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A new species in the genus *Notata* Hampson, 1891 (Lepidoptera: Erebidae, Arctiinae, Lithosiini)

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Abstract

A new species in the genus *Notata* Hampson, 1891, *N. kokoda* **spec. nov.**, is discovered from Papua New Guinea. An overview of the genus is given and the new species is described. Of all species pictures of the adults and genitalia are displayed.

Key words: overview, Indonesia, Papua, New Guinea, Papua New Guinea, description

Introduction

The genus *Notata* Hampson, 1891 has a wide distribution in the Oriental and Indo-Australian region. It was originally monotypic with *Notata parva* Hampson, 1891 as type species, but since the comprehensive review by De Vos (2020) six species were known to belong to this genus.

During a visit to the collection of the Natural History Museum in London, a series of males and females of an unknown *Notata* species was found among unsorted Arctiinae from Papua New Guinea. The habitus of the specimens was different from other known species in the genus and after study of the genitalia it became clear that this indeed concerns a new species.

A checklist of all currently known species is given below. A complete overview of adults of all species with the genitalia is depicted. It is expected that more species in the genus will be discovered.

Abbreviations

Fwl	Forewing length (measured from wingbase to apex)
NHMUK	Natural History Museum, London, UK

Material and methods

The genitalia of all species studied (at least one male and one female specimen per species) were dissected, mounted and depicted when available. Dissected genitalia were put in cold KOH 10% for one night. After washing and cleaning with 30% alcohol to remove fat, scales and dirt, the genitalia were stained in a solution of chlorazol black in 30% alcohol and fixed in 95% alcohol. Then the genitalia were prepared for preservation in Euparal Essence (to prevent air bubbles) and after a few minutes mounted on a glass slide in a few drops of Euparal medium following the standard used in the Natural History Museum in London (Robinson 1976): abdomen on the left side, genital armature top right, aedeagus bottom right. To prevent the smaller parts, like the aedeagus, from floating the Euparal drops were left to dry at least 24 hours without glass cover in a closed Petri dish (to protect against dust). The next day a proper size glass cover was put on the parts in the sticky Euparal, after adding a few fresh drops of Euparal. The complete slide was left to dry for a few weeks in the Petri dish. Labels were only added after drying completely,

so therefore it was necessary to write slide number and details on the petri-dish cover and to scratch the number on the glass slide to avoid mixing up with other drying slides. All slides were made by the author and were numbered with standard numbers of the labels provided by the museums.

Slides were studied with a WILD M3 binocular microscope at 60–400× magnification. Digital photographs were made with a motorized Zeiss V20 binocular microscope and a digital Axio MRc5 camera controlled by AxioManager M2 software. Forewing lengths (Fwl) were measured with a digital calliper from forewing base to apex; numbers were rounded to 0.5 mm.

Morphological terminology of the external structures (excluding the genitalia) mainly follows Scoble (1992) and Holloway *et al.* (2001). The terminology of the genitalia mainly follows Tuxen (1970) and Kôda (1987).

Systematical part

Checklist of the *Notata* species

parva Hampson, 1891 [Oriental, including Taiwan and Philippines, Sunda] (Figs 1–2, 14, 19–20, 29–30)
= *tenuilinea* (Hampson, 1914)
modicus (Lucas, 1892) [Queensland, Australia] (Figs 3–4)
zumkehri De Vos & Van Mastrigt, 2007 [Papua, Indonesia] (Figs 5–6, 15, 21–22, 31–32)
lambertsae De Vos, 2020 [Papua Barat, Indonesia] (Figs 7–8, 16, 23–24, 33–34)
sinnemai De Vos, 2020 [Papua Barat, Indonesia] (Figs 9–10, 17, 25–26, 35–36)
aurifimbria De Vos, 2020 [Papua, Indonesia] (Figs 11, 37–38)
kokoda **spec. nov.** [Papua New Guinea]

Notata kokoda **spec. nov.**

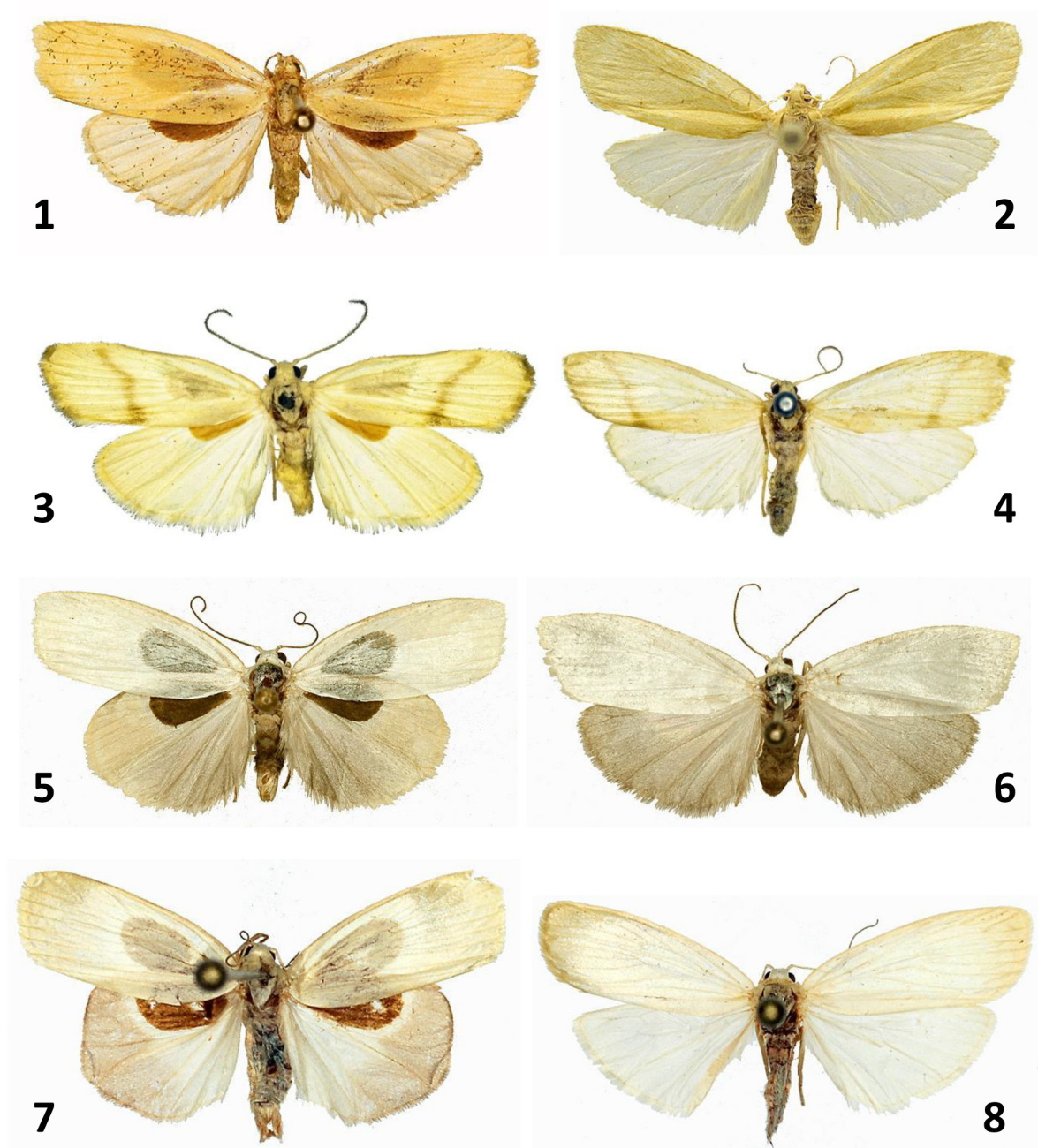
(Figs 12–13, 18, 27–28, 39–40)

Holotype: NHMUK014201593: ♂, [Papua New Guinea, Oro Province] Papua: Kokoda, 1.200 ft, viii.1933, L.E. Cheesman, B.M. 1933-427.

Paratypes: NHMUK014201593: 1 ♂; NHMUK014201595-96: 2 ♀♀; NHMUK(unnnumbered): 6 ♀♀, all same as holotype, with data ranging from vi–vii.1933, vii.1933 and viii.1933.

Diagnosis: The yellowish cream-white colour of the male wings distinguishes the species from the three other whitish species *N. zumkehri* De Vos & Van Mastrigt, 2007 (pure white forewings, grey hindwings), *N. lambertsae* De Vos, 2020 (cream-white forewing, grey hindwings with white parts) and *N. sinnemai* De Vos, 2020 (white forewing, white hindwing with grey parts). The androconial patch on forewings and hindwings is much larger than in the other species and the shape of the male hindwing is different than in the other species, i.e. with the termen concave (in other species straight or convex). The female with pale yellowish forewings resembles that of *N. lambertsae* but the new species has more narrow forewings and is darker yellow, *N. parva* has much more yellow forewings, in *N. zumkehri* and *N. sinnemai* the forewings are white, in *N. aurifimbria* the forewing has distinct golden fringes and in *N. modicus* the forewings have an oblique postmedian line. The male genitalia are remarkably reminiscent of those of *N. lambertsae*, but there are some differences. The small process at the end of the cucullus, just between the long curved process and the sacculus, is in *kokoda* short and rather triangular, while in *lambertsae* it is longer and finger-shaped. The sclerotized curve at the rim of the sacculus is in *kokoda* shorter than in *lambertsae*. The long curved process on the cucullus is in *lambertsae* more robust than in *kokoda*. In the female genitalia is the band with spikes at the bottom of the bursa in *kokoda* less dense than in *lambertsae* and the shape is different. The shape of the band most resembles that of *N. zumkehri* but is narrower in *N. kokoda*. *Notata parva* has the lower half of the bursa covered with only slightly sclerotized spikes, *N. sinnemai* has the band in the central part of the bursa like *N. aurifimbria*, but in *sinnemai* it is less densely and irregularly spiked than in *aurifimbria*.

Description: Fwl. ♂ 10 mm, ♀ 9.5 mm. Male with head and antennae cream-white, antennae with distal third suffused with dark grey. Thorax, abdomen and legs brown-yellow, anal tuft of same colour. Forewings of male almost rectangular, costa at basal third curved, termen slightly convex, almost straight. Hindwing broad, termen below apex



FIGURES 1–8. *Notata* species: **1.** *Notata parva* Hampson, 1891, ♂, Bali, Indonesia, RMNH; **2.** *N. parva* Hampson, 1891, ♀, Sabah, Borneo, Malaysia, USNM-ENT 00980606, Margaret Rosati; **3.** *N. modicus* (Lucas, 1892), ♂, Queensland, Australia, NHMUK014201620; **4.** *N. modicus* (Lucas, 1892), ♀, Queensland, Australia, NHMUK014201621; **5.** *N. zumkehri* De Vos & Van Mastrigt, 2007, holotype ♂, Pass Valley, Papua, Indonesia, RMNH; **6.** *N. zumkehri* De Vos & Van Mastrigt, 2007, paratype ♀, Walmak, Papua, Indonesia, RMNH; **7.** *N. lambertsae* De Vos, 2020, holotype ♂, Demaisi, Papua Barat, Indonesia, RMNH.INS.1282814; **8.** *N. lambertsae* De Vos, 2020, paratype ♀, Demaisi, Papua Barat, Indonesia, RMNH.INS.1282809.

slightly concave. Androconial marks on forewing and hindwing large, more or less oval and stretched. Colour of both wing pairs yellowish cream-white, near apex and margins somewhat darker, hindwings with a yellow fringeline. Androconial patches fawn-coloured at the underside of forewing and upperside of hindwing, seen through and indicated by a darker colour on upperside forewing and underside hindwing.

Female with head, antennae and patagia pale yellow. Meso- and metathorax and abdomen darker yellow. Legs yolk-yellow. Forewings like in male rather rectangular, curved at base, termen oblique and almost straight, unicolorous pale yellow without pattern. Hindwings broadly triangular shaped with round termen, cream-white with a yellow fringeline. Underside wings identical to upperside.

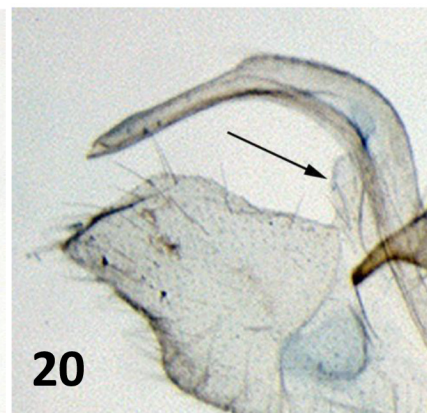
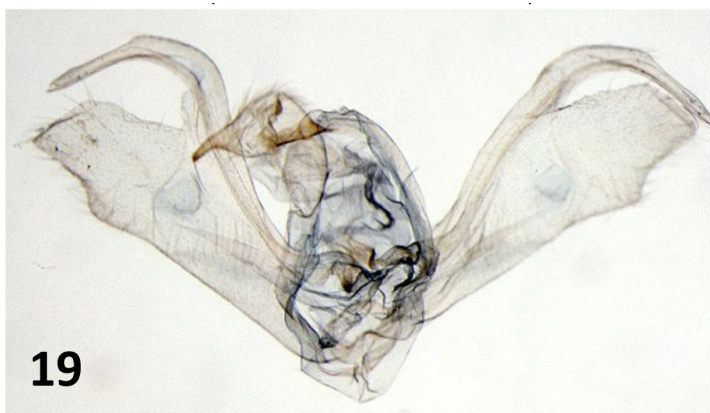


FIGURES 9–13. *Notata* species: **9.** *Notata sinnemai* De Vos, 2020, holotype ♂, Mokwam, Papua Barat, Indonesia, RMNH.INS.1282838; **10.** *N. sinnemai* De Vos, 2020, paratype ♀, Demaisi, Papua Barat, Indonesia, RMNH.INS.1282812; **11.** *N. aurifimbria* De Vos, 2020, holotype ♀, Jiwika, Baliem Valley, Papua, Indonesia, RMNH.INS.1282799; **12.** *N. kokoda* **spec. nov.**, holotype ♂, Kokoda, Oro Province, Papua New Guinea, NHMUK014201593 (©The Trustees of NHMUK); **13.** *N. kokoda* **spec. nov.**, paratype ♀, Kokoda, Oro Province, Papua New Guinea, NHMUK014201596 (©The Trustees of NHMUK).

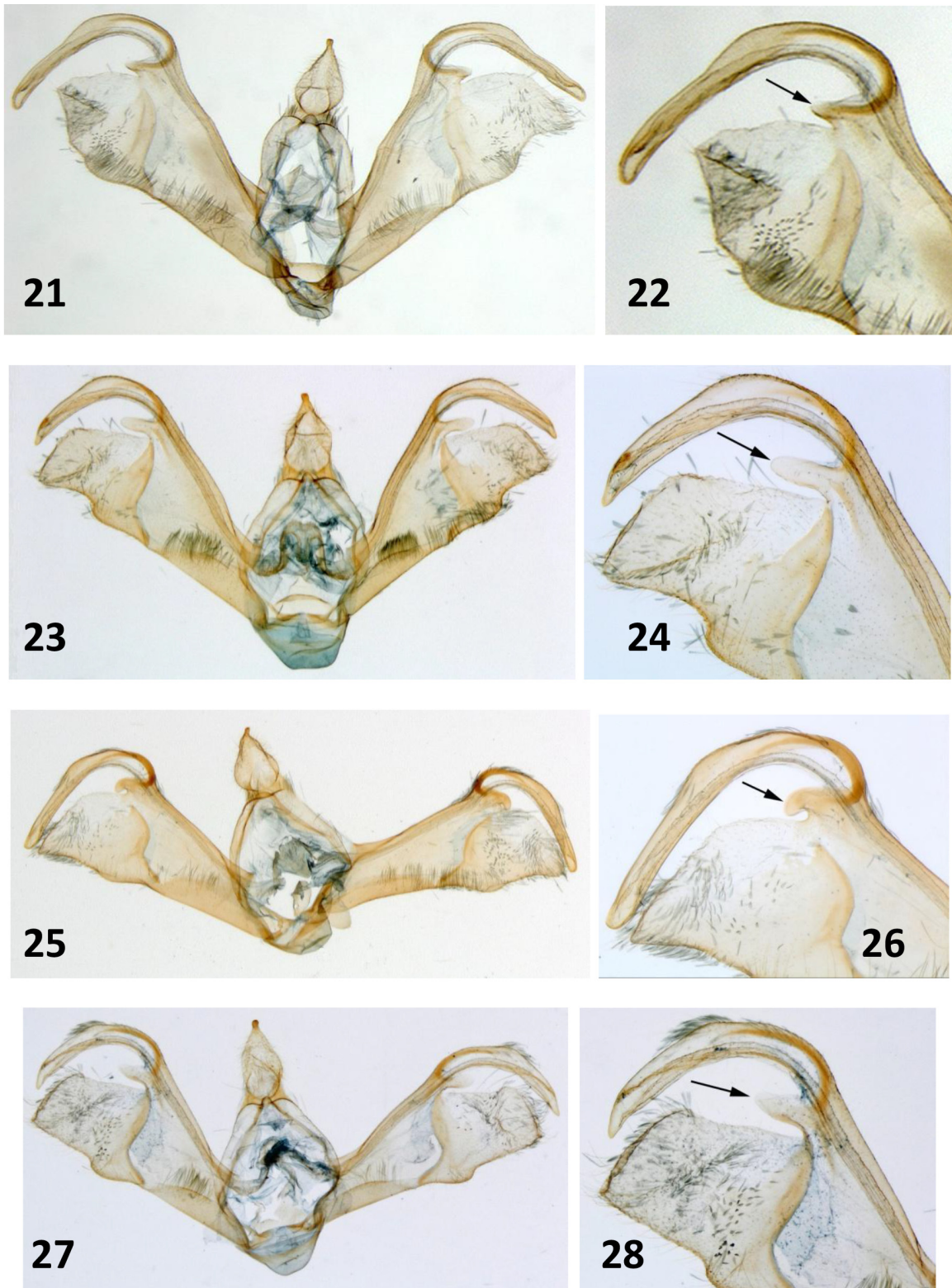
Male genitalia: Uncus beak-shaped, to the blunt apex narrowing. Tegumen wide. Vinculum with a short flattened saccus. Valvae of the typical *Notata* structure, costa of cucullus more or less straight with a curved robust distal process, at the first half with a stronger sclerotized narrow ridge, and with a rather blunt apex which passes the apex of sacculus. Smaller distal process on cucullus rather triangular. Sacculus with basal sclerotized flap and distally slightly sclerotized with the distal part slightly rectangular. The sclerotized curve at the rim of the sacculus short. Aedeagus bottle-shaped and small, at coecum broad, slightly curved in the middle and distally narrow.



FIGURES 14–18. Aedeagi of male *Notata* species: **14.** *Notata parva*, Bali, Indonesia, RMNH-RV1194; **15.** *N. zumkehri*, Lelambo, Papua, Indonesia, RMNH-RV1191; **16.** *N. lambertsae*, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1282815; **17.** *N. sinnemai*, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1282839; **18.** *N. kokoda spec. nov.*, Kokoda, Oro Province, Papua New Guinea, NHMUK014201593 (©The Trustees of NHMUK).



FIGURES 19–20. Male genitalia of *Notata parva*, arrow points at small distal process on cucullus: **19.** *Notata parva*, genital armature, Bali, Indonesia, RMNH-RV1194; **20.** *N. parva*, distal part of left valve, RV1194.



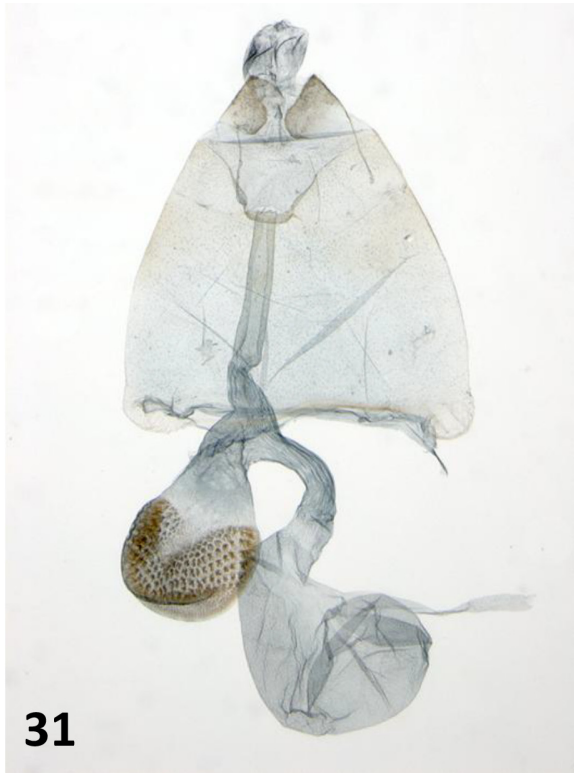
FIGURES 21–28. Male genitalia of *Notata* species, arrow points at small distal process on cucullus: **21.** *N. zumkehri*, genital armature, Lelambo, Papua, Indonesia, RMNH-RV1191; **22.** *N. zumkehri*, distal part of left valve, RV1191; **23.** *N. lambertsae*, genital armature, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1282815; **24.** *N. lambertsae*, distal part of left valve, RMNH.INS.1282815; **25.** *N. sinnemai*, genital armature, RMNH.INS.1282839; **26.** *N. sinnemai*, distal part of left valve, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1282839; **27.** *N. kokoda spec. nov.*, genital armature, Kokoda, Oro Province, Papua New Guinea, NHMUK014201593 (©The Trustees of NHMUK); **28.** *N. kokoda spec. nov.*, distal part of left valve, NHMUK014201593 (©The Trustees of NHMUK).



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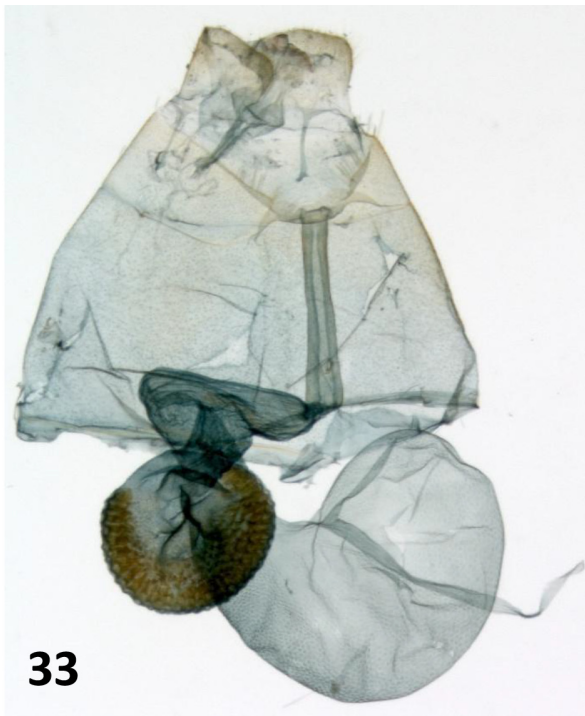


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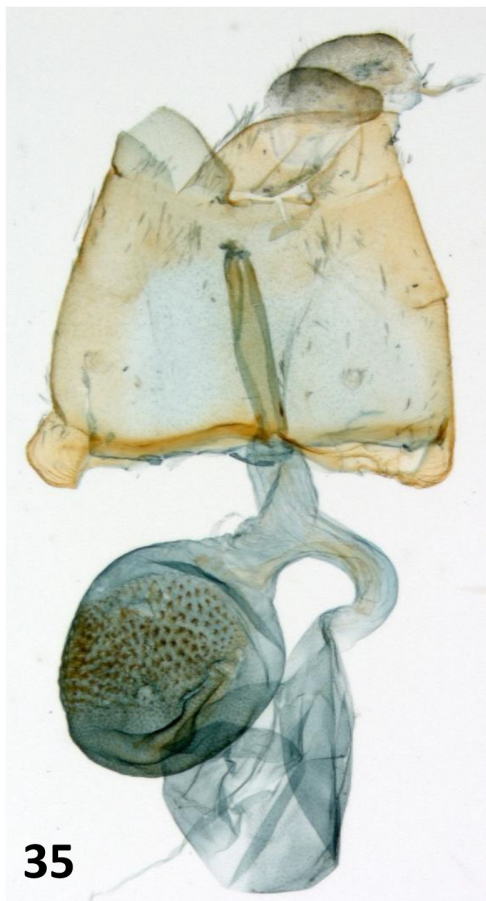
FIGURES 29–32. Female genitalia of *Notata* species: **29.** *Notata parva*, genital, Sabah, Borneo, Malaysia, BMNH5010; **30.** *N. parva*, bursa magnified, BMNH5010; **31.** *N. zumkehri*, genital, Lelambo, Papua, Indonesia, RV1192; **32.** *N. zumkehri*, bursa magnified, RV1192.



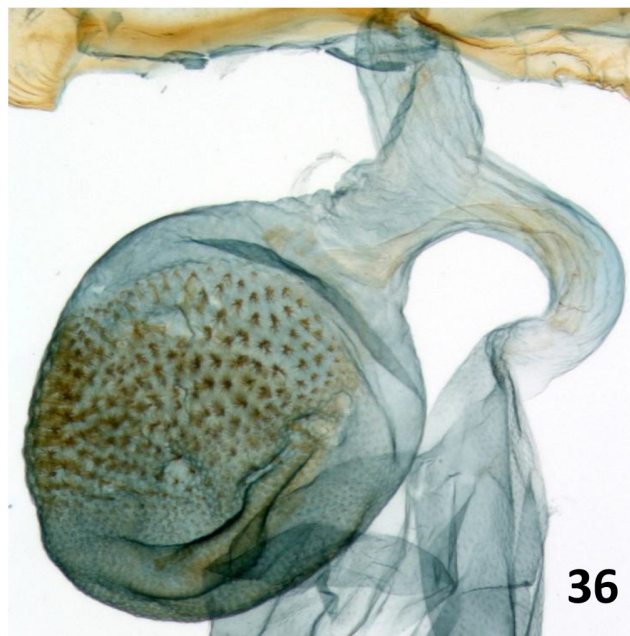
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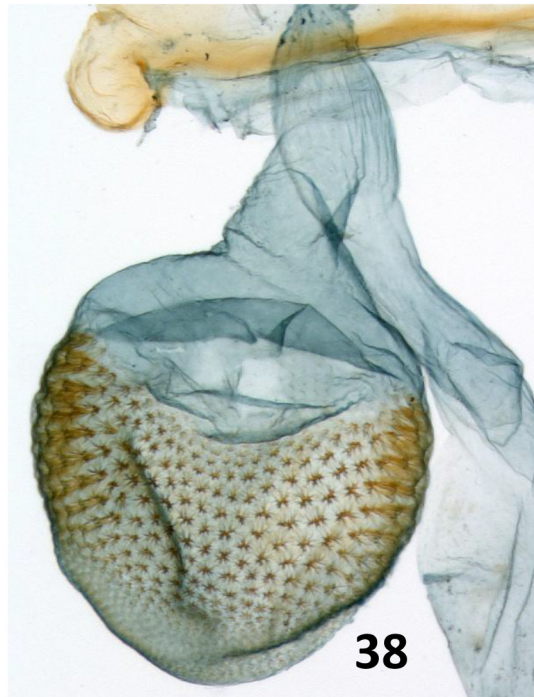
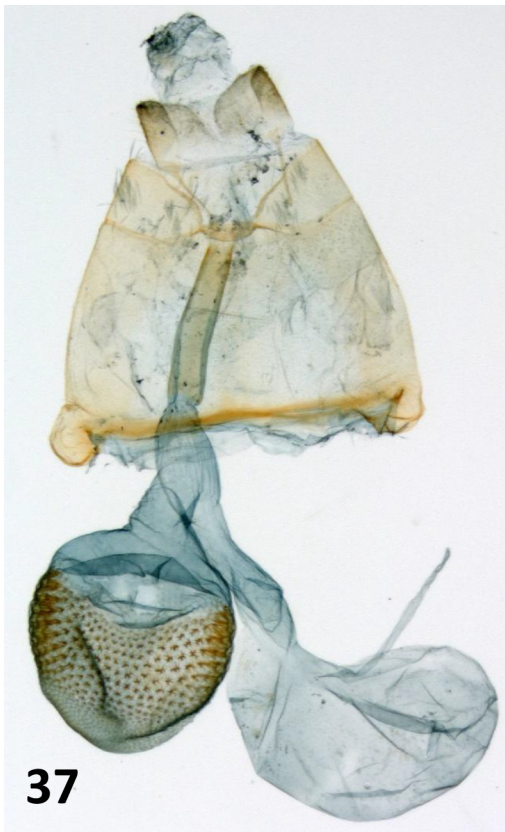


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FIGURES 33–36. Female genitalia of *Notata* species: **33.** *Notata lambertsae*, genital, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1282809; **34.** *N. lambertsae*, bursa magnified, RMNH.INS.1282809; **35.** *N. sinnemai*, genital, Demaisi, Arfak, Papua Barat, Indonesia, RMNH.INS.1282812; **36.** *N. sinnemai*, bursa magnified, RMNH.INS.1282812.



FIGURES 37–40. Female genitalia of *Notata* species: **37.** *Notata aurifimbria*, genital, Jiwika, Baliem Valley, Papua, Indonesia, RMNH.INS.1282799; **38.** *N. aurifimbria*, bursa magnified, RMNH.INS.1282799; **39.** *N. kokoda spec. nov.*, genital, Kokoda, Oro Province, Papua New Guinea, NHMUK014201596; **40.** *N. kokoda spec. nov.*, bursa magnified, NHMUK014201596 (©The Trustees of NHMUK).

Female genitalia: Antrum small and bowl-shaped, ductus bursae rather long and straight, forming a thick sclerotized tube and shortly continued as a constricted unsclerotized wrinkled tube, then split into a wide connection at the right to the ductus seminalis, running in a large globular bulla seminalis. At the left the cervix is widely connected to a small globular bursae which has a broad curved band of densely arranged asterisk-shaped spikes.

Distribution: The species is known only from the type locality Kokoda in the eastern part of Papua New Guinea, in the Oro Province.

Etymology: The specific epithet is homonymic of the type locality, Kokoda.

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Pictures of species are depicted with permission of the Natural History Museum in London, and the Naturalis Biodiversity Center in Leiden.

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