




## Two new species of the genus *Panau* (Lepidoptera: Cossidae) from the Philippines and Indonesia, with the redescription of *Panau variegatum*

## Два новых вида рода *Panau* (Lepidoptera: Cossidae) из Филиппин и Индонезии с переописанием *Panau variegatum*

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**Abstract.** Two new species of Cossidae are described, *Panau lourensi* **sp. nov.** from the Philippines and *P. tanimbari* **sp. nov.** from the island of Tanimbar in Indonesia. The new species are close to the poorly studied species *P. variegatum* (Roepke, 1957) from the island of Sulawesi in Indonesia. The male genitalia of the latter species are redescribed.

**Резюме.** Приведено описание двух новых видов Cossidae: *Panau lourensi* **sp. nov.** с Филиппинских островов и *P. tanimbari* **sp. nov.** с острова Танимбар в Индонезии. Новые виды наиболее близки к малоизученному виду *P. variegatum* (Роепке, 1957) с острова Сулавеси в Индонезии. Приводится переписание гениталий самца этого вида.

**Key words:** carpenter moths, taxonomy, redescription, Indonesia, the Philippines, Oriental Region, Cossidae, Zeuzerinae, *Panau*, new species

**Ключевые слова:** бабочки-древоточцы, таксономия, переписание, Индонезия, Филиппины, Ориентальный регион, Cossidae, Zeuzerinae, *Panau*, новый вид

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### Introduction

The genus *Panau* Schoorl, 1990 was proposed for the oriental species-group of the subfamily Zeuzerinae of the family Cossidae (Schoorl, 1990). *Xyleutes variegata* Roepke, 1957 was designated as a type species. The genus includes eleven valid species distributed from southern China and southern macroslope of the eastern Himalayas in the northwest to New Guinea in the southeast (Roepke, 1957; Holloway, 1986; Schoorl, 1990; Yakovlev, 2004, 2011, 2013, 2014). The majority of species

is distributed in Indonesia. During examination of the collection materials from the Philippines and Indonesia, we discovered two new species that are close to *P. variegatum*. They are described in this article. *Panau variegatum* is partially redescribed based on a re-examination of the holotype.

### Material and methods

The images of adults were taken with a Canon EOS 70D camera, illuminated in a lightbox.

The preparations of the male genitalia were made according to Lafontaine & Mikkola (1987). The slide-mounted genitalia were examined with a Zeiss Stemi 2000 C microscope. The images of the genitalia were taken with a Canon EOS 70D camera. Photos were enhanced and arranged to plates with Corel PHOTO-PAINT 2017 software. The morphological terminology follows Kristensen (2003).

The labels of the holotypes are cited verbatim. Each label is separated from other labels by a comma (;); lines in a label are separated by a slash (/).

The materials examined or mentioned herein are deposited in the collections listed below and abbreviated in the text as follows: Museum of Thomas Witt, Bavarian State Collection of Zoology, Munich, Germany (MWM); Naturalis Biodiversity Center, Leiden, the Netherlands (NBCL); the Natural History Museum [formerly the British Museum (Natural History)], London, UK (NHMUK); Senckenberg Naturhistorische Sammlungen, Dresden, Germany (SNSD).

## Taxonomy

### Order Lepidoptera

### Family Cossidae

### Subfamily Zeuzerinae

### Genus *Panau* Schoorl, 1990

### *Panau variegatum* (Roepke, 1957) (Figs 1–2)

*Xyleutes variegata* Roepke, 1957: 28–29, pl. 2, fig. 3, pl. 8, figs 4–4a (“*Xyleutes variegata* spec. nov.”).

*Panau variegata*: Schoorl, 1990: 166; Yakovlev, 2011: 72.

*Type locality*. “Tonsea Lama, North Celebes” [Indonesia, North Sulawesi, Minahasa Regency, 1°19′26.2″N 124°57′17.8″E].

*Type material examined*. *Holotype*. Male, with labels: “N. Celebes. / M. Tonsea Lama / 18 Maart 1920 / Mus. Leiden.”, “Typus / Holo / Roepke”, “Museum Leiden / verzameling / W K J Roepke”, “*Panau variegata*” (NBCL).

*Description of male genitalia*. Uncus long, with acute beak-like apex and deep longitudinal notch on lower surface. Gnathos arms thin, short, belt-like, not fused. Valve long, leaf-like, poorly narrowing to apex; outer margin semicircular; costal margin slightly curved, almost smooth; abdominal

margin with deep semicircular notch in proximal third. Juxta saddle-like, robust, with a pair of long leaf-like lateral processes. Saccus small, conical, apically semicircular. Phallus thick, with longitudinal folding along all surface; lateral surface of vesica with large finger-shaped cornutus being slightly smaller than phallus.

*Comparison*. Externally, the species is close to *P. tanimbari* sp. nov., from which it differs in the more expressed light brown pattern on the forewing, uniform thickness of the uncus and more expressed notch on the abdominal margin of the valve in the proximal third.

*Remarks*. Female is unknown. One of the paratypes, kept in NHMUK, was collected in New Guinea without indicating the exact location on the label (Roepke, 1957: 29). Its species affiliation will be checked later.

*Distribution*. Indonesia (Sulawesi Island), ? New Guinea.

*Flight period*. The type series was collected from March to July.

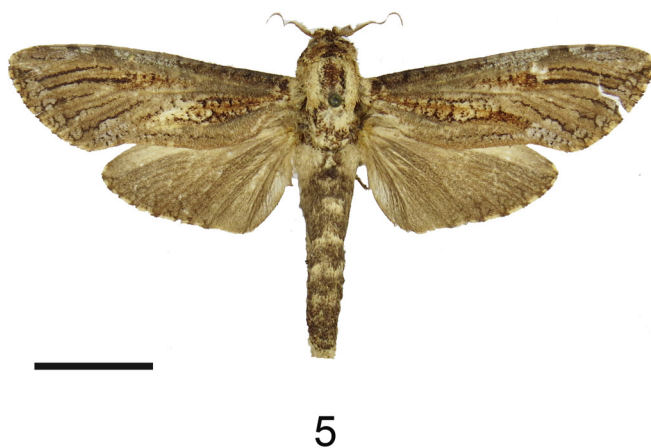
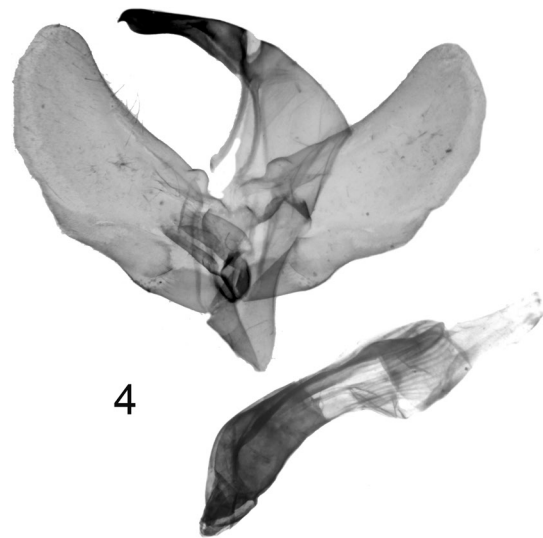
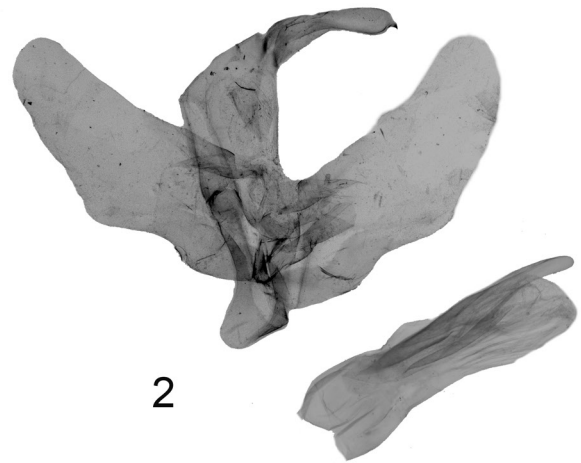
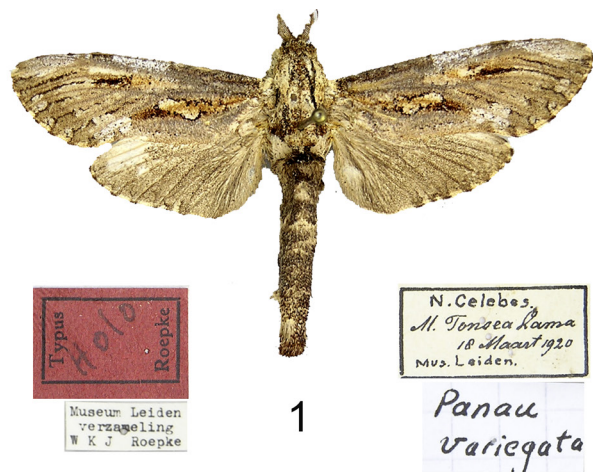
### *Panau lourensi* sp. nov.

(Figs 3–4)

*Holotype*. Male, with labels: “the Philippines N. Luzon / 5 km S Adams / 350 m 6–7 Apr. 2008, N 18°31.338′ E 120°55.690′ / J H Lourens”, “Genitalpräparat / Heterocera / Nr. 25.300 / Museum Witt, München”, “HOLOTYPUS / *Panau lourensi* / Yakovlev & Hulsbosch, 2023 / Yakovlev & Hulsbosch des., 2022” (MWM).

*Paratypes*. 3 males, with same locality and date as for holotype (MWM); 1 male, **Philippines**, *Occidental Mindoro*, Banban Mts, “Bulalacao Brgy Nicolai” [Bulalacao municipality, (?) Nicolai barangay (= district; not located)], 150 m, 12°20′N 121°12′E, 8 Jan. 2005, J.H. Lourens (MWM).

*Description*. *Male*. Length of forewing: 25.0 mm in holotype, 24.0–26.5 mm in paratypes. Antenna short, about one-fourth of forewing in length; two-thirds of antenna (basal and middle parts) bipectinate, with long setae (2.5–3.0 times as long as diameter of antenna stem); distal part of antenna unipectinate, with very short setae. Tegulae and patagia densely covered with light grey scales. Abdomen basally light grey, in other parts light brown. Forewing brown; two bright black wide strokes between veins of radial stem postdiscally; thin grey transverse strokes discally;



**Figs 1–6.** *Panau* spp., males (holotypes). 1–2, *P. variegatum* (Roepke, 1957); 3–4, *P. lourensi* **sp. nov.**; 5–6, *P. tanimbari* **sp. nov.** Habitus in dorsal view and labels (1); habitus in dorsal view (3, 5); male genitalia in frontal view and aedeagus in lateral view (2, 4, 6). Scale bars (1, 3, 5): 1 mm.



undulated grey strokes postdiscally and submarginally; light brown portion in area of cubital stem discally; fringe dark at veins, light between veins. Hind wing brown, without pattern; fringe dark at veins, light between veins.

Male genitalia. Uncus long, with acute beak-like apex and deep longitudinal notch on lower surface. Gnathos arms thin, long, belt-like, not fused. Valve long, leaf-like, slightly curved along all length, slightly narrowing to apex; outer margin semicircular; costal margin slightly curved; abdominal margin with two small notches in proximal and middle thirds. Juxta saddle-like, robust, with a pair of long leaf-like lateral processes. Saccus small, conical, apically acute. Phallus thick, with longitudinal folding along all surface; lateral surface of vesica with large finger-shaped cornutus being twice as small as phallus.

*Female* unknown.

*Comparison.* Externally, *P. lourensi* **sp. nov.** clearly differs from two other species considered in this article, in the dark pattern with poorly expressed light brown elements and in two small notches on the abdominal margin of the valve in the proximal and middle thirds.

*Etymology.* The new species is named in honour of the collector, J.H.M. Lourens. Dr Johannes H.M. Lourens has made a significant contribution to the study and conservation of Lepidoptera in the Philippines, as well as to the promotion of knowledge about Lepidoptera in this region.

*Distribution.* The Philippines: Luzon and Mindoro islands.

### ***Panau tanimbari* sp. nov.**

(Figs 5–6)

*Holotype.* Male, with labels: “Tenimber / Sunda Ins.”, “Stauding. u. Bang-Haas / Dresden, Ankauf 1961”, “Dresden / Coss 2”, “HOLOTYPUS / *Panau tanimbari* / Yakovlev & Hulsbosch, 2023 / Yakovlev & Hulsbosch des., 2022” (SNSD).

*Paratype.* 1 male, with same locality and date as for holotype (SNSD).

*Description. Male.* Length of forewing: 24 mm in holotype, 23 mm in paratype. Antenna short, about one-third of forewing in length; basal half of antenna bipectinate, with long setae (2.5–3.0 times as long as diameter of antenna stem); distal half of antenna unipectinate, with very short

setae. Tegulae and patagia densely covered with light grey scales. Abdomen basally light grey, in other parts light brown, with light grey spots on dorsal surface. Forewing grey-brown; long light brown stroke from wing base to postdiscal area between veins of cubital stem; light brown stroke in medial area postdiscally; thin undulated longitudinal lines between veins of medial and cubital stems postdiscally; poorly expressed grey reticulated pattern submarginally; fringe dark at veins, light between veins. Hind wing grey-brown, without pattern; fringe dark at veins, light between veins.

Male genitalia. Uncus long, with acute beak-like apex, apical third noticeably thickened and deep longitudinal notch on lower surface. Gnathos arms thin, long, belt-like, not fused. Valve long, leaf-like, slightly curved along length, slightly narrowing to apex; outer margin semicircular; costal margin slightly curved; abdominal margin with small notch in proximal third. Juxta saddle-like, robust, with a pair of long leaf-like lateral processes. Saccus small, conical, apically acute. Phallus thick, with longitudinal folding on all surface; lateral surface of vesica with large finger-shaped cornutus almost equal to phallus in length.

*Female* unknown.

*Comparison.* Externally, *P. tanimbari* **sp. nov.** is close to *P. variegatum*, from which it differs in the less expressed light brown pattern on the forewing, thick distal third of the uncus, and less expressed notch on the abdominal margin of the valve in the proximal third.

*Etymology.* The new species is named after the region where it was collected, the Tanimbar Island.

*Distribution.* Indonesia: Tanimbar Island.

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## References

- Holloway J.D.** 1986. The moths of Borneo: Key to families: Families Cossidae, Metarbelidae, Ratardiidae, Dudgeonidae, Epipyropidae and Limacodidae. *Malayan Nature Journal*, **40**: 1–166.
- Kristensen N.P.** 2003. Skeleton and muscles. In: **Kristensen N.P.** (Ed.). 36. *Lepidoptera, moths and butterflies*. 2. *Morphology, physiology, and development*. *Handbuch der Zoologie / Handbook of zoology*, **IV**. *Arthropoda: Insecta*: 39–131. Berlin & New York: Walter de Gruyter. <https://doi.org/10.1515/9783110893724.39>
- Lafontaine J.D. & Mikkola K.** 1987. Lock-and-key system in the inner genitalia of Noctuidae (Lepidoptera) as taxonomic character. *Entomologiske Meddelelser*, **55**: 161–167.
- Roepke W.** 1957. The cossids of the Malay Region (Lepidoptera: Heterocera). *Verhandelingen der Koninklijke Nederlandse Akademie van Wetenschappen, Afdeling Natuurkunde (Tweede Reeks)*, **52**(1): 1–60.
- Schoorl J.W.** 1990. A phylogenetic study on Cossidae (Lepidoptera: Ditrysia) based on external adult morphology. *Zoologische Verhandelingen*, **263**: 1–295.
- Yakovlev R.V.** 2004. New taxa of Cossidae from SE Asia. *Atalanta*, **35**(3–4): 369–382.
- Yakovlev R.V.** 2011. Catalogue of the family Cossidae of the Old World (Lepidoptera). *Neue entomologische Nachrichten*, **66**: 1–129.
- Yakovlev R.V.** 2013. Preliminary data on the Cossidae (Lepidoptera) for Arunachal-Pradesh State, North-East India, with a description of a new species. *Euroasian entomological Journal*, **12**(1): 98–102.
- Yakovlev R.V.** 2014. Descriptions of three new species of Cossidae (Lepidoptera) from Vietnam, with an updated annotated checklist. *Zootaxa*, **3802**(2): 240–256. <https://doi.org/10.11646/zootaxa.3802.2.6>

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