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A new endemic genus of Oecleini from Seychelles (Hemiptera: Fulgoromorpha: Cixiidae)

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Abstract

A new genus, *Fipsianus* gen. nov., from Seychelles is described. It is closely related to the genera *Volcanalia, Eumyndus, Borbonomyndus* and *Nesomyndus*. *Fipsianus,* is endemic to the granitic "inner islands" and comprises two species, *Fipsianus picturatus* (Distant , 1917) comb. nov. (type species; synonym *Volcanalia varicolor* Distant, 1917, syn. nov.) on Mahé and Silhouette islands and *Fipsianus andreae* sp. nov. on Praslin island. Both species are monophagous on the thief palm *Phoenicophorium borsigianum*.

Key words: Auchenorrhyncha, taxonomy, endemism, *Fipsianus*, *Volcanalia*, *Eumyndus*, *Borbonomyndus*, *Nesomyndus*, *Phoenicophorium*

Rezime

En nouvo zanr, *Fipsianus* gen. nov., sorti Sesel i ganny dekrir. I byen pros avek zanr *Volcanalia*, *Eumyndus*, *Borbonomyndus* ek *Nesomyndus*. *Fipsianus* i andemik dan bann "zil pros" granitik e i enkli de lespes, *Fipsianus picturatus* (Distant, 1917) comb. nov. (lespes tip, sinonim *Volcanalia varicolor* Distant, 1917, syn. nov.) lo zil Mahé ek Silhouette ek *Fipsianus andreae* nov. spec. lo Praslin. Toulede i monofaz lo lantannyen fey, *Phoenicophorium borsigianum*.

Introduction

The granitic "inner islands" of the Seychelles archipelago—Mahé, Silhouette, Praslin, La Digue and some small islands—are terrestrial peaks of a mainly submarine plateau which is a fragment of the former Gondwana continent isolated about 75 million years ago. Thus, the Seychelles granitic islands are the only mid-oceanic islands of continental origin (Stoddard, 1984). Due to their origin and age, the Seychelles host a diverse and archaic flora and fauna, completed by more recent immigrant taxa and introduced "alien" species. The planthopper fauna of the Seychelles was studied through the Percy Sladen Trust Expeditions in 1905 & 1908/1909 with the results being published mainly by Distant (1917). Within the Cixiidae, Distant (1917) erected four new, endemic genera to accommodate 14 new species. Within the tribe Oecleini Muir, 1922, he described one genus, *Volcanalia* Distant, 1917, including 12 species.

A re-examination of the type material and of additional, fresh material collected in 2006 and 2008 gave evidence that one of Distant's species, *Volcanalia picturata*, has to be placed in a separate genus of the Oecleini. This new genus is described below. In addition, a redescription of its type species and the first description of a congeneric new species are given.

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Material and methods

Type material was provided by The Natural History Museum, London (BMNH) and the University Museum of Zoology, Cambridge (CUMZ). Additional new material was collected in the Seychelles in winter 2006 and autumn 2008. The latter is stored in the collections of the Oekoteam—Institute for Animal Ecology and Landscape Planning, Graz, Austria [OEKO]. Insects were studied with an Olympus SZH10 stereo microscope and drawn with a camera lucida. Photographs were taken with a Nikon D70 digital camera.

Results

Fipsianus gen. nov.

Type species: *Volcanalia picturata* Distant, 1917

Etymology: The genus is dedicated to my son Philipp, nicknamed "Fipsi". Gender: masculine.

Description: Medium sized cixiids, body length about 4.2–5.2 mm, with cylindrical body and wings in resting position flat, roof-like.

Head with vertex much longer than wide, lateral keels distinctly elevated. Frons widening towards clypeus, widest part immediately above clypeus. Median keel on frons and clypeus present. Frontoclypeal suture straight. No median ocellus visible. Eyes large.

Pronotum small, caudal border with obtuse angle. Mesonotum with three longitudinal keels. Fore wings long, with setiferous tubercles along veins. Wing venation as shown in Figures 7A, 7B. Legs medium-sized, pro- and metatibiae yellowish with a black band medially, pro- and metatarsi black, hind tibiae without macrosetae, apically with six spines, grouped three by three, with distinct gap. Tarsi with 7+6 apical spines.

Male genital segment with small ventral and dorsolateral lobes. Anal segment short and stout, apically with two lobes directed ventrad. Aedeagus consisting of strong tubular shaft only, without flagellum. Aedeagus with rigid crests and spines ventrally and laterally.

Female genital segment truncate, ovipositor curved upwards. Inner female genitalia with long *ductus ejaculatorius*, wound helix-like.

Fipsianus picturatus (Distant, 1917), comb. nov.

Volcanalia picturata Distant, 1917: 281
Volcanalia varicolor Distant, 1917: 282, syn. nov.

Material studied: Syntypes of *Volcanalia picturata* Distant: Male, glued to card, abdomen dissected, probably by Singh-Pruthi, labelled: "(printed on card) Mahe, '08–9. / Seychelles Exp. / (handwritten) 38 // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." – Female, pinned, labelled: "(circular label with red border) Type / H.T. // (handwritten) Volcanalia / picturata / type Dist. // (handwritten) 94 // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." – Female, pinned, labelled: "(handwritten) 65 // Seychele Islands. / Percy Sladen Trust / Expedition. / 1913-170." – Female, pinned, dissected by I. Kammerlander, abdomen in microvial on same pin, labelled: "(handwritten) 65 // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." – Two females glued to one card, one without abdomen, the other one upside down, labelled: "(handwritten on card) 6 // Silhouette, '08. / Seychelles Exp. // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." – Female, pinned, labelled: "(handwritten) 49 // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." (all in BMNH).– Three females on three pins, each glued to a card, labelled "(printed on card) Mahe, '08-9. / Seychelles Exp.", with handwritten numbers 42, 53 and 104. – Female, glued to card, labelled "(handwritten) 29 // Mahe, '08. / Seychelles Exp." – Female, glued to card, labelled "(handwritten) 84" (in CUMZ)

Syntypes of *Volcanalia varicolor* Distant: Two males glued to card, one upside down, labelled: "(handwritten on card) 25 25 // (circular label with red border) Type / H.T. // (handwritten) Volcanalia / varicolor / type Dist." // Silhouette, '08. / Seychelles Exp. // (handwritten) spec. figd" – Male, glued to card, labelled: "(handwritten) 40 / Mahe, '08-9. / Seychelles Exp. // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." – Male, glued to card, labelled: "(handwritten) 104 / Mahe, '08-9. / Seychelles Exp. // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." – Male, pinned, labelled: "Mahe, '08-9. / Seychelles Exp. // (handwritten) 43 // Seychelle Islands. / Percy Sladen Trust / Expedition. / 1913-170." (all in BMNH) – Male, pinned, labelled: "Mahe, '08-9. / Seychelles Exp. // (handwritten) 43 // (handwritten) Volcanalia / varicolor / Dist" – Male, glued to card, labelled: "(handwritten on card) 94 // Mahe, '08-9. / Seychelles Exp." – Male, glued to card, labelled: "(handwritten) 42 / Mahe, '08-9. / Seychelles Exp.", all in CUMZ) .

Additional material: Mahé: Numerous specimens from the following sites: La Reserve E Anse Boileau, palm forest (4° 42' 32" S 55° 30' 6" E, 410–470m), 8.xi., 12.xi. and 14.xii.2006; Mare aux Cochons, near swamp, mixed forest (4° 38' S;55° 25' E, 350–400m), 7.xi. and 12.xii.2006; Monte Cristo E Anse a la Mouche, roadside vegetation (4° 44' 15" S;55° 30' 1" E, 130–150m), 13.xii.2006; Mt. Palmiste northeast of Grand Anse, mixed forest and highland glacis (4° 40' S 55° 26' E, 200m), 16.xi.2006; Near tea plantation 2 km E Port Glaud, mixed forest (4° 39' 42–43"S 55° 26' 12–20" E, 350–450m), 9., 10. and 13.xi.2006; northeast of Port Glaud, mixed forest (4° 39' 37"S 55° 25' 28" E, 150–250m), 9.xi.2006; S Bel Ombre, N Mont Le Niol, chrysobalanus shrub (4° 37' 35" S 55° 24' 16" E, 360–420m), 7.xi.2006; valley between Mt. Jasmin and Mt. Le Niol, mixed forest (4° 38' 5" S 55° 24' 30" E, 420–460m), 7.xi.2006; Congo Rouge, mixed and mossy montane forest (4° 38–39' S 55° 26' E, 350–820m), 10. and 17.xi.2006, all W. Holzinger & B. Komposch leg.; Morne Seychellois (4° 38' S 55° 26' E, 450–900 m), 16.ix.2008; Mt. Copolia, mixed forest (55° 26' 56'' E, 4° 39' 06'' S, 400–480m), 17.ix.2008; Congo Rouge, mixed and mossy montane forest, 18.ix.2008; Casse Dent (4° 38' S 55° 25' E, 400–500m), 19.ix.2008; Montagne Planeau, mixed forest (55° 26' E, 4° 40' S, 100–350m), 24.ix.2008, all W. Holzinger leg. (in OEKO).

Silhouette: Numerous specimens from the following sites: Path from La Passe to Jardin Marron, mixed forest (4° 28' 52" S 55° 14' 26" E, 250–320m), 20.xi.2006; Jardin Marron, Coco de Mer palm forest (4° 28' 55" S 55° 14' 19" E, 320–370m), 20. and 22.xi.2006; Mont Pot à Eau, mossy montane forest (4° 28' 51" S 55° 13' 59" E, 500–620m), 22.xi.2006, all W. Holzinger & B. Komposch leg.;path from La Passe to Jardin Marron, 20.ix.2008, and lowland glacis E La Passe (4° 29' 26''S 55° 15' 71'' E, 20–80m), 21.ix.2008, W. Holzinger leg. (in OEKO).

Description (see also Figs 1, 3, 5, 7A, 7C, 7D): Body length in males 4.2–4.6 mm, in females 4.7–5.2 mm.

Head and thorax ochraceous, mesonotum with blackish spot caudally, abdomen brownish to blackish with yellowish segment margins. Body coloration of females darker than males, richer in contrast. Frons with large, semicircular red band, adjacent area of clypeus also largely red. Prothoracic lateral areas red. Legs yellow, pro- and mesotibiae with central black band. 1st and 2nd tarsi black. Fore wings of males with light-brownish tinge, veins concolorous or wings blackish with light pterostigma; veins distad of pterostigma whitish. Fore wings of females opaque with three broad dark transverse bands: anterior one reaching from wingbase to tip of scutellum, middle one immediately follows, leading to middle of clavus and posterior one Y-shaped, reaching from proximal end of pterostigma to end of clavus and to apical cells of Cu.

Male anal segment short and stout, asymmetrical, its apical process bilobate, blunt, directed ventrad (Figs 5 A, B). Genital style long, apically pointed (Fig. 5 C). Aedeagus with four rigid spines: A long, bifurcate spine pointed cephalad on ventral side and three additional, slightly curved spines on left and right side and one subapically, pointing caudad (Figs 5 D, E, F).

Female abdomen truncate. Ovipositor curved upwards. Inner female genitalia as shown in Fig 7 C, with long *ductus ejaculatorius*, winding in 3–4 places.

FIGURE 1. *F. picturatus*, male. Silhouette, Jardin Marron, 20.ix.2008.
FIGURE 2. *F. andreae*, male. Praslin, Valleé de Mai, 22.ix.2008.

Ecology and distribution: The species is endemic to the two islands of Mahé and Silhouette. It is monophagous on the endemic "thief palm" *Phoenicophorium borsigianum* (K. Koch.) Stuntz and occurs in natural mid- and high altitude forests. It is distributed island-wide throughout Mahé and Silhouette almost wherever its host-plant occurs. *Fipsianus picturatus* is the most common planthopper on this plant. It was recorded on more than 50% of the leaves, in numbers of up to 15 hoppers per leaf. *Fipsianus picturatus* is a –

in planthopper terms – quite "immobile" species. The subgregarious and sedentary behaviour of this species facilitates ant-attendance. Interactions of the species with ants of the genera *Technomyrmex* and *Anoplolepis* are described by Holzinger (2009).

FIGURE 3. *F. picturatus*, female. Mahé, Mt. Copolia, 17.ix.2008.
FIGURE 4. *F. andreae*, female. Praslin, Valleé de Mai, 22.ix.2008.

***Fipsianus andreae* sp. nov.**

Material studied: Holotype: Male, glued on card, Seychelles, Praslin island, Vallée de Mai, palm forest (4° 19' 45" S 55° 44' 15" E, 130–250m), 23. ix. 2008, W. Holzinger leg. Paratypes: 7 ♂ 5 ♀ same locality and date as holotype, 7 ♂ 7 ♀ same locality as holotype, collected on 22. ix. 2008, W. Holzinger leg., and on 28.xi., 30.xi. and 2.xii.2006, W. Holzinger & B. Komposch leg.; 5 ♂ 30 ♀ Salazie–Track, highest point, *Chrysobalanus* shrub (4° 19' 20'' S 55° 43' 49'' E, 170–220m), 26.xi.2006; 1 ♀ near Anse Lazio, *Chrysobalanus* shrub (4° 17' 31" S 55° 42" E, 25m), 3.xii.2006; 2 ♂ 1 ♀ Fond Ferdinand, mixed forest and palm forest (4° 21' 14–20" S 55° 45' 15–35" E, 30–80m), 4.xii.2006; 1 ♂ 1 ♀ Mt Chenard NE Anse Kerlan, *Chrysobalanus* shrub (4° 18' 0" S 55° 41' 22" E, 100m), 6.xii.2006, all W. Holzinger & B. Komposch leg.; 10 ♂ 10 ♀ Vallée de Mai, palm forest 22. and 23.ix.2008, W. Holzinger leg. (all in OEKO except for 1 male and 1 female paratypes deposited in BMNH).

Etymology: The species is dedicated to my daughter Andrea.

Description (see also Figs 2, 4, 6, 7B): Body length in males 4.2–4.4 mm, in females 4.6–4.7 mm.

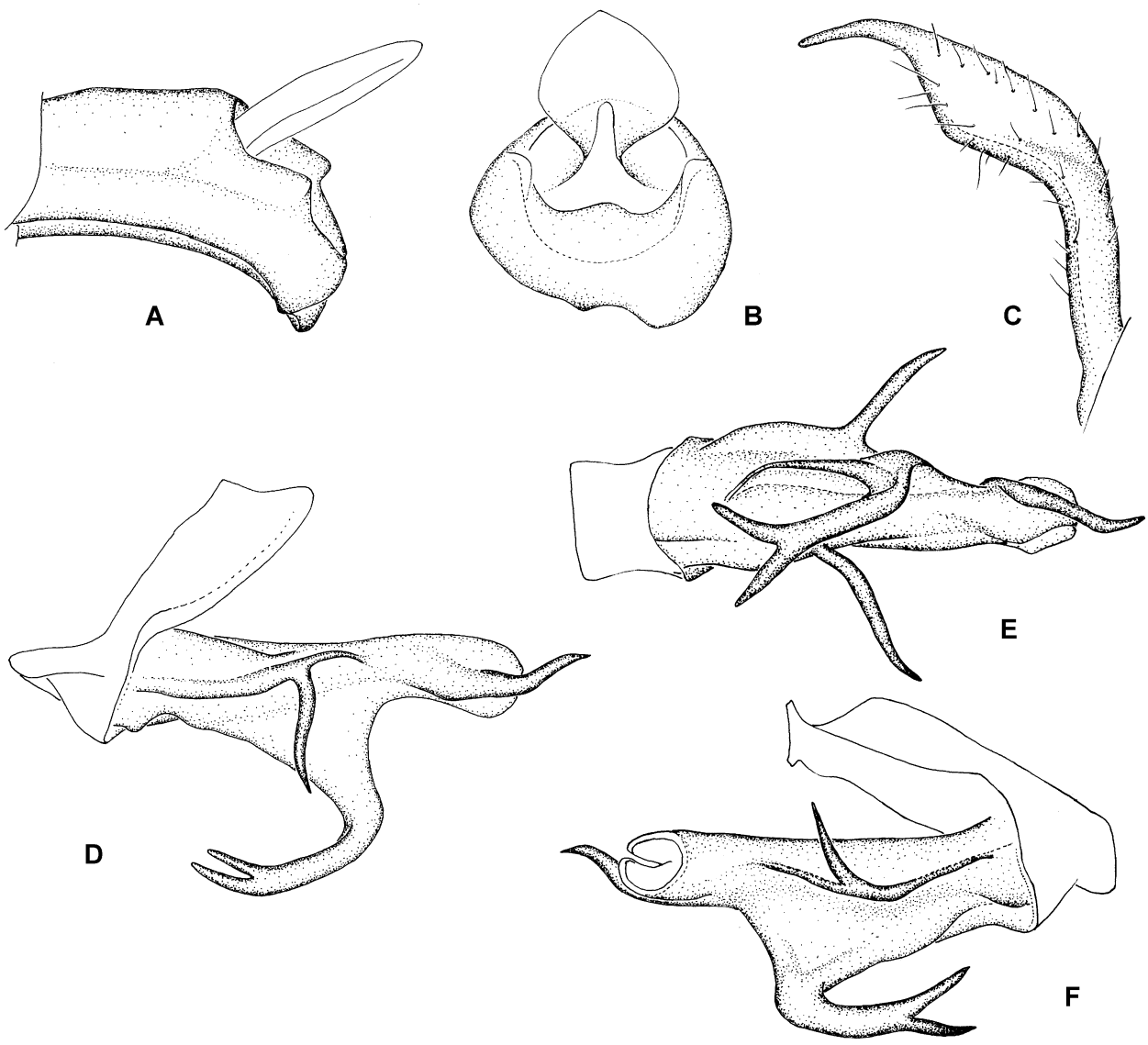

FIGURE 5. *F. picturatus*, male genitalia. A = anal segment, lateral view; B = anal segment, caudal view; C = genital style; D, E, F = aedeagus in left lateral, ventral and right lateral view.

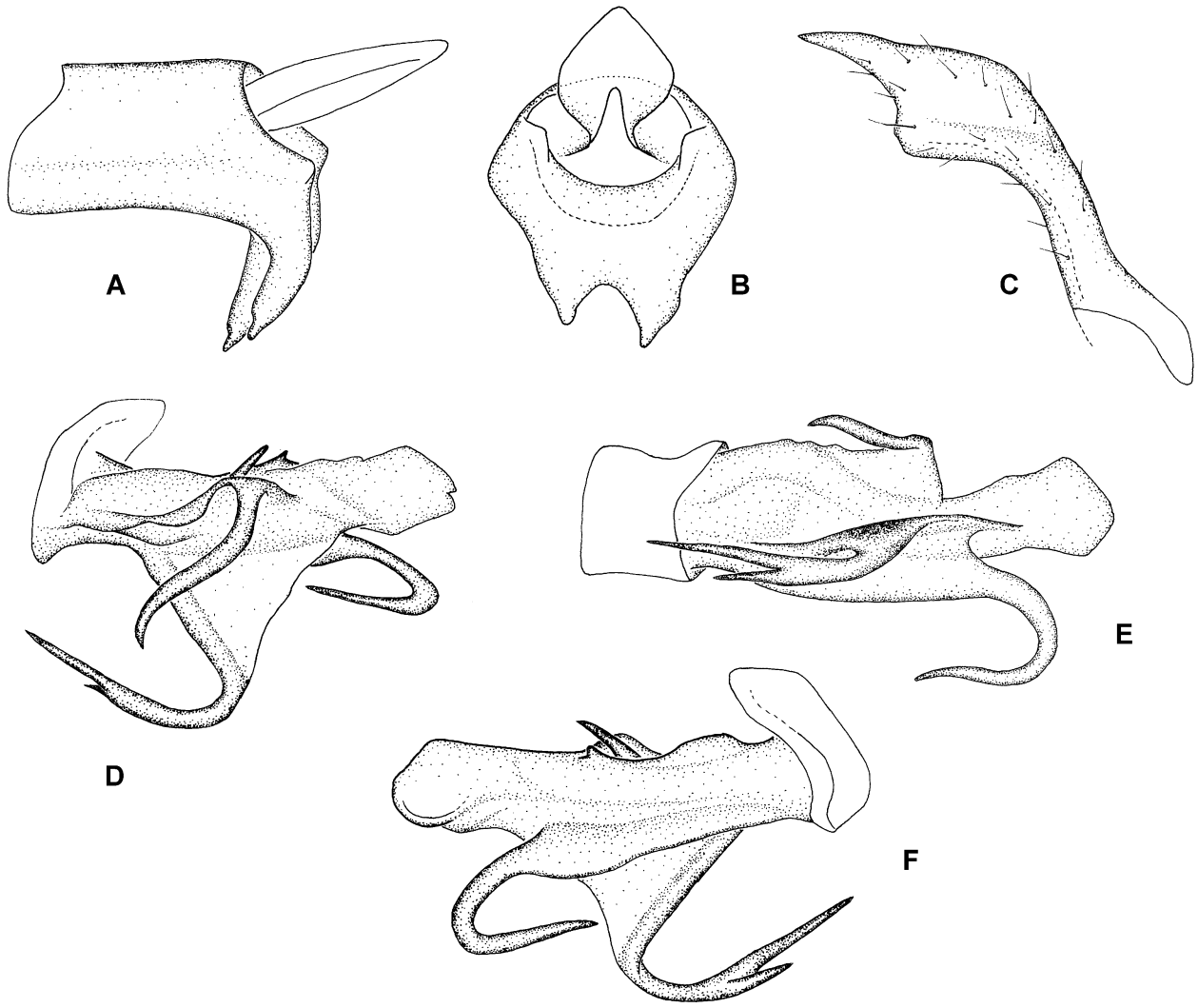

FIGURE 6. *F. andreae*, male genitalia. A = anal segment, lateral view; B = anal segment, caudal view; C = genital style; D, E, F = aedeagus in left lateral, ventral and right lateral view.

Head and thorax bright yellowish, sometimes orange, mesonotum with blackish spot caudally, abdomen brownish to blackish with yellowish segment margins. Body coloration of females again darker than males, richer in contrast. Frons with large, semicircular red band, adjacent area of clypeus also largely red. Prothoracic lateral areas red. Legs yellow, pro- and metatibiae with central black band. 1st and 2nd tarsi black. Fore wings of males semihyaline with yellowish tinge and three small dark spots (one at end of clavus, second one distad from first and third at base of pterostigma). Fore wings in females opaque with three small, disconnected, dark transverse bands as described in previous species.

Male anal segment short and stout, asymmetrical, with two apical pointed processes directed ventrocephalad (Figs 6 A, B). Genital style long, apically pointed, its subapical inner lobe much larger than in *F. picturatus* (cf. Figs 5 C and 6 C). Aedeagus with three larger rigid spines: long, bifurcate spine pointed cephalad on ventral side with its apical tips very different in length. On left, a long, strongly curved spine pointing cephalad. Distinctly shorter, almost straight spine on right side, pointing cephaloventrad. (Figs 6 D, E, F).

Differential diagnosis: This species is generally similar to the preceding species but males are brighter orange and females are distinctively darker than those of *F. picturatus*. Male genitalia differ in the shape of the anal segment appendages (longer and pointed in *F. andreae*), in the shape of the genital style (cf. Figs 5C and

6C) and in the shape and spinulation of the aedeagus. The apical spine of the aedeagus is missing in *F. andreae*. The ventral process is longer in *F. andreae* than in *F. picturatus*, more strongly bent with its apical tips very different in length.

Ecology and distribution: The species is monophagous on the endemic "thief palm" *P. borsigianum* and it is endemic to Praslin island. It occurs island-wide in natural mid- and high altitude forests, almost wherever its host-plant occurs. *Fipsianus andreae* occupies, on Praslin island, the same ecological niche as *F. picturatus* on Mahé and Silhouette and is the most common planthopper on its host plant.

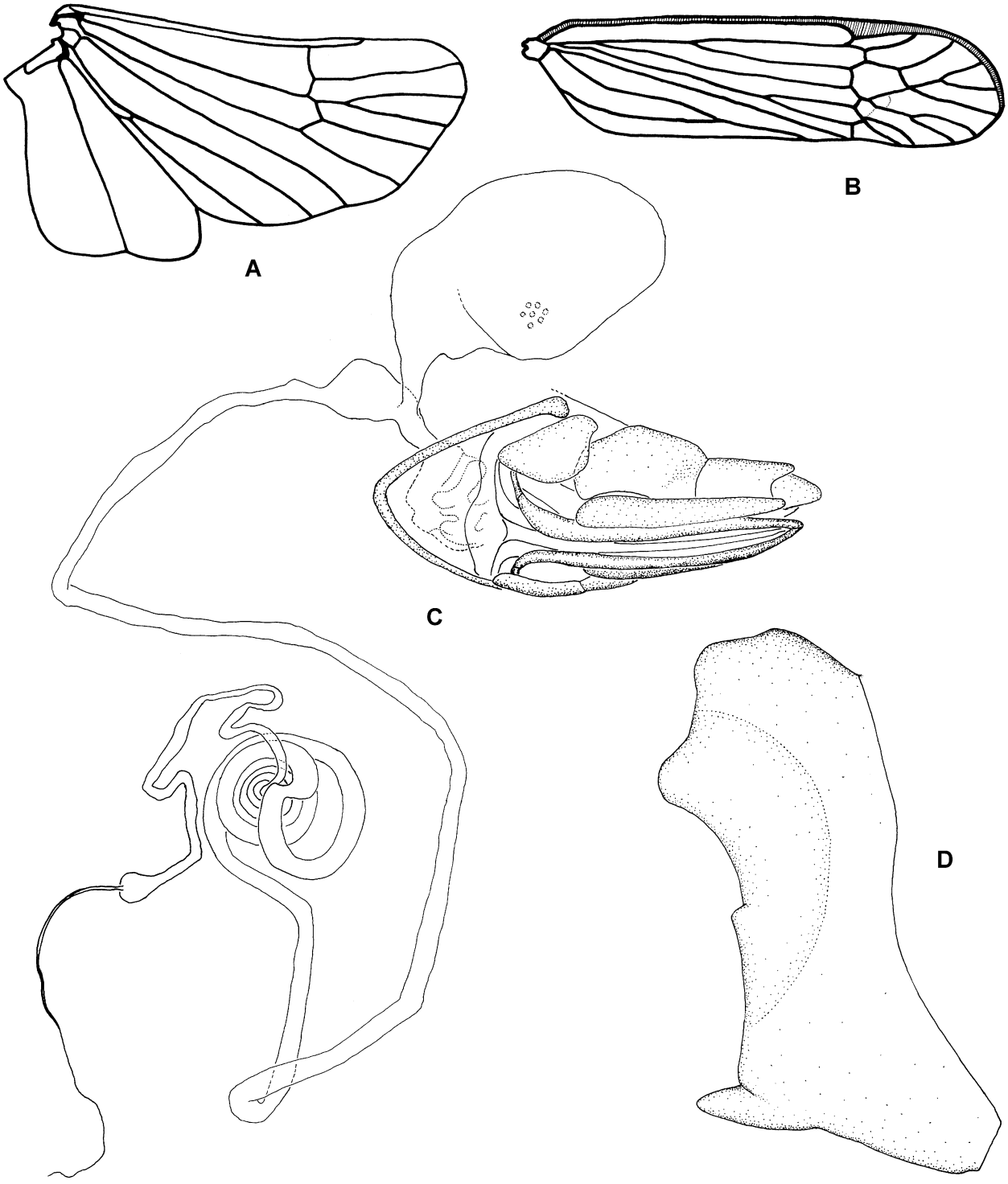

FIGURE 7. A = *F. picturatus*, hind wing. B = *F. andreae*, fore wing. C = *F. picturatus*, inner female genitalia. D = *F. picturatus*, male genital segment, lateral view.

Discussion

Lacking a phylogenetic concept of Oecleini Muir, 1922 (sensu Emeljanov 2002, Holzinger *et al.* 2002), it is difficult to propose autapomorphies for any genus or genus-group. However, Attie *et al.* (2002) recognise a possibly monophyletic group within Oecleini, occurring in the Seychelles, the Mascarenes and Madagascar, that is characterised by the lack of a transverse carina separating the frons from the vertex. This group consists of the genera *Borbonomyndus* Attie, Bourgoin & Bonfils, 2002, *Eumyndus* Synave, 1956, *Nesomyndus* Jacobi,1917 and *Volcanalia* Distant, 1917. *Fipsianus* nov. gen. also belongs to this group.

In *Eumyndus* (endemic to Madagascar) and *Borbonomyndus* (endemic to Réunion), the vertex is much shorter and broader than in *Volcanalia*, *Nesomyndus* and *Fipsianus*. *Nesomyndus* (endemic to Madagascar) is easily recognisable by the strongly v-shaped caudal border of its vertex. *Fipsianus* and *Volcanalia* (both endemic to the Seychelles) differ by the shape of the male genital styles (apically pointed in *Fipsianus*, blunt in *Volcanalia*) and by the shape of the apical process of the anal segment (bilobate in *Fipsianus*, semicircular to triangular in *Volcanalia*). The coloration of the pro- and mesotibiae and 1st and 2nd tarsi has to be considered as an autapomorphy of *Fipsianus*.

Fipsianus species are distinctly larger and more robust than species of *Volcanalia*. Thus, these two genera are easily separable even in the field: *Fipsianus* utilises the upper side of the palm leaves, where it is less sheltered from uncomfortable weather conditions (rain) whereas *Volcanalia* species sit and feed on the under side of their host plant leaves.

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