

## To the morphology of little-known *Pseudosesia lecerfi* (Hampson, 1919) (Lepidoptera: Sesiidae)

## К морфологии малоизвестного *Pseudosesia lecerfi* (Hampson, 1919) (Lepidoptera: Sesiidae)

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**КЛЮЧЕВЫЕ СЛОВА.** Lepidoptera, Paranthrenini, бабочки-стекляницы, *Pseudosesia lecerfi*, систематика, Ориентальный регион, Индонезия, Северное Малуку.

**ABSTRACT.** Males of *Pseudosesia lecerfi* (Hampson, 1919) from the northern part of the Maluku Islands, Indonesia, is described and illustrated for the first time. The data on its biotope is presented and illustrated. The larval host plant is unknown. This is the first record of the genus to the island of Halmahera.

**РЕЗЮМЕ.** Впервые приведено описание самцов *Pseudosesia lecerfi* (Hampson, 1919) с севера Малукуских островов, Индонезия. Данные о биотопе также представлены и проиллюстрированы. Это первая находка рода на острове Хальмахера.

### Introduction

As I have pointed out some times before, during a short-time trip to North Maluku, Indonesia in February–March 2017, I could collect several very interesting species of Sesiidae with the help of artificial sex attractants produced by PHEROBANK®, Wijk bij Duurstede, the Netherlands [Gorbunov, 2020a–b, 2022]. One of them was a representative of the genus *Pseudosesia* C. Felder, 1861. After a detailed study, it turned out to be *Pseudosesia lecerfi* (Hampson, 1919), the males of which were still unknown.

The genus *Pseudosesia* was established for a single species, *P. insularis* C. Felder, 1861, originated from the island of Ambon of the Maluku Islands of Indonesia [Felder, 1861]. There are currently 32 species in this genus [Kallies, 2001, 2020; Pühringer, Kallies, 2022]. It occurs through the entire Oriental and the northern part of the Australian Region from North India (Dar-

jeeling) in the north to North Australia (Queensland) in the south and from South India (Karnataka) in the west to islands of New Britain and Woodlark of Papua New Guinea in the east.

For a very long time, the genus *Pseudosesia* was considered a junior synonym of the genus *Paranthrene* Hübner, 1819, until A. Kallies returned the status of the genus to it [Kallies, 2001]. Here he gives a detailed morphological description of this genus and indicates that “The species of *Pseudosesia* show remarkable sexual dimorphism: males with typically well-developed transparent areas of the forewing, hindwing transparent except for well-developed discal spot and partly yellow bordered tergites; females typically with forewings opaque basal to the crossvein, or at least reduced transparent areas, abdomen black or with reduced yellow markings” [loc. cit.: 344]. Here I should add that males, like females, may have nearly completely opaque forewings (Figs 11–14).

In 1916–1917, F. Le Cerf described from Bacan Island, North Maluku Islands, Indonesia, *Paranthrene oberthueri* based on a single female [Le Cerf, 1916, 1917]. *Phlogothauma oberthueri* from Port Darwin, Australia, was also described in the same work. Two years later, G. Hampson synonymized the genus *Phlogothauma* Butler, 1882 with the genus *Paranthrene*, as a result of which these two taxa turned out to be secondary homonyms, and the author replaced the name *Paranthrene oberthueri* Le Cerf, 1916 with *Paranthrene lecerfi* Hampson, 1919 [Hampson, 1919].

Until now, *P. lecerfi* has been known from only one female (the holotype of *P. oberthueri*), and when collect-

ing a fairly good, but largely morphologically variable series of males, certain difficulties arose in their identification due to the remarkable sexual dimorphism of this genus. However, the general coloration of the forewing, the pattern of the arrangement of scales on the hindwing, and the habitation on one relatively small island allow me to unequivocally identify the collected males as belonging to this species.

The descriptions of specimens were made using a Leica EZ4 stereomicroscope with LED illuminations. Images of freshly collected moths and their habitat were taken with a Sony® α450 DSLR camera equipped with a Minolta® 50 f/2.8 Macro lens. The figure of the holotype of *P. lecerfi* and their labels were scanned using a Nikon® LS 2000 Cool Scan from Ektachrome® slides. The genitalia were photographed using a Keyence® BZ-9000 Biorevo Fluorescence Microscope. The processing of all illustrations was finalized with Adobe® Photoshop® 2020 software.

The material studied or mentioned herein is kept in the following collections: COGM — the collection of the A.N. Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences, Moscow, Russia; MHNP — Muséum National d'Histoire Naturelle, Paris, France.

All pictures of collected 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 №№ 0033-0034–2017). 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 № OG–055-2018) is pinned under the specimen and is listed in the archives of the author.

## Taxonomic account

### *Pseudosesia* C. Felder, 1861

“*Pseudosesia* Feld.” — Felder, 1861: 28. Type species: *Pseudosesia insularis* C. Felder, 1861, by monotypy.

= “*Conopyga* Feld.” — Felder, 1861: 27. Type species: *Conopyga metallescens* C. Felder, 1861, by monotypy. Synonymised by Kallies, 2020.

= “*Phlogothauma*, gen. nov.” — Butler, 1882: 237. Type species: *Phlogothauma scintillans* Butler, 1882, by monotypy. Synonymised by Kallies, 2020.

= “*Augangela*, n. g.” — Meyrick, 1932: 338. Type species: *Augangela xanthomias* Meyrick, 1932, by monotypy. Synonymised by Kallies, 2020.

Literature. Hampson, 1919: 100 (as a synonym of *Paranthrene*); Dalla Torre, Strand, 1925: 153 (as a synonym of *Paranthrene*); Naumann, 1971: 25; Heppner, Duckworth, 1981: 23 (as a synonym of *Paranthrene*); Fletcher, Nye 1982: 137; Eichlin, 1989: 166 (as a synonym of *Paranthrene*); Špatenka et al., 1993: 91 (as a synonym of *Paranthrene*); Špatenka et al., 1999: 106 (as a synonym of *Paranthrene*); Kallies, 2001: 343 (as a distinct genus); Kallies, 2020: 41 (as a distinct genus).

### *Pseudosesia lecerfi* (Hampson, 1919)

Figs 1–19.

“*Paranthrene lecerfi* n. n.” — Hampson, 1919: 109. New replacement name for *Paranthrene oberthueri* Le Cerf, 1916.

= “*Paranthrene Oberthüri* ♀ nov. sp.” — Le Cerf, 1916: 10, pl. CCCLXXVII, fig. 3153. Type locality: “Moluques, Batjan ...” [= Indonesia: North Maluku, Bacan Id.]. Holotype ♀ (MHNP). Junior secondary homonym of *Phlogothauma oberthueri* Le Cerf 1916.

Literature. Le Cerf, 1917: 267 (*Paranthrene Oberthüri*); Dalla Torre, Strand, 1925: 160 (*Paranthrene Lecerfi* as a synonym of *Paranthrene Oberthuri* [sic!]); Gaede, 1933: 795, pl. 94, row h (*Paranthrene lecerfi*); Heppner, Duckworth, 1981: 23 (*Paranthrene lecerfi*); Pühringer, Kallies, 2004: 21 (*Paranthrene lecerfi* as unnecessary replacement name for *Paranthrene oberthueri*); Kallies, 2020: 42 (*Pseudosesia lecerfi*); Arita et al., 2021: 31, 153, figs 325a–b (*Paranthrene oberthueri*).

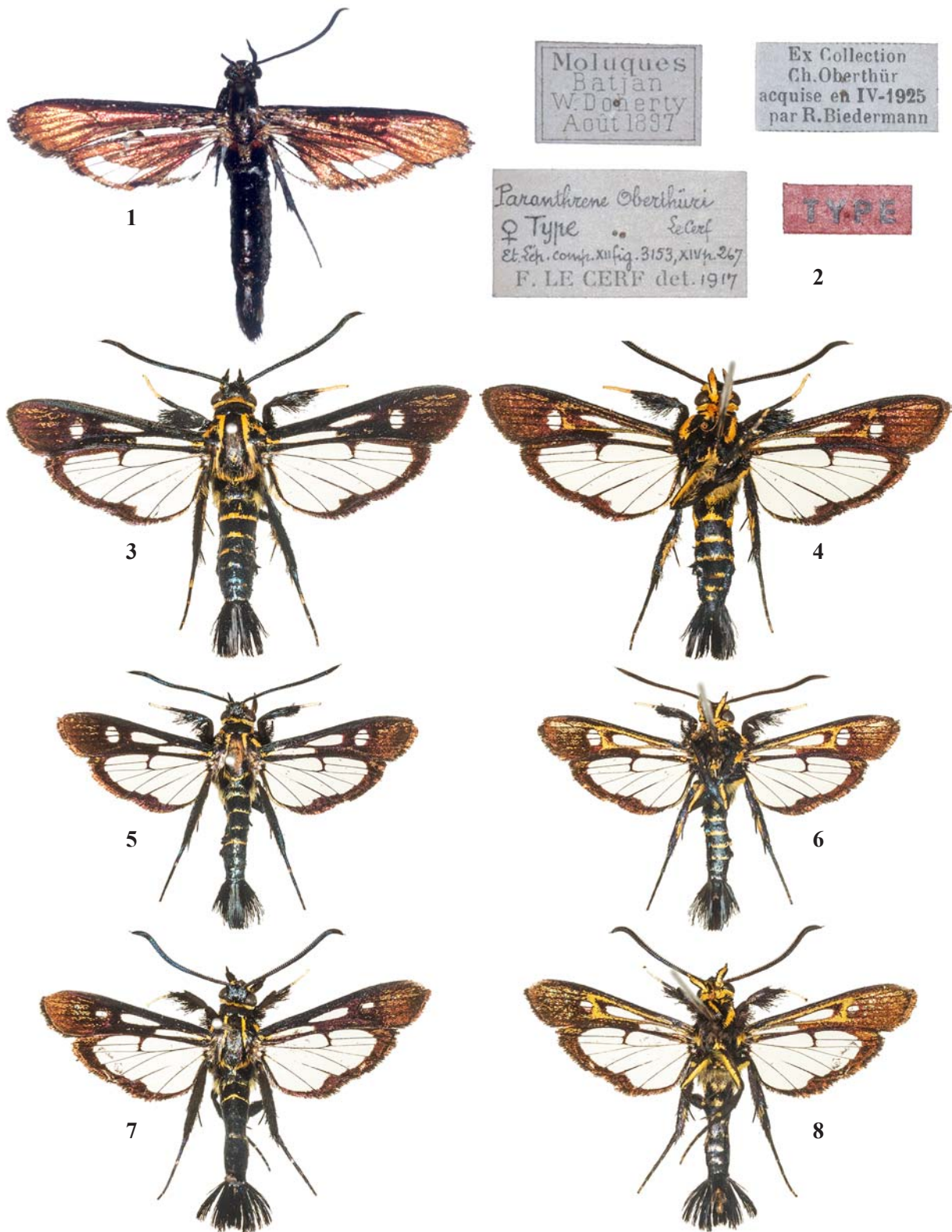
MATERIAL. 1 ♀ holotype (Fig. 1) with labels as in Fig. 2 (MHNP); 2 ♂♂, Indonesia, N Maluku, W Halmahera, 9 km NE Sidangoli, 00°56.09'N, 127°34.13' E, 120 m, 13.II.2017, O. Gorbunov leg. (Sesiidae pictures Nos 0037-0040–2017; 1 ♂ with genitalia preparation No OG–055-2018) (COGM); 3 ♂♂, with the same locality, 14.II.2017, O. Gorbunov leg. (Sesiidae pictures Nos 0031-0036–2017) (COGM); 1 ♂, Indonesia, N Maluku, E Halmahera, 18 km NE Subaim, 01°12.9'N, 128°15.3' E, 300 m, 16.II.2017, O. Gorbunov leg. (Sesiidae pictures Nos 0029-0030–2017) (COGM); 13 ♂♂, Indonesia, N Maluku, Bacan Id., Labuha, 00°39.390'S, 127°30.042'E, 118 m, 28.II.2017, O. Gorbunov leg. (Sesiidae pictures Nos 0043-0062–2017; 1 ♂ with genitalia preparation No OG–057-2018) (COGM); 14 ♂♂, Indonesia, N Maluku, Bacan Id., Labuha, 00°39.876'S, 127°30.444'E, 178 m, 01.III.2017, O. Gorbunov leg. (Sesiidae pictures Nos 0063-0084–2017; 1 ♂ with genitalia preparation No OG–056-2018) (COGM); 10 ♂♂, with the same locality, 03.III.2017, O. Gorbunov leg. (Sesiidae pictures Nos 0085-0102–2017) (COGM); 5 ♂♂, Indonesia, N Maluku, Bacan Id., Labuha, 00°36.98'S, 127°28.96'E, 30 m, 05.III.2017, O. Gorbunov leg. (Sesiidae pictures Nos 0103-0112–2017) (COGM).

DESCRIPTION. **Male** (Figs 3–4). Alar expanse 29.9 mm; body length 17.8 mm; forewing length 14.8 mm; antenna length 9.9 mm.

Head: antenna black with dark blue shine, scapus black with few yellow scales externally; frons dark brown with greenish-violet shine and a broad yellow stripe laterally; labial palpus internally completely black with dark blue shine, basal joint black basally and yellow distally, mid and apical joints yellow ventrally and black with dark blue shine dorsally, mid joints with yellow scales dorso-basally; vertex black with bright anthracitic shine; pericephalic hairs completely yellow; neck plate yellow with few black scales with dark blue shine.

Thorax: patagia black with bright blue-violet shine; tegula black with bright greenish-violet shine, narrowly yellow anteriorly, broadly yellow interiorly and with sparse yellow stripe medially; mesothorax black with greenish-violet shine with small yellow spot medially in distal third and narrowly yellow distal margin; metathorax black with greenish-violet sheen and a few yellow scales medially; thorax laterally black with bright greenish-violet shine and two large yellow spots anteriorly and at base of forewing; posteriorly, both metepimeron and metameron black with greenish shine, densely covered with yellow hair-like scales.

Legs: fore coxa black with dark blue shine, narrowly yellow basally and broadly yellow externally and distally; fore femur completely black with bright blue-violet shine; fore tibia with tuft of elongated scales posteriorly, completely black with bright greenish-violet shine; basal fore tarsomere completely black with bright blue-violet shine, remaining tarsomeres completely yellow; mid coxa black with greenish-violet shine and narrowly yellow both internally and distally; mid femur black with bright blue-violet shine and narrow



Figs 1–8. Variability of *P. lecerfi*: 1 — ♀, holotype, alar expanse 37.0 mm; 2 — ditto, labels; 3–4 — ♂, alar expanse 29.9 mm, Sesiidae picture Nos 0041-0042–2017; 5–6 — ♂, alar expanse 23.2 mm, Sesiidae picture Nos 0029-0030–2017; 7–8 — ♂, alar expanse 25.0 mm, Sesiidae picture Nos 0033-0034–2017. 3, 5, 7 — dorsal view; 4, 6, 8 — ventral view.

Рис. 1–8. Изменчивость *P. lecerfi*: 1 — ♀, голотип, размах крыльев 37,0 мм; 2 — то же, этикетки; 3–4 — ♂, размах крыльев 29,9 мм, Sesiidae снимки №№ 0041-0042–2017; 5–6 — ♂, размах крыльев 23,2 мм, Sesiidae снимки №№ 0029-0030–2017; 7–8 — ♂, размах крыльев 25,0 мм, Sesiidae снимки №№ 0033-0034–2017; 3, 5, 7 — сверху; 4, 6, 8 — снизу.

yellow posterior margin; mid tibia black with bright greenish-violet shine and few yellow scales exterior-medially, spurs entirely black with greenish shine; basal mid tarsomere black with bright greenish-violet shine and small yellow spot posterior-dorsally, tarsomeres 2–4 each black with greenish shine and narrow yellow ring distally, distal tarsomere yellow with a few black scales dorsally; hind coxa black with greenish shine; hind femur black with bright blue-violet shine and narrow but slightly broadened distally yellow posterior margin; hind tibia black with bright blue-violet shine and admixture of yellow scales interior-medially, spurs black externally and pale yellow internally; hind basal tarsomere black with

bright greenish-violet shine and small yellow spot posterior-dorsally, remaining tarsomeres black with greenish shine and small yellow spot posterior-dorsally.

Forewing: dorsally with narrow short yellow stripe between CuA-stem and vein 1A; costal margin black with dark dark greenish shine; remaining opaque surface black with dark bronze-violet shine and admixture of individual yellow scales between veins  $R_3$ – $M_2$  and CuA-stem and 1A; ventrally costal margin dark brown to black with dark violet shine, anal margin narrowly yellow; remaining opaque surface dark brown with bronze-violet shine and with more dense admixture of yellow scales; transparent areas poorly developed: anterior



Figs 9–14. Variability of *P. lecerfi*: 9–10 — ♂, alar expanse 27.1 mm, Sesiidae picture Nos 0051-0052–2017; 11–12 — ♂, alar expanse 27.5 mm, Sesiidae picture Nos 0063-0064–2017; 13–14 — ♂, alar expanse 28.5 mm, Sesiidae picture Nos 0071-0072–2017. 9, 11, 13 — dorsal view; 10, 12, 14 — ventral view.

Рис. 9–14. Изменчивость *P. lecerfi*: 9–10 — ♂, размах крыльев 27,1 мм, Sesiidae снимки №№ 0051-0052–2017; 11–12 — ♂, размах крыльев 27,5 мм, Sesiidae снимки №№ 0063-0064–2017; 13–14 — ♂, размах крыльев 28,5 мм, Sesiidae снимки №№ 0071-0072–2017. 9, 11, 13 — сверху; 10, 12, 14 — снизу.

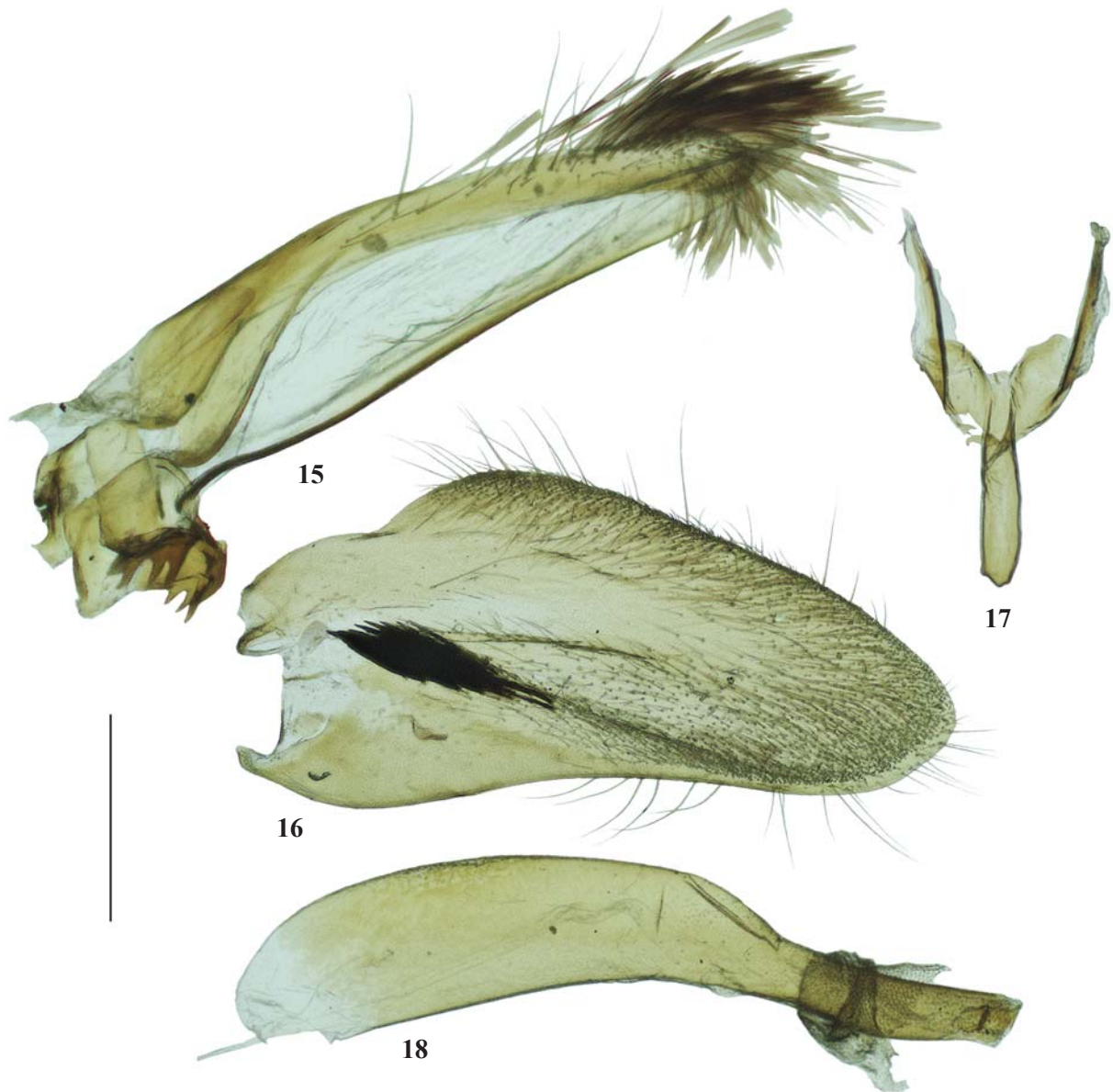
transparent area small, elongated-oval, posterior transparent area small, not reaching level of discal spot of hindwing, exterior transparent area small, oval, divided into three cells between veins  $M_1$ – $CuA_1$ ; cilia dark brown with bronze-violet shine.

Hindwing transparent; veins, discal spot, surface between veins R and  $M_1$  and outer margin black with dark violet shine dorsally and bronze-violet shine ventrally; discal spot cuneiform, reaching base of vein  $M_3$ ; outer margin broad, about as broad as length of cilia, but somewhat broader between veins CuP and 1A costally; cilia dark brown with dark violet shine and yellow anally.

Abdomen dorsally black with bright bronze-violet shine; tergites 1–4 each with narrow yellow stripe distally, tergites 5–7 each with few yellow scales distally; ventrally abdomen violet shine, sternite 1+2 with admixture of yellow scales; all

sternites with narrow yellow stripe distally; anal tuft well-developed, black with dark violet shine dorsally and greenish shine ventrally.

**Male genitalia** (paratype) (genital preparation No OG–055–2018) (Figs 15–18). Uncus long, narrow, slightly broadened and rounded distally, with simple setae and scales in distal half dorsally; tegumen short; gnathos narrow, with three thin sharp teeth laterally; tuba analis with subscaphium narrowly sclerotized (Fig. 15); valva (Fig. 16) semi-oval, covered with simple short and few long setae; medial crista low, with few simple soft setae; crista sacculi low and narrow, covered with strong simple setae; saccus (Fig. 17) about as long as vinculum, narrow, somewhat rounded basally; aedeagus (Fig. 18) rather broad, slightly longer than length of valva, distally distinctly narrowed and not armed; vesica with numerous minute cornuti.



Figs 15–18. Male genitalia of *P. lecerfi*. Genital preparation No OG–055–2018: 15 — tegumen-uncus complex; 16 — valva; 17 — saccus; 18 — aedeagus. Scale bar: 0.5 mm.

Рис. 15–18. Гениталии самца *P. lecerfi*. Препарат гениталий № OG–055–2018: 15 — тегумен-ункусный комплекс; 16 — вальва; 17 — саккус; 18 — эдеагус. Масштаб 0,5 мм.

**Female** (Fig. 1). A fairly complete morphological description of the appearance, as well as a depiction of the holotype, is given in Le Cerf [1916, 1917]. The female genitalia remain unexplored.

**INDIVIDUAL VARIABILITY** (Figs 3–14). Unknown for females, but males are quite variable. The variation in the number of yellow scales on the thorax, legs, abdomen and forewing is very noticeable. So, there is a specimen in which thin yellow rings are present only on the first two segments of the abdomen (Figs 7, 8), and there are specimens with such rings on all segments of the abdomen (Figs 11, 12). In addition, the transparent areas of the forewing are highly variable, especially the anterior and exterior one from fairly well developed (Figs 3, 5) to completely undeveloped (Figs 11, 13). Moreover, this species is quite variable in individual sizes: alar expanse 21.0–30.3 mm; body length 13.2–19.8 mm; forewing length 9.5–13.5 mm; antenna length 6.6–9.8 mm.

**DIFFERENTIAL DIAGNOSIS.** By the bronze shine of the opaque parts of the wings, the female of this species is somewhat similar to *P. meeki* (Druce, 1898) (type locality: “Trobriand Islands, Kiriwini...” [= Papua New Guinea: Trobriand Islands, Kiriwina Island]) and *P. scintillans* Butler, 1882 (type locality: “New Britain.” [= Papua New Guinea: Bismark Archipelago, New Britain Island]), from which it can be distinguished by opaque cell between veins CuP and 1A of the hindwing (cp. Fig. 1 in this article with fig. 110 in Kallies, 2020: 44 and fig. 168a in Arita et al., 2021: 104). From all other known *Pseudosesia* females, the female of *P. lecerfi* clearly differs in the colouration of the opaque parts of the wings and opaque cell between veins CuP and 1A of the hindwing. The

males of *P. lecerfi* are easily distinguished from all congeners by the structure of the transparent areas of the forewing.

**BIONOMICS.** The larval host plant is unknown. The males were collected from mid-February to early March with help of unspecific artificial sex pheromones.

**HABITAT.** Both on Bacan Island and on Halmahera Island, the males were collected in close proximity to small rivers in the so-called “Halmahera rain forest” (Fig. 19).

**DISTRIBUTION.** This species was collected at two sites on Halmahera Island and three localities on Bacan Island, North Maluku, Indonesia. Unfortunately, the exact type locality on Bacan Island is not known. The indication for Halmahera Island should be considered the first indication of the genus *Pseudosesia* for the island.

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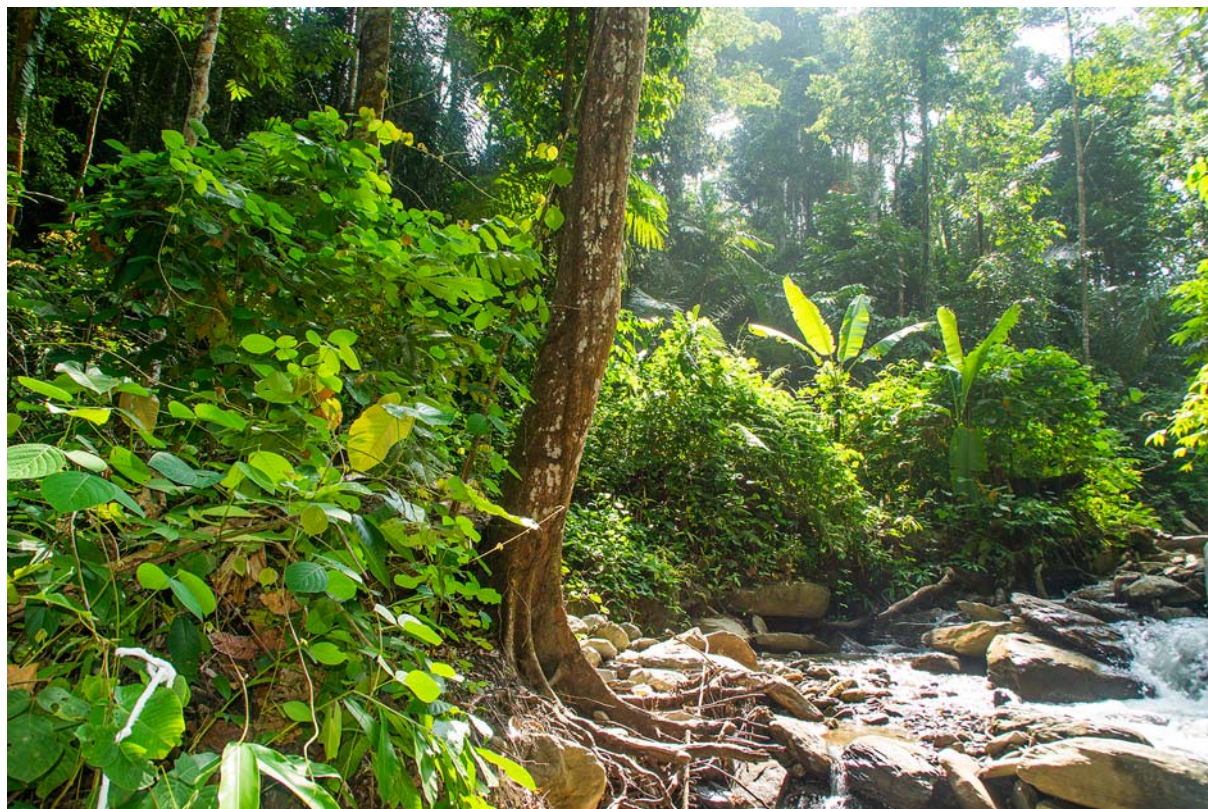


Fig. 19. Habitat of *P. lecerfi*. Indonesia, North Maluku, Bacan Id., Labuha, 00°39.390' S, 127°30.042' E, 118 m, 28.II.2017. Photo by O. Gorbunov.

Рис. 19. Биотоп *P. lecerfi*. Индонезия, Северное Малуку, остров Бачан, Лабуха, 00°39.390' ю.ш., 127°30.042' в.д., 118 м, 28.II.2017. Фото О. Горбунова.

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