

A new genus and species of clearwing moth of the tribe Paranthrenini (Lepidoptera: Sesiidae) from Southern Thailand

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ABSTRACT. A new genus and species from the tribe Paranthrenini (Lepidoptera, Sesiidae) is described and illustrated from Southern Thailand: *Nokonella semang* O. Gorbunov, gen. et sp.n. The new genus differs from the all known genera of the tribe in the combination of the structure of the labial palpus and the male genitalia. The new species, the type series of which consists of only two males, was collected with the help of artificial sex attractants. In its appearance and the structure of the male genitalia, this beautiful new species is unique and cannot be confused with any species of clearwing moth from the Indo-Malayan region. The female and the larval bionomics are unknown. The subgenus *Aritasesia* Nakamura, 2009, is restored from synonyms of the polyphyletic genus *Nokona* Matsumura, 1931 and its rank was raised to generic: *Aritasesia* Nakamura, 2009, stat.res. et stat.n. How to cite this article: Gorbunov O.G. 2026. A new genus and species of clearwing moth of the tribe Paranthrenini (Lepidoptera: Sesiidae) from Southern Thailand // *Invert. Zool.* Vol.23. No.1. P.136–145. doi: 10.15298/invertzool.23.1.08

KEY WORDS. Lepidoptera, Sesiidae, Paranthreninae, Paranthrenini, clearwing moths, new genus, new species, Thailand.

Новый род и вид бабочек-стеклянниц трибы Paranthrenini (Lepidoptera: Sesiidae) из Южного Таиланда

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РЕЗЮМЕ. Описан и проиллюстрирован новый род и вид из трибы Paranthrenini (Lepidoptera, Sesiidae) из Южного Таиланда: *Nokonella semang* O. Gorbunov, gen. et sp.n. Новый род отличается от всех известных родов трибы сочетанием строения губных щупиков и гениталий самца. Новый вид, типовая серия которого состоит всего из двух самцов, был собран с помощью искусственных половых аттрактантов. Своим внешним видом и строением гениталий самца этот прекрасный вид является уникальным и не может быть спутан ни с одним видом бабочек-стеклянниц из Индо-Малайского зоогеографического региона. Самка и биология преимагинальных стадий неизвестны. Подрод *Aritasesia* Nakamura, 2009, восстановлен из синонимов полифилетического рода *Nokona* Matsumura, 1931, и его ранг повышен до рода: *Aritasesia* Nakamura, 2009, stat.res. et stat.n.

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КЛЮЧЕВЫЕ СЛОВА. Lepidoptera, Sesiidae, Paranthreninae, Paranthrenini, бабочки-стекляницы, новый род, новый вид, Таиланд.

Introduction

The generic classification of the tribe Paranthrenini Niculescu, 1964 in the Indo-Malayan zoogeographic region remains virtually undeveloped. All of the currently known more than 90 species of the tribe (Pühringer, Kallies A., 2004; Kallies *et al.*, 2014; Gorbunov, 2016; Gorbunov, Arita, 2015, 2020a, b; Gorbunov, Koshkin, 2025) are included in eight genera, 37 of which are included in the genus *Nokona* Matsumura, 1931. Analyzing both the external morphology and the structure of the male genitalia of these species, one inevitably comes to the conclusion that *Nokona*, as currently understood, is a heterogeneous or polyphyletic taxon that requires serious revision.

The taxon *Nokona* was established as a subgenus of the genus *Paranthrene* Hübner, 1819 (type species: *Sphinx asiliformis* [Denis et Schiffermüller], 1775 [= *Sphinx tabaniformis* Rottemburg, 1775]) by famous Japanese entomologist S. Matsumura in 1931 (Matsumura, 1931). *Paranthrene yezonica* Matsumura, 1931, was designated as the type species of this subgenus. In his revision of the genus *Paranthrene* of Japan, K. Yano synonymized *P. yezonica* with *Sciapteron regale* Butler, 1878, and also questioned the possibility of separating the subgenus *Nokona* (Yano, 1965). As it turned out, *P. yezonica* is a junior subjective synonym, not of *S. regale*, but of *Sciapteron fEMALE* Leech, 1889 (Yata *et al.*, 2017).

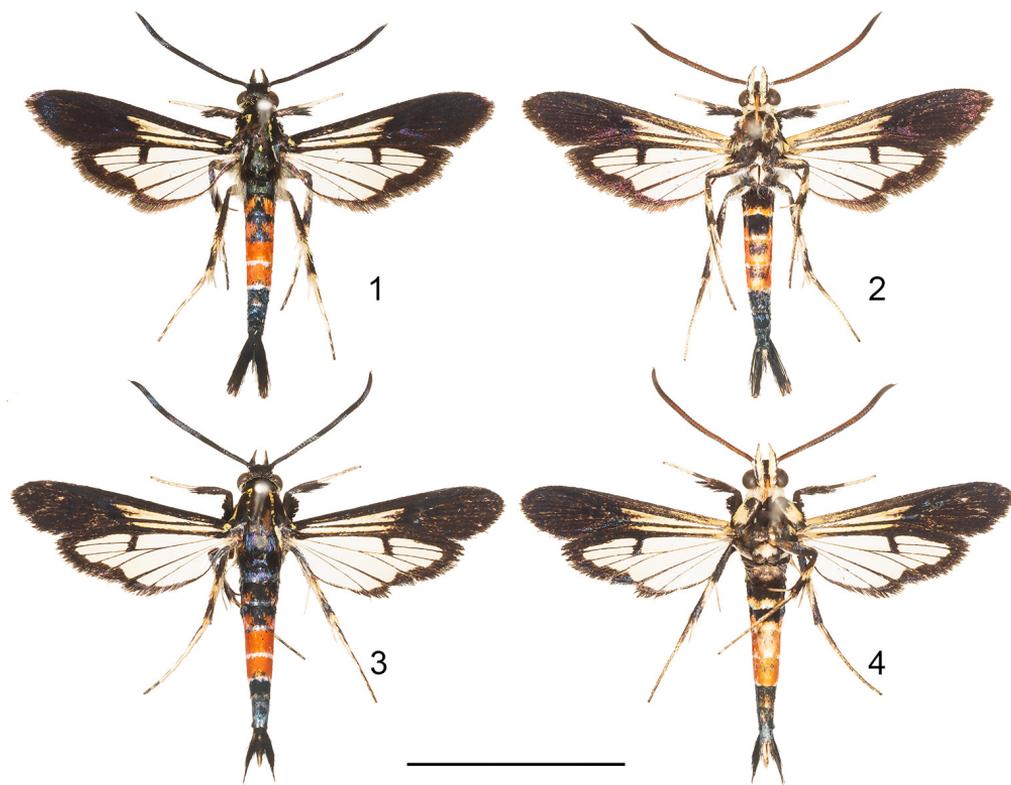
The subgenus *Aritasesia* of the genus *Nokona* was established by M. Nakamura in his work devoted to the description of pupae of 19 species of 11 genera of Japanese Sesiidae (Nakamura, 2009). *Bembecia pernix* Leech, 1889 was designated as the type species of the subgenus. Unfortunately, somewhat later this subgenus was synonymized with the genus *Nokona* on the basis that, “the genus *Nokona*... morphologically very diverse and includes a number of species groups, which are currently not formally recognized.” (Kallies *et al.*, 2014:

189). I agree with the latter, but I disagree with the act of synonymizing the taxon *Aritasesia* and believe that the structural features of the labial palpus (cp. Fig. 6 with Fig. 7 in this article), the genitalia of both males (figs 55, 56 in Špatenka *et al.*, 1999; figs 56–58 in Arita, Gorbunov, 2001) and females (figs 318–320 in Špatenka *et al.*, 1999), as well as pupation in a dense leathery cocoon, allow us to separate the well-defined so-called “*bicincta*-group” (Toševski, Arita, 1992: 619) into a separate taxon of the generic level, *Aritasesia* Nakamura, 2009, **stat.res.** et **stat.n.** At present I include in this genus up to a dozen species, which are distributed in the eastern part of the Palaearctic and in the northern Indo-Malayan regions.

During a rather successful expedition to southern Thailand in October–November 2025, I managed to collect, using artificial sex attractants, a pair of males of a very interesting species belonging to an unknown taxon of the tribe Paranthrenini. Detailed morphological analysis revealed that they belong to an as undescribed species. A combination of morphological characters indicates that this new species is clearly distinguishable from all currently known genera of Paranthrenini. Below, I describe the collected specimens as a new genus and a new species, *Nokonella semang* O. Gorbunov, gen.n. et sp.n.

While browsing through information about clearwing moths on the iNaturalist website (iNaturalist, 2026), I came across three images of a male and two females of the same species. They were photographed in southern Thailand. This information provides additional clues about the distribution and flight period of this beautiful new species.

As I have noted on numerous occasions, sex pheromones and sex attractants are playing an increasingly important role in studies of some groups of Lepidoptera, as they allow researchers to discover new species, identify populations of pests or rare species in collections, and monitor and regulate the seasonal flight of some moths (Efetov *et al.*, 2024, 2025, 2026a, b; Efetov,



Figs 1–4. Males of *Nokonella semang* O. Gorbunov, gen.n. et sp.n.: 1–2 — holotype, Sesiidae pictures Nos 0149–0150-2025; 3–4 — paratype, Sesiidae pictures Nos 0147–0148-2025. 1, 3 — dorsal view; 2, 4 — ventral view. Scale bar: 10 mm.

Рис. 1–4. Самцы *Nokonella semang* O. Gorbunov, gen.n. et sp.n.: 1–2 — голотип, Sesiidae снимки №№ 0149–0150-2025; 3–4 — паратип, Sesiidae снимки №№ 0147–0148-2025. 1, 3 — вид сверху; 2, 4 — вид снизу. Масштаб: 10 мм.

Gorbunov, 2021, 2024; Gorbunov, 2015, 2016, 2017, 2018a–c, 2019, 2022a–d, 2023, 2025a, b; Gorbunov, Efetov, 2018, 2024a, b, 2025a, b; Gorbunov *et al.*, 2025a, b).

Material and methods

The morphological examinations were made using a Leica EZ4 stereomicroscope with LED illumination. All images of moths and their habitat were taken with a Sony α 450 DSLR camera equipped with a Minolta 50 mm f/2.8 macro lens. The figures of heads and genitalia are taken with a Keyence® VHX-1000 Digital Microscope. The processing of all illustrations was finalized using Adobe Photoshop CC2020 software.

All labels of the holotype and paratype are cited verbatim. The labels of geographical data, imaging data and genitalia preparation numbers are printed on

white paper, but the type label is printed on red paper. Each label is separated by a semicolon “;” lines in a label are separated by a slash “/”. All pictures of the specimens are labeled with a number, consisting of letters and digits: name of the family, two consecutive digits separated by n-dash and a year following m-dash (e.g. SESIIDAE pictures Nos 0149-0150–2025). These letter and digit codes correspond to the numbering system of the figured specimens in the author’s archive. The genitalia preparation is stored in a microtube with glycerol and pinned under the specimen. The dissected genitalia are equipped with the corresponding number placed in the microtube. This number as a label (e.g. Genitalia preparation No. OG-031-2025) is pinned under the specimen and is listed in the archives of the author.

All studied material, including type specimens, is stored in the collection of the A.N. Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences, Moscow, Russia (COGM).

Taxonomic account

Order Lepidoptera Linnaeus, 1758
 Family Sesiidae Boisduval, 1828
 Subfamily Paranthreninae Niculescu, 1964
 Tribe Paranthrenini Niculescu, 1964

Genus *Nokonella* O. Gorbunov, gen.n.

Type species: *Nokonella semang* O. Gorbunov, sp.n.

DESCRIPTION. Medium or even small *Paranthrene*-like clearwing moths with a wingspan of about 22 mm.

Head with antenna long, reaching cross-vein of forewing, slightly serrated and ciliated; frons and vertex smooth-scaled; labial palpus long smooth-scaled ventrally (Fig. 5); proboscis well-developed, long, functional (Fig. 5). Thorax smooth-scaled, both metepimeron and metameron with long hair-like scales posteriorly. Legs smooth-scaled, but posterior margin of fore tibia covered with elongate scales. Forewing (Figs 1–4) with undeveloped external transparent area but with long and well-developed anterior and posterior transparent areas; veins R_1 – R_3 parallel, R_4 and R_5 stalked for about half of their length; distance between bases of veins R_{4+5} , M_1 , M_2 and M_3 nearly equal. Hindwing (Figs 1–4) transparent, discal spot broad with parallel margins, reaching base of vein M_3 ; base of vein M_3 located slightly basad of cross-vein. Abdomen smooth-scaled, anal tuft in form of two long and thin lobes (Figs 1–4).

Male genitalia. Uncus narrow, slightly broadened medially; tegumen short; gnathos narrow, with two beak-shaped teeth and one small one between them (Figs 5, 6); valva (Fig. 7) elongate-ovoid, densely covered with multifurcate setae in dorsal half and with row of long simple setae subventrally; medial crista low, with short setae, crista sacculi low, densely covered with strong pointed setae; saccus (Fig. 8) approximately one quarter of length of vinculum, straight, narrow, slightly forked basally; aedeagus (Fig. 9) about as long as valva, without arms distally.

Female. Unknown.

DIFFERENTIAL DIAGNOSIS. Superficially, this new genus can be confused with some species of the so-called *Nokona regalis*-group (Toševski, Arita, 1992), but it clearly differs from them in the labial palpus (with elongated scales ventrally in *Nokona regalis*-group, vs. smooth-scaled ventrally in *Nokonella*, gen.n.), well-developed anterior and posterior transparent areas of the forewing and by the structure of the male genitalia, especially the shape of the valva and the nature of the arrangement of the multifurcate setae on its inner surface (cp. Fig. 11 in this article with figs 58–60 in Špatenka *et al.*, 1999 or fig. 55b in Arita, Gorbunov, 2001). From *Nokona*

s. str., *Nokonella*, gen.n. is distinguished by its noticeably smaller size (wingspan over 25 mm in species of the genus *Nokona*, vs. wingspan of about 22 mm in the new genus), shape of the labial palpus (cp. Fig. 5 with Fig. 6 in this article) and by the structure of the male genitalia (cp. Figs 9–13 in this article with fig. 57 in Špatenka *et al.*, 1999, fig. 54a–d in Arita, Gorbunov, 2001 or fig. 34 in Kallies *et al.*, 2014). From *Aritasesia* Nakamura, 2009, stat.res. et stat.n., this new genus can be separated by the structure of the labial palpus (with elongated scales ventrally in the genus *comperd*, vs. smooth-scaled ventrally in *Nokonella*, gen.n.; compare Fig. 5 with Fig. 7 in this publication), and by the structure of the male genitalia (cp. Figs 9–13 in this article with figs 55, 56 in Špatenka *et al.*, 1999, figs 56–58 in Arita, Gorbunov, 2001 or fig. 32 in Kallies *et al.*, 2014). This new genus is somewhat closely related to *Pseudosesia* C. Felder, 1861 (type species: *Pseudosesia insularis* C. Felder, 1861) in the structure of the labial palpus (cp. Fig. 5 and 8 in this publication), but they can easily be distinguished from each other by the structure of the male genitalia, especially the structure of the gnathos, valva, vinculum and aedeagus (cp. Figs 9–13 in this article with figs 15–18 in Gorbunov, 2022d). The genus *Nokonella*, gen.n., differs from all other Oriental genera of the tribe Paranthrenini in its relatively small size, the structure of the male anal tuft, and the male genitalia.

BIOLOGY. The larval host plant is unknown. Moths on wings in May–June and October–November. Males were collected using artificial pheromone traps.

COMPOSITION. Monotypic. Only the type species *Nokonella semang* O. Gorbunov, sp.n. is included into this new genus.

RANGE. Currently known only from the following southern provinces of Thailand: Phetchaburi, Nakhon Si Thammarat, Phatthalung and Yala.

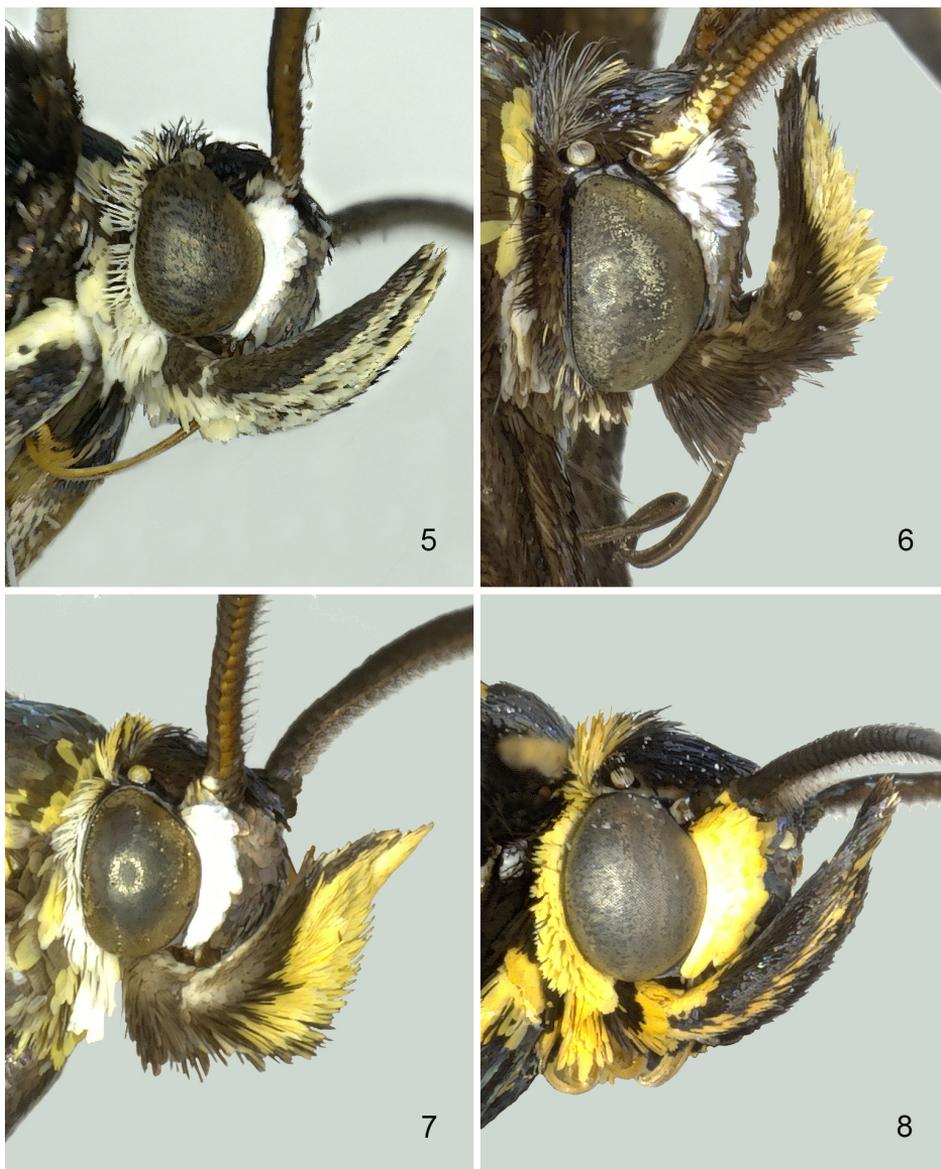
ETYMOLOGY. The name of this new genus is derived from the generic name of the closest relative *Nokona* and the diminutive suffix *-ella*, meaning little *Nokona*. The gender is feminine.

Nokonella semang O. Gorbunov, sp.n.

Figs 1–10.

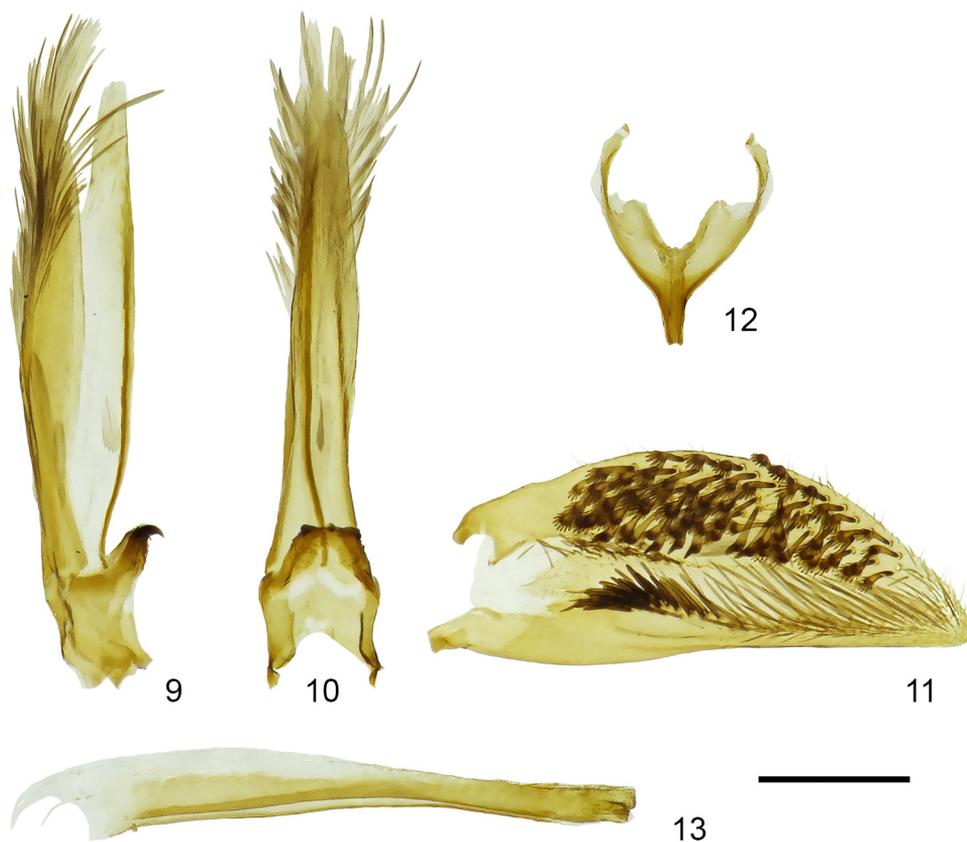
MATERIAL. **Holotype** ♂ (Figs 1–2) with labels: “**Thailand**, Yala, / Mueang Yala Distr., / 06°28.759'N, 101°16.359'E, / 156 m, 01.XI.2025, / O.G. Gorbunov leg.”; “SESIIDAE / Pictures Nos / 0149-0150–2025 / Photo by O.G. Gorbunov”; “HOLOTYPUS ♂ / *Nokonella semang* / O.G. Gorbunov, 2026 / O.G. Gorbunov des., 2025”.

Paratype ♂ (Figs 3–4): “**Thailand**, Phatthalung, / Nakhon Si Thammarat Mts., / 07°35.405'N, 099°48.539'E, / 217 m, 28.X.2025, / O.G. Gorbunov leg.”; “SESIIDAE / Pictures Nos / 0147–0148–2025 / Photo by O.G. Gorbunov”; “PARATYPUS



Figs 5–8. Lateral view of heads of Paranthrenini: 5 — *Nokonella semang* O. Gorbunov, gen.n. et sp.n. Holotype; 6 — *Nokona feralis* (Leech, 1889), ♂, Japan, Honshu, Nagano ken, Hase-mura, Maruyama-dani, 3–4.VIII.1994, Yu. Arita & O.G. Gorbunov leg.; 7 — *Aritasesia pernix* (Leech, 1889), comb.n., ♂, Japan, Honshu, Aichi ken, Nagoya-shi, Tempaku-ku, 13.XI.1994, ex larva from a stem of *Paederia foetida* L. (as *P. scandens*) (Rubiaceae), moth emerged 14.II.1995, O.G. Gorbunov & F. Igari leg.; 8 — *Pseudosesia lecerfi* (Hampson, 1919), ♂, Indonesia, North Maluku, Palau Bacan, Labuha, 00°36.98'S, 127°28.96'E, 30 m, 5.III.2017, O.G. Gorbunov leg.

Рис. 5–8. Вид сбоку голов Paranthrenini: 5 — *Nokonella semang* O. Gorbunov, gen.n. et sp.n. Голотип; 6 — *Nokona feralis* (Leech, 1889), ♂, Япония, Хонсю, префектура Нагано, окрестности горы Маруяма, 3–4.VIII.1994, Ю. Арита и О.Г. Горбунов leg.; 7 — *Aritasesia pernix* (Leech, 1889), comb.n., ♂, Япония, Хонсю, префектура Айти, Нагоя, район Темпаку, 13.XI.1994, ex larva из стебля *Paederia foetida* L. (как *P. scandens*) (Rubiaceae), бабочка вывелась 14.II.1995, О.Г. Горбунов и Ф. Игари leg.; 8 — *Pseudosesia lecerfi* (Hampson, 1919), ♂, Индонезия, Северное Малуку, остров Бачан, Лабуха, 00°36.98' ю.ш., 127°28.96' в.д., 30 м, 5.III.2017, О.Г. Горбунов leg.



Figs 9–13. Male genitalia of *Nokonella semang* O. Gorbunov, gen.n. et sp.n. Paratype. Genitalia preparation No. OG-031-2025: 9 — tegumen-uncus complex, lateral view; 10 — tegumen-uncus complex, ventral view; 11 — valva; 12 — saccus; 13 — aedeagus. Scale bar: 0.5 mm.

Рис. 9–13. Гениталии самца *Nokonella semang* O. Gorbunov, gen.n. et sp.n. Паратип. Препарат гениталий № OG-031-2025: 9 — тегумен-ункусный комплекс, вид сбоку; 10 — тегумен-ункусный комплекс, вид снизу; 11 — вальва; 12 — саккус; 13 — эдеагус. Масштаб: 0,5 мм.

♂ / *Nokonella semang* / O.G. Gorbunov, 2026 / O.G. Gorbunov des., 2025"; "Genitalia examined / by O.G. Gorbunov / Preparation No. / OG-031-2025".

DESCRIPTION. Male (Figs 1–2). Wingspan 21.8 mm; body length 14.6 mm; forewing length 10.0 mm; length of antenna 6.4 mm.

Head: flagellum black with dark blue-violet sheen, scapus grey with bronze sheen and silvery-white scales ventrally; frons grey with bright bronze-violet sheen and silvery-white stripe laterally; vertex black with bright greenish-blue sheen; labial palpus black with dark greenish-violet sheen exterior-dorsally and white to pale lemon-yellow interior-ventrally; occipital fringe white with pale lemon-yellow scales dorsally; neck plate white to pale lemon-yellow with several black scales with bright violet sheen medially.

Thorax: patagium black with bright blue sheen and several pale lemon-yellow scales ventrally; tegula black

with dark greenish-violet sheen, few pale lemon-yellow scales both anteriorly and at base of forewing and narrow lemon-yellow interior margin; mesothorax black with dark greenish-violet sheen and several lemon-yellow scales both medially and at posterior margin; metathorax black with dark greenish-violet sheen and tuft of pale lemon-yellow hair-like scales laterally; thorax laterally black with bright violet sheen and large lemon-yellow spot medially; posteriorly, both metepimeron and metameron grey with bronze sheen, densely covered with silvery-white, long, hair-like scales.

Legs: fore coxa lemon-yellow with golden tint, black spot with bright violet sheen sub basally and black with bronze-violet sheen distal margin; fore femur and fore tibia black with bronze-violet sheen and black elongate scales with bright violet sheen at posterior margin; fore tarsus white with golden tint and black with bronze-violet sheen basal tarsomere

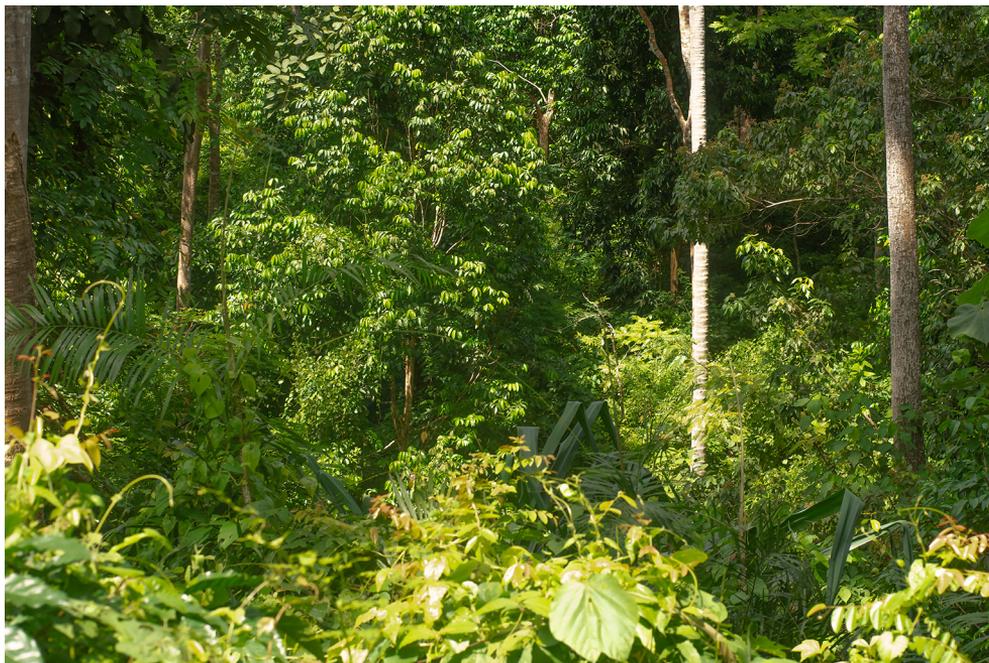


Fig. 14. Habitat of *Nokonella semang* O. Gorbunov, gen.n. et sp.n. Thailand, Yala Prov., Mueang Yala Distr., 06°28.759'N, 101°16.359'E, 156 m, 1.XI.2025.

Рис. 14. Биотоп *Nokonella semang* O. Gorbunov, gen.n. et sp.n. Таиланд, провинция Яла, район Муанг Яла, 06°28.759' с.ш., 101°16.359' в.д., 1.XI.2025.

ventrally; mid coxa black with greenish-violet sheen and several silvery-white scales interior-distally; mid femur black with bright violet sheen, lemon-yellow with golden tint anterior margin and silvery-white hair-like scales at posterior margin; mid tibia black with bright violet sheen, large longitudinal lemon-yellow spot with golden tint externally in basal half, and several lemon-yellow elongated scales distally; spurs white with golden tint; mid tarsus exterior-dorsally dark brown with bronze sheen and with small white spot with golden tint distally on three basal tarsomeres, interior-ventrally white with golden tint and with admixture of dark brown scales with bronze sheen on two distal tarsomeres; hind coxa white with golden tint interior-basally and black with bright greenish sheen exterior-distally; hind femur black with bright blue-violet sheen, white with golden tint posterior margin and silvery-white hair-like scales at posterior margin; hind tibia externally black with bright blue-violet sheen and small lemon-yellow spot both medially at base of mid spurs and distally; spurs white with golden tint; tarsus exterior-dorsally dark brown with bronze sheen and with small white spot with golden tint distally on three basal tarsomeres, interior-ventrally white with golden tint and with admixture of dark brown scales with bronze sheen on two distal tarsomeres.

Forewing dorsally with small lemon-yellow spot in basal part; costal and anal margins, CuA-stem and distal part of wing slightly distally of level of discal spot of hindwing black with dark violet sheen; cilia dark brown with dark bronze sheen; ventrally yellow with golden tint at base; costal and anal margins up to tip of level of discal spot of hindwing black with dark violet sheen; cilia brown with dark bronze sheen; external transparent areas undeveloped; anterior and posterior transparent areas long, slightly extends beyond level of discal spot of hindwing, densely covered with transparent scales with brown tint and bright electric blue-violet sheen.

Hindwing transparent; veins, discal spot and outer margin black with dark violet sheen dorsally and dark bronze-violet sheen ventrally; cilia dark brown with dark bronze sheen; outer margin narrow anally of vein CuP and broad in remaining part of wing, more broad between veins CuA₁-CuA₂.

Abdomen black with dark blue sheen; dorsally 2 and 3 each brick-red laterally; tergites 4 and 5 each completely brick-red; distal row of scales of tergites 2 and 3 laterally and tergites 4 and 5 entirely silvery-white with light violet tint; ventrally basal sternite and sternite 3 each with narrow orange stripe distally; sternites 4 and 5 each orange with round black spot with dark blue sheen medially; anal tuft black with dark blue sheen.

Male genitalia (genitalia preparation No OG-031-2025; Figs 5–9). Uncus narrow, slightly broadened medially, densely covered with long, wide scales in distal half dorsally; tegumen short; gnathos narrow, with two beak-shaped teeth and one small one between them; tuba analis with subscaphium narrowly sclerotized (Figs 5, 6); valva (Fig. 7) elongate-ovoid, densely covered with multifurcate setae in dorsal half and with row of long simple setae subventrally; medial crista low, with short setae, crista sacculi low, densely covered with strong pointed setae; saccus (Fig. 8) approximately one quarter of length of vinculum, straight, narrow, slightly forked basally; aedeagus (Fig. 9) rather narrow, slightly curved, about as long as valva, without arms distally, vesica with numerous rows of extremely minute spines.

Female. Judging by the photograph posted on the iNaturalist website, the female is somewhat robust than the male, the mesothorax dorsally has a thin lemon-yellow median stripe, the anal tuft is well-developed, dorsally with a thin lemon-yellow stripe laterally (iNaturalist, 2021a).

Female genitalia. Unknown.

INDIVIDUAL VARIABILITY. The paratype (Figs 3–4) has practically no significant differences from the holotype described above in the colouration, but it is slightly larger than the holotype. Its main sizes are: wingspan 22.8 mm; body length 14.9 mm; forewing 10.4 mm; antenna 6.9 mm.

DIFFERENTIAL DIAGNOSIS. In its appearance and the structure of the male genitalia, this beautiful new species is unique and cannot be confused with any species of clearwing moth from the Indo-Malayan region.

BIONOMICS. The larval host plant is unknown. Moths on the wings in May–June and October–November. Males came to lures with non-specific synthetic sex attractants in the first half of the day from about 10 am to 1 pm.

HABITAT. The specimens of the type series were collected in the lowland primary tropical rainforests (Fig. 10).

DISTRIBUTION. This species is currently known from southern Thailand. The type series was collected in provinces Phatthalung and Yala. In addition, iNaturalist has three images of this species (one male and two females) that I can confidently identify as *Nokonella semang* O. Gorbunov, sp.n., having been collected in provinces Phetchaburi (iNaturalist, 2021, 2025) and Nakhon Si Thammarat (iNaturalist, 2022).

ETYMOLOGY. This new species is named after the Semang people, an ethnic-minority group living in the lowlands and foothills of the primary and secondary tropical rainforests of southern Thailand and northern Peninsular Malaysia.

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