

A new species of the genus *Bembecia* Hübner, 1819 (Lepidoptera: Sesiidae) from the Volga region

Новый вид рода *Bembecia* Hübner, 1819 (Lepidoptera: Sesiidae) с Поволжья

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KEY WORDS. Sesiidae, Synanthedonini, clearwing moths, new species, Palaearctic Region, Russia.
КЛЮЧЕВЫЕ СЛОВА. Sesiidae, Synanthedonini, бабочки-стекляницы, новый вид, Палеарктика, Россия.

ABSTRACT. A new species, *Bembecia* (*Opacosphesia*) *eversmanni* O. Gorbunov, **sp.n.** from the Volga region in the European part of the Russian Federation, is described. This new species is very close to *B. (Opacosphesia) puella* Z. Laštůvka, 1989, and *B. (Opacosphesia) megillaeformis* (Hübner, 1813), but is distinguished by a noticeably paler coloration and smaller size. In addition, the new species is clearly distinguished from *B. (Opacosphesia) megillaeformis* by the structure and coloration of the apical area of the forewing. Larvae of the new species are oligophagous on several species of the genus *Astragalus* (Fabaceae). It is shown that neither the common host plant of the larvae nor external morphology can serve as reliable characters determining the generic affiliation of a taxon in such a complex group as the mimetic family Sesiidae. It is obvious that one of the most important features of generic taxonomy should be considered the morphological structure of the genitalia of both males and females, although sometimes there are incidents, such as with the description in the genus *Synanthedon* of the species *rubrocingulata*, which is a representative of the genus *Bembecia*, *Bembecia rubrocingulata* (Toševski, 2011), **comb.n.**

РЕЗЮМЕ. Приведено описание нового вида, *Bembecia* (*Opacosphesia*) *eversmanni* O. Gorbunov, **sp.n.** из Поволжья в Европейской части Российской Федерации. Этот новый вид очень близок к *B. (Opacosphesia) puella* Z. Laštůvka, 1989 и *B. (Opacosphesia) megillaeformis* (Hübner, 1813), но отличается заметно более бледной окраской и меньшим размером. Кроме этого, новый вид хорошо отличается от *B. (Opacosphesia) megillaeformis* строением и окраской апикального поля переднего крыла. Гусеницы нового вида являются олигофагами на

нескольких видах рода *Astragalus* (Fabaceae). Показано, что ни общее кормовое растение гусениц, ни внешняя морфология не могут служить надёжными признаками определяющими родовую принадлежность таксона в столь сложной группе, каковой является миметическое семейство Sesiidae. Очевидно, что одним из важнейших признаков родовой систематики следует считать морфологическую структуру гениталий как самцов, так и самок, хотя иногда случаются казусы, как, например, с описанием в роде *Synanthedon* вида *rubrocingulata*, который является представителем рода *Bembecia*, *Bembecia rubrocingulata* (Toševski, 2011), **comb.n.**

Introduction

As I have written few times, the clearwing moth fauna of Russia, despite an available species list in the “Catalogue of the Lepidoptera of Russia” [Gorbunov, 2008, 2019a, 2024a], has been studied very fragmentarily. Only a few regions of the Russian Federation can be characterized as relatively well-explored. The faunas of the Moscow and Tula regions [Gorbunov, Bolshakov, 2007; Bolshakov *et al.*, 2008] the Far East [Gorbunov, Tshistjakov, 1995, 1999; Tshistjakov, 2016; Gorbunov, 2022; Gorbunov, Koshkin, 2023], and the Crimean Peninsula [Efetov *et al.*, 2012; Gorbunov, Efetov, 2016, 2018, 2024; Gorbunov, 2019a, c–d, 2024b; Efetov, Gorbunov, 2021; Savchuk, 2024] can be quoted as examples.

The genus *Bembecia* Hübner, 1819 currently consists of 108 species [Gorbunov *et al.*, 2017; Gorbunov, 2019b, 2020, 2023a–b; Pühringer, Kallies, 2024]. This number, in my opinion, is far from final and in the future we should expect the emergence of new descriptions, especially from such Sesiidae-rich regions as the

North Caucasus, Iran, the republics of Central Asia and Western China.

Here, it seems to me, it is appropriate to make a remark about the taxonomic structure of the genus *Bembecia*. If you look closely at the representatives of the genus, the only feature that unites them into one taxon of the generic level is that all currently known host plants of larvae belong to the legume family. But, of course, this cannot be a sufficient condition for unification into one taxon. Moreover, among clearwing moths we have many examples when species from different taxa of the generic or even higher level have host plants of larvae of the same family or even genus. Some examples: species of the genera *Pennisetia* Dehne, 1850, and *Paranthrenella* Strand, 1916, feed on *Rubus* (Rosaceae), species of the genera *Sesia* Fabricius, 1775, and *Paranthrene* Hübner, 1819, feed on *Salix* and *Populus* (Salicaceae), species of the genera *Melittia* Hübner, 1819, *Neosphecia* Le Cerf 1916, *Macroscylesia* Hampson, 1919, and *Eichlinia* O. Gorbunov, 2020, feed on Cucurbitaceae, etc. Besides, I am sure that also appearance cannot be the main criterion for classifying such a complex group as the mimetic family Sesiidae in general and the genus *Bembecia* in particular. Perhaps the only and most accessible feature for the generic classification of Sesiidae remains the structure of both male and female genitalia, although it is sometimes interpreted inadequately. One example of this is the relatively recent description of the taxon *rubrocingulata* Toševski, 2011, in the genus *Synanthedon*, while the structure of the male genitalia [Toševski, 2011] indicates that it belongs to the genus *Bembecia*, *Bembecia rubrocingulata* (Toševski, 2011), **comb.n.**

All species of the genus *Bembecia* for which at least male genitalia are known can be grouped fairly easily. Some of these groups have genus-level names, such as *Scalarignathia* Căpușe, 1973, *Opacosphecia* Căpușe, 1973, *Pseudosphecia* Căpușe, 1973, *Ductispina* Căpușe, 1973, and *Paradipsosphecia* Căpușe, 1973 [Căpușe 1973a, b]. The use of these names to distinguish taxa of subgeneric rank, as was done in the review of the genus of the Crimean Peninsula [Gorbunov, Efetov, 2018], is not entirely successful, since *B. scopigera* (Scopoli, 1763) and *B. uroceriformis* (Treitschke, 1834) obviously do not correspond to the characteristics of the nominotypical subgenus. I think that our knowledge of the Palaearctic taxa of the family has reached such a level that a complete revision of the generic classification is necessary.

In the second edition of the “Catalogue of the Lepidoptera of Russia” [Gorbunov, 2019a] two species of the genus *Bembecia*, namely, *B. pallasi* O. Gorbunov, 2018 and *B. eversmanni* O. Gorbunov, 2018 were noted without any descriptions [Gorbunov, 2019a: 160]. Unfortunately, due to circumstances beyond my control, these two names were not published in the indicated year. Therefore, in accordance with Art. 13.1 ICZN [1999] the names *B. pallasi* O. Gorbunov, 2018 and *B. eversmanni* O. Gorbunov, 2018 should be considered as nomina nuda.

Subsequently, the first of the mentioned species was published in 2020 [Gorbunov, 2020], and the second

one, unfortunately, was not published at all. With this publication, I am correcting this situation.

Material and methods

The description is made using a Leica EZ4 stereomicroscope with LED illuminations, and images is taken with a Sony® α450 DSLR camera equipped with a Minolta® 50 f/2.8 Macro lens. The figures of the genitalia are taken with a Keyence® BZ-9000 Bioevo Fluorescence Microscope. The processing of all illustrations is finalized with the Adobe® Photoshop® CC 2020 software.

All labels of the holotype 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 0443–0444–2019). 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-056-1996) is pinned under the specimen and is listed in the archives of the author.

The material studied or mentioned herein is kept in the collection of the A.N. Severtsov Institute of Ecology and Evolution of the Russian Academy of Sciences, Moscow, Russia (COGM).

The names of plants were verified with the WFO [2024].

Taxonomic account

Bembecia (*Opacosphecia*) *eversmanni* O. Gorbunov, **sp.n.**

Figs 1–12, 25–31.

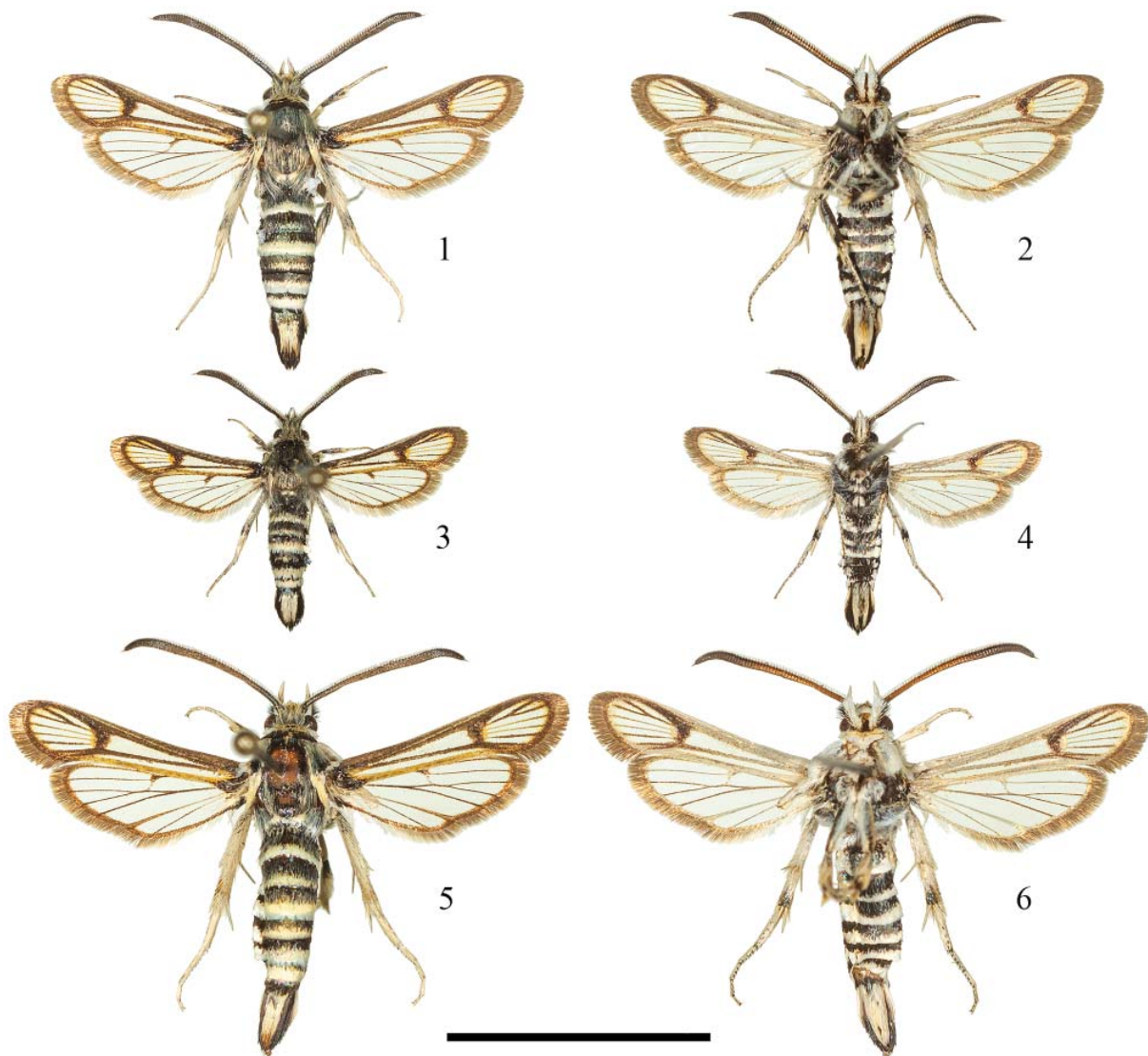
MATERIAL. Holotype ♂ (Figs 1–2) with labels: “Russia, Volgograd Region, / Filonovskaya, / 50°34' N, 042°45' E, / 24.V.1999, *ex l.*, / O. Gorbunov leg.”; “Host plant: / *Astragalus varius* / (Fabaceae) / Moth emerged 30.VI.1999”; “SESIIDAE / Pictures Nos / 0443–0444–2019 / Photo by O. Gorbunov”; “HOLOTYPUS ♂ / *Bembecia eversmanni* / O. Gorbunov, 2024 / O. Gorbunov des., 2018”.

Paratypes (58 ♂♂, 15 ♀♀): 1 ♀, Russia, Ul'yanovsk region, 160 km S of Ul'yanovsk, Ryabina, 13.VII.1993, V. Zolotukhin leg. (paratype of *Bembecia volgensis* O. Gorbunov, 1994); 1 ♂, Volgograd region, Kremenskaya, 49°28.30' N, 043°29.20' E, 11.VII.1996, O. Gorbunov leg. with genitalia preparation No OG-062-1996; 30 ♂♂, Russia, Volgograd region, 5 km SW of Sirotinskaya, 12–13.VIII.1996, O. Gorbunov leg., 2 ♂♂ with genitalia preparation Nos OG-056-1996 and OG-064-1996; 4 ♂♂, 2 ♀♀, Volgograd region, Kamennyi Brod, 49°47.40' N, 044°25' E, 14.VIII.1996, O. Gorbunov leg., 1 ♂ with genitalia preparation No OG-055-1996 (Sesiidae pictures Nos 0147–0148–2013, 0417–0420–2019; 1 ♀, Astrakhan' region, Baskunchak, Bogdo Mt., 48°07.037' N, 046°56.979' E, –3 m, 1–2.V.1997, *ex l.*, O. Gorbunov leg., bred from roots of *Astragalus vulpinus* (Fabaceae). Moths emerged 8.VII.1997 (Sesiidae pictures Nos 0433–0434–2019); 2 ♂♂, 1 ♀, Ul'yanovsk region, 4 km E of Ryabina, 52°55' N, 048°21' E, 21.V.1998, *ex l.*, O. Gorbunov leg., bred from roots of *Astragalus rupifragus* (Fabaceae). Moths emerged 30.VI and

7.VII.1998 (Sesiidae pictures Nos 0435–0440-2019); 9 ♂♂, 5 ♀♀, same locality, 9.VI.1998, *ex l.*, O. Gorbunov leg., bred from roots of *Astragalus zingeri* (Fabaceae). Moths emerged 1–25.VII.1998. 1 ♂ with genitalia preparation No OG-011-1998, 1 ♀ with genitalia preparation No OG-010-1998 (Sesiidae pictures Nos 0447–0450-2019, 0453–0468-2019); 3 ♂♂, 3 ♀♀, same locality as the holotype, 24.V.1999, *ex l.*, O. Gorbunov leg., bred from roots of *Astragalus varius* (Fabaceae). Moths emerged 26.VI–13.VII.1999, 1 ♂ with genitalia preparation No OG-007-1999, 1 ♀ with genitalia preparation No OG-006-1999 (Sesiidae pictures Nos 0427–0430-2019, 0441–0442-2019, 0445–0446-2019); 1 ♂, Volgograd region, 2 km NW of Chapurniki, 48°28' N, 044°28' E, 29.V.1999, *ex l.*, O. Gorbunov leg., bred from roots of *Astragalus vulpinus*

(Fabaceae), genitalia preparation No OG-008-1999. Moths emerged 8.VII.1999 (Sesiidae pictures Nos 0421–0422-2019); 2 ♀♀, Volgograd region, 2 km NW of Mikhailovka, 49°47' N, 044°23' E, 3–5.VI.2002, *ex l.*, O. Gorbunov leg., bred from roots of *Astragalus albicaulis* (Fabaceae). Moths emerged 6.VII and 20.VII.2002 (Sesiidae pictures Nos 0431–0432-2019); 4 ♂♂, same locality, 8.VII.2015, O. Gorbunov leg. (Sesiidae pictures Nos 0391–0396-2015, 0389–0390-2015); 2 ♂♂, Russia, Saratov region, Vol'sk District, Klyuchi, 109 m, 52°09.73' N, 047°05.76' E, 7.VII.2015, O. Gorbunov leg. (Sesiidae pictures Nos 0385–0388-2015).

DESCRIPTION. Male (holotype) (Figs 1–2). Alar expanse 17.9 mm; body length 11.0 mm; forewing length 8.0 mm; antenna length 4.3 mm.



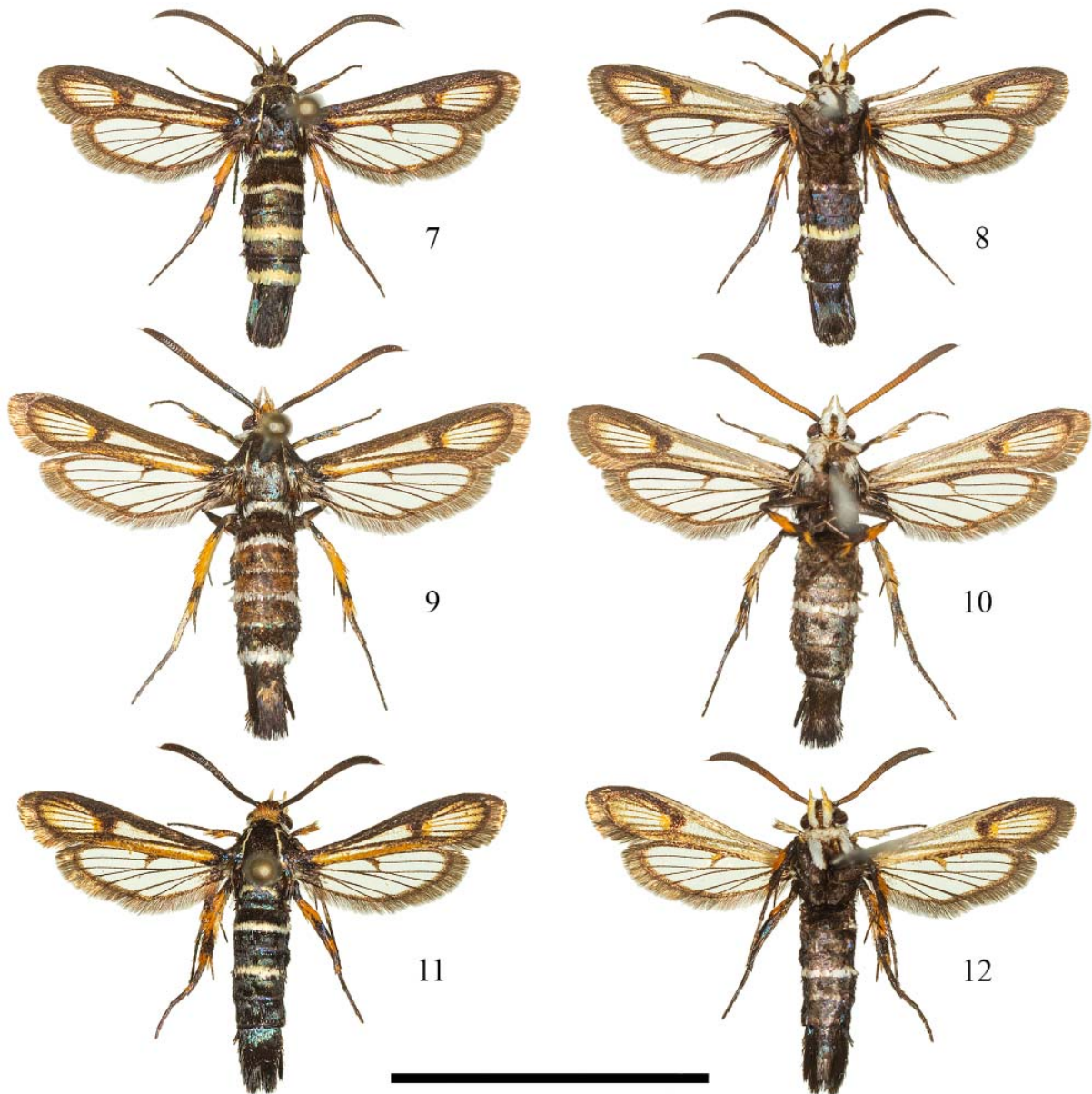
Figs 1–6. Males of *Bembecia eversmanni* O. Gorbunov, *sp.n.*: 1–2 — holotype, Sesiidae picture Nos 0443–0444-2019; 3–4 — paratype, Sesiidae picture Nos 0435–0436-2019; 5–6 — paratype, Sesiidae picture Nos 0421–0422-2019. 1, 3, 5 — dorsal view; 2, 4, 6 — ventral view. Scale: 10.0 mm

Рис. 1–6. Самцы *Bembecia eversmanni* O. Gorbunov, *sp.n.*: 1–2 — голотип, Sesiidae снимки №№ 0443–0444-2019; 3–4 — паратип, Sesiidae снимки №№ 0435–0436-2019; 5–6 — паратип, Sesiidae снимки №№ 0421–0422-2019. 1, 3, 5 — вид сверху; 2, 4, 6 — вид снизу. Масштаб: 10,0 мм.

Head: antenna dark brown with faint bronze-violet sheen, ventrally with admixture of few pale yellow scales, apical quarter somewhat darker; scapus dark brown to black dorsally and pale yellow ventrally; frons white with golden hue and several black scales medially; labial palpus white with golden hue, few black hair-like scales on basal palpomere and narrow stripe of black hair-like scales exteriorventrally on mid palpomere; vertex mixed with pale yellow and black hair-like scales and with small white spot ahead of ocellus; pericephalic

hairs pale yellow dorsally and white laterally; neck plate white with golden hue.

Thorax: patagia dark brown to black with bright greenish-bronze sheen and small white spot with golden hue laterally; tegula dark brown to black with greenish-violet sheen, small white spot with golden hue at base of forewing and pale yellow scales posteriorly; mesothorax dark brown to black with greenish-violet sheen; metathorax pale yellow; besides this, tegula and mesothorax densely covered with pale yellow hair-like scales masking

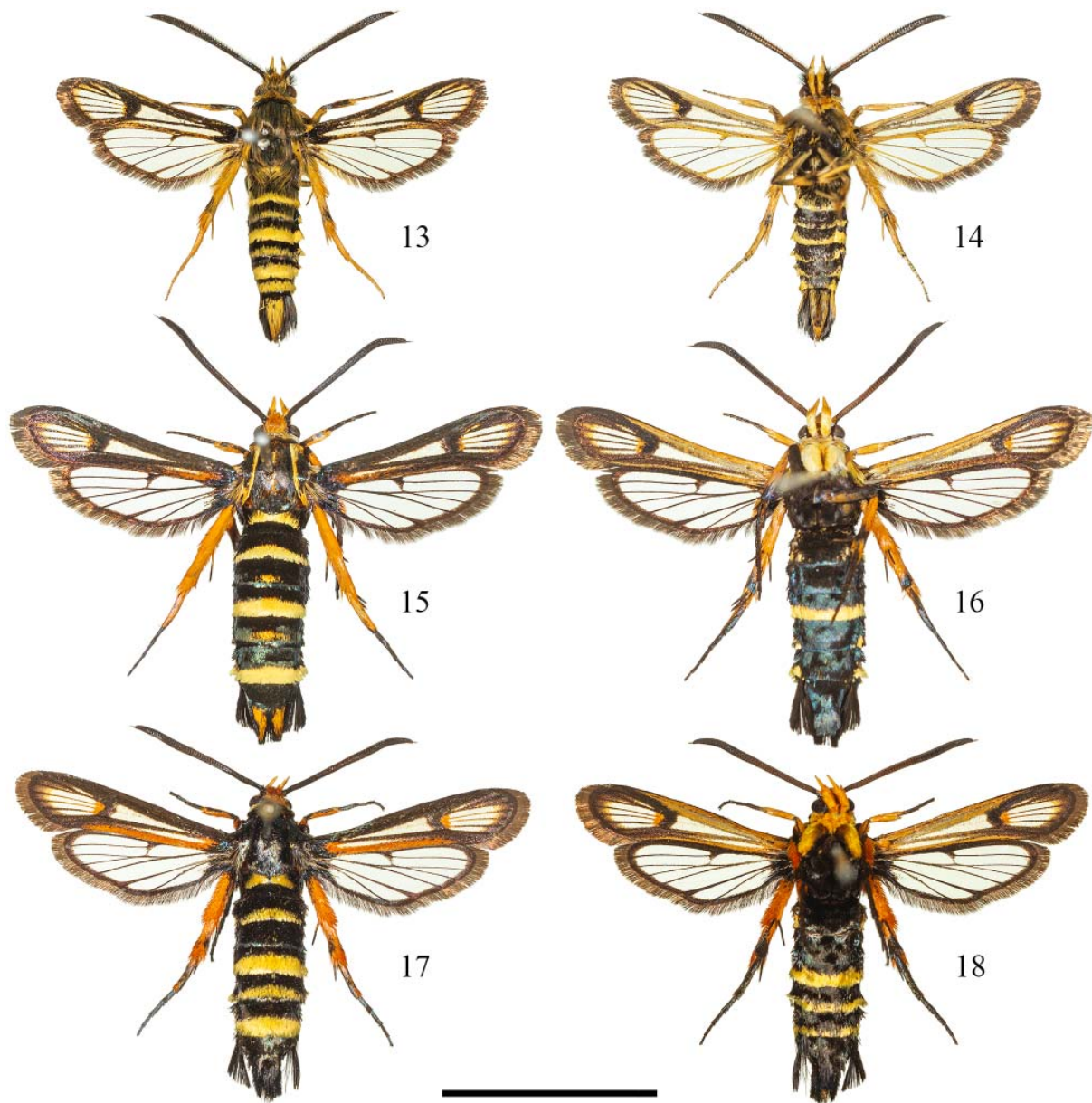


Figs 7–12. Females of *Bembecia eversmanni* O. Gorbunov, **sp.n.**: 7–8 — paratype, Sesiidae picture Nos 0459–0460-2019; 9–10 — paratype, Sesiidae picture Nos 0445–0446-2019; 11–12 — paratype, Sesiidae picture Nos 0433–0434-2019. 7, 9, 11 — dorsal view; 8, 10, 12 — ventral view. Scale: 10.0 mm

Рис. 7–12. Самцы *Bembecia eversmanni* O. Gorbunov, **sp.n.**: 7–8 — паратип, Sesiidae снимки №№ 0459–0460-2019; 9–10 — паратип, Sesiidae снимки №№ 0445–0446-2019; 11–12 — паратип, Sesiidae снимки №№ 0433–0434-2019. 7, 9, 11 — вид сверху; 8, 10, 12 — вид снизу. Масштаб: 10,0 мм.

background colouration; thorax laterally dark grey-brown with bright violet sheen and large white spot with golden hue anteriorly; posteriorly metepimeron black while metameron white and both densely covered with white hair-like scales.

Legs: fore coxa white with golden hue and with admixture of several black scales with purple sheen medially, besides this, fore coxa densely covered with white hair-like scales; fore femur white with golden hue and white hair-like scales at inner

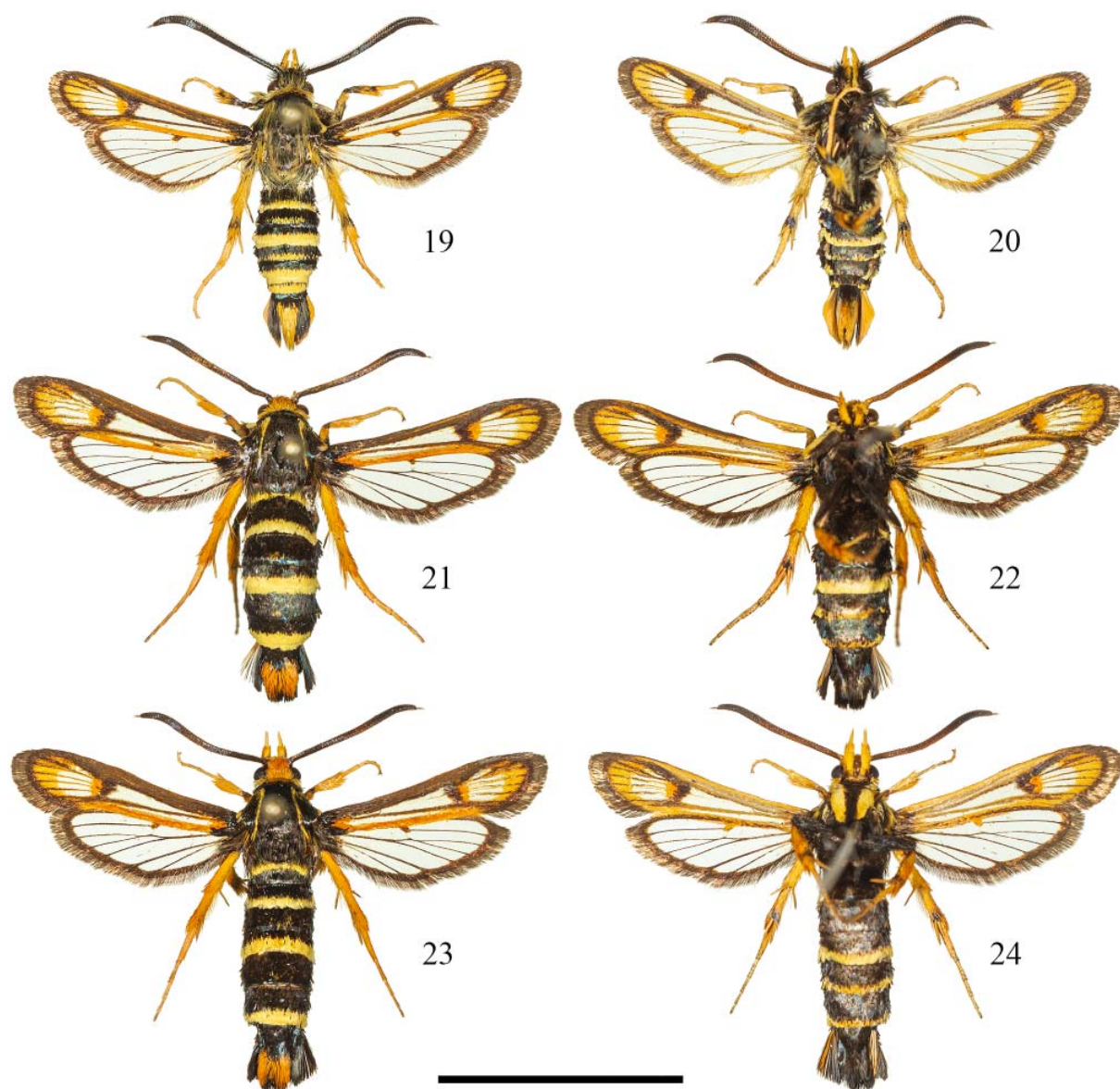


Figs 13–18. *Bembecia puella* Z. Laštůvka, 1989: 13–14 — ♂, Ukraine, Crimea, Solnechnaya Dolina, Echkidag, 44°53.658' N, 035°07.832' E, 246 m, 12.VII.2013, bred from roots of *Astragalus ponticus* (Fabaceae). Moth emerged 11.VIII.2013, O. Gorbunov, K. Efetov leg. Sesiidae picture Nos 0189–0190-2013; 15–16 — ♀, same locality and date, bred from roots of *Astragalus ponticus* (Fabaceae). Moth emerged 29.VII.2013, O. Gorbunov, K. Efetov leg. Sesiidae picture Nos 0161–0162-2013; 17–18 — ♀, Russia, Krasnodar Region, Malyi Utrish, Lysaya Mt., 44°43' N, 037°28' E, 10.VII.1998, bred from roots of *Astragalus utriger* (Fabaceae). Moth emerged 28.VIII.1998, O. Gorbunov leg. Sesiidae picture Nos 0087–0088-2022. 13, 15, 17 — dorsal view; 14, 16, 18 — ventral view. Scale: 10.0 mm

Рис. 13–18. *Bembecia puella* Z. Laštůvka, 1989: 13–14 — ♂, Украина, Крым, Солнечная долина, Эчкидаг, 44°53,658' с.ш., 035°07,832' в.д., 246 м, 12.VII.2013, выведена из корней *Astragalus ponticus* (Fabaceae). Бабочка вывелась 11.VIII.2013, О. Горбунов, К. Ефетов leg. Sesiidae снимки №№ 0189–0190-2013; 15–16 — ♀, там же и тогда же, выведена из корней *Astragalus ponticus* (Fabaceae). Бабочка вывелась 29.VII.2013, О. Горбунов, К. Ефетов leg. Sesiidae снимки №№ 0161–0162-2013; 17–18 — ♀, Россия, Краснодарский край, Малый Утриш, гора Лысая, 44°43' с.ш., 037°28' в.д., 10.VII.1998, выведена из корней *Astragalus utriger* (Fabaceae). Бабочка вывелась 28.VIII.1998, О. Горбунов leg. Sesiidae снимки №№ 0087–0088-2022. 13, 15, 17 — вид сверху; 14, 16, 18 — вид снизу. Масштаб: 10,0 мм.

margin; fore tibia dorsally dark brown to black with greenish-purple sheen, ventrally pale yellow with golden hue; fore tibia pale yellow with golden hue and admixture of brown scales with bronze sheen dorsally; mid coxa black with greenish-violet sheen and admixture of narrow white scales; mid femur

externally black with blue-violet sheen, internally white with golden hue, posteriorly with white hairy-like scales; mid tibia black with blue-violet sheen, large pale yellow spot exterior-dorsally and admixture of white scales with golden hue internally; spurs white with golden hue; mid tarsus entirely white



Figs 19–24. *Bembecia megillaeformis* (Hübner, 1813): 19–24 — ♂, Russia, Ul'yanovsk Region, Radishchevo District, env. of Ryabina, 52°55' N, 048°21' E, 21.V.1998, bred from roots of *Genista tinctoria* (Fabaceae). Moth emerged 22.VI.1998, O. Gorbunov leg. Sesiidae picture Nos 0305–0306-2015; 25–26 — ♀, same locality and date, bred from roots of *Genista tinctoria* (Fabaceae). Moth emerged 26.VI.1998, O. Gorbunov leg. Sesiidae picture Nos 0091–0092-2022; 27–28 — ♀, same locality and date, bred from roots of *Genista tinctoria* (Fabaceae). Moth emerged 25.VI.1998, O. Gorbunov leg. Sesiidae picture Nos 0093–0094-2022. 25, 27, 29 — dorsal view; 26, 28, 30 — ventral view. Scale: 10.0 mm
Рис. 19–24. *Bembecia megillaeformis* (Hübner, 1813): 19–24 — ♂, Россия, Ульяновская область, Радищевский район, окрестности Рябины, 52°55' с.ш., 048°21' в.д., 21.V.1998, выведена из корней *Genista tinctoria* (Fabaceae). Бабочка вывелась 22.VI.1998, О. Горбунов leg. Sesiidae снимки №№ 0305–0306-2015; 25–26 — ♀, там же и тогда же, выведена из корней *Genista tinctoria* (Fabaceae). Бабочка вывелась 26.VI.1998, О. Горбунов leg. Sesiidae снимки №№ 0091–0092-2022; 27–28 — ♀, там же и тогда же, выведена из корней *Genista tinctoria* (Fabaceae). Бабочка вывелась 25.VI.1998, О. Горбунов leg. Sesiidae снимки №№ 0093–0094-2022. 25, 27, 29 — вид сверху; 26, 28, 30 — вид снизу. Масштаб: 10,0 мм.

with golden hue; hind coxa black with greenish-violet sheen and admixture of white scales with golden hue; hind femur externally black with blue-violet sheen, internally white with golden hue, posteriorly with white hairy-like scales; hind tibia white with golden hue and admixture of several black scales both basally and apically; spurs white with golden hue; hind tarsus entirely white with golden hue.

Forewing: dorsally with basal part black with dark greenish-blue sheen; costal margin light brown with bronze sheen; Cu-stem, most part of discal spot, surface between veins R_1 – R_3 , veins R_4 , R_5 and M_3 , surface between vein CuA_1 and anal margin and outer margin brown with bronze sheen; anal margin yellow with admixture of several brown scales; discal spot with few yellow scales distally; veins M_1 and M_2 yellow with few brown scales distally; apical area extremely narrow yellow; transparent areas well-developed, but densely covered with translucent scales with light golden hue; external transparent area large, divided into six cells between veins R_2 and CuA_1 , level to vein M_2 about five times as broad as discal spot and about twice broader than apical area; cilia brown with bright bronze sheen; ventrally costal and anal margins, veins M_1 and M_2 and apical area pale yellow; most part of discal spot, surface between veins R_1 – R_3 brown; CuA-stem, veins CuA_1 and CuA_2 and outer margin brown; vein M_3 brown with few pale yellow scales; discal spot with few yellow scales distally; cilia brown with bright bronze sheen.

Hindwing transparent; dorsally veins, discal spot and outer margin brown with bronze sheen; discal spot narrow, reaching middle between bases of veins M_2 – M_3 ; outer margin narrow, about 0.3 times as broad as cilia; cilia brown with bright bronze sheen; ventrally veins and discal spot pale yellow to white with admixture of several brown scales on veins M_3 , CuA_1 and CuA_2 ; proximal half of outer margin pale yellow to white, distal half brown; cilia brown with bright bronze sheen.

Abdomen: dorsally black with greenish-bronze sheen; tergites 2, 4, 6 and 7 each with narrow pale yellow to white stripe distally; tergites 3 and 5 each with admixture of pale yellow to white scales medially; beside this, tergites 1–3 each sparsely covered with white hair-like scales; ventrally dark brown to black with greenish-violet sheen and few white hair-like scales; sternites 2–4 each with narrow, but broadened laterally, white stripe distally; sternites 5 with few white sternites 6 and 7 with more numerous white scales laterodistally; anal tuft well-developed, lanceolate; dorsally black with greenish-violet sheen with pale yellow to yellow scales medially and white scales laterally; ventrally pale yellow with few black scales.

Male genitalia (paratype; genital preparation No OG-011-1998) (Figs 25–29). Tegumen-uncus complex relatively broad; scopula androconialis well-developed, about 0.6 times as long as tegumen-uncus complex (Fig. 25); crista gnathi medialis broad, dome-shaped; crista gnathi lateralis narrow and short (Fig. 25); valva (Fig. 26) trapezoid, crista sacculi complex, with two distinct but cranially connected ridges: dorsal part S-shaped, densely covered with strong pointed setae, ventral part short, rounded, with small group of strong flat-topped setae, with short and narrow growth dorsally with several strong flat-topped setae; saccus (Fig. 27) relatively narrow, long, about 1.3 times as long as vinculum; aedeagus (Fig. 28) rather narrow, slightly bisinuate, about 1.2 times as long as valva; vesica with two groups of several strong cornuti (Fig. 29).

Female (paratype, Sesiidae pictures Nos 0459–0460-2019) (Figs 7–8). Alar expanse 15.1 mm; body length 8.9 mm; forewing length 6.9 mm; antenna length 4.1 mm.

Head: antenna dark brown to black with faint greenish-violet sheen, apical quarter somewhat darker; scapus dark

brown to black with few white scales ventrally; frons white with golden hue and grey scales with golden hue both medially and above; labial palpus with both basal and mid palpomeres white with golden hue, few black scales externally and yellow scales ventrally, apical palpomere yellow with golden hue and several black scales externally; vertex dark brown to black with dark violet sheen and few orange hair-like scales; periccephalic hairs pale yellow dorsally and white laterally; neck plate white with golden hue.

Thorax: patagia dark brown to black with bright greenish-violet sheen; tegula dark brown to black with blue-violet sheen, few pale yellow scales at base of forewing and narrow pale yellow inner margin; mesothorax dark brown to black with blue-violet sheen; metathorax yellow with tuft of black hair-like scales laterally; besides this, tegula and mesothorax sparsely covered with black hair-like scales; thorax laterally dark grey-brown with bright violet sheen, large white spot with golden hue anteriorly and narrow pale yellow stripe at base of forewing; posteriorly both metepimeron and metameron dark brown to black, densely covered with black hair-like scales.

Legs: fore coxa white with golden hue and narrow black with violet sheen inner margin; fore femur dark grey-brown with greenish-bronze sheen and few pale yellow scales interiorly; fore tibia dorsally dark grey-brown with greenish-bronze sheen, orange scales at posterior margin and few yellow scales distally, ventrally pale yellow with golden hue; fore tibia entirely brown to dark brown with bronze sheen; mid coxa dark brown to black with blue-violet sheen; mid femur dark brown to black with greenish-violet sheen and black hair-like scales at posterior margin; mid tibia dark brown to black with blue-violet sheen, large orange spot exteriorly and few orange scales dorsodistally; spurs dark grey-brown with bronze sheen; mid tarsus dark brown with bronze sheen and few orange scales dorsodistally on basal tarsomere; hind coxa dark brown to black with blue-violet sheen; hind femur dark brown to black with greenish-violet sheen and black hair-like scales at posterior margin; hind tibia orange with black with bright violet sheen broad ring both basally and subdistally; spurs dark brown with bronze sheen, internal spurs white internally; hind tarsus entirely dark brown with bronze sheen.

Forewing: dorsally with basal part black with dark greenish-blue sheen; costal margin black with violet sheen; Cu-stem dark brown to black with bronze sheen; anal margin dark brown to black with violet sheen and admixture of few orange scales; discal spot black with violet sheen and few orange scales distally; veins M_1 and M_2 dark brown with bronze sheen and few orange scales basally; vein M_3 and outer margin dark brown with violet sheen; apical area narrow dark brown with bronze sheen and yellow scales between veins R_5 – CuA_1 ; transparent areas rather well-developed, but densely covered with translucent scales with light golden hue; posterior transparent area small; external transparent area rather small, divided into four cells between veins R_5 and CuA_1 , level to vein M_2 about 1.6 times as broad as discal spot and about 2.7 times broader than apical area; cilia brown with bright bronze sheen; ventrally costal and anal margins and CuA-stem pale yellow with several yellow scales on R-stem and CuA-stem; most part of discal spot and surface between veins R_1 – R_3 dark brown with bronze-violet sheen; distal part of discal spot orange; veins M_1 – M_3 brown with several orange scales; apical area yellow proximally and brown with bronze sheen distally; outer margin dark brown with violet sheen; cilia brown with bright bronze sheen.

Hindwing transparent; veins and outer margin dark brown with bronze sheen; discal spot dark brown with bronze sheen and few orange scales ventrally, cuneiform, reaching base of

common stem veins M_3-CuA_1 ; outer margin narrow, about 0.5 times as broad as cilia; cilia brown with bright bronze sheen.

Abdomen: dorsally black with greenish sheen; tergites 2, 4 and 6 each with narrow pale yellow stripe distally; ventrally dark brown to black with greenish-violet sheen; sternites 2 and 5 each with few pale yellow scales laterodistally; sternite 4 with narrow pale yellow stripe distally; anal tuft black with greenish sheen dorsally and violet sheen ventrally.

Female genitalia (paratype; genital preparation No OG-010-1998) (Fig. 30). Papillae anales relatively broad, well-sclerotized basally and narrowly membranous distally, covered with short and long setae; tergite 8 narrow, slightly broadened ventrally, with short and long setae distally; posterior apophysis about 1.6 times as long as anterior apophysis; both lamellae antevaginalis and postvaginalis undeveloped; ostium bursae membranous in form of wrinkled slit, situated medio-ventral to tergite 8; antrum long, about 0.5 times as long as anterior apophysis, membranous, ductus bursae membranous gradually merges with corpus bursae, about as long as antrum; corpus bursae ovoid, without signum.

INDIVIDUAL VARIABILITY (Figs 1–12). Both males and females vary in the number of white, pale yellow and yellow scales on the head, thorax, legs and abdomen (Figs 1–12). Females are noticeably more variable in the coloration of various parts of the body. Thus, the number of orange scales on the anal margin of the forewing dorsally is very variable (Figs 7, 9, 11). In addition, there are several females that lack the pale yellow stripe on the tergite 6 of the abdomen (Fig. 11). Individual size is variable as follows. Males: alar expanse 14.5–23.0 mm; body length 10.0–14.5 mm; forewing length 6.5–10.0 mm; antenna length 4.5–7.0 mm. Females: alar expanse 13.5–21.5 mm; body length 8.6–13.8 mm; forewing length 6.2–10.0 mm; antenna length 3.3–5.6 mm.

DIFFERENTIAL DIAGNOSIS. This new species seems to be the closest to *B. puella* Z. Laštůvka, 1989 and *B. megillaeformis* (Hübner, 1813). In general, the colour pattern of males of *B. evermanni* sp.n. is very similar to that of males *B. puella* and differs only in being paler (cp. Figs 1–6 with Figs 13–14 in this publication or with fig. 15a–k in Gorbunov, Efetov, 2018). In addition, although males of both these species have similar maximum wingspan sizes, most males of *B. ever-*



Figs 25–30. Genitalia of *Bembecia evermanni* O. Gorbunov, sp.n.: 25–28 — paratype ♂. Genital preparation No OG-011-1998: 25 — tegumenuncus complex; 26 — valva; 27 — saccus; 28 — aedeagus; 29 — vesica; 30 — paratype ♀. Genital preparation No OG-010-1998. Scale bar 0.5 mm for 25–28, 30 and 0.2 mm for 29.

Рис. 25–30. Гениталии *Bembecia evermanni* O. Gorbunov, sp.n.: 25–28 — паратип ♂. Препарат гениталий № OG-011-1998: 25 — тегуменункусный комплекс; 26 — вальва; 27 — саккус; 28 — эдеагус; 29 — везика; 30 — паратип ♀. Препарат гениталий № OG-010-1998. Масштаб 0,5 мм для 25–28, 30 и 0,2 мм для 29.



Fig. 31. One of the habitats of *Bembecia eversmanni* O. Gorbunov, **sp.n.**: Russia, Volgograd Region, 2 km NW of Mikhailovka, 49°47' N, 044°23' E, 3.VI.2002. The white flowers are *Astragalus albicaulis* (Fabaceae), one of its host plants.

Рис. 31. Один из биотопов *Bembecia eversmanni* O. Gorbunov, **sp.n.**: Россия, Волгоградская область, 2 км СЗ Михайловки, 49°47' с.ш., 044°23' в.д., 3.VI.2002. Белые цветы — *Astragalus albicaulis* (Fabaceae), одно из кормовых растений.

smanni sp.n. are noticeably smaller than males of *B. puella*. The females of the new species are also noticeably paler and smaller than the females of *B. puella* (cp. Figs 7–12 with Figs 15–18 in this publication or with fig. 16a–k in Gorbunov, Efetov, 2018). The genitalia of males of *B. eversmanni sp.n.* have minor differences from those of *B. puella* in the form of crista gnati medialis, crista sacculi and saccus (cp. Figs 25–27 in this article with fig. 17a–c in Gorbunov, Efetov, 2018). The genitalia of females in these two species do not differ significantly.

B. eversmanni sp.n. is quite easily distinguished from *B. megillaeformis* by its paler colouration, but is very simple in the structure and colouring of the apical area of the forewing (apical area broad, about as broad as cilia, orange or yellow-orange in *B. megillaeformis*, vs. apical area narrow or even extremely narrow, yellow in male and dark brown with admixture of yellow scales in female of *B. eversmanni sp.n.*; cp. Figs 1–12 with Figs 19–24).

From all other representatives of the subgenus *Opacosphencia* living in relative proximity to the Volga region, namely, *B. parthica* (Lederer, 1870), *B. daghestanica* Gorbunov, 1991, and *B. gegamica* Gorbunov, 1991, *B. eversmanni sp.n.* is distinguished by its pale colour and smaller size.

BIONOMICS. The larvae of this new species live in the upper parts of the roots of various *Astragalus* species (Fabaceae). I bred them from the following species: *A. albicaulis* DC., *A. rupifragus* Pall., *A. varius* S.G. Gmel., *A. vulpinus* Willd., and *A. zingeri* Korsh. The larva pupates in a cocoon. Imagoes fly from the end of June to mid-August.

HABITAT. This new species is biotopically associated with steppes and semideserts. The most preferred habitats are mixed-grass steppes (Fig. 31) on calcified soil and artemisian semideserts.

DISTRIBUTION. This new species is currently known from several localities in the Middle (Ul'yanovsk region) and Lower Volga regions (Saratov, Volgograd and Astrakhan' regions).

ETYMOLOGY. This new species is named in honor of Eduard Eversmann [1794–1860], a professor of zoology and botany at Kazan University, a researcher of the fauna and flora of the Volga region and other parts of the Russian Empire.

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