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RESEARCH ARTICLE

A new species of the genus *Bembecia* Hübner, 1819 (Lepidoptera, Sesiidae) from Omsk Region of Russia (West Siberia)

Svyatoslav A. Knyazev[1]

1 *Altai State University, 61 Lenina St., Barnaul, 656049, Russia*

Corresponding author: Svyatoslav A. Knyazev (konungomsk@yandex.ru)

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Abstract

A new species, *Bembecia lavrovi* Knyazev, **sp. n.** from Omsk Region of Russia in West Siberia, is described based on a series of 80 specimens. A detailed description of the external characteristics of the male and female, as well as the structure of the male genitalia, is provided. The new species is close to *Bembecia sareptana* (Bartel, 1912) and *Bembecia aktashica* O. Gorbunov 2018 but is distinguished by its large size, more contrasting and bright coloring, details of the wing pattern and the structure of the genitals.

Keywords

Lepidoptera, biodiversity, clearwing moths, new species, West Siberia, steppe

Introduction

The genus *Bembecia* Hübner, 1819 consists of more than 110 described species (Gorbunov 2018; 2019; 2020; 2024). The fauna of this genus in Russia includes 19 species according to the last edition of Catalogue of Lepidoptera of Russia (Gorbunov 2019) and some additions published later (Gorbunov 2024). In the catalog of Lepidoptera of the Omsk region (Knyazev 2020), one species from the genus *Bembecia* is mentioned. It was mentioned as *Bembecia* sp. since there is no final

determination yet. Another species was published in the electronic atlas of Lepidoptera of the Omsk region (Knyazev 2024) as *Bembecia* ?*strandi* (W. Kozhantschikov, 1936) according to the preliminary determination before the revision of the types of Siberian *Bembecia* Hübner, 1819. During the studies of the Lepidoptera fauna in the steppes of the south of the Omsk region, in different localities we collected a large series of specimens of the genus *Bembecia*, some of which do not belong to any of the known species. Having studied the morphological features of a series of collected specimens previously attributed by us to *B.* ?*strandi* and compared them with the known species, the author decided to describe a new species.

Materials and methods

All material processed within the framework of this article was collected on the territory of the Omsk region in 2020–2024 by author and colleagues. Males of Sesiidae were attracted to pheromones (Pherobank) and caught flying near dispensers with air butterfly net. The female was found sitting on dry last year's grass.

All labels of type specimens are cited verbatim. Geographical data labels printed on the white paper, type labels are printed on the red paper. Each label of the holotype specimen separated by semicolon ";" and the lines in the labels are separated by slash symbol "/".

The photos were made using a Canon EOS 5D Mark II camera with a Canon EF-100mm macro lens. The images of the genitals were obtained using various devices: a Canon EOS 5D Mark II camera with a Canon MP-E 65 f2.8 lens, as well as an AmScope binocular microscope with RS-500C portable camera.

The holotype and five paratypes (all ♂♂) are kept in the collection of Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia (ZISP); one paratype (♂) is stored in collection of the Institute of Systematics and Ecology of Animals, Novosibirsk, Russia (ISEA); the remaining paratypes are stored in the collection of the S.A. Knyazev, Omsk, Russia (CSKO) and in collection of K.B. Ponomarev (CKPO).

Results

***Bembecia lavrovi* sp. n.**
http://zoobank.org/20C845F3-3739-4681-9A59-406C29DFEB71
Figs 1–12, 14

Material. Holotype ♂ (Figs 1–2), with labels: "Russia, Omsk Region, / Russko-Polyansky district, / 2 km SE of Buzan village, / 53°54′46.46″N 73°57′51.32″E, / 1.VII.2024, / S.A. Knyazev leg."; "HOLOTYPUS ♂ / *Bembecia lavrovi* / S. Knyazev, 2025 / S. Knyazev des., 2025" (ZISP).

Paratypes (78♂♂, 1♀): 13♂♂ with same locality and date as for holotype, S.A. Knyazev leg. (ZISP, CSKO, ISEA); 4♂♂ with same locality, 12.VI.2020, pheromones, S.A. Knyazev leg. (CSKO); 2♂♂ with same locality, 20.VII.2020, pheromones, S.A. Knyazev leg. (CSKO); 2♂♂ with same locality, 16-17.VI.2023, pheromones, S.A. Knyazev leg. (CSKO); 1♂ with same locality, 17.VI.2023, pheromones, S.A. Knyazev leg. (CSKO); 10♂♂, same locality, 20–21.VI.2024, S.A. Knyazev leg. (CSKO); 11♂♂, 1♀, same locality, 25–26.VI.2024, S.A. Knyazev leg. (CSKO); 9♂♂, same locality, 23.VI.2024, K.B. Ponomarev leg. (CKPO); 23♂♂, same locality, 29.VI.2024, K.B. Ponomarev leg. (CKPO); 3♂♂, RUSSIA, Omsk Region, Cherlacksky district, 4 km S of Krasnyi Oktyabr` village, 54.095322, 74.996405, 29–30.VI.2024, S.A. Knyazev leg (CSKO).

Description. Male. (holotype) (Figs 1–2). Alar expanse (wingspan) 25 mm; forewing length 11 mm; body length 10 mm; antenna length 7 mm.

Head: antenna black with blue sheen; scapus, frons and palpomeres black with black hair-like scales; neck-plate light gray.

Thorax: all parts are black with blue-greenish sheen covered with light brown hairs.

Legs: fore coxa black covered with light hairy-like scales; fore femur black with black and orange hairy-like scales; fore tibia black with orange hairy-like scales. Mid coxa black covered with black hairy-like scales; mid femur black with blue-green sheen and covered with orange hairy-like scales in medial part; mid tibia black with mixed black and orange hairy-like scales; spurs black with orange scales; mid tarsus black with orange hairy-like scales; hind coxa black; hind femur totally covered with orange hairy-like scales; hind tibia and tarsus black with an admixture of orange scales; spurs black with orange scales.

Forewing: dorsally with basal black part with green sheen; costal margin, outer margin and the most part of the discal spot black with greenish sheen and with an admixture of rare orange scales; Cu-stem, external part of discal spot, all veins in the external transparent area and the anal margin are orange; apical area orange; transparent areas covered with translucent scales with golden hue; fringe brown; ventrally the costal margin with a generous coating of yellow scales.

Hindwing transparent; dorsally veins orange in basal part, the outer part is covered with brown scales; discal spot small, covered mostly with brown scales with an admixture of orange scales; outer margin narrow, brown; fringe brown; ventrally discal spot completely covered in orange scales.

Abdomen: dorsally black with green-blue sheen; tergites 2, 6, 7 each with narrow yellow stripe; tergite 4 with a wider yellow stripe; ventrally black with green-blue sheen; sternite 4 with narrow but broadened laterally yellow stripe; sternites 2, 5, 7 with few yellow scales laterodistally; anal tuft dorsally black with green-blue sheen medially and orange scales laterally; ventrally colored the same as dorsally.

Male genitalia (paratype, Figs 9–12). Tegumen-uncus complex broad, triangular in shape; scopula androconialis well developed, about 0.56 times as long as tegument-uncus complex (Fig. 9); valva (Fig. 10) elongated, wide trapezoidal in

shape, with a slightly concave external edge; crista sacculi complex well developed, densely covered with setae; saccus (Fig. 11) narrow, long, about 0,7 times as long as vinculum; aedeagus (Fig. 12) narrow, about 1,0 times as long as valva; vesica with numerous small cornuti.

Female (paratype, figs 7–8). Alar expanse 26 mm; forewing length 12 mm; body length 12 mm; antenna length 7.5 mm.

Head: antenna black with blue sheen; scapus, frons and palpomeres black with black and orange hair-like scales; labial palpus with black and orange scales; neck-plate dark brown.

Thorax: all parts are black with blue sheen covered with light brown hairs.

Legs: fore coxa black covered with light hairy-like scales; fore femur black with black and orange hairy-like scales; fore tibia black dorsally and yellow ventrally. Mid coxa black covered with black hairy-like scales; mid femur black with blue-green sheen and covered with orange hairy-like scales in medial part; mid tibia black with mixed black and orange hairy-like scales; spurs black with orange scales; mid tarsus black with orange hairy-like scales; hind coxa black; hind femur totally covered with orange hairy-like scales; hind tibia and tarsus black with an admixture of orange scales; spurs black with orange scales.

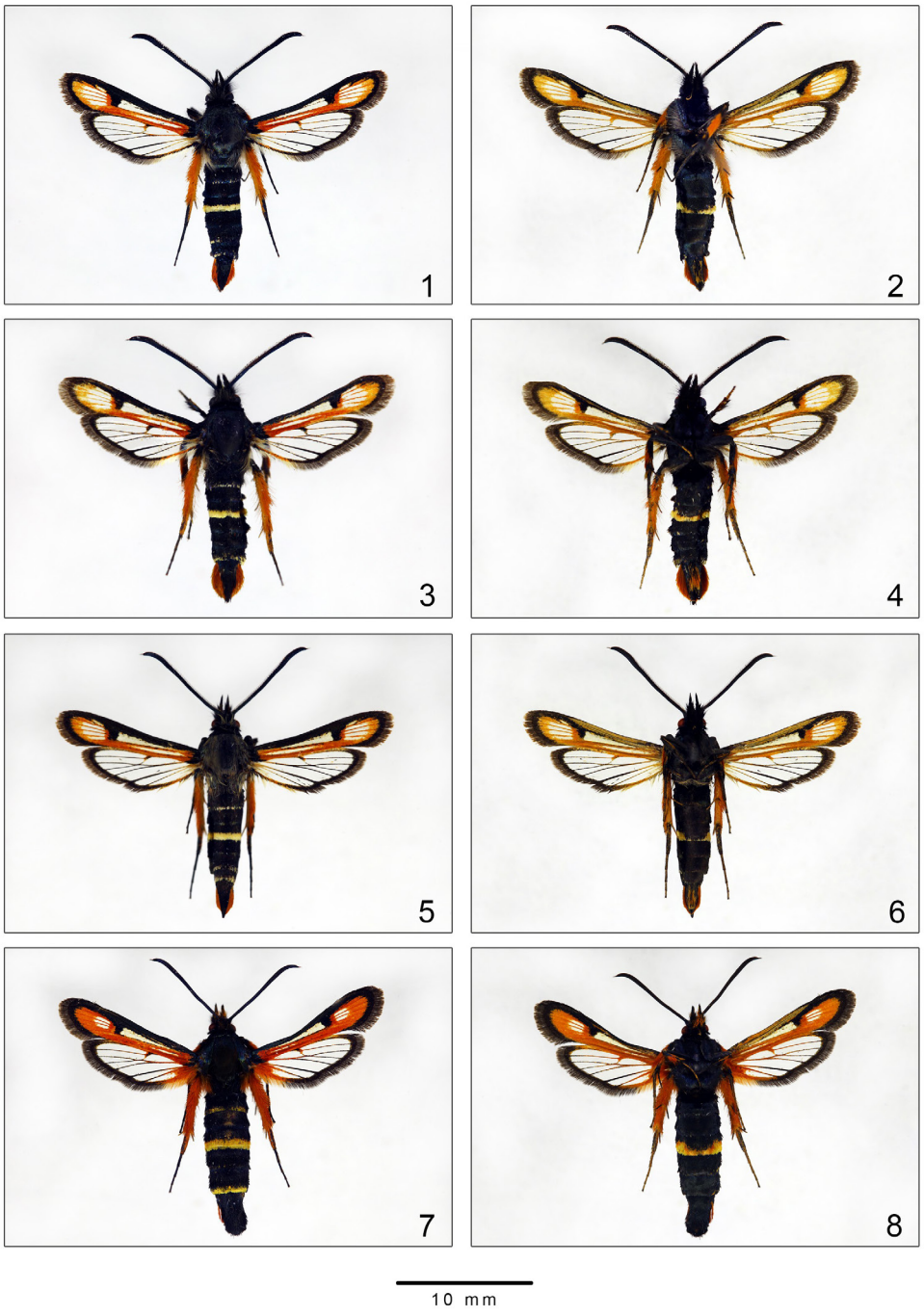
Forewing: dorsally with basal black part with blue-green sheen; costal margin, outer margin and the most part of the discal spot black with greenish sheen and with an admixture of a small number of orange scales; Cu-stem, external part of discal spot, all veins in the external transparent area and the anal margin are orange with rare black scales; apical area orange; transparent areas covered with translucent scales with golden hue; fringe brownish-grey; ventrally the costal margin with a generous coating of yellow scales.

Hindwing transparent; dorsally veins orange in basal part, the outer part is covered with brownish-black scales; discal spot small, covered mostly with black scales with an admixture of orange scales; outer margin narrow, greyish-brown with the small number of orange scales; the anal angle is richly covered with orange scales; fringe grey around the entire perimeter of the wing except the anal angle where it is orange; ventrally discal spot completely covered in orange scales.

Abdomen: dorsally black; tergites 2, 7 each with narrow yellow stripe; tergite 4 with a wider yellow stripe; tergites 3, 5, 6 with the smell number of yellow scales; ventrally black with green-blue sheen; sternite 4 with narrow but broadened laterally yellow stripe; sternites 2, 5, 6 with few yellow scales laterodistally; anal tuft dorsally black with blue sheen medially and orange scales laterally; ventrally colored the same as dorsally.

Female genitalia. Not studied.

Individual variability. In general, the species is quite slightly variable. Sometimes males (Figs 3–6) may have weakly expressed yellow stripes on tergites 2, 6 and 7, but the stripe on tergite 4 is always well expressed. There is also slight variability in size: the wingspan of males varies from 23 to 25 mm; body length varies from 9 to 11 mm.



Figures 1–8. Type specimens of *Bembecia lavrovi* Knyazev **sp.n.**: **1–2** – holotype, ♂; **3–6** – paratypes, ♂♂; **7–8** – paratype, ♀. **1**, **3**, **5**, **7** – dorsal view; **2**, **4**, **6**, **8** – ventral view.

Figures 9–12. Male genitalia of *Bembecia lavrovi* Knyazev **sp.n.**: **9** – tegument-uncus complex; **10** – valva; **11** – saccus; **12** – aedeagus.

Differential diagnosis. The new species looks like *B. sareptana* (Bartel, 1912) (type locality: Russia, Volgograd, Sarepta) and *B. aktashica* O. Gorbunov, 2018 (type locality: Russia, Altai Mts.) but it differs from them both in external features and in the structure of the genitals. *B. sareptana* (Bartel 1912) was described by the single female in the Genus *Dipsosphecia* Spuler, 1910 and illustrated as in original description also later in (Gorbunov 2018). The males of the new species differs from B. sareptana in its bigger size: Alar expanse 23–25 mm for *B. lavrovi* **sp. n.** versus 21–22 mm for *B. sareptana*. Good differences in the wing pattern also visible: the apical orange area is narrow and parallel to the outer margin of the forewing in *B. sareptana*, whereas it is very broad and rounded toward the costal margin in *B. lavrovi* **sp. n.** The apical and medial transparent areas are well defined in *B. sareptana*, but less so in *B. lavrovi* **sp. n.** The yellow stripes on the abdomen are wider and more pronounced in *B. sareptana*, while in *B. lavrovi* **sp. n.** they are significantly narrower and may be almost not pronounced. The anal tuft is also clearly distinguishable: it consists of black scales in the central part and orange ones on lateral parts in *B. lavrovi* **sp. n.**, while in *B. sareptana* it consists of yellow or orange scales in the central part and black ones on the lateral parts. The new species differs from *B. aktashika* in the shape of the valva and the structure of the tegumen-uncus complex; also good differences of the new species from *B. sareptana* in the shape of the valva and in the structure of the saccus.

The new species also differs from *B. aktashika* which is illustrated in (Gorbunov 2018) by its larger size: Alar expanse 23–25 mm for the males of *B. lavrovi* **sp. n.** versus 16–23.8 mm in *B. aktashica*. The wing pattern of the new species differs

well from that of *B. aktashika* with well-defined transparent zones, a clear and wide apical orange area, and a well-defined wide yellow stripe on the 4th abdominal segment.

Habitat. The new species inhabits dry and mixed-grass steppes (Fig. 13) on saline soils with the presence of different species of *Astragalus* spp. (Fabaceae).

Figure 13. Habitat of *Bembecia lavrovi* Knyazev **sp.n.**: steppe in the vicinity of Buzan village, Russko-Polyansky district of Omsk Region, 1.07.2024, photo by S.A. Knyazev.

Figure 14. Male of *Bembecia lavrovi* Knyazev **sp.n.** in nature: vicinity of Buzan village, Russko-Polyansky district of Omsk Region, 18.06.2023, photo by S.A. Knyazev.

Distribution. The new species is distributed in several localities on the South of Omsk Region, near the border with Kazakhstan Republic.

Ethymology. The new species is named in honor of Sergei Dmitrievich Lavrov (1874–1951), a professor of Zoological Department of the Siberian Institute of Agriculture and Forestry (Omsk State Agrarian University at this moment), a member of Siberian Branch of the Russian Geographical Society and one of the first researchers of the Lepidoptera fauna of Siberia, who published the first list of Lepidoptera of the Omsk region (Lavrov 1927), including several species of clearwing moths.

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References

Bartel M (1912) 24. Familie: Aegeriidae (Sesiidae). In: Seitz A (Hrsg.) (1909–1914): Die Gross-Schmetterlinge der Erde 2: I–VII, 1-479, pl. 1–56 [hier: 375–416]. Stuttgart (Fritz Lehmann).

Gorbunov OG (2018) New data on the clearwing moth fauna of the Altai Mountains, Russia, with the description of two new species (Lepidoptera, Sesiidae). Zootaxa 4425(2): 263–282. https://doi.org/10.11646/zootaxa.4425.2.4

Gorbunov OG (2019) Sesiidae. In: Sinev SY (Ed.) Catalogue of the Lepidoptera of Russia. Second Edition. Zoological Institute RAS, St.Petersburg, 158–161. [In Russian]

Gorbunov OG (2020) A new and poorly known clearwing moth of the genus *Bembecia* Hübner, 1819 ["1816"] from the European part of Russia and northwestern Kazakhstan (Lepidoptera: Sesiidae). Zootaxa 4729(4): 551–565. https://doi.org/10.11646/zootaxa.4729.4.6

Gorbunov OG (2024) A new species of the genus *Bembecia* Hübner, 1819 (Lepidoptera, Sesiidae) from the Volga Region. Russian Entomological Journal 33(3): 387–396.

Knyazev SA (2020) Catalogue of Lepidoptera of Omsk Oblast (Russia). Macrolepidoptera. Families: Hepialidae, Brachodidae, Cossidae, Sesiidae, Limacodidae, Zygaenidae, Thyrididae, Drepanidae, Uraniidae, Geometridae, Lasiocampidae, Lemoniidae, Endromididae, Saturniidae, Sphingidae, Notodontidae, Lymantriidae, Arctiidae, Syntomidae, Er-

ebidae, Nolidae, Noctuidae, Hesperiidae, Papilionidae, Pieridae, Lycaenidae, Nymphalidae, Satyridae. Acta Biologica Sibirica 6: 139–226. https://doi.org/10.3897/abs.6.e53005

Knyazev (2024) Lepidoptera of Omsk Region: illustrated catalogue and online database. Available from https://omflies.ru (accessed 1.12.2024).

Lavrov SD (1927) Contributions of the study of the insect fauna in the environs of Omsk. Trudy Sibirskogo Instituta Sel`skogo Khozyaistva i Lesovodstva 8(3): 51–99. [In Russian]