FBA 110325 (♂), FBA 110333 (♂) (BMNH), FBA 129687 (♀), FBA 129692 (♀), FBA 129594 (♀), FBA 129700 (♀); 30 Jun–14 Jul 2004, FBA 150812 (♀), FBA 150805 (♀), FBA 149270 (♀), FBA 149267 (♀), FBA 149269 (♀), FBA 150808 (♀); 21 Nov–13 Dec 2002, FBA 149640 (♀); 31 Oct–14 Nov 2002, FJTA8a\_MO1\_O5, FBA 089957 (♂); 1 Jan–10 Feb 2003, FJTA8a\_MO1\_12, FBA 090034 (♂); 3–10 Jan 2003, FBA 089983 (♀), FBA 089998 (♀), FBA 090033 (♀); 20–27 Dec 2002, 15.843° S, 179.966° W, FBA 144789 (♂); 3.2 km NW Lavena Village, Mt. Koronibuabua, 234 m, 13–11 Mar 2004, Malaise 2, Schlinger, Tokota'a, 15.855° S, 179.891° W, FBA 093860 (♂), FBA 093859 (♂); Devo Forest Reserve, 10–17 Oct 2002, FJ–9 Malaise, M. Irwin, E. Schlinger, M. Tokota'a, 179°59' E, 16°50' S, 800; FBA; 002569 (♀). **Viti Levu:** Naitasiri Prov., 4.8 km N Veisari Settlement, logging road to Waivudawa, 12 Dec 2002–3 Jan 2003, 300 m, Malaise 1, Schlinger, Tokota'a, 18.075° S, 178.362° E, FBA 177408 (♂), FBA 177396 (♂); 3.2 km E Navai Village, Veilaselase Track, 1020 m, 26 Jan–13 Feb 2004, Malaise 1, Schlinger, Tokota'a, 17.624° S, 178.009° E, FBA 122517 (♀), FBA 122506 (♀), FBA 122519 (♀); 2 km N Navai Village, old trail to Mt. Tomaniivi, 700 m, 26 Sep–11 Oct 2003, 300 m, Malaise 3, Schlinger, Tokota'a, 17.621° S, 178° E, FBA 124607 (♂), FBA 124622 (♀), FBA 124618 (♀), FBA 124604 (♀); 4 km WSW Colo-i-Suva Village, Mt. Nakobalevu, 372 m, 17 Mar–9 Apr 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 143381 (♀), FBA 143387 (♀); 325 m, 4–14 Nov 2003, Malaise 2, Schlinger, Tokota'a, 18.056° S, 178.422° E, FBA 140753 (♀), FBA 140753 (♀); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4947], 23 Sep–8 Oct 2002, Schlinger, Tokota'a, FJVL6b\_MO3\_O1, FBA 089719 (♂); 0.8 km SSW Volivoli Village, 25 m, Malaise trap, 3–13 Dec 2003, Schlinger, Tokota'a, FJVL6a\_M04\_27, FBA 089931 (♀); Vuda Prov., 1.5 km SW Vaturu Dam, 550 m, 2–14 Jul 2004, Malaise 1, E. Schlinger, M. Tokota'a, 17.744° S, 177.575° E, FBA 135865 (♀).

**Etymology.** The name refers to the short stout spinules in the apical sixth of mid femur.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

#### 40. *Parvisquama longicerca* Pont & Couri, sp. nov.

(Figs 81–85)

**Diagnosis.** Antenna brown, apex of scape and base of postpedicel yellow; palpus yellow; mid femur of male with a row of comb-like setulae in the apical half of anteroventral and posteroventral surfaces, the ones on posteroventral surface more developed (Fig. 81); hind femur with a row of comb-like posteroventral setulae in apical half; abdomen yellow with grey pollinosity on tergites 4 and 5; apex of abdomen as in Fig. 82; tergites 1+2–4 with a median brown longitudinal cloud, tergites 4–5 with round lateral brown clouds; male sternite 5 as in Fig. 83; male with cercal plate very long, about three times the height of epandrium and curved inwards at apex in lateral view (Figs 84–85).

**Material examined** (FAS): Holotype ♂, **FIJI: Viti Levu**: Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4947], 23 Sep–8 Oct 2002, E.I. Schlinger, M. Tokota'a, FJVL6b\_MO3\_O1, FBA 089669 (BPBM). Paratypes: **Viti Levu**: data as for holotype, FJVL6b\_MO3\_O1, FBA 089705 (♂), FBA 089704 (♂) (BMNH). **Taveuni**: Cakaudrove Prov., 5.6 km SE Tavuki Village, Devo Peak [15.843, 179.955], 1187 m, Malaise trap, 30 Jun–14 Jul 2004, 1188 m, E.I. Schlinger, M. Tokota'a, FJTA8b\_MO2\_O2. FBA 089959 (♂).

**Etymology.** The name refers to the long cercal plate of the male terminalia.

**Comments.** This may be the same as a species in BMNH from Vanuatu. Female unknown.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

#### 41. *Parvisquama longiseta* Pont & Couri, sp. nov.

(Figs. 86–89)

**Diagnosis.** Palpus brown, postpedicel about 2.2 times the length of the yellow pedicel; mid coxa with strong setae on ventral surface; mid femur with a comb-like series of strong setae in apical third of posteroventral surface (Fig. 86); hind femur with a comb-like series of fine posteroventral setae in apical half; abdominal syntergite 1+2 yellowish, tergites 3–4 with grey pollinosity, yellow only along the apical margin, tergite 5 with no yellow marks; tergites 3–4 with lateral and median brown clouds, tergite 5 with two round lateral clouds; apex of abdomen as in Fig. 87; male sternite 5 with long setae on margin, as in Fig. 88; cercal plate a little longer than height of epandrium in lateral view and a little sinuous; terminalia in lateral view as in Fig. 89.

**Material examined** (FAS): Holotype ♂, **FIJI: Taveuni**: Cakaudrove Prov., 5.3 km SE Tavuki Village, Mt. Devo, 1054 m, 10–17 Oct 2002, E.I. Schlinger, M. Tokota'a, 16.841° S, 179.958° W, FJTA9C\_M03\_03, FBA 090075 (BPBM).

**Etymology.** The name refers to the long setae on the margin of male sternite 5.

**Comments.** Female unknown.

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

#### 42. *Parvisquama tripuncta* (Malloch)

(Figs 90–98)

*Lispocephala tripuncta* Malloch, 1928b: 80. Holotype female, FIJI: Nadi, in BPBM (Lee *et al.* 1956: 338).

*Lispocephala tripuncta*; Emden, 1942: 97.

*Parvisquama tripuncta*; Pont, 1970b: 421; Pont, 1989: 697.

**Diagnosis.** Palpus yellow; postpedicel short; abdomen yellowish, sometimes more or less infuscated and greyish dusted; tergites 3–5 with brown rounded spots on each side and a brown median cloud; mid femur with anteroventral and posteroventral rows in the apical half, the latter denser (Fig. 90). Apex of male abdomen as in Fig. 91; sternite 5 as in Figs 92 (dorsal view) and 93 (ventral view); cercal plate as long as height of epandrium; cercal plate as in Figs 94 (dorsal view) and 95 (lateral view). Ovipositor, spermathecae and egg as in Figs 96–98.

**Material examined (FAS).** **FIJI: Vanua Levu:** Bua Prov., Batiqere Range, 5 km NW Kilaka Village, 145 m, 28 Jun–21 Jul 2004, Malaise 1, Schlinger, Tokota'a, 15.815° S, 178.986° E, FBA 104937 (♀), FBA ? (♀); 98 m, 3–10 Jun 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 093872 (♀), FBA 093878 (♀), FBA 114410 (♀); 113 m [16.732, 179], Malaise, 15–28 Jun 2004, Schlinger, Tokota'a, FJVN58d\_M01\_07 FBA 090201 (♀). **Taveuni:** Cakaudrove Prov., 5.6 km SE Tavuki Village, Devo Peak, 1187 m, 21 Nov–13 Dec 2002, Malaise 1, E.I. Schlinger, M. Tokota'a, 15.843° S, 179.966° W, FBA 149633 (♀), FBA 129595 (♀), FBA 129704 (♀), FBA 129690 (♀), FBA 129585 (♀), FBA 129591 (♀), FBA 129705 (♀), FBA 129698 (♀), FBA 149532 (♀), FBA 144815 (♀), FBA 110326 (♀), FBA 110324 (♀), FBA 149639 (♀), FBA 129593 (♀), FBA 149636 (♀); 1188 m, 30 Jun–14 Aug 2004, Malaise 1, Schlinger, Tokota'a, 15.843° S, 179.966° W, FBA 152599 (♀); 1054 m, 20–27 Dec 2002, Malaise 3, Schlinger, Tokota'a, 15.841° S, 179.958° W, FBA 128336 (♀), FBA 128339 (♀), FBA 128341 (♀), FBA 128326 (♀), FBA 147726 (♀); Tavuki Village, Mt. Devo, 734 m, Malaise trap [15.831, 179.98], 14 Jul–14 Aug 2004, E.I. Schlinger, M. Tokota'a, FJTA9a\_MO5\_O2. FBA 090120 (♀); 1187 m [15.843, 179.955], 31 Oct–14 Nov 2002, E.I. Schlinger, M. Tokota'a, FJTA8a\_MO1\_O5. FBA 089543 (♀), FBA 089546 (♀), FBA 089548 (♀); 1054 m, Malaise trap [15.841, 179.958], 10–17 Oct 2002, E.I. Schlinger, M. Tokota'a, FJTA9c\_MO3\_O3. FBA 090092 (♀), FBA 090079 (♀); 17–24 Oct 2002, FBA 098351 (♀), FBA 090111 (♀); 15 450 27.4° S, 179 58 04.1° W, 31 Oct–14 Nov 2002, E.I. Schlinger, M. Tokota'a, FJTA9c\_MO3\_O5, FBA 089175 (♀); 892 m, 31 Jul–14 Aug 2004, Malaise 4, E.I. Schlinger, M. Tokota'a, 15.837° S, 179.973° W, FBA 113182 (♀); 14–31 Jul 2004, Malaise 4, E.I. Schlinger, M. Tokota'a, 15.837° S, 179.973° W, FBA 151532 (♀); 5.3 km SE Tavuki Village, Mt. Devo, 1054 m, 20–27 Dec 2002, Malaise 3, Schlinger, Tokota'a, 15.841° S, 179.958° W, FBA 128345 (♀), FBA 128337 (♀); 17–24 Oct 2002, FBA 098371 (♀); Devo Forest Reserve, 10–17 Oct 2002, FJ–9 Malaise, M. Irwin, E. Schlinger, M. Tokota'a, 179°59' E, 16°50' S, 800; FBA; 002571 (♀). **Viti Levu:** Naitasiri Prov., 4 km WSW Colo-i-Suva Village, Mt. Nakobalevu, 372 m, 25 Feb–17 Mar 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 143384 (♀), FBA 143385 (♀), FBA 143382 (♀), FBA 143384 (♀); 4–14 Nov 2003, Malaise 3, Schlinger, Tokota'a, 18.055° S, 178.424° E, FBA 095351 (♀), FBA 095350 (♀); 3.2 km E Navai Village, Veilaselase Track, 1020 m, 8–24 Nov 2003, Malaise 1, Schlinger, Tokota'a, 17.624° S, 178.000° E, FBA 155848 (♀), FBA 155847 (♀); 26 Jan–13 Feb 2004, Malaise 1, Schlinger, Tokota'a, 17.624° S, 178.000° E, FBA 122551 (♀), FBA 122523 (♀), FBA 122515 (♀), FBA 122521 (♀), FBA 122527 (♀), FBA 122528 (♀) (BMNH); 4.8 km N Veisari Settlement, logging road to Waivudawa, 300 m, 12 Dec 2002–3 Jan 2003, Malaise 1, Schlinger, Tokota'a, 18.075° S, 178.362° E, FBA 177393 (♀), FBA 177403 (♀); 3.5 km N Veisari Settlement, logging road to Waivudawa, 14 Feb–8 Mar 2003, Malaise 3, E. Schlinger, M. Tokota'a, 18.068° S, 178.367° E, FBA 138509 (♀), FBA 177403 (♀); Vuda Prov., 1.5 km SW Vaturu Dam, 550 m, 2–14 Jul 2004, Malaise 1, E. Schlinger, M. Tokota'a, 17.744° S, 177.575° E, FBA 135863 (♀); 1 km E Abaca Village, Koroyanitu Nat. Park, 800 m, Savuione trail, 17.80° S, 177.33° E, 7–12 Oct 2002, Malaise 1, Schlinger, Tokota'a, FJVL01\_MO1\_02, FBA 081925 (♀); Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4847], 23 Sep–8 Oct 2002, Schlinger, Tokota'a, FJVL6b\_MO3\_O1, FBA 089718 (♀); Namosi Prov., 2 km SE Nabukavesi Village, Ocean Pacific Resort, 40 m, 22 Jun–7 Aug 2003, Malaise [18.171, 178.258], Schlinger, Tokota'a, FJVL18a\_MO1\_10, FBA 090235 (♀), FBA 090236 (♀); 1034 m, 17–20 Nov 2003, Malaise trap, PABRITA Wabu Baseline Survey, D. Veikori, E.E. Claridge [17.583, 178.083], FJVL12\_MO1\_FBA, FBA 090245 (♀). Other material examined. **FIJI: Cuvu:** 9 Aug 1919, R. Veitch, paralectotype 1♀ of *microlepis* (BMNH). **Taveuni:** 21 Dec 1921, H.W. Simmonds, paralectotype 1♀ of *microlepis* (MCSNM). **Viti Levu:** Suva, 22 Aug 1938, R.A. Lever, 1♀ (BMNH); Suva, 16 Jul 1939, R.A. Lever, 1♂ (BMNH); Suva Peninsula, at light, Jun 1956, H.S. Evans, 1♀ (BMNH); Suva, on office window, with prey, 24 Oct 1924, H.W. Simmonds, 1♀ (BMNH).

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

### Genus *Pygophora* Schiner

*Pygophora* Schiner, 1868: 295. Type-species: *Pygophora apicalis* Schiner, 1868, by original designation.

**Diagnosis.** Frons high, much wider at anterior margin than at vertex; two pairs of reclinate orbital setae and usually 2 frontal setae; frontal triangle short; arista with long hairs on basal half; prestomal teeth developed; dorsocentrals 1+3, the presutural seta sometimes preceded by a second short one; prealar seta absent; anepimeron bare; fore tibia with one median seta on posterior surface; hind tibia with one anteroventral, 2 anterodorsal and 2 posterodorsal setae.

**Comments.** Biology unknown; adults predaceous. Two species: *P. ctenophora* Bezzi, endemic, and a second unnamed but apparently endemic species known from a single male

#### 43. *Pygophora ctenophora* Bezzi

*Pygophora ctenophora* Bezzi, 1928: 169. Lectotype male, FIJI, Natova, in BMNH [designation by Pont, 1970b: 419].

*Pygophora ctenophora*; Malloch, 1929b: 160; Emden, 1942: 95, fig. 2; Crosskey, 1962: 465, figs 58, 95; Pont, 1989: 698.

**Diagnosis.** Antenna long, yellowish; face golden; palpus whitish in male, yellowish in female; legs yellow, mid femur in male with a double row of short posteroventral setae on apical third; male with the sides of tergite 4 bare, and the sides of tergite 5 with areas of dense short fine matted hairs.

**Material examined (FAS): FIJI: Taveuni:** Cakaudrove prov., 5.6 km SE Tavuki Village, Devo Peak, Malaise trap [15.843, 179.955], 31 Oct–14 Nov 2002, 1187 m, Schlinger, Tokota'a, FJTA8a\_M01\_05, FBA 089541 (♂); 5.3 km SE Tavuki Village, Mt. Devo [15.841, 179.958], 1054 m, Malaise trap, 14–21 Nov 2002, E.I. Schlinger, M. Tokota'a, FJTA9c\_M03\_07, FBA 090065 (♀). **Vanua Levu:** Bua Prov., Batiqere Range, 6 km NW Kilaka Village, 51 m, 3–10 Jun 2004, Malaise 3, Schlinger, Tokota'a, 15.811° S, 178.988° E, FBA 114993 (♀), FBA 115000 (♀); 98 m, 3–10 Jun 2004, Malaise 5, Schlinger, Tokota'a, 15.807° S, 178.991° E, FBA 093858 (♀), FBA 141819 (♀). **Viti Levu:** Sigatoka Sand Dunes Nat. Park, 1.1 km SSW Volivoli Village, 55 m, Malaise trap [18.1594, 177.4847], 14–22 Dec 2002, E.I. Schlinger, M. Tokota'a, FJVL6b\_M02\_03, FBA 089859 (♀), FBA 089832 (♀), FBA 089820 (♀), FBA 089860 (♀), FBA 089817 (♂), FBA 089858 (♂); Naitasiri Prov., 1.8 km E Navai Village, 700 m, old trail to Mt. Tomaniivi, 7–26 Jan 2004, Malaise 4, Schlinger, Tokota'a, 17.621° S, 177.998° E, FBA 120011 (♀); Vuda Prov., Koroyanitu N.H.O., Savuione Trail, FJ-1, Malaise in montane forest, 21 Sep–7 Oct 2002, M Irwin, E. Schlinger, M. Tokota'a, 17.40° S, 177.33° E, 450 m, FBA 002598 (♀). Other material examined. **Fiji: Lau:** Oneata, 19 Aug 1924, E.H. Bryan, 1♀ (BPBM) (Crosskey 1962); Namuka, 12 Aug 1924, E.H. Bryan, 1♀ (BPBM); Lakemba, Tubou, 0–50 m, 20 Feb 1971, N.L.H. Krauss, 1♂ (BPBM); Avea, 22 Sep 1924, E.H. Bryan, 1♀ (BPBM); Kambara, Naikeleyaga, 0–100 m, 22 Feb 1971, N.L.H. Krauss, 1♀ (BPBM). **Ovalau:** May 1921, H.W. Simmonds [not June as stated by Bezzi], paralectotype 1♀ (BMNH). **Taveuni:** 15 Jul 1924, S. Evans, 1♀ (BMNH). **Vanua Levu:** Nasese, 31 Jul 1921, H.W. Simmonds, paralectotype 1♀ (BMNH). **Viti Levu:** Natova, May 1918, R. Veitch, lectotype ♂ (BMNH); Natova, Apr 1918, R. Veitch, 1♂ (BMNH) (Crosskey 1962); Lautoka, 23 Mar 1910, R. Veitch, paralectotype 1♂ (MCSNM); Lami, Mar 1951, N.L.H. Krauss, 1♀ (BPBM) (Crosskey 1962); Lami, May 1951 N.L.H. Krauss, 1♀ (BPBM); Nadarivatu, 850 m, 8–13 Mar 1963, C.M. Yoshimoto, 1♀ (BPBM). **Yangasa Cluster:** Navutu-i-Loma, 8 Aug 1924, E.H. Bryan, 1♀ (BPBM) (Crosskey 1962).

**Distribution.** Known only from Fiji.

**Biological data.** Nothing is known of the habits and biology.

#### 44. *Pygophora* sp.

A single male has been seen of a second species of *Pygophora*, but as it is not in good condition (not fully hardened) we refrain from describing it. It is very similar to *P. pallipalpis* (Stein, 1910) known from Madagascar and the Seychelles (Crosskey, 1962: 522–524; Couri *et al.*, 2006: 873–874), as it has mid femur with 1 posterior preapical seta, frons with 2 strong and 2 weak frontal setae, and fronto-orbital plate with short setulae outside the frontal setae. It differs from *P. pallipalpis* by the shorter postpedicel, fore tibia without anterodorsal setae, hind tarsomere 1 of normal length, and hind tibia with the apical dorsal seta short, less than half as long as hind tarsomere 1.

**Material examined: Fiji: Viti Levu:** Mt. Victoria, Tholo North, west slope, 3000 feet, beating, 16 Sep 1938, E.C. Zimmerman, 1♂ (BPBM).

**Comments:** As this species has not been found since the original capture in 1938, it seems likely that it is now extinct.

**Distribution:** Known only from Fiji.

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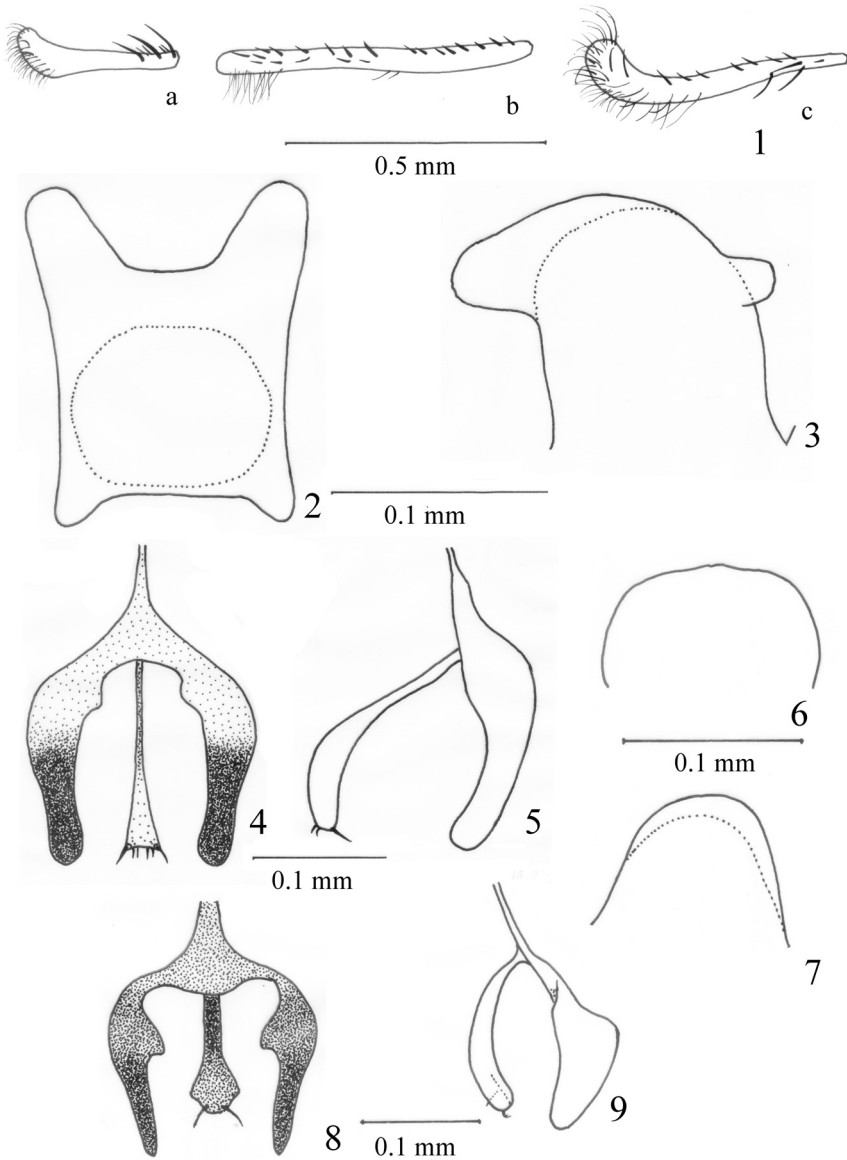


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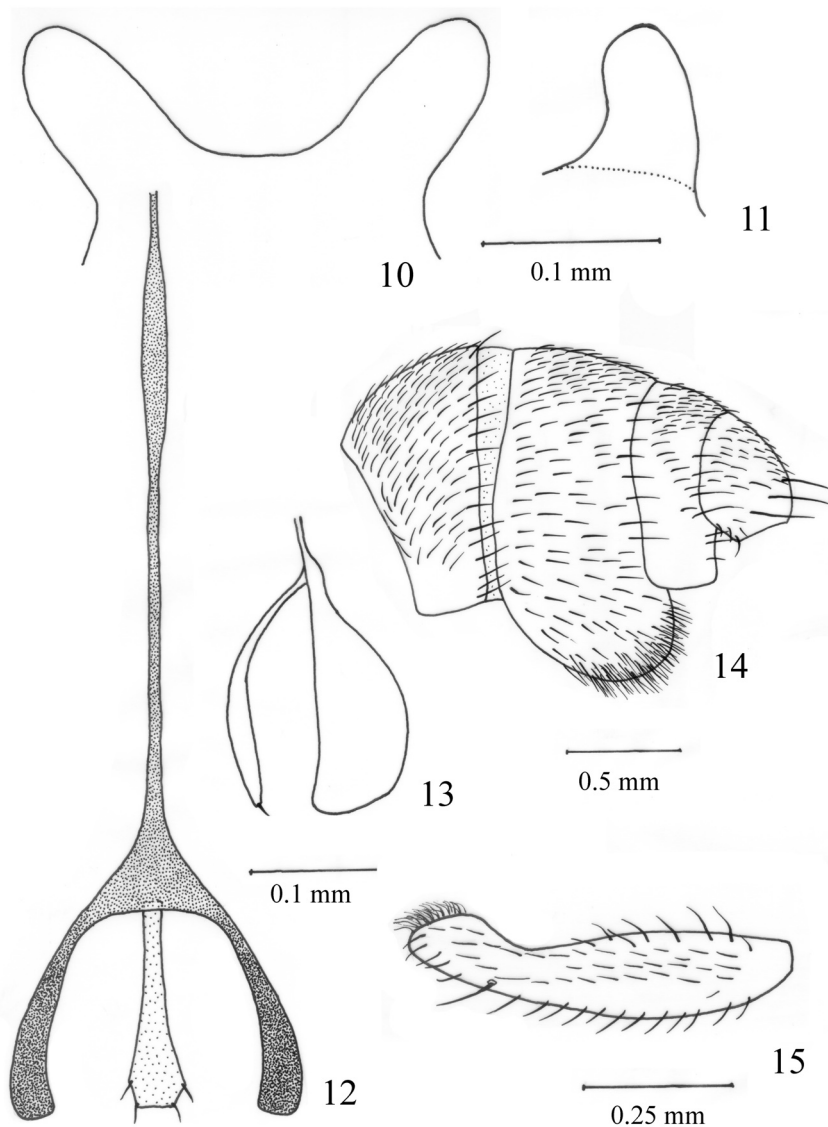


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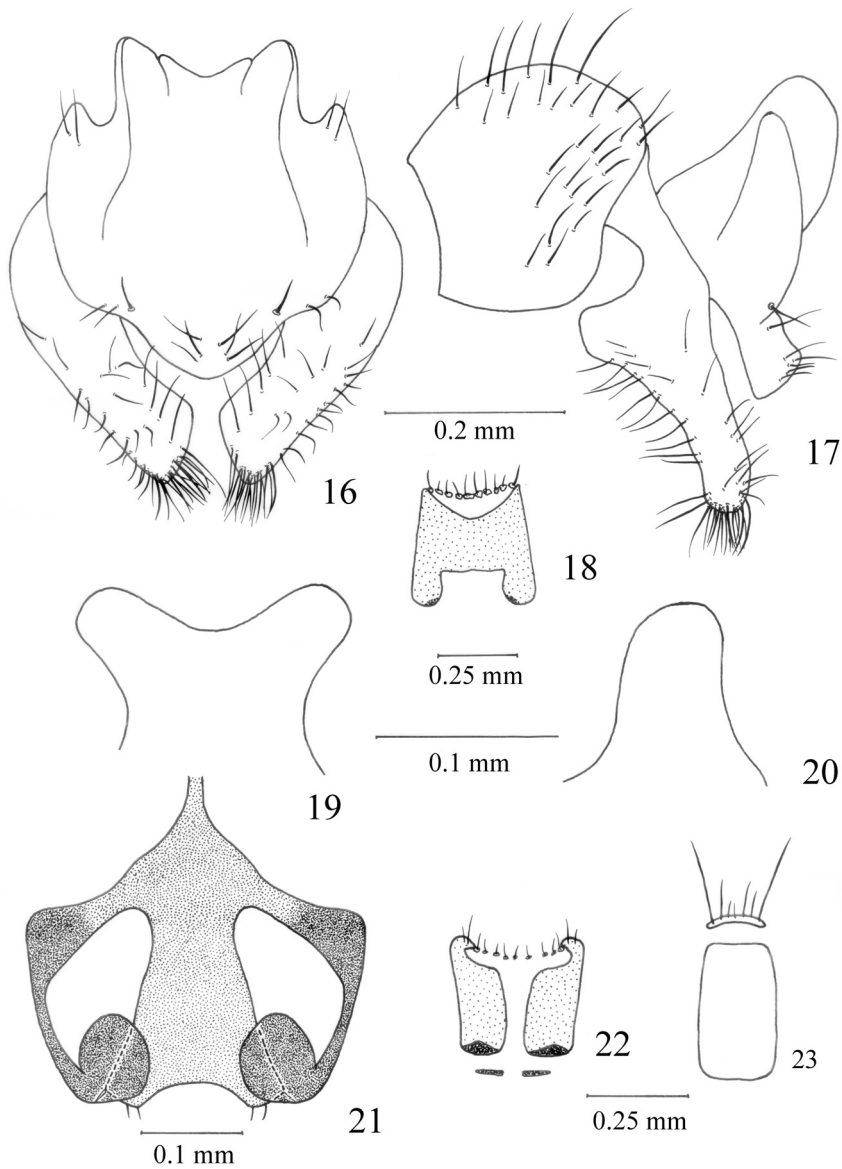
## ILLUSTRATIONS



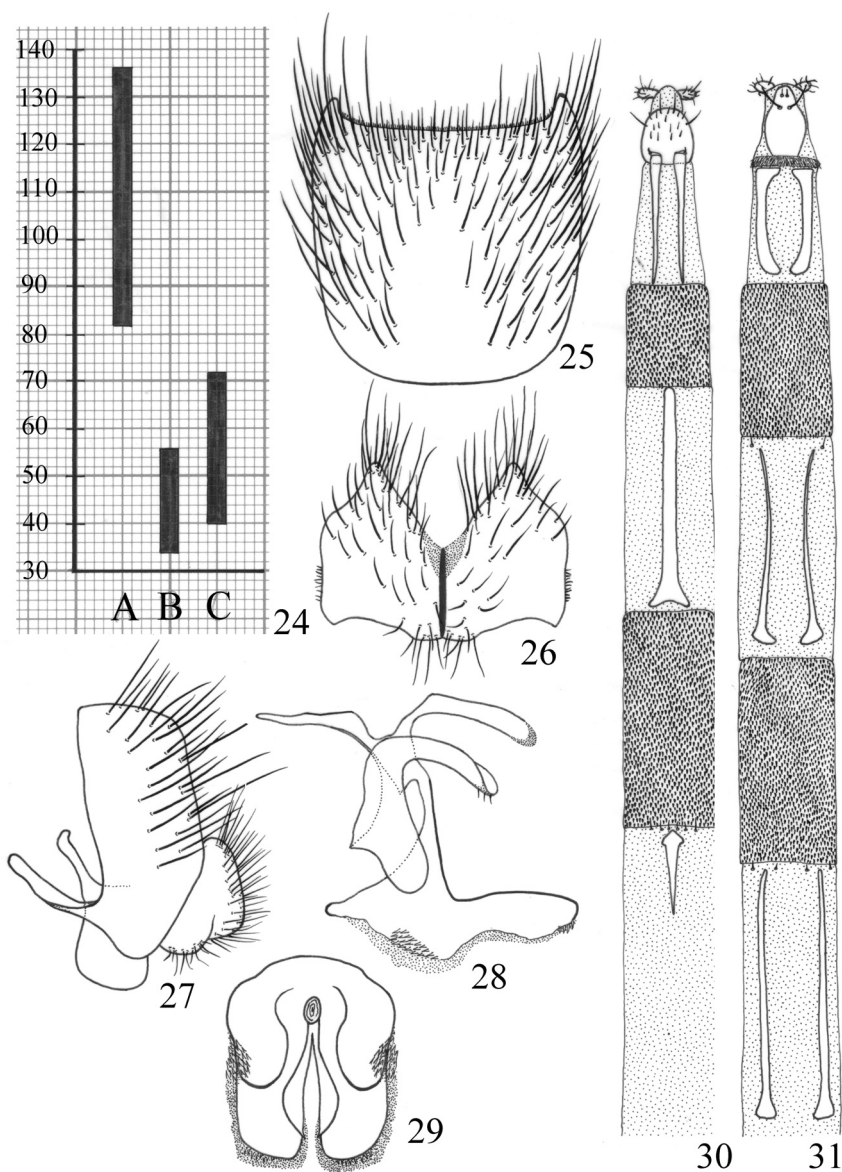
**Figures 1–9.** Fig. 1. Male palpus, lateral view, of (a) *Atherigona varia* (Meigen) (Europe), (b) *Atherigona orientalis* Schiner (Fiji), (c) *Atherigona splendens* Bezzi (Fiji). Scale lines 0.5 mm. **Figs 2–5.** *Atherigona bidens* Hennig. 2, male hypopygial prominence, dorsal view; 3, male hypopygial prominence, lateral view; 4, male trifoliate process, dorsal view; 5, male trifoliate process, lateral view. Viti Levu Island, Lautoka, Mar 1976 (N.L.H. Krauss). Scale lines 0.1 mm. **Figs 6–9.** *Atherigona matema* Curran. 6, male hypopygial prominence, posterior view; 7, male hypopygial prominence, lateral view; 8, male trifoliate process, dorsal view; 9, male trifoliate process, lateral view. Taveuni Island, Waiyevo, 0–100 m, Jan 1972 (N.L.H. Krauss). Scale lines 0.1 mm.



**Figures 10–15.** **Figs 10–13.** *Atherigona oryzae* Malloch. **10**, male hypopygial prominence, posterior view; **11**, male hypopygial prominence, lateral view; **12**, male trifoliate process, dorsal view; **13**, male trifoliate process, lateral view. Moala Island, 13 Jul 1924 (E.H. Bryan). Scale lines 0.1 mm. **Figs 14–15.** *Atherigona poecilopoda* Bezzi. **14**, male abdominal segments 1+2 to 5, lateral view; **15**, male fore femur, posterior view. Viti Levu Island, Savura Creek, 19 Mar 1981 (R.A. Beaver) (14); Viti Levu Island, Koronivia Research Station, 1 Mar 1963 (C.M. Yoshimoto) (15). Scale lines 0.5 mm (14) and 0.25 mm (15).

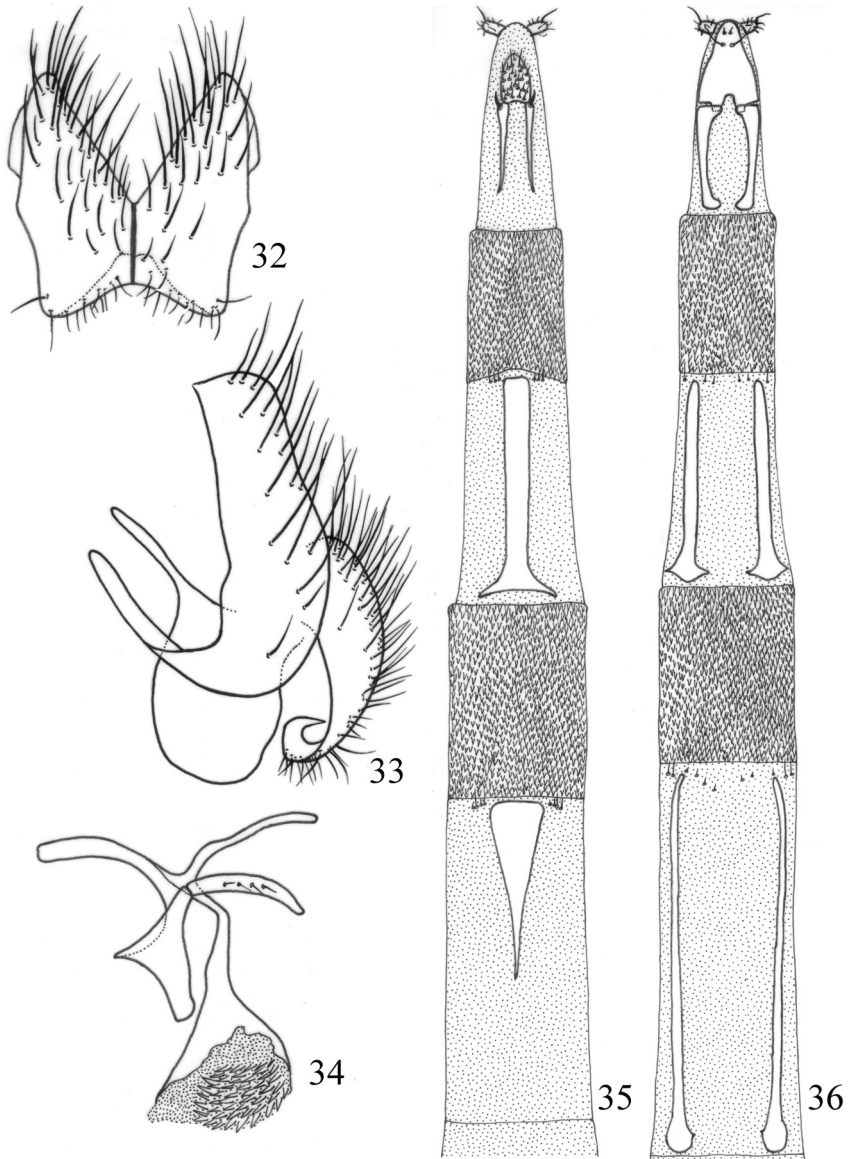


**Figures 16–23.** **Figs 16–18.** *Atherigona poecilopoda* Bezzi. **16**, male hypopygium, dorsal view; **17**, male hypopygium, lateral view; **18**, female tergite 8. Viti Levu Island, Savura Creek, 19 Mar 1981 (R.A. Beaver) (male), and Lau Islands, Vanua Masi, 5 Sep 1924 (female). Scale lines 0.2 mm (16, 17) and 0.25 mm (18). **Figs 19–23.** *Atherigona splendens* Bezzi. **19**, male hypopygial prominence, posterior view; **20**, male hypopygial prominence, lateral view; **21**, male trifoliate process, dorsal view; **22**, female tergite 8; **23**, female sternite 6. Viti Levu Island, Suva Bay, Pipe Trail, 22 Jul 1924 (E.H. Bryan) (male), and Matuku Island, 5 Jul 1924 (E.H. Bryan) (female). Scale lines 0.1 mm (19–21) and 0.25 mm (22–23).



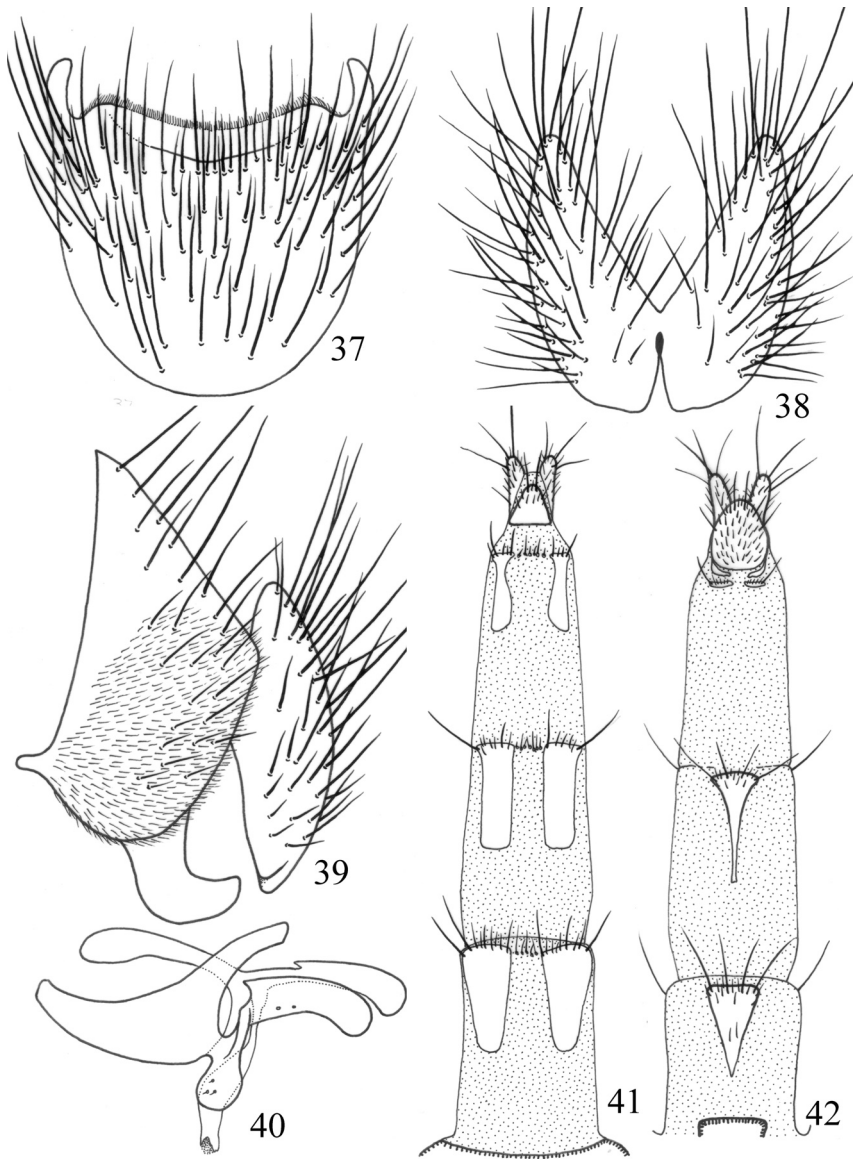
**Figures 24–31.** Fig. 24. *Musca sorbens* complex. Male frons/head ratio in African (A; n=11), Australian (B; n=10) and Fijian (C; n=16) specimens. Frons measured at narrowest point (at middle) and head at broadest point (viewed from in front). Figs 25–31. *Neomyia greenwoodi* (Bezzi). 25, male sternite 5; 26, male cercal plate, dorsal view; 27, male epandrium, cercal plate and surstylus, lateral view; 28–29, male phallic complex; 30, female, ovipositor, dorsal view; 31, female, ovipositor, ventral view. 40 km east of Nadi, 26 Jul 1967 (male); Colo-i-Suva, 30 Jun 1924 (female).



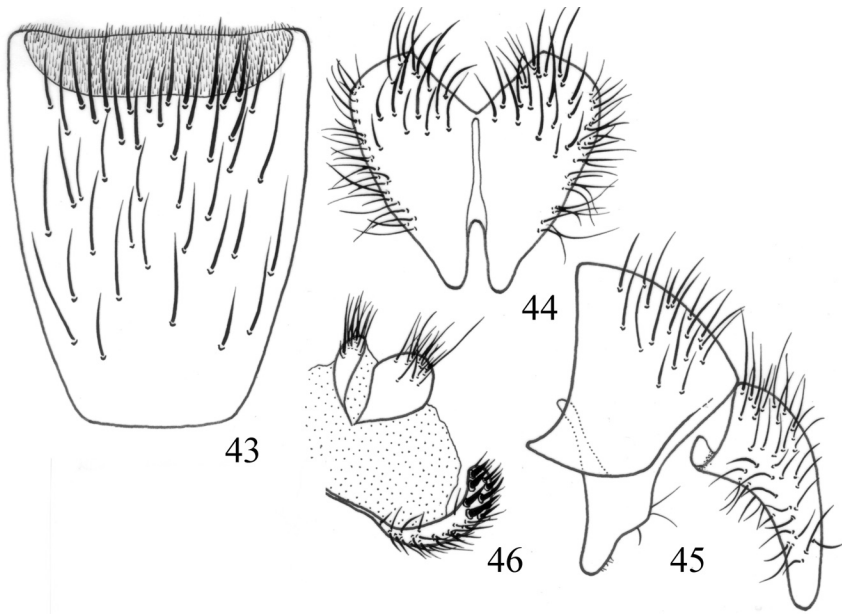


**Figures 32–36.** *Neomyia simmondsi* (Bezzi). **32**, male cercal plate, dorsal view; **33**, male epandrium, cercal plate and surstylus, lateral view; **34**, male phallic complex; **35**, female, ovipositor, dorsal view; **36**, female, ovipositor, ventral view. Nandarivatu, 8–13 Mar 1963 (male); Ba, Fiji (Muir) (female).

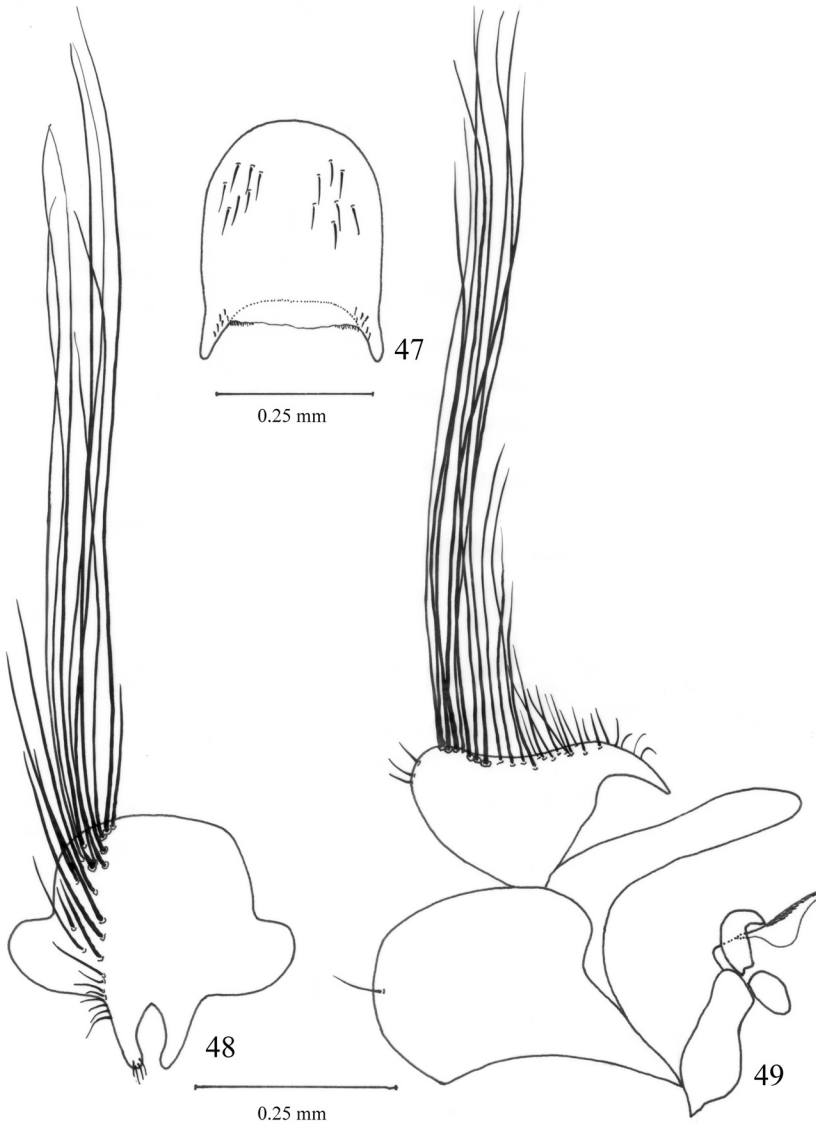




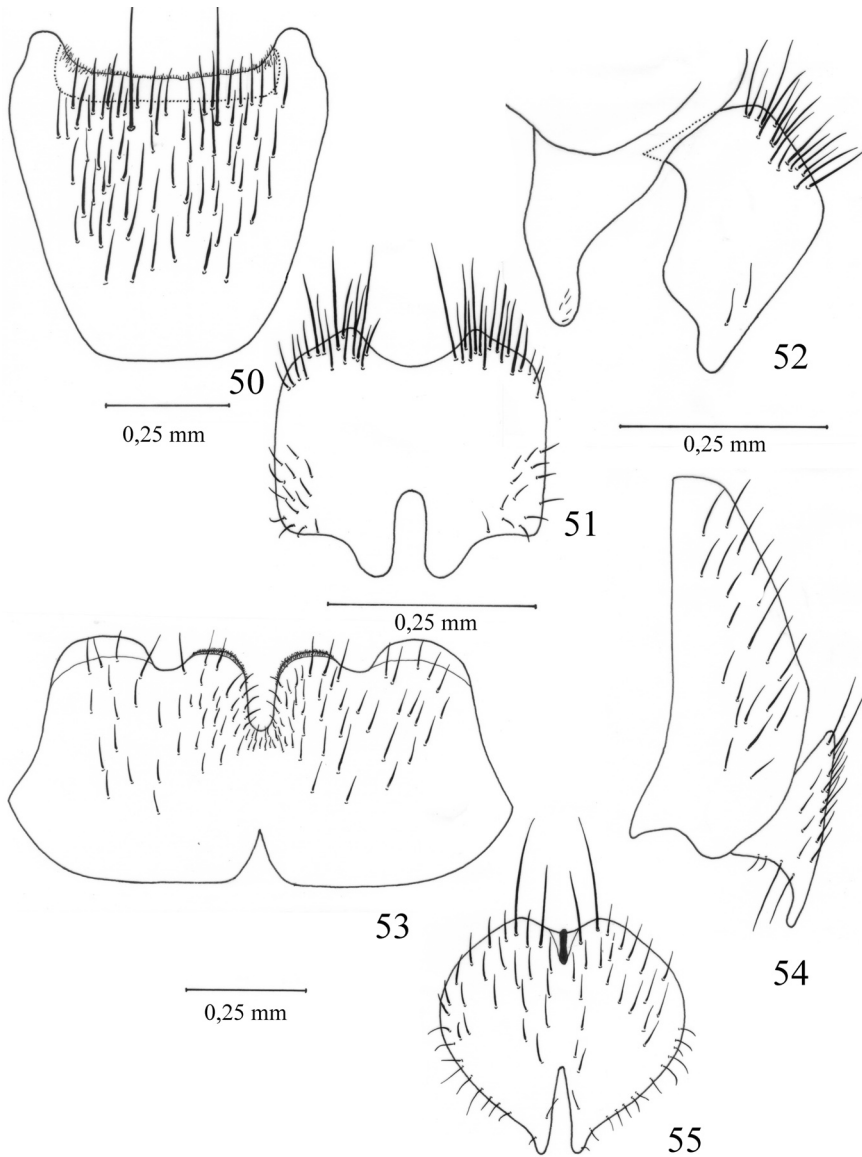
**Figures 37–42.** *Dichaetomyia elegans* Malloch. **37**, male sternite 5; **38**, male cercal plate, dorsal view; **39**, male epandrium, cercal plate and surstylus, lateral view; **40**, male phallic complex; **41**, female, ovipositor, dorsal view; **42**, female, ovipositor, ventral view. Vanua Levu, trans-insular road, above summit, 500–550 m, 6–9 Oct 1979 (male); Viti Levu, Nandarivatu, 2 Apr 1973 (female).



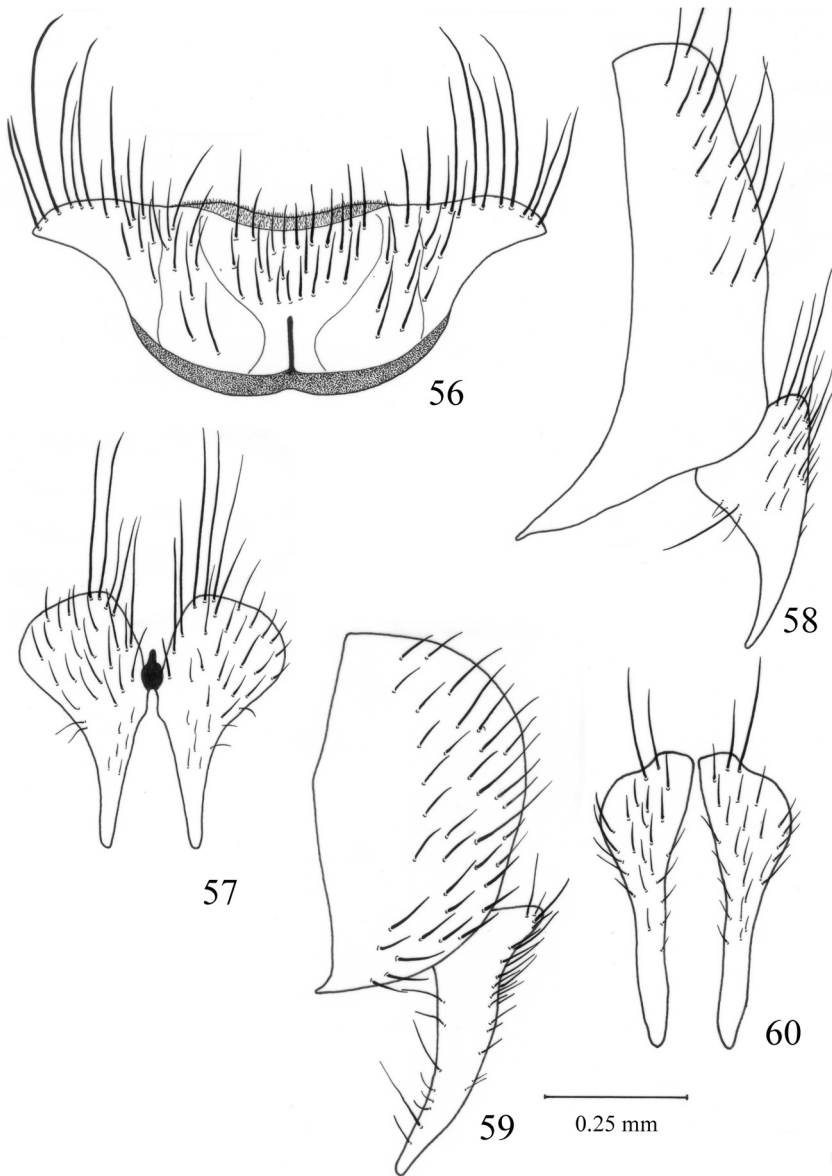
**Figures 43–46.** *Limnophora mesolissa* Bezzi. **43**, male sternite 5; **44**, male cercal plate, dorsal view; **45**, male epandrium, cercal plate and surstylus, lateral view; **46**, female, ovipositor, apex, lateral view. 40 km E of Nadi, 26 Jul 1967 (J. & M. Sedlacek) (male); Nadi, 1 Jul 1913 (J.F. Illingworth) (female).



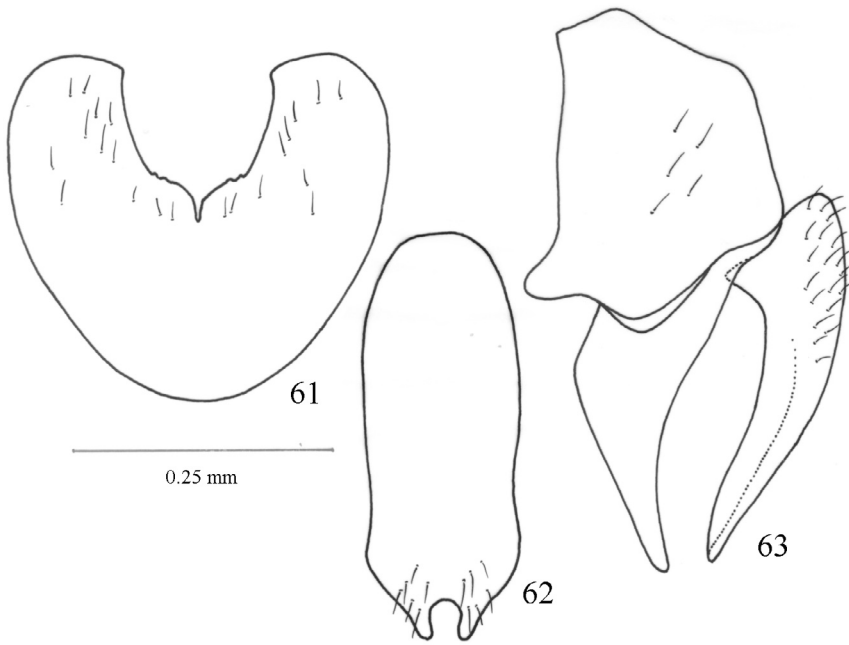
**Figures 47–49.** *Limmophora penicillata* Pont & Couri, sp. nov. 47, male sternite 5; 48, male cercal plate, dorsal view; 49, male epandrium, cercal plate, surstylus and phallic complex, lateral view. Male paratype from Matuku Island, 7 Jul 1924 (E.H. Bryan). Scale lines 0.25 mm.



**Figures 50–55.** **Figs 50–52.** *Limmophora shinonagai* Pont & Couri, sp. nov. **50**, male sternite 5; **51**, male cercal plate, dorsal view; **52**, male epandrium and surstylus, lateral view. Male paratype from Viti Levu, Mt. Victoria, 1000 m, 4–6 Mar 1978 (H. Shima). Scale lines 0.25 mm. **Figs 53–55.** *Lipse assimilis* Wiedemann. **53**, male sternite 5; **54**, male cercal plate, dorsal view; **55**, male cercal plate and epandrium, lateral view. Male from Viti Levu, Nadi, 12 Jul 1978 (S. Shinonaga). Scale line 0.25 mm.

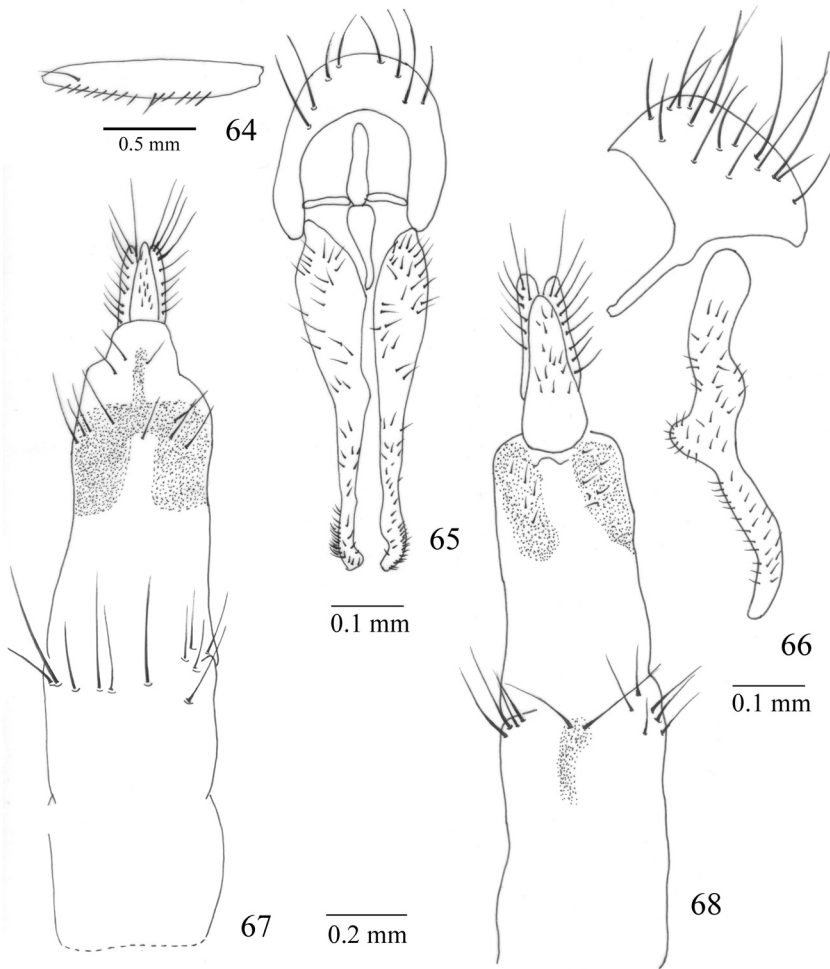


**Figures 56–60.** **Figs 56–58.** *Lispe bengalensis* (Robineau-Desvoidy). **56**, male sternite 5; **57**, male cercal plate, dorsal view; **58**, male cercal plate and epandrium, lateral view. Male from Nadi, 12 Mar 1978 (H. Kurahashi). Scale line 0.25 mm. **Figs 59–60.** *Lispe pectinipes* Becker. **59**, cercal plate, dorsal view; **60**, male cercal plate and epandrium, lateral view. Male from Taveuni, Cakaudrove Prov., Soqulu House in Soqulu Estate, 140 m, 21 Nov–13 Dec 2002, Malaise 1 (E.I. Schlinger, M. Tokota'a). Scale line 0.25 mm.

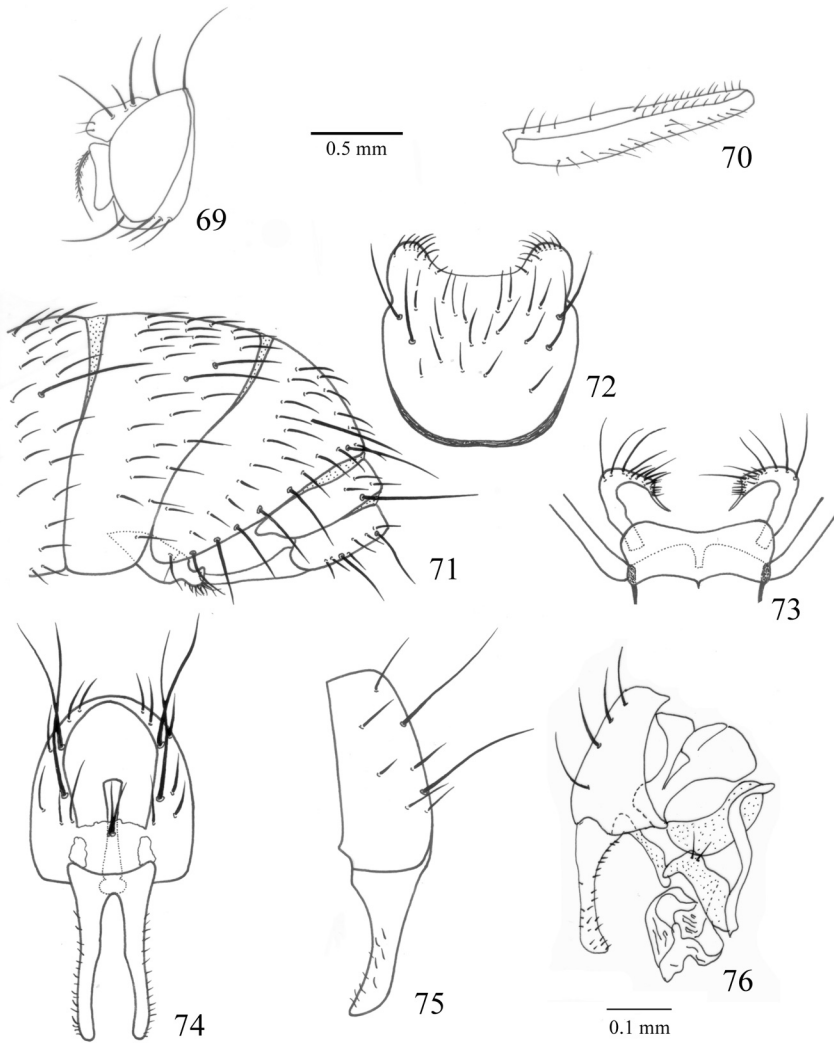


**Figures 61–63.** *Coenosia fijiensis* Pont & Couri, sp. nov. **61**, sternite 5, dorsal view; **62**, cercal plate, dorsal view; **63**, epandrium, cercal plate and surstylus, lateral view. Male from Viti Levu Island, Sigatoka Sand Dunes National Park, 1.1 km SSW Volivoli village, 55 m, Malaise trap, 14–27 Dec 2002 (E.I. Schlinger). Scale line 0.25 mm.

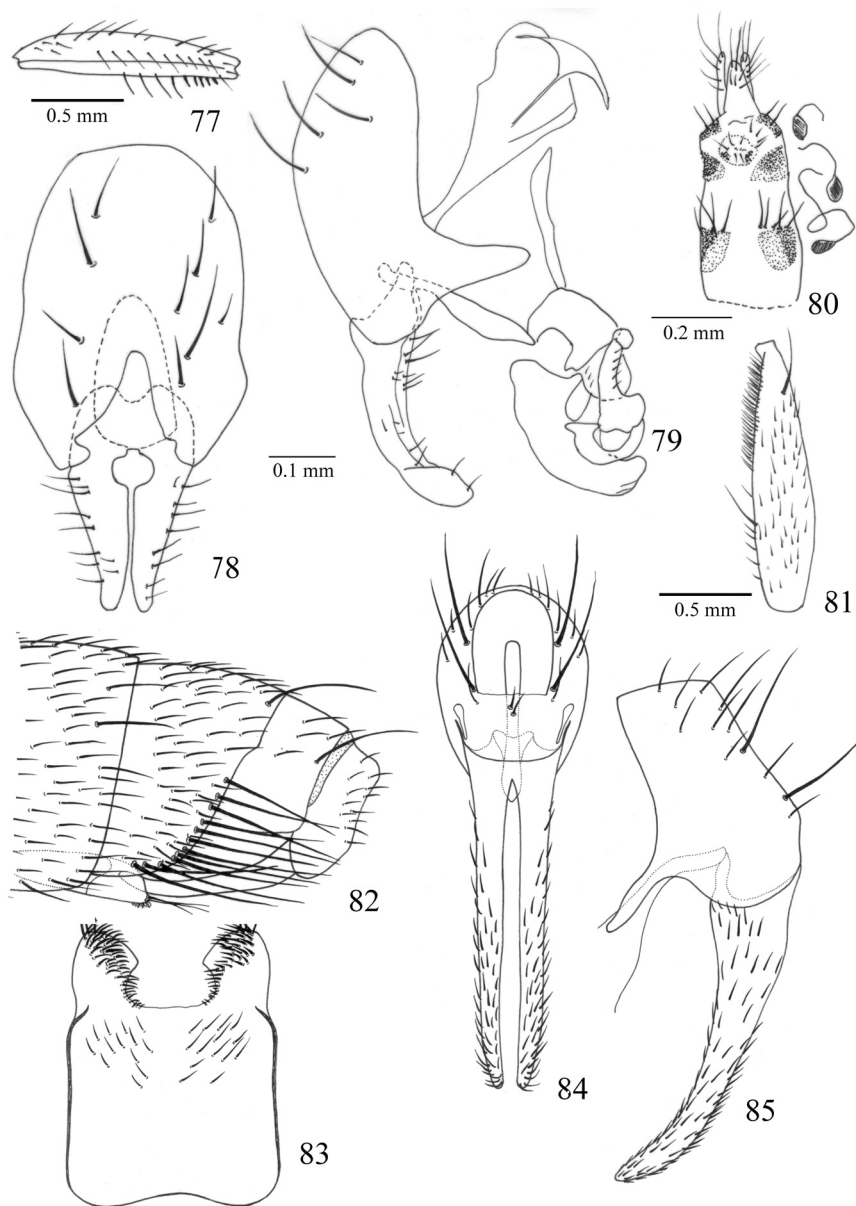




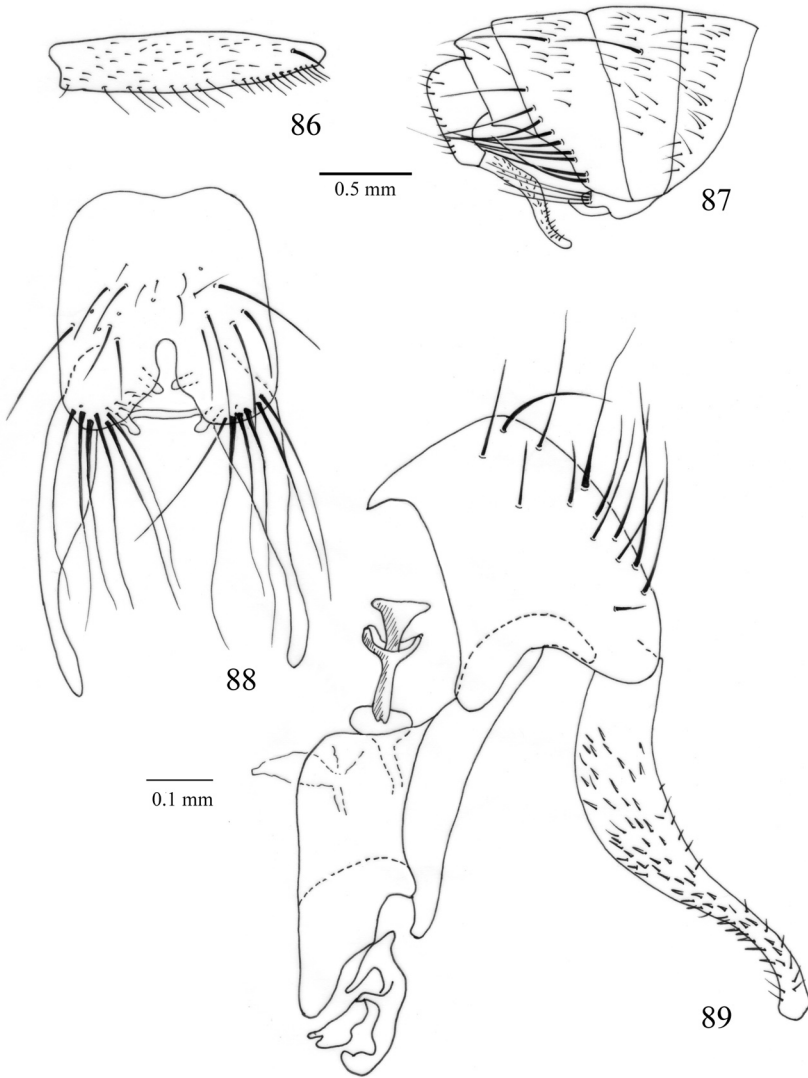
**Figures 64–68.** *Parvisquama curvicerca* Pont & Couri, sp. nov. **64**, male mid femur; **65**, epandrium, cercal plate, dorsal view; **66**, epandrium and cercal plate, lateral view; **67**, female ovipositor, dorsal view; **68**, female ovipositor, ventral view. Scale lines 0.5 mm (64), 0.1 mm (65–66), 0.2 mm (67).



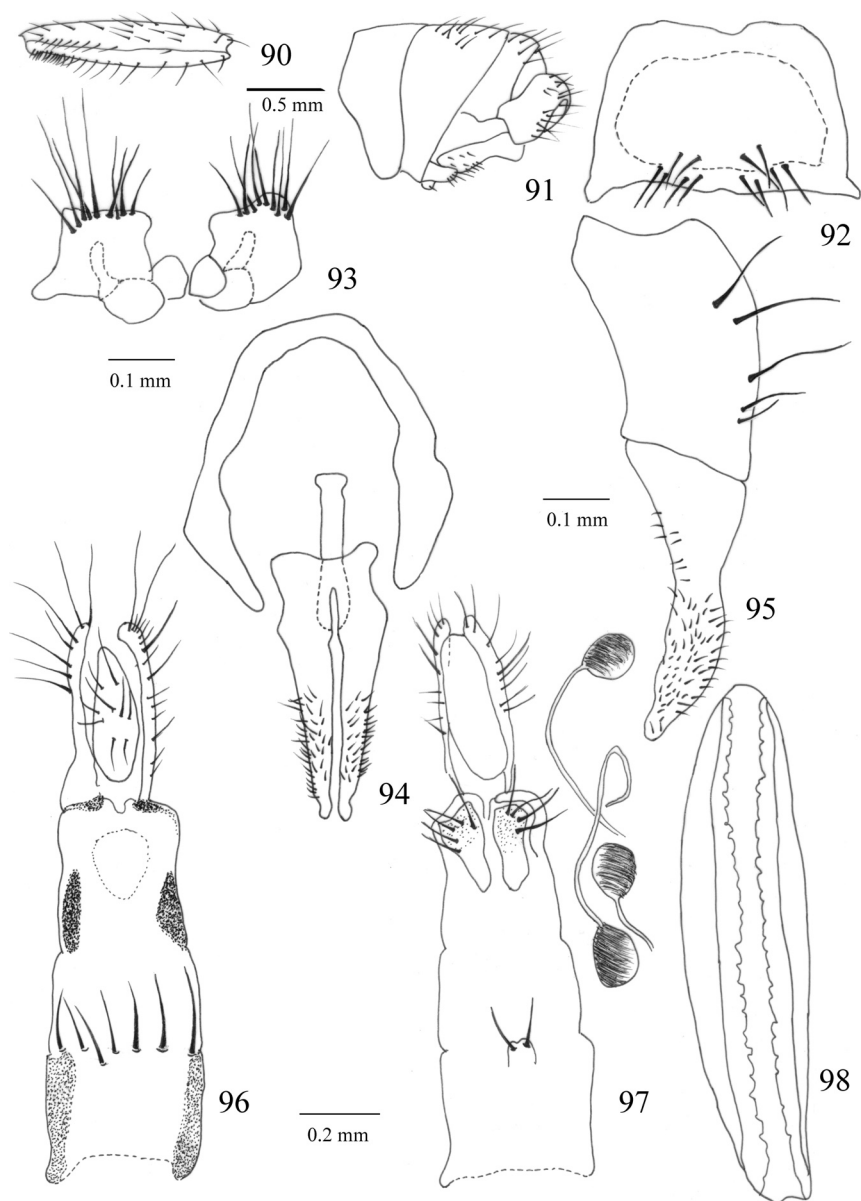
**Figures 69–76.** *Parvisquama dolichocera* (Bezzi). 69, male head, lateral view; 70, male mid femur; 71, male, apex of abdomen; 72, sternite 5, dorsal view; 73, sternite 5, ventral view; 74, epandrium, cercal plate and surstylus, dorsal view; 75, epandrium and surstylus, lateral view; 76, phallic complex, lateral view. Scale lines 0.5 mm (69–70), 0.1 mm (71–76).



**Figures 77–85.** **Figs 77–80.** *Parvisquama femorata* Pont & Couri, sp. nov. **77**, male mid femur; **78**, epandrium, cercal plate and surstylus, dorsal view; **79**, epandrium, cercal plate, surstylus, and phallic complex, lateral view; **80**, female ovipositor and spermathecae. Scale lines 0.5 mm (77), 0.1 mm (78–79), 0.2 mm (80). **Figs 81–85.** *Parvisquama longicerca* Pont & Couri, sp. nov. **81**, male mid femur; **82**, male, apex of abdomen; **83**, sternite 5, dorsal view; **84**, epandrium and cercal plate, dorsal view; **85**, epandrium and cercal plate, lateral view. Scale lines 0.5 mm (81–82), 0.1 mm (83–85).



**Figures 86–89.** *Parvisquama longiseta* Pont & Couri, sp. nov. **86**, male mid femur; **87**, male, apex of abdomen; **88**, sternite 5, dorsal view; **89**, terminalia male, lateral view. Scale lines 0.5 mm (86–87), 0.1 mm (88–89).



**Figures 90–98.** *Parvisquama tripuncta* (Malloch). 90, male mid femur; 91, apex of male abdomen; 92, sternite 5, dorsal view; 93, sternite 5, ventral view; 94, epandrium and cercal plate, dorsal view; 95, epandrium and cercal plate, lateral view; 96, ovipositor, dorsal view; 97, ovipositor and spermathecae, lateral view; 98, egg. Scale lines 0.5 mm (90), 0.1 mm (91–95), 0.2 mm (96–98).