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**Revision of the South Pacific endemic genera *Orthopsyche*
McFarlane 1976, *Abacaria* Mosely 1941 and *Caledopsyche*
Kimmins 1953 with the description of 29 new species
(Trichoptera: Hydropsychidae)**

JÁNOS OLÁH, KJELL ARNE JOHANSON & PETER C. BARNARD



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Abstract

The taxonomy of the SE Pacific endemic genera *Orthopsyche* McFarlane 1976, *Abacaria* Mosely 1941, and *Caledopsyche* Kimmins 1953 is revised, and 29 species are described as new. *Orthopsyche* is divided into 6 species groups. The *Orthopsyche fimbriata* group contains the 4 species: *O. fimbriata* (McLachlan), *O. thomasi* (Wise), *O. amiena* (Sykora), n. comb., and *O. wardi* Oláh & Johanson, **n. sp.** The *O. tnedi* group includes the 2 species: *O. tnedi* Oláh & Johanson, **n. sp.** and *O. rashala* Oláh & Johanson, **n. sp.** The *Orthopsyche peta* group holds the 5 species *O. peta* Oláh & Johanson, **n. sp.**, *O. piuna* Oláh & Johanson, **n. sp.**, *O. mcfarlanei* Oláh & Johanson, **n. sp.**, *O. ayapona* Oláh & Johanson, **n. sp.**, and *O. schefferae* Oláh & Johanson, **n. sp.** The largest *Orthopsyche nadauna* group includes 6 species: *O. pakaha* Oláh & Johanson, **n. sp.**, *O. nadauna* Oláh & Johanson, **n. sp.**, *O. vrupama* Oláh & Johanson, **n. sp.**, *O. sematho* Oláh & Johanson, **n. sp.**, *O. nevoissi* Oláh & Johanson, **n. sp.**, and *O. imbah* Oláh & Johanson, **n. sp.** The *Orthopsyche kina* group holds 2 species: *O. kina* Oláh & Johanson, **n. sp.** and *O. edhamasa* Oláh & Johanson, **n. sp.** The *Orthopsyche touna* group is monotypic, with only *O. touna* Oláh & Johanson, n. sp. represented.

Abacaria is divided into 6 species groups, with one *incertae sedis*. The *Abacaria subfusca* group includes the 3 species *A. subfusca* Kimmins, *A. orkeni* Illies, and *A. beroni*, n. comb. The *Abacaria ruficeps* group holds 3 species: *A. ruficeps* (Brauer), *A. robinsoni* Oláh & Barnard, **n. sp.**, and *A. moselyi* Oláh & Barnard, **n. sp.** The *Abacaria nuhu* group includes the 2 species: *A. nuhu* Oláh & Barnard, **n. sp.** and *A. cristova* Oláh & Barnard, **n. sp.** The *Abacaria fijiana* group comprises the 3 species *A. fijiana* (Mosely), *A. wekana* Oláh & Barnard, **n. sp.**, and *A. levu* Oláh & Barnard, **n. sp.** The *Abacaria kosova* group includes the 2 species *A. kosova* Oláh & Barnard, **n. sp.** and *A. savura* Oláh & Barnard, **n. sp.** A single species from New Caledonia, *A. caledona* Oláh & Johanson, **n. sp.** belongs to the *Abacaria caledona* group. *A. picea* (Brauer) is *incertae sedis* within *Abacaria*.

Caledopsyche is divided into 3 species groups, the *Caledopsyche kimminsi* group with the 6 species *C. kimminsi* Oláh & Johanson, **n. sp.**, *C. noumea* Oláh & Johanson, **n. sp.**, *C. leander* Scheffter & Ward, *C. cerberus* Scheffter & Ward, *C. cheesmanae* Kimmins, and *C. phallaina* Scheffter & Ward. The *Caledopsyche erotos* group includes the single species *C. erotos* Scheffter & Ward. The *Caledopsyche atalanta* group holds the 2 species *C. atalanta* Scheffter & Ward, and *C. apide* Oláh & Johanson, **n. sp.**

Key words: Trichoptera, Hydropsychidae, *Orthopsyche*, *Abacaria*, *Caledopsyche*, new species, New Caledonia, Fiji, Solomon Islands

Introduction

This paper is an account of the current taxonomic states of the genera *Abacaria* Mosely, *Caledopsyche* Kimmins, and *Orthopsyche* McFarlane, combined with the description of a significant number of new species, together with genitalia drawings for all known species. Several trichopterologists are currently working on the relationships among the hydropsychine genera, and recent progress has been made on the re-evaluation of genera in the subfamily Hydropsychinae by Scheffter (2005). The present paper contributes to

these efforts by giving an account of the genera of *Orthopsyche*, *Abacaria* and *Caledopsyche* with the description of 29 new species and with the assignment of species groups. The diverse genitalic morphology exhibited by the new species will help to evaluate the taxonomic status of these genera in future studies. Originally the separation of the genera was based primarily on wing venation characters. Here we give a short revision of these venational characters with some additional body features for eleven hydropsychnine genera in order to delineate the generic status of *Orthopsyche*, *Caledopsyche* and *Abacaria*. However, these characters were used carefully due to a certain degree of variation within the genera (Table 1). The diagnosis of the genus *Orthopsyche* was initially restricted to characters of the genitalia (McFarlane 1976). However, we have found that only a character complex of the wing venation together with the basic architecture of the posterior abdominal segments and other structural elements in a cladistic phylogenetic analysis gives real possibilities of confirming their monophyly (Scheffer 2005). In hydropsychnine genera the venation is rarely stable (Malicky 1997, Malicky and Chantaramongkol 2000). To support this we present some further examples: (1) the lack of fork 1 in the hind wing characterises the genus *Abacaria* Mosely, but is present in *Abacaria moselyi* Oláh & Barnard, **n. sp.** (2) In *Abacaria cristova* Oláh & Barnard, **n. sp.** and unlike others of the genus, this fork 1 is 'present' as an aberration, with Cu2 and A meeting before the costa, and the discoidal cell is closed. Moreover, the median cell is open in the holotype hind wing of that species while aberrantly closed in the paratype hind wing. Also, in the right wing the discoidal cell is open and median cell closed, but in the left hind wing both cells are open. (3) The genus *Hydromanicus* is characterised by having the forewing crossveins m—cu1 and cu separated, but in *H. jacobsoni* Ulmer, *H. albofasciatus* Ulmer and *H. malayanus* Banks these crossveins almost meet or run very close together. However, these aberrations do not hinder the correct determination of genera using Scheffer's (2005) key, or of species, if we combine their venation with characters of the posterior abdominal segments, even though the rather diverse genital structures alone are not reliable.

Materials and methods

Examination of a very large number of individuals (exceeding 10,000) in this study was necessary in order to evaluate the stability of the different characters applied in the systematics of the species and genera. In *Orthopsyche*, a total of 247 males and 48 females were examined, all from New Caledonia. In *Abacaria* 36 males from Fiji and the Solomon Islands, and 25 males and 8 females from New Caledonia were examined. In *Caledopsyche*, 3282 males and 6497 females were examined, all from New Caledonia.

The material from New Caledonia was collected in 2001 by K. A. Johanson, T. Pape and B. Viklund (all Swedish Museum of Natural History), and in 2003/2004 by K. A. Johanson. All holotypes from this material are deposited in the Muséum National

TABLE 1. Selected diagnostic characters of Hydropsychinae (Hydropsychidae) genera.

	Taxa:							
	<i>Hydatomanicus</i>		distant	distant	distant	convex / straight	convex / straight	distant
	<i>Hydatopsyche</i>		distant	convex / straight	convex / straight	separate	fused	distant
	<i>Hydromanicus</i>		distant	convex / straight	convex / straight	separate	separate	distant
	<i>Orthopsyche</i>		distant	convex / straight	convex / straight	separate	separate / fused	distant
	<i>Aoteapsyche</i>		distant	convex / straight	convex / straight	separate	separate	distant
	<i>Herbertorossia</i>		distant	convex / straight	convex / straight	separate	separate	distant
	<i>Caledopsyche</i>		distant	convex / straight	convex / straight	separate	separate	distant
	<i>Abacaria</i>		distant	convex / straight	convex / straight	separate	separate	distant
	<i>Potamyia</i>		close	convex / straight	convex / straight	fused	separate	close
	<i>Cheumatopsyche</i>		close	convex / straight	convex / straight	separate	separate	close
	<i>Hydropsyche</i>		distant	convex / straight	convex / straight	separate	separate	distant
Characters:								
Crossveins m-cu1 to cu1-cu2 in forewing			distant	convex / straight	convex / straight	separate	separate	distant
Ferrens shape of forewing			straight	convex / straight	convex / straight	separate	separate	convex / straight
Cu2 and A before wing margin in forewing			separate	convex / straight	convex / straight	separate	separate	separate
Sc and R before wing margin in forewing			separate	convex / straight	convex / straight	separate	separate	separate
Median cell in hind wing			closed	convex / straight	convex / straight	open	open	open
Stems of M and Cu1 in hind wing run			close	convex / straight	convex / straight	close	close	distantly
Forks on hind wing			1, 2, 3, 5	convex / straight	convex / straight	1, 2, 3, 5	1, 2, 3, 5	1, 2, 3, 5
Maxillary palp segment 5 length			long	convex / straight	convex / straight	long	long	long
Xth segment preanal appendage process			absent	convex / straight	convex / straight	absent	absent	present / absent

d'Histoire Naturelle, Paris, France (MNHNP). Additional material from New Caledonia was collected in February to March 2006 by Rudloff and Schaarschmidt and deposited in the Museum für Naturkunde, Humboldt-Universität, Berlin (MNHU). The material collected in Fiji was collected by P. A. Maddison in 1975, J. A. Uluinaceva in 1975, G. S. Robinson in 1971, and H. W. Simmonds in 1922. All holotypes from those collections are deposited in the Natural History Museum, London, England (BMNH). Additional Fijian material was collected by R. Brechlin in January 1998, and is deposited in MNHU. The Solomon Islands specimens were collected by the Royal Society Expedition in 1966, and the holotypes are deposited in BMNH. All specimens are stored in alcohol. Paratypes of all new New Caledonian species are deposited in the Swedish Museum of Natural History, Stockholm, Sweden (NRM).

Drawings of *Orthopsyche fimbriata* (McLachlan), *O. thomasi* (Wise), and *O. amiена* (Sykora) are modified from Neboiss (1986) to present a total picture of the morphological diversity of the genus.

Systematics

Orthopsyche McFarlane 1976

Type species: *Hydropsyche fimbriata* McLachlan 1862

Orthopsyche fimbriata (McLachlan 1862), McFarlane 1976 by original designation.

The wing venation of all the known species are identical with those of *Hydropsyche*, except that only the median cell is open in the hind wing. The erection of *Orthopsyche* by McFarlane (1976) was based upon this venational character together with structural details in the genitalia. However, the species from New Caledonia all show a wide range in these genitalic characters, and until a detailed cladistic analysis of phylogenetic relationships is performed we have to conclude that the open median cell in the hind wing remains the only character separating reliably this genus from the *Hydropsyche*. The difference from *Aoteapsyche*, the other endemic hydropsychid genus of New Zealand that also has an open median cell in the hind wing, is the presence of a straight termen in the forewing. The main difference from the hydropsychine genera *Hydromanicus*, *Hydatopsyche* and *Hydatomanicus* that also have an open median cell in the hind wing is that the stems of M and Cu1 in the hind wing run close together and are not widely separated. The previously described characters for *Orthopsyche* are not present in many of the new species. First, the pigmentation is not always light, there are species with a fuscous colour. Second, the anterior third of the phallus, the proximal phallobase, is not always vertical and rectangular, exhibiting a right angle, but there are species groups with an obtuse or even a very wide angle. The distal end of the phallic apparatus may be armed very differently with a simple sclerotized endothelial process of the endophallus (outer lip), with heavily

sclerotized spines, or with a brush of spines on the ventral endothecal membranous process. Third, the two segments of the inferior appendages are not equal or even sub-equal in length: there are New Caledonian species with a very short harpago.

The genus was previously known as an endemic genus of New Zealand but is now also recorded from New Caledonia.

Orthopsyche fimbriata group

Characteristics: Body and forewings pale ochraceous. Segment IX reduced; sternum shortened; tergum elongated backward; apical lobe on posterolateral margin nearly triangular. Segment X with elevated and bi-lobed apicodorsal, and short, digitate apicoventral setal warts. Inferior appendage with distally narrowing harpago. Phallosome almost right angled; its basoventral part elongated, occupying one third.

Two species are known from New Zealand and one described here from New Caledonia.

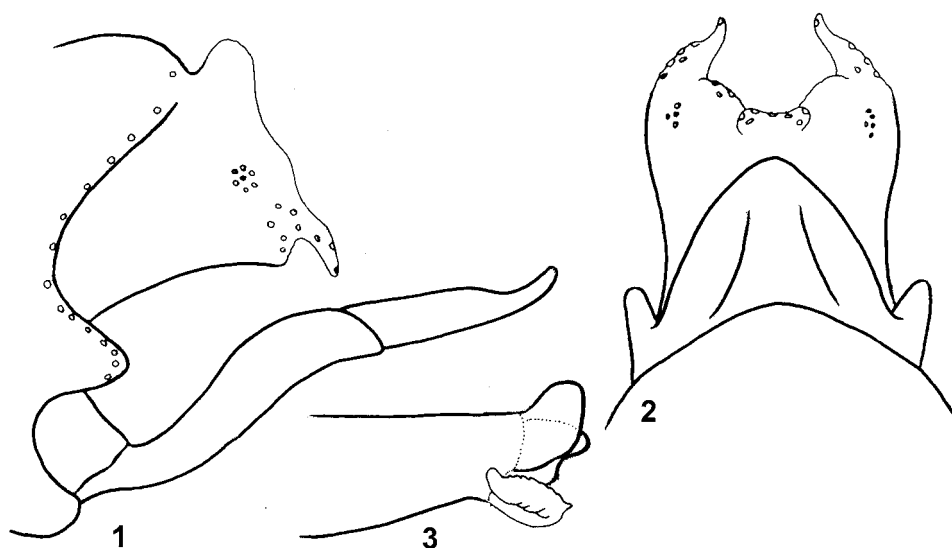
Orthopsyche fimbriata (McLachlan, 1862)

Fig. 1–3

Hydropsyche fimbriata MacLachlan 1862: 309.

Orthopsyche fimbriata (McLachlan); McFarlane 1976: 30.

Male holotype: New Zealand. [not examined]



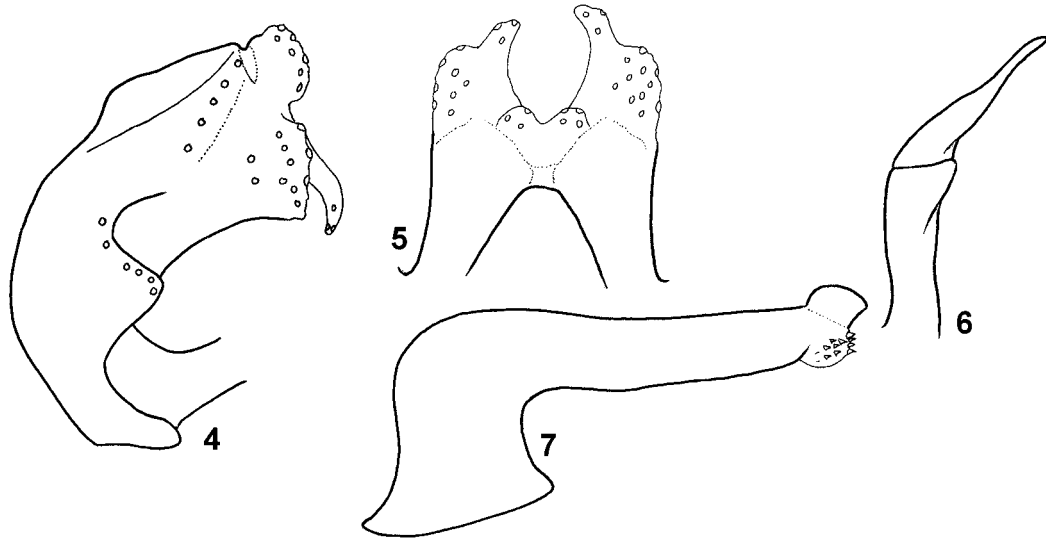
FIGURES 1–3. *Orthopsyche fimbriata* McLachlan 1862. 1 — genitalia, lateral; 2 — genitalia, dorsal; 3 — phallus apex, lateral. [modified after Neboiss 1986]

***Orthopsyche thomasi* (Wise 1962)**

Fig. 4–7

Hydropsyche thomasi Wise 1962: 248, 250.*Orthopsyche thomasi* (Wise 1962); McFarlane 1976: 30.

Male holotype: New Zealand, Auckland. [not examined]



FIGURES 4–7. *Orthopsyche thomasi* (Wise 1962). 4 — genitalia, lateral; 5 — genitalia, dorsal; 6 — right inferior appendage, ventral; 7 — phallus, lateral. [modified after Neboiss 1986]

***Orthopsyche amiena* (Sykora 1967), new combination**

Fig. 8–11

Cheumatopsyche amiena Sykora 1967: 592–593.*Orthopsyche amiena* (Sykora 1967); **new combination.**

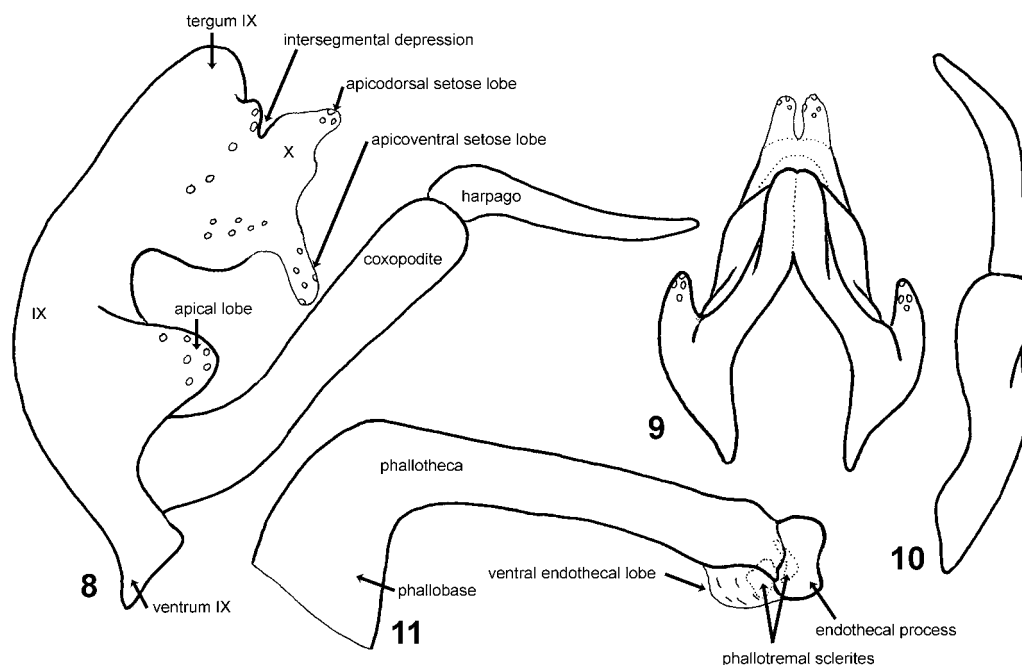
Holotype male: New Caledonia: River near Col d'Amieu, 478 m, 13–14.ix.1966. (Bishop 7473) Bishop Museum, Honolulu, Hawaii. [not examined]

***Orthopsyche wardi* Oláh & Johanson, new species**

Fig. 12–15

This species is close to *O. fimbriata*, but almost twice the size; it has a deeper inter-segmental depression between segments IX and X, the setose lobes on segment X are

differently formed, and the inferior appendage has shorter and not strongly tapering harpago.

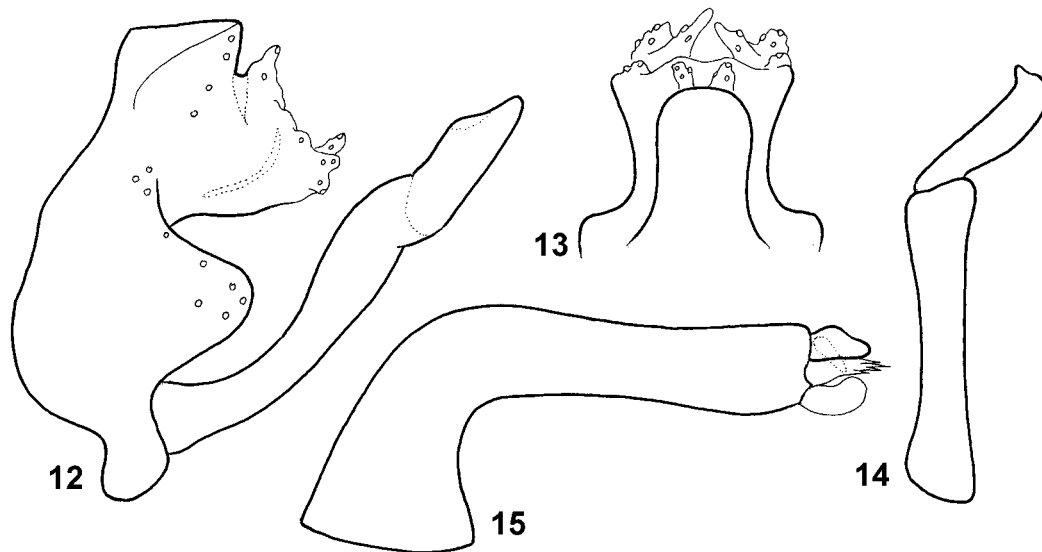


FIGURES 8–11. *Orthopsyche amiena* (Sykora 1967). 8 — genitalia, lateral; 9— genitalia, dorsal; 10 — right inferior appendage, ventral; 11 — phallus, lateral. [modified after Neboiss 1986]

Male. Body and wings pale ochraceous with golden pubescence. Maxillary palp segment 2 shorter than segment 3; segment 5 longer than segments 1–4 together. Dorsum of head pale with pale pubescent warts. Small swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing length 17.5 mm, hind wing length 13 mm.

Male genitalia (Fig. 12–15). Abdominal segment IX fused annularly; sternum short; tergum elongated, shifted backwards and quadrangular in dorsal aspect; sternum shortened abruptly; anterior margin irregularly bent in lateral aspect; apical lobe on posterolateral margin sub-triangular, located well above base of inferior appendages; spine row on posterior margin intermittent, grouped at ventral attachment and spreading at distal half of apical lobe. Inter-segmental depression between IXth and Xth segments deep, posterior terminal ending of IXth tergum straight, vertical. Segment X shortened; armed with digitate irregular lobes or warts; setose area on these processes (superior or preanal and intermediate appendages) dominate tenth segment; apicodorsal setose lobes fused into median elevation; clearly bi-lobed in dorsal aspect; apicoventral setose lobe together with lateral setose area forming complex of warts in lateral aspect; transverse suture on inter-segmental depression short; lateral suture running upwards distally and demarcating setose

distal wart complex. Inferior appendages with sinuate coxopodite; harpago broad and parallel-sided, abruptly shortened at apex in lateral aspect. Phallosome right angled; dorsum of horizontal section slightly concave in lateral aspect; basal section of phallosome small, down-curving, angled at around 90°, sclerotized endothelial process, or outer lip sub-triangular; phallosomal sclerite, or inner lip narrow oblique and heavily sclerotized; even in covered position dominating endothelial process; ventral endothelial lobes forming two pairs of membranous lobes; upper lobes with distal bundle of spines.



FIGURES 12–15. *Orthopsyche wardi* Oláh & Johanson, new species, holotype. 12 — genitalia, lateral; 13 — genitalia, dorsal; 14 — right inferior appendage, ventral; 15 — phallus, lateral.

Holotype male: NEW CALEDONIA: Province Sud: Mt. Dzumac, source stream of Ouinne River, downstream cross-point to mountain track, 22°01.997'S, 166°28.486'E, 795 m, over about 30 m waterfall, 18.xi–4.xii.2003, Malaise trap, loc#031 [KA Johanson] (MNHNP).

Paratypes: New Caledonia: Province Sud, stream, Col d'Amieu, 21°33.830'S, 165°45.584'E, 415 m, light trap, 3.xii.2001 [Johanson, Pape, Viklund] — 2 males (NRM); New Caledonia: Province Sud, Rivière Ouanéoué, at bride crossing road to Koghi Mountains, about 1.5 km from road RT1 Noumea-Dumbea, 22°10.861'S, 166°29.531'E, 11.xi.2003, 11.xii.2003, 20.i.2004, light trap, loc#024 [KA Johanson] — 4 males (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream of Ouinne River, at cross-point to mountain track, 22°02.218'S, 166°28.566'E, 797 m, 18.xi.2003, 3.xii.2003, light trap, loc#032 [KA Johanson] — 4 males, 1 female (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream of Ouinne River, downstream cross-point to mountain track, 22°01.997'S, 166°28.486'E, above waterfall, 795 m, 3.xii.2003, light trap, loc#061 [KA Johanson] — 3 males (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream

of Ouinne River, downstream cross-point to mountain track, 22°02.330'S, 166°28.605'E, 796 m, 3.xii.2003, light trap, loc#062 [KA Johanson] — 3 males (NRM).

Distribution: New Caledonia (Province Sud).

Etymology. *wardi*, dedicated to John B. Ward at the Canterbury Museum, New Zealand, for his valuable contribution to South Pacific Trichoptera taxonomy.

***Orthopsyche tnedá* group**

Characteristics: yellow and brown in colour; segment X developed into a large rounded body with extensive setal surfaces only, without no pronounced digitate processes or lobes; setose surfaces of superior and pre-anal appendages located on apicodorsal and apicoventral obtuse lobes; lateral and apicoventral lobes fused; phallic apparatus widely angled at about 150°; a sclerotized endothelial process, or outer lip, armed with heavily sclerotized spines; inferior appendages with short and slender harpago.

Two species are included in this group, both endemic to New Caledonia.

***Orthopsyche tnedá* Oláh & Johanson, new species**

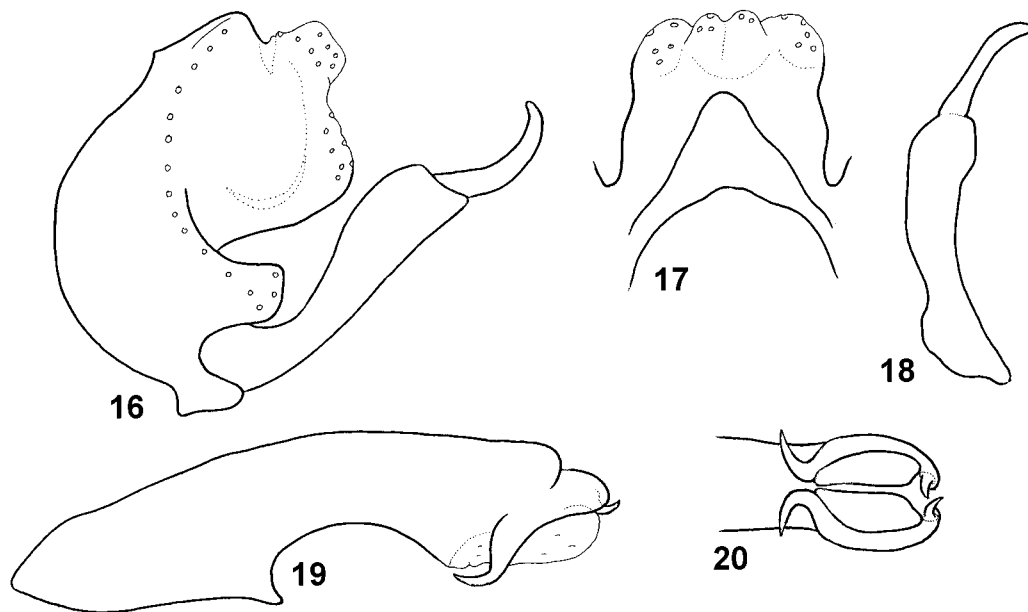
Fig. 16–20

This species is close to *O. rashala*, but its forewings are stramineous, not pale brown; and the wing membrane is uniformly coloured, not spotted. In the genitalia, the spines on the endothelial processes are better developed and curving more strongly than in *O. rashala*.

Male. Body bright yellow. Forewings stramineous. Eye and labrum area black. Maxillary palp segment 2 longer than segment 3; segment 5 as long as segments 1–4 together. Dorsum of head pale with pale pubescent warts being weakly visible. Small swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing length 7.5 mm, hind wing length 6.2 mm.

Male genitalia. Abdominal segment IX fused annularly; sternum short; tergum longer, shifted backward and sharply triangular in dorsal aspect; sternum shortened abruptly; anterior margin of segment rounded in lateral aspect forming a drawn bow; apical lobe on posterolateral margin quadrangular, located just above base of inferior appendages; spine row on posterior margin continuously complete, spreading on almost whole area of apical lobe. Inter-segmental depression between segments IXth and Xth shallow and right angled. Segment X developed into large body with short processes; setose area (on superior or pre-anal and intermediate appendages) diffused on processes of rather small lobes; dorsum bi-lobed with apicodorsal setose and obtuse lobes visible in dorsal aspect; apicoventral setose lobe more obtuse in lateral aspect; broad transverse suture at deepest point in inter-segmental depression; long, vertical, antieriad curving suture line demarcating setose distal end of segment. Inferior appendages with sinuous coxopodite;

dilated from midway to apex; harpago slender, up-curving mesally, armed with three apical spines. Phallosome obtusely angled; dorsum of phallosome convex in lateral aspect; basal section of phallosome small, down-curving, angled at around 150°; sclerotized endothelial process or outer lip developed into dorsal and ventral spine pairs, ventral spines larger, curving backward in lateral aspect and outward in ventral aspect, partially covering the enlarged phallosomal sclerites; ventral endothelial process small, membranous, visible in lateral aspect.



FIGURES 16–20. *Orthopsyche meda* Oláh & Johanson, new species, holotype. 16 — genitalia, lateral; 17— genitalia, dorsal; 18 — right inferior appendage, ventral; 19 — phallus, lateral; 20 — phallus apex, ventral.

Holotype male: NEW CALEDONIA: Province Nord: 50 m upstream bridge on Hienghène-Tnèdo road, 3.9 km S summit of Mt. Tnèda, 2.2 km E Tnèdo, 20°43.085'S, 164°49.928'E, 29 m, 7.xii.2003, light trap, loc#071 [KA Johanson] (MNHNP).

Paratypes: same data as holotype — 5 males (NRM); New Caledonia: Province Sud, stream, Sarraméa, 21°37.883'S, 165°51.958'E, 220 m, light trap, 19.xi.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, stream, Col d'Amieu, 21°34.451'S, 165°47.388'E, 366 m, Malaise trap, 30.xi–5.xii.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, stream, Col d'Amieu, 21°33.830'S, 165°45.584'E, 415 m, light trap, 3.xii.2001 [Johanson, Pape, Viklund] — 2 males (NRM); New Caledonia: Province Sud, Platou de Dogny, source of Dogny River, about 900 m SE summit of Platou de Dogny, 21.61917°S, 165.88072°E, 919 m, 25.xi–16.xii.2003, Malaise trap, loc#046 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Creek Froid, 10 m upstream bridge on La Foa-Koindé road, 200

m W crossroad to Ouipouin, 21°38.581'S, 165°56.672'E, 180 m, 4.i.2004, light trap, loc#105 [KA Johanson] — 5 males (NRM); New Caledonia: Province Sud, Fö Néchédeva stream, 2 m upstream bridge on La Foa-Koindé road, 21°38.812'S, 165°56.076'E, 124 m, 4.i.2004, light trap, loc#106 [KA Johanson] — 1 male (NRM); New Caledonia: South Province, La Foa, SE Sarramea vill., 5 km Farroa Riv., rainforest 400 m, 25–27.ii.2006 [Rudloff, Schaarschmidt] — 1 male (MNHU).

Distribution: New Caledonia (Province Nord and Province Sud).

Etymology. *tneda*, name derived from the type locality, along the road from Hieghène to Tnèdo.

***Orthopsyche rashala* Oláh & Johanson, new species**

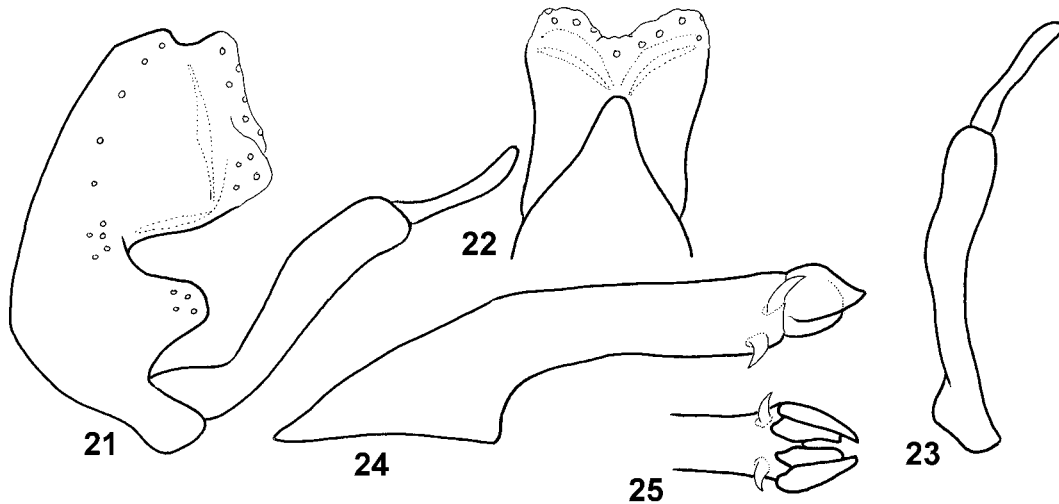
Fig. 21–25

This species is close to *O. tneda*, but has pale brownish forewings, not stramineous, and the membrane is spotted, not uniformly coloured. In the genitalia, the spines on the endothecal processes are less developed, and the phallic apparatus is more slender. The inter-segmental depression is reduced.

Male. Body fulvous. Forewing pale brownish, mottled with small lighter spots evenly distributed on wing membrane and visible only under microscope. Eyes black. Maxillary palp segment 2 longer than segment 3; segment 5 as long as segments 1–4 together. Head dorsum with 10 discernible setal warts. Single small, swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing length 6.5 mm, hind wing length 4.8 mm.

Male genitalia. Abdominal segment IX fused annularly; sternum shortening gradually; tergum long, shifted backward and triangular in dorsal aspect; anterior margin of segment rounded in lateral aspect, widest at posterolateral apical lobe; apical lobe on posterolateral margin sub-triangular, located well above base of inferior appendages; spine row on posterior margin continuous, doubled ventrally on segment X and spreading on distal half of apical lobe. Inter-segmental depression between segments IX and X very shallow, almost absent. Xth segment developed into large body with obtuse lobes only; setose area (superior or preanal and intermediate appendages) diffuse on obtuse lobes; dorsum, the dorsoapical setose, and obtuse lobes, fused into median elevation; not bi-lobed in dorsal aspect; apicoventral setose lobe more obtuse in lateral aspect; transverse suture in inter-segmental depression extended into long, vertical, antieriad curving suture demarcating setose distal end of segment X. Inferior appendages with coxopodite slightly narrowing near base, broadening distally and parallel sided at apex; harpago slender, curving dorsally in lateral aspect, armed with short apical spine. Phallosome obtusely angled; dorsum of phallosome convex in lateral aspect; basal section of phallosome small, downcurving, angled at 150°; sclerotized endothecal process or outer lip with tapering dorsal and ventral

pairs of spines, apparently connected to ventral endothelial lobes; phallotremal sclerites enlarged, ventral margin not covered by the endothelial process; membranous ventral endothelial process slightly visible in lateral aspect.



FIGURES 21–25. *Orthopsyche rashala* Oláh & Johanson, new species, holotype. 21 — genitalia, lateral; 22— genitalia, dorsal; 23 — right inferior appendage, ventral; 24 — phallus, lateral; 25 — phallus apex, ventral.

Holotype male: New Caledonia: Province Nord: Mt. Panié, stream at camp, 20.58139°S, 164.76444°E, 1310 m, 9.xii.2003, Malaise trap, loc#074 [KA Johanson] (MNHNP).

Paratypes: same data as holotype — 32 males, 4 females (NRM); New Caledonia: Province Nord, Mt. Panié, stream at camp, 20.58167°S, 164.76472°E, 1311 m, 9.xii.2003, Malaise trap, loc#073 [KA Johanson] — 14 males (NRM).

Distribution: New Caledonia (Province Nord).

Etymology. *rashala*, spot in Sanscrit, referring to the uniformly spotted forewing membrane.

***Orthopsyche peta* group**

Characteristics: ochraceous, except that *O. schefferae* has fuscous wings. Segment IX is short, longest at apicolateral lobe. Xth segment with characteristically robust dorsomedian and ventrolateral setose lobes of various length. Phallic apparatus obtusely angled at 130°; sclerotized endothelial process, or outer lip, half the width of phallosome end; phallotremal sclerites heavily sclerotized; ventral endothelial lobes divided; upper lobes sometimes spiny. Inferior appendages with well developed harpago, moderately slender,

short and broad only in *O. schefferae*, new species.

The species group is endemic to New Caledonia and includes 5 species.

***Orthopsyche peta* Oláh & Johanson, new species**

Fig. 26–29

Orthopsyche peta is close to *O. piuna*, new species, but the dorsum of segment IX is about twice as long, the inter-segmental depression is deeper and acutely angled at 30°, and the apicoventral lobe of Xth segment is much longer. The inferior appendages have a parallel-sided, straight harpago. A unique feature is the closed median cell in the hind wings, a character state absent in all other *Orthopsyche* species which may reflect a primitive state.

Male. Ochraceous forewing membrane. Body yellowish. Eye black. Setal warts on head and thorax bright white on yellow background. Maxillary palp segment 2 longer than segment 3; segment 5 about 1.5 times longer than segments 1–4 together. Dorsum of head with 10 discernible setal warts. Single small, swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Median cell in hind wing closed. Forewing length 10 mm, hind wing length 7.2 mm.

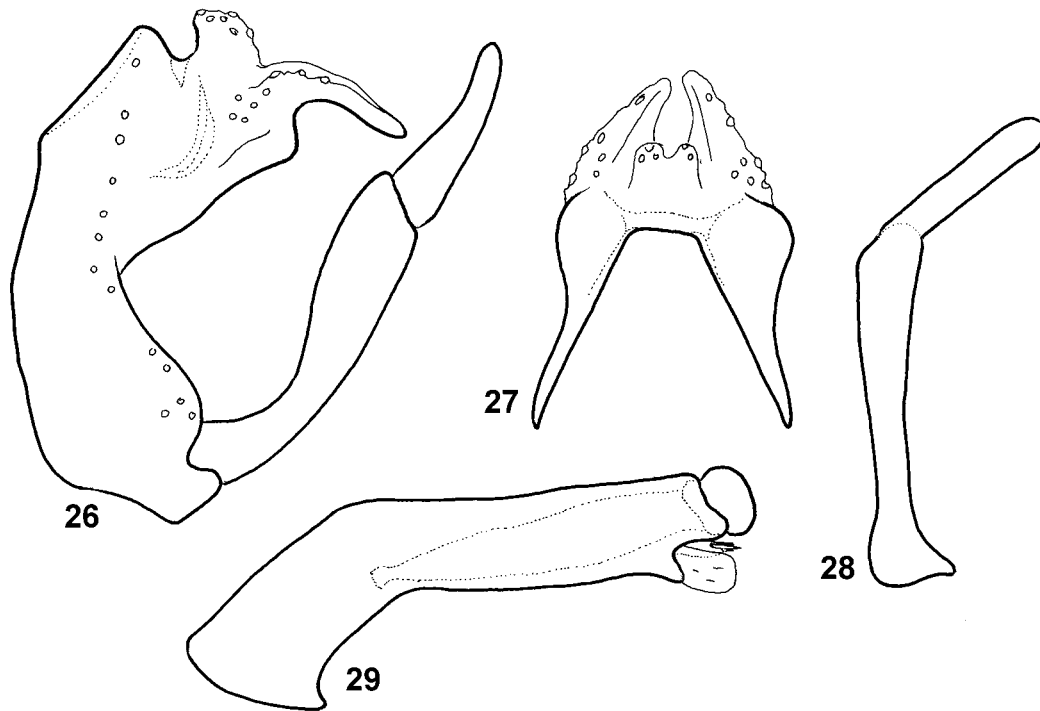
Male genitalia: Abdominal segment IX fused annularly, narrow; tergum long, shifted backwards; sternum shortened gradually; anterior margin formed accordingly in lateral aspect; upper half shifted gradually, lower smaller part more abruptly, middle part slightly convex; apical lobe on posterolateral margin weakly developed, obtusely angular near base of inferior appendages; posterior spine row intermittent, spines lacking above apical lobe and around ventral membranous joining segment X. Inter-segmental depression between segments IXth and Xth very deep, acutely angled at 30°. Segment X developed into compact body with robust processes; setose area (superior or preanal and intermediate appendages) diffuse on these processes; dorsum of segment bi-lobed due to formation of apicodorsal setose process visible in dorsal aspect; setose apicolateral lobes elongated, down-curving, and decorated with longitudinal rim of small warts; transverse suture usually located at bottom of inter-segmental depression demarcating border between segments IX and X; ventral suture wide and delineating setal distal end. Inferior appendages with sinuous coxopodite, apex moderately dilated; harpago about half as long as coxopodite, slightly narrowing distally in lateral aspect; in ventral aspect parallel sided, rod-like. Phallobase small, down-curving, obtusely angled at 130°; dorsum of phallotheca depressed slightly in lateral aspect; sclerotized endothelial process or outer lip rounded; as wide as heavily sclerotized phallotremal sclerites; phallotremal sclerites partly covered by sclerotized upper end of phallotheca and not completely by endothelial process; ventral endothelial process forms pair of membranous lobes and dark sclerotized single brush of spines, located above membranous lobes.

Holotype male: New Caledonia: Province Sud: Haute Yaté fauna reserve, 1760 m S

bridge Pont Perignon, 50 m upstream bridge over stream, 22.14954°S, 166.701211°E, 180 m, 14.xii.2003–13.i.2004, Malaise trap, loc#081 [KA Johanson] (MNHNP).

Distribution: New Caledonia (Province Sud).

Etymology. *peta*, from Sanscrit, meaning yellowish, after the bright yellow colour of the body and forewings.



FIGURES 26–29. *Orthopsyche peta* Oláh & Johanson, new species, holotype. 26 — genitalia, lateral; 27 — genitalia, dorsal; 28 — right inferior appendage, ventral; 29 — phallus, lateral.

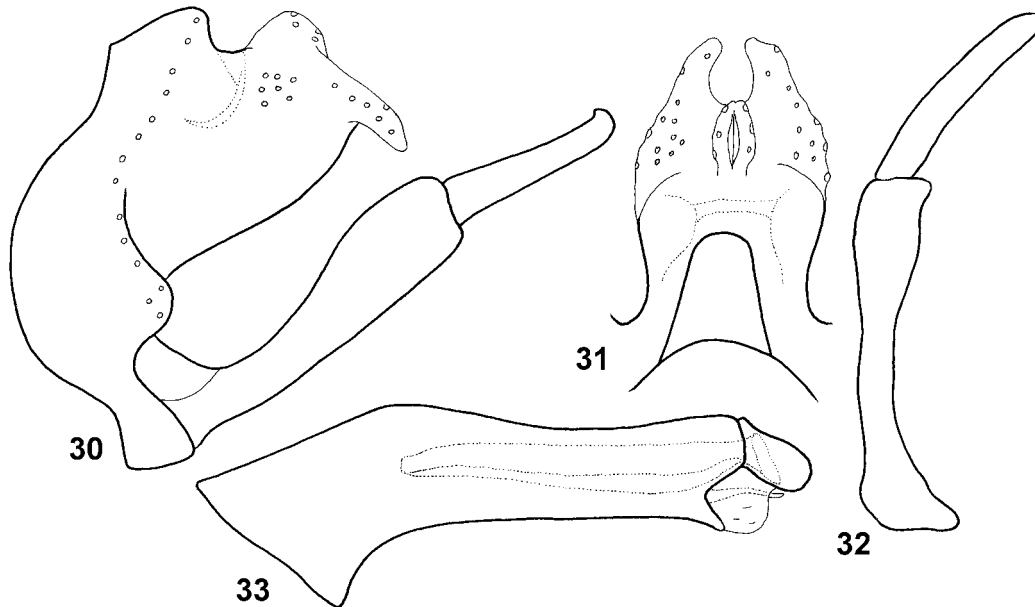
Orthopsyche piuna Oláh & Johanson, new species

Fig. 30–33

This species is close to *O. peta*, but the dorsum of the IXth segment is about half as long, its anterior margin more roundly convex, like a drawn bow. The inter-segmental depression is shallower and right angled. The apicoventral lobe of Xth segment is shorter. The apicodorsal pair of setose processes are almost fused mesad, and not bi-lobed in dorsal aspect. The head and thoracic setal warts are not bright white, but are nearly fulvous colour like their background.

Male. Ochraceous wing membrane, light brownish-fulvous body and black eye. Maxillary palp segment 2 about 1.5x longer than segment 3; segment 5 as long as segments 1–4 together. Dorsum of head with 10 discernible setal warts, not clearly visible

due to similar background colour and dense golden pubescence covering dorsum. Small swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing length 9 mm, hind wing length 7 mm.



FIGURES 30–33. *Orthopsyche mcfarlanei* Oláh & Johanson, new species, holotype. 30 — genitalia, lateral; 31— genitalia, dorsal; 32 — right inferior appendage, ventral; 33 — phallus, lateral.

Male genitalia. Segment IX fused annularly and narrow; tergum shifted backwards; sternum shortening abruptly; anterior margin in lateral aspect formed accordingly, upper half shifted gradually and lower smaller part more abruptly, middle part rounded, like a drawn bow; apical lobe on posterolateral margin well developed and sub-triangular, located above base of inferior appendages; posterior row of spines intermittent, spines absent above apical lobe and around ventral membranous joining of segment X. Inter-segmental depression between dorsum of segments IX and X deep and right angled. Segment X developed into compact body with robust processes; setose area (superior or preanal and intermediate appendages) diffused on these processes; dorsum of segment X dominated by central setose ridge due to dorsoapical setose process being fused and visible in dorsal aspect; setose apicolateral lobes elongated, directed straight obliquely and spotted with longitudinal row of small setal warts; transverse suture located at bottom of inter-segmental depression wide, demarcating border between segment IX and X; ventral suture widely delineating lateral setal wart, this wart continues into apicoventral setose lobe. Inferior appendages with sinuous coxopodite, apex dilated; harpago about half as long as coxopodite; slightly narrowing distally in lateral aspect; slightly curving mesad in

ventral aspect. Basal section of phallosome small, down-curving part forming obtuse angle at 130°; dorsum of phallosome depressed slightly midway in lateral aspect; sclerotized endothelial process or outer lip elongated horizontally, as wide as heavily sclerotized phallosomal sclerites; phallosomal sclerites covered by endothelial process; ventral endothelial process forms pair of membranous almost fused lobes plus dark sclerotized single brush of spines located above membranous lobes.

Holotype male: New Caledonia: Province Sud: small river under bridge on road between Noumea and Yaté, 1.5 km S Yaté Dam, 22°09.955'S, 166°52.905'E, 160 m, 12.xi.2003, light trap, loc#026 [KA Johanson] (MNHNP).

Paratypes: New Caledonia: South Province, road La Foa-Canala km 25, Reserve special de faune du Col d'Amieu et Table unio, rainforest 600 m, 18–21.ii.2006 [Rudloff, Schaarschmidt] — 1 male (MNHU, pinned); New Caledonia: South Province, Rivière Ouanèoue, at bridge crossing road to Koghi Mts., 22°10.861'S 166° 29.531'E, 20.I.2004 [KA Johanson] — 1 male 2 females (MNHU, pinned)

Distribution: New Caledonia (Province Sud).

Etymology. *piuna*, from Sanscrit piuna, meaning brown, referring to the pale brownish colour of the body.

***Orthopsyche mcfarlanei* Oláh & Johanson, new species**

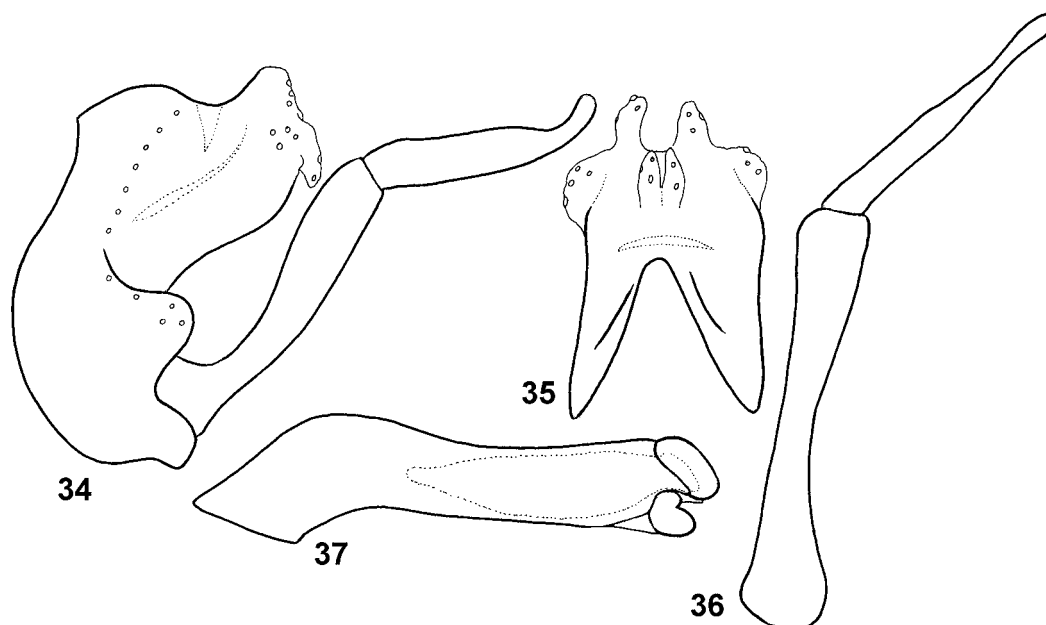
Fig. 34–37

Orthopsyche mcfarlanei is similar to *O. ayapona*, **n. sp.**, but both the apicodorsal and apicoventral setose lobes on segment X are slender, not broad. Harpago of the inferior appendages narrows stepwise in lateral aspect, and sub-straight in ventral view, with visible clavate apices. Sclerotized ventral endothelial lobes lack a strong brush of spines.

Male. Body pale brownish fulvous. Forewing membrane ochraceous. Eye black. Maxillary palp segment 2 longer than segment 3; segment 5 as long as segments 1–4 together. Head with 10 discernible dorsal setal warts, not clearly visible due to similar background colour and dense covering of golden pubescence on head dorsum. Small, swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked bundle of setae. Forewing length 11 mm, hind wing length 8 mm.

Male genitalia. Abdominal segment IX fused annularly and narrow; tergum shifted backward; sternum shortening abruptly; anterior margin in lateral aspect formed accordingly, with upper half gradually shifted and lower smaller part shifted more abruptly; middle part rounded like a drawn bow; apical lobe on posterolateral margin well developed and sub-triangular, located above base of inferior appendages; posterior row of spines intermittent; spines absent from above apical lobe and around ventral membranous joining of segment X. Inter-segmental depression between dorsum of segments IX and X shallow and obtusely angled at 120°. Segment X developed into compact body with

processes; setose area (superior or preanal and intermediate appendages) diffuse on these processes; dorsum of segment X dominated by central setose ridge being triangular in lateral aspect due to fused apicodorsal setose process visible in dorsal aspect; setose apicolateral lobes slender, directed downward; with wide transverse suture located at bottom of inter-segmental depression; ventral suture horizontal. Inferior appendages with straight coxopodite, without distal dilation; harpago more than half as long as coxopodite, stepwise narrowing distally in lateral aspect; forming a straight rod with clavate apex in ventral view. Basal section of phallosome small, down-curving part forming obtuse angle at 130°; in lateral aspect, dorsum of phallosome slightly depressed at midway; sclerotized endothelial process or outer lip sub-reniform, half as wide as end of phallosome, covering completely well sclerotized narrow and oblique phallosomal sclerites; ventral endothelial process sclerotized without spine brush.



FIGURES 34–37. *Orthopsyche piuna* Oláh & Johanson, new species, holotype. 34 — genitalia, lateral; 35 — genitalia, dorsal; 36 — right inferior appendage, ventral; 37 — phallus, lateral.

Holotype male. New Caledonia: Province Sud: Mt. Dzumac, source stream of Ouinne River, downstream crosspoint to mountain track, 22°01.997'S, 166°28.486'E, 795 m, over about 30 m waterfall, 18.xi–4.xii.2003, Malaise trap, loc#031 [KA Johanson] (MNHNP).

Paratypes: New Caledonia: Province Sud, stream, Koghi Mt., 22°10.327'S, 166°30.524'E, 522 m, Malaise trap, 12–16.xi.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50167°E, 417 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#004 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50073°E, 407 m, 02–16.xi.2003,

16–26.xi.2003, Malaise trap, loc#005 [KA Johanson] — 3 males (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 800 m S Koghi Restaurant, 22.18406°S, 166.50383°E, 420 m, 11–26.xi.2003, Malaise trap, loc#022 [KA Johanson] — 3 males, 4 females (NRM); New Caledonia: Province Sud, Rivière Ouanéoué, at bride crossing road to Koghi Mountains, about 1.5 km from road RT1 Noumea-Dumbea, 22°10.861'S, 166°29.531'E, 11.xi.2003, 11.xii.2003, 20.i.2004, light trap, loc#024 [KA Johanson] — 2 males, 3 females (NRM). New Caledonia: Province Sud, stream crossing way to Sanatorium 2.3 km E St. Laurent, ca. 30 m downstream bridge, 22°04.484'S, 166°19.900'E, 15.xi.2003, light trap, loc#028 [KA Johanson] — 14 males (NRM); New Caledonia: Province Sud, Monts Kwa Ne Mwa, along Noumea-Yaté road, 2.0 km E Pic Mouirange, 20 m upstream road, 22°12.356'S, 166°40.798'E, 220 m, 15–16.i.2004, light trap, loc#120 [KA Johanson] — 8 males, 6 females (NRM).

Distribution: New Caledonia (Province Sud).

Etymology. *Orthopsyche mcfarlanei* is named after A. G. McFarlane who established the genus *Orthopsyche*.

***Orthopsyche ayapona* Oláh & Johanson, new species**

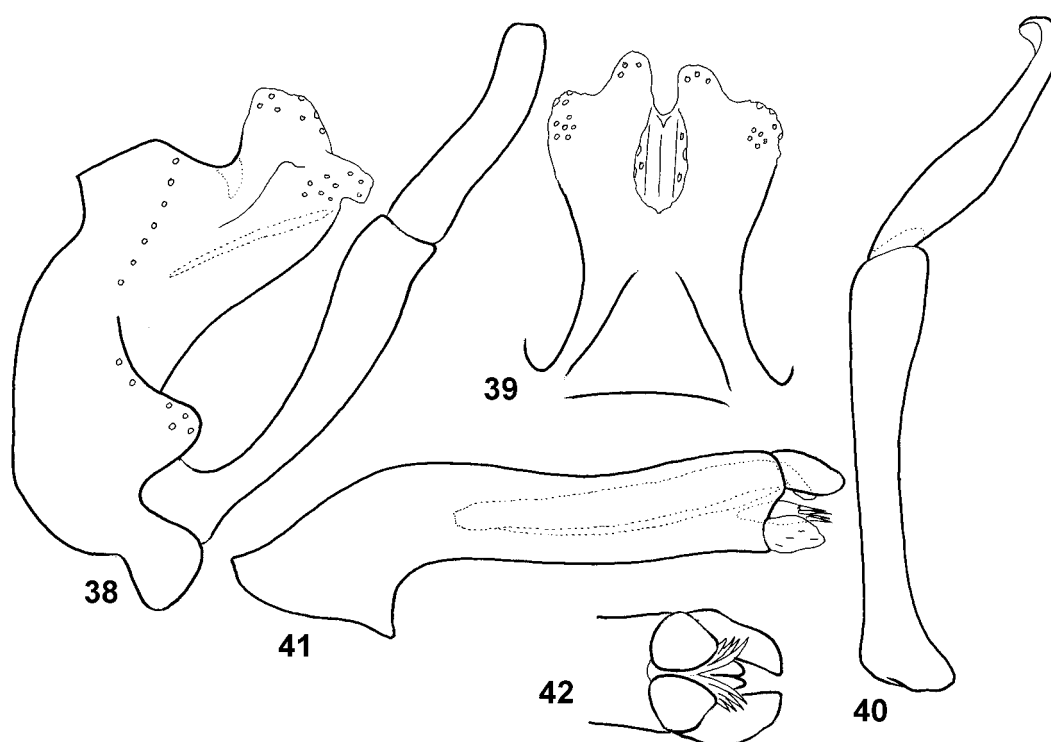
Fig. 38–42

Orthopsyche ayapona is similar to *O. mcfarlanei*, but both the apicodorsal and apicoventral setose lobes on segment X are robust, not slender. The inferior appendage harpago has no stepwise narrowing in lateral aspect, and the apex is simple in ventral aspect. The membranous ventral endothelial lobes have a well developed brush of spines.

Male. Body yellowish-white. Forewing membrane yellowish. Eyes black. Maxillary palp segment 2 longer than segment 3; segment 5 shorter than segments 1–4 together. Dorsum of head with 10 discernible setal warts, scarcely visible due to their colour being similar to the surrounding and dense golden pubescence covering head dorsum. Small swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked bundle of setae. Forewing length 12 mm, hind wing length 8 mm.

Male genitalia. Abdominal segment IX fused annularly, narrow; tergum slightly shifted backward; in lateral aspect sternum shortening abruptly; anterior margin formed accordingly, upper half shifted gradually and lower smaller part more abruptly, middle part convex; apical lobe on posterolateral margin well developed, nearly triangular, located above base of inferior appendages; posterior row of spines intermittent; spines lacking above apical lobe and around ventral membranous joint with segment X. Inter-segmental depression between dorsum of segments IX and X deep and right angled. Segment X developed into compact body with short processes; setose area (superior or preanal and intermediate appendages) fades out on these processes; dorsum of Segment X dominated by elevated, central setose ridge being quadrangular in lateral aspect due to fused apicodorsal, setose process visible in dorsal aspect; setose apicolateral lobes short, broad,

directed backwards obliquely; transverse suture located at bottom of inter-segmental depression wide; ventral suture horizontal, sinuous. Inferior appendages with sinuous coxopodite, distal dilation weak; harpago more than half as long as coxopodite, parallel-sided in lateral aspect, tapering, flat and out-curving in ventral aspect. Basal section of phallosome small, down-curving part forming obtuse angle at around 130°; in lateral aspect dorsum of phallosome depressed slightly at midway; sclerotized endothelial process, or outer lip, very small, elongated, less than half as wide as apex of phallosome, covering only upper half of well-sclerotized, narrow and oblique phallosomal sclerites; ventral endothelial process membranous with pair of spine brushes.



FIGURES 38–42. *Orthopsyche ayapona* Oláh & Johanson, new species, holotype. 38 — genitalia, lateral; 39— genitalia, dorsal; 40 — right inferior appendage, ventral; 41 — phallosome, lateral; 42 — phallosome apex, ventral.

Holotype male: New Caledonia: Province Sud: Fö Néchédeva stream, 2 m upstream bridge on La Foa-Koindé road, 21°38.812'S, 165°56.076'E, 124 m, 4.i.2004, light trap, loc#106 [KA Johanson] (MNHNP).

Paratypes: New Caledonia: Province Sud, Rivière Ouanéoué, at bride crossing road to Koghi Mountains, about 1.5 km from road RT1 Noumea-Dumbea, 22°10.861'S, 166°29.531'E, 11.xi.2003, 11.xii.2003, 20.i.2004, light trap, loc#024 [KA Johanson] — 6 males, 4 females (NRM); New Caledonia: Province Sud, stream, Sarraméa, 21°37.389'S, 165°51.083'E, 152 m, light trap, 4.xii.2001 [Johanson, Pape, Viklund] — 1 male (NRM);

New Caledonia: South Province, La Foa, SE Sarramea vill., 5km Farroa Riv., rainforest 400 m, 25–27.ii.2006 [Rudloff, Schaarschmidt] — 5 males, 4 females (MNHU).

Distribution: New Caledonia (Province Sud).

Etymology. *ayapona*, from Sanscrit, *ayapona*, meaning brush, referring to the well-sclerotized brush of spines connected to the ventral endothecal process

***Orthopsyche schefterae* Oláh & Johanson, new species**

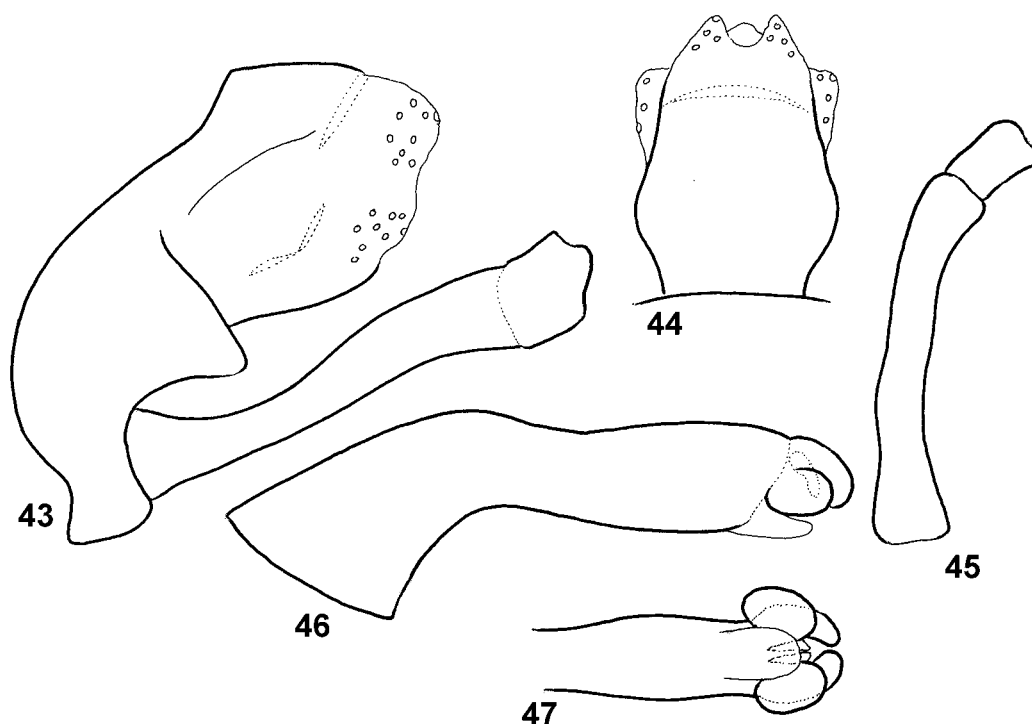
Fig. 43–47

Orthopsyche schefterae is similar to *O. piuna*, but differs in its strikingly coloured, fuscous forewings, yellow body and black eyes. Moreover, this species is easily distinguished from other species by unique morphology of the short and broad harpago of the inferior appendage.

Male. Forewing membrane fuscous. Body yellowish. Eyes black. Maxillary palp segment 2 longer than segment 3; segment 5 as long as segments 1–4 together. Dorsum of head with 10 discernible setal warts. Small swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked bundle of setae. Forewing length 12 mm, hind wing length 8.7 mm.

Male genitalia. IXth abdominal segment fused annularly, narrow; tergum long, shifted backward; sternum shortening abruptly; in lateral aspect, anterior margin formed accordingly; upper half shifted gradually and lower smaller part abruptly; middle part shallowly convex; apical lobe on posterolateral margin triangular, acute angular, located above the base of inferior appendages; posterior row of spines intermittent, spines lacking above apical lobe and around the ventral membrane between segment IX and X. Inter-segmental depression completely absent due to fusion of dorsum of segments IX and X. Segment X reduced to short body with short, wart-like processes; setose area (superior or preanal and intermediate appendages) reduced on these warts; transversal suture usually located at bottom of inter-segmental depression and demarcating the border between segments IX and X; ventral suture short; dorsum of segment X bi-lobed due to formation of apicodorsal setose lobes seen in dorsal aspect. Inferior appendage basally sinuous, apex moderately dilated; harpago short, truncate, with slightly bi-lobed apex. Basal part of phallosome small, down-curving in obtuse angle at 130°; dorsum of phallosome depressed midway in lateral aspect; sclerotized endothecal process or outer lip small, together with upper lobe of two partite ventral endothecal lobes completely covering the small sized phallosomal sclerites; lower pair of ventral endothecal process fused into single lobe visible from lateral and ventral aspects.

Holotype male: New Caledonia: Province Sud: Mt. Dzumac, source stream of Ouinne River, downstream crosspoint to mountain track, 22°01.997'S, 166°28.486'E, 795 m, over about 30 m waterfall, 18.xi–4.xii.2003, Malaise trap, loc#031 [KA Johanson] (MNHNP).



FIGURES 43–47. *Orthopsyche schefterae* Oláh & Johanson, new species, holotype. 43 — genitalia, lateral; 44— genitalia, dorsal; 45 — right inferior appendage, ventral; 46 — phallus, lateral; 47 — phallus apex, ventral.

Paratypes: same data as holotype — 12 males (NRM); New Caledonia: Province Sud, stream, Koghi Mt., 22°10.327'S, 166°30.524'E, 522 m, Malaise trap, 12–16.xi.2001 [Johanson, Pape, Viklund] — 2males (NRM). New Caledonia: Province Nord, stream, Mt. Aoupinié, 21°08.940'S, 165°19.409'E, 409 m, Malaise trap, 24–28.xi.2001 [Johanson, Pape, Viklund] — 2 males (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50073°E, 407 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#005 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Rivière Ouanéoue, at bride crossing road to Koghi Mountains, about 1.5 km from road RT1 Noumea-Dumbea, 22°10.861'S, 166°29.531'E, 11.xi.2003, 11.xii.2003, 20.i.2004, light trap, loc#024 [KA Johanson] — 1 male, 1 female (NRM); New Caledonia: Province Sud, stream crossing way to Sanatorium 2.3 km E St. Laurent, ca. 30 m downstream bridge, 22°04.484'S, 166°19.900'E, 15.xi.2003, light trap, loc#028 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream of Ouinne River, near crosspoint to mountain track, 22°02.439'S, 166°28.646'E, 805 m, 18.xi–4.xii.2003, Malaise trap, loc#029 [KA Johanson] — 1 male, 1 female (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream of Ouinne River, at crosspoint to mountain track, 22°02.218'S, 166°28.566'E, 797 m, 18.xi.2003, 3.xii.2003, light trap,

loc#032 [KA Johanson] — 3 males, 2 females (NRM); New Caledonia: Province Nord, N slope of Mt. Rembai, Xwé Méréxwana Stream, 21°33.804'S, 165°50.528'E, 309 m, 20.xi–12.xii.2003, Malaise trap, loc#037 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, stream at Refuge de Farino, 4.0 km W Grand Couli village, 21°38.934'S, 165°46.845'E, 260 m, 25.xi.2003, light trap, loc#044 [KA Johanson] — 13 males (NRM); New Caledonia: Province Sud, W slope Mt. Ningua, Kwé Néco Stream, at Camp Jacob, 3.7 km WNW summit of Mt. Ningua, on Bouloparis-Thio Road, about 50 m upstream road, 21°43.613'S, 166°06.567'E, 150 m, 29.xi–12.xii.2003, 12.xii.2003–05.i.2004, Malaise trap, loc#054 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream of Ouinne River, downstream crosspoint to mountain track, 22°01.997'S, 166°28.486'E, above waterfall, 795 m, 3.xii.2003, light trap, loc#061 [KA Johanson] — 2 males, 4 females (NRM); New Caledonia: Province Nord, 50 m upstream bridge on Hienghène-Tnèdo road, 3.9 km S summit of Mt. Tnèda, 2.2 km E Tnèdo, 20°43.085'S, 164°49.928'E, 29 m, 7.xii.2003, light trap, loc#071 [KA Johanson] — 3 males (NRM); New Caledonia: Province Nord, 1 m upstream road, below waterfall on Hienghène-Tnèdo road, 2.2 km SSW summit of Mt. Unpac, 4.9 km ESE Tnèdo, 20.73879°S, 164.85508°E, 7.xii.2003, light trap, loc#072 [KA Johanson] — 4 males (NRM); New Caledonia: Province Sud, Fö Néchédeva stream, 2 m upstream bridge on La Foa-Koindé road, 21°38.812'S, 165°56.076'E, 124 m, 4.i.2004, light trap, loc#106 [KA Johanson] — 2 females (NRM); New Caledonia: Province Nord, Etnbl. thermal de la Crouen, along RM3 and River la Crouen, about 30 m upstream the road, 21°32.105'S, 165°53.319'E, 15 m, 5.i.2004, Malaise trap, loc#110 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Col d'Amieu, Xwé Ko River, at bridge on road to St. forestière, 21°35.612'S, 165°48.241'E, 368 m, 8.i.2004, light trap, loc#114 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Col d'Amieu, Fo Waau Stream, at Pont Ouaou, 21°35.559'S, 165°48.311'E, 317 m, 10.i.2004, light trap, loc#116 [KA Johanson] — 2 males, 5 females (NRM); New Caledonia: Province Sud, Sarraméa, Xwé Wya River, at Hotel Evasion130, 21°38.318'S, 165°51.582'E, 127 m, 17–18.i.2004, light trap, loc#121 [KA Johanson] — 1 male (NRM); New Caledonia: South Province, road La Foa-Canala km 25, Reserve special de faune du Col d'Amieu et Table unio, rainforest 600 m, 18–21.ii.2006 [Rudloff, Schaarschmidt] — 1 male, 2 females (MNHU, pinned); New Caledonia: South Province, near Bourail NE, C. des Roussettes, rainforest 600 m, 21–23.ii.2006 [Rudloff, Schaarschmidt] — 2 males (MNHU); New Caledonia: South Province, La Foa, SE Sarramea vill., 5 km Farroa Riv., rainforest 400 m, 25–27.ii.2006 [Rudloff, Schaarschmidt] — 11 males, 4 females (MNHU).

Distribution: New Caledonia (Province Sud and Province Nord).

Etymology. The name of this species is dedicated to Dr Patricia W. Schefter (Royal Ontario Museum), for her valuable contribution to our understanding of Hydropsychinae systematics.

***Orthopsyche nadauna* group**

Characteristics: This group has members of medium to small size, with brownish-grey and stramineous colours, and with different pattern in the forewing. Segment IX has a broad, rounded anterior margin like a drawn bow; the apicoventral lobe on the posterior margin is triangular. Segment X has long and slender apicoventral digitate processes. Inferior appendages have a long and slender harpago. Phallic apparatus has an almost right angled bend and a short vertical base, not as long as in the *O. fimbriata* group; end of the phallosome has an acutely triangular elongation, demarcating the dorsally located sclerotized endothelial process and the membranous ventral endothelial lobes. There is a definite formal group of species according to the angle of the inter-segmental depression: obtuse angled in *O. pakaha*, right angled in *O. nadauna*, about 80° in *O. vrupama*, and gradually less acute angled in *O. sematho*, *O. nevoissi*, and *O. imbah*.

Six species are known in this group, all from New Caledonia.

***Orthopsyche pakaha* Oláh & Johanson, new species**

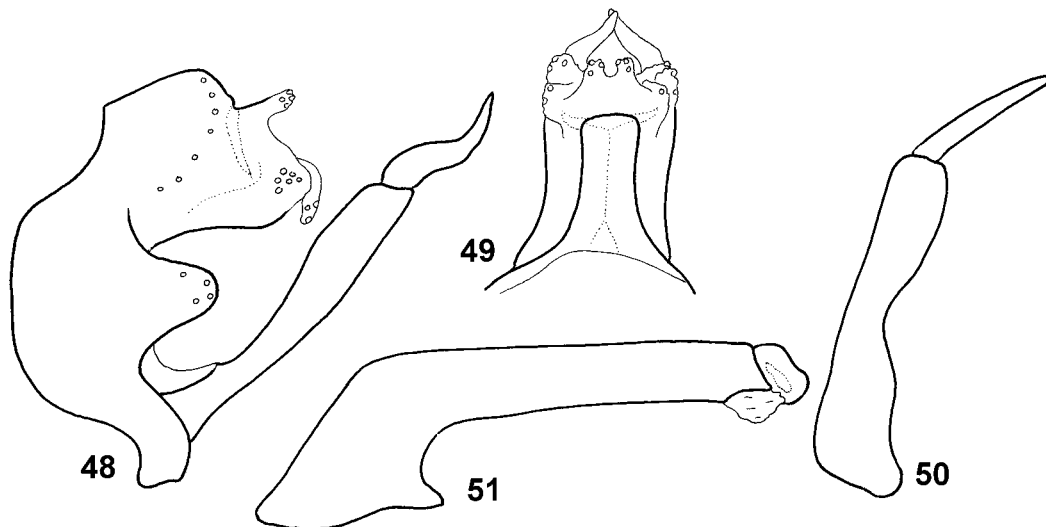
Fig. 48–51

This species is morphologically close to *O. vrupama* and *O. nadauna*, but on segment IX the apex of the enlarged and parallel sided tergum is not tapering as in *O. vrupama*, and not bi-lobed as in *O. nadauna*. The forewing pattern also includes fewer spots. The inferior appendages do not have an S-shaped harpago, but the basal half is broad with the distal half narrowing abruptly.

Male. Forewing membrane ochraceous with few, distinct brown spots. Body stramineous. Eye black. Brownish pigmented patches around and below crossvein Cu1-Cu2 as well as above and below the row of hamuli on A1. Maxillary palp with segment 2 longer than segment 3; segment 5 as long as segments 1–4 together. Dorsum of head with 10 discernible setal warts. Swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing length 9 mm, hind wing length 7 mm.

Male genitalia. Abdominal segment IX fused annularly, narrow; its tergum shifted backward; sternum shortening abruptly; anterior margin, lateral aspect, forms rounded, bow-shaped expansion; apical lobe on posterolateral margin well developed, nearly triangular, located well above inferior appendage bases; elongated and enlarged tergum IX rectangular in lateral aspect; in dorsal aspect broad, parallel sided toward complete apex; posterior spine row intermittent; spines absent above apical lobe and around ventral membranous joint with segment X. Inter-segmental depression between dorsum of segments IX and X obtuse angled. Segment X developed into compact body with slender processes; setose area (superior or preanal and intermediate appendages) diffuse on these processes; apicodorsal setose process fused mesally into a horizontal, obliquely elevated

process in lateral view, and bi-lobed in dorsal aspects; setose apicolateral lobes long and slender, directed downward in right angle; transverse suture located at bottom of stepwise, V-shaped inter-segmental depression; ventral suture horizontal, distal end curved upward in right angle. Inferior appendage with sinusoid coxopodite having distal dilation; harpago S-shaped, in lateral aspect narrowing abruptly from midway, straight in ventral aspect. Base of phallosome curving downwards in right angle; dorsum of phallosome straight in lateral aspect, with lateral tapering lobe; sclerotized endothelial process or outer lip nearly reniform; ventral endothelial process membranous without spines.



FIGURES 48–51. *Orthopsyche pakaha* Oláh & Johanson, new species, holotype. 48 — genitalia, lateral; 49 — genitalia, dorsal; 50 — right inferior appendage, ventral; 51 — phallus, lateral.

Holotype male: New Caledonia: Province Sud: stream at Refuge de Farino, 4.0 km W Grand Couli village, 21°38.934'S, 165°46.845'E, 260 m, 25.xi.2003, light trap, loc#044 [KA Johanson] (MNHNP).

Paratypes: same data as for holotype — 1 male (NRM); New Caledonia: Province Sud, stream, Sarraméa, 21°37.883'S, 165°51.958'E, 220 m, light trap, 19.xi.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, stream, Sarraméa, 21°37.389'S, 165°51.083'E, 152 m, Malaise trap, 18–21.xi.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50167°E, 417 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#004 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Monts Kwa Ne Mwa, on road between Noumea and Yaté, 1.5 km E Pic Mourange, 22°12.545'S, 166°40.246'E, 143 m, 9.xi.2003, 30.xii.2003, light trap, loc#018 [KA Johanson] — 5 males (NRM); New Caledonia: Province Sud, western part of Mt. Ningua, Kwé Néco Stream, 3.9 km W summit of Mt. Ningua, on Bouloparis-Thio Road,

about 50 m upstream road, 21°44.359'S, 166°06.009'E, 117 m, 20.xi.2003–12.xii.2003, 12.xii.2003–05.i.2004, Malaise trap, loc#035 [KA Johanson] — 3 males (NRM); New Caledonia: Province Nord, N slope of Mt. Rembai, Xwé Méréxwana Stream, 21°33.804'S, 165°50.528'E, 309 m, 20.xi–12.xii.2003, Malaise trap, loc#037 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, W slope Mt. Ningua, Kwé Néco Stream, at Camp Jacob, 3.9 km W summit of Mt. Ningua, on Bouloparis-Thio Road, about 50 m upstream road, 21°44.083'S, 166°06.298'E, 117 m, 29.xi.2003–12.xii.2003, Malaise trap, loc#053 [KA Johanson] — 5 males (NRM); New Caledonia: Province Nord, 50 m upstream bridge on Hienghène-Tnèdo road, 3.9 km S summit of Mt. Tnèda, 2.4 km E Tnèdo, 20°43.099'S, 164°50.108'E, 27 m, 7.xii.2003, Malaise trap, loc#069 [KA Johanson] — 4 males, 2 females (NRM); New Caledonia: Province Nord, 50 m upstream bridge on Hienghène-Tnèdo road, 3.9 km S summit of Mt. Tnèda, 2.2 km E Tnèdo, 20°43.085'S, 164°49.928'E, 29 m, 7.xii.2003, light trap, loc#071 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Creek Froid, 10 m upstream bridge on La Foa-Koindé road, 200 m W crossroad to Ouipouin, 21°38.581'S, 165°56.672'E, 180 m, 4.i.2004, light trap, loc#105 [KA Johanson] — 9 males (NRM); New Caledonia: Province Sud, Col d'Amieu, Fo Waau Stream, at Pont Ouaou, 21°35.559'S, 165°48.311'E, 317 m, 10.i.2004, light trap, loc#116 [KA Johanson] — 1 male, 4 females (NRM); New Caledonia: Province Sud, Sarraméa, Xwê Wya River, at Hotel Evasion130, 21°38.318'S, 165°51.582'E, 127 m, 17–18.i.2004, light trap, loc#121 [KA Johanson] — 1 male (NRM); New Caledonia: South Province, road La Foa-Canala km 25, Reserve special de faune du Col d'Amieu et Table unio, rainforest 600 m, 18–21.ii.2006 [Rudloff, Schaarschmidt] — 10 males, 11 females (MNHU); New Caledonia: South Province, near Bourail NE, C. des Roussettes, rainforest 600 m, 21–23.ii.2006 [Rudloff, Schaarschmidt] — 1 male (MNHU); New Caledonia: South Province, La Foa, SE Sarramea vill., 5 km Farroa Riv., rainforest 400 m, 25–27.ii.2006 [Rudloff, Schaarschmidt] — 3 males, 9 females (MNHU).

Distribution: New Caledonia (Province Nord and Province Sud).

Etymology. *pakaha*, from Sanskrit, straw, referring to the straw colour of the body and wings in this otherwise brownish coloured species.

***Orthopsyche nadauna* Oláh & Johanson, new species**

Fig. 52–55

This species is morphologically close to *O. vrupama*, but the inter-segmental depression between segments IX and X is stepwise, not V-shaped; the enlarged tergum IX has a bilobed apex in dorsal aspect, not tapering; and the inferior appendage has a straight harpago both in lateral and ventral aspect, not S-shaped as in *O. vrupama*.

Male. Forewing membrane ochraceous with distinct brown pattern. Body pale brownish. Eye black. In forewing, 2 large patches present on stem of Cu1, largest spot present between R1 and stem of Rs, 7 large spots present between C and Sc on basal half,

otherwise marbled brown with many smaller spots. Maxillary palp segment 2 longer than segment 3; segment 5 as long as segments 1–4 together. Head dorsum with 10 discernible setal warts. Proepisternum with single, swollen setal wart. Pretarsal claw symmetrical, without laterally flanked bundle of setae. Forewing length 9 mm, hind wing length 8 mm.

Male genitalia. Abdominal segment IX fused annularly, narrow; tergum shifted backwards; sternum shortening abruptly; in lateral aspect anterior margin forms rounded broadening, like a drawn bow; apical lobe on posterolateral margin well developed, nearly triangular, located well above base of inferior appendages; posterior row of spines intermittent, spines absent above apical lobe and around ventral membrane of segment X; elongated and enlarged tergum of segment IX rectangular in lateral aspect, slightly bi-lobed or mesally excised in dorsal aspect. Inter-segmental depression between dorsum of segments IX and X regularly stepwise. Segment X developed into compact body with slender processes; setose area (superior or preanal and intermediate appendages) diffuse on these processes; apicodorsal process fused mesally into horizontal, small process in lateral view and slightly bi-lobed in dorsal aspects; setose apicolateral lobes long and slender, directed backward and slightly downward; transverse suture located at corner of stepwise inter-segmental depression; ventral suture horizontal and distally curved upward. Inferior appendages with straight coxopodite, distally slightly dilated; harpago half as long as coxopodite, in lateral aspect narrowing abruptly distally; in ventral aspect straight and distinctly flattening. Basal section of phallosome down-curving forms right angle; dorsum of phallosome slightly convex in lateral aspect; apex with lateral, tapering lobe; sclerotized endothelial process or outer lip down-curving; ventral endothelial process membranous, without spines.

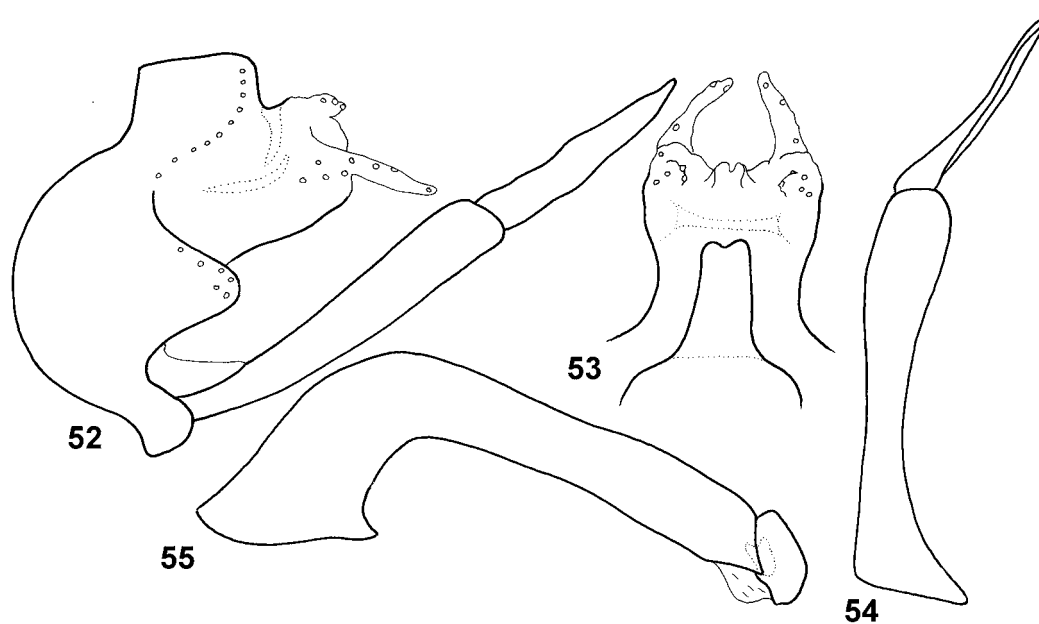
Holotype male: New Caledonia: Province Sud: W slope Mt. Ningua, Kwé Néco Stream, at Camp Jacob, 3.9 km W summit of Mt. Ningua, on Boulouparis-Thio Road, about 50 m upstream road, 21°44.083'S, 166°06.298'E, 117 m, 29.xi.2003–12.xii.2003, Malaise trap, loc#053 [KA Johanson] (MNHNP).

Paratypes: New Caledonia: Province Sud, western part of Mt. Ningua, Kwé Néco Stream, 3.9 km W summit of Mt. Ningua, on Boulouparis-Thio Road, about 50 m upstream road, 21°44.359'S, 166°06.009'E, 117 m, 20.xi.2003–12.xii.2003, 12.xii.2003–05.i.2004, Malaise trap, loc#035 [KA Johanson] — 3 males (NRM); New Caledonia: Province Sud, stream at Refuge de Farino, 4.0 km W Grand Couli village, 21°38.934'S, 165°46.845'E, 260 m, 25.xi.2003, light trap, loc#044 [KA Johanson] — 2 males (NRM); New Caledonia: Province Sud, Couvelée River at Haute Couvelée, 2.8 km SV summit of Mt. Piditéré, 3.5 km NNE Dumbéa, 22°07.488'S, 166°28.034'E, 27 m, 28.xi.2003, light trap, loc#051 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Creek Froid, 10 m upstream bridge on La Foa-Koindé road, 200 m W crossroad to Ouipouin, 21°38.581'S, 165°56.672'E, 180 m, 4.i.2004, light trap, loc#105 [KA Johanson] — 3 males (NRM); New Caledonia: Province Sud, Dogny River, 100 m upstream La Foa River, 2 m upstream bridge on La Foa-Koindé road, 21°39.012'S, 165°56.041'E, 43 m, 4.i.2004, light trap,

loc#107 [KA Johanson] — 3 males, 3 females (NRM); New Caledonia: Province Nord, E tnl. thermal de la Crouen, along RM3 and River la Crouen, about 30 m upstream the road, 21°32.105'S, 165°53.319'E, 15 m, 5.i.2004, Malaise trap, loc#110 [KA Johanson] — 1 male (NRM); New Caledonia: Province Nord, Forêt Plate, Ouendé River, at 2.5 km WNW summit of Katépouenda, 23.3 km E Pouembout, 21°07.490'S, 165°06.723'E, 470 m, 8.i.2004, Malaise trap, loc#112 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Sarraméa, Xwê Wya River, at Hotel Evasion130, 21°38.318'S, 165°51.582'E, 127 m, 17–18.i.2004, light trap, loc#121 [KA Johanson] — 1 male (NRM).

Distribution: New Caledonia (Province Sud and Province Nord).

Etymology. *nadauna*, from Sanscrit, pattern, referring to the forewing pattern.



FIGURES 52–55. *Orthopsyche nadauna* Oláh & Johanson, new species, holotype. 52 — genitalia, lateral; 53 — genitalia, dorsal; 54 — right inferior appendage, ventral; 55 — phallus, lateral.

Orthopsyche vrupama Oláh & Johanson, new species

Fig. 56–59

This species is similar to *O. nadauna*, but has the inter-segmental depression between segments IX and X formed like a V; tergum IX is enlarged with a tapering simple apex in dorsal aspect; and in lateral view harpago of the inferior appendages are S-shaped.

Male. Forewing membrane ochraceous with distinct brown pattern. Body pale brownish. Eyes black. Forewing pattern shows 2 large patches on stem of Cu1, a large patch in middle between R1 and stem of Rs, a total of 7 large spots present along basal wing half between C and Sc; membrane otherwise marbled brown with many small spots.

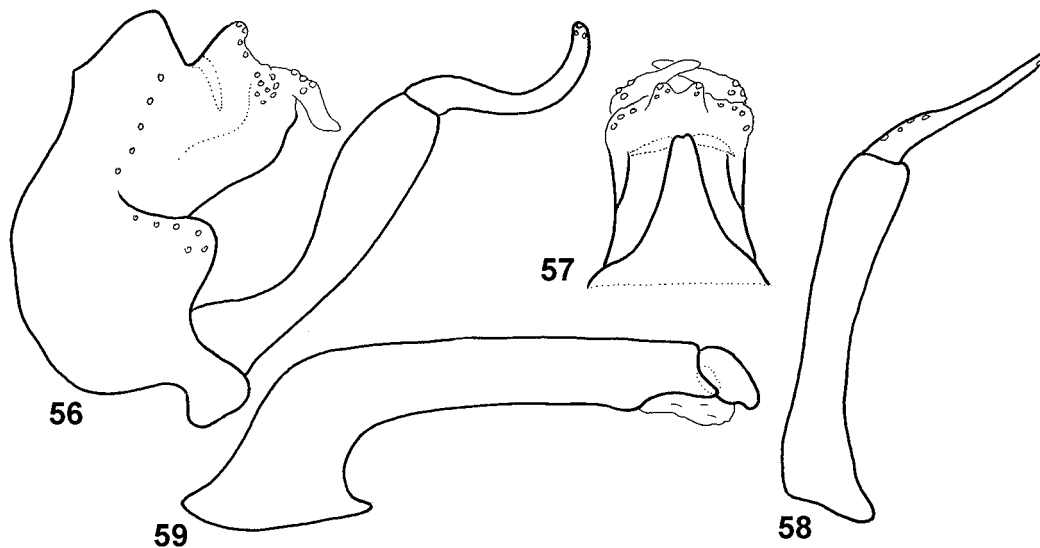
Maxillary palp segment 2 larger than segment 3; segment 5 equal to segments 1–4 together. Dorsum of head with 10 discernible setal warts. A swollen setal wart present on proepisternum. Pretarsal claw symmetrical, without laterally flanked bundle of setae. Forewing length 9 mm, hind wing length 8 mm.

Holotype male: New Caledonia: Province Sud: Creek Pernod, 7 m downstream bridge at Route du Carénage on Lac Yaté-Prony road, 22°10.862'S, 166°50.565'E, 162 m, 10.xii.2003, light trap, loc#076 [KA Johanson] (MNHNP).

Paratypes: same data as holotype — 1 male (NRM); New Caledonia: Province Sud, Creek Pernod, 7 m downstream bridge at Route du Carénage on Lac Yaté-Prony road, 22°10.862'S, 166°50.565'E, 162 m, 10.xii.2003, light trap, loc#076 [KA Johanson] — 1 female (NRM); 1?: same as holotype. New Caledonia: Province Sud, stream, Col d'Amieu, 21°34.451'S, 165°47.388'E, 366 m, Malaise trap, 30.xi–5.xii.2001 [Johanson, Pape, Viklund] · 1 male (NRM); New Caledonia: Province Sud, stream draining to Rivière des Pirogues, 850 m E summit of Mont Imbaah, 5.5 km E Lucky Creek in Plum, 22°16.837'S, 166°42.195'E, 31 m, 01.xii.2003, light trap, loc#060 [KA Johanson] — 15 males (NRM); New Caledonia: Province Sud, Rivière des Lacs, 1.1 km NW Lac en Huit, 4.9 km NW summit of Pic du Grand Kaori, 22°15.195'S, 166°52.178'E, 10.xii.2003, light trap, loc#078 [KA Johanson] — 1 male (NRM).

Distribution: New Caledonia (Province Sud).

Etymology. *vrupama*, after rupam, form in Sanscrit, and V, referring to the V-shaped inter-segmental depression between segments IX and X.



FIGURES 56–59. *Orthopsyche vrupama* Oláh & Johanson, new species, holotype. 56 — genitalia, lateral; 57 — genitalia, dorsal; 58 — right inferior appendage, ventral; 59 — phallus, lateral.

***Orthopsyche sematho* Oláh & Johanson, new species**

Fig. 60–63

ZOOTAXA

1356

This species resembles *O.vrupama* but is easily separated by the uniformly greyish forewing membrane. The inter-segmental depression is not regularly V-shaped, but rather acutely angled; apicoventral setose process on segment X is slender, longer and curved backwards; harpago of inferior appendages gradually tapering and up-curving. Apicolateral part of phallotheca with a tapering lobe, and the sclerotized and downward curving endothecal process tapering distally.

Male. Forewing membrane uniformly greyish with patchy iridescence due to uneven distribution of wing hairs. Body pale brownish. Eye black. Maxillary palp segment 2 longer than segment 3; segment 5 equal to segments 1–4 together. Head dorsum with 10 setal warts paler than surrounding area. A swollen setal wart present on proepisternum. Pretarsal claw symmetrical, without laterally flanked setal bundle. Forewing length 6.6 mm, hind wing length 4.5 mm.

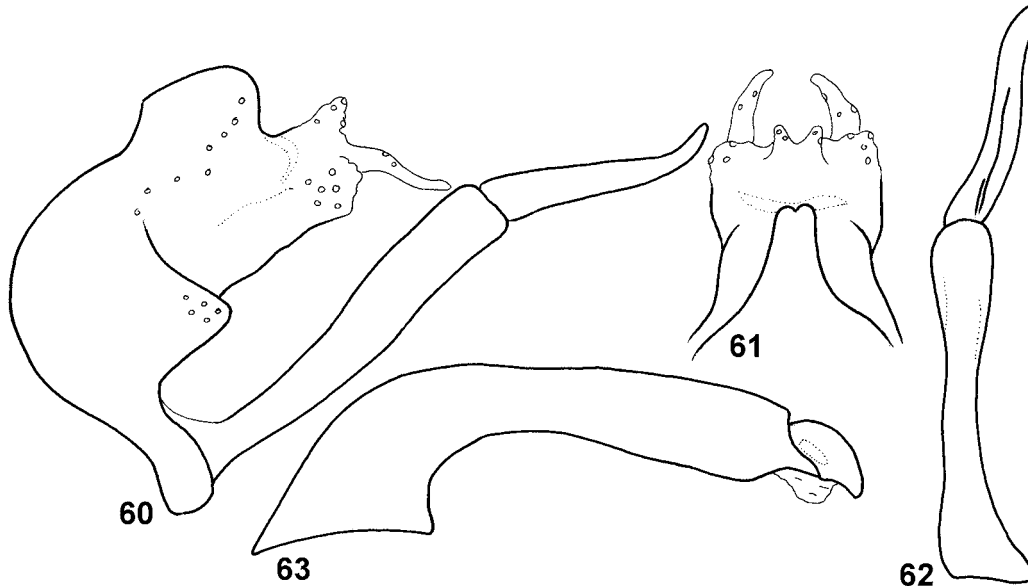
Male genitalia. Abdominal segment IX fused annularly, narrow; tergum shifted backward; sternum shortening abruptly; in lateral aspect, anterior margin forms rounded broadening, like a drawn bow; apical lobe on posterolateral margin well developed, triangular, located well above inferior appendages base; posterior row of spines intermittent, spines absent from area above apical lobe and around ventral membranous segment IX and segment X; tergum of segment IX elongated and enlarged, slightly tapering; in dorsal aspect with small excision on apex. Inter-segmental depression between dorsum of segments IX and X weakly acute-angled. Segment X developed into compact body with slender processes; setose area (superior or preanal and intermediate appendages) disappears on these processes; apicodorsal process fuses mesally into obliquely and backward elevating, small process in lateral view, and with bi-lobed apex in dorsal view; setose, erect apicolateral lobes long and slender, directed backward; transverse suture located at the bottom of V-shaped inter-segmental depression; ventral suture horizontal curving upward distally. Coxopodite of inferior appendages almost straight without distal dilation; harpago about half as long as coxopodite, narrowing gradually with curving apical third. Basal section of phallotheca down-curving, forming a right angle; dorsum of phallotheca convex in lateral aspect, terminal with apicolateral tapering lobe; sclerotized endothecal process or outer lip down-curving and tapering; small ventral endothecal process membranous without spines.

Holotype male: New Caledonia: Province Sud: lower part Rivière des Pirogues, 800 m WNW summit of Mont Imbaah, 4.7 km E Lucky Creek in Plum, 22°18.559'S, 166°41.227'E, 1.3 m, 01.xii.2003, light trap, loc#059 [KA Johanson] (MNHNP).

Paratypes: same data as holotype — 3 males (NRM); New Caledonia: Province Sud, Couvelée River at Haute Couvelée, 2.8 km SV summit of Mt. Piditéré, 3.5 km NNE Dumbéa, 22°07.488'S, 166°28.034'E, 27 m, 28.xi.2003, light trap, loc#051 [KA Johanson] — 1 male (NRM).

Distribution: New Caledonia (Province Sud).

Etymology. *sematho*, from patch in Sanscrit, referring to the patchy iridescence of the uneven setal coverage of the forewing membrane.



FIGURES 60–63. *Orthopsyche sematho* Oláh & Johanson, new species, holotype. 60 — genitalia, lateral; 61 — genitalia, dorsal; 62 — right inferior appendage, ventral; 63 — phallus, lateral.

***Orthopsyche nevoissi* Oláh & Johanson, new species**

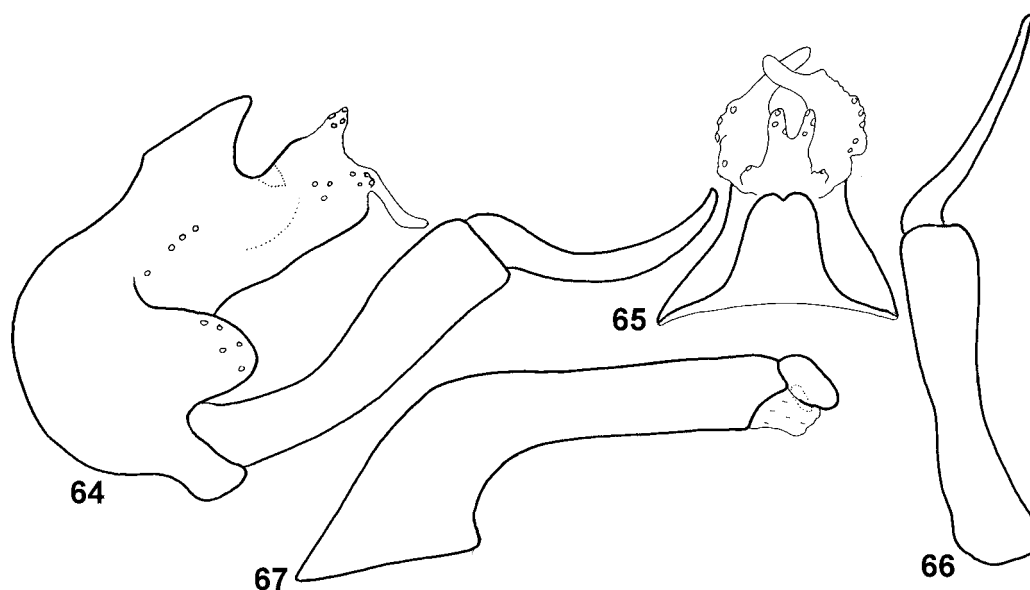
Fig. 64–67

This species is morphologically close to *O. imbah*, as regards the characteristic backwardly elongated and tapering tergite IX. *O. nevoissi*, however, has an ochraceous colour and large size compared to the greyish winged and smaller sized *O. imbah*. Moreover, in the genitalia, the apicodorsal setose process is tapering and not blunt, the harpago of the inferior appendages is tapering and not clavate. The distal ending of phallosome is also different.

Male. Fore wing membrane ochraceous with golden pubescence. Body stramineous. Eye black. Maxillary palp segment 2 longer than segment 3; segment 5 as long as segments 1–4 combined. Dorsum of head with 10 setal warts not clearly visible due to similar colour with surrounding areas and dense golden pubescence on head dorsum. Swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked bundle of setae. Forewing length 12.8 mm, hind wing length 9.7 mm.

Male genitalia. Abdominal segment IX fused annularly and narrow; tergum shifted backward; sternum shortening abruptly; in lateral aspect anterior margin forms rounded

broadening, like a drawn bow; apical lobe on posterolateral margin well developed, rounded, located immediately above base of inferior appendages; in lateral aspect elongated and enlarged tergum of segment IX shifted backwards and tapering, parallel-sided to slightly excised at apex; posterior row of spines intermittent, reduced; distal surface of apical lobe covered with setae and around 3–4 long setae above the apical lobe. Inter-segmental depression between the dorsum of segments IX and X obtusely angled. Segment X somehow elongated with slender processes; setose area (superior or preanal and intermediate appendages) diffused on these processes; apicodorsal setose process fused mesally into horizontal and obliquely elevated and tapering process in lateral view; bi-lobed in dorsal aspect; setose apicolateral lobes long and slender, bent downward in right angle; short transverse suture located at bottom of inter-segmental depression; ventral suture horizontal with distal ending turning upwards. Coxopodite of inferior appendages stout, basally sinusoid and distally dilated; harpago more than half as long as coxopodite, slender and narrowing gradually in lateral and ventral aspects. Basal part of phallosome down-curving into right angle; dorsum of phallosome straight in lateral aspect, terminally with lateral, tapering lobe; sclerotized endothelial process or outer lip sub-reniform; phallosomal sclerite small, ventral endothelial process membranous without spines.



FIGURES 64–67. *Orthopsyche nevoissi* Oláh & Johanson, new species, holotype. 64 — genitalia, lateral; 65 — genitalia, dorsal; 66 — right inferior appendage, ventral; 67 — phallus, lateral.

Holotype male: New Caledonia: Province Sud: stream at Refuge de Farino, 4.0 km W Grand Couli village, 21°38.934'S, 165°46.845'E, 260 m, 25.xi.2003, light trap, loc#044 [KA Johanson] (MNHNP).

Paratype: New Caledonia: Province Nord, stream, Mt. Aoupinié, 21°08.940'S,

165°19.409'E, 409 m, Malaise trap, 24–28.xi.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: South Province, near Bourail NE, C. des Roussettes, rainforest 600 m, 21–23.ii.2006 [Rudloff, Schaarschmidt] — 2 males (MNHU); New Caledonia: South Province, near Bourail NE, C. des Roussettes, rainforest 600 m, 1–2.iii.2006 [Rudloff, Schaarschmidt] — 1 male, 2 females (MNHU).

Distribution: New Caledonia (Province Sud and Province Nord).

Etymology. This species is dedicated to Arturs Neboiss (Museum of Victoria, Australia).

***Orthopsyche imbah* Oláh & Johanson, new species**

Fig. 68–71

This species resembles *O. nevoissi* as regards the characteristic backwardly elongated and tapering tergite IX. It differs from *O. imbah* in the grey forewing colour and smaller size. Moreover in *O. imbah* the apicodorsal setose process is blunt and not tapering, and the harpago of the inferior appendages is clavate and not tapering. The distal ending of the phallosome is also different.

Male. Forewing membrane and pubescence grey. Body pale brownish grey. Eye black. Small black spots on mediobasal end of each trochanter in contrast with pale body. Maxillary palp segment 2 longer than segment 3; segment 5 as long as sum of segments 1–4. Dorsum of head with 10 discernible setal warts. Single swollen setal wart present on propodeum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing length 7 mm, hind wing length 5 mm.

Male genitalia. Abdominal segment IX fused annularly and narrow; tergum shifted backward; sternum shortens abruptly; anterior margin in lateral aspect forms rounded broadening, like a drawn bow; apical lobe on posterolateral margin well developed, rounded, located immediately above base of inferior appendages; elongated and enlarged tergum of segment IX shifted backwards, tapering in lateral aspect and broad parallel-sided to in dorsal aspect slightly excised apex; posterior row of spines intermittent, spines lacking above apical lobe and around ventral membranous joint with segment X. Intersegmental depression between dorsum of segments IX and X obtusely angled. Body of segment X strongly elongated; setose area (superior or preanal and intermediate appendages) diffuses on processes; apicodorsal setose process fused mesad into elevated and blunt process in lateral view, and slightly bi-lobed in dorsal aspects; setose apicolateral lobes long and slender, directed downwards; no transversal suture visible at the bottom of the intersegmental depression; ventral suture long, horizontal. Coxopodite of inferior appendages basally sinusoid, with distal dilation; harpago longer than half coxopodite, slender, narrowing midway due to clavate apex, as visible both in lateral and ventral aspect. Basal section of phallosome down-curving, obtusely angled; both tergum and sternum of phallosome convex in lateral aspect, terminally with lateral, tapering lobe due

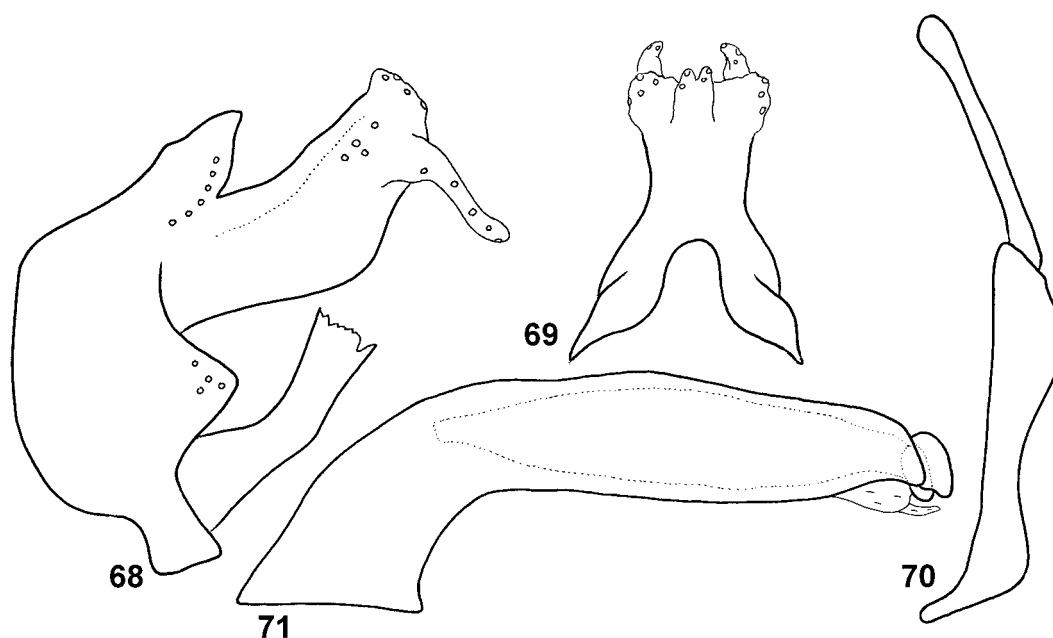
to ventral excision; sclerotized endothelial process or outer lip small; phallosomal sclerite small and heavily sclerotized, ventral endothelial process membranous accompanied with a smaller membranous mesal lobe.

Holotype male: New Caledonia: Province Sud: lower part Rivière des Pirogues, 800 m WNW summit of Mont Imbaah, 4.7 km E Lucky Creek in Plum, 22°18.559'S, 166°41.227'E, 1.3 m, 01.xii.2003, light trap, loc#059 [KA Johanson] (MNHNP).

Paratypes: same data as holotype — 4 males (NRM); New Caledonia: Province Sud, Rivière des Lacs, 1.1 km NW Lac en Huit, 4.9 km NW summit of Pic du Grand Kaori, 22°15.195'S, 166°52.178'E, 10.xii.2003, light trap, loc#078 [KA Johanson] — 30 males (NRM); New Caledonia: South Province, 17 km NW Yate, Reserve de la Madelaine, serpentine scrub, 02.iii.2006, light [Rudloff, Schaarsschmidt] — 2 males (MNHU).

Distribution: New Caledonia (Province Sud).

Etymology: *imbah*, named after the type locality of this species, Mt. Imbaah.



FIGURES 68–71. *Orthopsyche imbah* Oláh & Johanson, new species, holotype. 68 — genitalia, lateral; 69 — genitalia, dorsal; 70 — right inferior appendage, ventral; 71 — phallus, lateral.

Orthopsycha kina group

Body small, pale brown to greyish. Lateral body of segment IX sub-rectangular in lateral aspect due to shortening of tergum and sternum both anteriorly and posteriorly. The expanded, ball shaped form of the enlarged segment X is very striking; apicodorsal and apicoventral setose areas fused into large posterior setal area of the ball-shaped segment.

Inferior appendages basally geniculate with harpago very short. Phallic apparatus basally right angled and apically up-curving; endothecal process rounded, broader than apex of phallosome. An apomorphic feature of this species group is the heavily sclerotised dorsal lobe in the middle of phallosome.

***Orthopsyche kina* Oláh & Johanson, new species**

Fig. 72–75

Orthopsyche kina is similar to the other species in this group, *O. edhamasa*, but is easily separated by its segment X being produced ventrally and ending in a downwards directed apicoventral lobe; and its heavily sclerotized, well developed dorsal lobe on phallosome.

Male. Forewing membrane and pubescence greyish. Body pale brownish. Eye black. Maxillary palp segments 2, 3, and 4 equally long, segment 5 as long as segments 1–4 together. Dorsum of head with 10 discernible setal warts. Swollen setal wart present on proepisternum. Pretarsal claw slightly asymmetrical without laterally flanked bundle of setae, with outer pretarsal lobe. Forewing length 6.5 mm, hind wing length 5 mm.

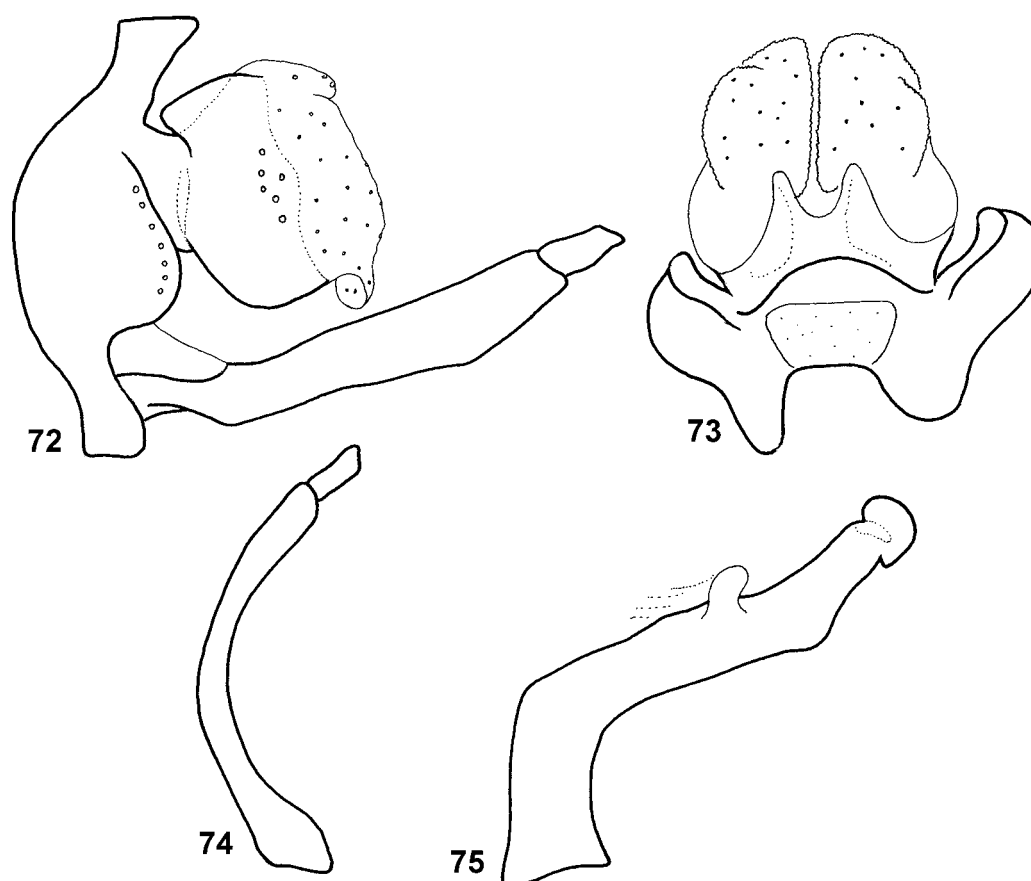
Male genitalia. Abdominal segment IX fused annularly and laterally produced, nearly sub-rectangular; tergum and sternum shortening both anteriorly and posteriorly; anterior margin in lateral aspect form flat, rounded, lateral lobe; apical lobe on posterolateral margin flat, located immediately above base of inferior appendage; upwardly elongated tergum of segment IX rectangular in lateral aspect, fine-granulated in lateral, but especially in dorsal aspects; posterior spine row reduced to flat apical lobe, absent on tergum. Inter-segmental depression between dorsum of segments IX and X deep, gap-like. Body of segment X expanded, ball-like in lateral aspect, with minute apicoventral lobe, in dorsal aspect separated mesally; entire apical surface of segment X covered by strong setae as result of fused apicodorsal and apicoventral setal lobes, most setae detached and setal bases on elevated tubercle visible only; lateral setose area reduced to small setae group; transversal suture absent at deep bottom of intersegmental depression, but visible on neck of ball-like segment X. Coxopodite of inferior appendages with 2 weak angles without distal dilation; harpago very short and quadrangular both in lateral and ventral aspects. Basal section of phallosome down-curving and right-angled; apical one quarter of phallosome up-curving and angulated ventrally; a heavily sclerotized lobe present on middle of horizontal section of phallosome forming a unique phallic apparatus in the family. The lobe visible as anchor for membranous tissue connecting to segment X; sclerotized endothecal process or outer lip well developed, rounded, broader than apex of phallosome; phallosomal sclerite small but heavily sclerotized, ventral endothecal membranous lobe not visible.

Holotype male: New Caledonia: Province Sud: Dumbea River, Branche Nord, 2.2 km SE summit of Mt. Peditéré, 22°07.503'S, 166°29.899'E, 25 m, 21.i.2004, light trap, loc#124 [KA Johanson] (MNHNP).

Paratype: same data as holotype — 1 male (NRM).

Distribution: New Caledonia (Province Sud).

Etymology. *kina*, meaning wart in Sanscrit, referring to the dominating distal setal surface of the expanded segment X with the elevated tubercle carrying a setal, wart-like alveolus.



FIGURES 72–75. *Orthopsyche kina* Oláh & Johanson, new species, holotype. 72 — genitalia, lateral; 73 — genitalia, dorsal; 74 — right inferior appendage, ventral; 75 — phallus, lateral.

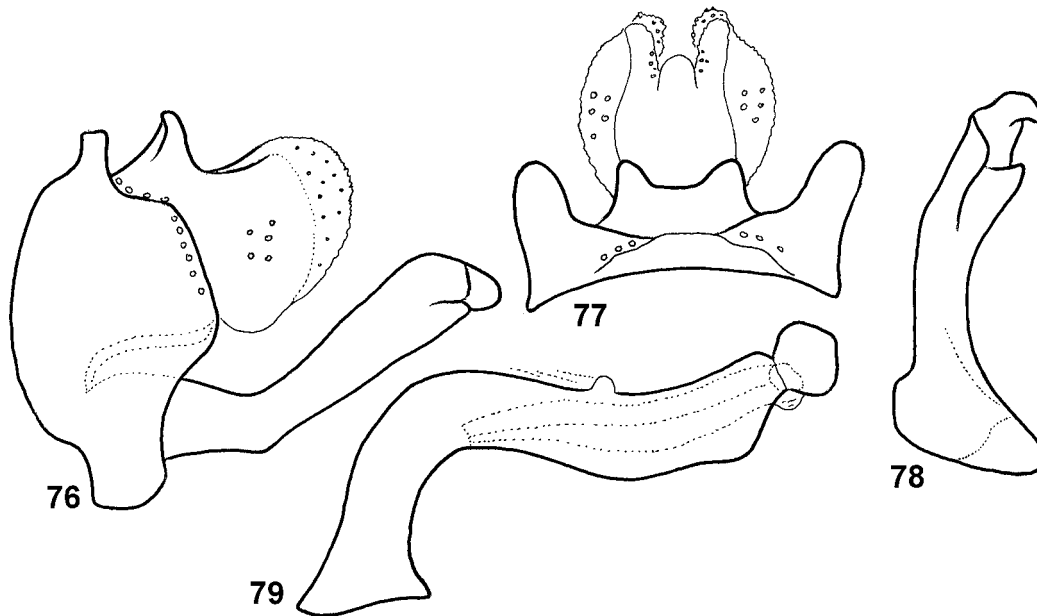
***Orthopsyche edhamasa* Oláh & Johanson, new species**

Fig. 76–79

This species is close to *O. kina*, the only other known member of the species group. *O. edhamasa* is separated by the expanded segment X being produced dorsally without a downwardly directed ventroapical lobe; the phallosome has a small dorsal lobe, and the apices of the harpago on inferior appendages are directed mesally.

Male. Forewing and pubescence greyish. Body pale brownish with grey tint. Eye dark.

Maxillary palp segments 2, 3, and 4 equally long; segment 5 as long as segments 1–4 together. Head dorsum with 10 discernible setal warts. Swollen setal wart present on proepisternum. Pretarsal claw slightly asymmetrical without laterally flanked setal bundle, with outer pretarsal lobe. Forewing length 5 mm, hind wing length 3.8 mm.



FIGURES 76–79. *Orthopsyche edhamaja* Oláh & Johanson, new species, holotype. 76 — genitalia, lateral; 77— genitalia, dorsal; 78 — right inferior appendage, ventral; 79 — phallus, lateral.

Male genitalia. Abdominal segment IX fused annularly and produced laterally, sub-rectangular; tergum and sternum shorten anteriorly and posteriorly; in lateral view, anterior margin forms flat, rounded lateral lobe; apical lobe on posterolateral margin flat, located above inferior appendage base; very short, upwardly elongated tergum of segment IX rectangular in lateral aspect, not granulated; posterior row of spines incompletely present on flattened apical lobe, some spines on inter-segmental slope. Inter-segmental depression between dorsum of segments IX and X deeply acute-angled. Body of segment X expanded into ball-like structure in lateral aspect, without visible apicoventral lobe, separated mesally in apical aspect; apical margin covered by strong setae on fused apicodorsal and apicoventral setal lobes, most setae detached and only setal bases on elevated tubercle visible; lateral setose area present; transversal suture not observed at bottom of inter-segmental depression. Coxopodite of inferior appendage bent at basal third, with distal groove present mesally; harpago very short, with mesally curving apex in ventral aspect. Basal section of phallosome down-curving at right angle; apical quarter of phallosome curving upwards, angled ventrad and narrowing at apex; heavily sclerotized minute lobe present on middle of horizontal section of phallosome, forming anchor for

membranous tissue connected with segment X; sclerotized endothecal process or outer lip well developed, rounded, broader than apex of phallotheca; phallotremal sclerite small but heavily sclerotized, small ventral endothecal membranous lobe present.

Holotype male: New Caledonia: Province Sud: Dumbea River, Branche Nord, 2.2 km SE summit of Mt. Piditéré, 22°07.503'S, 166°29.899'E, 25 m, 21.i.2004, light trap, loc#124 [KA Johanson] (MNHNP).

Distribution: New Caledonia (Province Sud).

Etymology. *edhamasa*, from Sanscrit *edhamasa*, meaning wart, referring to the distal setal surface of the expanded segment X with the elevated tubercle carrying setal, wart-like alveolus.

***Orthopsyche touna* group**

A single unique species belongs to this group. Its extremely elongated segment X, with its especially long apicoventral lobe separates this species group from other members of the genus.

***Orthopsyche touna* Oláh & Johanson, new species**

Fig. 80–84

The species has an extremely elongated and up-turned segment X which forms a uniquely derived, apomorphic character in the Hydropsychidae.

Male. Forewing membrane greyish brown, with pale spots and grey pubescence. Body pale brown. Eye black. Maxillary palp segment 2–4 equally long, segment 5 as long as segments 1–4 together. Head dorsum with 10 discernible setal warts. Swollen setal wart present on proepisternum. Pretarsal claw slightly asymmetrical, without laterally flanked setal bundle, with outer pretarsal lobe. Forewing length 6.5 mm, hind wing length 5 mm.

Male genitalia. Abdominal segment IX fused annularly, anteriorly convex, posteriorly concave with short sternum; apical lobe on posterolateral margin small, triangular, located above inferior appendage base; posterior spine row almost complete, except absent above apical lobe. Inter-segmental depression between dorsum of segments IX and X shallow, obtuse angled, deepest point shifted to segment X in lateral view; transverse suture not visible. Basic body of segment X elongated and directed upward; pair of setose apicodorsal lobes filiform, apicoventral setose surface produced into upward-directed, long, geniculate process about as long as harpago of inferior appendages; lateral setose area present. Coxopodite of inferior appendages sinuous basally, medially straight, slightly dilated apically; harpago as long as proximal, straight, rod like both in lateral and ventral aspects. Basal section of phallotheca right-angled down-curving; apical half of phallotheca widening, apex excised on dorsal corner; sclerotized endothecal process or outer lip well

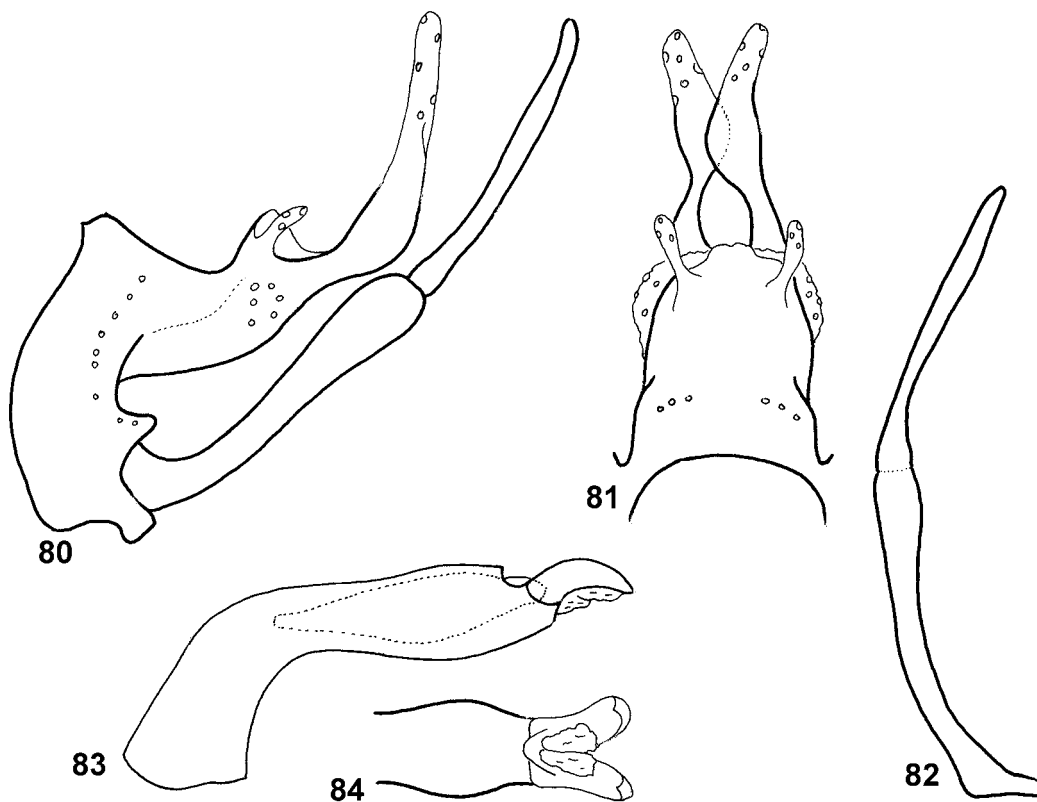
developed into horizontally elongated claw like and down-curving shell; phallostremal sclerite directed horizontally, narrow; ventral endothecal membranous lobe present.

Holotype male: New Caledonia: Province Sud: Mt. Dzumac, source stream of Ouinne River, at crosspoint to mountain track, 22°02.218'S, 166°28.566'E, 797 m, 18.xi.2003, 3.xii.2003, light trap, loc#032 [KA Johanson] (MNHNP).

Paratype: same data as holotype — 1 male (NRM).

Distribution: New Caledonia (Province Sud).

Etymology. *touna*, from Sanscrit *touna*, meaning double, referring to the large elongation of the apicoventral setose process on segment X, forming a double process together with the inferior appendages.



FIGURES 80–84. *Orthopsyche touna* Oláh & Johanson, new species, holotype. 80 — genitalia, lateral; 81 — genitalia, dorsal; 82 — right inferior appendage, ventral; 83 — phallus, lateral; 84 — phallus apex, ventral.

***Abacaria* Mosely, 1941**

Type species: *Hydropsychodes fijiana* Mosely 1934
Abacaria fijiana (Mosely 1941) by original designation.

Characteristics: The venation of *Abacaria* differs from *Cheumatopsyche* in having the forewing crossveins m and M—Cu widely distant from one another; and in the hind wings the stems of M and Cu1 run close together as far out as origin of fork 5. In these characters *Abacaria* resembles *Hydropsyche*, from which it differs in the hind wing by the absence of fork 1, and the open median cell. The male genitalia are characterised by an enlargement of the apical lobe on posterolateral margin of the segment IX. This process is developed into a huge lobe, and together with the enlarged segment X it dominates the genitalia.

The genus is known from New Guinea, New Caledonia, Solomon Islands and Fiji Islands.

***Abacaria subfusca* group**

This group apparently represents the more primitive branch in the genus. The apical lobe on the posterolateral margin of segment IX is moderately enlarged into a triangle. Segment X is simple, compact, and without any significant enlargement, complex or processes. The inferior appendage has a simple harpago. The phallic apparatus has no enlarged basal section of phallobase, so that the phalotheca forms a simple tube, with the abruptly down-curving basal third.

The known species of this group are endemic to New Guinea.

***Abacaria subfusca* Kimmins 1962**

Fig. 85–86

Abacaria subfusca Kimmins 1962:143–145.

Abacaria baretti Koorbot 1964; Neboiss (1987): 136.

Male holotype: Papua: Kokoda 1200 ft., viii–ix.1933 (BMNH) (examined).

Paratypes: same data as for holotype — 2 males, 7 females (BMNH) (examined).

Remarks: The microscope slide of the holotype of *Abacaria baretti* was labelled according to the original description, but the abdomen is of a female of an unknown species.

***Abacaria orkeni* Illies 1969**

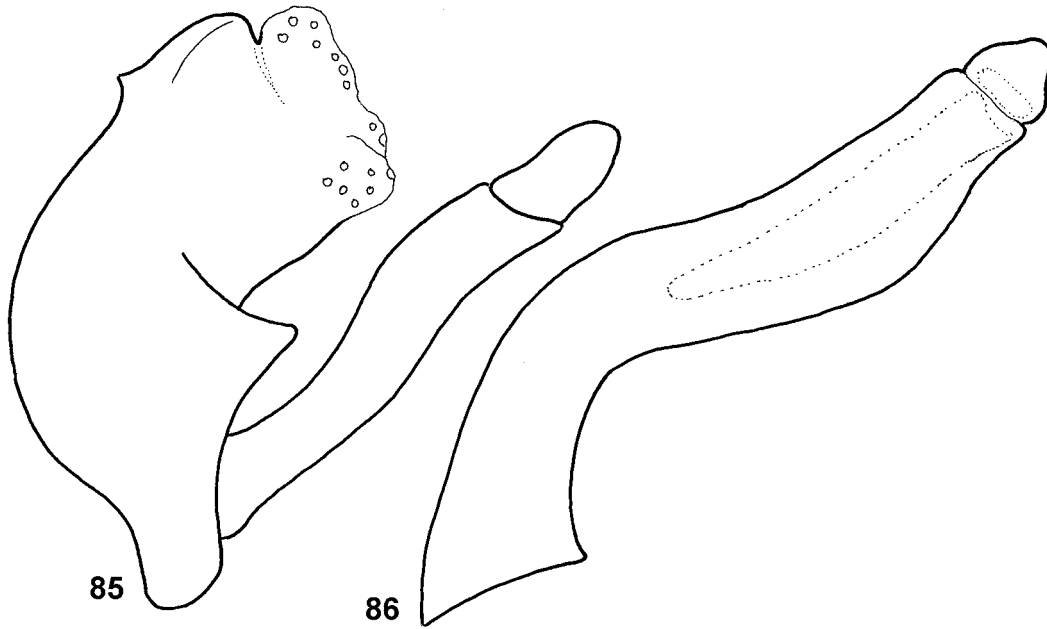
Fig. 87–89

Abacaria orkeni Illies 1969: 489–490.

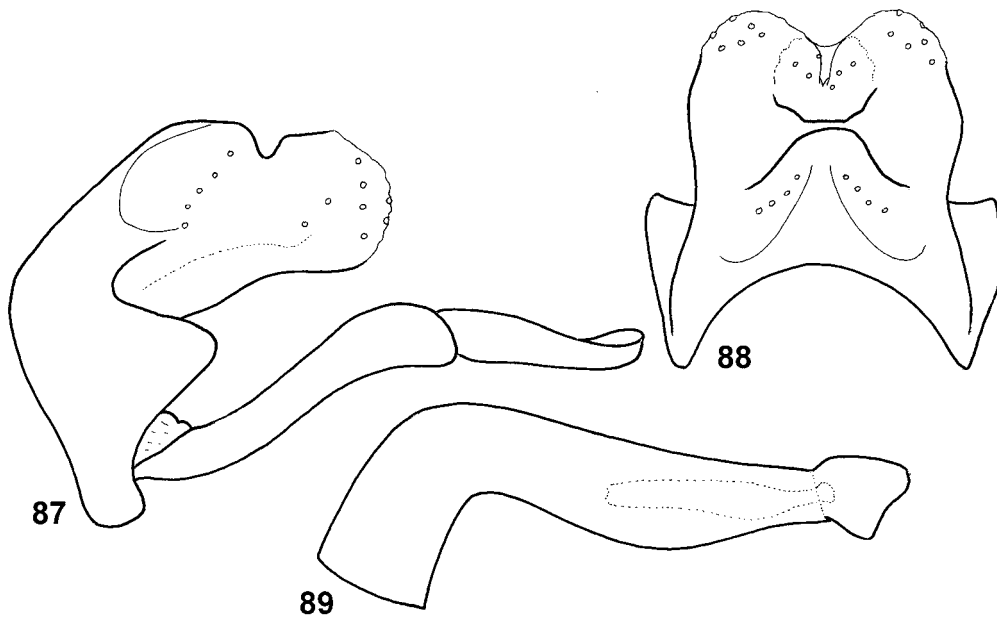
Holotype male: outlet of Lake Aunde, Mt. Wilhelm, Eastern Highlands, New Guinea,

3.x.1966 (J. Illies) (Coll.Ent.Dept. of C.S.I.R.O., Canberra). [not examined]

Allotype: 1 female, same data as holotype (Coll.Ent.Dept. of C.S.I.R.O., Canberra. [not examined])



FIGURES 85–86. *Abacaria subfusca* (Kimmins 1962). 85 — genitalia, lateral; 86 — phallus, lateral. [after Neboiss 1986]



FIGURES 87–89. *Abacaria orkeni* Illies 1969. 87 — genitalia, lateral; 88— genitalia, dorsal; 89 — phallus, lateral. [after Neboiss 1986]

Paratypes: same data as holotype — 10 males, 22 females. (Coll.Ent.Dept. of C.S.I.R.O., Canberra), one couple given to the Bishop Museum, Hawaii. [not examined]
Distribution: New Guinea (Eastern Highlands).

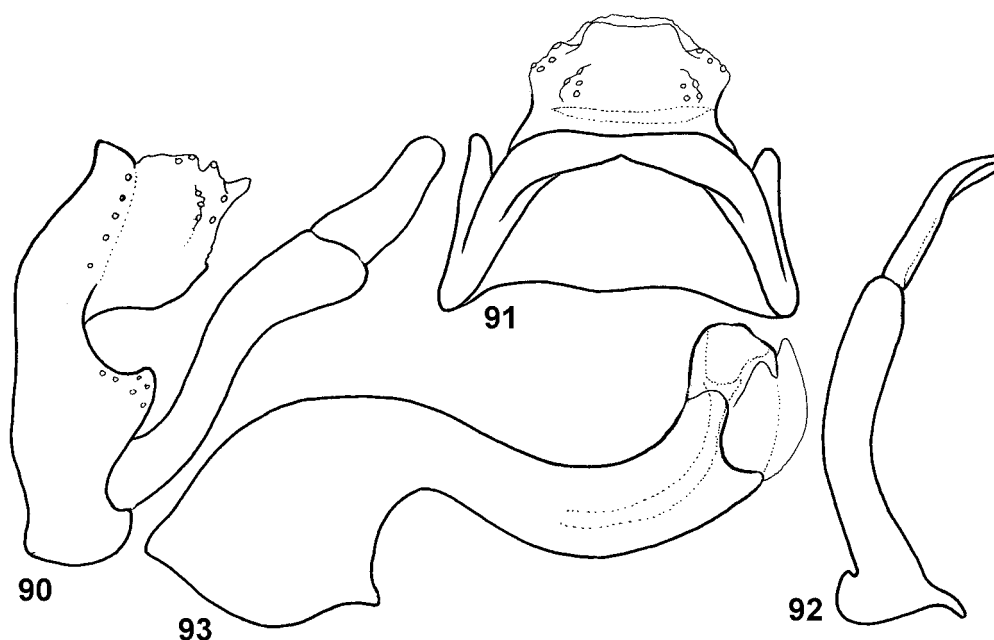
***Abacaria beroni* (Kumanski 1979)**

Fig. 90–93

Cheumatopsyche beroni Kumanski 1979: 203–205. **New combination.**

Holotype male: New Guinea, Telefomin, West Sepic Province, cca 1600 m, 25.vii–3.viii.1975 (National Natural History Museum, Sofia). [not examined]

Paratype: same data as holotype — 1 male (BMNH). [examined]



FIGURES 90–93. *Abacaria beroni* Kumanski 1979. 90 — genitalia, lateral; 91— genitalia, dorsal; 92 — right inferior appendage, ventral; 93 — phallus, lateral.

***Abacaria ruficeps* group**

Characteristics: The group is characterized by segment IX having the apical lobe on the posterolateral margin produced into an elongated extension with rounded apex being longer than segment X. The short segment X is vertically enlarged with a definite mesal excision on dorsal aspect. The tips of the apical lobe of segment X is supplied with groups of backwardly directed, strong, spines. Harpago of the inferior appendage is broad. The

phallic apparatus has no significant widening at the basal section of the phallosome, and the abruptly down-curving basal part is shorter than in the *Abacaria subfusca* group.

The known species of this group are restricted to Fiji Islands.

***Abacaria ruficeps* (Brauer 1867)**

Fig. 94–96

Hydromanicus ruficeps Brauer 1867: 506, 510–511.

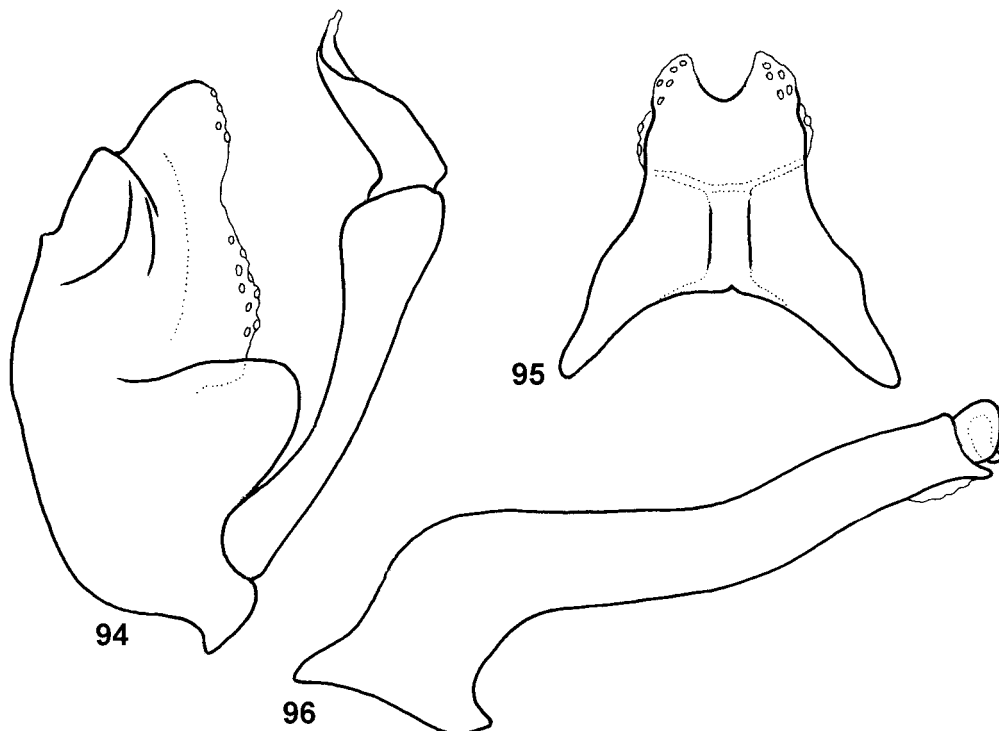
Hydropsychodes ruficeps (Brauer 1867); Ulmer (1905): 98–99.

Abacaria ruficeps (Brauer 1867); Mosely (1941): 366–368.

Holotype male: Fiji Isl. Viti Levu (BMNH). [examined]

New records: Fiji: Viti Levu: Mandarivatu 1100m, 27–30.vi.1968, MV traps [HS & GS Robinson] — 8 males, 2 females (BMNH).; Fiji: Mandarivatu, 21–27. xi. 1971 [GS Robinson] — 3 males (BMNH).; Fiji: Nausori Highlands, 1900m: B.M. 1975-4 [HS Robinson] — 2 males (BMNH); Fiji: Delasoi, 28.viii. 1975, M.V. light FVI 3213 [PA Maddison] — 1 male (BMNH); Fiji: Viti Levu, 45 km NE Nadi, 370 m, 20–21.i.1998 [R Brechlin] — 3 females (MNHU, pinned).

Distribution: Fiji (Viti Levu, Mandarivatu, Nausori Highlands, Delasoi).



FIGURES 94–96. *Abacaria ruficeps* (Brauer 1867). 94 — genitalia, lateral; 95— genitalia, dorsal; 96 — phallus, lateral [after Neboiss 1986]

Abacaria robinsoni Oláh & Barnard, new species

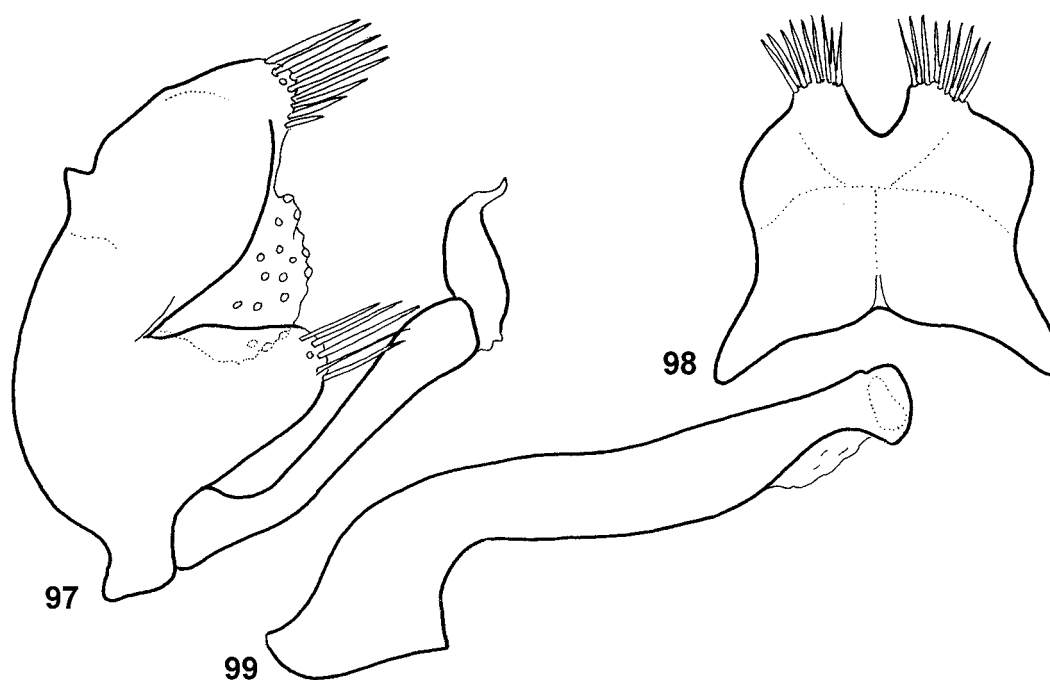
Fig. 97–99

ZOOTAXA

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This species is morphologically similar to *A. ruficeps*. The difference between the species is pronounced in the very distinct forewing patches in *A. robinsoni* that are missing in *A. ruficeps*. In *A. ruficeps* the tergum IX is long, forming a median keel in dorsal view, but very short in *A. robinsoni*. Segment X is laterally broadened forming a convex enlargement in dorsal view, a characteristic missing in *A. ruficeps*. The dorsum, and the apex of the phallic apparatus are also different. In addition, a very striking subapical constriction in *A. robinsoni* is missing in *A. ruficeps*.

Male. Maxillary palp with long segment 5. Body dark brown. Forewing membrane with pale patches; largest patches between forks 2, 3, 4 at the outer margin, along the termen between the apex and the tornus; distinct patch present also in discal cell; smaller patches present near the base of fork 5, on and above thyridial cell spot, and on the basal third of Cu2. Forewing length 6 mm.



FIGURES 97–99. *Abacaria robinsoni* Oláh & Barnard, new species, holotype. 94 — genitalia, lateral; 98— genitalia, dorsal; 99 — phallus, lateral.

Male genitalia. Abdominal segment IX fused annularly; sternum shortening abruptly and reduced into a narrow half circle; tergum shorter, forming narrow strip connecting the dominating lateral body; segment IX fused with enlarged segment X. Apical lobe on posterolateral margin developed into elongated lobe and armed with strong spines.

Segment X produced upwards into bifid apex, excised in dorsal aspect and armed with strong spines; setose area (preanal appendages, superior appendages) moved downward into large ventral convex surface of segment X. Coxopodite of inferior appendages sinuous, apex only moderately dilated; harpago basally wide, apically incurving, slender. Dorsum of phallosome almost straight, basal section small and down-curving, sclerotized endothelial process vertically elongated, completely covering the large sized phallosomal sclerites. Sternum of phallosome undulate, having pronounced and constricted sub-apex; ventral membranous endothelial process visible in constriction

Holotype male: Fiji: Vanua Levu: Nuivunda Forest, 3–5.ix.1975 [HS Robinson & P Maddison] (BMNH).

Paratypes: same data as holotype — 1 male (BMNH); Fiji, Vanua Levu, Daleikovo, 25.ii.1971. [GS Robinson] — 1 male (BMNH); Fiji, Viti Levu, 45 km NE Nadi, 370 m, 20–21.i.1998 [R Brechlin] — 3 females (MNHU, pinned).

Distribution: Fiji (Vanua Levu).

Etymology. The name of this species is dedicated to one of the collectors of the holotype, H. S. Robinson.

***Abacaria moselyi* Oláh & Barnard, new species**

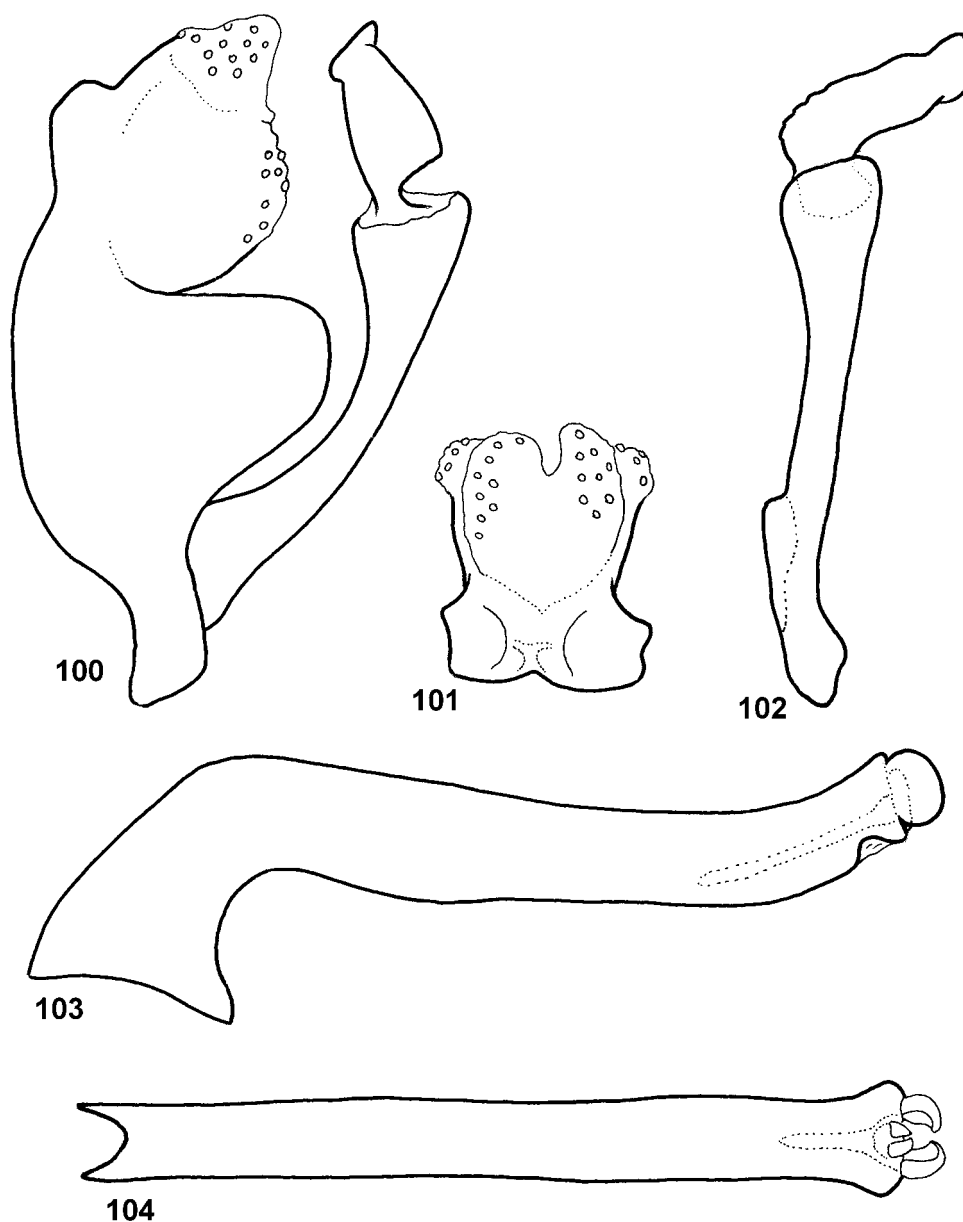
Fig. 100–104

This species is close both to *A. ruficeps* and *A. robinsoni* but differs in having a dark fuscous coloration, a unique pattern of forewing markings, a peculiar harpago of the inferior appendages, and a central setose hump on segment X. On the phallus, the very short subapical constriction differs from the long constriction of *A. robinsoni*.

Male. Body dark fuscous. Head with long maxillary palp segment 5. Forewing length 8 mm, with light patches. Largest patch present between forks 2, 3, and 4 at outer margin along termen, between apex and tornus; transparent patch located in central area of discoidal cell; smaller patch present immediately below it. In hind wings forks 1, 2, 3, 5 present. The presence of fork 1 in hind wing on the holotype, the single known specimen of the species could be a plesiomorphous trend or an aberration.

Male genitalia. Abdominal segment IX fused into very short annular ring. Sternum shortens abruptly, reduced into narrow half ring; tergum shorter than sternum, forming a narrow strip connecting the huge lateral body of segment IX and enlarged segment X. Apical lobe on posterolateral margin developed into elongated lobe almost as large as segment X, and dominating the genitalia. Segment X produced upwards into central setose circular hump with bifid apex in dorsal aspect; setose area (preanal appendages, superior appendages) moved downwards forming the lower convex surfaces on both sides of segment X. Coxopodite of inferior appendages sinuous along length, apex strongly dilated. Harpago forms inwardly turning plate with constricted base or stalk in lateral aspects. No basal constriction in ventral view, the parallel-sided, rectangular band turning mesad, with

a weak but definite subapical constriction. Phallosome turns into straight tube of phallicata, with up-curving distal third, ventral part deeply constricted sub-apically. Sclerotized endothelial process circular, slightly elongated vertically, completely covering the narrow phallosomal sclerites. Entire phallosome forms perfectly regular rod in ventral aspect. Ventral membranous endothelial process with vestigial membrane visible in sub-apical constriction.



FIGURES 100–104. *Abacaria moselyi* Oláh & Barnard, new species, holotype. 100 — genitalia, lateral; 101 — genitalia, dorsal; 102 — right inferior appendage, ventral; 103 — phallosome, lateral; 104 — phallosome, ventral.

Holotype male: Fiji Islands: Tamavan: 5.ii.1922 (H.W. Simmonds). By Imp.Inst. Ent. B.M. 1940-80 (BMNH).

Distribution: Fiji (Tamavan).

Etymology. The species name is dedicated to M. E. Mosely who established the genus name *Abacaria*.

Abacaria nuhu group

Characteristics: Segment IX is short and has a moderately elongated apical lobe on the posterolateral margin. Segment X is about twice as long as the apical lobe on segment IX. The elongated segment X is supplied with a pair of digitate processes widely separated in dorsal aspect. The inferior appendages are geniculate, harpago forming a simple rod. The phallic apparatus is shortened, with well-developed endothecal process and phallostremal sclerites, membranous process clearly visible. The species group is restricted to the Solomon Islands.

Abacaria nuhu Oláh & Barnard, new species

Fig. 105–108

This species is similar to *A. cristova*, from which it can be separated by the shape of segment X, the fused and geniculate inferior appendages, and by the longer sternite of segment IX.

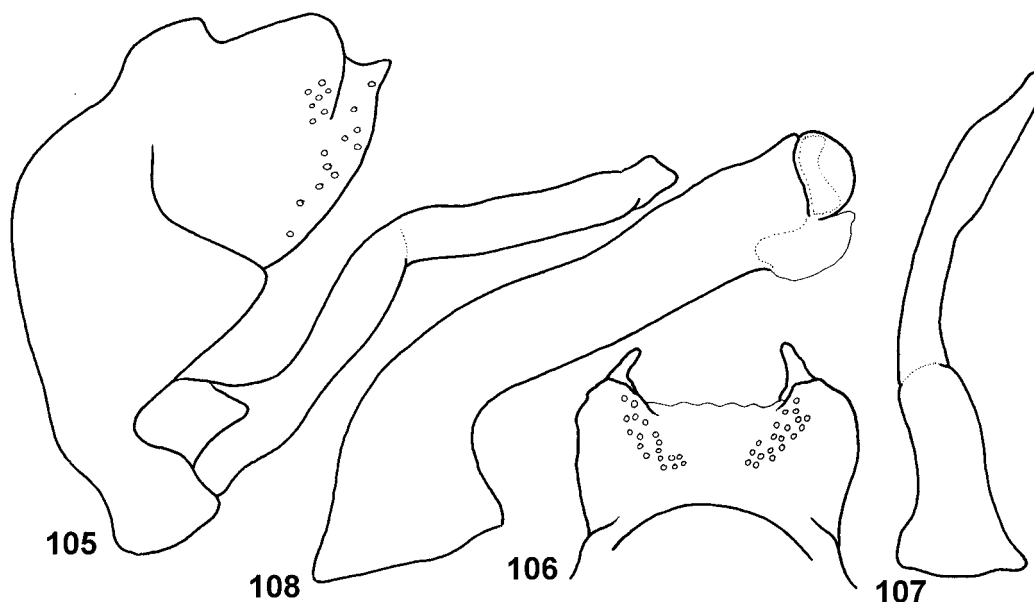
Male. Body light brown. Maxillary palp segment 5 long. Forewing length 10 mm, membrane pale, without patches. Hind wing forks 2, 3, 5 present.

Male genitalia. Abdominal segment IX fuses into very short annular ring; sternum shortens moderately into half ring; tergum shorter than sternum, forms a narrow strip connecting huge lateral body of segments IX and X. Apical lobe on posterolateral margin forms triangular lobe about half the size of segment X. Segment X produced backwards, resulting in a body much longer than the triangular apical lobe; widely bilobed in dorsal view, with two separated dorsal setose areas situated mesally on lobes. Lower setose area (preanal appendages, superior appendages) forms convex surfaces on both sides of segment X, armed with small digitate projections on dorsal termination being widely separated in dorsal aspect. Inferior appendages with coxopodite and harpago almost fused; almost equally broad in lateral aspect, except with dilated basal articulation; in ventral aspect, harpago terminally tapering. Phallosome turns into a straight tube of phallicata after vertical base; subapical ventral part not sclerotized. Sclerotized endothecal process half-circular, completely covering well developed phallostremal sclerites. Large membranous endothecal process visible on transparent, weakly sclerotized, ventral subapical corner.

Holotype male: Solomon Islands: Guadalcanal: Nuhu, 25.x.1965, backwater pool, fast flowing village stream (Roy. Soc. Exped. B.M. 1966-1) (BMNH).

Distribution: Solomon Islands (Guadalcanal).

Etymology. *nuhu*, named after the type locality, Nuhu.



FIGURES 105–108. *Abacaria nuhu* Oláh & Barnard, new species, holotype. 105 — genitalia, lateral; 106— genitalia, dorsal; 107 — right inferior appendage, ventral; 108 — phallus, lateral.

***Abacaria cristova* Oláh & Barnard, new species**

Fig. 109–113

This species is similar to *A. nuhu*. It can be separated from other species in the group by the shape of segment X, the S-shaped inferior appendages and by the shorter sternite of segment X.

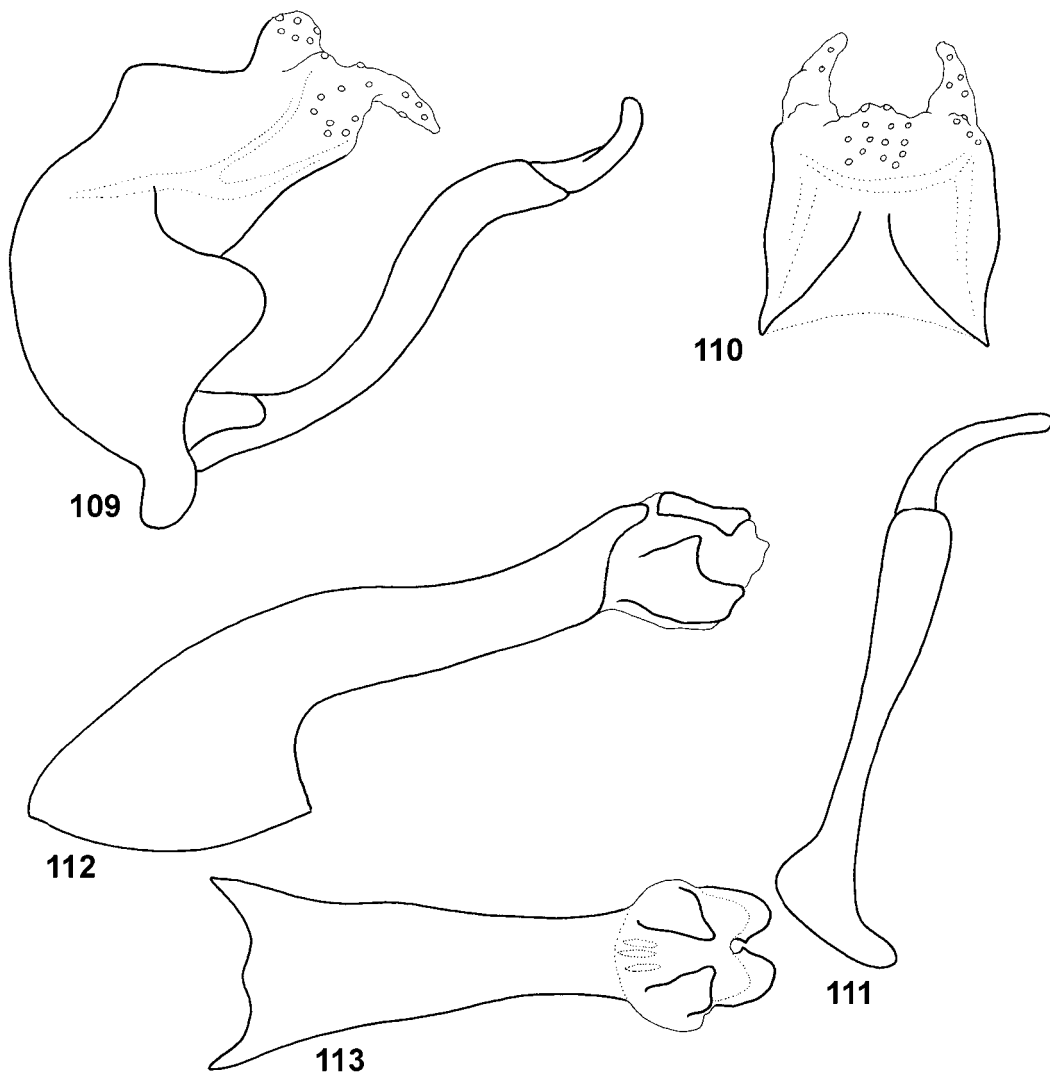
Male. Body light fulvous. Maxillary palp 5th segment long. Forewing length 7 mm, membrane pale, without patches. Hind wing forks 2, 3, 5 present.

Male genitalia. Abdominal segment IX fused into short annular ring; sternum short, forming half ring; tergum forms short, narrow strip connecting huge lateral body of segment IX with enlarged segment X; apical lobe on posterolateral margin developed into a triangular lobe with rounded apex, being half as long as segment X. Segment X with produced upward hump, and downward directed setose process. Segment X much longer than triangular apical lobe. In dorsal aspect segment X widely bi-lobed with setose processes and upward directed hump forming central setose area. Lower setose area (preanal appendages, superior appendages) forms distal surfaces on both sides of segment

X. Inferior appendage S-shaped, almost parallel-sided, basal articulation weakly dilated; harpago slender in ventral aspect. Vertical basal section enlarged, phallosome turns into straight tube of phallicata with sub-apical, ventral part not membranous. Sclerotized endothelial process modified into bi-lobed plate; phallosomal sclerites curved upward. Large membranous endothelial process dominates entire apex of phallicata and pairs of endothelial processes.

Holotype male: Solomon Islands: San Cristoval camp2, 150' 30.vii.1965 (Roy Soc. Exped.) B.M. 1966-1. (BMNH)

Paratype: same data as holotype — 1 male (BMNH).



FIGURES 109–113. *Abacaria cristova* Oláh & Barnard, new species, holotype. 109 — genitalia, lateral; 110— genitalia, dorsal; 111 — right inferior appendage, ventral; 112 — phallus, lateral; 113 — phallus, ventral.

Distribution: Solomon Islands.

Etymology. *cristova*, named after the type locality, San Cristoval in the Solomon Islands.

Remarks: In holotype hind wing the discal cell is closed and the median cell is open. However, in the paratype right hind wing, the discal cell is open and median cell closed, but in the (aberrant) left hind wing both cells are open.

***Abacaria fijiana* group**

Characteristics: Segment IX has a reduced tergum and the sternum is very short. Segment X is bi-lobed in dorsal aspect; elongated, longer than the apical lobe at the posterolateral margin of segment IX. The apical lobe is semicircular or nearly triangular with a rounded apex. The coxopodite of the inferior appendages has an additional lobe, arising at the dilated articulation with the harpago. The phallosome has a small basal section that forms a straight, horizontal phallicata. The species of this group are restricted to the Fiji Islands.

***Abacaria fijiana* (Mosely 1934)**

Fig. 114–118

Hydropsychodes fijiana Mosely 1934: 20–22, 25.

Abacaria fijiana (Mosely 1934); Mosely 1941: 364–365. Designated as genotype of *Abacaria*.

Male holotype: Fiji: Vanua Levu, Dreketi River, ix.1922. (H.W. Simmonds) (BMNH). (examined)

New records: Fiji: Vanua Levu, “Governors pool” Navonu Ck., 5 km W. Buca Bay, 8.ii.1971 MV. trap — 2 males (BMNH); Fiji: Savudvodro Dam, 10.ii.1971 [GS Robinson] — 1 male (BMNH).

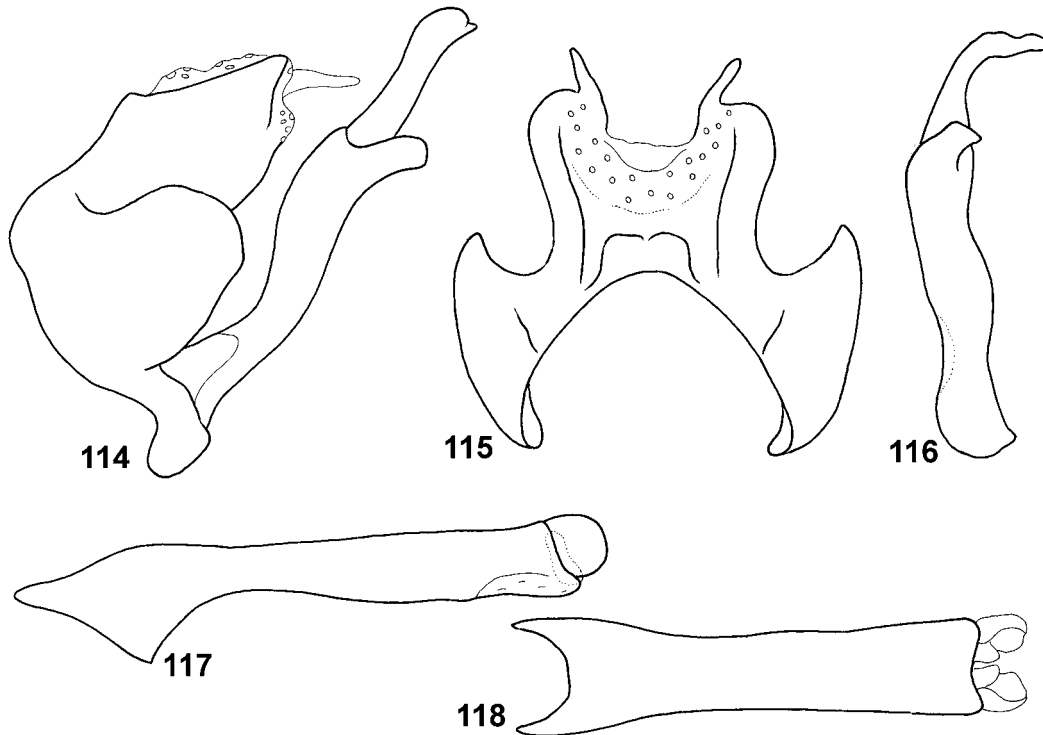
***Abacaria wekana* Oláh & Barnard, new species**

Fig. 119–123

This species is similar to *A. fijiana* (Mosely). The genitalia of the two species are similar, but the excision and setose area on segment IX are V-shaped, not U-shaped as in *A. fijiana*, the sclerotized endothelial process is sub-reniform not semicircular, and both the coxopodite and harpago of the inferior appendages are formed differently.

Male. Body pale chestnut. Maxillary palp with long segment 5. Forewing length 5.6 mm; membrane pale fuscous with paler areas before and anteriorly on discal cell, median cell and above end of thyridial cell. Extension and intensity of pale areas is unstable, as

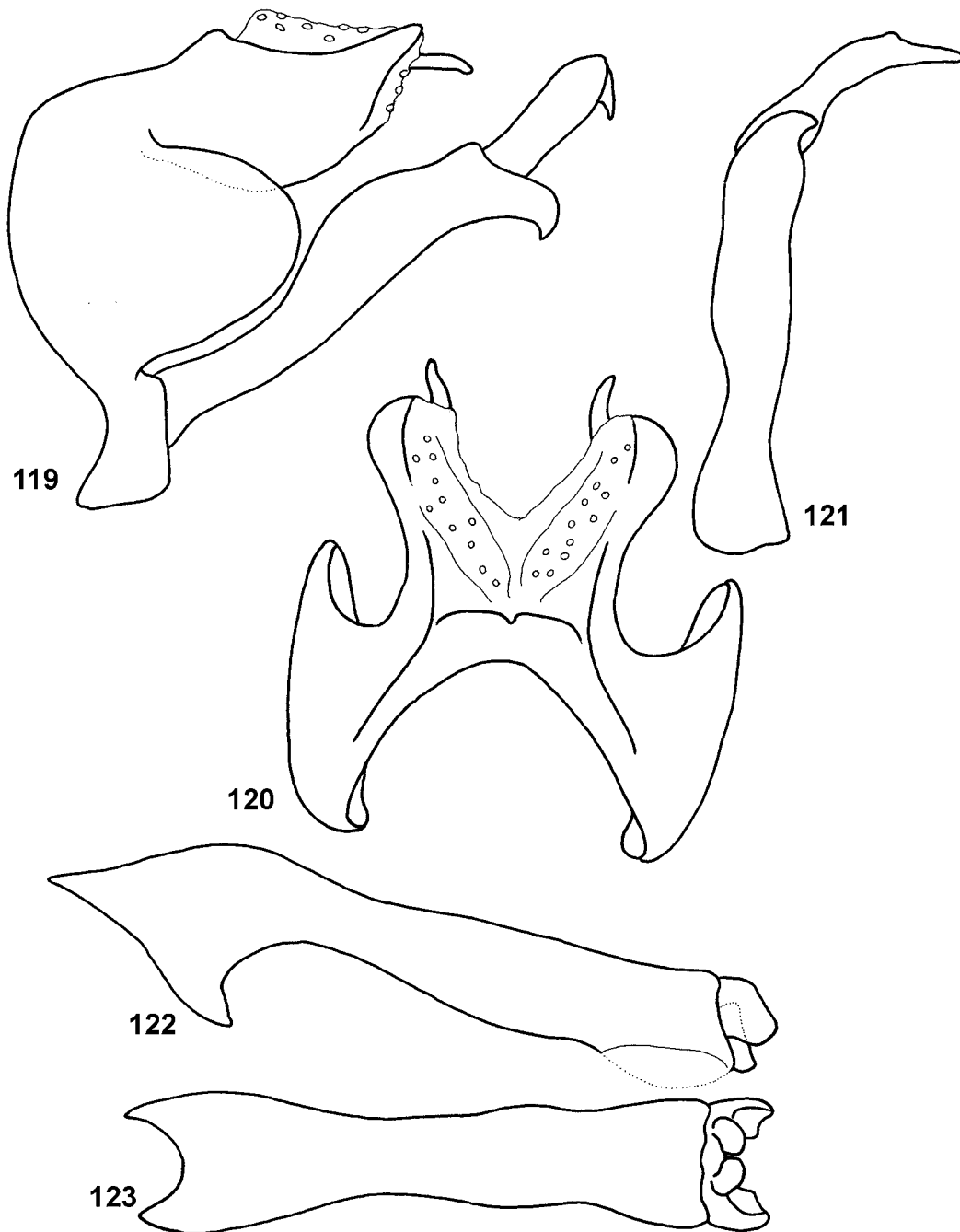
some paratypes have a uniformly coloured forewing membrane. In hind wing forks 2, 3, 5 present.



FIGURES 114–118. *Abacaria fijiana* (Mosely 1934). 114 — genitalia, lateral; 115— genitalia, dorsal; 116 — right inferior appendage, ventral; 117 — phallus, lateral; 118 — phallus, ventral.

Male genitalia. Abdominal segment IX fused annularly; sternum short and reduced into a narrow half ring; tergum short, forming narrow strip connecting dominating lateral body of segments IX and X. Apical lobe on posterolateral margin developed into almost regular semicircular lobe fitting into sinuous first half of coxopodite of inferior appendage. Segment X enlarged, armed with pair of filiform process; setose area (preanal appendages, superior appendages) V-shaped in dorsal aspect, bordering deep excision of segment X. Inferior appendage with coxopodite sinuous at proximal half, encircling apical lobe on posterolateral margin of segment IX; apex of coxopodite produced into dilated, down-curving process on ventral side; incurving apex of harpago tapering, with excision visible in caudoventral aspect. Dorsum of phallosome nearly straight; basal section small; sclerotized endothelial process sub-reniform, covering half the phallosomal sclerites. Uniformly sclerotized phallosomal tube excised and replaced with a less sclerotized and more transparent ventrally dilated apex.

Holotype male: Fiji: Viti Levu: Suva, Suvara Creek, 1.x.1975 [PA Maddison] (BMNH).



FIGURES 119–123. *Abacaria wekana* Oláh & Barnard, new species, holotype. 119 — genitalia, lateral; 120— genitalia, dorsal; 121 — right inferior appendage, ventral; 122 — phallus, lateral; 123 — phallus, ventral.

Paratypes: same data as holotype — 6 males (BMNH); Fiji: Viti Levu: Savura Creek, 31.vii.1975, light [PA Madison] — 1 male (BMNH); Fiji: Viti Levu: Forestry area, inland

from Galoa, 31.viii.1975 light [PA Madison] — 2 males (BMNH); Fiji: Viti Levu: Koronivia Res. Station, Nausori, 25.ii.1975, light [PA Madison] — 2 males (BMNH); Fiji: Viti Levu: Delasoi Tailevu, 28.viii.1974, light [PA Madison] — 1 male (BMNH); Fiji: Viti Levu: Suva, i.1975 [HS Robinson] — 1 male (BMNH); Fiji: Viti Levu: Suva, xi. 1974 [HS Robinson] — 1 male (BMNH); Fiji: Viti Levu: 3 mi. S of Naqali, Naitasivi, 8.xii. 1970 [HS & GS Robinson] — 2 males (BMNH); Fiji: Viti Levu: Mandarivatu, 21–27.xi.1971 [GS Robinson] — 1 male (BMNH); Fiji, Viti Levu, Dobuilevu, Wainimbuka River, 20.i.1971. [GS Robinson] — 1 male (BMNH); Fiji, Viti Levu, Savura Creek, 29.vii.1974 [GS Robinson] — 3 males (BMNH); Fiji: Viti Levu: Savura Creek, 20.viii. 1974 [GS Robinson] — 1 male (BMNH); Fiji: Viti Levu: Mandarivatu, 27–30.vi.1968, M.V. trap, [HS & GS Robinson] — 1 male (BMNH); Fiji: Viti Levu: Kovonivia, Res. Station, 6.ii. 1975 light trap [JA Uluinaceva] — 2 males (BMNH); Fiji, Viti Levu, 45 km NE Nadi, 370 m, 20–21.i.1998 [R Brechlin] — 4 males, 19 females (MNHU, pinned).

Distribution: Fiji island (Viti Levu).

Etymology. *wekana*, relative in Fijian, referring to the morphologically close relationship with *A. fijiana*.

***Abacaria levu* Oláh & Barnard, new species**

Fig. 124–127

This species is distinguished from other species by the unique distal-mesal setal complex on segment X; the inferior appendage and the phallic apparatus are differently formed than in the other species of the group.

Male. Body dark with fulvous legs. Maxillary palp with long segment 5. Forewing membrane brown without patches, darker pigmented along veins Sc, R1, Cu1, and around fork 1 and discal cell; forewing length 11 mm. Hind wing forks 2, 3, 5 present.

Male genitalia. Abdominal segment IX fused into shortened annular ring; sternum short, forming a half ring; tergum short, forming narrow strip connecting lateral bodies of segment IX and X. Apical lobe on posterolateral margin developed into triangular lobe with rounded apex half the length of segment X. The compact body of segment X terminates with complex of setal alveoli elevated by large tubercles; in dorsal aspect, tubercle surface located along mesal surface of sinuate excision of bi-lobed segment; laterodistal corners with tapering small processes without setae. Segment X twice length of triangular apical lobe. In lateral aspect, lower setose area (preanal appendages, superior appendages) forms distal surfaces on both sides of segment X. Coxopodite of inferior appendage with straight ventral margin and sinusoid dorsal margin, resulting in dilated apex with secondary lobe surpassing articulation with harpago; harpago tapers and curves mesally; vertically oriented basal section of phallic apparatus small; phallosome turns into straight tube of phallicata. Sclerotized endothelial process half as broad as its apex and half as long as vertically elongated phallosomal sclerites being free in lateral aspect.

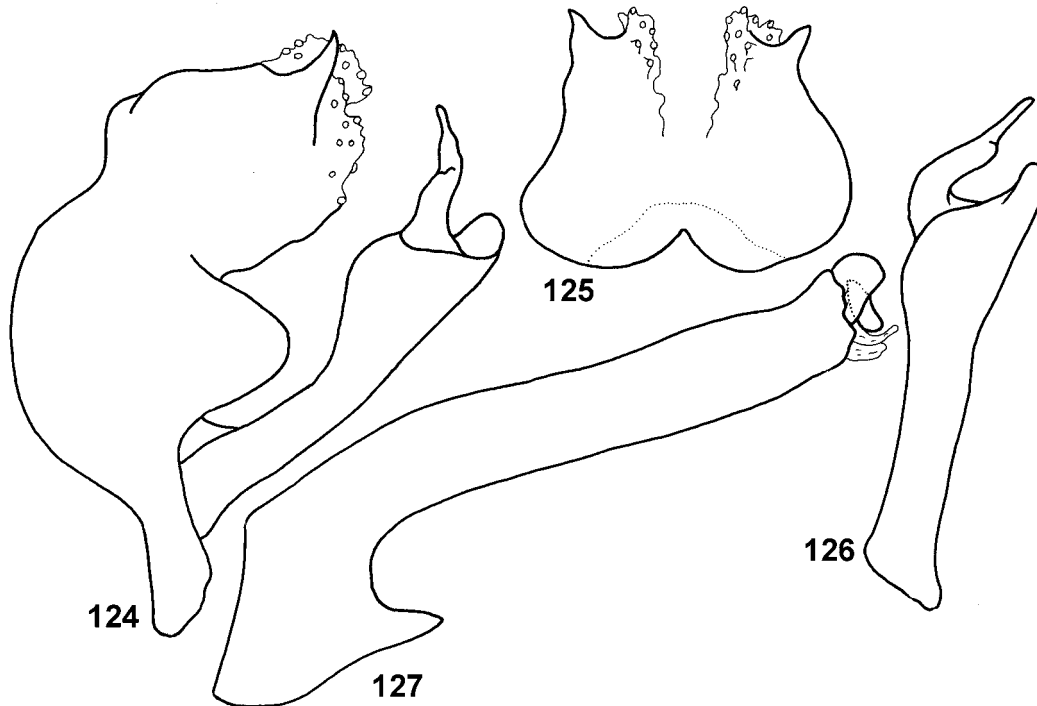
Membranous ventral endothecal process bi-lobed.

Holotype male: Solomon Islands: San Cristoval camp2, 150' 30.vii.1965, Roy Soc. Exped. B.M. 1966-1 (BMNH).

Paratype: same data as holotype — 1 male (BMNH).

Distribution: Solomon Islands.

Etymology. *levu*, from Fijian, large, referring to the large size of this species.



FIGURES 124–127. *Abacaria levu* Oláh & Barnard, new species, holotype. 124 — genitalia, lateral; 125 — genitalia, dorsal; 126 — right inferior appendage, ventral; 127 — phallus, lateral.

Abacaria kosova group

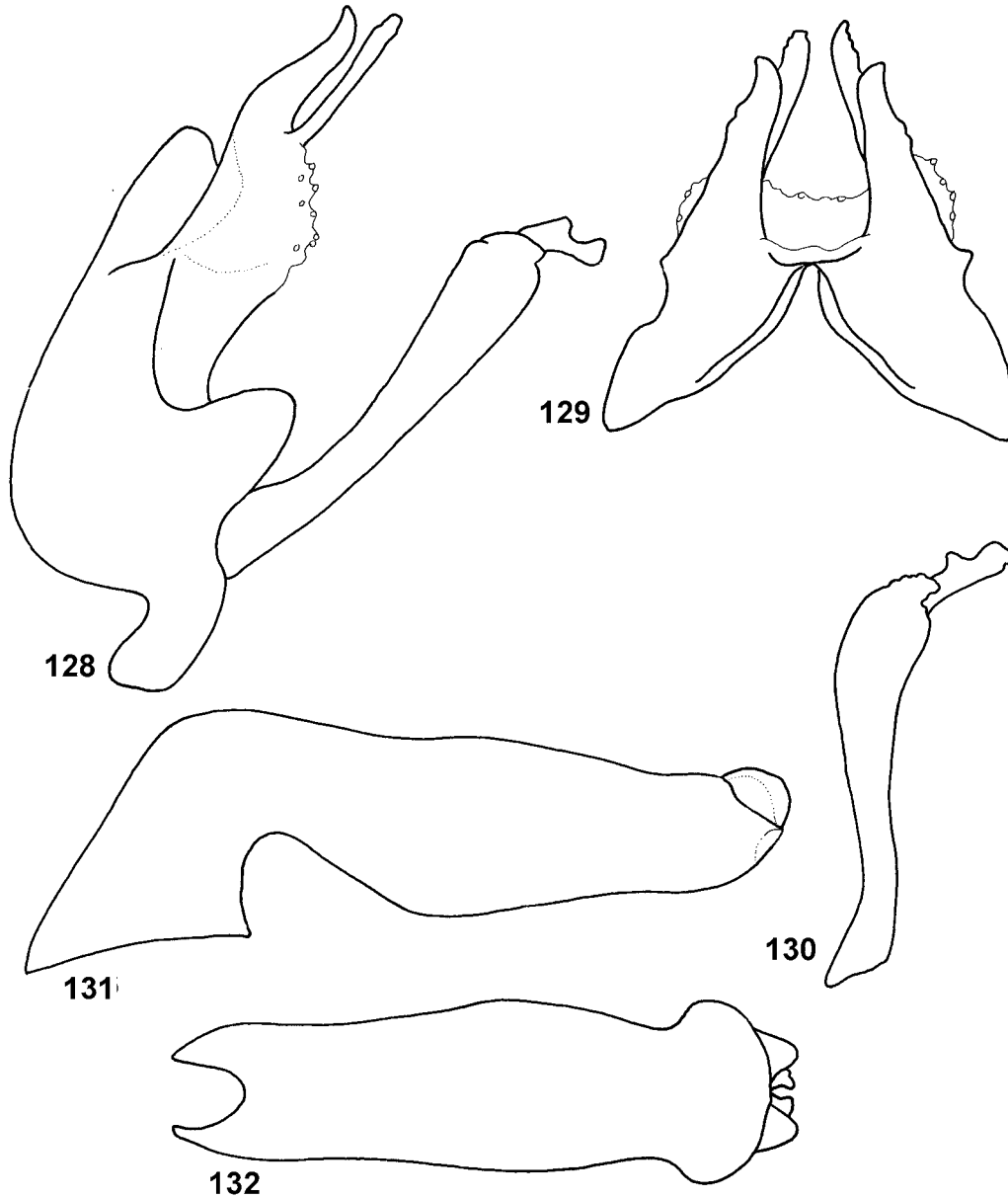
This species group includes species with strongly modified genitalia as follows: Segment X has elongated digital processes; the ventral setose area or lobes in segment X dominate over the dorsal area; apical lobes of segment X longer than segment IX; and phallic apparatus robust or sinuous.

Abacaria kosova Oláh & Barnard, new species

Fig. 128–132

This species is similar to the other known species of the group but is separated by the

segment X having convergent apices of digital processes; inferior appendages with harpago dorsally bi-lobed; and phallic apparatus has straight phallicata.



FIGURES 128–132. *Abacaria kosova* Oláh & Barnard, new species, holotype. 128 — genitalia, lateral; 129— genitalia, dorsal; 130 — right inferior appendage, ventral; 131 — phallus, lateral; 132 — phallus, ventral.

Male. Body pale fulvous. Maxillary palp with long 5th segment. Forewing length 6 mm; membrane uniformly pale, without patches. Hind wing forks 2, 3, 5 present.

Male genitalia. Abdominal segment IX fused into shortened annular ring with short

sternum moved posteriorly; tergum short; apical lobe on posterolateral margin developed into sub-triangular lobe with rounded apex almost as long as segment X. Segment X with digitate body elongated vertically, with two pairs of long processes; apices of upward directed segment X stretched much higher than tergum IX; area of setal alveolus elevated by large tubercles visible in lateral aspect; in dorsal aspect both pairs of digital processes with converging apices; vertically positioned segment X twice as long as triangular apical lobe; in lateral aspect lower setose area (preanal appendages, superior appendages) forms distal surfaces on both sides of segment X. Inferior appendages with coxopodite slightly up-curving; harpago dorsally bi-lobed. Basal section of phallic apparatus small, oriented vertically; phallosome turns into straight tube of phallicata; sternum strongly dilated with capitate apex. Semicircular sclerotized endothelial process covers entire narrowing end of phallicata. Vertically elongated phallosomal sclerites completely covered by endothelial processes.

Holotype male: Fiji: Viti Levu: Tholo-i-Suva, 14-15.xi.1970 [HS & GS Robinson] (BMNH).

Distribution: Fiji (Viti Levu).

Etymology. *kosova*, from Fijian, cutting, referring to the deep excavation of segment X, resulting in long, separated, digital processes and a long excision which reaches almost to the tergum of segment IX.

***Abacaria savura* Oláh & Barnard, new species**

Fig. 133–137

This species is morphologically close to *A. kosova*. It is separated by the divergent upper pair of digital processes on segment X; strongly sinusoid inferior appendages, the harpago being longer and tapering; and the sinuous phallosome with truncated endothelial processes.

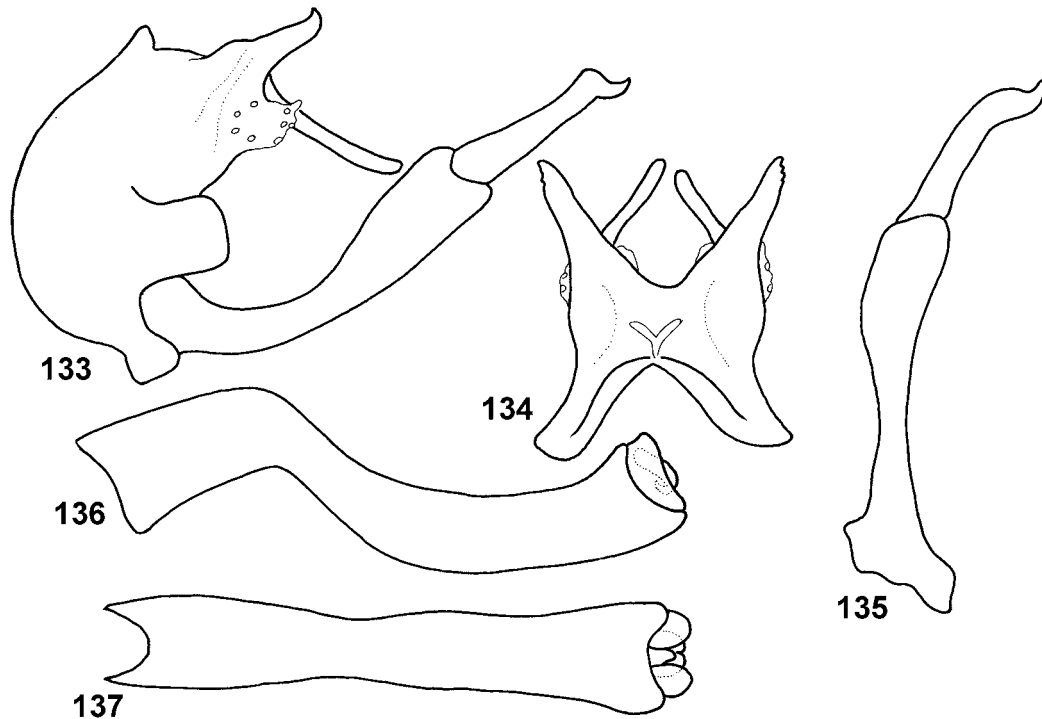
Male. Body brown with fulvous legs. Maxillary palps with long segment 5. Forewing length 5.5 mm, membrane pale brownish, without patches. In hind wings forks 2, 3, 5 present.

Male genitalia. Abdominal segment IX fused into shortened annular ring; sternum short, forming a half ring; tergum shorter than sternum, connecting huge lateral body of segment IX to enlarged segment X; apical lobe on posterolateral margin developed into rectangular, elongated lobe with rounded apex about half as long as segment X. Segment X separated into three pairs of processes visible in lateral aspect; third pair of processes represent lower setose area; segment X twice as long as triangular apical lobe; In dorsal aspect, upper pair of digital processes diverging, with intermediate, longest and most slender pair converging apically. Inferior appendages with sinuous coxopodite, gradually dilated; end of harpago tapering and curving mesally. Phallosome as broad as apex of phallicata, the latter being strongly sinuous. Sclerotized endothelial process truncate, covers apex. Small part of elongated phallosomal sclerites free in lateral aspect.

Holotype male: Fiji: Viti Levu: Savura Creek, 31.vii.1975 [PA Maddison] (BMNH).

Distribution: Fiji (Viti Levu).

Etymology. *savura*, derived from the type locality of the species, Savura Creek.



FIGURES 133–137. *Abacaria savura* Oláh & Barnard, new species, holotype. 133 — genitalia, lateral; 134— genitalia, dorsal; 135 — right inferior appendage, ventral; 136 — phallus, lateral; 137 — phallus, ventral.

Abacaria caledona group

This monotypic group contains a New Caledonian species which differs from all other species groups by having a downwardly directed lobe located centrally on the upper margin of sternite V; an enlarged apicoventral setose process of segment X that dominates the genital structure; and a peculiar phallic apparatus having an extremely long, almost right angled basal section.

Abacaria caledona Oláh & Johanson, new species

Fig. 138–141

This species is characterized by having a downward directed lobe located at the middle of the upper margin of sternite V; an enlarged apicoventral setose process of segment X

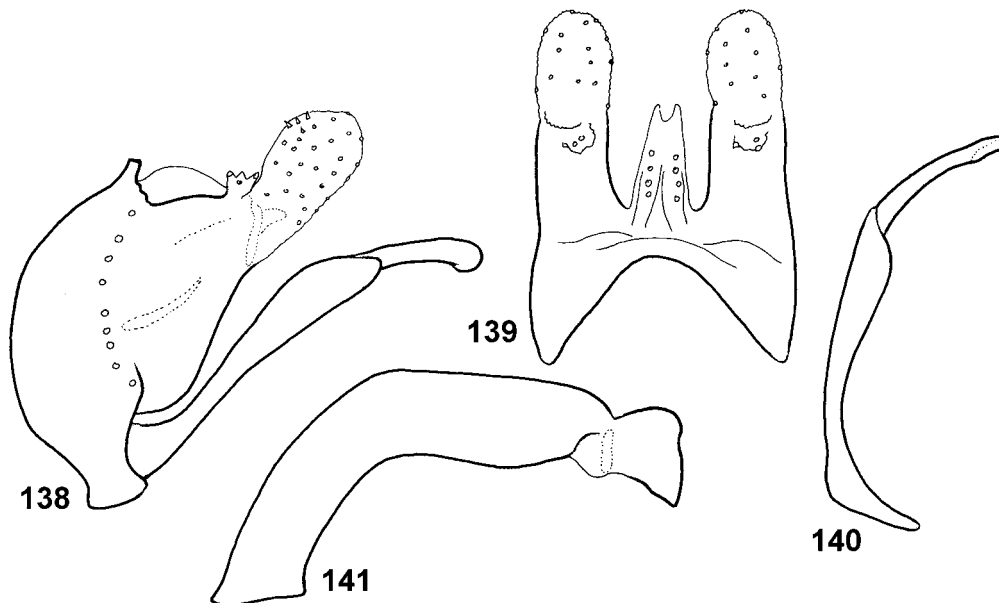
which dominates the genital structure; and a peculiar phallic apparatus having an extremely long, almost right angled basal section.

Male. Body small, body fuscous; eye black. Maxillary palp segment 2 longer than segment 3, segment 5 equal to segments 1–4 together. Dorsum of head with 10 discernible setal warts. Swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked bundle of setae. Forewing with fuscous wing membrane with dark pubescence; long, hyaline window present along basal one-third of the M1+2 stem continuing into first one-quarter of M1+2+3+4. Forewing length 5.4 mm, hind wing length 4.6 mm.

Male genitalia. Abdominal segment IX fused annularly and narrow; tergum and sternum shortening gradually; in lateral aspect anterior margin form rounded broadening, like a drawn bow; apical lobe on posterolateral margin reduced into small protuberance; posterior row of spines almost complete, but comprising around 14–16 stout uniform spines, denser around protuberance, dorsally scattered. Inter-segmental depression between dorsum of segments IX and X reduced, forming small acute angle. Body segment X comprises of bifid dorsomesal lobe with apicodorsal setose surface and pair of enlarged lateral part almost reaching base of inferior appendages; ventroapical setose surface developed into large, rounded, upward directed lobe; lateral setose area shifted dorsally, developed into small wart; intersegmental depression without transversal suture, 1 vertical suture visible delineating basal border of ventroapical lobe, another, oblique, horizontal suture present on middle of the lateral body of segment X. Inferior appendages with slender coxopodite, dilated distally; rod-like harpago clavate. Down-curving basal section of phallosome, almost right angled and as long as horizontal section, without heavily sclerotized endothecal process; endothecal process, shaped like a bird head, dominates phallic apparatus; phallosomal sclerite narrow, vertical, heavily sclerotized, 1 pair of ventral endothecal membranous lobes clearly visible both in lateral and vertical aspects.

Holotype male: New Caledonia: Province Sud: Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50490°E, 457 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#001 [KA Johanson] (MNHN).

Paratypes: same data as holotype — 12 males (NRM); New Caledonia: Province Sud: stream, Sarraméa, 21°37.097'S, 165°49.351'E, 262 m, Malaise trap, 18–21.xi.2001 [Johanson, Pape, Viklund] — 2 males, 2 females (NRM); New Caledonia: Province Sud: Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50393°E, 447 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#002 [KA Johanson] — 9 males, 6 females (NRM); New Caledonia: Province Sud: Monts des Koghis, ca 800 m S Koghi Restaurant, 22.18406°S, 166.50383°E, 420 m, 11–26.xi.2003, Malaise trap, loc#022 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud: Monts des Koghis, ca 800 m S Koghi Restaurant, 22.18447°S, 166.50315°E, 400 m, 11–26.xi.2003, Malaise trap, loc#023 [KA Johanson] — 1 male (NRM).



FIGURES 138–141. *Abacaria caledona* Oláh & Johanson, new species, holotype. 138 — genitalia, lateral; 139— genitalia, dorsal; 140 — right inferior appendage, ventral; 141 — phallus, lateral.

Incertae sedis in Abacaria

Abacaria picea (Brauer 1867)

Hydromanicus piceus Brauer 1867: 506, 511–512.

Hydropsychodes piceus (Brauer 1867); Ulmer (1905): 98–100.

Abacaria picea (Brauer 1867); Mosely (1941): 368.

Male holotype: Fiji Isl., Viti. (not examined)

Remarks: Only a drawing of the maxillary palp was included in Brauer's (1867) description of this species. Based upon this together with type locality information, this species was transferred to *Abacaria* by Mosely (1941). The types are not available.

Caledopsyche Kimmins 1953

Type species: *Caledopsyche cheesmanae* Kimmins 1953. Original designation.

Species of *Caledopsyche* differ from all other *Hydropsychinae* in the absence of fork 3 in the hind wings. Kimmins (1953) considered that this is not an abnormality as it was absent in all three specimens of the first described species, *C. cheesmanae*. Later this character

proved to be stable (Schefter & Ward 2002), and is also supported by the new species described here.

***Caledopsyche kimminsi* group**

Characteristics: The species of this group are small sized and have pale brown greyish bodies. In the forewing crossvein m is distant to crossvein M-Cu, crossvein M-Cu close to thyridial nygma; Cu2 open, reaching wing margin separately from A1. In the hind wing forks 2 and 5 present; crossvein m absent, crossvein M—cu not visible, M3+4 and Cu1a run very close. In the genitalia, segment IX has a short, abruptly narrowing tergum and sternum with rounded, bow-like anterior margin and nearly triangular apical lobe. Segment X is moderately elongated and parallel sided. The phallic apparatus is short and obtusely angled. The inferior appendages have a long harpago.

***Caledopsyche kimminsi* Oláh & Johanson, new species**

Fig. 142–145

This species is similar to *C. noumea*, and can be recognized by the absence of an S-shaped suture network on segment X; the absence of an apicodorsal setose lobe; the inferior appendages with harpago much longer than coxopodite; and the phallosome constricted midway. Moreover, the dorsum of the head has only seven discernible setal warts.

Male. Wing and body pale griseous with ochraceous tint. Maxillary palp segment 2 slightly longer than segment 3; segment 5 equal in length to segments 1–4 together. Head dorsum with seven discernible setal warts. A small swollen setal wart scarcely visible on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing membrane uniformly griseous with darker setae, but without any distinct pattern; Abdominal segment 5 without ventrolateral finger-like lobes. Forewing length 4.2 mm, hind wing length 3.1 mm.

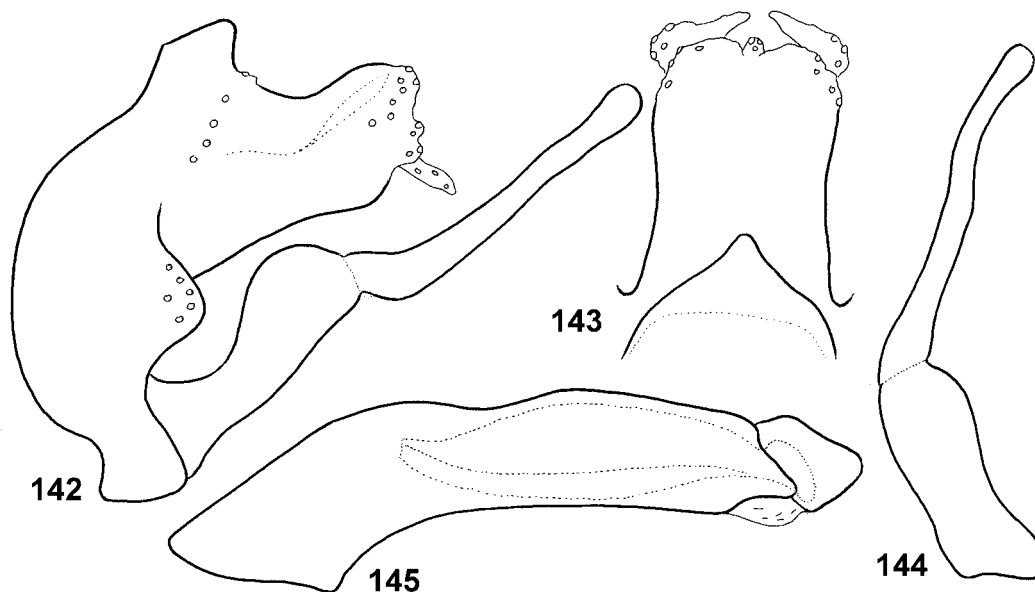
Male genitalia. Segment IX broad with short tergum and sternum; anterior margin rounded like a drawn bow; apicolateral lobe on posterior margin rounded triangularly, located midway from inferior appendages; posterior spine row disrupted, present on margin of apicolateral lobe and on base of tergum X, at margin of inter-segmental depression; tergum IX triangular in dorsal view. Segment X long, tergum concave in lateral aspect; inter-segmental depression shallow and broad; 2 pairs of setal lobes present distally of transversal suture line, pair of large apicoventral, finger like process present; apicodorsal lobe reduced to lateral rim demarcating less sclerotized, seta-free, basal part; lateral lobe, or preanal appendages, reduced to small warts located at base of digitate apicoventral part, directed mesoventrally, clearly visible only from caudal aspect; suture pattern dominated by heavily pigmented transverse vertical branch forming rim of setose

apicodorsal area. Inferior appendages with shortened and slightly sinuous coxopodite, strongly dilated from midway to apex; harpago elongated, significantly longer than coxopodite, digitate, parallel sided, with geniculate base and clavate ending. Phallic apparatus stout, phallosome bent at about 45°; down-curving phallobase not broadened, almost as broad as its horizontal stem; endophallus long, arising from phallosome bend, broad, nearly occupying whole tube, ventral sclerous band well developed; phallosome narrowing visibly midway and slightly apically, with ventral excision; endothelial processes or apical valves nearly triangular, phallosomal sclerites long, vertical, well sclerotized, covered completely by endothelial processes; ventrolateral endothelial membrane or process present in ventral subapical excision.

Holotype male: New Caledonia: Province Nord: river below waterfall, Mt. Panié, 20°35.864'S, 164°49.780'E, 350 m, Malaise trap, 22–28.xi.2001, 6 male, 1 female paratypes [Johanson, Pape, Viklund] (MNHN).

Distribution: New Caledonia (Province Nord).

Etymology. *kimminsi*, named after D. E. Kimmins who described the genus *Caledopsyche*.



FIGURES 142–145. *Caledopsyche kimminsi* Oláh & Johanson, new species, holotype. 142 — genitalia, lateral; 143— genitalia, dorsal; 144 — right inferior appendage, ventral; 145 — phallus, lateral.

***Caledopsyche noumea* Oláh & Johanson, new species**

Fig. 146–149

This species is morphologically close to *C. kimminsi*, but is easily distinguished by having

a head with 12 setal warts. On segment X the species has a very long and upwardly directed apicodorsal pair of lobes; an S-shaped suture pattern demarcating the less sclerotized and seta free base of the sclerotized setose distal area and lobes. The coxopodite of the inferior appendages is longer than the harpago; and the phallosome is not constricted midway, narrowing only subapically.

Male. Body pale griseous. Maxillary palp segment 2 longer than segment 3; segment 5 equal in length to sum of segments 1–4. Head dorsum with 12 discernible setal warts, although two small lateral warts are almost touching a larger lateral wart. A small, swollen setal wart present on proepisternum. Pretarsal claw symmetrical without laterally flanked setal bundle. Forewing membrane uniformly griseous with darker setae, without any distinct pattern. Forewing length 5.5 mm, hind wing length 4.4 mm. Abdominal segment 5 without ventrolateral finger-like lobes.

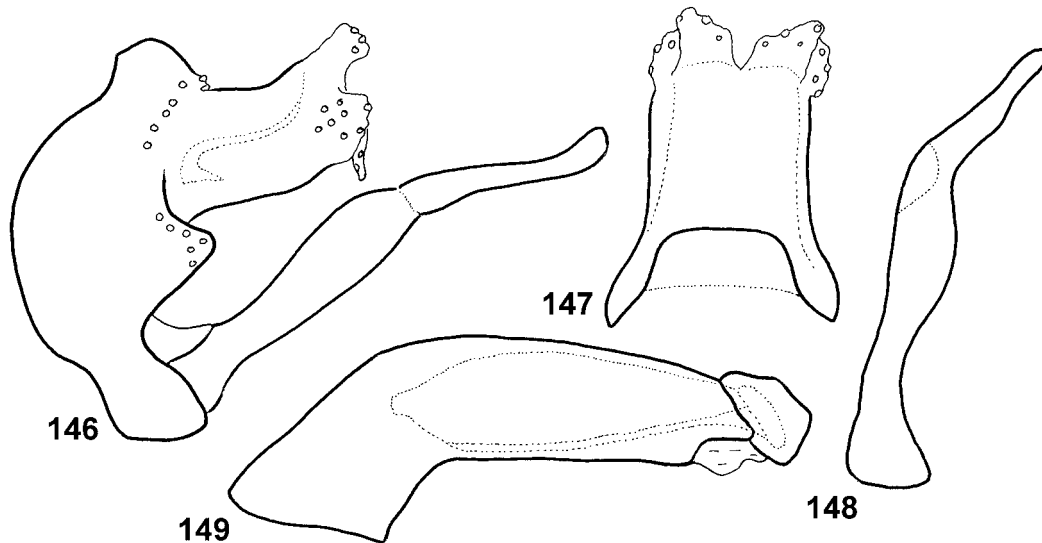
Male genitalia. Segment IX broad with short tergum and sternum; anterior margin rounded like drawn bow; apicolateral lobe on posterior margin bluntly triangular, located midway from inferior appendages; posterior spine row disrupted, present on margin of lateroapical lobe and on base of tergum X, at margin of intersegmental depression; tergum IX nearly rectangular in dorsal aspect. Segment X long, dorsum concave in lateral aspect; inter-segmental depression shallow, broad; base clearly delineated by strongly pigmented S-shaped suture; 3 pairs of setal lobes present distally from S-shaped suture, apicodorsal lobe quadrangular in lateral view, triangular in dorsal view; lateral lobe or preanal appendages bluntly rounded; apicoventral lobes finger-like, directed meso-ventrally, clearly visible only from caudal aspect; suture pattern with heavily pigmented transverse vertical upper branch and in continuation a sclerotized, broader, horizontal branch. Segment X with basal part located behind transversal suture, less pigmented; from dorsal aspect apicodorsal lobes well separated. Inferior appendages with coxopodite slightly sinuate, dilated from midway to apex, articulation of harpago not apparent, harpago digitate, parallel sided, narrowing stepwise. Phallic apparatus stout, phallosome bend about 45°, down-curving basal section not broadened, almost as broad as horizontal stem; endophallus long, arising from phallosomal bend, broad, filling almost whole tube; phallosome narrowing only slightly apically, with ventral excision; endothelial processes or apical valves nearly quadrangular, coffin-shaped; phallosomal sclerites long vertical, well-sclerotized and covered completely by endothelial processes; ventrolateral endothelial membrane or process present in ventral sub-apical excision.

Holotype male: New Caledonia: Province Sud: stream crossing Noumea-Yaté road immediately W of turnoff to Rivière Bleue Reserve, 22°10.191S, 166°44.474'E, 162 m, 22.xi–04.xii.2003, Malaise trap, loc#040, [KA Johanson] (MNHN).

Paratypes: same data as holotype — 4 males (NRM).

Distribution: New Caledonia (Province Sud).

Etymology. *C. noumea* is named after the capital of New Caledonia, Noumea.



FIGURES 146–149. *Caledopsyche noumea* Oláh & Johanson, new species, holotype. 146 — genitalia, lateral; 147— genitalia, dorsal; 148 — right inferior appendage, ventral; 149 — phallus, lateral.

***Caledopsyche leander* Scheffer & Ward 2002**

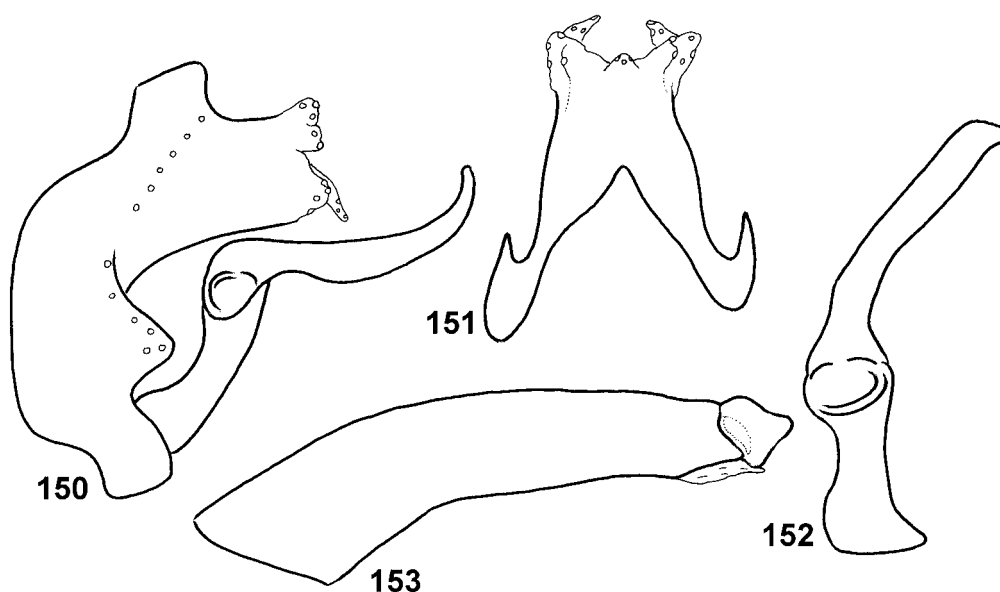
Figs 150–153

Male holotype: New Caledonia: stream on Mt Aoupinié, 22 km SW of bridge at Ponérihouen on Goa road, 485 m (N37), 17–21 October 1972 (WL and JG Peters) (Royal Ontario Museum, not examined).

New records: New Caledonia: Province Sud, Réserve spéciale de fauna de la haute Yaté, along road on southern part of Marais de la Rivière Blanche, stream draining to Marais de la Rivière Blanche, 1.35 km S Pont Pérignon, 22°08.496'S, 166°42.152'E, 180 m, 6.xi–16.xi.2003, Malaise trap, loc#009 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream of Ouinne River, near crosspoint to mountain track, 22°02.073'S, 166°28.460'E, 810 m, 18.xi–4.xii.2003, Malaise trap, loc#030 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, stream, Col d'Amieu, 21°33.830'S, 165°45.584'E, 415 m, light trap, 3.xii.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, stream at Refuge de Farino, 4.0 km W Grand Couli village, 21°38.934'S, 165°46.845'E, 260 m, 25.xi.2003, light trap, loc#044 [KA Johanson] — 8 males and 8 females *in copula* (NRM); New Caledonia: Province Sud, stream draining to Rivière des Pirogues, 850 m E summit of Mont Imbaah, 5.5 km E Lucky Creek in Plum, 22°16.837'S, 166°42.195'E, 31 m, 01.xii.2003, light trap,

loc#060 [KA Johanson] — 2 males (NRM); New Caledonia: Province Sud, Haute Yaté fauna reserve, 1760 m S bridge Pont Perignon, 50 m upstream bridge over stream, 22.14954°S, 166.701211°E, 180 m, 14.xii.2003–13.i.2004, Malaise trap, loc#081 [KA Johanson] — 1 male, 1 female (NRM); New Caledonia: Province Sud, Monts Kwa Ne Mwa, along Noumea-Yaté road, 2.0 km E Pic Mouirange, 20 m upstream road, 22°12.356'S, 166°40.798'E, 220 m, 15–16.i.2004, light trap, loc#120 [KA Johanson] — 36 males (NRM).

Distribution: New Caledonia (Province Sud and Province Nord).



FIGURES 150–153. *Caledopsyche leander* Schefter & Ward 2002. 150 — genitalia, lateral; 151— genitalia, dorsal; 152 — right inferior appendage, ventral; 153 — phallus, lateral.

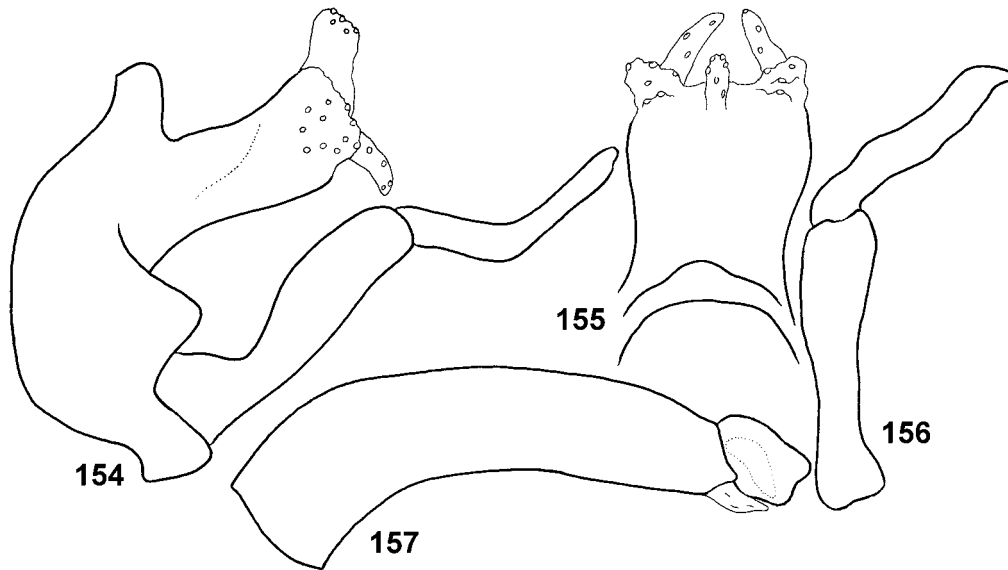
***Caledopsyche cerberus* Schefter & Ward 2002**

Fig. 154–157

Male holotype: New Caledonia: stream on Pic Mouirange, Camp des Travaux Publics on Terr. Route 2, 153 m (N27), 24–29 September 1972, (WL and JG Peters) (Royal Ontario Museum, not examined).

New records: New Caledonia: Province Sud: Monts Kwa Ne Mwa, on road between Noumea and Yaté, 1.5 km E Pic Mouirange, 22°12.545'S, 166°40.246'E, 143 m, 9.xi.2003, 30.xii.2003, light trap, loc#018, 3 male [KA Johanson] — 1 male, 2 females (NRM).

Distribution: New Caledonia (Province Sud).



FIGURES 154–157. *Caledopsyche cerberus* Schefter & Ward 2002. 154 — genitalia, lateral; 155— genitalia, dorsal; 156 — right inferior appendage, ventral; 157 — phallus, lateral.

***Caledopsyche cheesmanae* Kimmins 1953**

Fig. 158–160

Holotype male:(mounted as microscopic preparation), allotype female (abdomen mounted in Canada balsam): N. New Caledonia: Pueblo, 0–1,500 ft., x.1949 (L.E.Cheesman) (BMNH, examined).

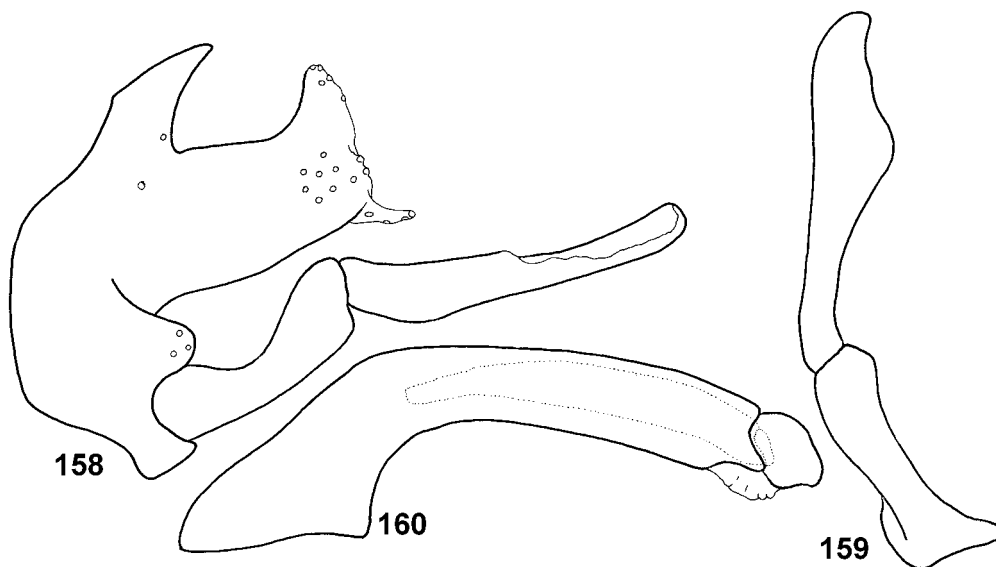
New records: New Caledonia: Province Sud, Monts Kwa Ne Mwa, on road between Noumea and Yaté, 1.5 km E Pic Mouirange, 22°12.545'S, 166°40.246'E, 143 m, 9.xi.2003, 30.xii.2003, light trap, loc#018 [KA Johanson] — 1 male (NRM); New Caledonia: Province Nord, Wemwâdiu stream, 850 m E summit Kôgi Mt., 5 m upstream road, about 200 m S Tiwaka River, 20°49.020'S, 165°14.165'E, 24 m, 6–27.xii.2003, Malaise trap, loc#067 [KA Johanson] — 1 male (NRM); New Caledonia: Province Nord, stream in Creek de Bambou, 5 m N road RT7 Ouégoa-Koumac, 20°27.863'S, 164°19.784'E, 58 m, 19.xii.2003, Malaise trap, loc#087 [KA Johanson] — 2 males (NRM).

Distribution: New Caledonia (Province Sud and Province Nord).

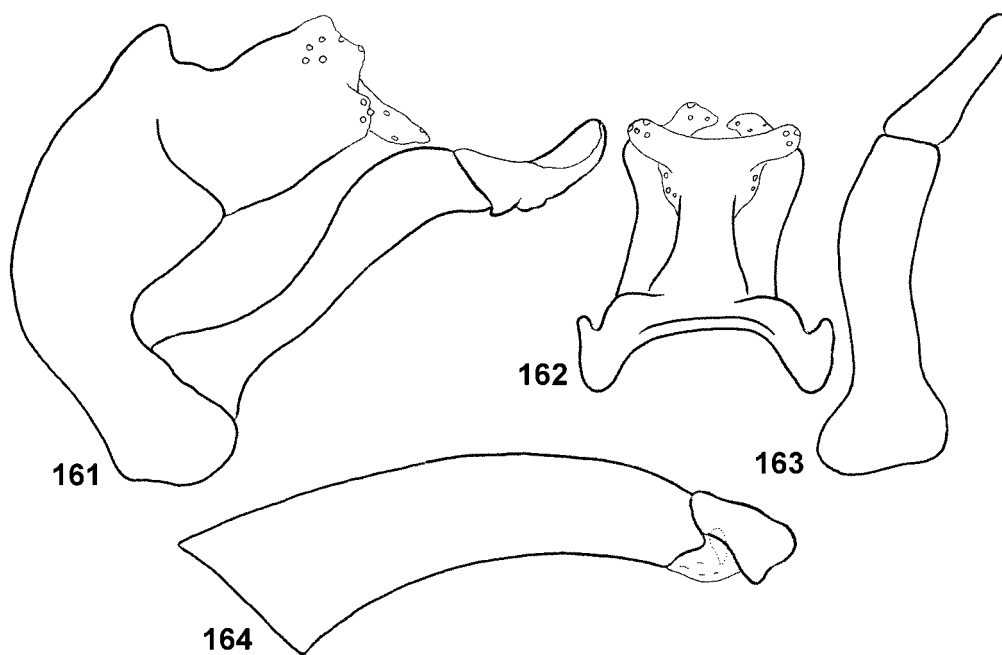
***Caledopsyche phallaina* Schefter & Ward 2002**

Fig. 161–164

Male holotype: New Caledonia: mountain stream up Boulari River, 3 November 1958 (C.R. Joyce) (Royal Ontario Museum, not examined).



FIGURES 158–160. *Caledopsyche cheesmanae* Scheffer & Ward 2002. 158 — genitalia, lateral; 159—right inferior appendage, ventral; 160 — phallus, lateral.



FIGURES 161–164. *Caledopsyche phallaina* Scheffer & Ward 2002. 161 — genitalia, lateral; 162— genitalia, dorsal; 163 — right inferior appendage, ventral; 164 — phallus, lateral.

***Caledopsyche erotos* group**

Characteristics: one species, *C. erotos*, belongs to this group. This species represents the most abundant Hydropsychidae on New Caledonia. The body is brown. Segment IX has a bifid dorsum, deeply excised; the apical lobe is enlarged and rounded and almost covering the basal part of the inferior appendages. The harpago of the inferior appendages is short. The phallic apparatus has a right-angled, long basal section.

New records: New Caledonia: Province Sud, Dumbea river, Branche sud, 22°08.344'S, 166°30.147'E, 42 m, 03.xi.2003, light trap, loc#006 [KA Johanson] — 3 males (NRM); New Caledonia: Province Sud, Tontouta River, 4.8 km WSW summit of Mt. Vulcain, 21°55.258'S, 166°19.895'E, 41 m, 15.xii.2003, light trap, loc#083 [KA Johanson] — 14 males (NRM); New Caledonia: Province Sud, Monts Kwa Ne Mwa, along Noumea-Yaté road, 2.0 km E Pic Mouirange, 20 m upstream road, 22°12.356'S, 166°40.798'E, 220 m, 15–16.i.2004, light trap, loc#120 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Dumbea River, Branche Nord, 2.2 km SE summit of Mt. Piditéré, 22°07.503'S, 166°29.899'E, 25 m, 21.i.2004, light trap, loc#124 [KA Johanson] — 8 males (NRM).

Distribution: New Caledonia (Province Sud).

***Caledopsyche erotos* Scheffer & Ward 2002**

Fig. 165–168

Holotype male: New Caledonia: Carigou, 6534 75463, 120 m, at uv, 24 September 1997 (NJ Mary) (Canterbury Museum, New Zealand, not examined).

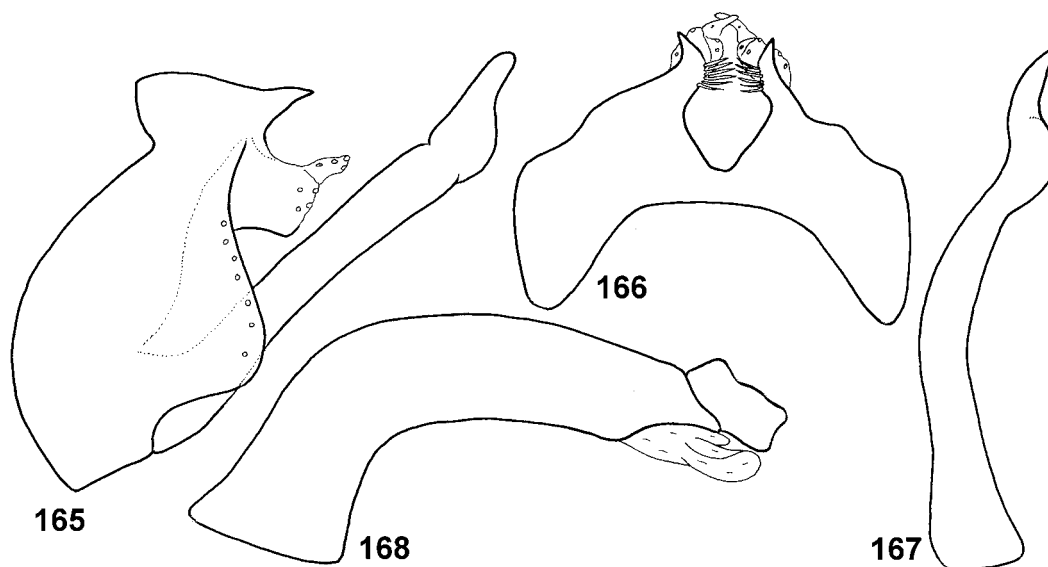
New records: New Caledonia: Province Sud, stream, Sarraméa, 21°37.883'S, 165°51.958'E, 220 m, light trap, 19.xi.2001 [Johanson, Pape, Viklund] — 3 males (NRM); New Caledonia: Province Sud, stream, Sarraméa, 21°37.389'S, 165°51.083'E, 152 m, Malaise trap, 18–21.xi.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Nord, Amoa River, 12 km W Poindimié, 20°58.092'S, 165°11.804'E, 23 m, light trap, 25–26.xi.2001 [Johanson, Pape, Viklund] — 4 males, 4 females *in copula* (NRM); New Caledonia: Province Sud, riverbank of Tamoa River, near outlet to sea, 22°02.257', 166°12.569'E, 5.xi.2003, light trap, loc#008 [KA Johanson] — 4 males, 5 females (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 1.0 km from road RT1 between Noumea and Dumbéa, water reservoir about 100x100 m diameter, 22°10.919'S, 166°29.182'E, 91 m, 10.xi.2003, light trap, loc#020 [KA Johanson] — 80 males: 50 females, 3 pairs *in copula* (NRM); New Caledonia: Province Sud, Rivière Ouanéoue, at bride crossing road to Koghi Mountains, about 1.5 km from road RT1 Noumea-Dumbea, 22°10.861'S, 166°29.531'E, 11.xi.2003, 11.xii.2003, 20.i.2004, light trap, loc#024 [KA Johanson] — 116 males, 200 females (NRM); New Caledonia: Province Sud, Monts Kwa Ne Mwa, on road between Noumea and Yaté, Rivière des

Pirogues, 22°11.225'S, 166°43.338'E, 100 m, 7.xi.2003, light trap, loc#016 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 1.0 km from road RT1 between Noumea and Dumbéa, water reservoir about 100x100 m diameter, 22°10.919'S, 166°29.182'E, 91 m, 10.xi.2003, light trap, loc#020 [KA Johanson] — 45 females (NRM); New Caledonia: Province Sud, western part of Mt. Ningua, Kwé Néco Stream, 3.9 km W summit of Mt. Ningua, on Bouloparis-Thio Road, about 50 m upstream road, 21°44.359'S, 166°06.009'E, 117 m, 20.xi.2003–12.xii.2003, 12.xii.2003–05.i.2004, Malaise trap, loc#035 [KA Johanson] — 9 males (NRM); New Caledonia: Province Sud, Tamoia River, 700m S road RT1 between Noumea and La Foa, 22°04.518'S, 166°16.592'E, 19.xi.2003, light trap, loc#033 [KA Johanson] — 600 males, 1000 females (NRM); New Caledonia: Province Nord, western slope of Kugüö Mt., Xwé Wida Di Stream, 2 km E Koh, 21°35.474'S, 165°50.776'E, 154 m, 20.xi–12.xii.2003, Malaise trap, loc#036 [KA Johanson] — 1 male (NRM); New Caledonia: Province Nord, N slope of Mt. Rembai, Xwé Méréxwana Stream, 21°33.804'S, 165°50.528'E, 309 m, 20.xi–12.xii.2003, Malaise trap, loc#037 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, Hwa Hace Mt., Hwa Motu River, at Pont Wamuttu, about 1.0 km E Nassirah on Bouloparis-Thio Road, about 200 m upstream bridge, 21°48.094'S, 166°04.298'E, 137 m, 20.xi.2003–12.xii.2003, Malaise trap, loc#034 [KA Johanson] — 1 male, 4 females (NRM); New Caledonia: Province Sud, (60 m downstream loc#038,)on road between Noumea and Yaté, 1.0 km NW Pont des Japonais, 22°11.427'S, 166°42.868'E, 113 m, 22.xi–4.xii.2003, Malaise trap, loc#039 [KA Johanson] — 20 males, 30 females (NRM); New Caledonia: Province Sud, stream at Refuge de Farino, 4.0 km W Grand Couli village, 21°38.934'S, 165°46.845'E, 260 m, 25.xi.2003, light trap, loc#044 [KA Johanson] — 65 males, 25 females, 4 pairs *in copula* (NRM); New Caledonia: Province Sud, Couvelée River at Haute Couvelée, 2.8 km SV summit of Mt. Pidotéré, 3.5 km NNE Dumbéa, 22°07.488'S, 166°28.034'E, 27 m, 28.xi.2003, light trap, loc#051 [KA Johanson] — 30 females (NRM); New Caledonia: Province Sud, St. Vincent, Bongou Stream, at bridge on road to Tribu de Bangou, 700 m N RT1 Noumea-Tontoutu road, 22°03.477'S, 166°15.718'E, 26.xi.2003, light trap, loc#050 [KA Johanson] — 100 males, 40 females (NRM); New Caledonia: Province Sud, W slope Mt. Ningua, Kwé Néco Stream, at Camp Jacob, 3.9 km W summit of Mt. Ningua, on Bouloparis-Thio Road, about 50 m upstream road, 21°44.083'S, 166°06.298'E, 117 m, 29.xi.2003–12.xii.2003, Malaise trap, loc#053 [KA Johanson] — 14 males (NRM); New Caledonia: Province Sud, W slope Mt. Ningua, Kwé Néco Stream, at Camp Jacob, 3.7 km WNW summit of Mt. Ningua, on Bouloparis-Thio Road, about 50 m upstream road, 21°43.613'S, 166°06.567'E, 150 m, 29.xi–12.xii.2003, 12.xii.2003–05.i.2004, Malaise trap, loc#054 [KA Johanson] — 1 male (NRM); New Caledonia: Province Sud, lower part Rivière des Pirogues, 800 m WNW summit of Mont Imbaah, 4.7 km E Lucky Creek in Plum, 22°18.559'S, 166°41.227'E, 1.3 m, 01.xii.2003, light trap, loc#059 [KA Johanson] — 12 males (NRM); New Caledonia: Province Sud, Dothio River, 10 m E bridge at Atè, 6.2 km WNW Thio, 21°35.288'S, 166°09.070'E, 13 m, 29.xi.2003, light trap, loc#057 [KA Johanson] — 42 males, 45

females (NRM); New Caledonia: Province Nord, 50 m upstream bridge on Hienghène-Tnèdo road, 3.9 km S summit of Mt. Tnèda, 2.4 km E Tnèdo, 20°43.099'S, 164°50.108'E, 27 m, 7.xii.2003, Malaise trap, loc#069 [KA Johanson] — 30 males, 50 females (NRM); New Caledonia: Province Nord, 50 m upstream bridge on Hienghène-Tnèdo road, 3.9 km S summit of Mt. Tnèda, 2.2 km E Tnèdo, 20°43.085'S, 164°49.928'E, 29 m, 7.xii.2003, light trap, loc#071 [KA Johanson] — 40 males, 60 females (NRM); New Caledonia: Province Nord, Bouérabate Stream, S Monts Ninndo, along road Barabache-Boulagoma, 20°17.409'S, 164°11.242'E, 60 m, 19.xii.2003, Malaise trap, loc#089 [KA Johanson] — 2 males, 3 females (NRM); New Caledonia: Province Sud, Xwé Pemöu Stream, 300 m N bridge over Dathio River at Atè, 6.2 km WNW of Thio, 21.58835°S, 166.15117°E, 13 m, 29.xi.2003, light trap, loc#056 [KA Johanson] — 40 males, 60 females (NRM); New Caledonia: Province Nord, Rivière Néhoué, at camp site Amenage de Néhoué, 20°25.037'S, 164°13.222'E, 12 m, 19.xii.2003, light trap, loc#090 [KA Johanson] — 150 males, 150 females (NRM); New Caledonia: Province Nord, Rivière Néhoué, camp Amenage de Néhoué, 20°25.015'S, 164°13.245'E, 12 m, 19.xii.2003, light trap, loc#091 [KA Johanson] — 25 males, 25 females (NRM); New Caledonia: Province Nord, Héémwâ Pwei River, 50 m upstream bridge on Touho-Hienghene road, 1.0 km N Paola, 20.76512°S, 165.10979°E, 22.xii.2003, light trap, loc#095 [KA Johanson] — 200 males, 300 females (NRM); New Caledonia: Province Nord, Ponandou Tiôgé River at Kôgi, 3.9 km SSW Touho, 20°49.043'S, 165°13.551'E, 25 m, 26.xii.2003, light trap, loc#100 [KA Johanson] — 500 males, 1000 females (NRM); New Caledonia: Province Nord, Abwalá River, 3.5 km WNW Amoss, 20°15.787'S, 164°23.387'E, 10 m, 27.xii.2003, light trap, loc#101 [KA Johanson] — 20 males, 30 females (NRM); New Caledonia: Province Nord, Plaine des Gaïacs, Rivière Rouge, 14.2 km NW summit of Mt. Rouge, 50 m upstream road RT1 Noumea-Koné, 20°31.573'S, 164°46.690'E, 23 m, 2.i.2004, light trap, loc#104 [KA Johanson] — 80 males, 120 females (NRM); New Caledonia: Province Nord, Héémwâ Pwei River, 50 m upstream bridge on Touho-Hienghene road, 1.1 km N Paola, 20.76503°S, 165.10974°E, 22.xii.2003, light trap, loc#094 [KA Johanson] — 50 males, 69 females (NRM); New Caledonia: Province Nord, Etnbl. thermal de la Crouen, along RM3 and River la Crouen, about 30 m upstream the road, 21°32.105'S, 165°53.319'E, 15 m, 5.i.2004, Malaise trap, loc#110 [KA Johanson] — 10 males, 20 females (NRM); New Caledonia: Province Sud, Dogny River, 100 m upstream La Foa River, 2 m upstream bridge on La Foa-Koindé road, 21°39.012'S, 165°56.041'E, 43 m, 4.i.2004, light trap, loc#107 [KA Johanson] — 5 males, 10 females (NRM); New Caledonia: Province Nord, Forêt Plate, Ouendé River, at 2.5 km WNW summit of Katépouenda, 23.3 km E Pouembout, 21°07.490'S, 165°06.723'E, 470 m, 8.i.2004, Malaise trap, loc#112 [KA Johanson] — 15 males, 25 females (NRM); New Caledonia: Province Sud, Col d'Amieu, Xwé Ko River, at bridge on road to St. forestière, 21°35.612'S, 165°48.241'E, 368 m, 8.i.2004, light trap, loc#114 [KA Johanson] — 30 males (NRM); New Caledonia: Province Sud, Col d'Amieu, Fo Waau Stream, at Pont Ouaou, 21°35.559'S, 165°48.311'E, 317 m, 10.i.2004, light trap, loc#116 [KA Johanson] — 100 females (NRM); New

Caledonia: Province Nord, Kômwâdù River, 20 m upstream bridge on RPN3 road Canala-Thio, 2.6 km ESE Nakéty, 21°33.445'S, 166°04.204'E, 17 m, 12.i.2004, light trap, loc#117 [KA Johanson] — 500 males, 1500 females (NRM); New Caledonia: Province Sud, Sarraméa, Xwê Wya River, at Hotel Evasion130, 21°38.318'S, 165°51.582'E, 127 m, 17–18.i.2004, light trap, loc#121 [KA Johanson] — 20 males, 1001 females (NRM); New Caledonia: Province Sud, artificial lake 2.6 km S summit of Mt. Mè Tu Novia, about 400 m N Pocquereux River, 7.4 km E La Foa, 21°43.859'S, 165°54.034'E, 28 m, 19.i.2004, light trap, loc#123 [KA Johanson] — 10 males, 20 females (NRM).

Distribution: New Caledonia (Province Sud and Province Nord).



FIGURES 165–168. *Caledopsyche erotos* Schefter & Ward 2002. 165 — genitalia, lateral; 166—genitalia, dorsal; 167 — right inferior appendage, ventral; 168 — phallus, lateral.

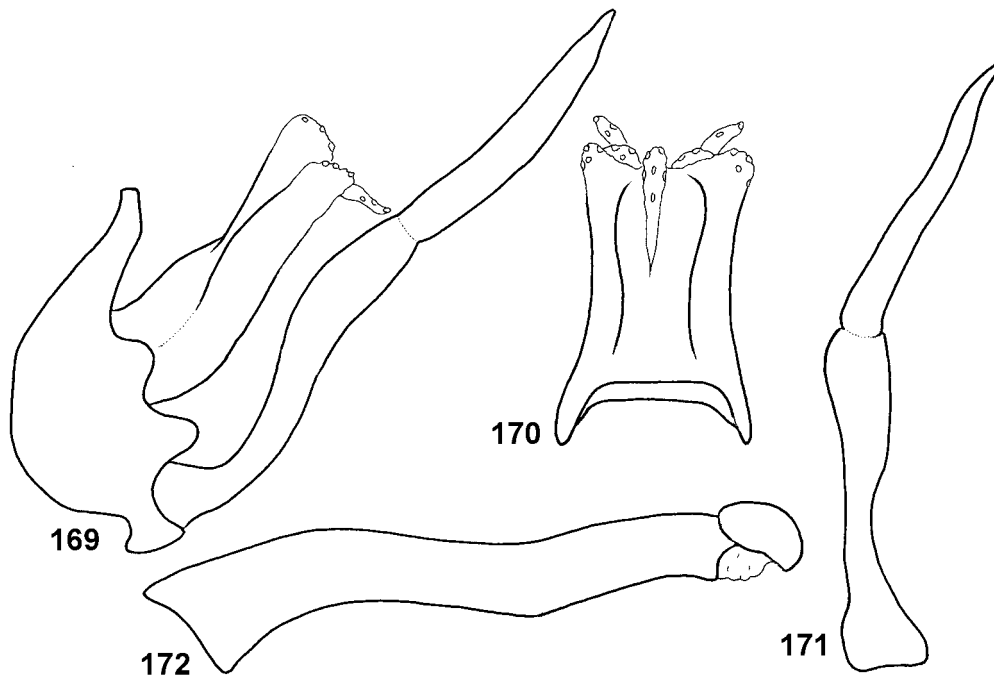
***Caledopsyche atalanta* group**

Characteristics: Body dark fuscous. In the genitalia, segment IX has a rounded bow-like anterior margin and an abrupt shortening of the tergite and sternite; segment X is unusually elongated and obliquely directed upward; the depression between segments IX and X is very deep; the inferior appendages and phallic apparatus are both slender and elongated.

***Caledopsyche atalanta* Schefter & Ward 2002**

Fig. 169–172

Holotype male: New Caledonia: Tributary of Carionan River, 5 km NNW of Païta, 11–12 October 1972 (WL and JG Peters) (Royal Ontario Museum, not examined)



FIGURES 169–172. *Caledopsyche atalanta* Schefter & Ward 2002. 161 — genitalia, lateral; 162— genitalia, dorsal; 163 — right inferior appendage, ventral; 164 — phallus, lateral.

New records: New Caledonia: Province Sud, stream, Koghi Mt., 22°10.327'S, 166°30.524'E, 522 m, Malaise trap, 12–16.xi.2001 [Johanson, Pape, Viklund] 1 male, 4 females (NRM); New Caledonia: Province Sud, stream, Koghi Mt., 22°10.280'S, 166°30.480'E, 430 m, Malaise trap, 2–5.xii.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, stream, Sarraméa, 21°37.883'S, 165°51.958'E, 220 m, light trap, 19.xi.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, stream, Platou de Dogny, 21°36.853'S, 165°52.548'E, 846 m, Malaise trap, 18–21.xi.2001 [Johanson, Pape, Viklund] — 2 males (NRM); New Caledonia: Province Sud, stream, Platou de Dogny, 21°36.853'S, 165°52.548'E, 846 m, Malaise trap, 2–5.xii.2001 [Johanson, Pape, Viklund] — 1 male (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50490°E, 457 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#001 [KA Johanson] — 58 males (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50393°E, 447 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#002 [KA Johanson] — 32 males (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50245°E, 427 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#003 [KA Johanson] — 2 males, 200 females (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50245°E, 427 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#003

[KA Johanson] — 4 males, 100 females (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 300 m S Koghi Restaurant, 22.18288°S, 166.50073°E, 407 m, 02–16.xi.2003, 16–26.xi.2003, Malaise trap, loc#005 [KA Johanson] — 124 males, 150 females (NRM); New Caledonia: Province Sud, Réserve spéciale de fauna de la haute Yaté, along road on southern part of Marais de la Rivière Blanche, side stream to Rivière Blanche, 10.75 km SW Pont Pérignon, 22°10.073'S, 166°39.903'E, 180 m, 6.xi–16.xi.2003, Malaise trap, loc#012 [KA Johanson] — 2 males (NRM); New Caledonia: Province Sud, Réserve spéciale de fauna de la haute Yaté, along road on southern part of Marais de la Rivière Blanche, stream draining to Marais de la Rivière Blanche, 3.7 km SW Pont Pérignon, 22°09.327'S, 166°40.841'E, 180 m, 6.xi–16.xi.2003, Malaise trap, loc#013 [KA Johanson] — 1 male, 2 females (NRM); New Caledonia: Province Sud, Monts Kwa Ne Mwa, on road between Noumea and Yaté, 2.0 km E Pic Mouirange, 22°12.356'S, 166°40.798'E, 220 m, 7–16.xi.2003, 16–30.xi.2003, Malaise trap, loc#014 [KA Johanson] — 34 males, 28 females (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 800 m S Koghi Restaurant, 22.18311°S, 166.50564°E, 460 m, 10–26.xi.2003, Malaise trap, loc#019 [KA Johanson] — 26 males (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 800 m S Koghi Restaurant, 22.18365°S, 166.50451°E, 440 m, 11–26.xi.2003, Malaise trap, loc#021 [KA Johanson] — 11 males, 15 females (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 800 m S Koghi Restaurant, 22.18447°S, 166.50315°E, 400 m, 11–26.xi.2003, Malaise trap, loc#023 [KA Johanson] — 11 males (NRM); New Caledonia: Province Sud, Rivière Ouanéoue, at bride crossing road to Koghi Mountains, about 1.5 km from road RT1 Noumea-Dumbea, 22°10.861'S, 166°29.531'E, 11.xi.2003, 11.xii.2003, 20.i.2004, light trap, loc#024 [KA Johanson] — 18 males, 2 females (NRM); New Caledonia: Province Sud, Monts des Koghis, ca 800 m S Koghi Restaurant, 22.18406°S, 166.50383°E, 420 m, 11–26.xi.2003, Malaise trap, loc#022 [KA Johanson] — 15 males, 15 females (NRM); New Caledonia: Province Sud, stream crossing way to Sanatorium 2.3 km E St. Laurent, ca. 150 m upstream bridge, 22°04.484'S, 166°19.910'E, 15–30.xi.2003, Malaise trap, loc#027 [KA Johanson] — 13 males, 36 females (NRM); New Caledonia: Province Sud, Mt. Dzumac, source stream of Ouinne River, near crosspoint to mountain track, 22°02.439'S, 166°28.646'E, 805 m, 18.xi–4.xii.2003, Malaise trap, loc#029 [KA Johanson] — 19 females (NRM); New Caledonia: Province Sud, Platou de Dogny, source of Dogny River, about 900 m SE summit of Platou de Dogny, 21.61917°S, 165.88072°E, 919 m, 25.xi–16.xii.2003, Malaise trap, loc#046 [KA Johanson] — 15 males, 20 females (NRM); New Caledonia: Province Sud, Platou de Dogny, source of Dogny River, about 100 S of loc 046 and nearly 1.0 km SE summit of Platou, 21.62095°S, 165.88072°E, 917 m, 25.xi–16.xii.2003, Malaise trap, loc#047 [KA Johanson] — 30 females (NRM); New Caledonia: Province Sud, Platou de Dogny, source of Dogny River, about 1.2km SE summit of Platou, about 200 m from waterfall, 21.62067°S, 165.88290°E, 915 m, 25.xi–16.xii.2003, Malaise trap, loc#048 [KA Johanson] — 6 males, 5 females (NRM); New Caledonia: Province Nord, Mt. Panié, stream at camp, 20.58139°S, 164.76444°E,

1310 m, 9.xii.2003, Malaise trap, loc#074 [KA Johanson] — 16 males, 15 females (NRM); New Caledonia: Province Nord, Creek de Orangers (Xwê Xwai Stream), 3.7 km NW Koh, 300 m upstream bridge on RPN3 Koh-Kouaoua, 21°31.084'S, 165°48.168'E, 161 m, 5.i.2004, Malaise trap, loc#109 [KA Johanson] — 1 male, 1 female (NRM); New Caledonia: Province Sud, Monts Kwa Ne Mwa, along Noumea-Yaté road, 2.0 km E Pic Mouirange, 20 m upstream road, 22°12.356'S, 166°40.798'E, 220 m, 15–16.i.2004, light trap, loc#120 [KA Johanson] — 5 males, 2 females (NRM).

Distribution: New Caledonia (Province Sud and Province Nord).

***Caledopsyche apide* Oláh & Johanson, new species**

Fig. 173–177

This species resembles *C. atalanta* in having a fuscous body and forewing colour. Also the genital structures are similar to those in *C. atalanta*. *C. apide* is separated by having shorter inferior appendages not tapering distally; a straight phallosome; shorter segment X; shallower intersegmental depression between segments IX and X; and differently formed dorsodistal and lateral setose lobes of segment X.

Male. Body fuscous. Maxillary palp segment 2 as long as segment 3; segment 5 as long as segments 1–4 together. Head dorsum with 9 discernible setal warts, although the large central wart on the anterior looks like a fused pair; small swollen setal wart present on proepisternum. Pretarsal claw symmetrical, without laterally flanked setal bundle. Forewing membrane uniformly fuscous, with darker setae, without distinct pattern. Forewing length 5.4 mm, hindwing length 4.0 mm. Abdominal segment 5 without ventrolateral finger-like lobes.

Male genitalia. Segment IX laterally broad with gradually shortening tergum and abruptly shortening sternum; anterior margin sub-rectangular; apicolateral lobe on posterior margin blunt triangular, located near inferior appendages; posterior spine row continuous, present on margin of apicolateral lobe, and on base of tergum X on margin of inter-segmental depression; tergite IX sub-rectangular in dorsal view, with weak central elevation. Segment X long; dorsum almost straight and elevating in lateral aspect, forming very deep inter-segmental depression with tergite IX; base of segment clearly demarcated by strongly pigmented horizontal and transverse suture pattern; 3 pairs of setal lobes present distally of this suture line; pair of apicodorsal lobes fused into central plate; lateral lobes or preanal appendages form broad plate setose only at the distal triangle; apicoventral lobes finger-like, directed mesoventrally, clearly visible only from caudal aspect; suture pattern with heavily pigmented transverse vertical upper branch and in continuation a sclerotized horizontal branch; basal part of segment X less pigmented behind transversal suture. Inferior appendage coxopodite basally sinuate, parallel sided, dorsoventrally depressed at apex, giving a significant broadening in ventral aspect; harpago digitate, parallel sided, narrowing stepwise from halfway. Phallic apparatus slender, phallosome bent at 35°;

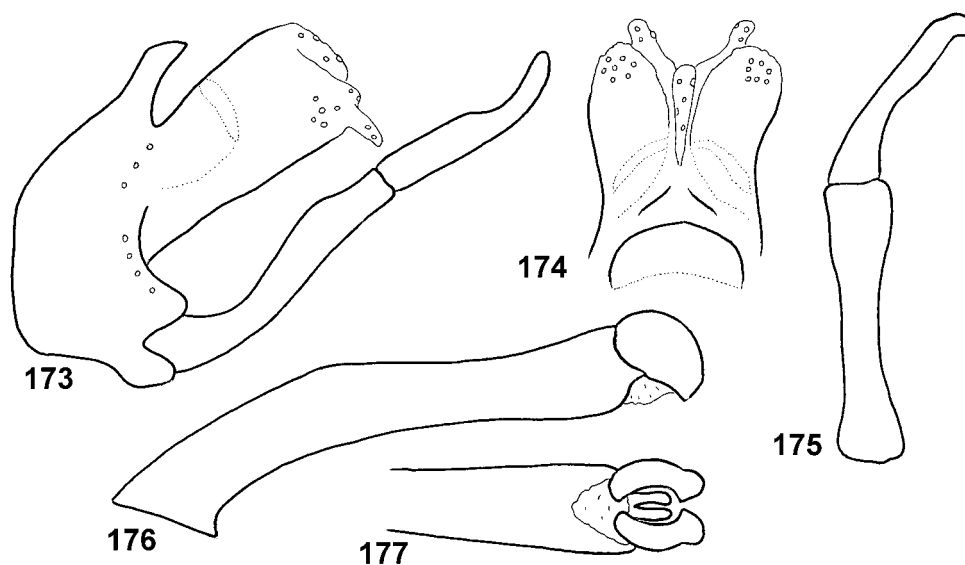
downcurving phallobase as broad as horizontal stem; dorsum of horizontal stem concave; endophallus half as long as phalotheca, very broad, filling almost whole tube; phalotheca broadening apically, with ventral excision; endothelial processes or apical valves semicircular with ventral point; phallosomal sclerites long, vertical, well sclerotized, covered completely by endothelial processes; ventral sub-apical excision with ventrolateral endothelial membrane or process.

Holotype male: New Caledonia: Province Nord: Mt. Panié, stream at camp, 20.58139°S, 164.76444°E, 1310 m, 9.xii.2003, Malaise trap, loc#074 [KA Johanson] (MNHNP).

Paratype: New Caledonia: Province Nord: Mt. Panié, stream at camp, 20.58167°S, 164.76472°E, 1311 m, 9.xii.2003, Malaise trap, loc#073 [KA Johanson] — 1 male (NRM).

Distribution: New Caledonia (Province Nord).

Etymology. *apide*, from Sanscrit, fuscous, referring to the body and wing colour.



FIGURES 173–177. *Caledopsyche apide* Oláh & Johanson, new species, holotype. 173 — genitalia, lateral; 174— genitalia, dorsal; 175 — right inferior appendage, ventral; 176 — phallus, lateral; 177 — phallus apex, ventral.

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