

## Three new Arctiinae species from Lake Habbema (Lorentz National Park) in Papua, Indonesia (Lepidoptera: Erebidae)

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**Abstract:** Three new Arctiinae (Erebidae) from Lake Habbema (Lorentz National Park), Papua, Indonesia, are described of previous already revised genera: *Spilosoma renateae* **spec. nov.**, *Oeonosia lorentz* **spec. nov.** and *Cyana (Cryptanaema) habbema* **spec. nov.** The species are compared with allied species and imagines and genitalia are depicted.

**Rangkuman:** Tiga spesies baru Arctiinae (Erebidae) dari Danau Habbema (Taman Nasional Lorentz), Papua, Indonesia dideskripsi dari Genera yang telah direvisi sebelumnya: *Spilosoma renateae* **spec. nov.**, *Oeonosia lorentz* **spec. nov.** dan *Cyana (Cryptanaema) habbema* **spec. nov.** Spesies-spesies ini dibandingkan dengan spesies sekerabat, gambar dan alat kelamin (genitalia) dibuat deskripsinya.

**Keywords:** *Spilosoma*, *Oeonosia*, *Cyana*, new species, Lake Habbema, New Guinea

### Abbreviations used

Fwl – Forewing length (measured from base to apex)

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

PIF – Papua Insects Foundation

RMNH.INS – acronym of Naturalis Biodiversity Center, Leiden, The Netherlands

### Introduction

As already predicted in previous revisions of the New Guinea species of the Arctiinae genera *Spilosoma*, *Oeonosia* and *Cyana* (De Vos, 2007; De Vos & Suhartawan, 2011; De Vos, 2012; De Vos, 2017), still new species are being found. Since we are able to travel to more remote areas in the interior of New Guinea it is obvious that we come across other species than those well known from coastal and easy to reach areas. Especially in mountain ranges many isolated populations of unknown species exist, particularly at higher altitudes.

In 2018 an expedition of the Papua Insects Foundation (PIF) went to Lake Habbema in the Lorentz National Park (Papua, Indonesia), at an altitude of more than 3400 meter. This locality was already made famous by the historical 3<sup>rd</sup> Archbold Expedition in 1938-1939 (Toxopeus, 1940) and much of the collected material from that expedition is still preserved in Naturalis Biodiversity Center in Leiden, The Netherlands. Nevertheless the historical results there are still new species of Lepidoptera found in that area. Three of such finds will be treated here, belonging to the Arctiinae (Erebidae). It is already clear by now that more publications of new species of Lepidoptera from the Lake Habbema area will follow.

In 2011 a comprehensive revision was published by De Vos & Suhartawan of the genus *Spilosoma* with all at that time 27 known species. Somewhat later four additional new species were published (De Vos, 2013a; 2013b; De Vos & Van Haren, 2014). The same happened with the New Guinea species of the genus *Oeonosia* (De Vos, 2007; 2012) and *Cyana* (De Vos, 2017) when after publication new species were found (De Vos, 2018). And it is most likely that this is not the end of the row.

One species belonging to tribe Arctiini and two of Lithosiini are being described new to science here below.

## Description of the species

### Arctiini

#### ***Spilosoma renateae* spec. nov.** (Figs 1-6, 18)

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**Holotype:** ♂ KSP-65134, Indonesia, Papua, Lorentz Reserve, Lake Habbema, 3457 m, at light, 4°08'S – 138°42'E, 30.ix-1.x.2018, leg. R. de Vos (PIF).

**Paratypes** 3 ♂♂ KSP-65135, RMNH.INS.1108409, RMNH.INS.1108643, same as holotype; 4 ♂♂ RMNH.INS.1255916-1255919 [in coll. S. Sinnema], Indonesia, Papua, Habbema Lake, 4°08'07"S - 138°42'08"E, 3400 m, 30.ix-2.x.2018, PIF expedition, leg. Sinnema.

**Diagnosis:** Wingpattern similar to *Spilosoma grandimacula* De Vos & Suhartawan, 2011, and certainly closely allied to it, but groundcolour much paler and pattern finer and with more contrast, pattern of *grandimacula* is rougher. Male genitalia also similar to those of *grandimacula* but apical process on right valve longer and carinal plate of aedeagus with different shaped teeth. It belongs to the *persimilis* group of species. Female yet unknown.

**Description:** Fwl. ♂ 21-22 mm. Head dark brown, labial palpa black, antennae pale buff, at the ventral side black. Thorax dorsally dark brown with a median black band which is broader caudally, thorax ventrally black, legs black but with tibia at outer side rosy red. Abdomen dorsally rosy red, with a dorsal median black band compiled of confluent black dots which in some specimens are partly isolated, laterally with a row of black dots, ventrally black mixed with buff, anal segments ventrally buff and rosy red.

Forewing with ground colour buff, in some specimens scarcely sprinkled with scattered black scales. Subbasally a black costal spot and double black stripe on the cubital vein present in holotype but in pale specimens this may be absent or faint. At the costa three large black squarish patches antemedial, medial and postmedial, which take part in three broken sinuous transverse bands: antemedial band represented by an oblique black costal bar and a smaller patch at the dorsum, medial band often well defined by a sinuous row of irregular shaped dots running from costa to dorsum, postmedial row of dots in holotype clearly defined but in others faint and only clear at the costa. A row of small submarginal dots running from apex to halfway length of termen.

Hindwings rosy red with some yellowish tinge at the dorsum and termen. With a black central stigma spot and a black medial irregular band which is in holotype clearly defined, but in paler specimens faint, a broader submarginal band is in holotype complete by confluent dots, but in pale specimens this band is broken up in isolated and paired dots.

Fringes of hindwing yellow, apically black. Ventral side of wings much like in *grandimacula*, but with paler ground colour and finer pattern. Ground colour pale buff, the basal half of the forewing cell filled with rosy red. Black pattern as on upperside but heavily extended, especially in holotype bands and spots confluent. On the hindwing a large stigma patch which is isolated or partly confluent with the medial band (in *grandimacula* it is integrated in the medial band).

Male genitalia (prep. RMNH.INS.1108643): Similar to those of *grandimacula* but with some differences. Uncus broadly beak-shaped, with a sharp down bend apex. Tegumen evenly wide at full length (in *grandimacula* with a wide collar at base of uncus). Base of valve, like in *grandimacula*, with at joint with tegumen a broad ribbon-shaped peniculus-like structure with stronger sclerotized apex. Juxta heart-shaped with sclerotized concave upper rim, somewhat longer than in *grandimacula*. Vinculum deep 'U'-shaped. Valva slender, with finger-shaped apex slightly curved inwards, right valve with much longer apical process than in *grandimacula*. Cucullus with at two-third a triangular process with a sharp apex (in *grandimacula* this process is a rounded lobe), sacculus halfway with a finger-shaped process which is slightly oblique (in *grandimacula* with a right angle). Aedeagus short, slightly curved with a short coecum. Distally broadening and split. Carinal plate with about six sharp short teeth in a row of about similar size (in *grandimacula* distally increasing in size and irregular positioned). Vesica with shallow lobes and two longer diverticuli, dorso-distally with a field of tiny scobination and four additional field of even smaller scobination, ventral lobe deep, ventrally covered with small cornutal spines.

Variation: One specimen (RMNH.INS.1108647) has the forewing suffused with darkbrown and has a totally black thorax and head, but its pattern is identical. At the ventral side the buff ground colour is heavily suffused with dark brown scales. The genitalia are for the greater part identical to the studied paratype, apart from the process on the sacculus being sharper and the carinal plate on the aedeagus has smaller teeth. For the time being it is considered to be a dark form of the new species but it is not included in the type series to avoid confusion when more material and information comes available and its taxonomic status should be revised.

Female unknown.

**Distribution:** The species is found in the vicinity of Lake Habbema, Lorentz National Park, Papua, Indonesia. It was found at an altitude of 3457 meters.

**Etymology:** The species is named in honour of Miss Renate Kramer, who accompanied and assisted the members of the Papua Insects Foundation during the expedition in 2018. She is a very good friend of us and a passionate nature lover. Her effort for the welfare of captive wild animals is admirable.

## Lithosiini

### ***Oeonosia lorentz spec. nov.*** (Figs 9-10, 20, 24)

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**Holotype:** ♂ RMNH.INS.1108644, Indonesia, Papua, Lorentz Reserve, Lake Habbema, 3457 m, at light, 4°08'S – 138°42'E, 30.ix-1.x.2018, leg. R. de Vos (PIF).

**Paratypes** 2 ♀♀, KSP-65136, RMNH.INS.1108645, same as holotype; 1 ♀, Indonesia, Papua, Habbema Lake, 4°08'07"S-138°42'08"E, 3400 m, 30.ix-2.x.2018, PIF expedition, leg. Sinnema.

**Diagnosis:** Resembles *Oeonosia cruda* De Vos, 2012 and dark forms of *O. longistriga* (Bethune-Baker, 1908), but with broader forewings and suffused hindwings. The pattern and scaling of this new species seems even rougher than in *cruda*.

**Description:** Fwl. ♂ 24.5 mm, ♀ 23.5-26.5 mm. Male with antennae bipectinate, brown. Labial palpa dark brown. Head and tegulae dark brown with mixed buff hairy scales. Thorax with grey-brown flat scaling. Forelegs dark brown, mid- and hindlegs buff with dark brown bands. Abdomen with first caudal segments with pale buff hairy scaling, rest of abdomen dark grey, anal tuft buff. Forewings rather broad, brown with rough scaling. A faint pattern of a dark brown oblique and broken medial fascia which runs from dorsum to two-third length of costa but is not reaching it. Fringes of forewing dark brown.

Hindwing grey-brown, paler at wingbase. Underside identical to upperside.

Female with brown antennae at one side dentate and ciliate. Palpa dark brown with some buff bands. Head pale buff, thorax and tegulae like in male, dark brown mixed with buff hairy scaling. Legs as in male. Abdomen with first caudal segments with pale buff long hairy scales, the rest of abdomen dorsally with pale grey flat scaling. Forewings dark brown mixed with pale buff scales giving it a marbled appearance. A faint oblique dark brown band present which is broken into two parts, one medial on the cubital vein and one at the end of the cell. Hindwing pale grey-brown, at dorsum slightly paler. Fringes yellow-buff.

Male genitalia (RMNH.INS.1108644): Uncus claw-shaped, not so long as in *cruda*, with a sharp apex. Tegumen long and stretched and less sclerotized. Saccus large, deeply "U"-shaped with a strong sclerotized rim. Valvae rather broad, cucullus broadly disc-shaped, less sclerotized than sacculus. Harpe thick, strongly sclerotized and caudally with an irregular rim and strongly curved at a right angle. Sacculus broadly based, gradually narrowing with a rather thick apical process with a bifurcate apex. Tube of aedeagus short and straight, vesica at base with a collar of tiny chitinous drops, followed by a corona of cornutal thorns (similar as in *abenaho* De Vos, 2012), distally with two strongly sclerotized cornuti, of different size and both somewhat squarish and with a double apex (in *abenaho* one is thorn-like).

Female genitalia (RMNH.INS.1108645): Rather obscure female genitalia because it is only slightly sclerotized. However, most striking is the very long ductus bursae which is not seen this long in other species. Cervix bursae swollen with wrinkles and gradually flowing in the long ductus bursae. Bursa copulatrix small and without any sclerotization.

**Distribution:** The species is found in the vicinity of Lake Habbema, Lorentz National Park, Papua, Indonesia. It was found at an altitude of 3457 meters.

**Etymology:** The name of the species refers to the Lorentz National Park, Papua, Indonesia, to which Lake Habbema belongs, the type locality of this species.

***Cyana (Cryptanaema) habbema spec. nov.*** (Figs 16-17, 27)

urn:lsid:zoobank.org:act: 62E4AD6C-849C-4FF4-A97E-EA05312905F2

**Holotype:** ♂ KSP-65137, Indonesia, Papua, Lorentz Reserve, Lake Habbema, 3457 m, at light, 4°08'S–138°42'E, 30.ix-1.x.2018, leg. R. de Vos (PIF).

**Paratypes** 1 ♂, RMNH.INS.1108649, same as holotype; 1 ♂, Indonesia, Papua, Habbema Lake, 4°08'07"S - 138°42'08"E, 3400 m, 30.ix-2.x.2018, PIF expedition, leg. Sinnema.

**Diagnosis:** Forewings black with pattern of white spots, hindwings with for the genus unusual dark faded patches, not seen in any other *Cyana* species. Male genitalia very small but with the typical subgeneric features for *Cryptanaema* De Vos, 2017, to which it belongs.

**Description:** Fwl. ♂ 15 mm. Male with thin ciliate antennae, black. Head, palpa, patagia and tegulae black, thorax dorsally whitish grey. Legs black with thin white bands. Abdomen grey. Forewing with ground colour black, in basal and submarginal field with red-brown colour. In the middle of costa a distinct square spot and a smaller white spot at the end of the androconial pouch post-medial. A post-medial row of small white spots present.

In one of the two paratypes (RMNH.INS.1108649) the pattern is reduced. It lacks the submarginal red-brown colour and the post-medial row of spots and the thorax is black.

Hindwings creme-white with dorsum somewhat darker. A straight subbasal grey band running from costa to dorsum, a narrow grey stigma-bar and a large irregular grey subapical patch. At the underside identical to upperside, but with more contrast.

Male genitalia (RMNH.INS.1108649): Very small but with the typical structure of *Cyana*. Uncus long and slender, curved. Tegumen rather broad, dorsally with a thicker rim. Valvae with broad cucullus flat and slightly sclerotized. Sacculus broad, in the middle broadening, apically narrowing, finger-shaped and ending with a claw-shaped thorn. Clasper irregular triangular, rather narrow, flat and pressed against the apical part of the sacculus.

Vinculum shallow and rounded without developed saccus. Aedeagus short, straight, distally narrowing. Ventrally with an obscure square carinal plate. Vesica globular, ventrally in the center with a field of chitinous drops and basally with a field of tiny scobination.

Female yet unknown.

**Distribution:** The species is found in the vicinity of Lake Habbema, Lorentz National Park, Papua, Indonesia. It was found at an altitude of 3457 meters.

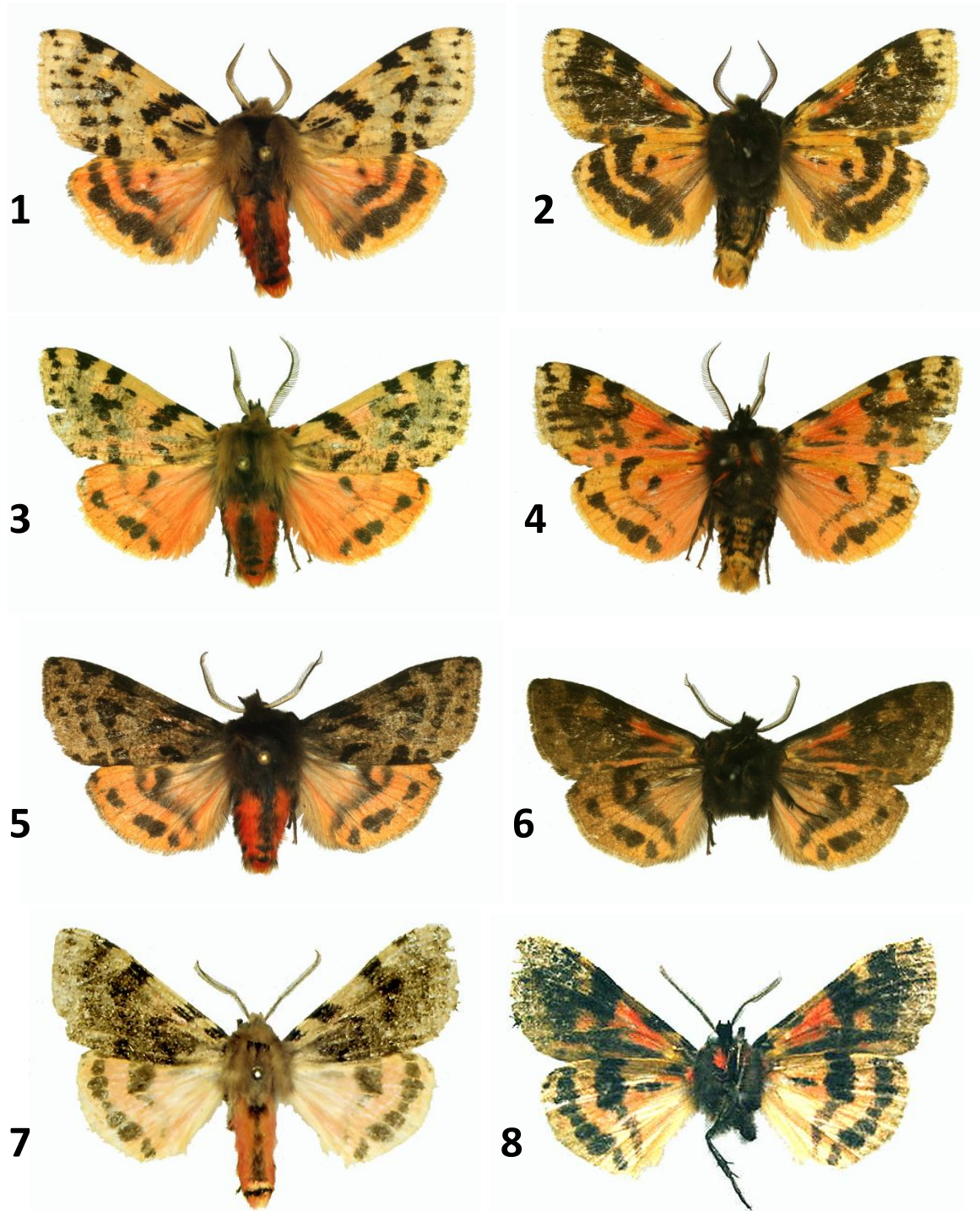
**Etymology:** The species name refers to Lake Habbema, Papua, Indonesia, in which vicinity the type specimens were found.

**Acknowledgement**

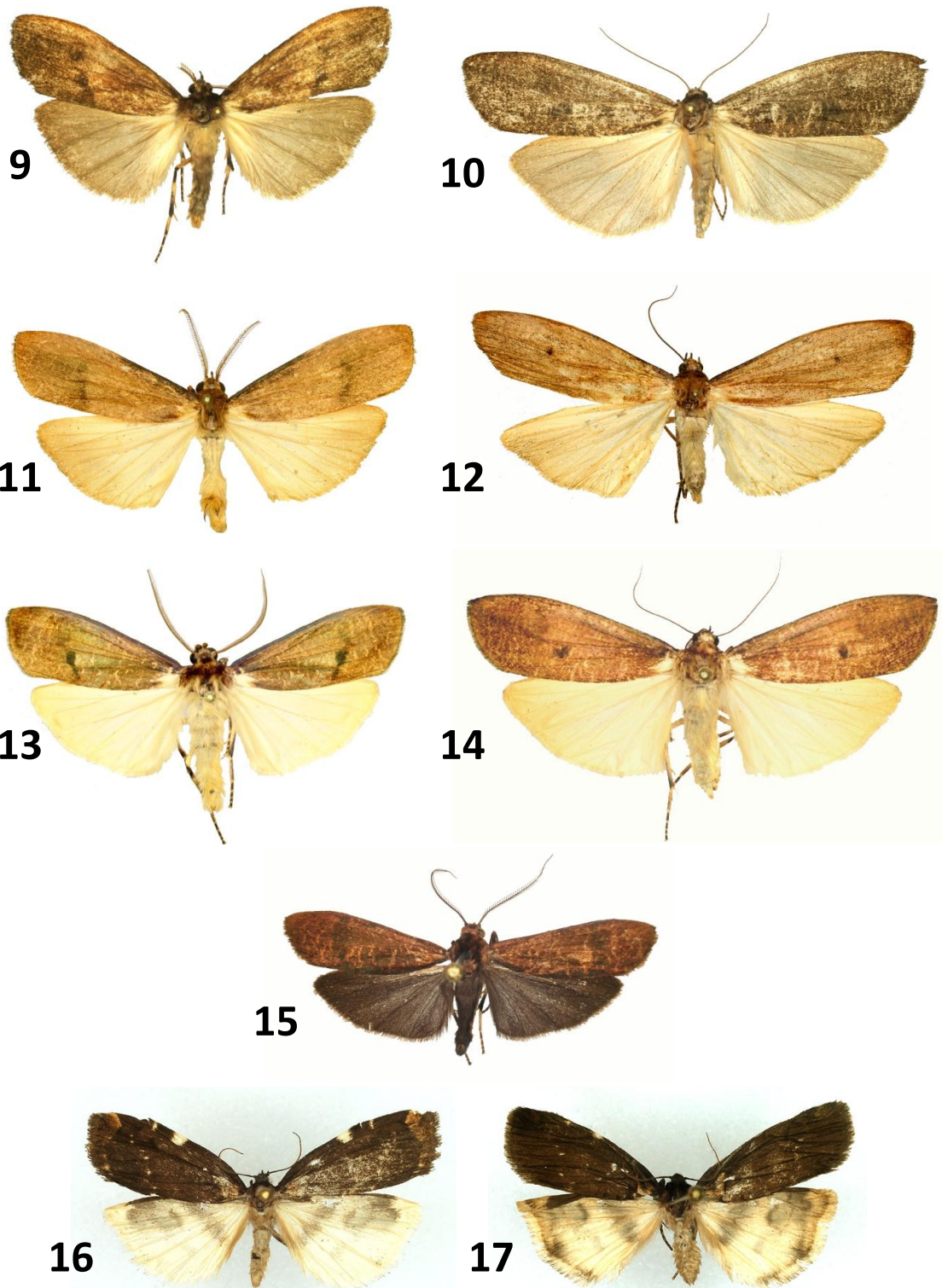
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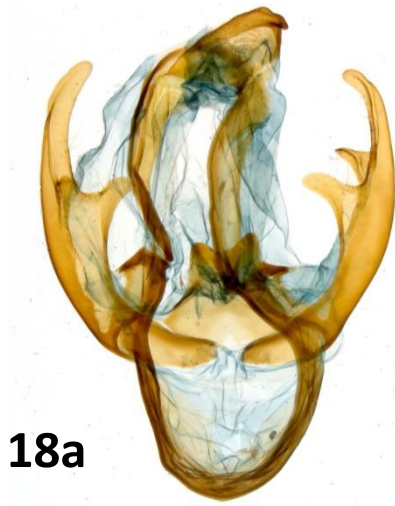


**Figs 1-6.** *Spilosoma renateae* spec. nov. **1.** Holotype ♂, Lake Habbema, KSP-65134; **2.** idem, verso; **3.** Paratype ♂, Lake Habbema, RMNH.INS.1108409; **4.** idem, verso; **5.** dark form ♂, Lake Habbema, RMNH.INS.1108647; **6.** idem (abdomen dissected), verso.  
**Figs 7-8.** *Spilosoma grandimacula* De Vos & Suhartawan, 2011. **7.** Holotype ♂, Bilogai, KSP-23091; **8.** Idem (abdomen dissected), verso.



**Figs 9-15.** *Oeonosia* species. **9.** *Oeonosia lorentz* **spec. nov.**, holotype ♂, Lake Habbema, RMNH.INS.1108644; **10.** *O. lorentz* **spec. nov.**, paratype ♀, Lake Habbema, RMNH.INS.1108645; **11.** *O. cruda* De Vos, 2012, paratype ♂, Foja Mts, KSP; **12.** *O. cruda* De Vos, 2012, paratype ♀, Foja Mts, KSP; **13.** *O. longistriga* (Bethune-Baker, 1908) ♂, Pass Valley, RMNH; **14.** *O. longistriga* (Bethune-Baker, 1908) ♀, Pass Valley, RMNH; **15.** *O. abenaho* De Vos, 2012, holotype ♂, Pass Valley, RMNH.  
**Figs 16-17.** *Cyana (Cryptanaema) habbema* **spec. nov.** **16.** Holotype ♂, Lake Habbema, KSP-65137; **17.** Paratype ♂, Lake Habbema, RMNH.INS.1108649.





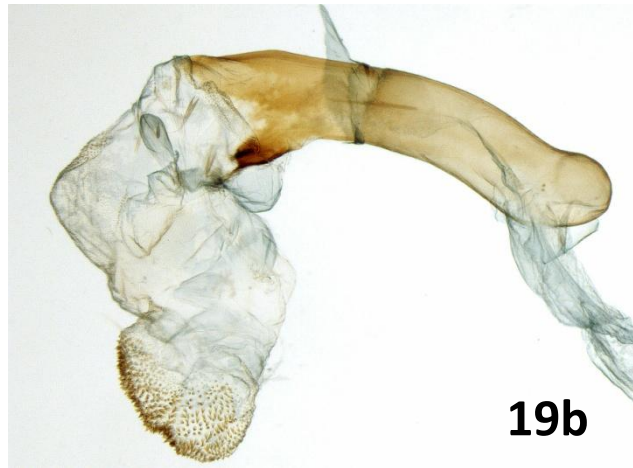
**18a**



**18b**

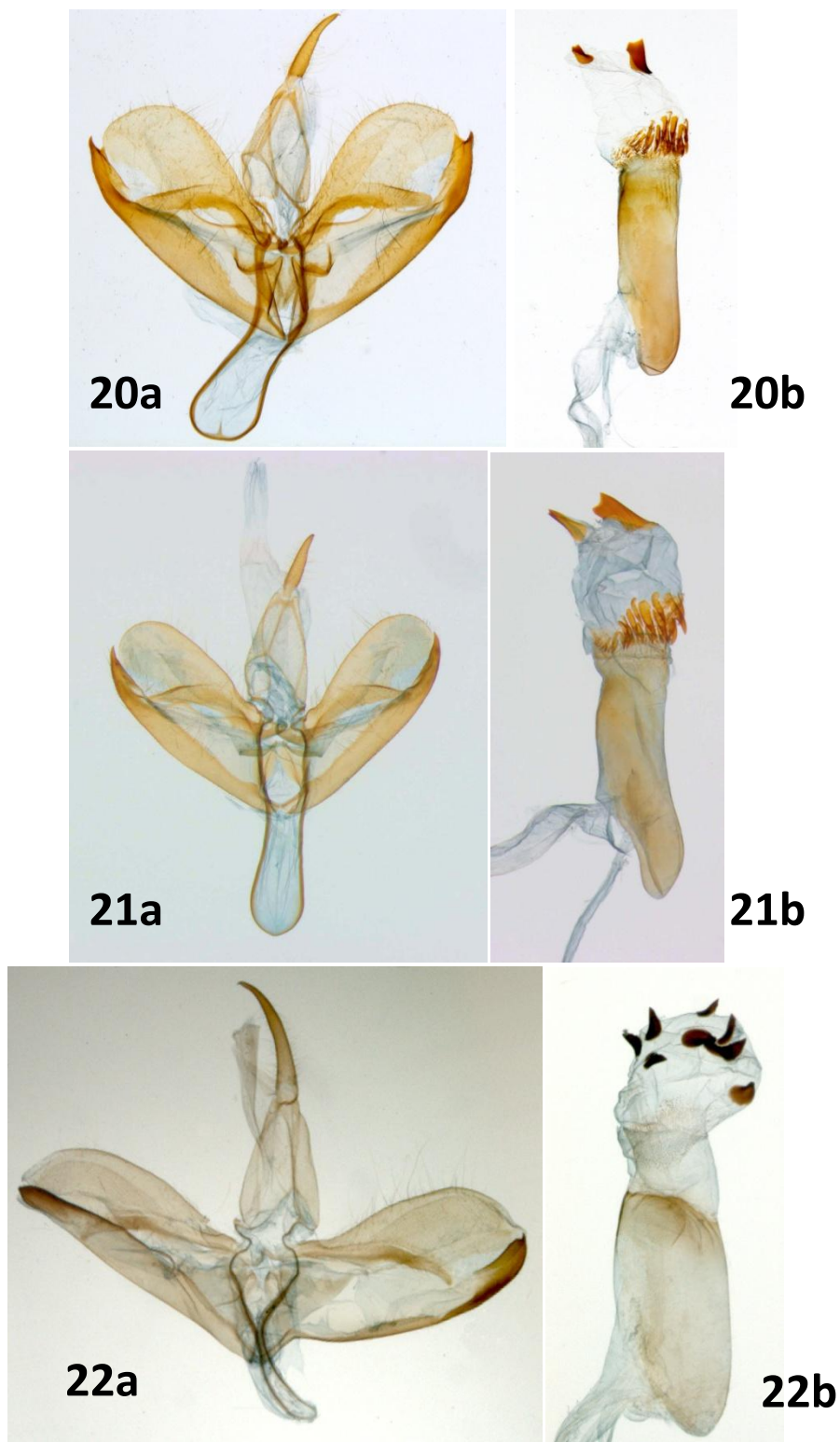


**19a**



**19b**

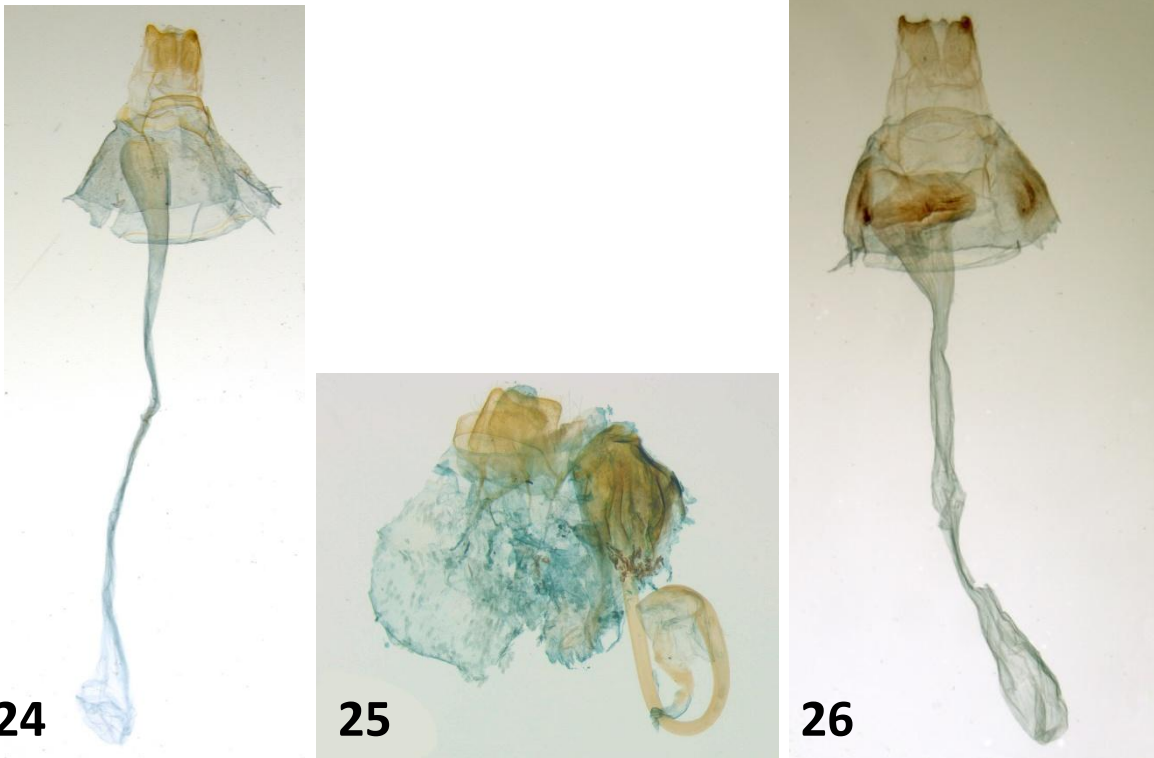
**Figs 18-19.** *Spilosoma* male genitalia: **a.** male genital armature; **b.** aedeagus. **18.** *Spilosoma renateae* **spec. nov.**, RMNH.INS.1108643; **19.** *S. grandimacula* De Vos & Suhartawan, 2011, KSP-23091.



**Figs 20-22.** *Oeonosia* male genitalia: **a.** male genital armature; **b.** aedeagus. **20.** *Oeonosia lorentz spec. nov.*, RMNH.INS.1108644; **21.** *O. abenaho* De Vos, 2012, RMNH-RV1406; **22.** *O. cruda* De Vos, 2012, RMNH-RV1266.



**Fig. 23.** *Oeonosia longistriga* (Bethune-Baker, 1908), male genitalia RV1267: **a.** male genital armature; **b.** aedeagus.



**Figs 24-26.** *Oeonosia* female genitalia. **24.** *Oeonosia lorentz* **spec. nov.**, RMNH.INS.1108645; **25.** *O. cruda* De Vos, 2012, RMNH-RV1404; **26.** *O. longistriga* (Bethune-Baker, 1908), RMNH-RV1276)



**Fig. 27.** *Cyana habbema* **spec. nov.**, male genitalia RMNH.INS.1108649: **a.** male genital armature; **b.** aedeagus.