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Description of the female of *Cyana sumbawensis* Černý, 2016 (Lepidoptera: Erebidae: Arctiinae) and new data on its variation and distribution

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Abstract. The female of the little-known lichen moth species *Cyana sumbawensis* Černý, 2016 is described for the first time. A redescription of the male of this species is also provided, and intraspecific variation is presented. Based on the new data, an updated diagnosis of *C. sumbawensis* is given. Previously, the species was known only from the type series collected on Sumbawa Island. New records from the islands of Bali, Lombok, and Flores show a rather wide distribution of *C. sumbawensis*, not only within Wallacea but also in Sundaland.

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Keywords: Lithosiini, biodiversity, taxonomy, new records, Wallacea, Sundaland, Lesser Sunda Islands, Indonesia

Описание самки *Cyana sumbawensis* Černý, 2016 (Lepidoptera: Erebiidae: Arctiinae) и новые данные об его изменчивости и распространении

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Аннотация. Впервые описана самка малоизвестного вида лишайниц *Cyana sumbawensis* Černý, 2016. Также приведено переописание самца этого вида и показана внутривидовая изменчивость. Экземпляры с Ломбока и Бали более яркие по сравнению с особями из типового местонахождения и имеют красно-оранжевый рисунок. На Флоресе бабочки более светлые, с охристым рисунком крыльев. Ширина и форма полос на переднем крыле мало варьируют, за исключением самца, собранного на Бали, у которого полосы уже, чем у экземпляров с других островов. На основе новых данных дан уточненный диагноз *C. sumbawensis*. Ранее этот вид был известен только по типовой серии, собранной на острове Сумбава. Новые находки с островов Бали, Ломбок и Флорес показывают довольно широкое распространение *C. sumbawensis* не только в Уоллесии, но и в Сундаленде.

Ключевые слова: Lithosiini, биоразнообразии, таксономия, новые находки, Уоллесия, Сундаленд, Малые Зондские острова, Индонезия presents data on intraspecific variation and an updated diagnosis of this species. Illustrations of the adult specimens and male and female genitalia from different islands are provided.

Material and methods

Specimens of *Cyana sumbawensis* were collected at night by a light trap using a LepiLED® UV lamps in Bali and Lombok Islands, and WSB/E24-E23 250 Watt lamp in Flores Island. For genitalia preparation, specimens were prepared by boiling the abdomen in 10 % KOH for 3–5 minutes. The genitalia are kept in a micro-tube with glycerin pinned to the specimens. The genitalia were photographed using a Zeiss Stemi 2000-C

Introduction

The little-known species *Cyana sumbawensis* Černý, 2016 was described based on a small series of males from Sumbawa Island (Černý 2016). During our field studies, we discovered this species on the islands of Bali, Lombok, and Flores, which significantly expands the understanding of its distribution range. Notably, on the islands of Lombok and Flores, previously unknown females of this species were collected together with males. On Lombok Island, a single copulating pair of *C. sumbawensis* was collected, confirming that the females and males belong to the same species. This paper provides the first description of the *C. sumbawensis* female and

stereomicroscope with a Zeiss AxioCam ERc5s microscope camera (for specimens from Bali and Lombok) and a Leica M165C stereomicroscope with a FLEXACAM C1 digital camera (for specimens from Flores). The images of the specimens were taken with a Sony SLT-A65 digital camera with a Sony 2.8/50 macro lens (for specimens from Bali and Lombok) and a Canon EOS 7D camera with a Canon EF 100mm f/2.8L Macro IS USM lens (for specimens from Flores).

This study is based on materials from the collection of the Russian Museum of Biodiversity Hotspots (RMBH), N. Laverov Federal Center for Integrated Arctic Research of the Ural Branch of the Russian Academy of Sciences (Arkhangelsk, Russia) and the research collection of Evgeny S. Koshkin (Khabarovsk, Russia).

Results

Family Erebidae Leach, 1815

Subfamily Arctiinae Leach, 1815

Tribe Lithosiini Billberg, 1820

Cyana sumbawensis Černý, 2016

(Figs. 1–3)

Cyana sumbawensis Černý, 2016: 427, figs. 15, 16, 26. Type locality: 'Indonesien, Sumbawa (W), Prov. Nusa Tenggara, Barat, 430 m, Gunung Mt. Tambora.'

Material examined. Indonesia, Bali Province, **Bali Island:** 1♂, Karangasem Regency, 10 km NE of Amlapura, 08°23'16"S, 115°40'11"E, 460 m, heavily disturbed monsoon forest, 13.09.2025, E. S. Koshkin leg.; Indonesia, West Nusa Tenggara Province, **Lombok Island:** 1♂, 2♀, near Sembalun Bumbung village, 08°24'12"S, 116°32'11"E, 1400 m, mountainous disturbed monsoon forest, 28.08.2024, E.S. Koshkin leg.; 3♂, 4♀, near Sembalun Bumbung village, 08°24'11"S, 116°32'11"E, 1415 m, mountainous disturbed monsoon forest, 29.08.2024, E. S. Koshkin leg.; 3♂, 3♀, near Sembalun Bumbung village, 08°24'10"S, 116°32'11"E, 1425 m, mountainous disturbed monsoon forest, 30.08.2024, E. S. Koshkin leg.; 4♂, 2♀ (including 1 pair *in copula*), near Sembalun Bumbung village, 08°24'41"S, 116°32'36"E, 1555 m, mountainous monsoon forest, 17–18.09.2025,

E. S. Koshkin leg.; 1♂, near Sembalun Bumbung village, 08°24'54"S, 116°32'50"E, 1800 m, mountainous monsoon forest at the border with the savanna, 18–19.09.2025, E. S. Koshkin leg.; 2♂, 1♀, near Sembalun Bumbung village, 08°24'41"S, 116°32'39"E, 1590 m, mountainous monsoon forest, 20–21.10.2025, E. S. Koshkin leg.; Indonesia, East Nusa Tenggara Province, **Flores Island:** 5♂, Sano Ngoang Lake, camp site, secondary mountain forest with old nutmeg trees on a hill slope, 08°42'33"S, 119°59'51"E, 21–22.01.2015, I. Bolotov leg.; 3♂, Labuan Bajo, disturbed monsoon forest, 08°32'17"S, 119°53'05"E, 21–22.01.2020, V. Spitsyn & E. Spitsyna leg.; 1♂, Labuan Bajo, disturbed monsoon forest, 08°30'42"S, 119°54'09"E, 13.02.2020, V. Spitsyn & E. Spitsyna leg.; 5♂, Borong, dry monsoon forest and banana plantations, 90 m, 08°49'05"S, 120°37'33"E, 24–27.01.2020, V. Spitsyn & E. Spitsyna leg.; 1♂, 2♀, Bajawa, Wolokoro Ecolodge, heavily disturbed monsoon forests and eucalyptus plantings, 08°49'02"S, 120°56'03"E, 28–31.01.2020, V. Spitsyn & E. Spitsyna leg.; 1♀, Mbeliling Mountain Ecolodge, mountain monsoon forest, 08°35'21"S, 119°59'12"E, 5–7.02.2020, V. Spitsyn & E. Spitsyna leg.

Diagnosis. The male of *Cyana sumbawensis* is externally similar to *C. costifimbria* (Walker, 1862) (type locality: Borneo), *C. vespertata* (Černý, 1993) (type locality: Philippines, Luzon), and *C. aurorae* Lourens, 2011 (type locality: Philippines, Leyte), but it differs from them by having a discal spot and a different shape of the orange bands on forewing (compare Figs. 1 A–D in this paper with Figs. 12a, 13a, 14a in Černý 1993 and Figs. 15a, 16a, 17a, 17c in Lourens 2011). In the male genitalia of *C. sumbawensis*, the saccular process reaches the apex of the valva (in *C. costifimbria* and *C. vespertata*, it is shorter than the valva). The costal margin of the valva in *C. sumbawensis* has a small, rounded projection, whereas in *C. costifimbria*, *C. vespertata*, and *C. aurorae* it is larger and pointed. In the vesica of *C. sumbawensis*, the largest cluster of cornuti appears as an oblong and uniformly wide area, while in *C. costifimbria*, *C. vespertata*, and

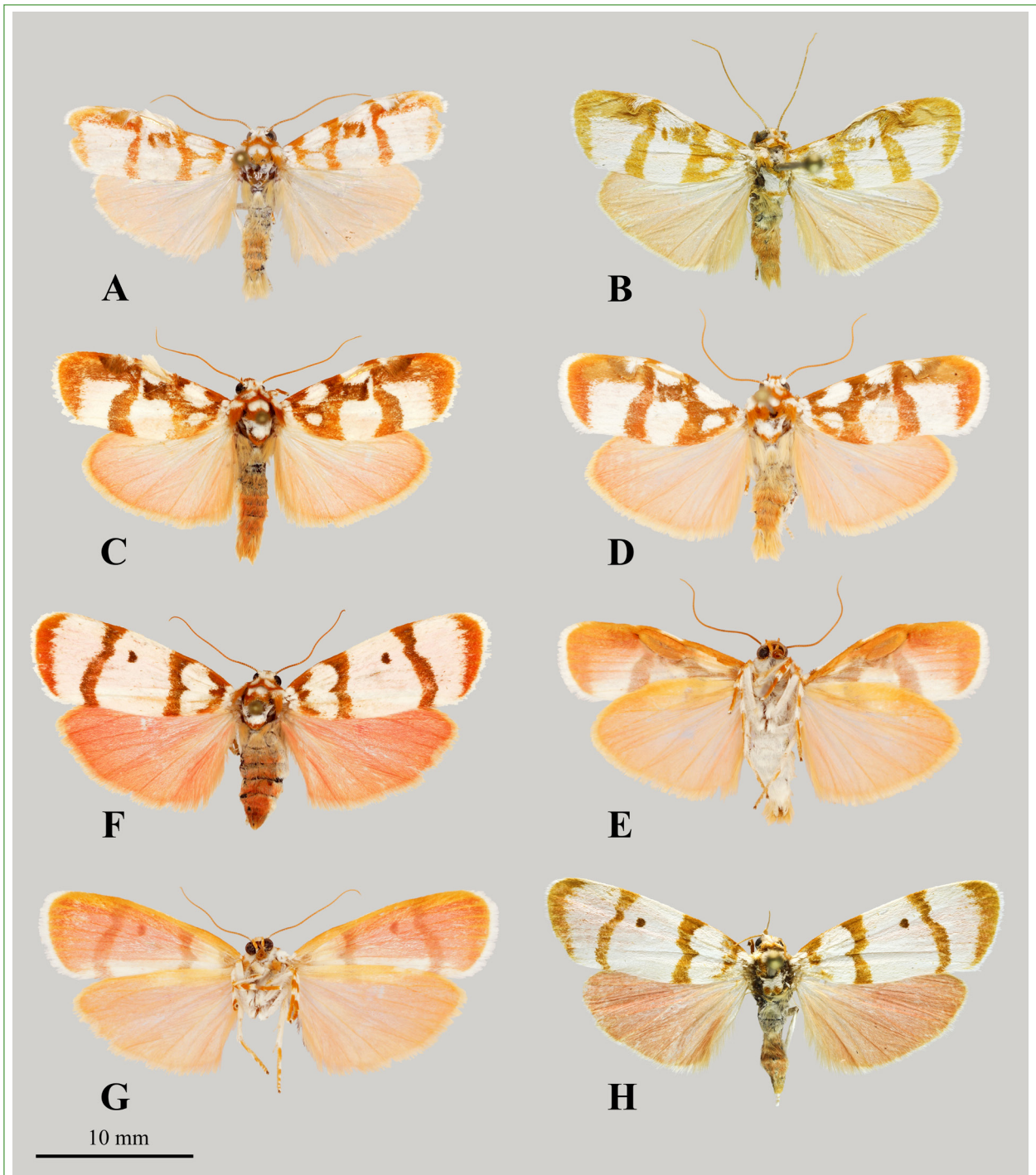


Fig. 1. *Cyana sumbawensis*, adults, habitus: A — ♂, Bali Island, 13.10.2025; B — ♂, Flores Island, 21–22.01.2020; C — ♂, Lombok Island, 28.08.2024; D, E — ♂, Lombok Island, 18–19.10.2025; F, G — ♀, Lombok Island, 29.08.2024; H — ♀, Flores Island, 5–07.02.2020. A–D, E, H — upperside, E, G — underside

Рис. 1. *Cyana sumbawensis*, имаго, внешний вид: A — ♂, остров Бали, 13.10.2025; B — ♂, остров Флорес, 21–22.01.2020; C — ♂, остров Ломбок, 28.08.2024; D, E — ♂, остров Ломбок, 18–19.10.2025; F, G — ♀, остров Ломбок, 29.08.2024; H — ♀, остров Флорес, 05–07.02.2020. A–D, F, H — верхняя сторона; E, G — нижняя сторона

C. aurorae it takes the form of a long ribbon of uneven width (compare Figs. 2 A–C in this paper with Figs. 45, 46, 74, 75 in Černý 1993

and Figs. 15d–h, 16c–g, 17e–i in Lourens 2011). In females of *C. sumbawensis*, unlike those of *C. costifimbria*, *C. vespertata*, and

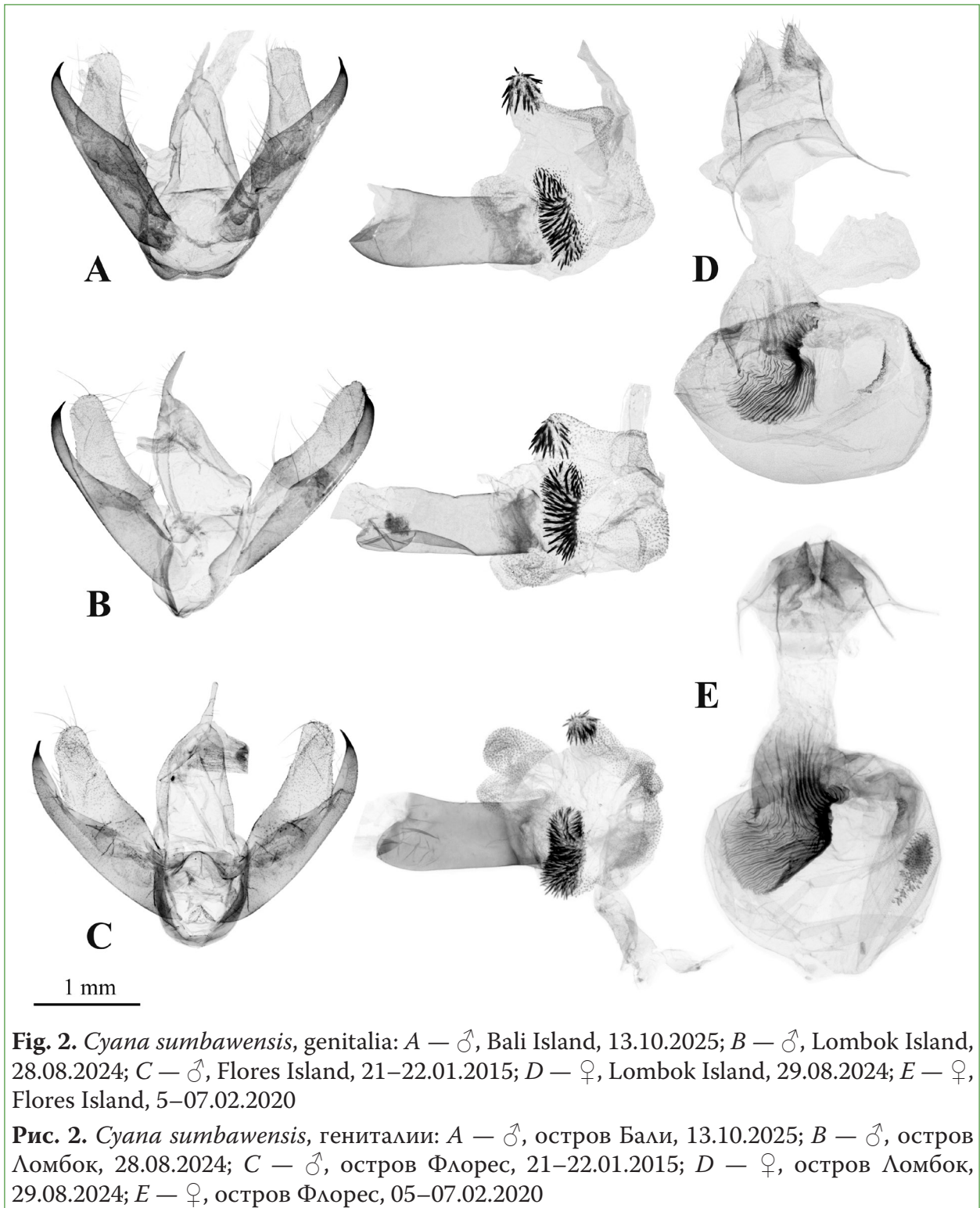


Fig. 2. *Cyana sumbawensis*, genitalia: A — ♂, Bali Island, 13.10.2025; B — ♂, Lombok Island, 28.08.2024; C — ♂, Flores Island, 21–22.01.2015; D — ♀, Lombok Island, 29.08.2024; E — ♀, Flores Island, 5–07.02.2020

Рис. 2. *Cyana sumbawensis*, гениталии: A — ♂, остров Бали, 13.10.2025; B — ♂, остров Ломбок, 28.08.2024; C — ♂, остров Флорес, 21–22.01.2015; D — ♀, остров Ломбок, 29.08.2024; E — ♀, остров Флорес, 05–07.02.2020

C. aurorae, the antemedial and postmedial bands on the forewings are not outlined in black, they have a different shape, and the discal spot is red rather than black (compare Figs. 1 E, H in this paper with Figs. 12b, 13b, 14b in Černý 1993 and Figs. 15b, 15c, 16b, 17b, 17d in Lourens 2011). The posterior sclerotized plate in the female genitalia of

C. sumbawensis is more rugose and longer compared to the aforementioned species, and the appendix bursae is smaller (compare Figs. 2 D, E in this paper with Figs. 98, 99 in Černý 1993 and Fig. 15 of Plate 4 and Figs. 15i, 16h, 17j in Lourens 2011).

Redescription of the male. Wingspan 19–27 mm, forewing length 10–12.5 mm ($n = 30$).



Fig. 3. Distribution records of *Cyana sumbawensis*: red circle indicates its type locality, and blue circles indicate new records. The base of the map was obtained from: https://commons.wikimedia.org/wiki/File:Lesser_Sunda_Islands_en.png

Рис. 3. Места находок *Cyana sumbawensis*: красный круг указывает на типовое местонахождение, синие круги — на новые находки. Источник основы карты: https://commons.wikimedia.org/wiki/File:Lesser_Sunda_Islands_en.png

Head white with small orange spot on the top, frons orange. Labial palps short, slightly curved, orange. Proboscis well-developed, brown. Antennae orange, scape densely covered with white scales. Thorax white, with orange longitudinal band in middle part, posterior margin orange. Patagium white, tinged with orange along margins. Tegula orange with white spot at anterior margin. Legs white with orange bands. Forewing white with pattern of orange bands and spots. Subbasal and antemedial bands broad, connected in the middle parts and at the inner margin, such that two white spots are formed between them. Antemedial band slightly curved. Two discal spots: one large and irregular, other small and narrow (these spots usually fused with each other and antemedial band in specimens from Lombok). Postmedial band broad but narrows towards the costal margin of wing. Terminal band broad, expanding from the inner margin to the costa. Orange costal area is situated between postmedial and terminal bands. End of androconial lobe along costal margin with tuft of white and orange hairs. Cilia white. Hindwing pink, slightly darker at margins. Cilia pinkish (Figs. 1 A–D). Underside of forewing pink with whitish inner area and intense pink oblong-rounded relief spot under androconial lobe. Underside of hindwing intense pink (Fig. 1 E). Abdomen pink or brownish orange with lighter base dorsally,

white ventrally. **Male genitalia.** Uncus small, thin, apically pointed. Tegumen broad, longer than uncus. Saccus broad, rounded. Valva long, narrow, with rounded apex. Costa slightly curved with rounded protrusion in basal third. Saccular process broad, hook-shaped at apex, slightly curved inwards, reaching apex of valva. Aedeagus straight, short and thick. Vesica slightly shorter than aedeagus, sack-shaped, with four finely scobinated diverticula. Two diverticula bearing asymmetrical clusters of numerous fine needle-like cornuti (Figs. 2 A–C).

Description of the female. Wingspan 26–29.5 mm, forewing length 11–14 mm ($n = 15$). Head, thorax, and abdomen are similar to those of male. Forewing white with pattern of red-orange bands and discal spot. Subbasal band broad, with three outward projections (most prominent ones along costal and inner margins of wing). Antemedial band broad, slightly curved in middle part, with sharp inward projection. Discal spot small, rounded. Postmedial band broad, slightly curved, with smooth outward projection near inner margin of wing and small inward projection at level of discal spot. Terminal band broad, expanding in middle part. Cilia white. Red-orange elements of pattern do not connect with each other, unlike in male. Hindwing red-pink, unicolorous. Cilia pink (Figs. 1 F, H). Underside of forewing pink, with whitish area along inner margin, and slightly translucent pattern from

upperside. Underside of hindwing intense pink (Fig. 1 G). **Female genitalia.** Ovipositor short and broad. Papillae anales trapezoidal with acute angles, weakly setose. Apophyses thin. Apophyses anteriores slightly shorter than apophyses posteriores. Ostium bursae broad. Ductus bursae long, broad. Corpus bursae saccate, with broad and long rugose posterior sclerotized plate, short medial lateral sclerotized band and one large signa. Appendix bursae small, saccate, membranous (Figs. 2 D, E).

Remarks on variation. Specimens from the type locality on Sumbawa Island exhibit an orange colour of the transverse bands on the forewing (Černý 2016). Specimens from Lombok and Bali are brighter, with red-orange bands (Figs. 1 A, C–G). On Flores Island, the moths are the palest, displaying an orange-ochre colouration of the forewing pattern (Figs. 1 B, H). This pigmentary variation may be associated with specific features of biogeochemical background or climate characteristics across different islands. The width and shape of the forewing bands show little variation. An exception is a single male specimen collected on Bali Island, which has narrower bands than those observed in specimens from other islands (Fig. 1 A). Specimens from different islands show no significant differences in the genitalia structure (Fig. 2).

Ecology. On the islands of Bali, Lombok, and Flores, *Cyana sumbawensis* inhabits various

types of forests, ranging from primary to heavily disturbed ones, at elevations from sea level up to 1,800 m above sea level. While adult specimens have been collected in January, February, August, and October, continuous activity throughout the year is presumed. On the islands of Lombok and Flores, *C. sumbawensis* occurs sympatrically with two other species of the genus *Cyana*: *C. javanica* (Butler, 1877) and *C. flaviplaga* (Heylaerts, 1891).

Distribution. Indonesia, Lesser Sunda Islands: Sumbawa (Černý 2016), Bali, Lombok, Flores (new records) (Fig. 3). The observation from East Timor submitted to iNaturalist (*Cyana sumbawensis* 2026) requires confirmation.

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