

## The “underwing” *Lambula* species from New Guinea with twelve new species (Lepidoptera, Erebidae, Arctiinae, Lithosiini)

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**Abstract:** The so called “underwing” *Lambula* species from New Guinea, with vivid coloured and patterned underwings, are reviewed. Of the eighteen known species belonging to this group twelve are new to science: *Lambula albicentra* **spec. nov.**, *L. arfakensis* **spec. nov.**, *L. costiplaga* **spec. nov.**, *L. flavibasis* **spec. nov.**, *L. fuscibasis* **spec. nov.**, *L. longiductus* **spec. nov.**, *L. marginata* **spec. nov.**, *L. nigrescens* **spec. nov.**, *L. pallescens* **spec. nov.**, *L. sibilensis* **spec. nov.**, *L. tristis* **spec. nov.** and *L. vanrossemi* **spec. nov.** Two taxa are synonymized: *Lambula dampierensis* Rothschild, 1916 **syn. nov.** and *Darantasia triangulum* Gaede, 1925 **syn. nov.** are both junior synonyms of *Ilema cuprea* Rothschild, 1912 (now in *Lambula*). The species are (re)described, adults and genitalia are depicted.

**Rangkuman:** Spesies-spesies *Lambula* dari New Guinea ditinjau. Spesies-spesies ini juga disebut dengan nama “sayap bawah”. Warna dan pola sayap bawah spesies ini sangat jelas. Dari delapanbelas spesies di dalam kelompok ini, ada duabelas yang baru diketahui: *Lambula albicentra* **spec. nov.**, *L. arfakensis* **spec. nov.**, *L. costiplaga* **spec. nov.**, *L. flavibasis* **spec. nov.**, *L. fuscibasis* **spec. nov.**, *L. longiductus* **spec. nov.**, *L. marginata* **spec. nov.**, *L. nigrescens* **spec. nov.**, *L. pallescens* **spec. nov.**, *L. sibilensis* **spec. nov.**, *L. tristis* **spec. nov.** dan *L. vanrossemi* **spec. nov.** Dua taksa dijadikan sinonim: *Lambula dampierensis* Rothschild, 1916 **syn. nov.** dan *Darantasia triangulum* Gaede, 1925 **syn. nov.** dua-duanya adalah sinonim dari *Ilema cuprea* Rothschild, 1912 (sekarang bagian *Lambula*). Semua spesies ini diletakan (ulang) dan gambar spesies serta gambar genetaliaanya disajikan.

**Keywords:** *Lambula*, underwings, new species, New Guinea

### Abbreviations used

IND - Indonesia

KSP - Koleksi Serangga Papua, Universitas Cenderawasih, Waena, Papua, Indonesia

MFNB - Museum für Naturkunde, Berlin, Germany

NHMUK - acronym of Natural History Museum, London, United Kingdom

PNG - Papua New Guinea

RMNH.INS - acronym of Naturalis Biodiversity Center, dept. Entomology, Leiden, The Netherlands

### Introduction

The genus *Lambula* Walker, 1866 is known as being rather difficult to define. The compilation of the genus is probably heterogenous and needs further refining by study of the genitalia and

at molecular basis. Traditionally it is grouped together by wing shape, pattern and genitalia. They resemble more or less species of the genera *Eilema* Hübner, [1819] and *Brunia* Moore, 1878 but are usually much smaller. Some species with an arched forewing costa resemble species from genera like *Macaduma* Walker, 1866 or *Darantasia* Walker, 1859 (revised by De Vos, 2019), in which some previously have been placed. Most species are known from New Guinea, adjacent islands and the Bismarck Archipelago. Few species are known outside the New Guinea area, like Australia and the Sunda region.

Many new species are still waiting to be described. They can roughly be divided into two unnatural groups: species with dull uniform patterned hindwings and species with vivid and colourful patterned hindwings. It is the last group which is treated in this review, here named the “underwing” *Lambula* species. Eighteen species are known of this group, of which twelve are new to science.

The male genitalia are of the typical lithosiine type, with a small thin uncus, long and slender valvae with a slender and long distal process on the sacculus, the aedeagus being a tube with usually a long needle-shaped cornutus. Female genitalia always have two more or less trumpet-shaped signa, the ductus bursae can be very different between the species, from very short to extremely long.

The other species group, with dull and uniform patterned hindwings will be treated in a future review.

#### **Checklist of all *Lambula* species in New Guinea (species with \* will be treated in this paper)**

*aethalocis* Hampson, 1914 [PNG]

*fuliginosa* (Rothschild, 1912) homonym, nec Walker, 1862

*agraphia* Hampson, 1900 [PNG]

\**albicentra* **spec. nov.** [Papua, IND]

\**arfakensis* **spec. nov.** [Papua Barat, IND]

*aroa* Bethune-Baker, 1904 [Papua-Papua Barat, IND; PNG]

*bilineata* Bethune-Baker, 1904 [Papua-Papua Barat, IND; PNG]

*bifasciata* Rothschild, 1912

*aroa* Bethune-Baker, 1904 (in part, female)

\**biplagiata* (Gaede, 1925) [Papua, IND; PNG]

*bivittata* (Rothschild, 1912) [Papua-Papua Barat, IND]

\**buergersi* Gaede, 1925 [Papua, IND; PNG]

*castanea* Rothschild, 1912 [Papua, IND]

\**costiplaga* **spec. nov.** [Papua Barat, IND]

\**cuprea* (Rothschild, 1912) [Papua, IND; PNG]

*dampierensis* Rothschild, 1916 **syn. nov.**

*triangulum* (Gaede, 1925) **syn. nov.**

\**flavibasis* **spec. nov.** [Papua Barat, IND]

\**flavipuncta* Gaede, 1925 [PNG]

*flavobrunnea* Rothschild, 1912 [Papua-Papua Barat, IND]

\**flavogrisea* (Rothschild, 1912) [Papua-Papua Barat, IND]

\**fuscibasis* **spec. nov.** [Papua, IND]

*hypopolius* Rothschild, 1916 [Papua Barat, IND; PNG]

*tetrastigmata* Rothschild, 1915

*laniafera* Hampson, 1900 [Papua-Papua Barat, IND]

\**longiductus* **spec. nov.** [Papua, IND]

\**marginata* **spec. nov.** [Papua Barat, IND]

\**nigrescens* **spec. nov.** [Papua Barat, IND]

\**orbonella* Hampson, 1900 [Papua Barat, IND]

\**pallescens* **spec. nov.** [Papua Barat, IND]

*plicata* Hampson, 1900 [Papua Barat, IND]

*punctifer* Hampson, 1900 [Papua-Papua Barat, IND]

\**sibilensis* **spec. nov.** [Papua, IND]

\**tristis* **spec. nov.** [Papua, IND]

*umbrina* (Rothschild, 1915) [Papua, IND]

\**vanrossemi* **spec. nov.** [Papua Barat, IND]

### Description of the species with coloured underwings

#### ***Lambula orbonella* Hampson, 1900** (figs 1, 26-27)

*Lambula orbonella* Hampson (1900: 101); Draudt (1914: 222); Hampson (1914: 446); Strand (1922: 508)

**Holotype:** ♂ NHMUK: [Indonesia, Papua Barat], Kapaur [= Fakfak], S.W N Guinea, xii.1896, Doherty, 97-81, *Lambula orbonella*, type ♂, Hmps. n.

**Diagnosis:** The males of this species are very similar to those of *L. cuprea*, although the border of the dark margin on the hindwing is sharply defined in *orbonella* and faintly in *cuprea*. The differences with *L. arfakensis* **spec. nov.** are more distinct, the forewing costa of *orbonella* less arched than in *arfakensis*. The anal tuft of the abdomen is paler than in *arfakensis*. Thorax in *orbonella* in holotype orange-yellow, in *arfakensis* unicolorous with forewings, dark brown, but this may be subject to variation. Cucullus in male genitalia of *orbonella* narrower than in *arfakensis*, aedeagus of *orbonella* with a long slender “S”-shaped cornutus, in *arfakensis* the cornutus is shorter, thicker and almost straight. Females of *orbonella* are still unknown but it is to be expected that they will resemble those of *arfakensis* in appearance. Female unknown.

**Description:** ♂ 8 mm. Head orange-yellow with usually a black dot on the cranium. Antenna scarcely ciliate, alternating yellow and black ringed, distally more yellow. Thorax orange-yellow with some dorsal black dots, legs yellow. Abdomen dark brown with a yellow-brown anal tuft covering the external valvae.

Forewing with costa regularly arched and with a narrow fold along the apical half of the costa. Dorsum convex, together with the arched costa resulting in a short rounded termen. Forewing unicolorous dark brown except for the yellow base of the wing.

Hindwing yellow with a dark brown margin, narrowly running from tornus to halfway the termen, from there broadly running to the costa and with a shallow tooth in the middle. Costa of hindwing grey-brown with the edge of the suffusion not sharp.

Male genitalia: Uncus small, slender and finger-shaped with a sharp apex. Tegumen thin, weakly sclerotized, vinculum broad with the caudal part concave. Saccus very shallow concave, almost straight. Valvae long and narrow, with costa of cucullus straight, basal half broadly sclerotized, distal half narrowing and with unsclerotized inner part which is covered with long hairs. Sacculus narrow based, slightly narrowing distad and extended with narrow straight process and with a distal slightly inwardly bent thorn which is exceeding the length of the cucullus. A longitudinal fold on the inner margin of the cucullus which is slightly broader in the middle. The center of the valve hardly sclerotized. Aedeagus tube-shaped, distally narrowing. Vesica with one long slender needle-shaped cornutus which is basally broader and S-curved, apex of base sharply beak-shaped.

**Distribution:** The species is with certainty only known from its type locality, Kapaur (= Fakfak, Onin Peninsula, West Papua).

***Lambula arfakensis* spec. nov.** (figs 2-3, 28-29, 46-47)

urn:lsid:zoobank.org:act: 0B8D2BC5-35A5-4904-8A45-018C28FC3782

**Holotype:** ♂ RMNH.INS.910531: Indonesia, Irian Jaya, Birdshead Peninsula, Warkapi (nr Breie), primary lowland forest, 500 m, at light, 12.xi.1993, A.J. de Boer, A.L.M. Rutten & R. de Vos, [former] collectie Zoölogisch Museum Amsterdam.

**Paratypes** (1 ♂, 8 ♀♀): 1 ♂ RMNH.INS.1108489, 4 ♀♀ RMNH.INS.1108490, 1108512-1108514: same as holotype; 1 ♀ RMNH.INS.1108491: Indonesia, Irian Jaya, Birdshead Peninsula, Prafi, 200 m, 15 km W Andai, 0° 52'S 133° 53'E, 13.ii.1996, at light, secondary forest, ZMA-exp. 1996, [former] collectie Zoölogisch Museum Amsterdam; 2 ♀♀ RMNH.INS.1108492-1108493: Indonesia, Papua Barat, Birdshead Peninsula, Arfak Mountains, Maripi, 112 m, 0° 55'S 133° 58'E, 19.xi.2011, at light, Papua Insects Foundation; 1 ♀ RMNH.INS.1108515: Indonesia, Irian Jaya, Birdshead Peninsula, Arfak Mts, Warmare Dua, 300 m, 0° 58'S, 133° 53'E, 27.ii.1996, at light, primary forest/cultiv. area, ZMA-exp. 1996, [former] Collectie Zoölogisch Museum Amsterdam.

**Diagnosis:** Similar to *L. orbonella* (see above), however, the forewing costa of *arfakensis* in males much stronger arched than in *orbonella*. The anal tuft of the abdomen is dark, while in *orbonella* it is pale. Aedeagus of *arfakensis* almost straight, shorter and thicker than in *orbonella*. Females with normal shaped forewings, hindwings like in male with yellow center.

**Description:** ♂ 8-9 mm; ♀ 9-10 mm. Male: Head dark brown with some scattered orange scales. Antenna like in *orbonella*, alternating yellow and black ringed, distally more yellow. Thorax dark brown with yellow patches, legs yellow with dark brown bands. Abdomen dark brown with a dark buff anal tuft.

Forewing with costa strongly arched and with a fold in the curve of the costa. Dorsum slightly convex, together with the arched costa resulting in a short almost straight termen. Forewing unicolorous dark brown except for some dark yellow at the base of the wing.

Hindwing similar to that of *orbonella*, yellow with a dark brown margin, narrowly running from tornus to halfway the termen, from there broadly running to the costa and with a shallow tooth in the middle.

Female: Head and thorax dark yellow with on the cranium, between the antennae, a black dot. Antenna thin with short cilia, alternate with black and yellow rings. Abdomen dark brown,

distal end yellow. Legs yellow with broad dark brown bands, tarsi yellow. Forewings of normal shape, rather long, almost unicolorous brown which can be paler or darker. The very wingbase of the forewings yellow. Hindwings like in male, yellow with dark brown margin, which is narrow from tornus to halfway termen and then broadly running towards the grey-brown costa with a tooth in the middle.

Male genitalia: Uncus small, finger-shaped and slightly curved with a sharp apex, larger and thicker than in *orbonella*. Tegumen thin, weakly sclerotized, vinculum and saccus broad, with a more or less straight caudal rim. Valvae elongate, with costa of cucullus slightly sinuous, basal half broadly sclerotized, distal half gradually less sclerotized towards the blunt apex, much broader than in *orbonella*, covered with long hairs. Sacculus narrow based, slightly narrowing distad and extended with narrow straight process and with a distal thorn which is exceeding the length of the cucullus like in *orbonella*. A broad longitudinal fold on the inner margin of the cucullus which is gradually narrowing towards the extension of the sacculus. The center of the valve less sclerotized. Aedeagus tube-shaped, distally slightly narrowing. Vesica with one long needle-shaped cornutus which is significantly broader than in *orbonella* and at the full length almost equal in thickness, only slightly curved in the middle, apex of base faintly hook-shaped.

Female genitalia: Antrum strongly sclerotized, flattened and with a twist to the left side and with a fold on the right side. Ductus bursae S-curved, rather long, first half slightly sclerotized with a clear core, second half towards bursa copulatrix unsclerotized. Cervix bursae at the top of the bursa, with the ductus seminalis at the right side. Bursa copulatrix oval shaped with two signa. Both signa identical, quite large, broadly trumpet-shaped with the pointed side with a curled blunt apex, edges of signa strongly dentated.

**Distribution:** The species is restricted to the Arfak Mountains, Birdshead Peninsula, Papua Barat, Indonesia.

**Etymology:** The name *arfakensis* refers to its type locality.

***Lambula cuprea* (Rothschild, 1912)** (figs 4-5, 30-31, 48-49)

*Ilema cuprea* Rothschild (1912: 221)

*Lithosia cuprea*: Draudt (1914: 209)

*Lambula dampierensis* Rothschild (1916: 332); Strand (1922: 507) **syn. nov.**

*Darantasia triangulum* Gaede (1925: 242) **syn. nov.**

**Holotype** *Ilema cuprea*: ♀ NHMUK: Kumusi R., N.E.Brit.N.Guin., low elev., viii.[19]07. (A.S. Meek), *Ilema cuprea* Type Rothschild, Rothschild Bequest, B.M. 1939-1.

**Syntype** *Lambula dampierensis*: 1 ♀ NHMUK: Dampier Isl., ii-iii.1914, (Meek's Expedition), *Lambula dampierensis* Type Rothschild, Rothschild Bequest, B.M. 1939-1.

**Holotype** *Darantasia triangulum*: ♀ MFNB: D[deutsch].N[eu].Guinea 1913, Hauptlg.b.Malu I-II., Kais.Augustaf. Exp., Bürgers S.G., Type.

**Diagnosis:** Males very similar to those of *orbonella*, although the border of the dark margin in the hindwing is faintly defined in *cuprea* while in *orbonella* this is sharp. Females are easily distinguished by the yellow pattern on the brown forewings (triangular patch and thin line), while in *arfakensis* the forewings are unicolorous brown.

**Description:** ♂ 8 mm; ♀ 9-10 mm. Male: Head and thorax dark yellow, head with a black spot on cranium between the antennae and a dark patch behind it, thorax with broad dark brown bands. Antennae brown-yellow, dark rings faintly visible. Abdomen dark brown, but first two segments buff, anal tuft dark yellow. Legs yellow.

Forewings of similar shape as in *orbonella* but costal fold in *cuprea* longer, dark brown with wingbase yellow. Hindwings yellow with a dark margin which runs from tornus to costa, gradually broadening and with a faint border, not sharply defined as in *orbonella*.

Female: Head and thorax orange-yellow, head with a tiny black spot between the antennae. Abdomen dark brown with the tymbal plates pale yellow and with an orange distal segment which colour continues at the underside of the abdomen. Legs yellow.

Forewings of normal shape, brown with a violet shimmer, especially at the basal half. Wingbase yellow, a yellow cubital vein and a yellow patch above it in the middle part of the cell. Hindwings like in male, yellow with a broadening dark brown margin of which the border is not sharply defined.

Male genitalia: Uncus claw-shaped, compared to *orbonella* and *arfakensis* quite large and robust. Tegumen long and thin, vinculum broad, strongly sclerotized and with the saccus widely concave. Valvae slender, over full length almost equal broad. Cucullus with straight costa, at apex rounded, covered with shorter and longer setae. Sacculus stronger sclerotized than cucullus, stretched, distally extended by a slender sharply pointed process of which the apex is curved inwards. In the center of the sacculus a small ridge. Aedeagus bottle-shaped with a long and slender vesica. A relatively short narrow needle-shaped cornutus which has a long barb at the base.

Female genitalia: Ostium rim almost straight but irregular. Antrum strongly sclerotized, first part funnel-shaped, continued by a broad flattened ribbon-shaped part which is curved to the left. Ductus bursae very broad and flattened which is curved to the right, with a more or less sclerotized core. Strongly constricted and wrinkled continued by the cervix bursae which is cap-shaped and carries the ductus seminalis at the right side. Bursa copulatrix globular with two distinct signa. Signa trumpet-shaped with the pointed side with a blunt curled apex. One side of the trumpet-part extended, the trumpet-mouth wide with at one side a triangular-shaped extended sclerotization, edges of the signa dentated.

**Distribution:** The species is found in the eastern half of New Guinea: Papua New Guinea and Dampier Island, and recently some localities are known in the eastern part of Papua, Indonesia (Mamberamo River, Jayawijaya Mountains, Star Mountains and Foja mountains).

### ***Lambula biplagiata* (Gaede, 1925)** (figs 6, 50-51)

*Darantasia biplagiata* Gaede (1925: 242)

**Holotype:** ♀ MFNB: D[deutsch]. N[ew]. Guinea 1913, Hauptlg. b. Malu I-II., Kais. Augustafl. Exp., Bürgers S.G., Type.

**Diagnosis:** Females of this species are easily distinguished from all others in the group by the strong yellow pattern on the forewings (yellow hind margin, costal patch and stretched patch on the cubital vein). The distal part of the abdomen in females yellow. Male is unknown.

**Description:** ♀ 9-10.5 mm. Head and thorax dark yellow, head with a black spot between the antennae, in some specimens the thorax can partly be suffused with dark brown. Abdomen dark brown, first segment, including the tymbal plates, buff coloured, distal segment yellow which is continued at the underside of the abdomen. Legs yellow.

Forewings of normal shape, ground colour dark brown with violet shimmer, a strong dark yellow wing pattern: a broad margin along the termen, wingbase, costal and dorsal rim, a subapical costal patch and a large stretched patch above the cubital vein running into the cell, cubital vein yellow. Hindwing pale yellow with a broad dark brown margin, broadening towards costa and not sharply bordered.

Female genitalia: Ostium narrow with an excavated rim. Antrum sclerotized and elongated funnel-shaped. Ductus bursae broad with one short coil and one wide coil, the last one with a strongly sclerotized left side, followed by the narrow tube-shaped ductus. Cervix bursae very simple as a cap on top of the bursa copulatrix, without wrinkles, the ductus seminalis originating from the apex. Bursa copulatrix oval shaped with two trumpet-shaped signa. Signa with the edges heavily dentated, the pointed side blunt and slightly curved, the trumpet-mouth at one side extended with an extremely irregular rim.

**Distribution:** Known from its type locality in Papua New Guinea and from two localities in Papua, Indonesia (Getentiri and Vriendschap River).

***Lambula flavibasis* spec. nov.** (figs 7-8, 32-33, 52-53)

urn:lsid:zoobank.org:act: 89CFAC0F-7FA0-4147-93AD-85CE4DDB2A9D

**Holotype:** ♂ RMNH.INS.1108494: Indonesia, Papua Barat, Onin Peninsula, Huri-Mber, 607 m, 2° 46'26"S 132° 18'47"E, 1-2.xi.2014, at light, Leg. S. & J. Sinnema, F. Groenen & P.J. Zumkehr, Papua Insects Foundation.

**Paratypes** (1 ♂, 1 ♀): 1 ♂ RMNH.INS.910543, 1 ♀ RMNH.INS.1108495: same as holotype.

**Diagnosis:** The species somewhat resembles *arfakensis* with its strongly arched costa of the forewing in males but the base of the forewing is in *flavibasis* much more extended with yellow. The dark margin on the hindwings is much broader. The female has a faint yellow line on the fold of the forewing.

**Description:** ♂ 8.5 mm; ♀ 8.5 mm. Male: Head and thorax orange-yellow, no black dot present (on holotype), but this might vary. Antennae yellow without dark rings. Abdomen dark brown, almost black, with the first segment yellow and with a yellow anal tuft. Legs yellow with a narrow black band on the tibia. Forewings like in *arfakensis* strongly arched at the costa, dorsum almost straight, the costal fold running from base to subapical position where the costa is slightly constricted. Ground colour dark brown with a broad yellow wingbase, broader than any of the other treated species. Hindwings yellow with a broad dark brown margin and with a tooth in the middle of the border.

Female: Head and thorax yellow, head with a large round patch on the cranium between the antennae, thorax with two broad brown parallel longitudinal bands. Abdomen dark brown or black with the tymbal plates yellow and with the distal end yellow which is continued at the underside of the abdomen. Legs yellow with a broad black band on the tibia. Forewings of normal shape, rather narrow. Ground colour dark brown, the wingbase yellow and a yellow

cubital vein. Hindwings yellow with a black margin which runs from tornus to costa, at the apex very broad.

Male genitalia: Uncus small and sharply claw-shaped. Tegumen long and narrow with a thin rim. Tegumen wide with a deeply divided two-lobed saccus. Valvae very slender and elongate, cucullus straight and narrow which is covered with setae, apically rounded. Sacculus narrow and elongate with a slender process which is strongly curved inwards and with a sharp apex. Aedeagus broadly bottle-shaped, apically gradually narrowing. Vesica with long and slender sinuous needle-shaped cornutus, at its base slightly broader with some tiny thorns.

Female genitalia: Ostium wide with a concave rim, antrum sclerotized, broad, short and flattened without curve. Ductus bursae broad with one coil near the antrum, no significant sclerotization. Cervix bursae cap-shaped at the right side of the top of the bursa copulatrix. The bursa copulatrix oval shaped with two trumpet-shaped signa which are flattened and almost without teeth, at the trumpet-mouth at one side widely regularly extended, the pointed side with a blunt rectangular apex.

**Distribution:** Only known from the type locality in the Onin Peninsula, Papua Barat, Indonesia.

**Etymology:** The name *flavibasis* refers to the relatively broad yellow forewing base.

***Lambula nigrescens spec. nov.*** (figs 9-10, 34-35, 54-55)

urn:lsid:zoobank.org:act: 4EB326A7-3D47-4D10-9F9E-CB064023B9B2

**Holotype:** ♂ RMNH.INS.1108516: Indonesia, Papua Barat, Birdshead Peninsula, Tamrau Plateau, Senopi, 476 m, 0° 50'S 132° 55'E, 21-23.xi.2011, at light, Papua Insects Foundation.

**Paratypes** (2 ♂♂, 5 ♀♀): 2 ♀♀ RMNH.INS.1108517-1108518: same as holotype; 1 ♂ RMNH.INS.1108496, 3 ♀♀ RMNH.INS.1108497, 1108519-1108520: Indonesia, Papua Barat, Onin Peninsula, Huri-Mber, 607 m, 2° 46'26"S 132° 18'47"E, 1-2.xi.2014, at light, Leg. S. & J. Sinnema, F. Groenen & P.J. Zumkehr, Papua Insects Foundation; 1 ♂ RMNH.INS.1108498: Indonesia, Irian Jaya, Birdshead Peninsula, Arfak Mts, Warmare Dua, 300 m, 0° 58'S, 133° 53'E, 27.ii.1996, at light, primary forest/cultiv. area, ZMA-exp. 1996, [former] Collectie Zoölogisch Museum Amsterdam.

**Diagnosis:** Males have the forewings black without yellow base, the hindwings yellow with a broad dark margin. Head and thorax black. The presumed females are much different from males, cinnamon-coloured forewings and totally black hindwings.

**Description:** ♂ 8-8.5 mm; ♀ 8.5-10 mm. Male: Head, antennae and thorax entirely black. Abdomen black, but with the first segment and tymbal plates buff, anal tuft dark brown. Legs yellow with tibia and tarsi dark grey. Forewing with costa only arched in basal half, costal fold narrow, running from base to subapical area. Ground colour black or very dark brown with only slightly yellow at the very wingbase. Hindwing yellow with a broad black margin, from tornus to costa gradually broadening.

Female: Judging the simultaneously capture of males and females on different localities, the in appearance very different females are presumed to belong to this species. However, as long as molecular proof or a recorded copulation does not exist it will be uncertain if both, male



and female, really belong to the same species. For the time being it is considered that they do belong to one species.

Very similar to *flavogrisea* (see below), but clearly different in genitalia. Head and thorax orange-yellow without any pattern, antenna brown. Abdomen black, yellow at the ventral side. Legs yellow. Forewings of normal shape, yellow and densely sprinkled with brown scales giving the wings a yellow ochre appearance, wingbase and costal rim in the subapical and apical zone yellow. Apical fringes slightly suffused. Hindwing black, dorsum buff, a reddish-yellow fringeline.

Male genitalia: Uncus claw-shaped with sharp apex. Tegumen slightly sclerotized, at base of uncus a sclerotized manchet. Vinculum with a very wide saccus with two broad rounded lobes. Valvae rather broad compared to the previous species. Cucullus with costa straight and at basal half sclerotized, at distal half slender, extended and unsclerotized and covered with setae, apex with a blunt point. Sacculus broadly based, gradually narrowing towards the long and slender process which is curved inwards and with a sharp apex. An elongated narrow ridge runs from base into a slender, slightly sinuous clasper with a club-shaped apex. Aedeagus tube-shaped, vesica with a thick and rather short needle-shaped cornutus which has an elongated ridge at both sides and is slightly curved.

Female genitalia: Ostium hardly sclerotized, antrum slightly sclerotized and forms a rather long straight broad tube. The unsclerotized ductus bursae continues with a coil and is ribbon shaped with a shield-shaped plate from where it deforms in a short wrinkled tube. The cervix bursae is shallow cap-shaped, integrated in the top of the bursa copulatrix, with the ductus seminalis at the left side. Bursa copulatrix globular with two trumpet-shaped signa, which are rather small with the pointed part blunt and curved up, trumpet-mouth with one side extended, edges of the signa with tiny teeth.

**Distribution:** Found at moderate altitudes in the Birdshhead Peninsula and Onin Peninsula, Papua Barat, Indonesia.

**Etymology:** The name *nigrescens* refers to the black forewings of the male.

***Lambula flavogrisea* (Rothschild, 1912)** (figs 11, 56-57)

*Polosia flavogrisea* Rothschild (1912: 216); Draudt (1914: 218)

*Lambula flavogrisea*: Hampson (1914: 447); Strand (1922: 508)

**Holotype:** ♀ NHMUK: nr. Oetakwa R., Snow Mts., Dutch N. G., up to 3500 ft., x. xii. 1910 (Meek), *Polosia flavogrisea* Type Rothsch., Rothschild Bequest, B.M. 1939-1.

**Diagnosis:** The females are resembling those of *nigrescens* but in *flavogrisea* the ground colour of the forewings are paler cinnamon and with the apical fringes black to half the termen, while in *nigrescens* the fringes are only slightly suffused in the apex. The genitalia of both species are distinctly different. Male unknown.

**Description:** ♀ 9.5 mm. Very similar to the female of *nigrescens* (see previous species). Head and thorax orange-yellow without any pattern. Antenna brown. Abdomen dorsally dark brown, ventrally yellow. Legs yellow with some dark brown bands on tibia and femur.

Forewings of normal shape, ground colour cinnamon, without dark scales. Fringes from apex to halfway termen grey-brown. Hindwings identical to those of *nigrescens*, black with a reddish-yellow fringeline, costa pale buff, dorsum black.

Female genitalia: Ostium rim straight but irregular. Antrum sclerotized, funnel-shaped with the spout slightly curved to the right. Ductus bursae rather thick with one coil and wrinkled. Cervix bursae shallow, on top of the bursa copulatrix, with the ductus seminalis originating at the left side. Bursa copulatrix oval shaped, with two large signa. Signa more or less trumpet-shaped, with the pointed side undeeply furcated like a fish tail, the trumpet-mouth wide with one side triangular extended, edges of the signa dentated.

**Distribution:** Widely distributed with known localities in the Snow Mountains (Papua, Indonesia) and the Birdshead Peninsula, Papua Barat, Indonesia.

***Lambula sibilensis spec. nov.*** (figs 12-14, 36-37, 58-59)

urn:lsid:zoobank.org:act: A1D06CCF-347D-4C0C-A622-CE526047C029

**Holotype:** ♂ RMNH.INS.1108499: Indonesia, Papua, Kecamatan Oksibil, Mabilabol, 1340 m, 4°54'S 140° 37'E, 21-25.ii.2005, at light, disturbed montane forest, UNCEN-ZMA Expedition, Papua Indonesia 2005, [former] Collectie Zoölogisch Museum Amsterdam.

**Paratypes** (4 ♀♀): 4 ♀♀ RMNH.INS.1108500-1108502, 1108521: same as holotype.

**Diagnosis:** Males more or less resemble those from *orbonella* and *cuprea*, but the dark margin of the hindwing is much broader. Females with forewings variable from cinnamon with dark veins to unicolorous dark brown, hindwings with very broad dark hindmargin.

**Description:** ♂ 8.5 mm; ♀ 8.5-10 mm. Male: Head and thorax yellow, antennae dark yellow with suffused alternate rings. Abdomen dark brown with the first segment and tymbal plates yellow. Anal tuft dark yellow. Legs yellow. Forewing broad and at costa rounded near apex, with a narrow costal fold which runs from base to subapical zone. Ground colour brown, wingbase yellow. Hindwing yellow with a broad dark brown hind margin.

Female: Appears to occur in two colour forms, a brown and an orange form.

Brown form with head pale yellow with a dark patch on the cranium between the antennae, thorax darker yellow. Abdomen dark brown with the first segment, including the tymbal plates, pale yellow and with the anal segment yellow. Forewings of normal shape, brown ground colour with the basal part fading to pale yellow, including the costal rim which is pale yellow to half the wing length. Hindwing pale yellow with a very broad dark brown hind margin.

Orange form with the head and thorax orange-yellow without any pattern. Antennae dark yellow with alternate dark rings. Abdomen for the greater part dark brown, except for the first segment and tymbal plates which are buff and a dark yellow anal part. Legs dark yellow. Forewing with ground colour orange or orange-yellow which slightly fades darker distally and with all veins suffused with brown. Hindwings pale yellow with a broad dark brown hind margin, in the middle indented.

Male genitalia: Uncus slender and claw-shaped with a sharp apex. Tegumen long and thin, weakly sclerotized, vinculum broad, saccus widely concave. Valvae long and compared to other allied species rather broad. Costa of cucullus almost straight, in the middle slightly noded, over full length slightly sclerotized, apex narrow and rounded. Sacculus broadly

based, at the rim in the middle noded and extended with a slender process which is inwardly bent and carries a sharp thorn at the apex and which is exceeding the length of the cucullus. Cucullus in the center of the inner rim with a short straight narrow blunt process which is pointed towards the base of the extension of the sacculus. The center of the valve hardly sclerotized. Aedeagus tube-shaped, curved at the rim of the coecum and distally gradually narrowing. Vesica with one long slender straight needle-shaped cornutus, apex of base with an unclear thicker structure.

Female genitalia: Genitalia similar to *longiductus* (see below) but with some distinct differences. Ostium small and narrow, antrum very short, sclerotized and button-shaped. Ductus bursae narrow and extremely long, over full length to the coil ribbed like a harmonica, at the end of the ductus one coil with smooth surface and with the right side rim sclerotized and irregular. Cervix bursae integrated in the top of the bursa copulatrix, with the ductus seminalis originating at the right side. Bursa copulatrix oval shaped with two large signa. Signa widely trumpet-shaped with the pointed side blunt, the trumpet-mouth with one side extended, but both signa at a different way: the left signum extended with a rounded disc, the right signum with an excavation and folding the tissue of the bursa. The edges of the signa with tiny teeth.

**Distribution:** Found in the Sibil Valley, Star Mountains, Papua, Indonesia.

**Etymology:** The name refers to “Sibil”, which is the name of the valley where Mabilabol, the type locality, is located. It is also the name of the river, Ok Sibil, which runs through this valley and to which the village Mabilabol often is misnamed with “Oksibil”.

***Lambula longiductus spec. nov.*** (figs 15, 60-61)

urn:lsid:zoobank.org:act: 8B0F74B4-754C-494E-A88F-A808018C4FC2

**Holotype:** ♀ RMNH.INS.1108503: Indonesia, Papua, Kab. Yahukimo, Lelambo (distr. Kangguruk), 4° 01'S-139° 47'E, 900 m, at light, 24-26.x.2008, leg. P.J. Zumkehr.

**Paratype:** 1 ♀ RMNH.INS.1108504: same as holotype.

**Diagnosis:** Females with brown forewings but with the costal rim yellow. Males are yet unknown but it is expected that they will resemble those from *sibilensis*. Similar to *marginata* too but *longiductus* has a paler ground colour and no yellow wing fold. Male not yet known.

**Description:** ♀ 7.5-8.5 mm. Similar to the brown form of the female of *sibilensis*, but much smaller and with different genitalia (see below). Head orange with three dark spots, one between the antennae and two behind the antennae on the cranium. Thorax with patagia and tegulae orange, the greater part of the thorax black with some dark yellow patches. Abdomen dark brown, anal part yellow. Underside of abdomen yellow. Legs yellow.

Forewings rather broad, costal rim arched. Ground colour cinnamon-brown, very wingbase and costal rim yellow, fringes buff. Hindwings yellow with a dark grey-brown hind margin which is broad in the tornus, constricted in the subternal zone and again very broad in the apical area. Fringes buff.

Female genitalia: Ostium small but wider than in *sibilensis*, antrum sclerotized, short and bowl-shaped. Ductus bursae extremely long, but shorter and slightly broader than in *sibilensis*,

ribbed like a harmonica to the coils. At the end of the ductus bursae two open coils with the surface smooth and the right side rim broader sclerotized than in *sibilensis*, rim less irregular than in *sibilensis*. Cervix bursae clearly defined from the bursa copulatrix by a constriction between both, oval shaped and with the origin of the ductus seminalis at the top of the cervix. Bursa copulatrix globular with two identical signa (in *sibilensis* not identical). Signa perfectly trumpet-shaped with a rather sharp apex, at the trumpet-mouth one side short extended.

**Distribution:** Known from the type locality only, in the Jayawijaya Mountains, Papua, Indonesia.

**Etymology:** The name refers to the extremely long ductus bursae of the female.

***Lambula marginata spec. nov.*** (figs 16, 62-63)

urn:lsid:zoobank.org:act: 8AFF59A9-A324-4BE8-B59A-AFE2F59058B2

**Holotype:** ♀ RMNH.INS.910529: Indonesia, Irian Jaya, Birdshead Peninsula, Warkapi (nr Breie), primary lowland forest, 500 m, at light, 12.xi.1993, A.J. de Boer, A.L.M. Rutten & R. de Vos, [former] collectie Zoölogisch Museum Amsterdam.

**Paratypes** (2 ♀♀): 1 ♀ RMNH.INS.1108505: same as holotype; 1 ♀ RMNH.INS.910530: Indonesia, Irian Jaya, Birdshead Peninsula, Arfak Mts, Warmare Dua, 300 m, 0° 58'S, 133° 53'E, 27.ii.1996, at light, primary forest/cultiv. area, ZMA-exp. 1996, [former] Collectie Zoölogisch Museum Amsterdam.

**Diagnosis:** Females with forewing like in *longiductus* with a yellow costal rim but the ground colour of forewing darker and with a faint yellow wing fold. Male is yet unknown.

**Description:** ♀ 8-9 mm. Head dark yellow with three black spots, one between the antennae and two behind the antennae. Thorax with patagia and tegulae dark yellow, tegulae with the center black, the center of the thorax black. Abdomen dark brown, first segment and tymbal plates buff, anal segment yellow. Legs yellow.

Forewings of normal shape, costa not so strong arched as in *longiductus*. Ground colour dark brown, the wingbase and costal rim yellow and a yellow streak on the wing fold. Fringes pale yellow. Hindwings yellow with a very broad black wing margin which is not constricted like in *longiductus*. Fringes grey.

Female genitalia: Ostium very wide, the rim broadly sclerotized and together with the short antrum "Y"-shaped. Ductus bursae unsclerotized, rather broad and with a twist just behind the antrum. Cervix bursae integrated on the top of the bursa copulatrix with the origin of the ductus seminalis at the right side. Bursa copulatrix globular with two large signa. Signa broadly trumpet-shaped, the extension of the trumpet-mouth as large and of similar shape as the caudal part of the signum. The edges of the signum very irregular dentated.

**Distribution:** The species has been found in the northern part of the Arfak Mountains, Papua Barat, Indonesia, at moderate altitudes.

**Etymology:** The name *marginata* refers to the broad black and regular margin of the hindwings.

***Lambula costiplaga* spec. nov.** (figs 17, 38-39)

urn:lsid:zoobank.org:act: 0726FA2D-186D-47F0-823E-FC4C106DE55A

**Holotype:** ♂ RMNH.INS.1108506: Indonesia, Irian Jaya, Birdshead Peninsula, Prafi, 200 m, 15 km W Andai, 0° 52'S 133° 53'E, 13.ii.1996, at light, secondary forest, ZMA-exp. 1996, [former] collectie Zoölogisch Museum Amsterdam.

**Diagnosis:** Male with similar wing shape as in *orbonella* but ground colour much paler and with black subbasal costal patch, followed by a pale yellow central costal patch. Female unknown.

**Description:** ♂ 8 mm. Frons and vertex of head buff, cranium yellow without pattern. Antennae yellow-brown with indistinct dark rings. Thorax orange. Abdomen dark brown with the tymbal plates orange-buff, anal tuft orange-buff. Legs yellow. Forewings with costa almost straight, termen rounded, costal fold very narrow and present in the apical area. Ground colour buff with darker brown scaling, wingbase orange which is continued along the costa in the basal zone, followed by a costal black streak in the subbasal zone and a pale yellow streak in the medial zone. Marginal field pale yellow. Hindwing yellow with a dark brown margin along dorsum, very narrow along termen and broad in apical area. Fringes of hindwing dark brown.

Male genitalia: The valvae very similar to those of *sibilensis*, which are compared here, though, aedeagus distinctly different. Uncus slender and claw-shaped with a sharp apex, but somewhat shorter and thicker as in *sibilensis*. Tegumen long and thin, weakly sclerotized, vinculum broad, saccus widely concave, but less wide than in *sibilensis*. Valvae very similar to those of *sibilensis*, but narrower in *costiplaga*. Costa of cucullus almost straight, slightly sinuous, apex narrow and rounded. Sacculus broadly based, at the rim in the middle noded and extended with a slender straight process (in *sibilensis* curved inwards), apex with a noded sharp thorn. Cucullus with a straight finger-shaped process (clasper) pointing towards the base of the extension of the sacculus. The center of the valve less sclerotized. Aedeagus tube-shaped, slightly curved. Vesica with one very long (much longer than in *sibilensis*) slender faintly “S”-curved needle-shaped cornutus, apex of base with a spatula-shaped structure.

**Distribution:** Only known from the type locality, Andai, at the northeast coast of the Birdshead Peninsula, Papua Barat, Indonesia.

**Etymology:** The species name refers to the dark costal patch on the forewing.

***Lambula tristis* spec. nov.** (figs 18, 64-65)

urn:lsid:zoobank.org:act: 2925550A-4724-4625-BD63-D533F585C90C

**Holotype:** ♀ RMNH.INS.1108507: Indonesia, Papua, Kecamatan Nipsan, Walmak, 1710 m, 4°07'S - 138°36'E, 31.i-9.ii.2005, at light, cultivated area, UNCEN-ZMA Expedition, Papua Indonesia 2005, [former] Collectie Zoölogisch Museum.

**Paratypes** (3 ♀♀): 1 ♀ RMNH.INS.1108508: Indonesia, Papua, Kab. Yahukimo, Lelambo (distr. Kangguruk), 4° 01'S-139° 47'E, 900 m, at light, 24-26.x.2008, leg. P.J. Zumkehr; 2 ♀♀ KSP48735-48736: [Indonesia], Prov. Papua, Kab. Pegunungan Bintang, Borme, 900 m, 26.vii-1.viii.2006, KEP/UNCEN.

**Diagnosis:** A very dark species, females resembling those of *Lambula buergersi* (see below). Females with the forewing almost black, at very wingbase yellow and basal half with metallic bluish shimmer, hindwings with very broad dark margin. Male unknown.

**Description:** ♀ 10-10.5 mm. Head and thorax orange, in holotype (Walmak) without pattern but specimens from Borme show three weak dots on the head, one between the antennae and two behind it. Antennae orange with black alternate rings. Abdomen black, first segment and tymbal plates golden yellow, rim of anal segment yellow which is connected to the yellow underside. Legs yellow with the distal part of tibia suffused with black. Forewing with wingbase yellow, the entire rest of the forewing dark brown, in basal third with metallic bluish shimmer. Hindwing with only the wingbase pale yellow, a very broad black or very dark brown wing margin.

Female genitalia: Ostium rim almost straight, irregular and slightly sclerotized. Antrum weakly sclerotized, flat and shield-shaped with a "V"-shaped rim in the ductus bursae. Ductus bursae broad with in the middle a large even broader sclerotized collar which is ventrally open, continued by an unsclerotized part of the ductus with a longitudinal constriction. Cervix bursae large and globular with the ductus seminalis originating at the right side. Bursa copulatrix globular, twice as large as the cervix bursae with which it is broadly connected. Two large trumpet-shaped signa with a sharp apex at the pointed side, the trumpet-mouth wide with at one side extended sclerotization, edges of the signa dentated.

**Distribution:** The species is found at higher altitudes in the Jayawijaya Mountains and Star Mountains of Papua, Indonesia.

**Etymology:** The name *tristis* refers to the dark and gloomy colour and pattern of the species. The dark pattern is extremely extended, leaving hardly any yellow in the wingbases.

***Lambula buergersi* Gaede, 1925** (figs 19-20, 40-41, 66-67)

*Lambula bürgersi* Gaede (1925: 236)

**Lectotype (designated from syntype series):** ♂ MFNB: D[deutsch]. N[ew]. Guinea 1913, Hauptlg.b.Malu I-II., Kais.Augustafl.Exp., Bürgers S.G., Type.

**Paralectotype:** 1 ♀ MFNB: same as lectotype.

**Diagnosis:** Males and females entirely dark brown, except for the orange pattern on head and thorax. Most conspicuous in the male is the pale area under and around the costal pouch.

**Description:** ♂ 8 mm; ♀ 9.5 mm. Male: Head and thorax orange with intensive dark pattern, the head with three large dark patches, one between the antennae and two just behind it. Antennae orange with alternate dark rings. Thorax with four longitudinal stripes. Abdomen dark brown with the first segment and tymbal plates buff, anal tuft large and pale buff. Legs

buff with dark pattern. Forewings of male with arched costa and a large costal pouch which runs from subbasal to subapical area. Ground colour dark brown, wingbase yellow, the area under the pouch buff. Hindwings entirely chocolate brown, wingbase pale yellow which continues to halfway dorsum.

Female: Head and thorax identical to male. Antennae unicolorous brown. Abdomen dark brown, first segment and tymbal plates buff. Anal segment slightly paler, yellowish. Ventral side of abdomen yellow. Legs buff. Forewings normally shaped, entirely dark grey-brown, except for the orange wingbase. Hindwings entirely grey-brown, at wingbase with pale yellow. Male genitalia: Uncus rather short and claw-shaped with a sharp apex. Tegumen long and thin, weakly sclerotized, vinculum rather thin, but with a large saccus which is laterally robust with a thick rim, bifurcate. Valvae ear-shaped, cucullus rather broad with round apex, costa of cucullus in apical half gradually bent. Sacculus broadly based, apical half broader than basal half. A flat spatula-shaped clasper obliquely running from cucullus towards base of apical process of the sacculus, at basal side with a tooth. Process of sacculus rather short, finger-shaped, almost straight and with a blunt apex. The center of the valve less sclerotized. Aedeagus long and slender, slightly constricted at two places. Vesica covered with two bands of tiny spicula and with one needle-shaped cornutus which is rather short compared to other species, base of cornutus spoon-shaped.

Female genitalia: Ostium rather small, slightly sclerotized. Antrum small shield-shaped, stronger sclerotized than ostium. Distal half of the bursa copulatrix ribbon-shaped and sclerotized, gradually retracting to the left rim of the bursa and curled to the right, second half of the ductus bursae unsclerotized and evenly broad. Cervix bursae unsclerotized, wrinkled and on top of the bursa copulatrix, ductus seminalis originating at the right side. Bursa copulatrix globular, with two broad trumpet-shaped signa, trumpet-mouth at one side irregularly extended, roughly dentated, base of trumpet broadly blunt.

**Distribution:** Known from the type locality, Malu at the Sepik River in Papua New Guinea and recently found in the Foja Mountains in Hotice Camp of the Foja Expedition in 2005, Papua, Indonesia.

### ***Lambula flavipuncta* Gaede, 1925** (fig. 21)

*Lambula flavipuncta* Gaede (1925: 235)

**Holotype:** ♀ MFNB: D[deutsch]. N[ew]. Guinea 1913, Hauptlg.b.Malu I-II., Kais.Augustafl.Exp., Bürgers S.G., Type.

**Note:** The type specimen must be considered as lost since the parcel with the actual specimen has been disappeared in the mail.

**Diagnosis:** Forewings somewhat similar to those of *cuprea* with its yellow markings, but in *flavipuncta* this pattern is faint instead of sharp and the hindwings are unicolorous grey. Male unknown.

**Description:** ♀ 9 mm. Female: Head and thorax pale yellow with heavy grey pattern. Head with a trapezium-shaped patch between the antennae, thorax with patagia, tegulae and actual thorax suffused with grey patches. Abdomen grey-brown, first segment and tymbal plates pale yellow. Ventral side of abdomen yellow. Legs yellow. Forewing pale brown with

costa and dorsum with a yellow rim. A round pale yellow patch between cubital vein and anal vein distad from the center of the wing. Hindwings grey-brown, at base pale yellow. Female genitalia not studied.

**Distribution:** Only known from the type locality, Malu at the Sepik River in Papua New Guinea.

***Lambula albicentra spec. nov.*** (figs 22, 68-69)

urn:lsid:zoobank.org:act: 2D758A52-83AF-4C9E-897F-DFB87D785B02

**Holotype:** ♀ RMNH.INS.1108509: Indonesia, Papua, Kecamatan Nipsan, Walmak, 1710 m, 4°07'S - 138°36'E, 31.i-9.ii.2005, at light, cultivated area, UNCEN-ZMA Expedition, Papua Indonesia 2005, [former] Collectie Zoölogisch Museum.

**Paratype:** 1 ♀ RMNH.INS.1108510: Indonesia, Papua, Kab. Yahukimo, Walmak (distr. Nipsan), 1710 m, 4° 07'S - 138° 36'E, 24-29.x.2008, at light, leg. R. de Vos & P.J. Zumkehr, [former] Collectie Zoölogisch Museum.

**Diagnosis:** Female with forewing unicolorous grey-brown, hindwing white with dark margin. Male unknown.

**Description:** ♀ 9 mm. Head and thorax buff, head with one black spot between the antennae. Antennae dark brown. Abdomen black, anal tip whitish. Legs buff with distal half of tibia black. Forewings rather long and narrow. Ground colour buff without any pattern. Hindwings white with a black margin, running from tornus and constricted in the subternal area, in apical area very broad. The border of the dark margin with the white center is diffuse.

Fringes of both wings pale grey.

Female genitalia: Ostium sclerotized, half circular with a broad folded rim. Antrum small, indistinct. Ductus bursae rather long, almost at full length wrinkled like a harmonica, caudal part near cervix bursae sclerotized with two coils, like a cochlea, last coil with an irregular rim. Cervix bursae cap-shaped with smooth surface, ductus seminalis originating at the right side. Bursa copulatrix globular with two trumpet-shaped signa. Signa with trumpet-mouth at one side extended, base of trumpet with asymmetrically curled sharp apex, sides of trumpeted dentated.

**Distribution:** Only known from the type locality, the village Walmak, in the Jayawijaya Mountains, Papua, Indonesia.

**Etymology:** The name of the species refers to the white center of the hindwing.

***Lambula vanrossemei spec. nov.*** (figs 23, 42-43)

urn:lsid:zoobank.org:act: 88CFAF8D-4366-4D95-9A1E-B86B8AD3BCDB

**Holotype:** ♂ KSP-65132: Indonesia, Papua Barat, Birdshead Peninsula, Arfak Mountains, Mokwam, 1510 m, 1°06'S - 133°54'E, 6-10.xi.2011, at light, Papua Insects Foundation, [former] Collectie Zoölogisch Museum Amsterdam.

**Paratypes** (20 ♂♂): 1 ♂ KSP-65133, 19 ♂♂ RMNH.INS.1108523-1108541: same as holotype.



**Diagnosis:** Males with forewing black, the head, thorax and very wingbase rufous. Hindwings white with dark grey margin. Female unknown.

**Description:** ♂ 9-10 mm. Head and thorax rufous without pattern, metathorax black. Antennae dark brown. Abdomen black, distal half with dark blue metallic shimmer. Male valvae externally exposed and covered with dark brown scales. Legs dark brown. Forewings apically and with termen rounded. Ground colour of forewing black, very wingbase like head and thorax rufous. Hindwings white with broad grey-brown wing margin, very narrow along dorsum and from tornus to costa almost equally broad.

Male genitalia: Uncus slender claw-shaped. Tegumen rather short, vinculum with a broad widely two-lobed saccus. Valvae stretched and curved, cucullus long and rather narrow, basal half sclerotized, apical half unsclerotized with round apex, covered with setae. Sacculus rather broad with a curved outer rim, extended by a long and slender ventral curved process with a sharp apex. Base of clasper running along the cucullus and coming loose with a thumb-shaped process covered with setae and pointing at the base of the sacculus extension. Aedeagus short and tube-shaped, straight and behind the coecum slightly constricted. Vesica with one short slightly sinuous needle-shaped cornutus, base with a large arrow head.

**Distribution:** Only known from the type locality, the birdwatching centre in Mokwam, a village in the northern part of the Arfak Mountains, Papua Barat, Indonesia.

**Etymology:** The species is named in honour of Prof. Dr. Maarten van Rossem, Dutch historian, television personality, writer, columnist and former professor, for his interest in natural history, his sober but sharp look on the World and always wearing black. The species, with its black forewings but hiding the beautiful white centered hindwings and with its delicate rufous head and thorax, symbolizes that the apparently cynical and critical Maarten van Rossem in fact hides a human being with common sense and who may be more humane than one would think at first glance. Another reason would be that Maarten’s father was an entomologist who gave him some entomological ornaments in his childhood which Maarten still cherishes in his memory [quote in Dutch television program: “De Slimste Mens”].

***Lambula pallescens* spec. nov.** (figs 24, 70-71)

urn:lsid:zoobank.org:act: 2BD028D5-1ABA-4989-9EF2-326F17CE9CC1

**Holotype:** ♀ RMNH.INS.910540: Indonesia, Irian Jaya, Wandammen Peninsula, Tandia, 2° 52’S - 134° 32’E, 21.ii.1996, at light, cultivated area, ZMA-exp. 1996.

**Diagnosis:** Female with forewings pale buff, scarcely sprinkled with dark scales. Hindwings pale yellow with very broad dark hind margin. Male unknown.

**Description:** ♀ 9 mm. Head and thorax pale buff with grey suffusion. Antennae buff. Patagia with suffusion in the center, leaving the margins buff. Abdomen with first segment and tymbal plates pale buff, the center segments brown-grey and the distal part dark brown. Abdomen ventrally yellow. Legs yellow-buff. Forewings entirely pale buff, scarcely sprinkled with dark

brown scales which in the middle of the wing form an indistinct fascia. Hindwings dark grey with the basal half fading to pale buff. Fringes of fore- and hindwing grey.

Female genitalia: Ostium wide and simple, slightly sclerotized. Antrum broad, flattened and sclerotized, stretched triangular-shaped with a slight twist near the ductus bursae. Ductus bursae short with a strongly sclerotized funnel-shaped structure, continued by an unsclerotized part which is very short and ends in the long and broad tube-shaped cervix bursae. The ductus seminalis originates from a lobe near the bursa copulatrix. The cervix bursae is gradually continued by the oval shaped bursa copulatrix. Bursa copulatrix with two widely trumpet-shaped signa with a sharp basal apex and with a wide extension at one side of the trumpet mouth which pulls a long pledge at the surface of the bursa.

**Distribution:** Only known by the holotype which is found on the Wandammen Peninsula, Papua Barat, Indonesia.

**Etymology:** The name refers to the almost uniform pale colour of the forewing.

***Lambula fuscibasis spec. nov.*** (figs 25, 44-45)

urn:lsid:zoobank.org:act: 2CF6883F-4A16-46DE-90E4-89A0FC3E97FC

**Holotype:** ♂ RMNH.INS.1098919: [Indonesia], Irian Jaya, Modio, 25.v.1985, HvM[astrigt].

**Diagnosis:** Male with both wing pairs pale yellow with forewing costa dark brown subbasally, submarginally scarcely sprinkled with dark scales. Androconial patch on hindwing costa dark brown. Female unknown.

**Description:** ♂ 9.5 mm. Head, thorax and abdomen yellow-buff. Antennae yellow. The condition of the specimen is poor which makes it impossible to notice any detailed pattern on the head or thorax. Abdomen with yellow anal tuft. Legs yellow. Forewings yellow with some scarcely sprinkled brown scaling, especially in the submarginal area where it borders a slightly paler marginal zone. From base to submarginal zone a broad dark brown costal streak. The pale yellow hindwing with rounded termen and a conspicuous dark brown costal androconial patch.

Male genitalia: Uncus long and slender claw-shaped. Tegumen slightly sclerotized, at apex with two more sclerotized lobes. Vinculum stronger sclerotized with a wide saccus which is concave (in fig. 44 this is hardly visible because it is flipped over). Valvae narrow, stretched and curved. Cucullus long and narrow, basal half slightly sclerotized, apical half slender, curved and finger-shaped, unsclerotized. Sacculus narrow, following the curve of the valve, at apex rounded and extended with a long and slender claw-shaped process which is at the left valve longer than at the right valve. Aedeagus a rather long sinuous tube with one long needle-shaped cornutus with an axe-shaped base.

**Distribution:** Only known by the holotype which was found in Modio, West of the Snow Mountains, Papua, Indonesia.

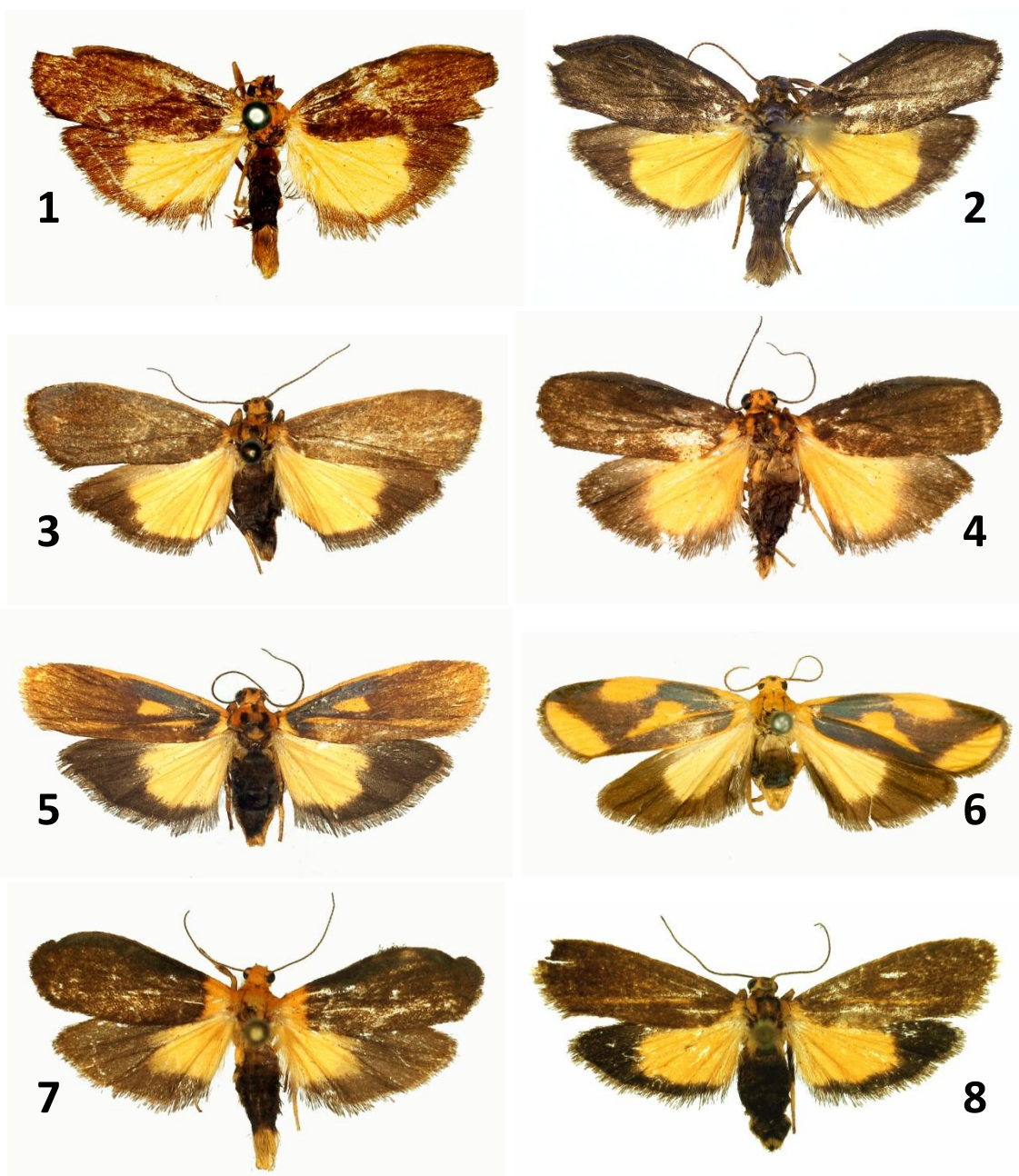
**Etymology:** The name of the species refers to the dark streak at the base of the costa of the forewing.

### Acknowledgements

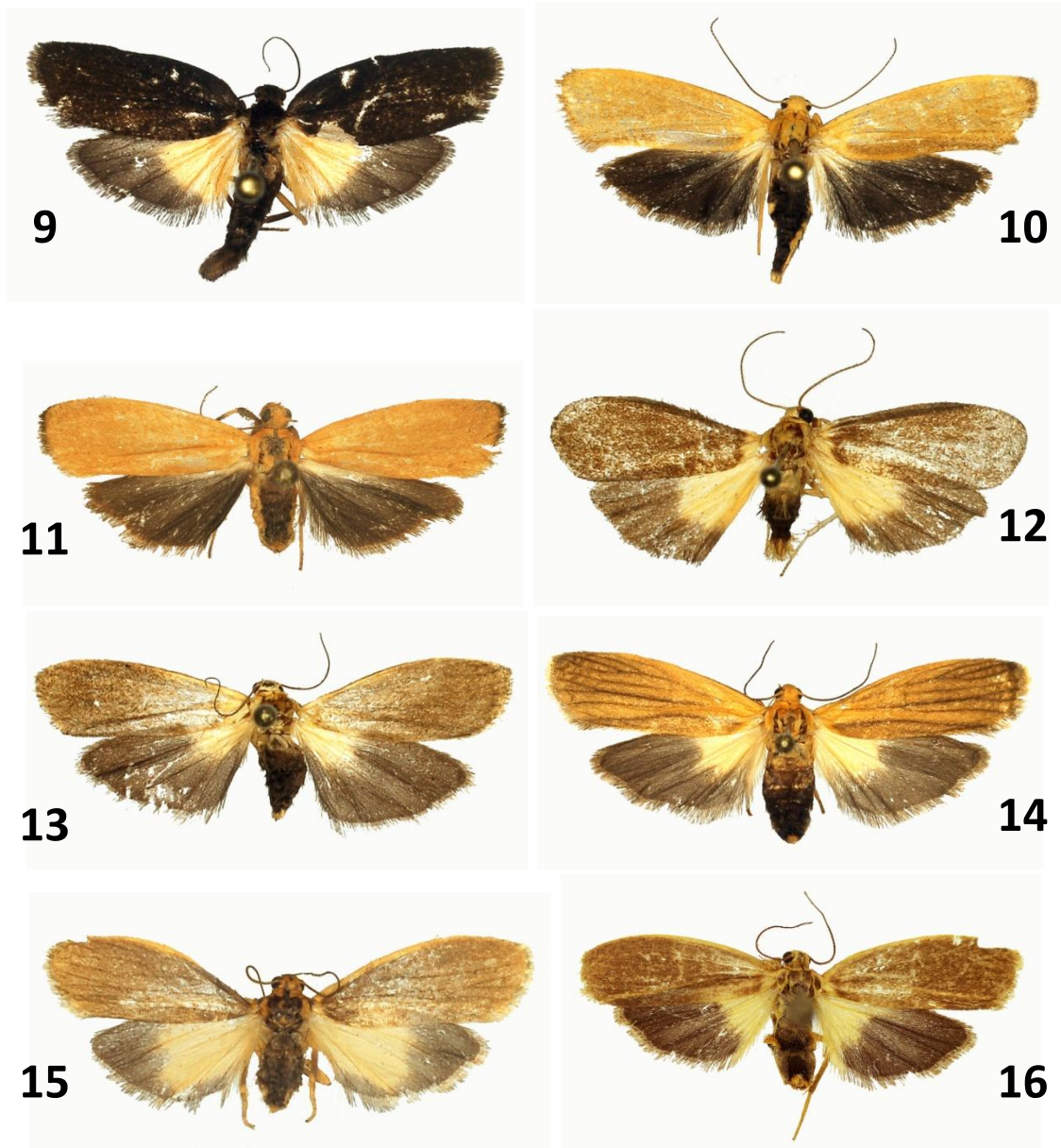
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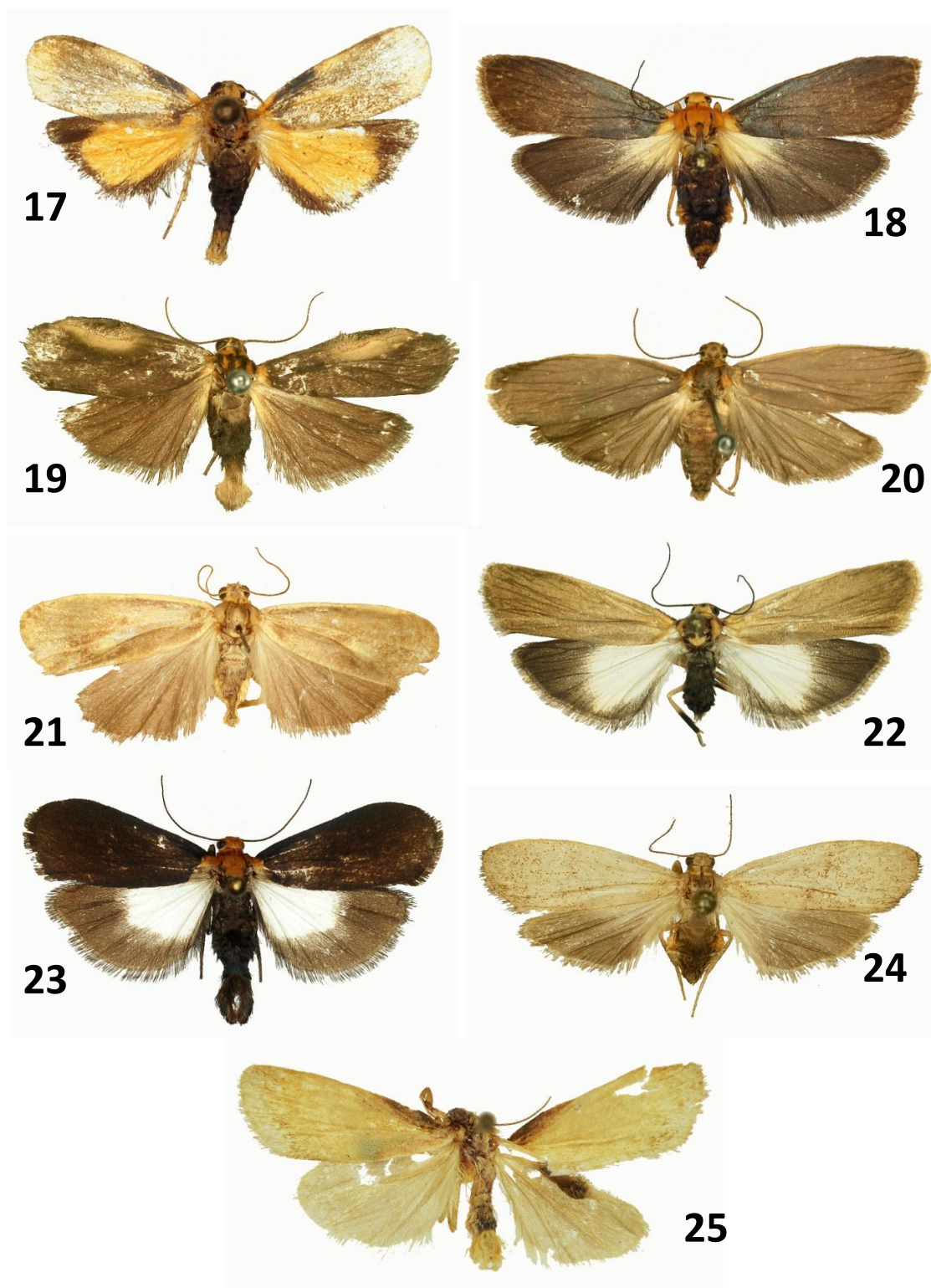
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**Figs. 1-8.** Adults of *Lambula* species. **1.** *Lambula orbonella* Hampson, 1900, ♂ holotype, Kapaur [=Fakfak], Papua Barat, Indonesia, BMNH(E)-1325422; **2.** *Lambula arfakensis* **spec. nov.**, ♂ holotype, Warkapi, Papua Barat, Indonesia, RMNH.INS.910531; **3.** *Lambula arfakensis* **spec. nov.**, ♀ paratype, Warkapi, Papua Barat, Indonesia, RMNH.INS.910532; **4.** *Lambula cuprea* (Rothschild, 1912), ♂, Lelambo, Papua, Indonesia, RMNH.INS.1108549; **5.** *Lambula cuprea* (Rothschild, 1912), ♀, Lelambo, Papua, Indonesia, RMNH.INS.1118940; **6.** *Lambula biplagiata* (Gaede, 1925), ♀ holotype, Malu, PNG, MFNB; **7.** *Lambula flavibasis* **spec. nov.**, ♂ paratype, Huri-Mber, Papua Barat, Indonesia, RMNH.INS.910543; **8.** *Lambula flavibasis* **spec. nov.**, ♀ paratype, Huri-Mber, Papua Barat, Indonesia, RMNH.INS. 1108495.



**Figs. 9-16.** Adults of *Lambula* species. **9.** *Lambula nigrescens* **spec. nov.**, ♂ holotype, Senopi, Papua Barat, Indonesia, RMNH.INS.1108516; **10.** *Lambula nigrescens* **spec. nov.**, ♀ paratype, Senopi, Papua Barat, Indonesia, RMNH.INS.1108517; **11.** *Lambula flavogrisea* (Rothschild, 1912), ♀, Prafi, Papua Barat, Indonesia, RMNH.INS.1108550; **12.** *Lambula sibilensis* **spec. nov.**, ♂ holotype, Mabilabol, Papua, Indonesia, RMNH.INS.1108499; **13.** *Lambula sibilensis* **spec. nov.**, ♀ paratype, Mabilabol, Papua, Indonesia, RMNH.INS.1108500; **14.** *Lambula sibilensis* **spec. nov.**, ♀ paratype, Mabilabol, Papua, Indonesia, RMNH.INS.1108521; **15.** *Lambula longiductus* **spec. nov.**, ♀ holotype, Lelambo, Papua, Indonesia, RMNH.INS.1108503; **16.** *Lambula marginata* **spec. nov.**, ♀ paratype, Warmare Dua, Papua Barat, Indonesia, RMNH.INS.910530.

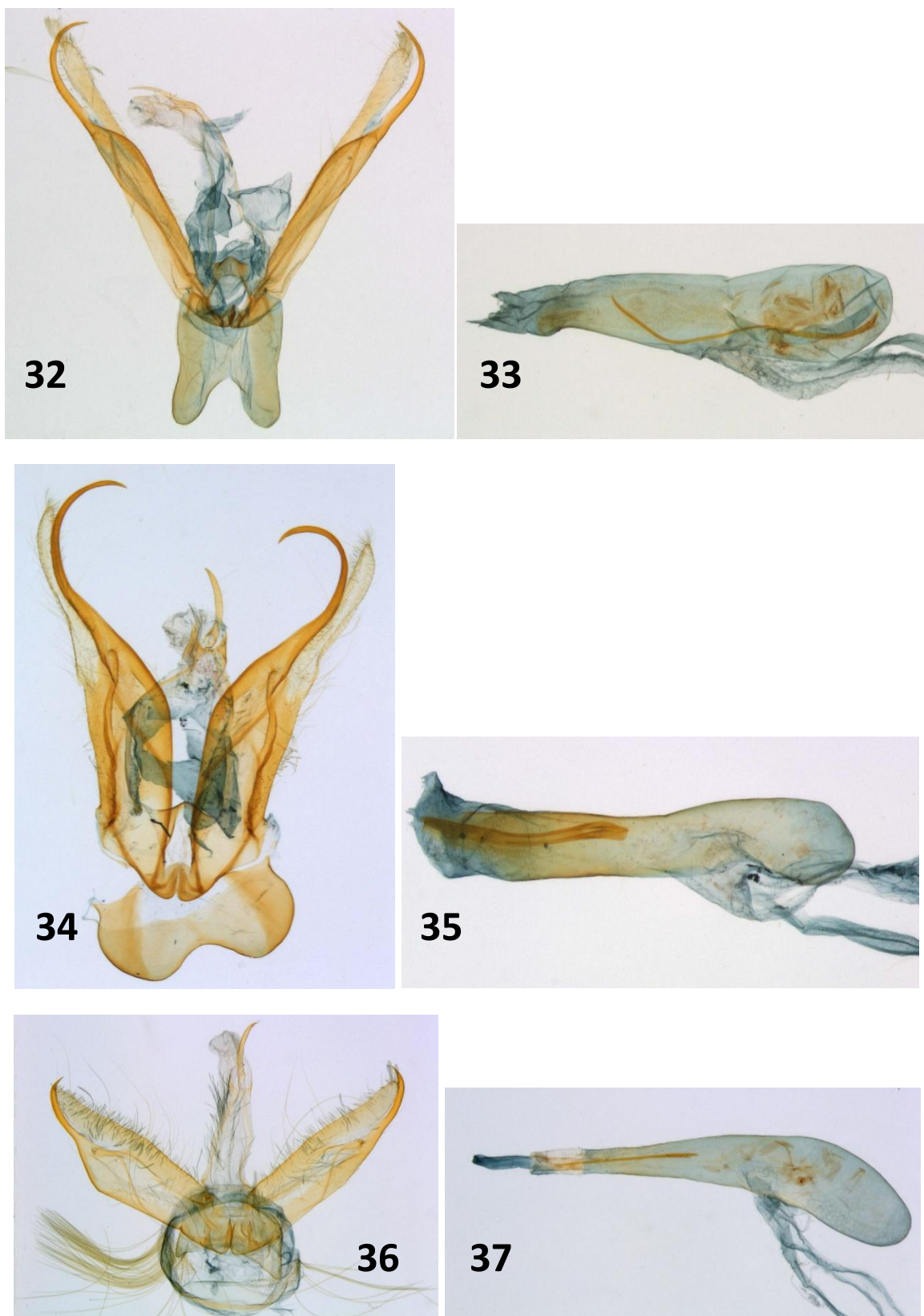


**Figs. 17-25.** Adults of *Lambula* species. **17.** *Lambula costiplaga spec. nov.*, ♂ holotype, Prafi, Papua Barat, Indonesia, RMNH.INS.1108506; **18.** *Lambula tristis spec. nov.*, ♀ holotype, Walmak, Papua, Indonesia, RMNH.INS.1108507; **19.** *Lambula buergersi* Gaede, 1925, ♂ lectotype, Malu, PNG, MFNB; **20.** *Lambula buergersi* Gaede, 1925, ♀ paralectotype, Malu, PNG, MFNB; **21.** *Lambula flavipuncta* Gaede, 1925, ♀ holotype, Malu, PNG, MFNB; **22.** *Lambula albicentra spec. nov.*, ♀ holotype, Walmak, Papua, Indonesia, RMNH.INS.1108509; **23.** *Lambula vanrossemi spec. nov.*, ♂ holotype, Mokwam, Papua Barat, Indonesia, KSP-65132; **24.** *Lambula pallescens spec. nov.*, ♀ holotype, Tandia, Papua Barat, Indonesia, RMNH.INS.910540; **25.** *Lambula fuscibasis spec. nov.*, ♂ holotype, Modio, Papua, Indonesia, RMNH.INS.1098919.



**Figs. 26-31.** Male genitalia of *Lambula* species.

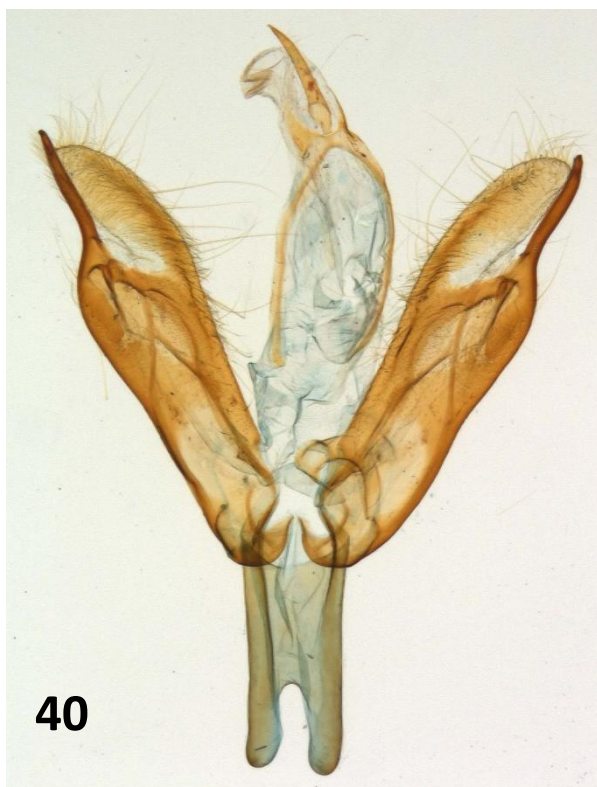
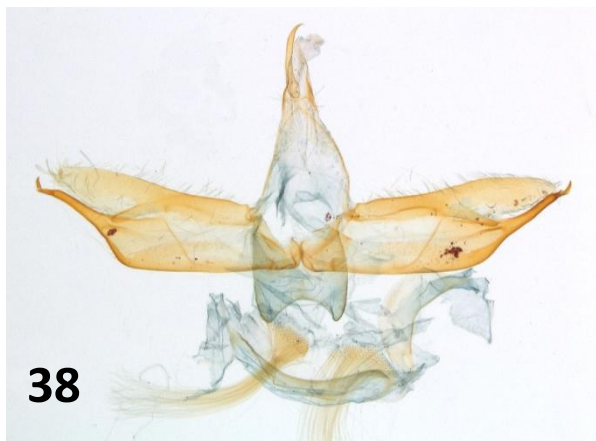
**Figs. 26-27.** *Lambula orbonella*, NHMUK-010917756, slide NHMUK-010315153: **26.** genital armature; **27.** aedeagus. **Figs. 28-29.** *Lambula arfakensis*, slide RMNH-RV1652: **28.** genital armature; **29.** aedeagus. **Figs. 30-31.** *Lambula cuprea*, slide RMNH-RV1640: **30.** genital armature; **31.** aedeagus.



**Figs. 32-37.** Male genitalia of *Lambula* species.

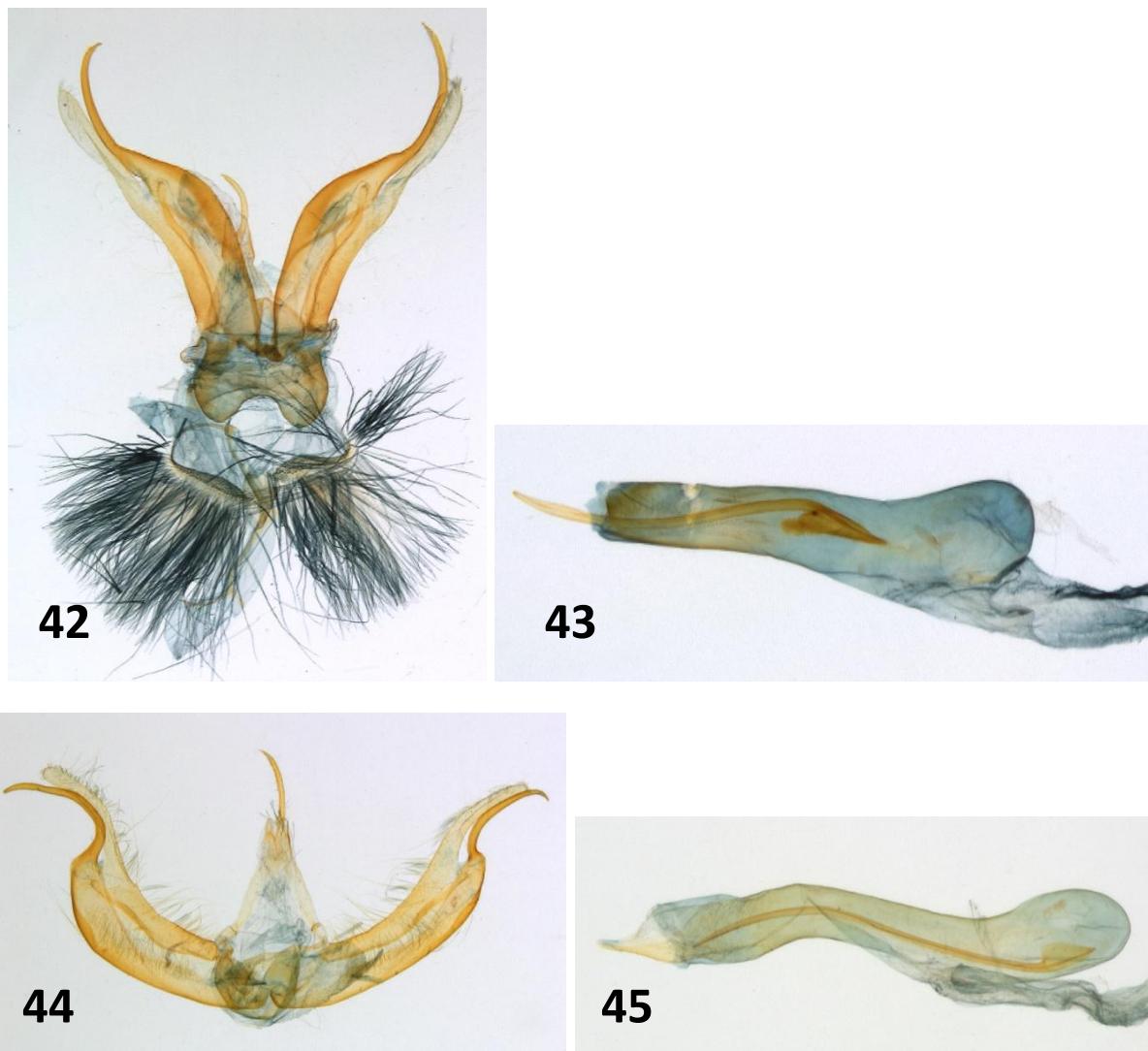
**Figs. 32-33.** *Lambula flavibasis*, slide RMNH-RV1642: **32.** genital armature; **33.** aedeagus. **Figs. 34-35.** *Lambula nigrescens*, slide RMNH-RV1628: **34.** genital armature; **35.** aedeagus. **Figs. 36-37.** *Lambula sibilensis*, slide RMNH-RV1650: **36.** genital armature; **37.** aedeagus.





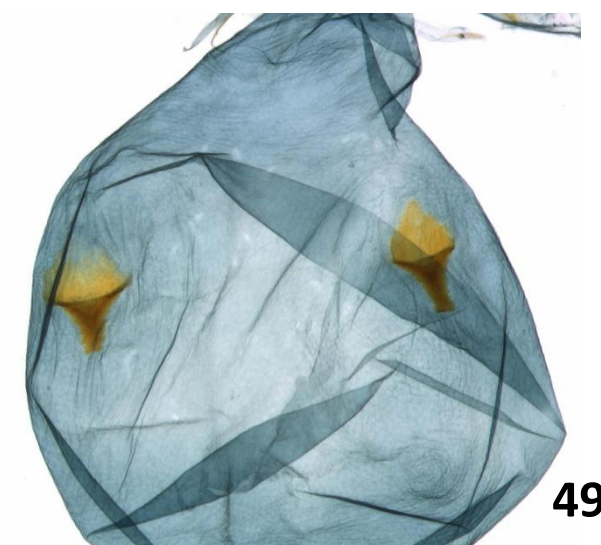
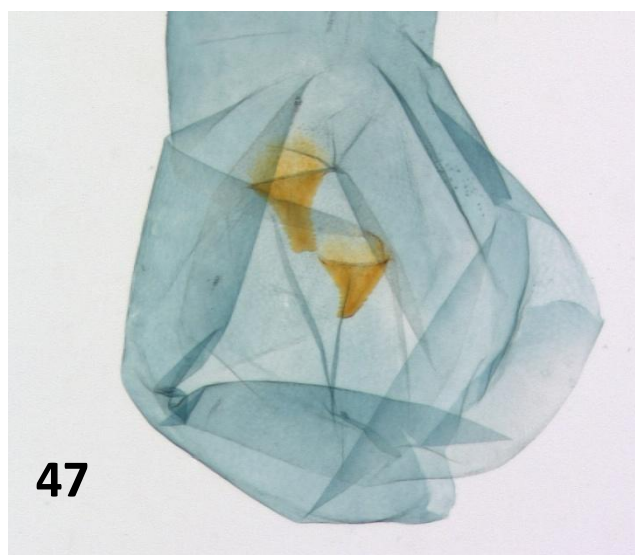
**Figs. 38-41.** Male genitalia of *Lambula* species.

**Figs. 38-39.** *Lambula costiplaga*, slide RMNH-RV1659: **38.** genital armature; **39.** aedeagus. **Figs. 40-41.** *Lambula buergersi*, slide MFNB-RV1679: **40.** genital armature; **41.** aedeagus.



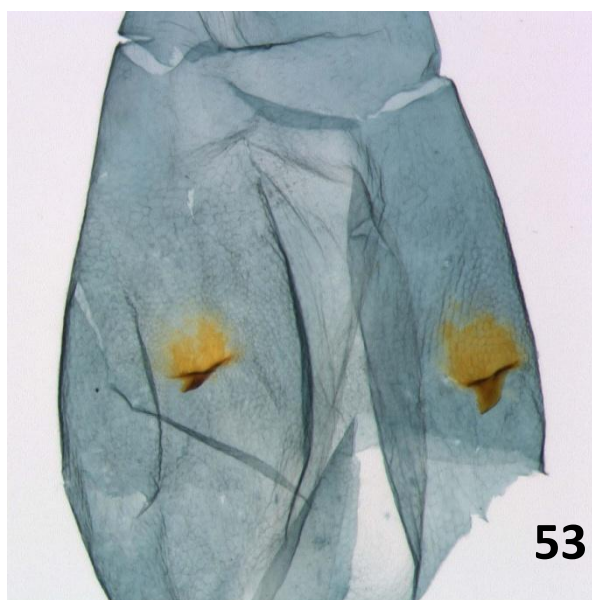
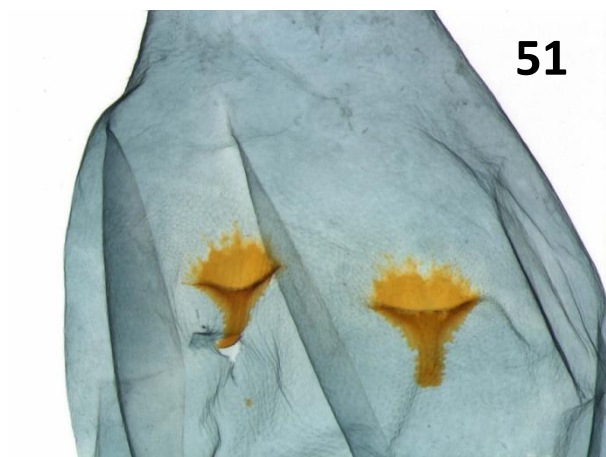
**Figs. 42-45.** Male genitalia of *Lambula* species.

**Figs. 42-43.** *Lambula vanrossemi*, slide RMNH-RV1666: **42.** genital armature; **43.** aedeagus. **Figs. 44-45.** *Lambula fuscibasis*, slide RMNH-RV1672: **44.** genital armature; **45.** aedeagus.



**Figs. 46-49.** Female genitalia of *Lambula* species.

**Figs. 46-47.** *Lambula arfakensis*, slide RMNH-RV1663: **46.** genital; **47.** signa. **Figs. 48-49.** *Lambula cuprea*, slide RMNH-RV1636: **48.** genital; **49.** signa.



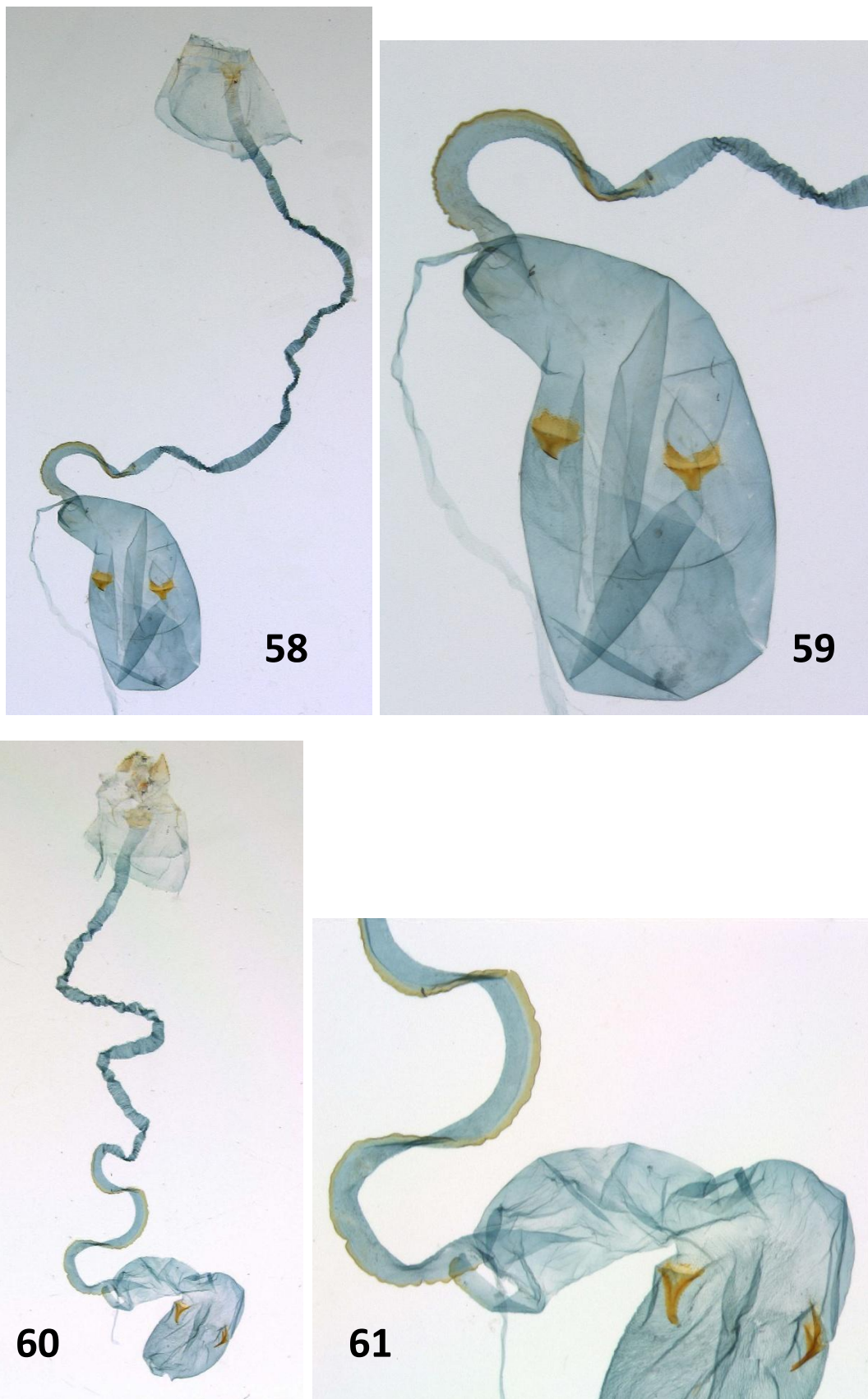
**Figs. 50-53.** Female genitalia of *Lambula* species.

**Figs. 50-51.** *Lambula biplagiata*, slide RMNH-RV1614: **50.** genital; **51.** signa. **Figs. 52-53.** *Lambula flavibasis*, slide RMNH-RV1643: **52.** genital; **53.** signa.

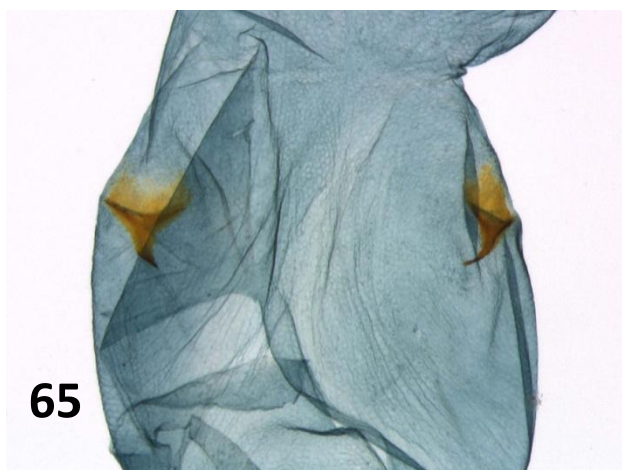
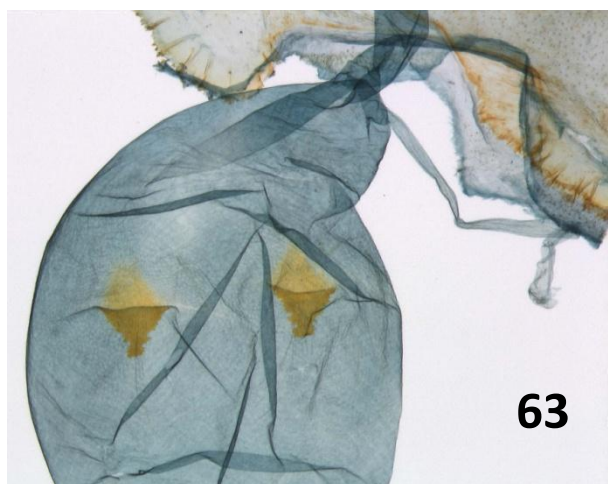


**Figs. 54-57.** Female genitalia of *Lambula* species.

**Figs. 54-55.** *Lambula nigrescens*, slide RMNH-RV1664: **54.** genital; **55.** signa. **Figs. 56-57.** *Lambula flavogrisea*, slide RMNH-RV1662: **56.** genital; **57.** signa.

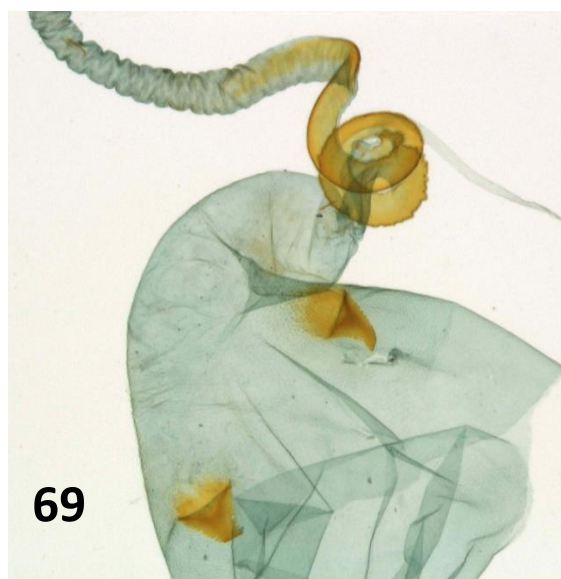
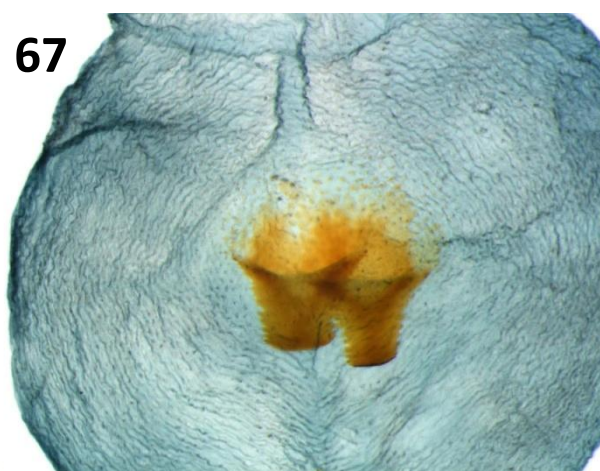


**Figs. 58-61.** Female genitalia of *Lambula* species.  
**Figs. 58-59.** *Lambula sibilensis*, slide RMNH-RV1660: **58.** genital; **59.** signa. **Figs. 60-61.** *Lambula longiductus*, slide RMNH-RV1641: **60.** genital; **61.** signa.



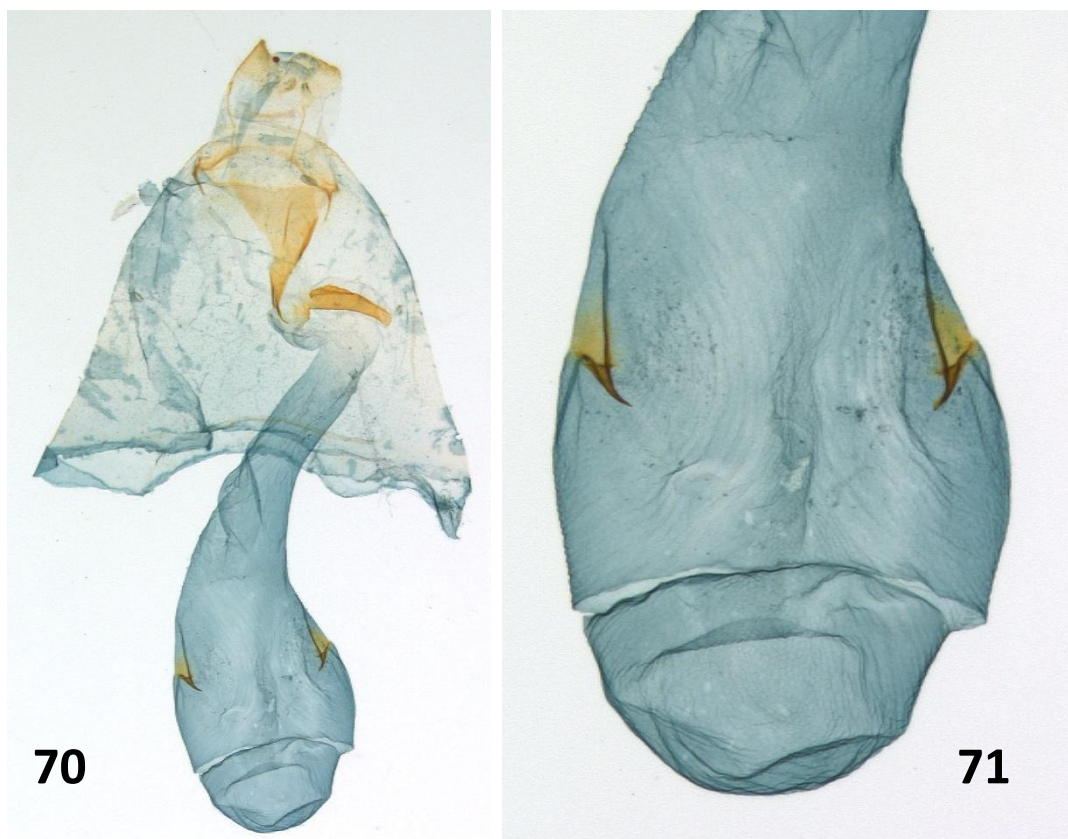
**Figs. 62-65.** Female genitalia of *Lambula* species.

**Figs. 62-63.** *Lambula marginata*, slide RMNH-RV1645: **62.** genital; **63.** signa. **Figs. 64-65.** *Lambula tristis*, slide RMNH-RV1644: **64.** genital; **65.** signa.



**Figs. 66-69.** Female genitalia of *Lambula* species.  
**Figs. 66-67.** *Lambula buergersi*, slide MFNB-RV1680: **66.** genital; **67.** signa. **Figs. 68-69.** *Lambula albicentra*, slide RMNH-RV1627: **68.** genital; **69.** signa.





**Figs. 70-71.** Female genitalia of *Lambula pallescens*, slide RMNH-RV1654. **70.** genital; **71.** signa.