

## ***Cyme maartjekijneae*, a new lichen moth species from New Guinea (Lepidoptera: Erebidae, Arctiinae)**

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**Abstract:** A new species from Papua, Indonesia, *Cyme maartjekijneae* spec. nov., is described. The adult and genitalia are illustrated. A comparison is made with *Cyme biagi* (Bethune-Baker, 1908) with which it shares some internal similarities.

**Rangkuman:** Satu spesies baru dari Papua, Indonesia, *Cyme maartjekijneae* spec. nov., dideskripsi. Serangga dewasa dan alat genitalia dideskripsi. Perbandingan di buat dengan *Cyme biagi* (Bethune-Baker, 1908) dimana di temukan beberapa persamaan internal.

**Keywords:** Papua, Indonesia, Papua New Guinea, description

### **Introduction**

During the process of revising the genus *Cyme* C. Felder, 1861 the authors discovered an exceptionally patterned and bright coloured new species. At the time of writing a very dear colleague of us passed away far too young due to cancer. A promise was made to name one of the newly discovered *Cyme* species after this colleague (see further in Etymology). A decision was made to publish this species separately from the generic revision, in respect to this person and relatives, and because the actual revision will take much more time to be completed.

The genus *Cyme* C. Felder, 1861 has a wide distribution in the Indo-Australian region, from Singapore to the Solomon Islands. Most species occur in the Papuan region and are very colourful with a similar pattern of pale patches combined with bright red dots or lines on a brown or otherwise dull ground colour. Many species show a strong variability which makes it hard to circumscribe real species with respect to colour forms. The species are often characterised by bright coloured wing patterns, like in genera *Miltochrista* Hübner, 1819, *Asura* Walker, 1854, *Barsine* Walker, 1854 and *Lyclene* Moore, [1860], with which species of *Cyme* were historically often mixed and confused. As of yet, 42 named species are recognized in the genus (Looijenga, 2021), but many other species are awaiting to be described. A thorough revision of the genus is in preparation.

## Abbreviations

FWL – forewing length

KSP – Koleksi Serangga Papua, Waena, Papua, Indonesia

NHMUK – Natural History Museum, London, United Kingdom

RMNH – Collection of Naturalis Biodiversity Center, Leiden, The Netherlands (former Rijksmuseum voor Natuurlijke Historie)

RMNH.INS. – Acronym for unique collection numbers of specimens and slides in RMNH

## Material and methods

Specimens were photographed with a Nikon D600 with AF Micro-Nikkor 60mm f/2.8D lens, mounted on a Kaiser RSX Copy Stand with RTX camera arm and using a 32 W circular lamp mounted on a light box (Fritz Weber).

Genitalia were dissected, mounted and illustrated. Abdomens were put in cold KOH 10% overnight. After washing and cleaning with 30% alcohol to remove scales and loose tissues, the genitalia were stained in Chlorazol black solution in 30% alcohol and fixed in 95% alcohol. The pieces were then soaked 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 procedure used at the Natural History Museum in London (Robinson, 1976): abdomen on the left side, genital armature top right, phallus bottom right. To prevent the smaller parts, like the phallus, 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, adding a few fresh drops of Euparal. The complete slides were left to dry for weeks in the Petri dish. Labels were only added after drying completely, so therefore it was necessary to write a slide number on the glass slide to avoid mixing up with other drying slides. The preparation slides of Naturalis Biodiversity Center were made by the first author and were numbered with a unique standard number of labels provided by the museum. The slides of the Natural History Museum were made and numbered by Dr. Alberto Zilli.

Digital photographs were made with a motorised Zeiss V20 binocular microscope and a digital Axio MRc5 camera controlled by Axiomanager M2 software.

Forewing lengths were measured with a digital calliper from forewing base to apex.

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 Volynkin (2024).

## Systematic part

### *Cyme maartjekijneae* spec. nov. (figs 1-4, 7-8, 11-12)

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**Holotype:** ♂ (RMNH.INS.1560948), [Indonesia, Papua], Ned. Nw Guinea, Waris District, Ampas, 30.VII.1938, W. Stüber leg., coll. J.M.A. v. Groenendael, in RMNH.

**Paratypes:** 1 ♀ (RMNH.INS.1560949), [Indonesia, Papua], Ned. Nw Guinea, Achterland Hollandia, 20.X.1936, W. Stüber leg., coll. J.M.A. v. Groenendael, in RMNH; 1 ♀ (KSP 24425), [Indonesia, Papua], Irian Jaya, CI-RAP Furu Camp, Dabre-Mamberano, 138°38'10"E - 0°17'04"S, 1-7.ix.2000, Henk van Mastrigt [leg.], in KSP; 1 ♀ (NHMUK015208917), Nomnagihé, 25 miles south of Wangaar, 2000 ft., Dutch N. Guinea, Jan.-Feb. 1921. C., F., & J. Pratt [leg.], in NHMUK.

**Diagnosis:** This species cannot be confused with any other congeners. Externally not resembling any other species of *Cyme* or other genera of tribe Lithosiini. The combination on the forewing of yolk-yellow ground colour, distal rosy-red tinge and rather simple black transverse lines and spots is unique. The genitalia show the characteristic *Cyme* configuration and share numerous similarities with those of *C. biagi* (Bethune-Baker, 1908). Male genitalia in both species with juxta with a deep U-shaped excision inferiorly, vinculum broadly "U"-shaped, valvae broadest at base, cucullus with costal half more strongly sclerotized than ventral one. Sacculus equally broad throughout its length, tapered towards a broad blunt and distally curved distal saccular process in *maartjekijneae* (fig. 7), while it narrows towards a shorter and blunt distal saccular process in *biagi* (fig. 9). Medial saccular process in both species strongly developed and asymmetrical, in *maartjekijneae* slender with a sharp apex, whereas in *biagi* robust and bluntly thumb-shaped. Medial ampulla in *maartjekijneae* with a rather sharp apex, at base narrowing, while in *biagi* the medial ampulla is almost rectangular and broad. Female genitalia with antrum more strongly sclerotized at sides, appendix bursae "phrygian-cap"-shaped and corpus bursae with tiny scobination in both species. However, the appendix bursae in *maartjekijneae* is positioned slightly more anteriorly on the corpus bursae, contrary to *biagi* (fig. 13), in which it is positioned more in the middle. The antrum and sclerotized part of the ductus bursae in *maartjekijneae* is very similar to that in *biagi*, though that of *biagi* is distinctly longer and with a wider ostium rim.

**Description:** FwL: ♂ 14.1 mm, ♀ 14.1 mm. Head and thorax pale yellow. Holotype with pale grey spot on frons, but this spot may be absent (see fig. 15). Tegulae with dark grey lining at base, mesonotum with paired spaced grey dots below patagium and posterior with pale grey suffusion. Foreleg yellow with rosy-red tinge from base to middle of tibia, then dark grey; midleg more extensively yellow, with distal grey patch on tibia and grey tarsus; hindleg yellow, with only terminal tarsomeres grey. Abdomen yellow.

Forewing with yolk-yellow ground colour and black pattern elements. A small spot at very base of costa and another one at the base of discal cell, the latter followed by a short thick basal dash; antemedial line thick, sub-vertical; postmedial line thick, almost perpendicular to costa and oblique from this to middle of disc, then abruptly angular inwardly up to cubitus, from where it proceeds almost vertically to anal margin; after thin yellow-rosy interspace (widest at costa), postmedial followed by thin parallel black line emitting short black smudges externally, and a long thick wedge-like sub-medial one almost reaching termen; distal field rosy-red, almost split into bigger anterior and smaller posterior ones by aforementioned wedge; termen and fringe black, originating thick distal edge bordering externally the wing (best evident in alive individuals, see figs 14-15). Hindwing creamy-yellow with feeble orange hue, at costa and in apical area with stronger orange tinge; terminal line orange and very thin, in male black and lined internally with orange, in female pale brown all through.

Underside: Forewing yolk-yellow with orange tinge, with upperside pattern shining through; dark grey mark at costa in correspondence of postmedial line, and feeble one of wedge-like mark; termen dark grey. Hindwing creamy-yellow with orange hue at apex and towards termen; fringe yellow or grey.

Male genitalia: Tegumen long, with broad, elongated sub-triangular arms with heavily sclerotized rims, laterally covered with dense brushes of hair-like scales. Vinculum broadly “U”-shaped. Valva broad at base, valvula at apex broad and rounded and with costal half more strongly sclerotized than ventral one; lamella centralis wide, running from costa to distal process of sacculus; ampulla robust, folded inwards with short triangular process and blunt hooked apex; sacculus rather equally broad throughout its length but slightly constricted in the middle; ventral edge heavily sclerotized, tapered towards a slender blunt and curved distal saccular process; at the distal end of the sacculus a long deep excision proximal to distal process. Uncus long and hook-shaped, thickened at the apex and partly unsclerotized ventrally. Juxta inferiorly with an arched notch.

Phallic tube short and thick, slightly tapered distally, with heavily sclerotized, slightly excurved carinal plate. Vesica with four distinct diverticula, all minutely scobinated; at the base of the vesica ventrally a small globular diverticulum with tiny scobination, dorsally a stretched more heavily scobinated diverticulum and a large trunk-shaped ventral diverticulum with proximally scobination, distally narrowing without scobination, one large and heavily sclerotized bar-shaped cornutus present at base.

Female genitalia: Rim of ostium bursae widely “V”-shaped, pleated. Ductus bursae with broad funnel-shaped antrum, laterally heavily sclerotized, gradually narrowing anteriorly and with short membranous section of ductus bursae connected to corpus bursae; corpus bursae large, globular, completely covered with tiny scobination, strongly folded at the connection with ductus bursae; appendix bursae ventral, broad-based, originating sub-medially from anterior half of corpus and pointing to right, shaped like a “phrygian cap”, strongly covered with chitinous drops, ; one small disc-shaped signum present at the right side of corpus bursae.

Variation: Antemedial line of forewing may be more or less interrupted with yellow colour in correspondence with veins.

**Distribution:** Recorded in both, lowland and highland areas of New Guinea. Until now only known from three localities in lowland areas in Indonesia, namely Ampas, Achterland Hollandia (Jayapura) and Mamberamo, one at approximately 610 m (Nomnagihé), and with one observation from the wild in a locality in Arfak Mountains: Kwau at approximately 540 m of elevation (iNaturalist observation by Segerer, 2015). Furthermore, another observation from the wild is known from Papua New Guinea in the Torricelli Mountains at Lumi (James T. Wareing). Given the present range, it is very likely that the species is rare but widespread.

**Etymology:** This species is named in honour of the late Maartje Kijne, a dear colleague of the authors from Naturalis Biodiversity Center. Maartje was an education content developer at the museum of Naturalis and she was known for her energetic and flamboyant appearance. Naming this species, unique and colourful in appearance, serves as a lasting tribute to Maartje Kijne and her invaluable contributions for inspiring the next generation of natural scientists.

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The family of Maartje, in particular Jan Kijne and Leo van der Sluijs, and close friends of Maartje, Krista Leusink, Kris de Greef and many others, we like to thank for their patience for the release of this publication.

## References

- Holloway, J.D., G. Kibby & D. Peggie, 2001.** The Families of Malesian Moths and Butterflies. Fauna Malesiana Handbook 3. – Brill, Leiden, The Netherlands, 455 pp.
- Looijenga, N., 2021.** The discovery of a sibling species next to *Cyme reticulata* Felder, 1861 in New Guinea and a review of some allied taxa (Lepidoptera: Erebidæ, Arctiinae, Lithosiini). *Suara Serangga Papua (SUGAPA digital)* 13(2): 113-130.
- Scoble, M.J., 1992.** The Lepidoptera. Form, Function and Diversity. – Oxford University Press, Oxford, 404 pp.
- Volynkin, A.V., 2024.** On the terminology of the genitalia structures of lichen moths (Lepidoptera: Erebidæ: Arctiinae: Lithosiini) with some references to Noctuidæ. *Ecologica Montenegrina* 73: 176-207.



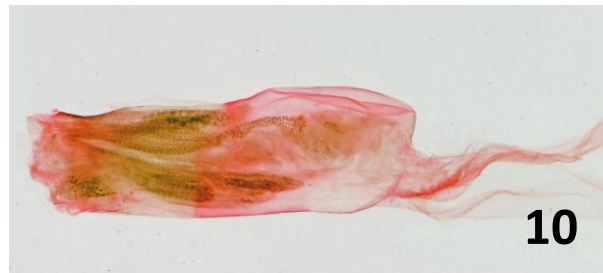
**Figs 1-4.** Adults of *Cyme maartjekijneae* spec. nov.: **fig. 1.** Holotype ♂, Ampas, Papua, Indonesia (RMNH.INS.1560948); **fig. 2.** Holotype ♂ (verso); **fig. 3.** Paratype ♀, surroundings of Jayapura, Papua, Indonesia (RMNH.INS.1560949) ; **fig. 4.** Paratype ♀ (verso). Scale bar = 5 mm.



**Figs 5-6.** Adults of *Cyme biagi* (Bethune-Baker, 1908): **fig. 5.** ♂, Sogeri, Papua New Guinea (NHMUK015208915); **fig. 6.** ♀, Hydrographer Mts., Papua New Guinea (NHMUK015110058). Scale bar = 5 mm.

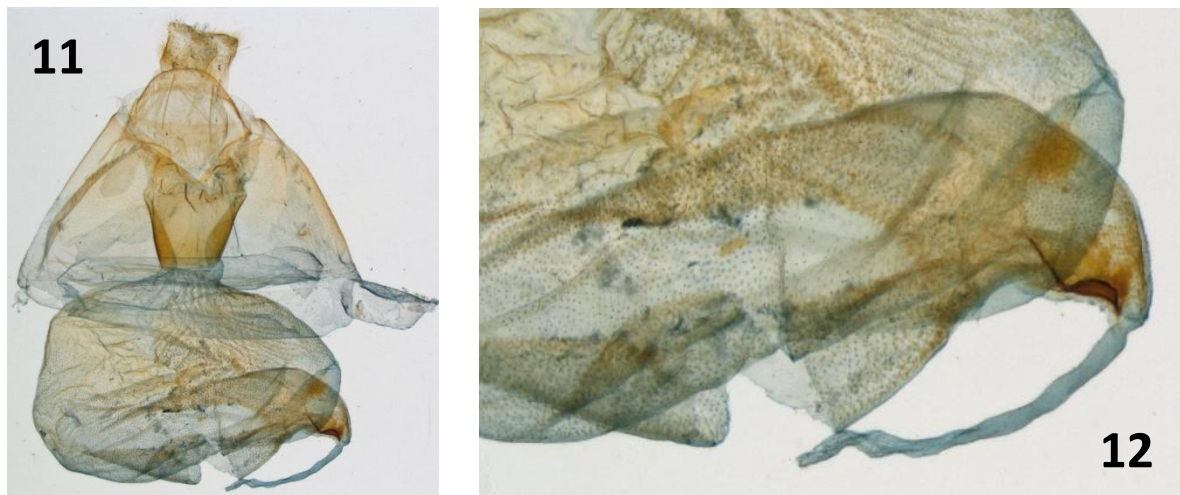


**Figs 7-8.** Male genitalia from holotype of *Cyme maartjekijneae* **spec. nov.** (RMNH.INS.1560948). **Fig. 7.** genital armature; **fig. 8.** phallus.

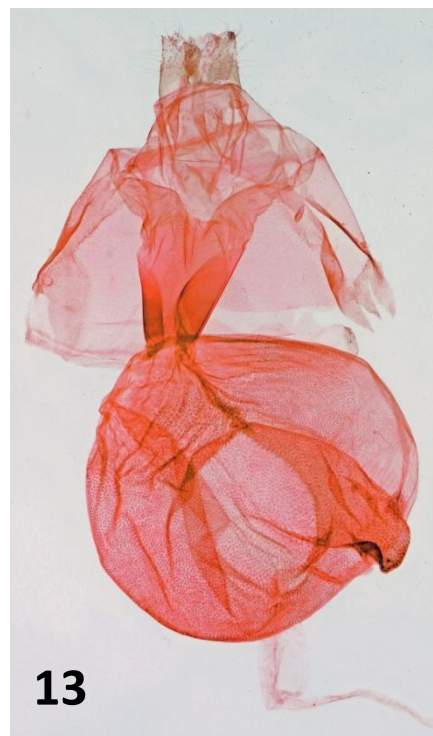


**Figs 9-10.** Male genitalia of *Cyme biagi* (Bethune-Baker, 1908) (NHMUK015208915). **Fig. 9.** genital armature; **fig. 10.** phallus.





**Figs. 11-12.** Female genitalia from paratype of *Cyme maartjekijneae* **spec. nov.**, (RMNH.INS.1560949). **Fig. 11.** habitus; **fig. 12.** diverticula bursae with ductus seminalis.



**Fig. 13.** Female genitalia of *Cyme biagi* (Bethune-Baker, 1908) (NHMUK015110058), habitus.





**Figs 14-15.** *Cyme maartjekijneae* **spec. nov.**, natural pictures. **Fig. 14.** Kwau, Arfak Mts, West Papua, Indonesia (photo: Benoit Segerer); **fig. 15.** Lumi, Torricelli Mountains, Papua New Guinea (photo: James T. Wareing).