

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

<sup>1</sup>Rob de Vos & <sup>2</sup>Alberto Zilli

<sup>1</sup>Naturalis Biodiversity Center, Darwinweg 2, 2333 CR Leiden, The Netherlands  
Email: rob.devos@naturalis.nl (ORCID: 0000-0001-5527-9991)

<sup>2</sup>Natural History Museum, Life Sciences, Insects Division, Cromwell  
Road, SW7 5BD, London, United Kingdom  
Email: a.zilli@nhm.ac.uk (ORCID: 0000-0002-3416-8069)

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**Abstract:** The *Lambula* species from New Guinea with plain coloured hindwings are treated. The already known species are redescribed or reviewed, and ten new species are described, namely *Lambula brunnescens* **spec. nov.**, *L. contrastata* **spec. nov.**, *L. crispumcornuta* **spec. nov.**, *L. flavistrigata* **spec. nov.**, *L. punctilinea* **spec. nov.**, *L. keilyacornuta* **spec. nov.**, *L. nigromarginata* **spec. nov.**, *L. palliflava* **spec. nov.**, *L. ophiocornuta* **spec. nov.** and *L. supioria* **spec. nov.**

Four taxa are synonymised: *Crambidia bifasciata* Rothschild, 1912 **syn. nov.**, *Macaduma umbrina* Rothschild, 1915 **syn. nov.** and *Lambula bilineata* Gaede, 1925 **syn. nov.** are all subsumed under *Lambula bilineata* Bethune-Baker, 1904. *Lambula pallescens* De Vos, 2019 **syn. nov.** is synonymised with *Lambula punctifer* Hampson, 1900.

Adults and genitalia of all species are illustrated.

**Rangkuman:** Spesies *Lambula* dari New Guinea dengan sayap belakang berwarna polos. Spesies yang sudah dikenal dideskripsi ulang atau ditinjau kembali, dan sepuluh spesies baru dideskripsikan, yaitu *Lambula brunnescens* **spec. nov.**, *L. contrastata* **spec. nov.**, *L. crispumcornuta* **spec. nov.**, *L. flavistrigata* **spec. nov.**, *L. punctilinea* **spec. nov.**, *L. keilyacornuta* **spec. nov.**, *L. nigromarginata* **spec. nov.**, *L. palliflava* **spec. nov.**, *L. ophiocornuta* **spec. nov.** and *L. supioria* **spec. nov.** Empat taxa bersinonim yaitu: *Crambidia bifasciata* Rothschild, 1912 **syn. nov.**, *Macaduma umbrina* Rothschild, 1915 **syn. nov.** dan *Lambula bilineata* Gaede, 1925 **syn. nov.** semua dimasukkan ke dalam *Lambula bilineata* Bethune-Baker, 1904. *Lambula pallescens* De Vos, 2019 **syn. nov.** bersinonim dengan *Lambula punctifer* Hampson, 1900. Tahap dewasa dan alat genitalia semua spesies dideskripsikan.

**Keywords:** revision, redescription, Papua Barat, Papua, Papua New Guinea, Indonesia.

### Abbreviations used

Fwl. – Forewing length (measured from wing base to apex with a digital caliper)

BMNH – former acronym (British Museum of Natural History) of NHMUK

IND - Indonesia

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

MFN – Museum für Naturkunde, Berlin, Germany

NBC – Naturalis Biodiversity Center, Leiden, The Netherlands

NHMUK – Natural History Museum, London, United Kingdom

PNG – Papua New Guinea

RMNH – acronym for Naturalis Biodiversity Center, Leiden, The Netherlands (former Rijksmuseum van Natuurlijke Historie)

RMNH.INS – Prefix of Naturalis Biodiversity Center for slides and specimen numbers

### Introduction

The genus *Lambula* Walker, 1866 is particularly rich in species in New Guinea and adjacent islands, a few species occurring in Australia and the Sunda region. Females of the species considered to belong to the genus *Lambula* have all the typical lithosiine appearance, with moderately to strongly elongated narrow forewings and normally shaped, more or less triangular hindwings. Males usually have broader forewings, some with modifications like androconial pockets or folds on the anal area of forewing and costal one of hindwing. The most reliable diagnostic characters for species of the genus are found in the genitalia. In the male ones, the valva has a long and slender saccular process, the uncus is usually small and thin, and the aedeagus vesica possesses a needle-shaped cornutus which can be very long. In the female genitalia, the posterior section of the ductus bursae may be partially or wholly sclerotized, and is sometimes dilated towards ostium bursae into a more or less broad antrum of characteristic shape; a lateral outgrowth with species-specific configuration—here termed “diverticulum (ductus bursae)” — is also usually present along the right side of the ductus; and the bursa copulatrix shows two horn-shaped signa with a wide transverse streak at the middle that marks the boundary between a strongly sclerotized anterior half and a more weakly sclerotized posterior plate.

Currently, 37 species of *Lambula* are known from New Guinea and adjacent islands. De Vos (2019) treated 18 of them with patterned or striking coloured hindwings. In this paper the species with dull or plain coloured hindwings will be examined. *Lambula hypopolius* Rothschild, 1916 has been transferred to *Orieosia* Bucsek, 2012 (De Vos, 2022). *Lambula pallescens* De Vos, 2019 **syn. nov.** (= *Lambula punctifer* Hampson, 1900) and *L. fuscibasis* De Vos, 2019 are treated in this paper again, as these are for obvious reasons better placed in the “plain underwing” group, and the availability of additional specimens allowed to refine the characterization of sexes and their variation.

It is easy to assume that more species of *Lambula* will be discovered, especially from the yet unexplored remote or isolated areas of New Guinea. These rather obscurely patterned and dull coloured species might not be very inviting to carry research on, but their remarkable

diversification provides an excellent example of the speciation events that developed in an eco-geographically complex area such as Papuaasia.

### Updated checklist of the species of *Lambula* from New Guinea

\* = taxa treated by De Vos (2019)

aethalocis Hampson, 1914 [PNG]

= *fuliginosa* Rothschild, 1912 nec Walker, 1862

agraphia Hampson, 1900 [PNG]

albicentra De Vos, 2019\* [Papua, IND]

arfakensis De Vos, 2019\* [Papua Barat, IND]

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

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

= *bifasciata* Rothschild, 1912 **syn. nov.**

= *umbrina* Rothschild, 1915 **syn. nov.**

= *bilineata* Gaede, 1925 **junior primary homonym**

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

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

brunnescens **spec. nov.**

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

castanea Rothschild, 1912 [Papua, IND]

contrastata **spec. nov.**

costiplaga De Vos, 2019\* [Papua Barat, IND]

crispumcornuta **spec. nov.**

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

= *dampierensis* Rothschild, 1916

= *triangulum* Gaede, 1925

flavibasis De Vos, 2019\* [Papua Barat, IND]

flavipuncta Gaede, 1925\* [PNG]

flavistrigata **spec. nov.**

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

punctilinea **spec. nov.**

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

fuscibasis De Vos, 2019

keilyacornuta **spec. nov.**

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

longiductus De Vos, 2019\* [Papua, IND]

marginata De Vos, 2019\* [Papua Barat, IND]

nigrescens De Vos, 2019\* [Papua Barat, IND]

nigromarginata **spec. nov.**

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

*palliflava* **spec. nov.**

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

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

= *pallescens* De Vos, 2019 **syn. nov.**

*sibilensis* De Vos, 2019\* [Papua, IND]

*ophiocornuta* **spec. nov.**

*supioria* **spec. nov.**

*tristis* De Vos, 2019\* [Papua, IND]

*vanrossemi* De Vos, 2019\* [Papua Barat, IND]

## Systematic part

### ***Lambula bilineata* Bethune-Baker, 1904** (figs 1-7, 52, 71)

*Lambula bilineata* Bethune-Baker, 1904

= *Crambidia bifasciata* Rothschild, 1912 **syn. nov.**

= *Macaduma umbrina* Rothschild, 1915 **syn. nov.**

= *Lambula bilineata* Gaede, 1925; **junior primary homonym**

Quotations: Bethune-Baker (1904: 416), Draudt (1914: 222), as *Lambula bilineata*; Rothschild (1912: 219), Draudt (1914: 212), as *Crambidia bifasciata*; Hampson (1914: 445), Rothschild (1915: 45), Strand (1922: 507), as *Lambula bifasciata*; Hampson (1914: 444), Strand (1922: 508), as *Lambula laniafera* sensu Hampson, 1914 nec Hampson, 1900 [misidentifications]; Rothschild (1915: 46), Strand (1922: 654), as *Macaduma umbrina*; Gaede (1925: 235), as *Lambula bilineata* Gaede, 1925 nec Bethune-Baker, 1904.

**Holotype (bilineata):** ♂ (NHMUK: BMNH(E)1325413), [Papua New Guinea], Upp. Aroa R., Brit. N.G., March 03., (Meek), *Lambula bilineata*, Rothschild Bequest, B.M. 1939-1.

**Holotype (bifasciata):** ♀ (NHMUK: BMNH(E)1325429), [Papua New Guinea], Biagi, Mambare R., 5000 ft., B.N.G., Feb. 06., (A.S. Meek.), *Crambidia bifasciata* Type Rothschild, Rothschild Bequest, B.M. 1939-1.

**Holotype (umbrina):** ♂ (NHMUK: BMNH(E)1325425), [Indonesia, Papua], Utakwa R., Dutch N. Guin., 3000 ft., Jan. 1913., A.F.R. Wollaston, *Macaduma umbrina* Type Rothschild, Rothschild Bequest, B.M. 1939-1.

**Holotype (bilineata):** ♂ (MFN.LEP.1444), [Papua New Guinea], D.N.Guinea, Kais.Augustafl.Exp., [1912-1913], Bürgers S.G., Type.

**Notes:** Despite in the NHMUK collection there is female specimen (fig. 5) of *Lambula bilineata* Bethune-Baker, 1904 labelled as a “type” of *Lambula aroa* Bethune-Baker, 1904 by the original author of the two taxa himself, Bethune-Baker (1904) only described male(s) for both species, thus no females enter the relative type series, and the aforementioned circumstance must be regarded as a mere case of misidentification (and mislabeling).

However, this example shows the difficulty in properly circumscribing the species in this group.

The concept of *Lambula bilineata* Gaede, 1925 is conspecific with that of *Lambula bilineata* Bethune-Baker, 1904 so that the two names would be synonymous but the fact that they are also primary homonyms prevails in making the former permanently invalid, in that the junior name.

**Diagnosis:** A rather small-sized species. Specimens from the Central Mountain Range seem in general larger than those from the Arfak Mountains. Male and female are very similar in appearance. The wing pattern somewhat resembles that of the females of *Lambula bivittata* (Rothschild, 1912) and *L. palliflava* **spec. nov.**, but in those species the transverse lines are distinctly oblique and broader, and the size of *bilineata* is much smaller. Male with darker hindwings than female. On the underside, costal areas of fore- and hindwing not modified, without any lobe or pocket as in most other species. The genitalia however show the characteristic *Lambula* configuration. Male genitalia with short and sword-shaped cornutus bearing two short processes at base, in the next species appearing similar but with curled base. Female genitalia with broad funnel-shaped antrum and large horn-shaped signa with blunt anterior plate and broad posterior one. In the next species the antrum is smaller and rather shallow, bowl-shaped, and the signa are smaller and shorter, with distinctly triangular, acutely tipped anterior plate.

**Redescription:** Fwl. ♂ 8.1-8.6 mm., ♀ 8.2-10.1 mm. Head and patagia dark buff (male) to grey (female), thorax including tegulae dark brown, abdomen pale grey at base, suffused to dark brown or black dorsally, laterally yellow. Male with grey anal tuft. Legs buff to brown. Forewing narrow with rounded termen, and straight anal margin. Ground colour of forewing in male buff with scattered dark brown scales, in female grey with scattered dark grey scales. Two dark transverse lines: one antemedian line, irregular but straight, running from costa to anal margin, and one more or less "S"-shaped postmedian line running from subapical position to just basally from tornus. Both lines may vary in contrast between specimens. Apical area often suffused with dark scales.

Hindwings in male and female more or less triangular; dark grey with pale grey fringe in male, cream-coloured suffused with dark grey at apex and with white fringe in female.

Male genitalia rather compact. Tegumen bell-shaped, vinculum with shallow bilobed saccus. Valva short, oval-shaped; sacculus basally broad, distally gradually narrowed and continued by a slender and long, slightly curved process with a sharp hook at the apex, and followed by an unsclerotized area before cucullus; ampulla broad finger-shaped, bent at the middle; cucullus with arched costa, slightly sclerotized, covered with long setae, and with rather blunt apex. Uncus short claw-shaped and curved, with sharp apex. Tuba analis large and bulbous.

Aedeagus a short and broad curved tube. Vesica with a rather broad dagger-shaped cornutus, blunt at apex.

Female genitalia with a broad funnel-shaped antrum, continued into a long broad and membranous ductus bursae, its lateral diverticulum at halfway of the ductus, short and oval, connected via a short and wide duct; cervix bursae broad, with complex wrinkles and folds, and ductus seminalis from its right posterior hump; corpus bursae globular with large signa, anteriorly with slightly curved and blunt tip, distally, above the transverse streak, with large, smeared out sclerotized plate.

**Distribution:** Widely distributed in New Guinea, mainly along the Central Mountain Range, and recently found in the Arfak Mountains (Papua Barat, Indonesia). Occurring at moderate elevation between 200-1500 meters. A common species.

***Lambula contrastata* spec. nov.** (figs 8-9, 53, 72)

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**Holotype:** ♂ (RMNH.INS.1108807), Indonesia, Papua, Kecamatan Nipsan, Walmak, 1710 m, 4°07' S – 138°36' E, 31.i-09.ii.2005, at light, cultivated area, UNCEN-ZMA Expedition Papua Indonesia 2005, in NBC.

**Paratypes:** 9 ♂♂ (RMNH.INS.1108811, 1108837, 1108904-908, KSP65147-148), 4 ♀♀ (RMNH.INS.1108808, 1108912-913, KSP65149), same data as holotype; 1 ♂ (RMNH.INS.1108909), 2 ♀♀ (RMNH.INS.1108812, 1108914), same locality as holotype, but 24-29.x.2008, leg. R. de Vos & P.J. Zumkehr; 1 ♂ (RMNH.INS.1108910), Ned. Nieuw Guinea, Sterrengebergte (Star Mts.), Sibil, 1260 m, at light, 11.vi.1959, Sterrengebergte Expeditie, coll. RMNH; 2 ♀♀ (RMNH.INS.1108915-916), Neth. New Guinea, Star Mountain Range, Sibil, 1260 m, 140°37'49" E – 4°54'43" S, 13.v-9.viii.1959, at light, Star Mountains Exp. 1959, Collectie Rijksmuseum van Natuurlijke Historie (RMNH); 1 ♀ (RMNH.INS.1108917), Indonesia, Irian Jaya, Pass Valley, 49 km N Wamena, 2140 m, at light, 25.x.1993, A.J. de Boer, A.L.M. Rutten & R. de Vos; 2 ♂♂ (RMNH.INS.1108813, 1108817), 1 ♀ (RMNH.INS.1108818), Indonesia, Papua Barat, Birdshead Peninsula, Arfak Mountains, Mokwam, 1469 m, 1°06' S – 133°54' E, 21-23.x.2014, at light, Leg. P.J. Zumkehr & F. Groenen; 1 ♂ (RMNH.INS.1108911), 1 ♀ (RMNH.INS.1108814), 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; these all in NBC; 1 ♀ (NHMUK-014201575), [Indonesia, Papua], nr. Oetakwa R., Snow Mts., Dutch N. G., up to 3500 ft., x. xii. 1910 (Meek), Rothschild Bequest, B.M. 1939-1; 1 ♀ (NHMUK-BMNH#1325427), [Indonesia, Papua], Canoe Camp, Utakwa R., Dutch N. Guin., xii.1912, A.F.R. Wollaston; both in NHMUK.

**Diagnosis:** Externally resembling *Scoliacma suzannae* De Vos, 2008 by the pale basal triangular mark and characteristic brown pattern elements of forewing, this species cannot be confused with any other congeners. Forewing of male with conspicuous pale triangular basal field, dark brown basal costa, black zigzagging antemedian line connected to the discal

spot and a broad brown median band, followed by a pale submarginal field. The female essentially shows the same pattern but with less contrasting colours and with tinges of grey instead of brown.

In the male genitalia, the aedeagus shows a sword-shaped cornutus with curled base which bears a small thorn at the end. Female genitalia with shallow bowl-shaped antrum, and comparatively small, wider than long signa.

**Description:** Fwl. ♂ 9.7-11.8 mm., ♀ 9.7-11.2 mm. Head of male with black frons, yolk-yellow integument and reddish brown antennae. Patagia half yolk-yellow, half black. Notum and tegulae black, mixed with dark brown. Legs dark grey with buff bands. Forewing of male broad triangular, costa arched, without androconial pocket on underside. Ground colour of forewing pale yellow-buff. Costal area suffused with black in basal field, distally yellow. A zigzagging antemedian line, running straight up from anal margin to cubital vein, thinly connected with a distinct black discal spot. A broad dark brown median band, bordered by a broad postmedian line. Submarginal field pale yellow-buff. Along termen a suffused dark brown rim; fringe buff with brown subbasal line. Hindwing of male more or less triangular, with arched costa and straight termen. Ground colour pale yellow, slightly darker at costa and feebly suffused with brown at apex. Abdomen buff, anal tuft yellow.

Female with black labial palpi, yellow-grey frons and integument and two grey dots. Antennae brown. Patagia yellow with grey centre, tegulae and notum black, mixed with grey. Forewing of female normal lithosiine-shaped, with arched costa. Ground colour pale grey, scarcely sprinkled with grey-brown scales. An irregular square-shaped patch at middle along the anal margin, in the cell a vertical twinned discal spot. Costal rim yolk-yellow, suffused with dark grey-brown in apical area. Postmedian line as an obscure band running from subapical area to tornus. Rim of termen and fringe line with dark grey-brown suffusion, fringe buff. Hindwing of female of normal shape, entirely pale yellow. Abdomen grey-buff. Distal half dorsally black, laterally yellow. Legs dark grey with buff bands.

Male genitalia with high and fragile tegumen. Vinculum with cone-shaped saccus without lobes. Valve long and narrow based, widened at middle in correspondence of the broader sacculus. Cucullus almost straight, narrow and at apex tongue-shaped. Saccular process short and straight, with sharp apex similar to a claw. Uncus long and slender. Aedeagus short, broadest at coecum, distally narrowed. Cornutus curled in one coil at base, rather thick, with sharp extremity at base and blunt distal end.

Female genitalia with rather simple ostium bursae, showing shallow bowl-shaped antrum. Ductus bursae membranous, rather broad, slightly constricted before antrum and without apparent lateral diverticulum, cervix bursae long and swollen, with posterior hump to the right of ductus bursae, continued by a globular corpus bursae. Horn-shaped signa broad and short, laterally stretched.

**Distribution:** The species seems to be restricted to the western part of New Guinea. It is most abundant in the Central Mountain Range in the Jayawijaya Mountains, Star Mountains

and Snow Mountains, but it is also found in the northern Arfak Mountains where the individuals are of paler colour than the populations from the Central Mountain Range. The species has been found at elevations comprised between 1000-2100 meters.

**Etymology:** The name of the new species is derived from its contrasted pattern on the forewing.

***Lambula flavobrunnea* Rothschild, 1912** (figs 10-11, 54)

*Lambula flavobrunnea* Rothschild, 1912

Quotations: Rothschild (1912: 214), Draudt (1914: 222), Hampson (1914: 445), Strand (1922: 507).

**Holotype:** ♂ (NHMUK: BMNH(E)1325406), [Indonesia, Papua], Mt. Goliath, 5-7000 ft., Centr. Dutch N.Guinea, about 139.long., Februar 1911 (A.S. Meek), *Lambula flavobrunnea* Type Rothschild, Rothschild Bequest, B.M. 1939-1.

**Diagnosis:** This species resembles the males of *Lambula punctilinea* **spec. nov.** but it is of smaller size and with rougher scaling on the forewing. The median fascia consists of an obscure oblique row of dark patches, while in *punctilinea* this is a distinct curved row of short dark stripes on each vein. Furthermore the forewing apex of *flavobrunnea* is of normal shape, while in *punctilinea* this is slightly concave at costa. The head of *flavobrunnea* is distinctly narrower than that of *punctilinea* and the abdomen is slenderer and with a smaller anal tuft than in *punctilinea*.

The male genitalia of *flavobrunnea* have robust valvae, broader and with more strongly sclerotized cucullus compared to those of *punctilinea*. Their sacular process is much shorter than in *punctilinea*. The sacculus in *flavobrunnea* is oval with a broad sclerotized rim around a wide unsclerotized centre, while in *punctilinea* it is stretched and only thinly bordered by a sclerotized rim. Sacculus in *flavobrunnea* is also acutely narrowed and extended with a straight and slender process with a short, slightly hooked apex, while that of *punctilinea* is gradually narrowed and extended with a curved and even thinner process with a longer hooked apex. The aedeagus in *flavobrunnea* has a broad straight sword-shaped cornutus, while in *punctilinea* the cornutus is “S”-shaped and with its base in the shape of a bird’s beak.

Females of *flavobrunnea* are yet unknown.

**Redescription:** Fwl. ♂ 10.1-10.8 mm. Width of the frons equal to the diameter of the eye. Head, antennae, thorax and abdomen entirely concolorous, yellow-brown, with some paler yellowish hairs near the thorax on the first abdominal segment. Legs pale brown-yellow. Forewing broad with arched costa, termen and anal margin convex. Ground colour yellow-

brown with rough scattered reddish-brown scaling. In the middle of the forewing an obscure and oblique row of three blurred patches. Hindwing cream-white, more or less triangular with a strongly arched costa on which androconial scales are concealed under the convex anal field of forewing.

Male genitalia with fragile and almost unsclerotized, high and bottle-shaped tegumen. Vinculum with a broad and bilobed saccus (in fig. 54 it is flipped upwards). Valva robust and broad. Cucullus narrow and tongue-shaped, sclerotized, Sacculus broadly rimmed with an unsclerotized centre which is obliquely crossed by a thin sclerotized ridge. Sacculus distally acutely narrowed and extended into a rather short and straight slender process with a short hooked apex. Uncus thin and curved with a sharp apex. Anal tube pronounced and globular. Aedeagus short and straight, tube-shaped. Vesica with one large sword-shaped cornutus, with a short curl at its base.

**Distribution:** Not many specimens are known of this species, all having been found in the Central Mountain Range at Mt. Goliath (Gn. Mandala) and Pass Valley, Jayawijaya Mountains, Papua, Indonesia, at elevations comprised between 1500-2140 meters.

***Lambula punctilinea spec. nov.*** (figs 12-13, 55, 73)

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**Holotype:** ♂ (RMNH.INS.1108801), Indonesia, Papua, Kecamatan Abenaho, Pass Valley, 1950 m, 3°51' S – 139°05' E, 11-17.ii.2005, at light, disturbed montane forest, UNCEN-ZMA Expedition 2005.

**Paratypes:** 5 ♂♂ (RMNH.INS.1109036-1109040), same as holotype; 3 ♂♂ (RMNH.INS.1109008, 1109041-1109042), Indonesia, Papua, Kecamatan Nipsan, Walmak, 1710 m, 4°07' S – 138°36' E, 31.i-09.ii.2005, at light, cultivated area, UNCEN-ZMA Expedition Papua Indonesia 2005; 1 ♂ (RMNH.INS.1108931), 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; 2 ♀♀ (RMNH.INS.1108803-1108804), Indonesia, Irian Jaya, Pass Valley, 49 km N Wamena, 2140 m, at light, 25.x.1993, A.J. de Boer, A.L.M. Rutten & R. de Vos; 2 ♀♀ (RMNH.INS.1108924, 1109007), [Indonesia, Papua], Ned. Nieuw Guinea, Sterrengebergte, Molbakon, 2-11.ix.1959, Sterrengebergte Exp., Coll. RMNH.

**Diagnosis:** A rather large-sized species in the genus. The head is much broader than in the similar species *Lambula flavobrunnea*. Males have exceptional wing shapes. The forewing is stretched triangular with an almost straight costa that is slightly concave before apex; in *flavobrunnea* the costa is arched without such concave section. The cubital vein is unusually bent towards the costa, which causes folds in the wing surface, contrary to *flavobrunnea*, in which this vein is of rather normal shape but less visible because of a rougher scaling. The median fascia is an oblique and curved row of 5-6 short thin stripes on the veins, while in

*flavobrunnea* this is an oblique row of a few larger dark patches. The hindwing is broader than in *flavobrunnea* and has also the costa strongly arched.

Females described here have been matched with the males on the basis of size, pattern and collection event; their genitalia are typical for *Lambula*. Forewing shape of female characteristic for Lithosiini, i.e. rather narrow and stretched. The conspicuous row of diffuse dots on the forewing is very similar to that of female *Lambula fuscibasis* De Vos, 2019. However, *punctilinea* has paler hindwings than *fuscibasis*, though only the genitalia provide reliable diagnostic characters, the antrum of *punctilinea* being less transversely stretched than that of *fuscibasis*, and the ductus bursae shorter and sclerotized only in its posterior half, not strongly bent at middle like the longer, all sclerotized through ductus of *fuscibasis*.

**Description:** Fwl. ♂ 10.5-11.9 mm, ♀ 10.0-11.4 mm. Frons wider than eye diameter, pale buff, thorax of same colour as forewing. Forewing of male varying from pale brown to reddish brown with a median curved row of about 5-6 short dark stripes, running from costa to anal margin, this row varying from obscure or faint to well pronounced. Rough scaling present along costa before apex and at middle of wing disc. Costa slightly concave pre-apically. Hindwing with strongly arched, cream-white costa, and fringe usually darker than rest of wing. Abdomen pale brown-yellow with a voluminous set of three anal tufts.

Female fore- and hindwing of normal shape. Costa of forewing arched. Forewing pale brown with scattered darker brown scales. A distinct median row of about six dark brown dots, some occasionally partially confluent, obliquely running from costa to anal margin.

Male genitalia with tegumen hardly sclerotized, long and stretched triangular with two sclerotized ribbons running towards the small and thin, needle-shaped recurved uncus. Vinculum with deeply bilobed saccus. Valva rather narrow, curved. Cucullus narrow, only slightly sclerotized, covered with long setae, oblong tongue-shaped with a rather blunt apex. Sacculus broad, with unsclerotized center and bordered by a thin sclerotized rim, distally gradually narrowed and continued by a long slender, curved process, hooked and sharp at apex. Tuba analis large and bulbous.

Aedeagus a short and slightly curved tube. Vesica with “S”-shaped cornutus whose base is in shape of a bird’s beak.

Female genitalia with asymmetric ostium bursae, with a wide and shallow infundibular antrum proceeding from its left into ductus bursae. Antrum sword-shaped, straight and sclerotized only along its right side. Ductus bursae relatively long and narrow, slightly sinuous, sclerotized only in its posterior half, with long thin lateral diverticulum from between the two sections. Cervix bursae small dome-shaped, rather acute posteriorly in correspondence of origin of ductus seminalis. Corpus bursae large ovoid, signa slightly wider than long.

**Distribution:** A common species. Recorded from the Indonesian part of New Guinea, mainly from the Central Mountain Range (Jayawijaya Mountains and Star Mountains, Papua) at

elevations between 900-2150 meters, but recently specimens have been found in the northern Arfak Mountains (Papua Barat) as well.

***Lambula bivittata* (Rothschild, 1912)** (figs 14-16, 56, 74)

*Scoliacma bivittata* Rothschild, 1912

Quotations: Rothschild (1912: 215), Draudt (1914: 219), as *Scoliacma bivittata*; Hampson (1914: 446), Strand (1922: 507), as *Lambula bivittata*.

**Holotype (bivittata):** ♀ (NHMUK: BMNH(E)1325421), [Indonesia, Papua], Mt. Goliath, 5-7000 ft., Centr. Dutch N.Guinea, about 139.long., Februar 1911 (A.S. Meek), *Scoliacma bivittata* Type Rothsch., Rothschild Bequest, B.M. 1939-1.

**Diagnosis:** There are three allied species to *bivittata* with resembling forewing pattern and genitalia structure, which will be discussed here. Forewing of male in *bivittata* is reddish brown with a well defined oblique postmedian fascia. *Lambula aethalocis* Hampson, 1914 has dark brown forewing and is densely sprinkled with dark brown to black scales obscuring rest of pattern; *L. palliflava* **spec. nov.** is buff-brown with distinctly pale yellow hindwing, and in *L. keilyacornuta* **spec. nov.** the forewing is for the greater part without pattern and yellow-brown, the basal half being slightly darker. Hindwing of male in *bivittata* is grey-buff; in *aethalocis* pale yellow with grey-brown suffusion around apex and tornus; in *palliflava* the pale yellow area is much larger, and in *keilyacornuta* it is entirely grey.

Forewing of female in *bivittata* is grey, densely sprinkled with reddish brown scales, and with the two oblique fasciae well defined; *palliflava* has narrower forewing, grey and sprinkled with grey-brown scales and with thinner oblique fasciae, and *keilyacornuta* has pale buff forewing that is sprinkled in the distal half with grey-brown scales and shows one broad oblique median fascia. The female of *aethalocis* is unknown. Hindwing of females in *bivittata* cream-white, in *palliflava* pale yellow, and in *keilyacornuta* grey.

Male genitalia of *bivittata* with a straight cornutus showing a short tooth at its base, *aethalocis* with a slightly curved needle-shaped cornutus without basal tooth, *palliflava* with a longer needle-shaped cornutus bearing a larger basal tooth and with a longer continuation of the cornutus, and *keilyacornuta* with a smoothly sigmoid cornutus with a peculiar base in the form of a "Papuan axe". Valva in *bivittata* is robust and with longer and thinner saccular process than in *palliflava*, in *aethalocis* with hook-shaped process, and in *keilyacornuta* with much thicker process than in the three other mentioned species. In the female genitalia, *bivittata* shows the longest 7<sup>th</sup> abdominal segment with respect to allies, a small, weakly sclerotized funnel-shaped antrum, membranous ductus bursae with feeble sclerotization alongside its right posterior section, blunt and short tubular thick diverticulum, and very long cervix bursae, gradually broadened into ovoid corpus bursae, whose paired signa are comparatively small with respect to those of the other two species (female of *aethalocis* being unknown). *Lambula palliflava* has substantially no dilated antrum, short mesially

inflated ductus that is wholly sclerotized in its posterior end, very small and ovoid lateral diverticulum, conical cervix bursae, and large ovoid corpus bursae. *Lambula keilyacornuta* shows markedly asymmetric ostium, with broadly albeit shallowly U-shaped antrum opening into ductus bursae from its left side, long and thin, posteriorly curled diverticulum of ductus bursae, cervix bursae bulged into dome-shaped end at right side, and bottle-shaped corpus bursae.

**Redescription:** Fwl. ♂ 9.2-10.6 mm, ♀ 11.0-11.9 mm. Male with head and thorax dark reddish-brown, abdomen dark brown-grey, anal tuft pale brown. Forewing rather short and broad, costa strongly arched, termen oblique, anal margin slightly convex. Ground colour reddish-brown, densely sprinkled with darker scales, more densely so at costa, margin and even more so at apex. Costal area in basal field with a large patch of greyish rough scales. Postmedian line strongly accentuated, obliquely running from costa to anal margin. Antemedian line indistinct, at costa and anal margin accentuated as dark patches. Underside of forewing with a narrow longitudinal pocket along costa from base to half the wing length. Hindwing of normal shape, more or less triangular with rounded apex. Ground colour of hindwing entirely greyish buff, basally and in anal field with two streaks of short hairs.

Female with head, thorax and abdomen dark grey, abdomen laterally whitish. Forewing rather narrow stretched triangular, with costa less arched than in male. Ground colour pale grey, densely sprinkled with darker grey scales, more densely so at base and apex. Antemedian and postmedian lines well distinct, dark grey, obliquely running from costa to anal margin. Hindwing approximately triangular. Ground colour cream-white, slightly suffused at apex.

Male genitalia with long, stretched and narrow tegumen with a thin sclerotized lateral rim. Vinculum with a bilobed cone-shaped saccus. Valva with long cucullus, gradually broadened distally and with oblique apical margin. Sacculus long and almost equally wide throughout its length, with a broad and strongly sclerotized rim, distally strongly narrowed into a long, slender and curved process, with a sharp apex. Ampulla a longitudinal ridge, its apex slightly curved and pointing towards the center of the sacculus. Uncus rather long, slender and slightly curved, with a sharp apex. Aedeagus a rather simple tube, nodded at one-third, distally ending with a sharp triangular plate. Vesica with a long, straight and slender needle-shaped cornutus bearing basally a knot on the dorsal side.

Female genitalia with very long 7<sup>th</sup> abdominal segment, antrum small, feebly expressed and weakly sclerotized. Ductus bursae narrow, sclerotized only posteriorly along its right side, with lateral diverticulum aligned and comparable in size to posterior section of ductus, while the anterior section connects at right angle to the posterior one and is not really separable from very long and gradually widening cervix bursae. Corpus bursae also not showing definite boundary with cervix bursae, gradually broadened into globular widest section where signa are positioned, while fundus bursae is slightly narrowed and blunt. Signa with short pointed lateral projections, anterior plate heavily sclerotized, with blunt apex and irregularly spined sides, and smeared out posterior sclerotization.

**Distribution:** The species is recorded at elevations comprised between 900-2000 meters in the Indonesian part of New Guinea, from Central Mountain Range (Star Mountains, Jayawijaya Mountains, Sudirman Mountains), Foja Mountains and Arfak Mountains, and in Papua New Guinea, from Biagi and Angabunga river (4 ♂♂ in NHMUK). It is a common species.

***Lambula aethalocis* Hampson, 1914** (figs 20-21, 57)

*Lambula aethalocis* Hampson, 1914, nom. nov. pro *Scoliacma fuliginosa* Rothschild, 1912 nec *Lithosia fuliginosa* Walker, 1862 [transferred to *Lambula* by Hampson (1900: 99)]

= *Scoliacma fuliginosa* Rothschild, 1912 [transferred to *Lambula* by Hampson (1914: 446)],

**junior secondary homonym**

Quotations: Rothschild (1912: 215) and Draudt (1914: 219), as *Scoliacma fuliginosa*; Hampson (1914: 446), Strand (1922: 507), as *Lambula aethalocis*.

**Holotype (aethalocis/fuliginosa):** ♂ (NHMUK: BMNH(E)1325428), [Papua New Guinea, Central Province], Brit. N. Guinea, Angabunga R., affl. of St. Joseph R., Brit.N.Guinea, 6000 ft, upwards. Nov.04.-Febr.05. (A.S. Meek), *Scoliacma fuliginosa* Type Rothsch., Rothschild Bequest, B.M. 1939-1.

**Diagnosis:** Only males are known, dark brown with two darker oblique transverse lines on the forewing, and at half wing length a large diffuse black patch at the costa. Hindwing pale yellow, suffused with dark grey scales at tornus and apical half. For comparison with three other resembling species see diagnosis of *bivittata*.

**Redescription:** Fwl. ♂ 9.6 mm. Head and thorax dark brown. Abdomen grey with a thick buff-brown anal tuft. Forewing brown, densely sprinkled with dark brown scales, at mid-costa a large diffuse black and brown patch which is connected to an oblique dark brown median fascia. Postmedian fascia also oblique, at termen with thin dark brown suffusion. Fringe pale buff, with dark brown or blackish brown midline in darkest specimens. Hindwing with pale yellow ground colour, broadly suffused with grey-brown in apical half and at tornus. Fringe pale yellow.

Male genitalia with long and narrow, rather fragile tegumen. Vinculum "V"-shaped, bilobed. Valva slender with long and narrow tongue-shaped cucullus, basal third well sclerotized, distally less sclerotized, with rounded apex. Sacculus narrow with dorsal and ventral rims broad, enclosing a membranous centre. Saccular process a slender hook with sharp apex. Uncus long and thin, curved with a sharp apex. Aedeagus simple and short, with a rather short slightly curved needle-shaped cornutus.

**Distribution:** The type locality is in the easternmost part of Papua New Guinea, in the Central Province. Other specimens are known from Hydrographer Mountain Range (Oro Province), the Kratke Mountains (Eastern Highland Province) and, with a wide gap, in the Paniai District (Papua, Indonesia).

***Lambula palliflava* spec. nov.** (figs 22-23, 58, 75)

urn:lsid:zoobank.org:act: 207D16C3-25F4-4BDF-A71A-96994A4BFD09

**Holotype:** ♂ (RMNH.INS.1108853), Indonesia, Papua Barat, Birdshead Peninsula, Arfak Mountains, Demaisi, 1645 m, 1°10' S – 133°53' E, 24.x.2014, at light, S. & J. Sinnema, F. Groenen & P.J. Zumkehr [Papua Insects Foundation].

**Paratypes:** 3 ♂♂ (RMNH.INS.1108852, 1108880, 1108893), same as holotype; 5 ♀♀ (RMNH.INS.1108854, 1108894-97), 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; 3 ♀♀ (RMNH.INS.1108855, 1108881, 1108898), Indonesia, Papua Barat, Birdshead Peninsula, Arfak Mountains, Mokwam, 1469 m, 1°06' S – 133°54' E, 21-23.x.2014, at light, leg. P.J. Zumkehr & F. Groenen.

**Diagnosis:** Resembling *Lambula aethalocis*, but with some notable differences. Ground colour of male buff-brown sprinkled with dark brown scales. The oblique median fascia is hardly visible and the postmedian fascia is obscure; hindwing pale yellow with the costal part suffused with grey-brown (in *aethalocis* such suffusion is more extended at apex and tornus). Ground colour in female buff, in the similar *bivittata* grey. Hindwing pale yellow, cream-white in *bivittata*.

Male genitalia of *palliflava* with longer and less strong curved saccular process than *aethalocis*, and with broader cucullus. Aedeagus with longer needle-shaped cornutus than in *aethalocis*, and with a tooth at the base of the cornutus. Female genitalia in *bivittata* with bursa copulatrix much slenderer than in *palliflava*, and with larger signa without spined sides. More detailed comparison in the diagnosis of *bivittata*.

**Description:** Fwl. ♂ 9.5-10.4 mm., ♀ 10.4-11.8 mm. Head, thorax and abdomen of male dark grey to black, abdomen with yellow anal tuft. Forewing strongly arched with a stretched oval pocket along the costa underside from base to half of wing length; termen oblique. Forewing with buff ground colour, densely sprinkled with dark brown scales. In midcostal area a black patch of rough scales, probably with scent function. Antemedian line indistinct or absent, postmedian line dark brown, oblique and rather distinct. Hindwing pale yellow with apical area suffused with grey at costa. Basal field with a streak of darker yellow hairs along the wing fold and greyish hairs along anal margin. Legs yellow with some buff mottling.

Female with dark grey head, black thorax and abdomen with some grey hairs. Forewing narrow and of normal shape. Ground colour pale buff, loosely sprinkled with dark brown scales. Antemedian and postmedian lines present but rather faint, dark brown, running obliquely from costa to anal margin. Hindwing pale yellow without pattern. Legs yellow to buff coloured.

Male genitalia with long narrow triangular tegumen. Vinculum with bilobed cone-shaped saccus. Valva narrowly elongated. Cucullus narrow at base, gradually broadened distally with oblique apical margin and covering of long setae. Saccus evenly broad, distally gradually narrowed and with a slender, smoothly arched process with a sharp apex. Ampulla in the middle of the valva, elongated and slightly curved. Uncus slender, slightly curved with sharp claw-shaped apex. Aedeagus a rather short tube shallowly concave ventrally before coecum, distally with a sclerotized ribbon; vesica with a long needle-shaped cornutus, basally slightly bent and with a short dorsal tooth.

Female genitalia with inconspicuous antrum, the ductus bursae just narrowed posteriorly into a tube-like ostium bursae, ductus bursae overall fusiform, membranous anteriorly and sclerotized posteriorly, with short ovoid lateral diverticulum from its anterior third and marked constriction separating it from cervix bursae. Cervix bursae membranous, dome-shaped, with ductus seminalis branching from its right side. Corpus bursae very large and ovoid, signa with tiny lateral serration in the anterior plate before the median streak, posteriorly to this with semicircular plate.

**Distribution:** Found in the northern Arfak Mountains (Papua Barat, Indonesia) at an elevation of 1450-1650 meters. The collecting biotopes correspond to mossy damp forest. A local, rather uncommon species.

**Etymology:** The name *palliflava* (Latin: *pallida flava* = pale yellow) addresses to the colour of the hindwings.

***Lambula agraphia* Hampson, 1900** (figs 17-19, 59, 76)

*Lambula agraphia* Hampson, 1900

Quotations: Hampson (1900: 558), Rothschild (1916: 323), Strand (1922: 507).

**Holotype:** ♂ (NHMUK: BMNH(E)1325407), [Papua New Guinea, Milne Bay Province], Milne Bay, A.S. Meek, 1900-45, *Lambula agraphia*., type ♂ Hmpsn.

**Diagnosis:** The darkest coloured species in the group, allied to *plicata*. Forewing in both sexes dark brown; hindwing uniformly grey. Male with rounded forewing termen, female with an obscure “S”-shaped median fascia.

Male genitalia asymmetric and robust, valva with strong and thick saccular process, contrary to more delicate ones of other species of the group. Saccus long with two shallow lobes.

Right valva with shorter extension than left valva, both curved, but right one stout and abruptly narrowed apically into sharp tip, while left one gradually narrowed. Aedeagus straight and simple, with short needle-shaped cornutus bearing at base an oblique branch which originates a “Papuan axe” configuration (cf. next species, while aforementioned species of the group lack such branch).

Female genitalia with strongly asymmetric ostium bursae, the antrum appearing as a gutter that proceeds to the left into a tightly “U”-shaped posterior section of ductus bursae, and long tubular, membranous lateral diverticulum of ductus bursae (sclerotized in the next species). Cervix bursae membranous, as a swollen wrinkled section aligned with anterior one of ductus bursae, in the next species instead protruding as a distinct lobe at the right side. Corpus bursae with bigger and longer signa than in the next species.

**Redescription:** Fwl. ♂ 8.6 mm, ♀ 9.9-10.2 mm. Head and thorax black, abdomen dark grey. Legs with dark brown femora, buff tibiae, and black tarsi. Forewing of male broad triangular with rounded apex and termen. Ground colour dark brown, somewhat darker in basal half. Hindwing of male broad with rounded apex and termen, unicolorous grey.

Female with arched costa and convex termen. Ground colour dark grey-brown with a diffuse dark “S”-shaped median fascia. Hindwing of normal shape, unicolorous grey.

Male genitalia with high and fragile tegumen and slender finger-shaped uncus with sharp apex. Vinculum with broad and rather long, shallow bilobed saccus. Cucullus narrow, tongue-shaped and slightly sclerotized. Sacculus broad with a broad arched ridge in the middle. Right valva with shorter and stouter curved saccular process than left one, apically more abruptly narrowed into acute tip. Left valva with long curved process gradually narrowed into long sharp apex. Aedeagus simple and straight, with short and straight, needle-shaped cornutus branched basally into short and sharp hooked process resembling a traditional “Papuan axe”.

Female genitalia with asymmetric ostium bursae; ductus bursae very long, its two sections with very different appearance: posterior one sclerotized, narrow tubular and arched into transversely positioned “U” configuration at left of side of body, its terminal tract with longer and more strongly sclerotized inner wall than outer one, and opening into ostium almost as a flat, horizontally oriented antrum; anterior section broad, long and flat, entirely membranous, and shallowly curved to the left. Lateral diverticulum very long and narrow tubular, just before posterior section of ductus bursae. Cervix bursae well distinct as a swollen and wrinkled part posterior to corpus bursae. Ductus seminalis branching from small hump on most posterior section of cervix. Corpus bursae ovoid, signa with large quadrangular posterior plate with blurred edges and vase-like anterior section with blunt apex.

**Distribution:** The type locality is Milne Bay (Papua New Guinea) in the far eastern part of New Guinea. Recently two female specimens also have been collected, and verified by genital study, in the Indonesian part of New Guinea from Kouh (Merauke Area, Papua) and

Dotir River (Wandammen Peninsula, Papua Barat). All specimens have been found at low elevation near the sea level.

***Lambula keilyacornuta spec. nov.*** (figs 24-25, 60, 77)

urn:lsid:zoobank.org:act: AE1D5AE9-E2F8-4233-9A90-62781426192D

**Holotype:** ♂ (RMNH.INS.1108856), 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 ♂ (RMNH.INS.1108857), as holotype; 1 ♂, 1 ♀ (RMNH.INS.1108858-1108859), Indonesia, Papua Barat, Birdshead Peninsula, Tamrau Plateau, Senopi, 494 m, 0°50'S – 132°55'E, 7-9.xi.2014, at light, leg. S. & J. Sinnema, F. Groenen & P.J. Zumkehr; 1 ♂ (RMNH.INS.1108860), 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.1108935), Indonesia, Irian Jaya, Birdshead Peninsula, Warkapi (nr Breie), primary lowland forest, 500 m, at light, 12.xi.1993, leg. A.J. de Boer, A.L.M. Rutten & R. de Vos; 1 ♂ (RMNH.INS.1108936), Indonesia, Irian Jaya, Birdshead Peninsula, Tuan Wowi (nr Andai), primary lowland forest, 240 m, at light, 2.xi.1993, leg. A.J. de Boer, A.L.M. Rutten & R. de Vos.

**Diagnosis:** Externally resembling *Lambula aethalocis* and *L. palliflava*, but easily distinguished by the pale forewings and black abdomen and thorax in both sexes. Males with yellow forewing without complete fascia. The forewing of male is densely covered with scattered brown scales. Anal field at two-third from base with a diffuse black remnant of a fascia which in some specimens is reaching as far as the cubital vein. Hindwing like in *aethalocis* and *palliflava*, pale yellow, but with a broad grey marginal band. Marginal rim yellow, fringe grey with a dark grey subbasal line, especially near the apex. Female with yellow-buff forewing with a broad oblique median fascia. The distal half of the wing densely sprinkled with dark brown scales, the basal half with only a few brown scales. Hindwing as in male.

Genitalia resembling those of *agraphia* but with some noteworthy differences (see diagnosis of that species). Male genitalia with saccular process much thicker than in *aethalocis* and *palliflava*, aedeagus with a characteristic cornutus similar to that of *agraphia*, in shape of a "Papuan axe", while in *aethalocis* and *palliflava* the cornutus is almost straight and simple, needle-shaped. Female genitalia with asymmetric ostium bursae, the antrum being very wide and shallowly arched, proceeding into ductus bursae from its left. Ductus bursae long and narrow, its posterior section sclerotized along the right side but twisted just distally to lateral diverticulum from membranous anterior section of ductus, such diverticulum long tubular and sclerotized, curled in one coil.

**Description:** Fwl. ♂ 9.1-10.8 mm, ♀ 9.5 mm. Male with head, thorax and most part of abdomen black, excepting first two grey abdominal segments and grey-buff anal tuft. Legs buff-brown. Forewing of male with rounded apex and convex termen. Ground colour yellow to buff-yellow, covered with scattered dark brown and black scales. Anal field at two-third from base with a diffuse black patch as a remnant of a fascia which in some specimens reaches the cubital vein, but in most ones is faded. Marginal rim black, fringes grey or buff. Hindwing with pale yellow ground colour, at margin and costa with a broad grey margin. Marginal rim yellow, fringe grey with a dark grey subbasal line in apical area.

Female with thorax and distal half of abdomen black. Head and caudal part of abdomen dark grey. Legs buff. Forewing pale buff with a diffuse black oblique median fascia, distally to which the wing is densely covered with scattered dark brown scales, while basally there are only a few dark scales. Marginal rim black, more pronouncedly so at apex. Hindwing pale yellow with a broad grey margin. Marginal rim and fringe as in male.

Male genitalia with high and narrow tegumen. Vinculum with large cone-shaped bilobed saccus. Valvae slightly asymmetric, the right valva narrower than left one. Cucullus long, tongue-shaped and slightly sclerotized, that of left valva broader. Sacculus with a broad rim, in the middle with a dense field of setae. Saccular process of right valva slightly curved, narrower than in left valva, in which it is stouter and more strongly curved; both with sharp apex. Uncus short, slender and claw-shaped, tuba analis large.

Aedeagus widest at middle, distally with a sclerotized tongue. Cornutus slightly “S”-shaped with basal, obliquely branching process conferring to the structure the shape of a traditional “Papuan axe”.

Female genitalia with shallow asymmetric, bowl-shaped antrum proceeding into ductus bursae from the left side, the ductus long and flat, slightly twisted in its posterior section, that is membranous on left side and distinctly sclerotized on right one almost up to lateral diverticulum, such outgrowth long and slender, sclerotized and curled posteriorly in one coil. Anterior section of ductus bursae membranous. Cervix bursae membranous, with voluminous dome-shaped lobe at the right side, from where ductus seminalis arises. Corpus bursae bottle-shaped; signa large, with flat truncate anterior end.

**Distribution:** Found on the Birdshead Peninsula and Onin Peninsula (Papua Barat, Indonesia) at moderate elevations between 100-600 meters.

**Etymology:** The species name is derived from the shape of the male cornutus which resembles a traditional Papuan axe from the Una-tribe. In the “Una” language this axe is called “keil ya”. The taxon name is a combination of this local name and cornutus in the feminine form.

***Lambula plicata* Hampson, 1900** (figs 26-27, 61)

*Lambula plicata* Hampson, 1900

Quotations: Hampson (1900: 98), Draudt (1914: 221), Strand (1922: 509), Van Eecke (1926: 347 [uncertain identity]).

**Holotype:** ♂ (NHMUK: BMNH(E)1325410), [Indonesia, Papua Barat], Kapaur [= Fakfak], New Guinea [1896]. W. Doherty, 98-152, *plicata* type ♂. Hmps. n.

**Note:** Van Eecke (1926) mentioned a male specimen from Buru (Station 7, 7.ix.1921, [leg. L.J. Toxopeus], RMNH) but this specimen could not be traced. However, on biogeographical grounds it seems most unlikely that this specimen is indeed conspecific with the *plicata* holotype from Fakfak, but this cannot be confirmed.

**Diagnosis:** Resembling *Lambula keilyacornuta* but male of *plicata* has narrower forewings without such a rounded apex as that of *keilyacornuta*. The forewing is uniform buff coloured and densely sprinkled with reddish brown scales, otherwise patternless. Hindwing brown-yellow.

Male genitalia with slender, short and almost straight saccular process, in *keilyacornuta* the process being robust and curved. The aedeagus of *plicata* is comparatively short, with the needle-shaped cornutus curved at very base almost at straight angle and bearing sort of flag-like flap. In *keilyacornuta* the aedeagus is longer and the cornutus is sinuous with the basal process forming an acute angle.

**Redescription:** Fwl. ♂ 8.0 mm. Head, thorax and abdomen dark grey-brown, anal tuft grey. Forewing broad and short, costa slightly concave at basal half due to a longitudinal androconial pocket on the underside. Anal margin bowed. Ground colour buff, densely sprinkled with reddish brown scales, no other pattern elements being present. Hindwing brown-yellow.

Male genitalia with long and fragile tegumen. Vinculum with broad cone-shaped saccus. Valva relatively short, cucullus tongue-shaped and strongly sclerotized. Sacculus broad, distally narrowed into short and almost straight process with sharp apex. Uncus rather long and slender with sharp apex. Aedeagus short and simple with short needle-shaped cornutus bent at its base into a straight angle and with a flag-like structure.

Female unknown.

**Distribution:** Only known after two males, the holotype and an additional specimen, which have been collected in Kapaur (= Fakfak), Onin Peninsula, Papua Barat, Indonesia.

***Lambula laniafera* Hampson, 1900** (figs 28-29, 62, 78)

*Lambula laniafera* Hampson, 1900

Quotations: Hampson (1900: 98), Draudt (1914: 221), Hampson (1914: 444), Strand (1922: 508).

**Holotype:** ♂ (NHMUK: BMNH(E)1325409), [Indonesia, Papua Barat], Kapaur [= Fakfak], N.Guinea., Feb. 1897., Doherty., 97-279, *laniafera* type ♂. Hmpsn.

**Diagnosis:** *Lambula laniafera* is the smallest sized of four other allied species (treated below). It is very similar to *L. aroa*, but is paler and has a broader dark marginal rim in the male forewing. The basal field is usually of the same colour as the rest of the wing, while in *aroa* this is variable. Differences in genitalia between the two species are given under *aroa*.

**Redescription:** Fwl. ♂ 9.0-9.6 mm, ♀ 10.2-10.8 mm. Male with head, thorax and abdomen dark brown, and reddish-buff anal tuft. Legs reddish-brown. Forewing rather short, with slightly arched costa, convex termen, and straight anal margin. Ground colour pale buff, dark brown at wingbase, especially along costa, and distally beyond dark brown median fascia more conspicuously sprinkled with red-brown scales. Median fascia oblique, running from basal one-third of costa to middle of anal margin. Marginal rim sharp, dark brown to black; fringe grey.

Hindwing short and triangular, with a strong dark brown to black tooth at costa, and pledged, dark grey-brown coloured with reddish-brown irroration along the central pledge; fringe dark grey-brown.

Female with dark grey-brown head, thorax and abdomen. Abdomen laterally yellow-buff. Fore- and hindwing of normal shape, rather short. Ground colour of forewing buff, heavily sprinkled with fine reddish-brown scales. Median fascia usually a little diffuse, running from below costa to middle of anal margin. Apical half of termen with black or dark grey marginal rim, fringe grey. Hindwing with slightly sinuous costa, unicolorous grey with reddish-brown marginal rim, and grey fringe.

Male genitalia with narrow, stretched tegumen and slender claw-shaped uncus. Vinculum with cone-shaped saccus. Valva narrow and straight with elongated, apically slightly broadened cucullus. Sacculus narrow with a large pledge at the base of the apical process, this long and slender, curved inwards. Aedeagus rather short tube-shaped with a long needle-shaped cornutus. Cornutus at base with a trigger-like configuration at an angle of 90°.

Female genitalia without specialized antrum, ductus bursae long and flat, straight, mostly membranous, without distinct anterior and posterior sections, rather all homologous to the latter if the lateral diverticulum is taken as a landmark in comparison to other species, such outgrowth small and foot-shaped. Cervix bursae long tubular, not clearly separate from corpus bursae but with small posterior hump on right side, where origin of ductus seminalis

is found. Corpus bursae rather narrow, ovoid. Signa of almost equal size and length on either side of transverse streak, with a finely laterally dentated anterior part, apex of which blunt.

**Distribution:** Abundant in the Birdshhead Peninsula (Papua Barat, Indonesia), including Onin Peninsula, but also found in Wandammen Peninsula (Papua Barat), the Snow Mountains and the Cyclops Mountains (Papua). Some specimens are known from Kokoda, Owen Stanley Range, Papua New Guinea (NHMUK).

***Lambula aroa* Bethune-Baker, 1904** (figs 30-32, 63, 79)

*Lambula aroa* Bethune-Baker, 1904

Quotations: Bethune-Baker (1904: 416), Draudt (1914: 221) as *Lambula aroa*;

Hampson (1914: 444), Rothschild (1915: 44), Strand (1922: 508) sub *Lambula laniafera*

Hampson, 1900 (misidentifications).

**Holotype:** ♂ (NHMUK: BMNH(E)1325411), [Papua New Guinea], Upp. Aroa R., Brit. N.G., IV.03., (Meek), Rothschild Bequest, B.M. 1939-1, Type.

**Note:** See above under *Lambula bilineata* Bethune-Baker, 1904 for the status of a female specimen labelled as a “type” of *Lambula aroa*.

**Diagnosis:** Distinctly larger and darker than *laniafera* and in male with broader forewings. Hindwings paler than in *laniafera*. Male genitalia in *aroa* with narrow curved valvae, in *laniafera* straight. Cornutus in *aroa* curved with hook-shaped base, in *laniafera* straight with trigger-shaped base. Female of *aroa* with smaller signa and larger lateral diverticulum of ductus bursae. Ductus bursae similarly flat ribbon-shaped but narrower and more sclerotized, the sclerotization irregularly edged towards ostium bursae and with unevenly lobate anterior end.

**Redescription:** Fwl. ♂ 9.8-10.7 mm., ♀ 9.7-11.4 mm. Male with reddish-brown head, and dark brown thorax. Abdomen and legs grey-brown, anal tuft large and buff. Forewing of male broad triangular with rather sharp apex. Costa at two-thirds with a bend in correspondence of termination of androconial pocket on the underside. Ground colour of forewing pale buff or beige, with a distinct dark brown or black median fascia which is usually rather irregular, especially in the costal half. Basal half of wing usually only scarcely sprinkled with reddish-brown scales. Distal half of wing densely sprinkled with reddish-brown scales except for a broad marginal band. A narrow black marginal rim from apex to just above tornus, fringe grey. Forewing underside with a broad oval androconial pocket below costa. Hindwing uniformly grey, with buff to reddish brown longitudinal brush along median fold and strong tooth-shaped pledge of androconial scales at apex; marginal rim yellow, fringe grey.

Female with reddish-brown to grey head, brown or grey thorax, dorsally dark grey and laterally yellowish abdomen. Legs brown or grey. Forewing typically lithosiine, with arched costa. Ground colour buff, densely sprinkled with brown scales, though in some specimens such irroration is weak in basal area. A dark brown sinuous median fascia running from mid-costa to middle of anal margin. Marginal rim in apical area black. Hindwing uniformly grey, with fringe of paler grey.

Specimens from the Arfak Mountains (Papua Barat, Indonesia) are slightly darker and more grey-brown than those from the Central Mountains Range.

Male genitalia with narrow tegumen, tapered and stretched towards base of uncus. Vinculum with bilobed cone-shaped saccus. Valva narrow and curved. Sacculus straight, distally strongly narrowed into long and slender curved process with sharp apex. Ampulla between sacculus and cucullus arched and broad. Cucullus half the width of saccular section of valva, its distal half weakly sclerotized, at apex narrow. Uncus slender claw-shaped. Aedeagus straight, tube-shaped and distally tapered. Cornutus long, needle-shaped with sharp distal end, basally broad and spatulate.

Female with very large 7<sup>th</sup> abdominal segment, the bursa copulatrix hardly reaching its anterior edge. Antrum unexpressed, ductus bursae flat ribbon-shaped, rectilinear, moderately sclerotized except anteriorly, where sclerotization ends into mesial, antero-ventral lobe, with ampullar diverticulum connected via a relatively long and narrow ductus. Cervix bursae relatively swollen and long, with ductus seminalis arising from its right posterior end. Corpus bursae ovoid. Signa with anterior plate much larger than distal part, more or less triangular with strongly dentate, concave sides and sharp corners in correspondence of the transverse streak, distally only slightly extended with some irregular sclerotization.

**Distribution:** Widely distributed and common in New Guinea. Seems to follow the Central Mountain Range from East to West. Found at high elevations between 900-1700 meters along the Aroa River (Central Province, Papua New Guinea), and in Indonesia in the Star Mountains, the Jayawijaya Mountains (Papua), and in the Birdshead Peninsula in the Arfak Mountains (Papua Barat).

### ***Lambula castanea* Rothschild, 1912** (figs 33, 64)

*Lambula castanea* Rothschild, 1912

Quotations: Rothschild (1912: 214), Draudt (1914: 221), Hampson (1914: 444), Strand (1922: 507).

**Holotype:** ♂ (NHMUK: BMNH(E)1325408), [Indonesia, Papua], nr. Oetakwa R., Snow Mts., Dutch N. G., up to 3500 ft., x. xii. 1910 (Meek), *Lambula castanea* Type Rothsch., Rothschild Bequest, B.M. 1939-1.

**Diagnosis:** Male resembling *Lambula laniafera* and *L. aroa* but with the median fascia of forewing clearly defined and straight, pointing obliquely to costa, while in *laniafera* and *aroa* such band is more diffuse and bends internally at costa. It belongs to a complex with two other closely allied species (described hereafter) which have the median fascia obliquely directed distally, namely *Lambula crispumcornuta* **spec. nov.** and *L. ophiocornuta* **spec. nov.** However, in *castanea* the ground colour of the forewing is pale reddish brown and the median fascia broader and more diffuse at costa, in *crispumcornuta* the forewing is buff coloured with a sharp and thin median line, and in *ophiocornuta* the forewing is dark reddish brown with a thin and sharp median line that abruptly bends inwardly at costa. In the male genitalia, *castanea* exhibits narrow and sinuous valvae, while in *laniafera* these are straight and in *aroa* curved; in *crispumcornuta* and *ophiocornuta* the valvae are similar to those of *castanea* with some differences in the saccular processes, but the most reliable diagnostic characters consist of the shape of the saccus and cornutus. The saccus of *castanea* is deeply bilobed and broadly rounded, in *crispumcornuta* it is wide and shallow with pointed lobes, while in *ophiocornuta* it is deeply bilobed with narrower lobes than in *castanea*. The cornutus of *castanea* is long and “S”-shaped, not straight as in *laniafera* and *aroa*. In *crispumcornuta* the cornutus is even more strongly curled with a thicker base and in *ophiocornuta* it is much shorter and less twisty.

The female of *castanea* is unknown. Its habitus is most probably comparable to that of female *crispumcornuta* and *ophiocornuta*. There might be some candidate specimens for the female of *castanea*, i.e. two females from “Etappenberg” (former German New Guinea, MfN) and “Hydrographer Mountains” (former British New Guinea, NHMUK), respectively, but these should be verified after molecular testing since these localities happen to fall quite far apart from the type locality.

**Redescription:** Fwl. ♂ 10.3-10.4 mm. Male with red-brown head and thorax. Abdomen dark brown-grey, with large brown-yellow anal tuft. Legs reddish brown, femora darker brown. Forewing broad triangular, with arched costa and convex termen. Ground colour of forewing pale red-brown, more or less evenly sprinkled with darker red-brown scales. Median fascia clearly defined as a rather thick straight line, from just below costa to anal margin. Marginal rim black, fringe reddish-grey. Basal half of costal area dark brown because of the longitudinal androconial fold of the underside shining through.

Hindwing grey, dark grey in costal area and with dark grey and red-brown scales in discal cell; marginal rim yellow, fringe pale grey.

Male genitalia with rather broad but fragile tegumen with thin sclerotized rim. Vinculum broad with deeply bilobed saccus with broad rounded lobes. Valva narrow, sinuous, wider at the middle than at base and distally. Cucullus narrow, slightly sclerotized at costa, apically slender and tongue-shaped. Sacculus broadest at the middle, distally extended with a long curved slender process with sharp apex. Ampulla obscure, as a narrow arched ridge between cucullus and sacculus. Uncus claw-shaped, with rather broad base and sharp apex. Aedeagus

short and rather thick, bottle-shaped. Vesica with a long, strongly “S”-shaped slender cornutus, thickest at base.

**Distribution:** Apparently restricted to the Central Mountain Range in Papua, Indonesia. Found in the Snow Mountains, at an elevation of about 1000 meters. Known with certainty only after the holotype.

***Lambula crispumcornuta* spec. nov.** (figs 34-35, 65, 80)

urn:lsid:zoobank.org:act: 40C7393A-9134-4BA5-A2B6-65B4103B86A6

**Holotype:** ♂ (RMNH.INS.1108863), Indonesia, Papua Barat, Birdshead Peninsula, Arfak Mountains, Mokwam, 1469 m, 1°06' S – 133°54' E, 21-23.x.2014, at light, Leg. P.J. Zumkehr & F. Groenen.

**Paratypes:** 1 ♂ (RMNH.INS.1108884), 3 ♀♀ (RMNH.INS.1108864, 1108885, 1108899), same as holotype; 3 ♀♀ (RMNH.INS.1108900-902), same as holotype, but 1510 m, 6-10.xi.2011, Papua Insects Foundation; 1 ♂ (RMNH.INS.1108846), Indonesia, Papua, Kecamatan Abenaho, Landikma, 914 m, 3°49' S – 139°14' E, facing rainforest, 18-22.ii.2009, A.J. de Boer, M. Schouten & R. Mambrasar; 1 ♀ (RMNH.INS.1108903), [Indonesia, Papua], Araboebivak, 15.x.1939, Nieuw Guinea Exp. K.N.A.G. 1939, Museum Leiden.

**Diagnosis:** Similar to *Lambula castanea*, but with more brown or buff ground colour than reddish brown. Sure identification can only be achieved via dissection of genitalia. Male genitalia with broader valva and longer saccular process than in *castanea*, and saccus with wider and larger pointed lobes. Aedeagus broader and with strongly “S”-shaped cornutus whose base bends into a curl, while in *castanea* it is less strongly sinuous and not bent at base. Female of *crispumcornuta* with posterior section of ductus bursae broadly expanded into wide infundibular antrum, while in *ophiocornuta* the corresponding section is shorter, narrower and almost rectangular, terminating into transverse ostium bursae of equal width. Lateral diverticulum from ductus bursae much larger in *crispumcornuta* than in *ophiocornuta* and with a sclerotized part. Signa very similar, in *crispumcornuta* with posterior plate shorter than in *ophiocornuta*.

**Description:** Fwl. ♂ 9.3-10.4 mm., ♀ 10.0-11.4 mm. Male with very dark brown head and thorax and black abdomen, caudally with some paler scaling. Anal tuft dark buff-yellow. Legs with dark grey femora, and yellow tibiae and tarsi. Forewing of male broad triangular, with convex termen and sharp apex. Ground colour of forewing buff, sprinkled with numerous reddish brown scales. Median fascia black and thin, running from costa, where it is more indistinct, to middle of anal margin. The very dark longitudinal androconial pocket below costa on the underside shines through the upperside of the wing, so for the dark hindwing.

Hindwing short, strongly arched at costa, and straight at termen. Ground colour lead-grey, marginal rim yellow, fringe pale grey.

Head and thorax of female black-brown, abdomen black, laterally and ventrally dark grey. Legs yellow. Costa of forewing arched, termen convex. Ground colour of forewing buff, densely sprinkled with reddish brown and darker brown scales. Median fascia black, running from two-thirds of costa to middle of anal margin. Apical half of termen with black marginal rim. Hindwing of female lead-grey, at base slightly paler. Marginal rim yellow, fringe grey.

Male genitalia with wide triangular tegumen. Vinculum broad, saccus with two wide lobes. Valva rather broad, especially in the middle. Costa of cucullus sclerotized, ampulla forming a broad flap reaching the sacculus, then acutely narrowed to a long and slender, tongue-shaped distal part. Sacculus at base narrow and folded, strongly curved and narrowed to a long sinuous, slender process with sharp apex. Uncus slender and curved, with sharp apex. Aedeagus short and broad barrel-shaped. Cornutus long and slender, strongly "S"-shaped and with its broader base curled inwards.

Female genitalia with distinct constriction between narrow short infundibular anterior and wide flat posterior sections of ductus bursae, the former membranous with feeble ventral sclerotization, the latter wholly sclerotized and very widened posteriorly into shallow antrum with broad slit of ostium bursae. Lateral diverticulum of ductus bursae from the constriction, long and arched, with narrower proximal half ridged by long sclerotized strip and swollen membranous termination. Cervix bursae very long and of almost equal width all through, with minor posterior hump on right side and only feebly widening towards spherical corpus bursae. Signa more or less fish-shaped with strong and sharp transverse streak. Anterior plate of signum triangular with concave and strongly dentate sides, posterior one semicircular.

**Distribution:** Holotype and most of the paratypes were found in the northern Arfak Mountains (Indonesia, Papua Barat) at about 1500 meters. Two paratypes were found in eastern areas, one in Araboebivak at the Westside of the Snow Mountains, and one in Landikma (914 meters) in the Jayawijaya Mountains (both Indonesia, Papua). It seems most abundant in the Arfak mountains but in general it appears to be a rare species.

**Etymology:** The name refers to the curly shape (Latin: *crispum* = curl) of the aedeagus cornutus, which is very characteristic for the species.

***Lambula ophiocornuta spec. nov.*** (figs 36-37, 66, 81)

urn:lsid:zoobank.org:act:5FEF7040-3665-406D-BA76-0D634F3A5525

**Holotype:** ♂ (RMNH.INS.1108861), 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, Indonesia 2005.

**Paratypes:** 1 ♂ (RMNH.INS.1108882), 2 ♀♀ (RMNH.INS.1108862, 1108883) same as holotype; 1 ♀ (RMNH.INS.1109009), [Indonesia, Papua], Ned. Nieuw Guinea, Sterrengebergte (Star Mts), Sibil, 1260 m, at light, 12.vi.1959, Sterrengebergte Expeditie, coll. RMNH.

**Diagnosis:** A comprehensive comparison of the three allied species, *castanea*, *crispumcornuta* and *ophiocornuta*, is given in the diagnoses of the first two species above. This is the darkest coloured species of the three. Most conspicuous in the male is the acutely bent median fascia at the costa, the shape of the saccus and the short “S”-shaped cornutus. Females are only reliably identified after dissection of the genitalia.

**Description:** Fwl. ♂ 8.8-9.5, ♀ 10.1-11.4 mm. Male with dark reddish-brown head, antennae and thorax. Abdomen brown-grey with a yellowish anal tuft. Forewing broad triangular with arched costa and convex termen. Ground colour reddish-brown with suffusion of dark brown scales, especially along the proximal side of the median fascia and in the broad marginal area, leaving thence a paler postmedian field. Hindwing almost round because of a strongly arched costa; its part concealed under the forewing is dark brown-grey with brown streaks, while the visible one is pale brown-grey with a yellow marginal rim and pale grey fringe.

Female with grey-brown head and thorax, and dark grey to black abdomen, laterally brown-yellow. Legs pale buff. Forewing rather broad with arched costa. Ground colour buff-brown, sprinkled with reddish-brown and black scales. Median fascia almost straight, black, running obliquely from two-thirds of costa to middle of anal margin. Marginal rim black, fringe grey. Hindwing uniformly dark grey, somewhat paler in basal area, marginal rim yellow, fringe pale grey.

Male genitalia with high and fragile tegumen with a thin sclerotized rim. Vinculum with broad, deeply bilobed saccus with rather narrow lobes. Valva narrow, broadest at middle. Cucullus almost completely sclerotized, broadly based, distally narrowed into a tongue-shaped distal part with blunt apex. Sacculus narrow with a folded twist in the middle and narrowed into a long and slender sinuous process with sharp apex. Uncus rather robust, claw-shaped, curved and with sharp apex. Aedeagus short and slightly swollen, vesica with an “S”-shaped slender cornutus with a broad base somewhat in the shape of a snake.

Female genitalia with large 7<sup>th</sup> abdominal segment, bursa copulatrix twice as long as this segment. Ductus bursae long and slightly sinuous, of even width, with longer anterior membranous anterior section and shorter, almost rectangular sclerotized posterior section, this without dilated antrum. Lateral diverticulum just proximal to sclerotized section, moderately developed, footh-shaped. The unsclerotized ductus bursae is continued by a slightly swollen and wrinkled, long tubular cervix bursae. Corpus bursae ovoid. Signa with a sharp streak in the middle, a fish-tail configuration with strongly dentate sides at the anterior end, and with irregularly edged and less sclerotized distal part.

**Distribution:** The species has been found in the Sibil Valley in the Star Mountains (Papua, Indonesia) at elevations comprised between 1260-1340 meters.

**Etymology:** The species name refers to the shape of the cornutus in the vesica which reminds of a snake (Greek: Ophis = snake).

***Lambula punctifer* Hampson, 1900** (figs 38-41, 67, 82)

*Lambula punctifer* Hampson, 1900

*Lambula pallescens* De Vos, 2019 **syn. nov.**

Quotations: Hampson (1900: 100), Draudt (1914: 222), Rothschild (1915: 45), Strand (1922: 509); De Vos (2019: 73) as *Lambula pallescens*.

**Holotype (punctifer):** ♂ (NHMUK-BMNH(E)1325426), [Indonesia, Papua Barat], Kapaur [= Fakfak], S.W N Guinea, Dec.1896., Doherty., 97-81, punctifer. type ♂. Hmpsn.

**Holotype (pallescens):** ♀ (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.

**Note:** *Lambula pallescens* De Vos, 2019 has been described after one female from Tandia (Wandammen Peninsula, Papua Barat, Indonesia) (De Vos, 2019). The name of the species was chosen for the pale appearance of the female holotype, but with the recent availability of three additional females and one male it became clear that the pale colour is perhaps an exception. The new specimens are quite darker than that described by De Vos (2019). Such variation in the females is described below. With the availability of a male it also became clear by study of its genitalia that it matches the rather worn male holotype of *Lambula punctifer* Hampson, 1900, so that the two names are here brought into synonymy. A redescription of the species follows below, based upon the fresh male specimen rather than the worn holotype.

**Redescription of male** (RMNH.INS.1109010), Indonesia, Papua Barat, Onin Peninsula, Werba, 106 m, 2°53' S – 132°13' E, 30.x.2014, at light, leg. S. & J. Sinnema, F. Groenen & P.J. Zumkehr: Fwl. ♂ 10.4 mm. Head, antennae and thorax black. First two abdominal segments grey, rest of abdomen black, laterally and ventrally grey, anal tuft grey. Legs ochreous-yellow. Forewing rather narrow, costa for two-thirds straight, its apical third rounded, termen convex. Ground colour ochre, along the straight part of costa with a dark brown longitudinal fold, along apex this dark brown colour is continued. A vague blackish remnant of an oblique fascia between middle of anal margin and cubital vein is present. Marginal rim black, fringe pale grey. Hindwing with slightly arched costa, not so strongly as in the following two species. Ground colour grey, somewhat paler at wingbase. A yellow marginal rim, fringe pale grey.

Male genitalia with pear-shaped tegumen, basally with wide circular unsclerotized centre. Vinculum rather narrow with a deep “U”-shaped saccus. Valva elongated, almost rectangular and evenly broad along its full length. Cucullus with rather broad tongue-shaped apex. Sacculus rather broad, in the middle with densely ciliated caudal rim, distally gradually narrowed and extended with a short but strongly curved claw-shaped process. Uncus small and slender with sharp apex. Aedeagus small and bottle-shaped with broad coecum. Cornutus rather short curved needle-shaped, with barb-shaped base, including an inner tooth.

**Variation of female:** Three recently known specimens from Onin Peninsula show that colouration of this species can be much darker: 1 ♀ (RMNH.INS.1108871), Indonesia, Papua Barat, Onin Peninsula, Huri-Mber, 607 m, 2°46' S – 132°18' E, 1-2.xi.2014, at light, leg. S. & J. Sinnema, F. Groenen & P.J. Zumkehr; 2 ♀♀ (RMNH.INS.1109015-1109016), Indonesia, Papua Barat, Onin Peninsula, Werba, 106 m, 2°53' S – 132°13' E, 30.x.2014, at light, leg. S. & J. Sinnema, F. Groenen & P.J. Zumkehr.

Head, antennae and thorax black (pale buff in holotype of *pallescens*), first three abdominal segments and anal segment grey, mid-segments black (in holotype pale buff, mid-segments being brown-grey and the distal part dark brown). Forewing densely covered with dark grey-brown scales, an obscure median oblique fascia is running from two-thirds of costa to middle of anal margin; termen near apex blackish (in holotype of *pallescens* forewings pale buff, scarcely sprinkled with dark brown scales which in the middle of the wing form an indistinct fascia). Hindwing dark grey with a yellow marginal rim and pale grey fringe (in holotype of *pallescens* dark grey with the basal half pale buff; marginal rim yellow and fringe grey).

**Distribution:** The known localities are all close to each other: Tandia, in the south of Wandammen Peninsula, and Kapaur (Fakfak), Werba and Huri-Mber on Onin Peninsula, all in Papua Barat, Indonesia.

***Lambula nigromarginata spec. nov.*** (figs 42, 68)

urn:lsid:zoobank.org:act: 8CA48D3D-CB43-4636-8A0D-82F725B1525B

**Holotype:** ♂ (RMNH.INS.1108872), Indonesia, Papua Barat, Birdshead Peninsula, Neney Valley, Arfak, Benyas, 722 m, 1°27' S – 134°01' E, 17.xi.2011, at light, Papua Insects Foundation.

**Paratypes:** 1 ♂ (NHMUK010918912), [Papua New Guinea, Oro Province], Hydrographer Mts, Brit. N.G., 2500 ft, Jan. 1918, Eichhorn Bros.; 2 ♂♂ (NHMUK014201611, NHMUK014201613), same data but Feb. 1918, 1 ♂ (NHMUK014201612), same data but Apr. 1918; 1 ♂ (NHMUK014201591), [Indonesia, Papua], near Oetakwa River, 11.x.1910, 3500 ft, A.S. Meek.

**Diagnosis:** This species belongs to a group of three sibling species: *Lambula punctifer*, *L. fuscibasis* and *L. nigromarginata*, of which the last one has a diffuse black-brown band along the termen of the male forewing, which is distinctly broader at the apex and is bordered by a black marginal rim, *fuscibasis* has an evenly broad obscure band along the termen and *punctifer* has a very narrow marginal rim.

The male genitalia of this group of species have very narrow valvae which are strongly curved. In *nigromarginata* it is mostly narrow with a broader base, in *fuscibasis* and *punctifer* it is evenly narrow along the full length.

Aedeagus long and curved with an extremely long and thin needle-shaped cornutus, and slightly curved with a small wing-like basal extension, in *L. fuscibasis* the needle-shaped cornutus is straighter and shorter with a larger flag-like basal extension, and in *punctifer* the aedeagus is small bottle-shaped with a short cornutus showing a barb-shaped base.

Female unknown.

**Description:** Fwl. ♂ 9.5 mm, 9.5-10.9. Male with black head, antennae and thorax. First two abdominal segments dark grey, rest of abdomen black, except for grey anal tuft. Legs buff, outer side of forelegs with some blackish suffusion. Forewing of male broad triangular with arched costa and convex termen and anal margin. Basal half of costa with a narrow fold. Ground colour of forewing ochreous brown, costal fold black and along rest of costa smoked with blackish scales. Along termen a black-brown band which is broader at the apex, bordered by a thin black marginal rim, fringe dark grey. Along the anal field the blackish androconial fold of the hindwing is shining through. Hindwing broadly triangular with rounded apex, and strongly arched costa with a black triangular androconial fold which is covered by the anal field of the forewing. Ground colour of hindwing grey, fringe pale grey. Male genitalia with broad tegumen with a thin sclerotized rim, at base of uncus clock-shaped. Uncus slender, curved and with sharp apex. Vinculum with broad and widely shallow bilobed saccus. Valvae narrow and strongly curved, broadly based, narrowing in the middle. Cucullus narrow, sclerotized and laterally long trunk-shaped extended. Sacculus broadly based, narrowing and extended by a long, slender hook-shaped process with a sharp apex. Aedeagus slender and rather long, curved. Vesica with an extremely long, curved and thin needle-shaped cornutus, base of cornutus broader with the form of the eye of a needle.

**Distribution:** Widely distributed in mountain areas of New Guinea. Type locality in the Arfak Mountains (Papua Barat, Indonesia), furthermore it is known from Utakwa River (Lorentz Reserve, Papua, Indonesia) and Hydrographer Range (Oro Province, Papua New Guinea). It is found at elevations comprised between 700-1000 meters.

**Etymology:** The name *nigromarginata* refers to the unevenly broad black-brown rim along the termen of the male forewing.

***Lambula fuscibasis* De Vos, 2019** (figs 43-47, 69, 83)

*Lambula fuscibasis* De Vos, 2019

Quotations: De Vos (2019: 74)

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

**Note:** This species was described after one male from Modio (Paniai District, Papua, Indonesia) (De Vos, 2019). Since recently many additional specimens of both sexes became available, it is now clear that the holotype is actually a very pale and worn specimen which does not properly show the average features of the species. Therefore a redescription of the habitus of the male is necessary as herein detailed, while the female is here described for the first time. The females are much resembling those of *L. punctilinea*, so that a reliable identification can only be achieved after study of the genitalia.

**Redescription:** Fwl. ♂ 8.6-9.9 mm, ♀ 10.0-11.2 mm. Male with dark reddish brown to dark grey-brown head, antennae and thorax, abdomen pale brown-grey with reddish brown anal tuft. Legs red-brown. Forewing of male broad triangular with a blunt nod in the middle of the costa, basal half of costal area with a narrow longitudinal fold. Termen oblique, almost straight. Ground colour ochreous-brown, fold towards costa black, a broad reddish-brown marginal band running from costa to anal margin, narrowly continued along the margin to base of wing. At the middle of the anal margin usually a small black patch of variable size is present, but in some specimens it is absent. Hindwing more or less rounded with a highly arched costa, apex and termen rounded. Ground colour brown-grey with cream-white fringe.

Female with dark brown-grey head, antennae, thorax and greater part of abdomen, abdomen laterally paler grey. Legs dark buff. Forewing rather short, of the usual lithosiine shape, i.e. narrow stretched triangular, with arched costa. Ground colour dark buff, sprinkled with dark brown scales. A median row of usually six distinct black dots runs in a curve from two-thirds of costa to middle of anal margin. Hindwing normally shaped, grey with the termen bordered with yellow-brown, fringe cream-white to pale grey.

Male genitalia as described by De Vos (2019).

Female genitalia with exceedingly long and narrow, ribbon-like entirely sclerotized ductus bursae mostly positioned at the left side of 7<sup>th</sup> abdominal segment, ending posteriorly into horizontal, mesially oriented gutter-like antrum; ductus twisted at middle so that origin of lateral diverticulum is on left instead of right and anterior section of ductus points towards midline; diverticulum long tubular. Cervix bursae broad cupular, with small posterior hump to right of junction with ductus bursae and ductus seminalis from its ventral side. Corpus bursae ovoid, signa with arched median streak and toothed sides, truncated anteriorly, and with subtriangular posterior plate.

**Distribution:** The type locality is Modio, a village in the Paniai District of Papua, Indonesia. The species is now known from more localities and appears to be widely distributed in New Guinea. Specimens are known from the Indonesian Jayawijaya Mountains (Walmak) and Star Mountains (Abmisibil, Mabilabol) in Papua, and the Arfak Mountains (Mokwam, Demaisi, Maripi) (all in RMNH) in Papua Barat, but also from Papua New Guinea in the Kratke Mountains (Eastern Highlands, Bantibasa), Angabunga River (Central Province) and Biagi, Mambare River (Oro Province) (all in NHMUK). It seems to be a common species.

***Lambula brunnescens* spec. nov.** (figs 48-49, 70)

urn:lsid:zoobank.org:act: C5601406-AF11-47F7-9A4C-982D5CA882E5

**Holotype:** ♂ (NHMUK010918900), [Papua New Guinea, Oro Province], Hydrographer Mts, Brit. N.G., 2500 ft, Feb. Mrch. 1918, (Eichhorn Bros.), Rothschild Bequest B.M. 1939-I.

**Paratype:** 1 ♂ (NHMUK010918901), [Papua New Guinea, Milne Bay Province, D'Entrecasteaux Islands], Goodenough Island, April 1913, A.S. Meek, Rothschild Bequest, B.M. 1939-I.

**Diagnosis:** The only *Lambula* species of which the forewings of male are plain dark brown. Hindwings pale yellow with a broad and diffuse brown-grey marginal band. Male genitalia with long and very narrow valvae, and aedeagus with extremely long cornutus. Female unknown.

**Description:** Fwl. ♂ 8.7 mm. Head, antennae and thorax black, abdomen grey with golden yellow anal tuft. Legs buff with dark grey suffusion on each segment. Forewings short and broad, with strongly arched costa and rounded apex. Basal half of costal area with a rather broad elongated fold. Ground colour of forewing dark chocolate brown, with narrow black rim at termen and dark grey fringe. Hindwing with arched costa and apex with a prominent blunt angle. Ground colour pale yellow with a diffuse broad brown-grey marginal band. Fringe dark grey with a thin whitish fringe line.

Male genitalia with a clock-shaped, weakly sclerotized tegumen. Vinculum with saccus deeply bilobed with narrow lobes. Valva narrow and stretched, cucullus very narrow and straight, extended into tongue-shape. Sacculus slightly broader than rest of valva, with a narrow base and slightly and gradually broadened to its middle from where it acutely narrows into a slender, slightly curved process with sharp apex. Uncus almost straight and slender with a sharp apex. Aedeagus short and curved, "pistol-shaped", with vesical cornutus extremely long and slender, needle-shaped, almost straight, basally slightly thicker but without conspicuous structures.

**Distribution:** The species has been found in the East of Papua New Guinea in Oro Province (Hydrographer Range) and Milne Bay Province (Goodenough Island).

**Etymology:** The name of the species refers to the dark chocolate brown forewings of the male.

***Lambula supioria* spec. nov.** (figs 50, 84)

urn:lsid:zoobank.org:act: B97A254C-979E-4254-B640-2ABC0BFCAF67

**Holotype:** ♀ (RMNH.INS.1108867), Indonesia, Papua, Supiori Island, Kab. Supiori Utara, Nansfori, 0°41' S – 135°40' E, sea level, at light, 16-19.x.2008, leg. R. de Vos & P.J. Zumkehr.

**Paratypes:** 2 ♀♀ (RMNH.INS.1108888, 1109017), same as holotype.

**Diagnosis:** Male unknown. Females of this species are very dark without any significant pattern in the wings. The buff forewings are densely covered with dark brown scales, their distinct black marginal rims are bordered internally by a pale buff line, and fringe is pale grey. Hindwing uniformly dark grey with grey fringe and a whitish fringe line. The best distinguishing features are seen in the genitalia. The ductus bursae is broad ribbon-shaped, similarly sclerotized but distinctly broader and more sinuous than in *aroa*, and much shorter than the long, wholly sclerotized one of *fuscibasis*.

**Description:** Fwl. ♀ 8.1-9.3 mm. Female with black head, antennae, thorax and abdomen. Legs dark buff with some suffusion of dark scales. Forewing narrow, with slightly arched costa. Ground colour buff, entire wing equally and densely sprinkled with dark brown scales. Marginal rim black, lined internally by thin pale buff line. Fringe pale grey. Hindwing triangular, with termen rather convex at the middle. Ground colour dark grey, fringe grey with a whitish fringe line.

Female genitalia without specialized antrum, ductus bursae wide, partially sclerotized only posteriorly with a cup-like configuration, and looser sclerotization proximal to this; anterior section rather long and broad, unsclerotized, with lateral tubular curled diverticulum very anterior, just posterior to constriction with cervix bursae. Cervix bursae very long and gradually broadened. Corpus bursae large ovoid. Ssigna comparatively long, with arched median streak and dentate edges of the anterior part, their posterior plate almost circular.

**Distribution:** The locality where all three known specimens were found is at the North side of Supiori Island (Schouten Islands, Papua, Indonesia).

**Etymology:** The species name is derived from the island where the type specimens have been found, Supiori Island.

***Lambula flavistrigata spec. nov.*** (figs 51, 85)

urn:lsid:zoobank.org:act: B1216088-0FE6-4B6C-9B82-3C68C89A6678

**Holotype:** ♀ (RMNH.INS.1108889), 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.**Diagnosis:** Male unknown. This species is easily recognizable, at least in the female sex, by its sulphur-yellow forewings and a yellow streak along the anal vein of the hindwing, not seen in any of the other known *Lambula* species. The female genitalia resemble those of *Lambula albicentra* De Vos, 2019, with a conspicuous double coil in the ductus bursae, but in *flavistrigata* this coil is sclerotized only along one side and is much looser, while in *albicentra* it is tight and entirely sclerotized.**Description:** ♀ Fwl. 8.0 mm. Head, patagia and tegulae yellow, antennae basally yellow, distally suffused with dark grey. Greater part of thorax black with some yellow scaling. Abdomen black with dark grey hairs on first two segments, and small yellow anal tuft. Legs yellow. Forewing of normal lithosiine shape, almost entirely sulphur-yellow, basal costal rim narrowly black. Hindwing normally shaped, dark grey with a conspicuous pale yellow streak along the anal vein. A second but shorter streak runs along the cubital vein from base to half way wing length. Fringe mixed with yellow and dark grey.

Female genitalia with minute squarish antrum leading to an exceedingly long and narrow ductus bursae with minutely wrinkled surface which produces a wide and a tight coil before junction with cervix bursae, both narrowly sclerotized along the outer side, the smallest coil with an irregular dentate rim. No lateral diverticulum of ductus bursae present. Cervix bursae broad cupular and slightly arched, with posterior hump bearing origin of ductus seminalis. Corpus bursae globular. Signa with terminally hooked anterior plate.

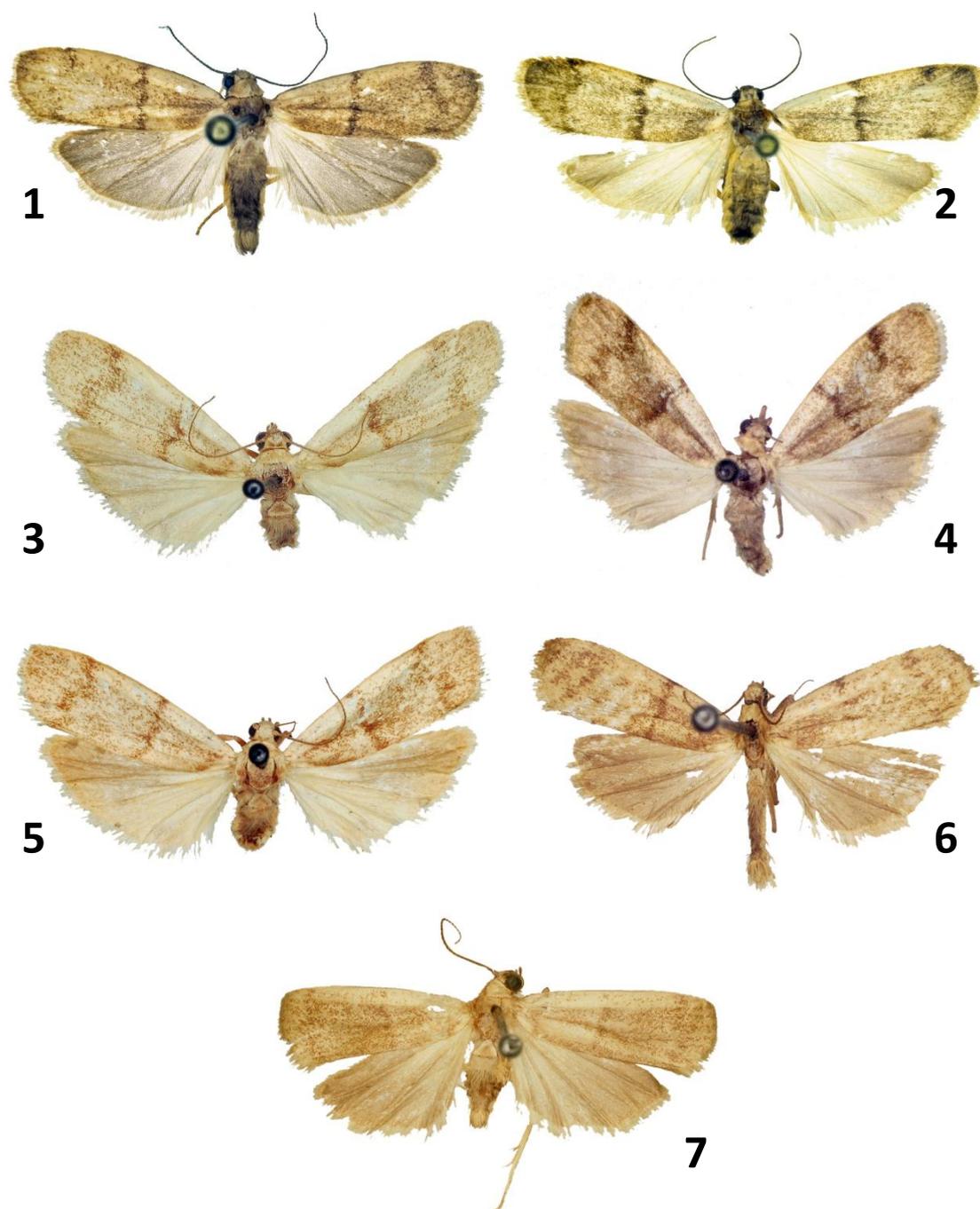
**Distribution:** The only known specimen is the holotype, which was collected in Lelambo, a small village in the Jayawijaya Mountains, Papua, Indonesia, at an elevation of 900 meters.**Etymology:** The name of the species refers to the yellow streaks on the dark grey hindwings.**Acknowledgements**

This publication could not have been possible without the support and help of the following persons and institutions, Museum für Naturkunde (Berlin, Germany) and Koleksi Serangga Papua (Waena, Papua, Indonesia), and personally Theo Leger (MfN), Viola Richter (MfN) and Evie Warikar (KSP), that we all thank for giving us the opportunity to study the necessary material in the collections. We thank the Museum für Naturkunde for allowance to depict specimens from their collections. The first author is also grateful to Geoff Martin for hospitality at The Natural History Museum (NHMUK) and The Uyttenboogaart-Eliassen

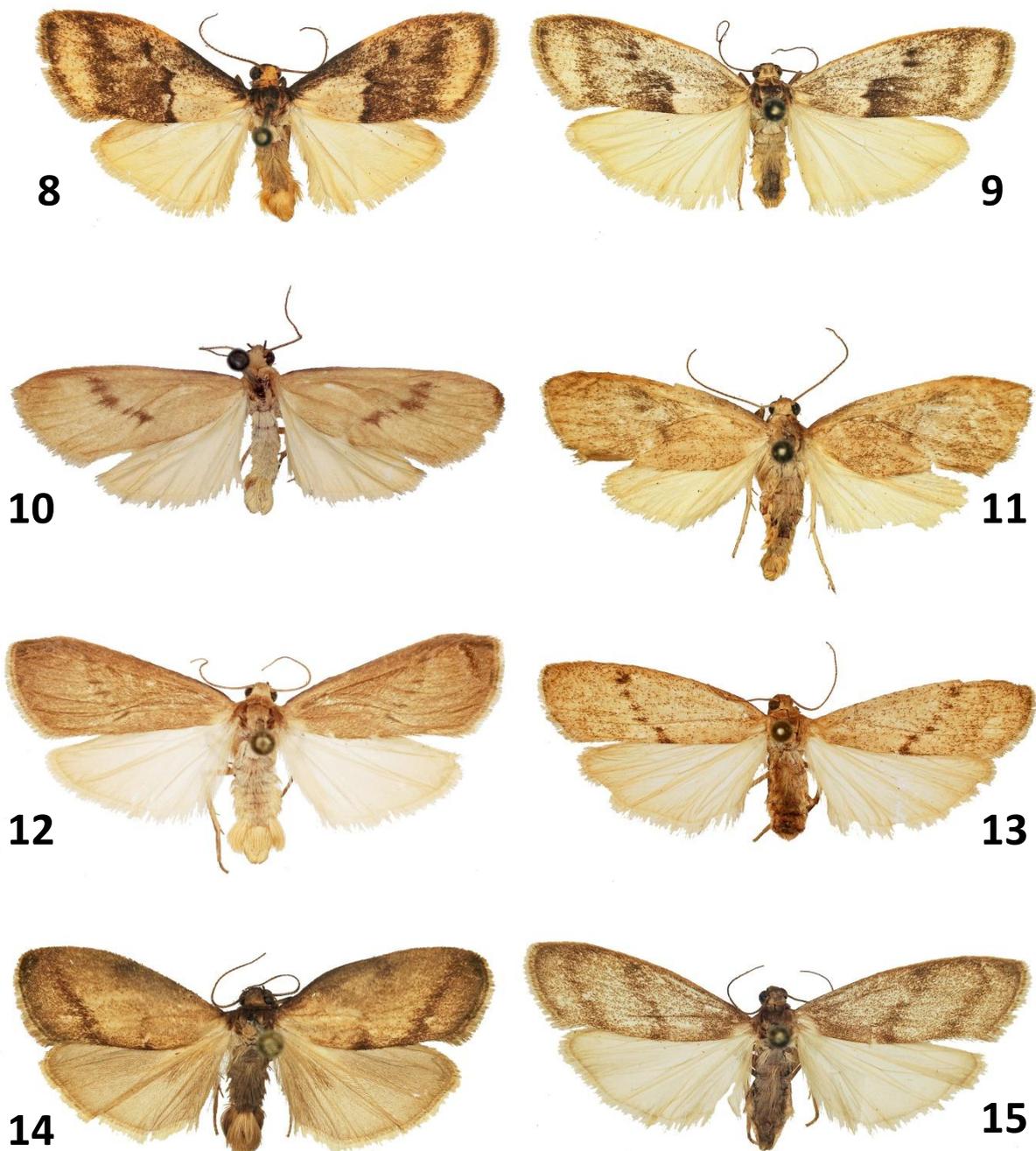
Foundation for financially supporting his visits to museums and the expeditions in Indonesian New Guinea, during which many new species were discovered. A special thanks to Mrs. Daawia Suhartawan (Waena, Papua, Indonesia) for the translation of the abstract (Rangkuman).

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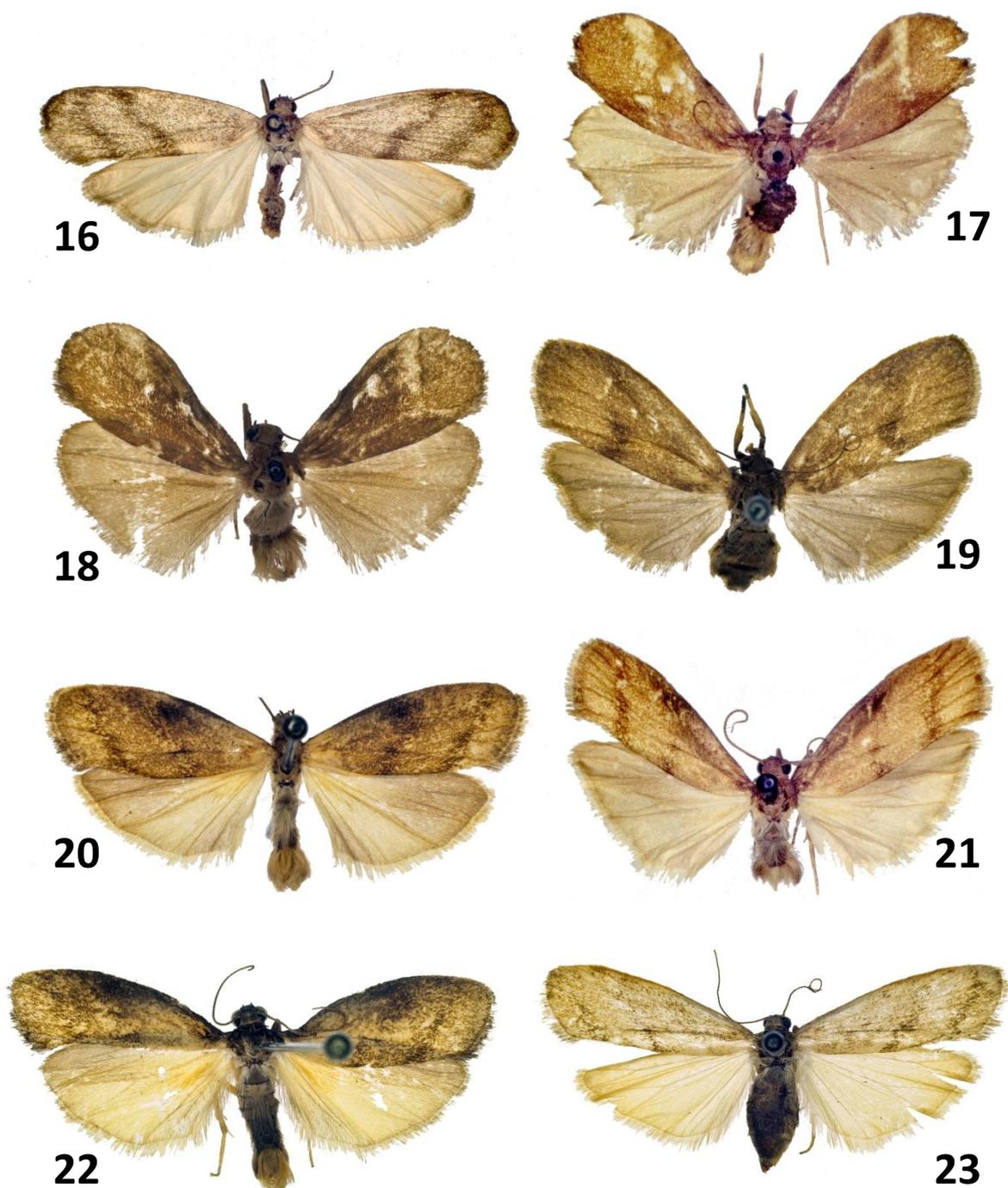
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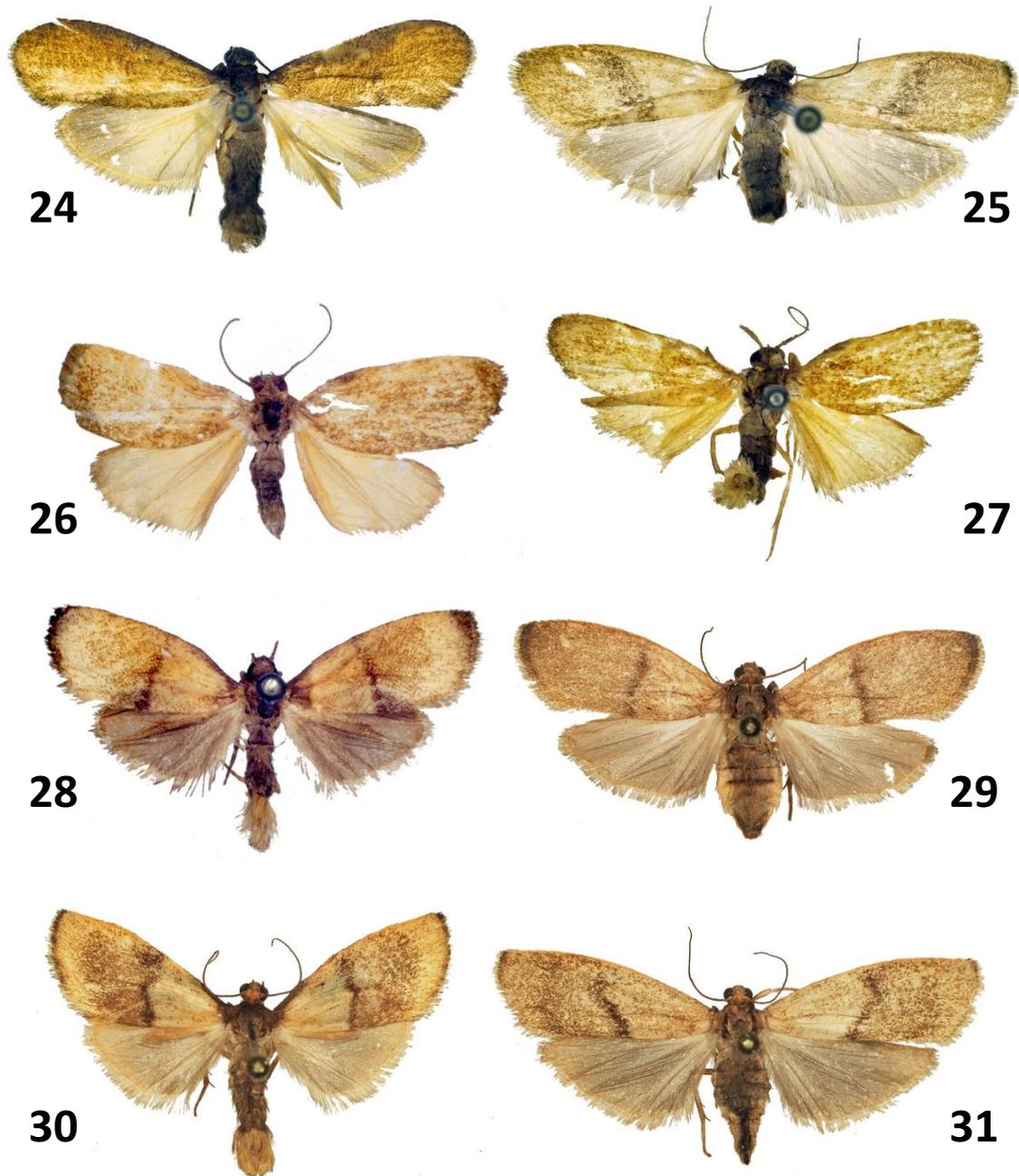
**Figs 1-7:** *Lambula bilineata* Bethune-Baker, 1904. **Fig. 1.** ♂, Senopi, Tamrau Plateau, Papua Barat, Indonesia, RMNH.INS.1108795; **Fig. 2.** ♀, same locality, RMNH.INS.1108798; **Fig. 3.** ♂, holotype *Lambula bilineata* Bethune-Baker, 1904, Upper Aroa River PNG, NHMUK-BMNH(E)1325413; **Fig. 4.** ♀, holotype *Crambidia bifasciata* Rothschild, 1912 **syn. nov.**, Biagi, Mambare River, Papua New Guinea, NHMUK-BMNH(E)1325429; **Fig. 5.** ♀, erroneously labeled and misidentified as “syntype *Lambula aroa* Bethune-Baker, 1904”, Upper Aroa river, Papua New Guinea, NHMUK-BMNH(E)1325412; **Fig. 6.** ♂, holotype *Macaduma umbrina* Rothschild, 1915 **syn. nov.**, Utakwa River, Snow Mountains, Papua, Indonesia, NHMUK-BMNH(E)1325425; **Fig. 7.** ♂, holotype *Lambula bilineata* Gaede, 1925 **syn. nov.**, Kaiserin Augustafloss Expedition, MFN.LEP.1444.



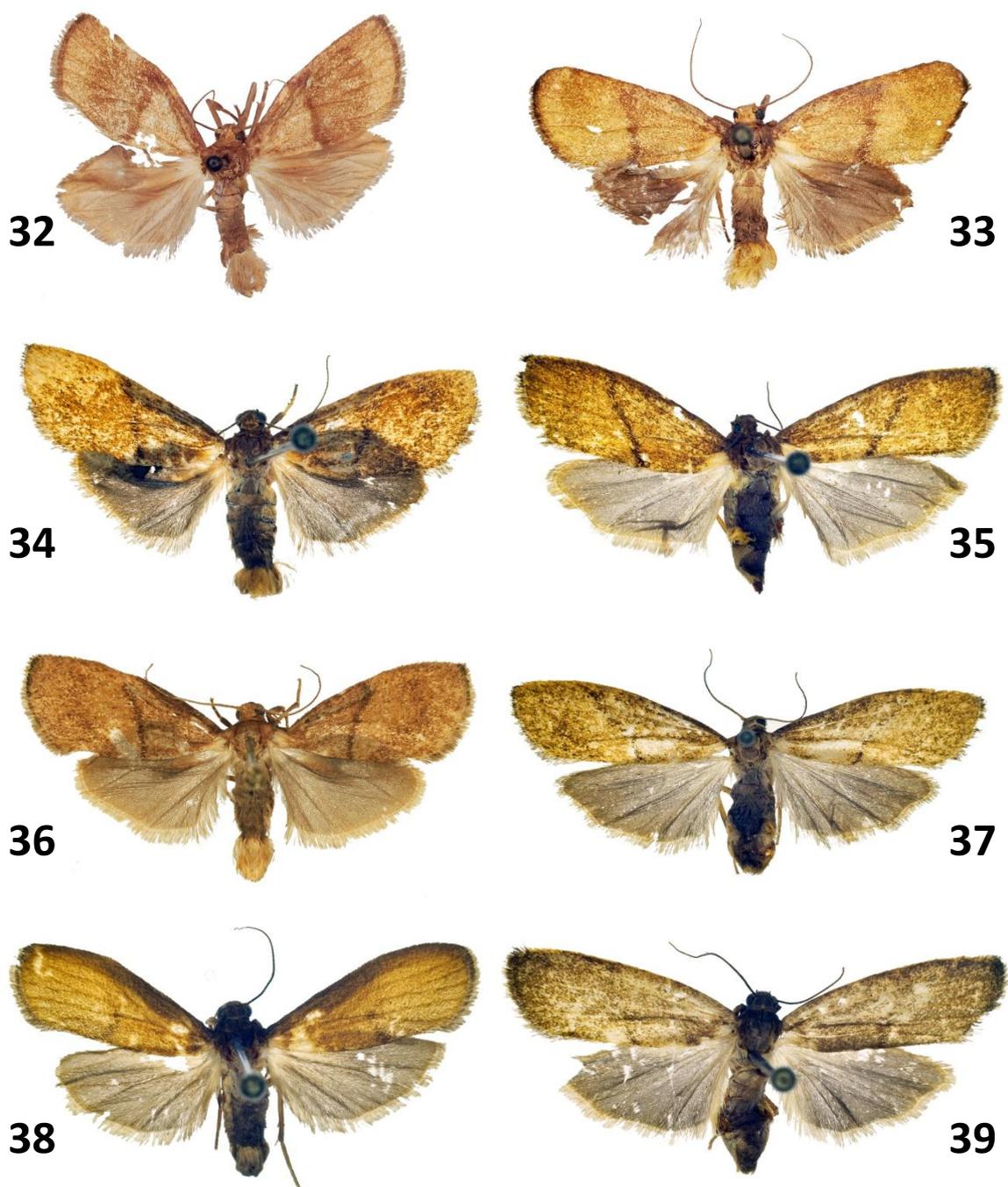
**Figs 8-15.** *Lambula* species, adults. **Fig. 8.** *Lambula contrastata* **spec. nov.** ♂, holotype, Walmak, Papua, Indonesia, RMNH.INS.1108807; **Fig. 9.** *L. contrastata* **spec. nov.** ♀, paratype, same locality, RMNH.INS.1108808; **Fig. 10.** *L. flavobrunnea* Rothschild, 1912 ♂, holotype, Mt. Goliath, Papua, Indonesia, NHMUK-BMNH(E)1325406; **Fig. 11.** *L. flavobrunnea* ♂, Pass Valley, Papua, Indonesia, RMNH.INS.1108802; **Fig. 12.** *L. punctilinea* **spec. nov.** ♂, holotype, Pass Valley, Papua, Indonesia, RMNH.INS.1108801); **Fig. 13.** *L. punctilinea* **spec. nov.** ♀, paratype, same locality, RMNH.INS.1108803; **Fig. 14.** *L. bivittata* (Rothschild, 1912) ♂, Pass Valley, Papua, Indonesia, RMNH.INS.1108849; **Fig. 15.** *L. bivittata* ♀, same locality, RMNH.INS.1562494.



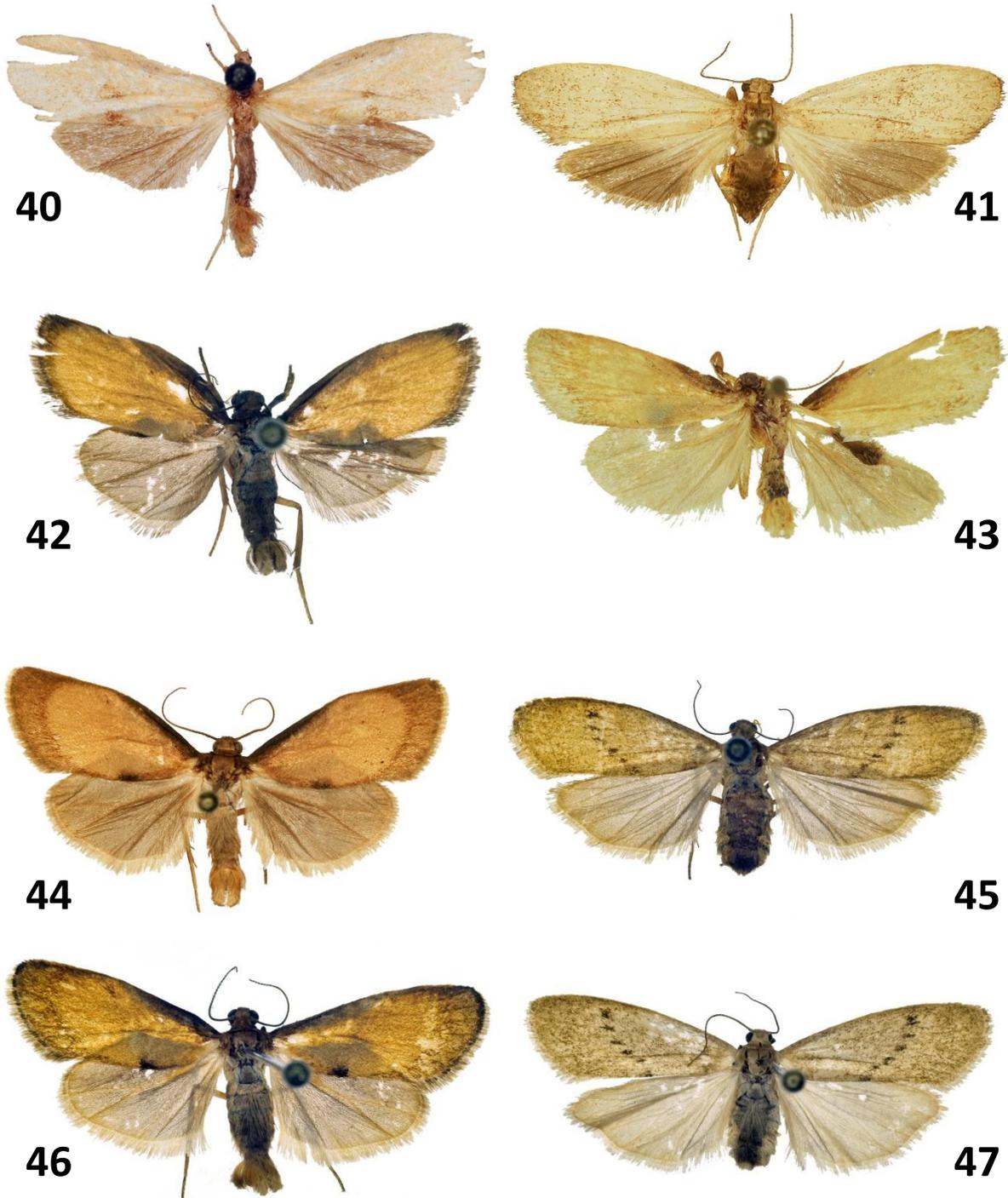
**Figs 16-23.** *Lambula* species, adults. **Fig. 16.** *Lambula bivittata* (Rothschild, 1912) ♀, holotype, Mt. Goliath, Papua, Indonesia, NHMUK-BMNH(E)1325421; **Fig. 17.** *L. agraphia* Hampson, 1900 ♂, holotype, Milne Bay, Papua New Guinea, NHMUK-BMNH(E)1325407; **Fig. 18.** *L. agraphia* ♂, same locality, NHMUK010918902; **Fig. 19.** *L. agraphia* ♀, Goodenough Island, Papua New Guinea, NHMUK010918903; **Fig. 20.** *L. aethalocis* Hampson, 1914 ♂, Bantibasa district, Kratke Mts, Papua New Guinea, NHMUK010918913; **Fig. 21.** *L. aethalocis* ♂, holotype *Scoliacma fuliginosa* Rothschild, 1912, Angbunga River, Papua New Guinea, NHMUK-BMNH(E)1325428); **Fig. 22.** *L. palliflava* *spec. nov.* ♂, holotype, Demaisi, Arfak Mts, Papua Barat, Indonesia, RMNH.INS.1108853; **Fig. 23.** *L. palliflava* *spec. nov.* ♀, paratype, Mokwam, Arfak Mts, Papua Barat, Indonesia, RMNH.INS.1108854.



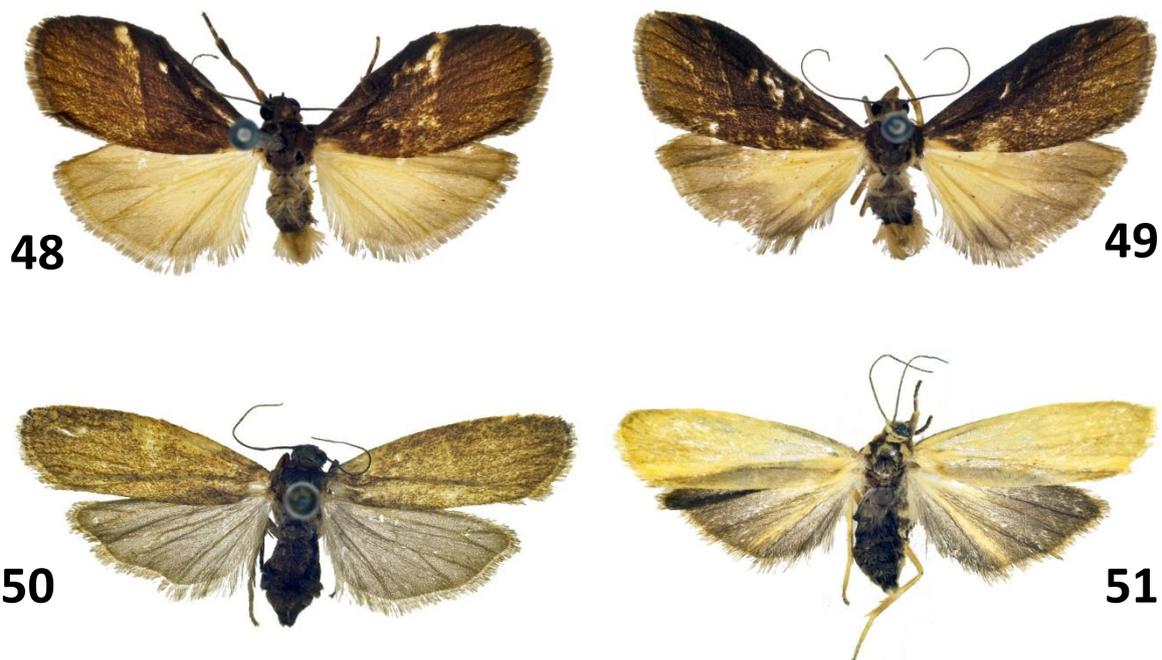
**Figs 24-31.** *Lambula* species, adults. **Fig. 24.** *Lambula keilyacornuta* **spec. nov.** ♂, holotype, Huri-Mber, Onin Peninsula, Papua Barat, Indonesia, RMNH.INS.1108856; **Fig. 25.** *L. keilyacornuta* **spec. nov.** ♀, paratype, Senopi, Papua Barat, Indonesia, RMNH.INS.1108859; **Fig. 26.** *L. plicata* Hampson, 1900 ♂, holotype, Kapaur [Fakfak], Onin Peninsula, Papua Barat, Indonesia, NHMUK-BMNH(E)1325410; **Fig. 27.** *L. plicata* ♂, same locality, NHMUK010918897; **Fig. 28.** *L. laniafera* Hampson, 1900 ♂, holotype, Kapaur [Fakfak], Onin Peninsula, Papua Barat, Indonesia, NHMUK-BMNH(E)1325409; **Fig. 29.** *L. laniafera* ♀, Meja Reserve, Manokwari, Papua Barat, Indonesia, RMNH.INS1108839; **Fig. 30.** *L. aroa* Bethune-Baker, 1904 ♂, Walmak, Papua, Indonesia, RMNH.INS.1108841; **Fig. 31.** *L. aroa* ♀, same locality, RMNH.INS.1108842.



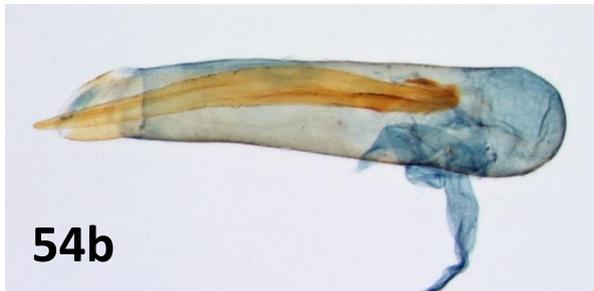
**Figs 32-39.** *Lambula* species, adults. **Fig. 32.** *Lambula aroa* Bethune-Baker, 1904 ♂, holotype, Upper Aroa River, Papua New Guinea, NHMUK-BMNH(E)1325411; **Fig. 33.** *L. castanea* Rothschild, 1912 ♂, holotype, Utakwa River, Papua, Indonesia, NHMUK-BMNH(E)1325408; **Fig. 34.** *L. crispumcornuta* **spec. nov.** ♂, holotype, Mokwam, Arfak, Papua Barat, Indonesia, RMNH.INS.1108863; **Fig. 35.** *L. crispumcornuta* **spec. nov.** ♀, paratype, same locality, RMNH.INS.1108864; **Fig. 36.** *L. ophiocornuta* **spec. nov.** ♂, holotype, Mabilabol, Star Mts, Papua, RMNH.INS.1108861; **Fig. 37.** *L. ophiocornuta* **spec. nov.** ♀, paratype, same locality, RMNH.INS.1108862; **Fig. 38.** *L. punctifer* Hampson, 1900 ♂, Werba, Onin Peninsula, Papua Barat, Indonesia, RMNH.INS.1109010; **Fig. 39.** *L. punctifer* ♀, Huri-Mber, Onin Peninsula, Papua Barat, Indonesia, RMNH.INS.1108871.



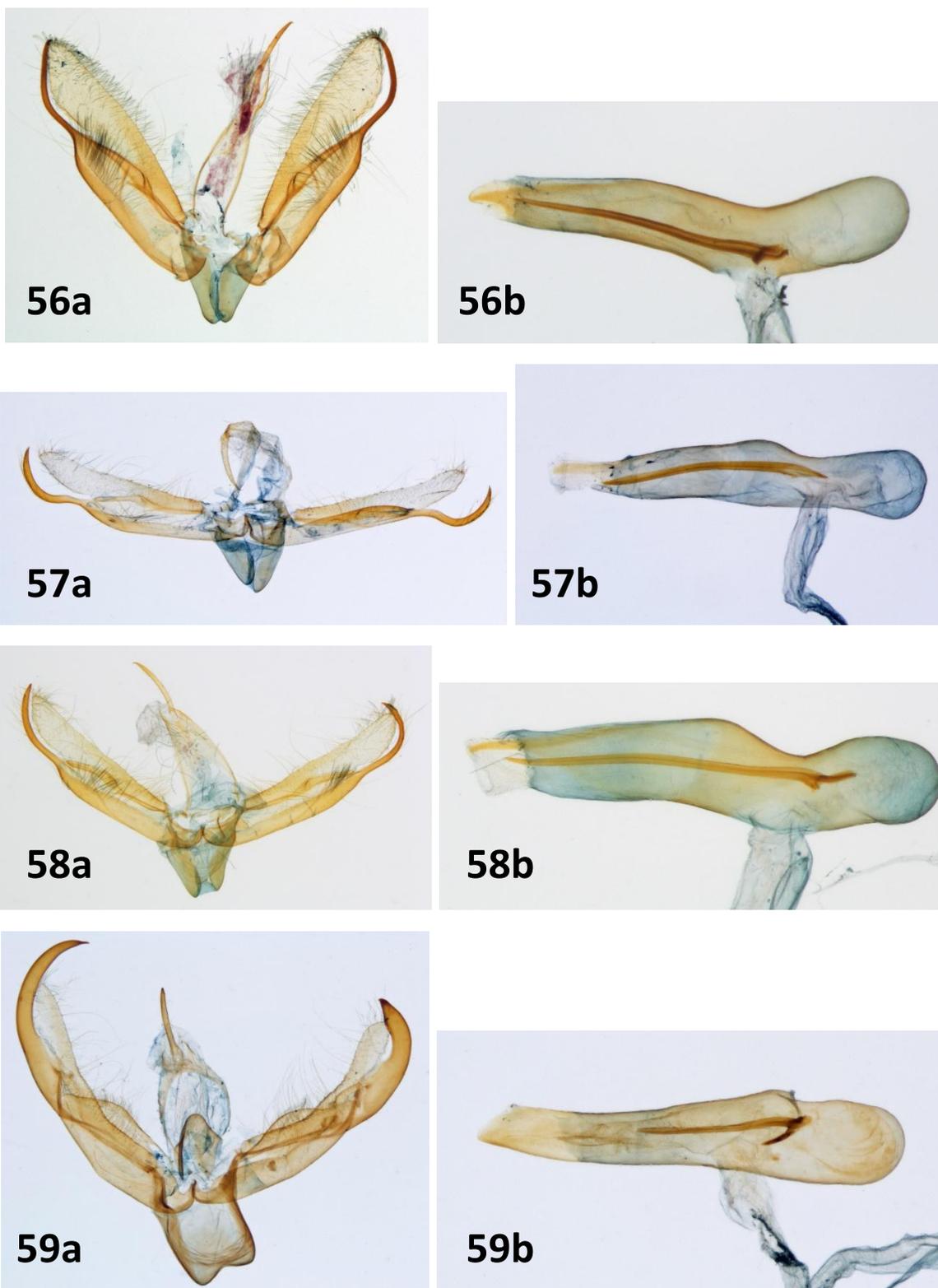
**Figs 40-47.** *Lambula* species, adults. **Fig. 40.** *Lambula punctifer* Hampson, 1900 ♂, holotype, Kapaur (Fakfak), Onin Peninsula, Papua Barat, Indonesia, NHMUK-BMNH(E)1325426; **Fig. 41.** *L. punctifer* ♀, holotype *Lambula pallescens* De Vos, 2019, Tandia, Wandammen Peninsula, Papua Barat, Indonesia, RMNH.INS.910540; **Fig. 42.** *L. nigromarginata* spec. nov. ♂, holotype, Benyas, Arfak, Papua Barat, Indonesia, RMNH.INS.1108872; **Fig. 43.** *L. fuscibasis* De Vos, 2019 ♂, holotype, Modio, Paniai district, Papua, Indonesia, RMNH.INS.1098919; **Fig. 44.** *L. fuscibasis* ♂, Walmak, Papua, Indonesia, RMNH.INS.1108868; **Fig. 45.** *L. fuscibasis* ♀, same locality, RMNH.INS.1108869; **Fig. 46.** *L. fuscibasis* ♂, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1108870; **Fig. 47.** *L. fuscibasis* ♀, Mokwam, Arfak, Papua Barat, Indonesia, RMNH.INS.1109004.



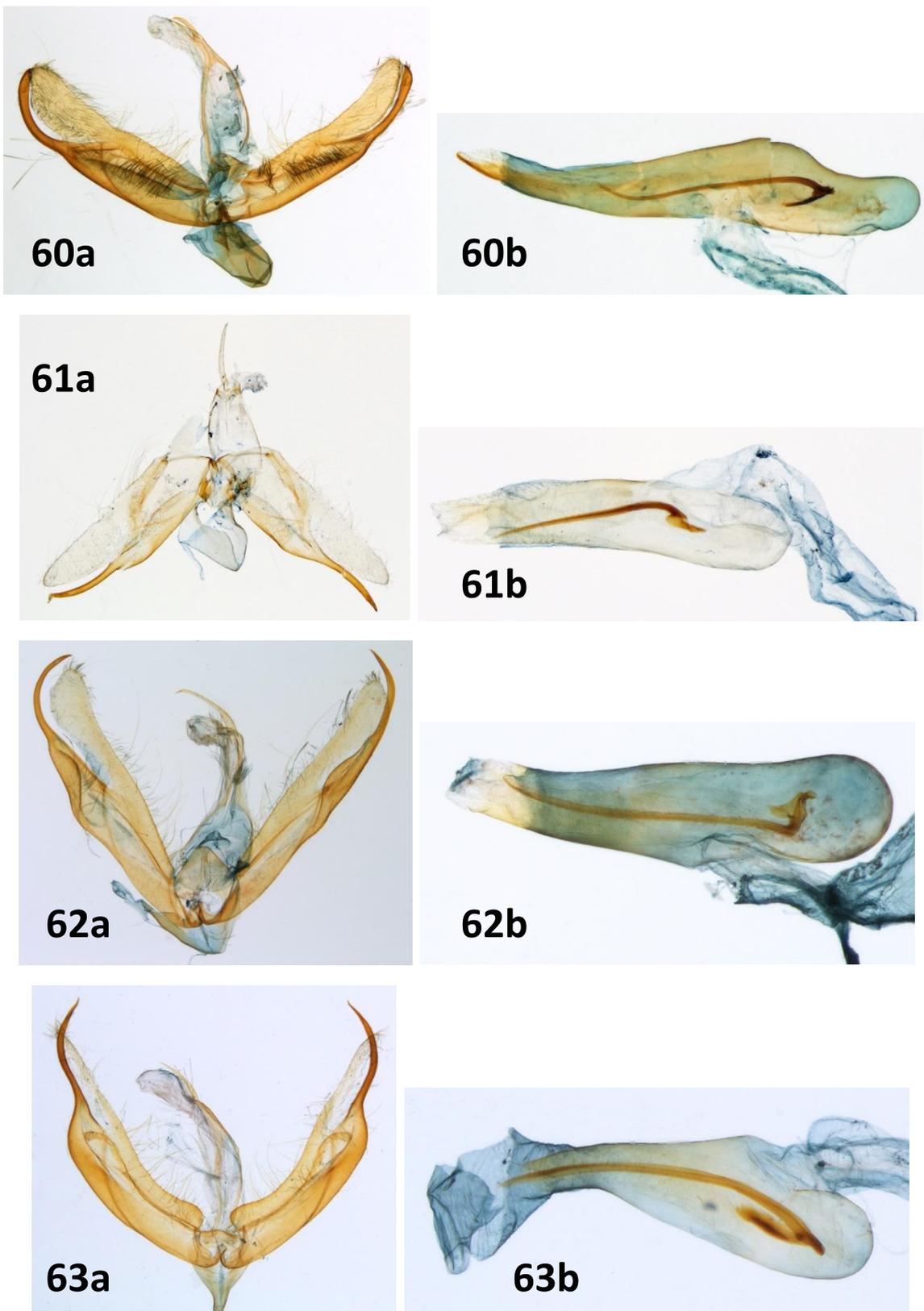
**Figs 48-51.** *Lambula* species, adults. **Fig. 48.** *Lambula brunnescens* **spec. nov.** ♂, holotype, Hydrographer Mts, Papua New Guinea, NHMUK010918900; **Fig. 49.** *L. brunnescens* **spec. nov.** ♂, paratype, Goodenough Island, Papua New Guinea, NHMUK010918901; **Fig. 50.** *L. supioria* **spec. nov.** ♀, holotype, Nansfori, Supiori Island, Papua, Indonesia, RMNH.INS.1108867; **Fig. 51.** *L. flavistrigata* **spec. nov.** ♀, holotype, Lelambo, Papua, Indonesia, RMNH.INS.1108889.



**Figs 52-55.** Male genitalia of *Lambula* species. **a.** genital armature, **b.** aedeagus. **Fig. 52.** *Lambula bilineata*, Senopi, Papua Barat, Indonesia, RMNH.INS.1108795; **Fig. 53.** *L. contrastata*, paratype, Mokwam, Papua Barat, Indonesia, RMNH.INS.1108817; **Fig. 54.** *L. flavobrunnea*, Pass Valley, Papua, Indonesia, RMNH.INS.1108802; **Fig. 55.** *L. punctilinea*, paratype, Walmak, Papua, Indonesia, RMNH.INS.1109008.



**Figs 56-59.** Male genitalia of *Lambula* species. **a.** genital armature, **b.** aedeagus. **Fig. 56.** *Lambula bivittata*, Walmak, Papua, Indonesia, RMNH.INS.1108851; **Fig. 57.** *L. aethalocis*, Kratke Mts, Papua New Guinea, NHMUK10918913; **Fig. 58.** *L. palliflava*, paratype, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1108880; **Fig. 59.** *L. agraphia*, Milne Bay, Papua New Guinea, NHMUK10918902.



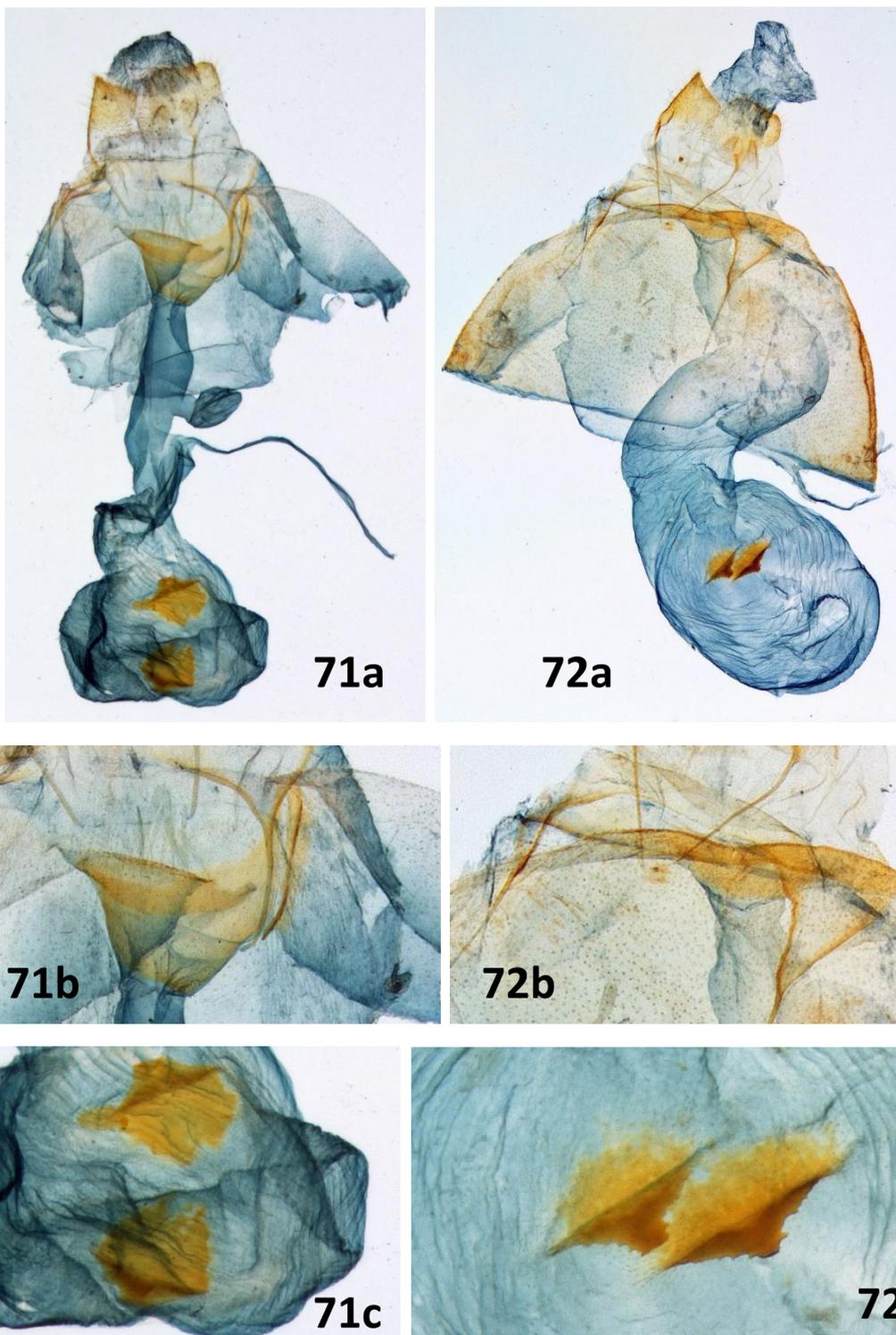
**Figs 60-63.** Male genitalia of *Lambula* species. **a.** genital armature, **b.** aedeagus. **Fig. 60.** *Lambula keilyacornuta*, paratype, Huri-Mber, Papua Barat, Indonesia, RMNH.INS.1108857; **Fig. 61.** *L. plicata*, Kapaur [Fakfak], Papua Barat, Indonesia, NHMUK10918897; **Fig. 62.** *L. laniafera*, Sentani, Papua, Indonesia, RMNH.INS.1108838; **Fig. 63.** *L. aroa*, Mokwam, Papua Barat, Indonesia, RMNH.INS.1108843.



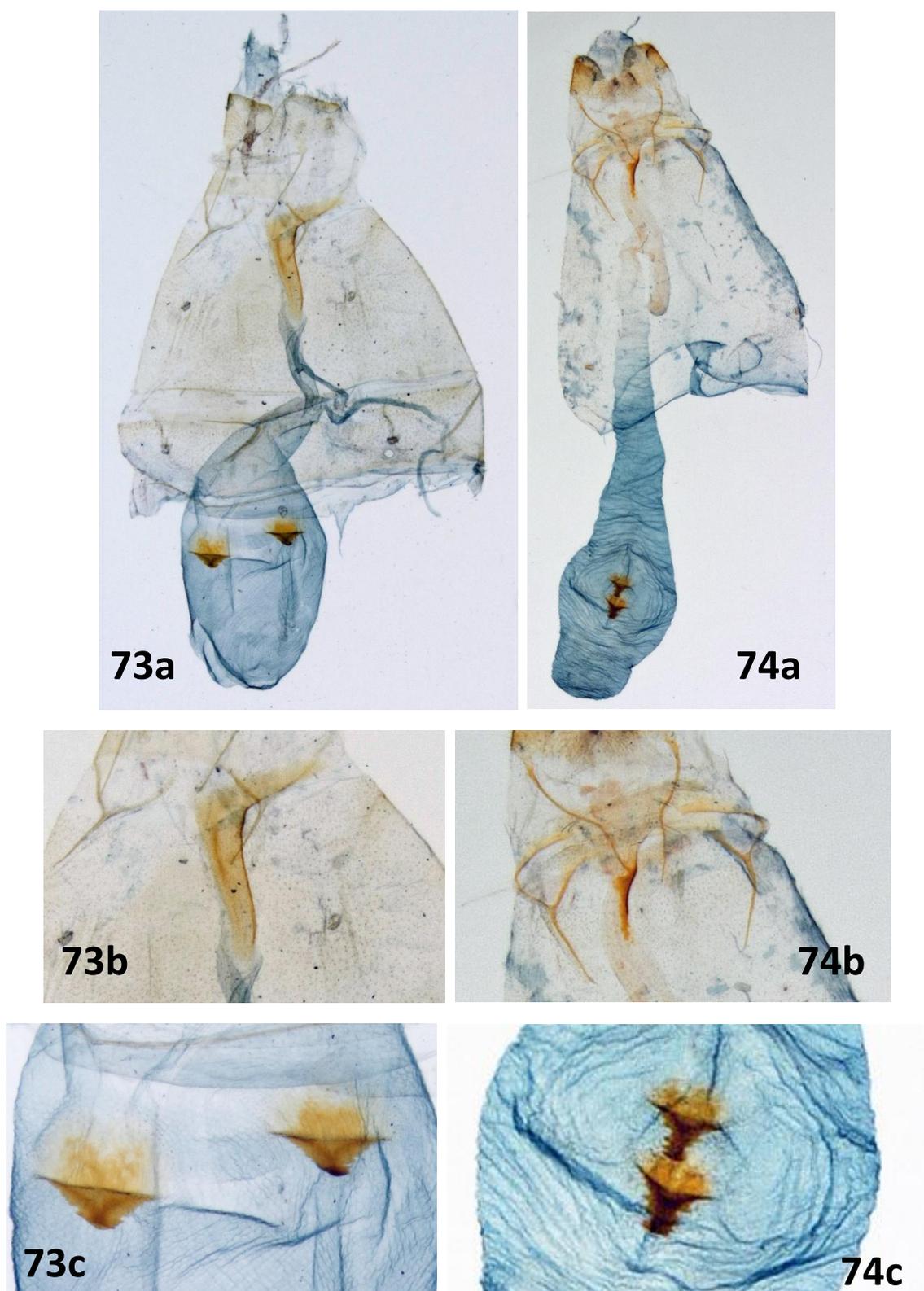
**Figs 64-67.** Male genitalia of *Lambula* species. **a.** genital armature, **b.** aedeagus. **Fig. 64.** *Lambula castanea*, Utaqua River, Papua, Indonesia, NHMUK10918898; **Fig. 65.** *L. crispumcornuta*, paratype, Landikma, Papua, Indonesia, RMNH.INS.1108846; **Fig. 66.** *L. ophiocornuta*, paratype, Mabilabol, Papua, Indonesia, RMNH.INS.1108882; **Fig. 67.** *L. punctifer*, holotype, Kapaur [Fakfak], Papua Barat, Indonesia, NHMUK010315339.



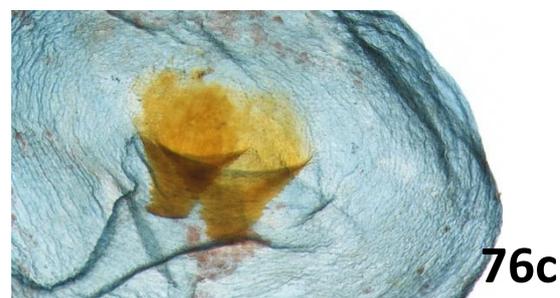
**Figs 68-70.** Male genitalia of *Lambula* species. **a.** genital armature, **b.** aedeagus. **Fig. 68.** *Lambula nigromarginata*, holotype, Benyas, Arfak, Papua Barat, Indonesia, RMNH.INS.1108872; **Fig. 69.** *L. fuscibasis*, Walmak, Papua, Indonesia, RMNH.INS.1108886; **Fig. 70.** *L. brunnescens*, holotype, Hydrographer Mts, Papua New Guinea, NHMUK010918900.



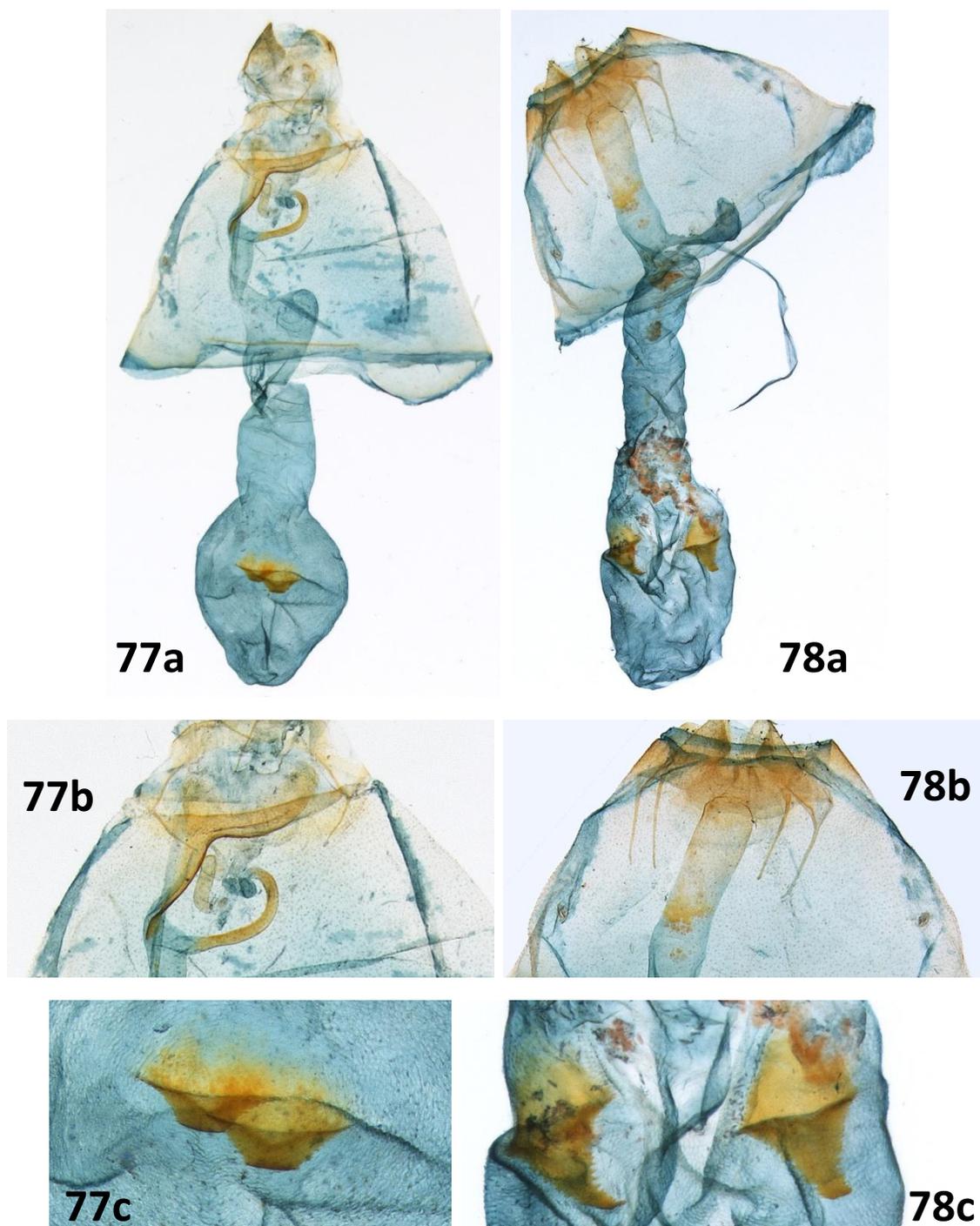
**Figs 71-72.** Female genitalia of *Lambula* species. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified. **Fig. 71.** *Lambula bilineata*, Lelambo, Papua, Indonesia, RMNH.INS.1108800; **Fig. 72.** *L. contrastata*, paratype, Mokwam, Papua Barat, Indonesia, RMNH.INS.1108818.



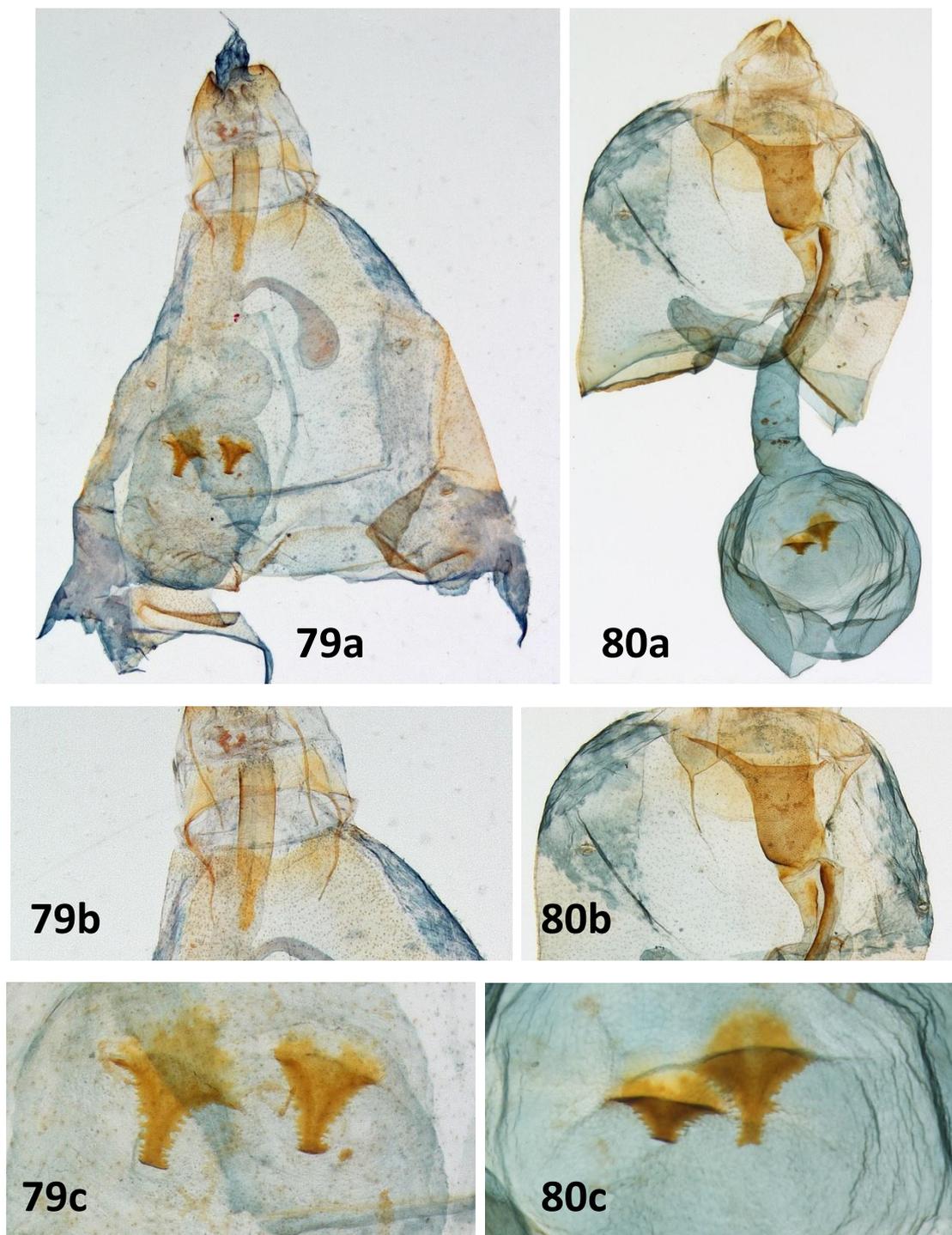
**Figs 73-74.** Female genitalia of *Lambula* species. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified. **Fig. 73.** *Lambula punctilinea*, paratype, Pass Valley, Papua, Indonesia, RMNH.INS.1108804; **Fig. 74.** *L. bivittata*, Pass Valley, Papua, Indonesia, RMNH.INS.1108850.



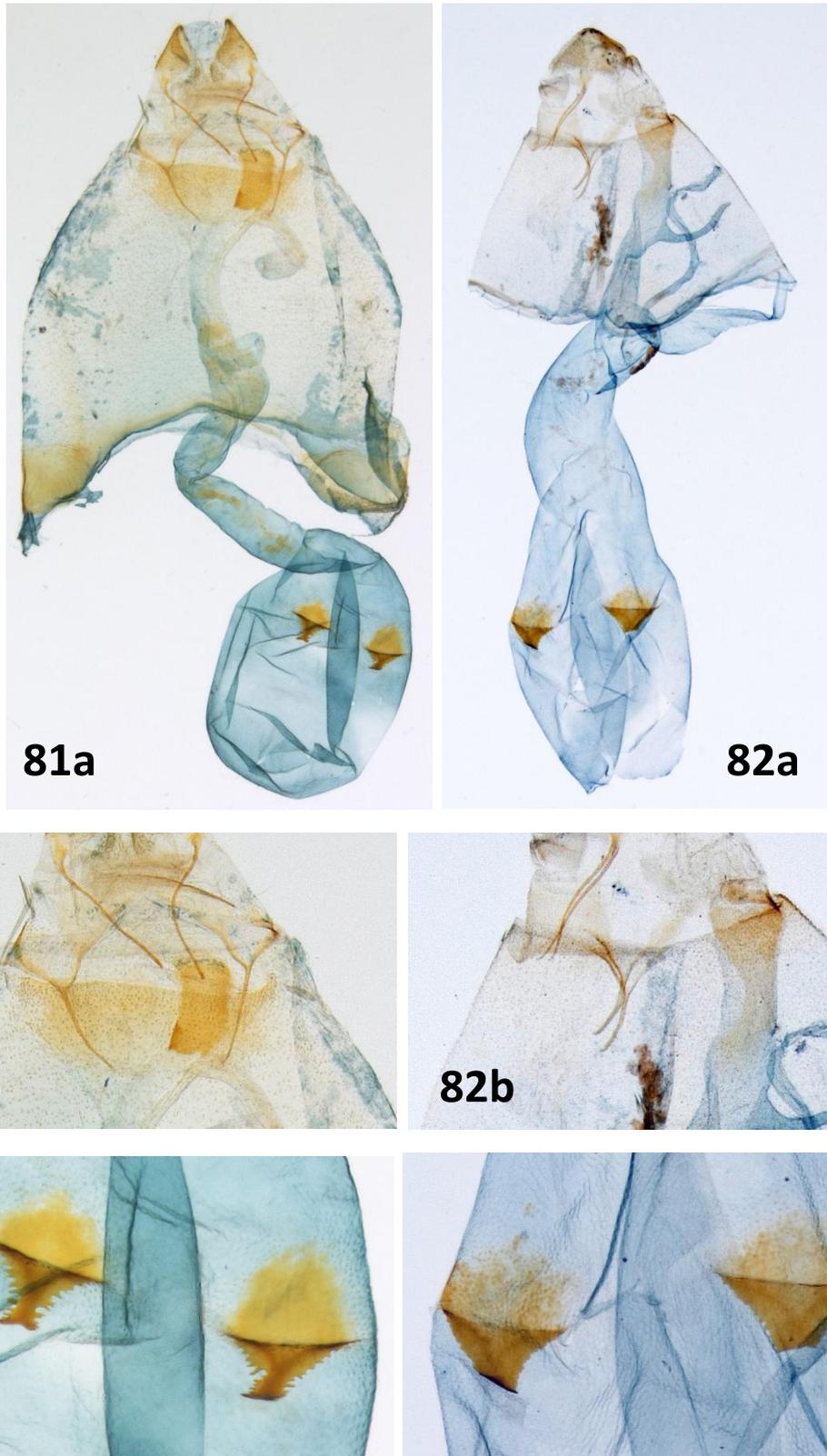
**Figs 75-76.** Female genitalia of *Lambula* species. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified. **Fig. 75.** *Lambula palliflava*, paratype, Mokwam, Arfak, Papua Barat, Indonesia, RMNH.INS.1108881; **Fig. 76.** *L. agraphia*, Dotir River, Wandammen, Papua Barat, Indonesia, RMNH.INS.1108874.



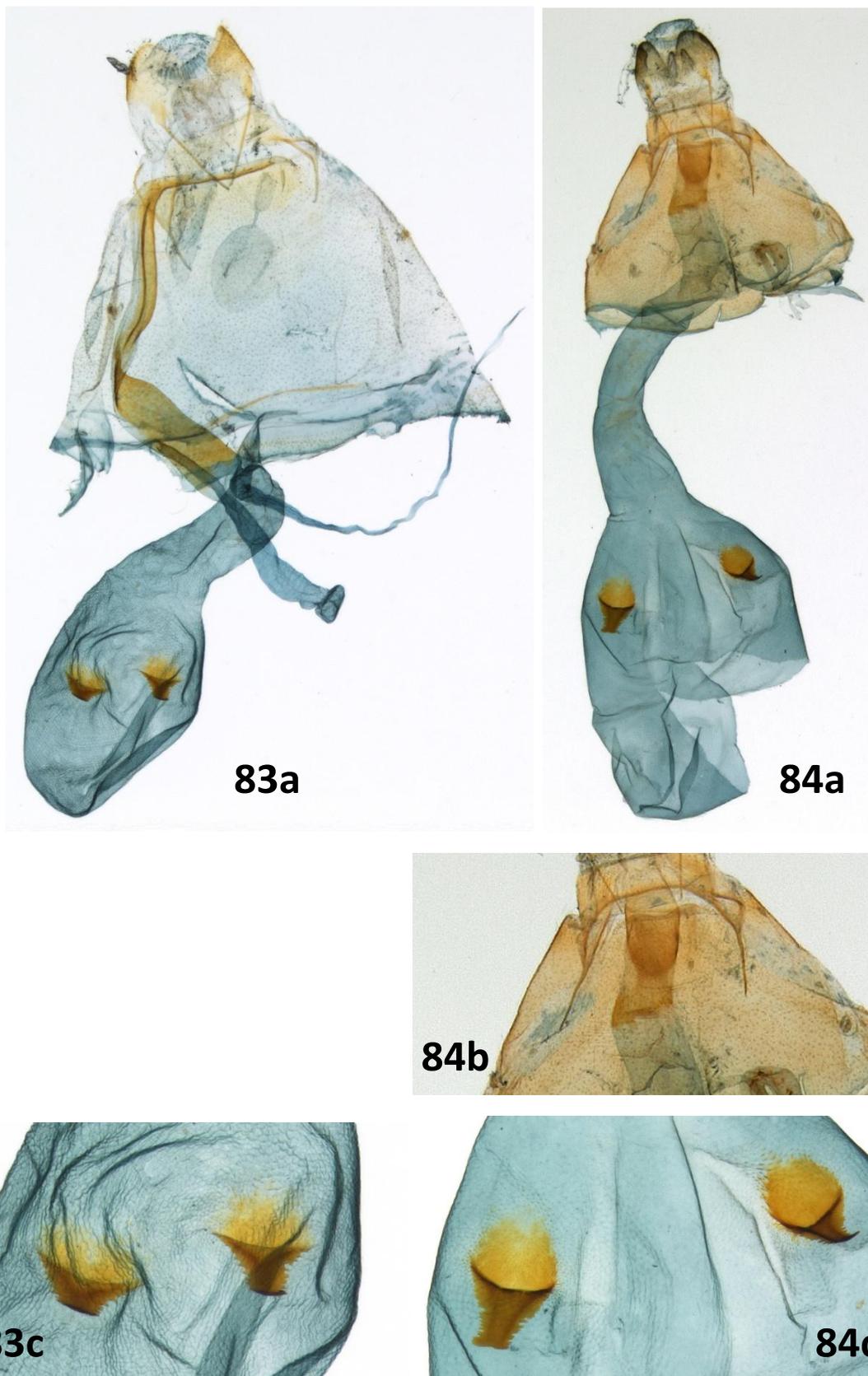
**Figs 77-78.** Female genitalia of *Lambula* species. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified. **Fig. 77.** *Lambula keilyacornuta*, paratype, Senopi, Papua Barat, Indonesia, RMNH.INS.1108859; **Fig. 78.** *L. laniafera*, Prafi, Arfak, Papua Barat, Indonesia, RMNH.INS.1108840.



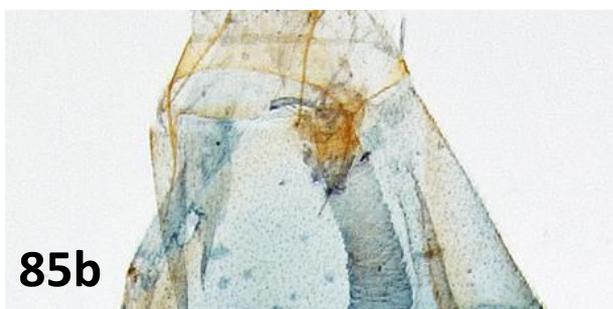
**Figs 79-80.** Female genitalia of *Lambula* species. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified. **Fig. 79.** *Lambula aroa*, Walmak, Papua, Indonesia, RMNH.INS.1108842; **Fig. 80.** *L. crispumcornuta*, paratype, Mokwam, Arfak, Papua Barat, Indonesia, RMNH.INS.1108885.



**Figs 81-82.** Female genitalia of *Lambula* species. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified. **Fig. 81.** *Lambula ophiocornuta*, paratype, Mabilabol, Papua, Indonesia, RMNH.INS.1108883; **Fig. 82.** *L. punctifer*, Canoe Camp, Utkwa River, Papua, Indonesia, NHMUK-BMNH(E)1325427.



**Figs 83-84.** Female genitalia of *Lambula* species. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified. **Fig. 83.** *Lambula fuscibasis*, Maripi, Arfak, Papua Barat, Indonesia, RMNH.INS.1108890; **Fig. 84.** *L. supioria*, paratype, Nansfori, Supiori Island, Papua, Indonesia, RMNH.INS.1108888.



**Fig. 85.** Female genitalia of *Lambula flavistrigata*, holotype, Lelambo, Papua, Indonesia, RMNH.INS.1108889. **a.** genitalia, **b.** antrum magnified, **c.** signa magnified.