

A new species of the genus *Synanthedon* Hübner, 1819 (Lepidoptera: Sesiidae) from the European Russia

Новый вид рода *Synanthedon* Hübner, 1819 (Lepidoptera: Sesiidae) из европейской части России

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КЛЮЧЕВЫЕ СЛОВА. Sesiidae, Synanthedonini, *Synanthedon*, бабочки-стекляницы, новый вид, Палеарктика, Россия.

ABSTRACT. A new species, *Synanthedon losmanovi*, **sp.n.** from the Chuvash Republic and Moscow Oblast' in European Russia, is described and figured. Both externally and in the structure of the male genitalia, this new species seems to be the closest to Nearctic *Synanthedon fatifera* Hodges, 1963 and *S. viburni* Engelhardt, 1925, but superficially, it is very similar to the Palaearctic *Conopia spheciiformis* ([Denis et Schiffermüller], 1775), and *Thamnosphacia pseudoscoliaeformis* (Špatenka et Arita, 1992). The larval host plant and the features of their biology are unknown, but judging by the biotope where the typical specimens were collected, it may be *Alnus glutinosa* (L.) Gaerth. (Betulaceae).

РЕЗЮМЕ. Приведено описание нового вида, *Synanthedon losmanovi*, **sp.n.** из Чувашской Республики и Московской области в европейской части России. Как габитусом, так и по строению гениталий самца этот новый вид, по-видимому, наиболее близок к неарктическим *Synanthedon fatifera* Hodges, 1963 и *S. viburni* Engelhardt, 1925, но внешне он очень похож на палеарктические *Conopia spheciiformis* ([Denis et Schiffermüller], 1775) и *Thamnosphacia pseudoscoliaeformis* (Špatenka et Arita, 1992). Кормовое растение гусениц и особенности их биологии неизвестны, но, судя по биотопу, где были собраны типовые экземпляры, это может быть *Alnus glutinosa* (L.) Gaerth. (Betulaceae).

Introduction

As has been repeatedly noted, 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. Among the regions of the country that can be characterized as relatively well studied, Moscow Oblast' was indicated, while the Chuvash Republic, despite the existence of a publication on the clearwing moths of the region [Lastukhin, 2010], was not considered well-studied [Gorbunov, 2024b]. Despite this, the discovery of a new species of Sesiidae for the Upper Volga region, and especially for the Moscow region, should be considered a sensational finding, although during the last few years several new species of clearwing moths have been described from the Volga region [Gorbunov, 2019b–c, 2020].

Material and methods

The description was made using a Leica EZ4 stereomicroscope with LED illuminators, and photos of dry specimens were obtained with a Sony® α450 DSLR camera equipped with a Minolta® 50 f/2.8 Macro lens, while specimens in the nature were taken with a Sony® α850 DSLR camera equipped with a Sigma Macro 75–300 with a Raynox DSR-150 MacroScan Conversion 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 0147–0148–2024). 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-019–2024) is pinned under the specimen and is listed in the archives of the author.

The holotype and two paratypes (♂ and ♀) are kept in the collection of the A.N. Severtsov Institute of Ecology and Evo-

lution of the Russian Academy of Sciences, Moscow, Russia (COGM), the remaining paratypes are stored in the collection of A.V. Ivanov (CAIC).

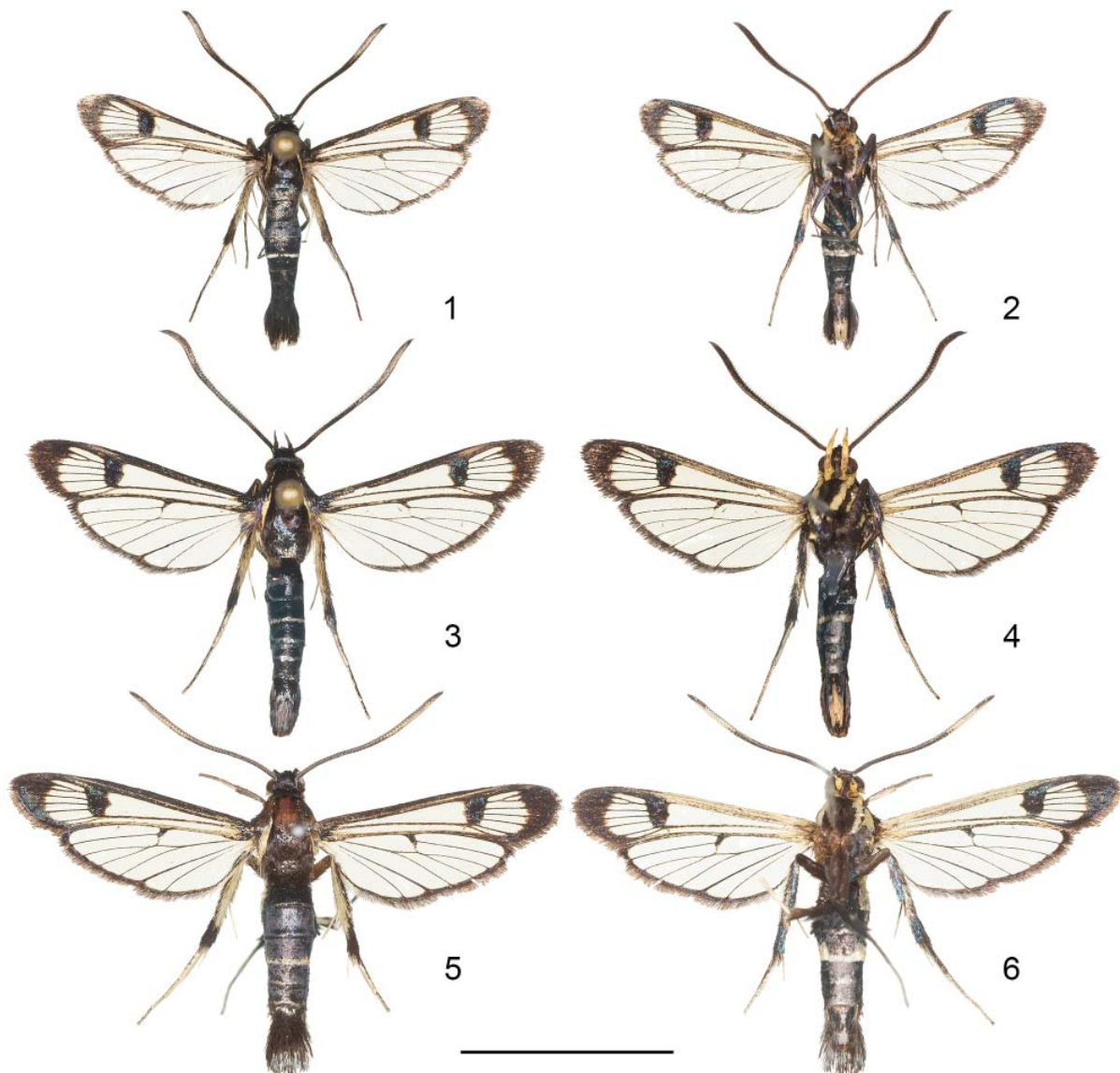
The names of plants were verified with the WFO [2024].

Taxonomic account

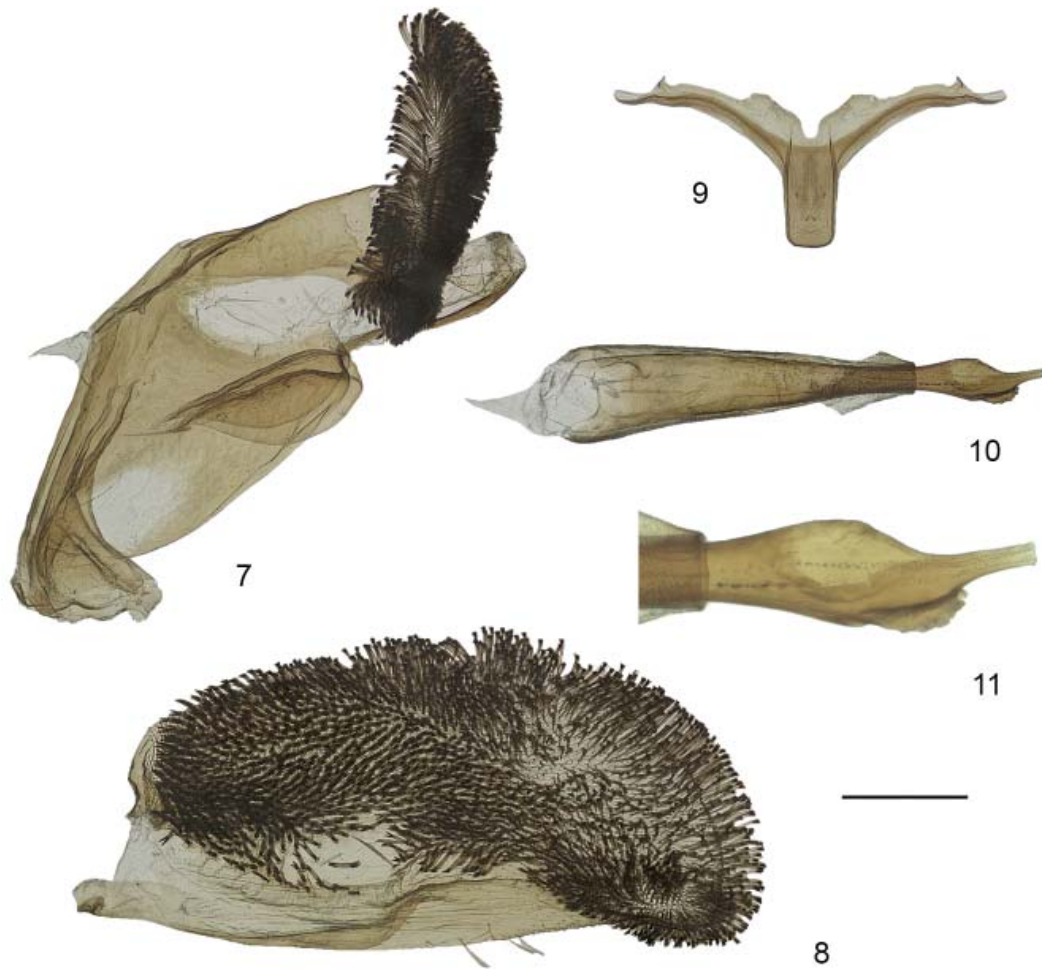
Synanthedon losmanovi, sp.n.

Figs 1–14.

MATERIAL. **Holotype** ♂ (Figs 1–2) with labels: “Russia, Chuvash Republic, / Alatyř’ Distr., env. Atrat’, / 54°58’40”N, 46°43’14”E, / plot 79, 27.VI.2018, / A.V. Ivanov leg.”; “2,5 км ЮВВ с. Атраць / В. 79 ГПЗ Присурск. / 54°58’40”N, / 46°43’14”E”; “SESIIDAE / Pictures Nos / 0149–0150–2024 /



Figs 1–6. *Synanthedon losmanovi*, sp.n.: 1–2 — holotype ♂, Sesiidae picture Nos 0149–0150–2024; 3–4 — paratype ♂, Sesiidae picture Nos 0151–0152–2024; 5–6 — paratype ♀, Sesiidae picture Nos 0151–0152–2024. 1, 3, 5 — dorsal view; 2, 4, 6 — ventral view. Scale bar: 10.0 mm.
Рис. 1–6. *Synanthedon losmanovi*, sp.n.: 1–2 — голотип ♂, Sesiidae снимки №№ 0149–0150–2024; 3–4 — паратип ♂, Sesiidae снимки №№ 0151–0152–2024; 5–6 — паратип ♀, Sesiidae снимки №№ 0151–0152–2024. 1, 3, 5 — вид сверху; 2, 4, 6 — вид снизу. Масштаб: 10,0 мм.



Figs 7–11. Male genitalia of *Synanthedon losmanovi*, **sp.n.** Paratype ♂. Genital preparation No. OG-019-2024: 7 — tegumen-uncus complex; 8 — valva; 9 — saccus; 10 — aedeagus; 11 — carina penis. Scale bar: 0.5 mm for 7–10 and 0.2 for 11.

Рис. 7–11. Гениталии самца *Synanthedon losmanovi*, **sp.n.** Паратип ♂. Препарат гениталий № OG-019-2024: 7 — тегумен-ункусный комплекс; 8 — вальва; 9 — саккус; 10 — эдеагус; 11 — карина пенис. Масштаб: 0,5 мм для 7–10 и 0,2 для 11.

Photo by O.G. Gorbunov”; “HOLOTYPUS ♂ / *Synanthedon losmanovi* / O. Gorbunov et / A. Ivanov, 2024 / O.G. Gorbunov des., 2023”.

Paratypes (10 ♂♂, 1 ♀): 3 ♂♂, with same locality and date, A.V. Ivanov leg. (1 ♂ with pictures Nos 0147–0148-2024); 1 ♀, Russia, Moscow Oblast, 9 km SW of Zvenigorod, Zvenigorod Biological Station of the M.V. Lomonosov Moscow State University, 150 m, 55°42'N, 036°43'E, 06.VII.2011, I.G. Ust'yantsev leg. (pictures Nos 0151–0152-2024); 2 ♂♂, Russia, Chuvash Republic, Mariinsko-Posadskiy Distr., vicinity of Vodoleevo, 23.VI.2018, A.V. Ivanov leg. (1 ♂ with genitalia preparation No. OG-028-2024); 2 ♂♂, with same locality, 56°11'87"N, 047°83'39"E, 3.VII.2022, A.V. Ivanov leg.; 2 ♂♂, Russia, Chuvash Republic, Alatyrskiy Distr., vicinity of Atrat', Prisurskiy Nature Reserve, plot 100, 14.VI.2021, A.V. Ivanov leg. (1 ♂ with genitalia preparation No. OG-019-2024).

DESCRIPTION. Male (holotype) (Figs 1–2). Alar expanse 19.4 mm; body length 11.0 mm; forewing length 9.0 mm; antenna length 6.3 mm.

Head: antenna dark brown to black with dark greenish-blue sheen and whitish apical quarter; scapus black with dark violet

sheen; frons dark brown with bronze-violet sheen and narrow white stripe laterally; basal palpomere of labial palpus lemon-yellow with golden hue, remaining palpomeres lemon-yellow with golden hue ventrally and dark brown to black with purple-violet sheen dorsally; vertex dark brown to black with greenish-violet sheen; pericephalic hairs black dorsally and lemon-yellow laterally; neck plate lemon-yellow with golden hue.

Thorax: patagia dark brown to black with greenish-bronze sheen; tegula dark brown to black with greenish-violet sheen, several lemon-yellow scales both at inner margin and posteriorly; meso- and metathorax dark brown to black with blue-violet sheen; thorax laterally dark brown to black with bright violet sheen and large lemon-yellow spot with golden hue at base of forewing; posteriorly metepimeron and metameron black with bright violet sheen and both densely covered with dark brown to black hair-like scales.

Legs: fore coxa dark brown to black with blue-violet sheen and narrow lemon-yellow exterior margin; fore femur dark brown to black with blue-violet sheen externally and pale yellow with golden hue internally; fore tibia dark brown to black with bronze sheen dorsally and pale yellow with golden hue



Fig. 12–13. Males of *Synanthedon losmanovi*, **sp.n.**: Russia, Moscow Oblast', Ramenskiy Distr., Khripan', 55°38.417'N, 38°11.384'E, 8.VI.2010, Photo by V.I. Gumenyuk.

Рис. 12–13. Самцы *Synanthedon losmanovi*, **sp.n.**: Россия: Московская область, Раменский район, Хрипань, 55°38.417' с.ш., 38°11.384' в.д., 8.VI.2010, Фото В.И. Гуменюк.

ventrally; fore tarsus dark brown to black with bronze sheen with admixture of several yellow scales with golden hue ventrally on basal tarsomere; mid coxa dark brown to black with blue-violet sheen; mid femur dark brown to black with blue-violet sheen externally and pale yellow with golden hue internally; mid tibia dark brown to black with blue-violet sheen and small whitish spot exterior-medially; spurs whitish with golden hue; mid tarsus whitish with golden hue interior-ventrally, exterior-dorsally dark brown to black with mid basal tarsomere with blue-violet sheen and remaining tarsomeres bronze with golden hue; hind coxa dark brown to black with blue-violet sheen; hind femur dark brown to black with blue-violet sheen externally and pale yellow with golden hue internally; hind tibia dark brown to black, in basal two third exterior-dorsally with bronze sheen and with golden sheen interior-ventrally, in distal third with blue-violet sheen; spurs whitish with golden hue; hind tarsus interior-ventrally whitish with golden hue, exterior-dorsally basal tarsomere dark brown to black with blue-violet sheen and several whitish scales with golden hue, remaining tarsomeres with bronze sheen.

Forewing: dorsally with basal part black with bright greenish-blue sheen; costal and anal margins, CuA-stem, discal spot, veins within external transparent area and apical area black with dark blue-violet sheen; ventrally costal margin whitish with golden hue; CuA-stem and anal margin black with dark violet sheen and dense admixture of whitish scales with golden hue; surface between veins R_1 – R_3 , discal spot, veins within external transparent area and apical area black with dark blue-violet sheen; transparent areas well-developed, posterior transparent area extending to distal edge of vein CuA_2 , external transparent area large, divided into seven cells between veins R_3 and CuA_2 , level to vein M_2 about 2.4 times as broad as dis-

cal spot and about as broad as apical area; cilia dark brown with bronze-violet sheen.

Hindwing transparent; dorsally veins, discal spot and outer margin black with dark blue-violet sheen; ventrally veins, discal spot and outer margin black with admixture of several whitish scales with golden hue; discal spot narrow and short, extending to base of vein M_2 ; outer margin narrow, about 0.5 times as broad as cilia; cilia dark brown with bronze-violet sheen, pale yellow anally.

Abdomen: black with greenish-violet sheen; dorsally tergites 1 and 2 each narrowly pale yellow to white laterally; tergite 4 with narrow pale yellow to white stripe distally; ventrally sternite 4 with pale yellow to white stripe distally; anal tuft well-developed, lanceolate; black with greenish-violet sheen and several pale yellow scales medially; ventrally pale yellow.

Male genitalia (paratype; genital preparation No OG-019-2024) (Figs 7–11). Tegumen-uncus complex relatively broad; scopula androconialis well-developed, about 0.6 times as long as tegumen-uncus complex (Fig. 7); crista gnathi medialis broad and long; crista gnathi lateralis narrow, short, semioval (Fig. 7); valva (Fig. 8) elongate, ovoid; crista sacculi undeveloped, but with several flat-topped setae and more ventral naked ridge (Fig. 8); saccus (Fig. 9) relatively narrow, flat-topped, short about 0.4 times as long as vinculum; aedeagus (Fig. 10) gradually narrowed distally and with slightly broadened carina penis subdistally (Fig. 11), about 0.8 times as long as valva; vesica with numerous minute cornuti.

Female (paratype, Sesiidae pictures Nos 0151–0152-2024) (Figs 5–6). Alar expanse 26.0 mm; body length 14.2 mm; forewing length 11.3 mm; antenna length 8.0 mm. Somewhat larger and robust than males. The colouration of various parts of the body, legs and wings is nearly the same

as in the male, but the anal tuft is without pale yellow scales.

Female genitalia. Not studied.

INDIVIDUAL VARIABILITY (Figs 1–4). Unknown for females. Males slightly varying in the number of pale yellow

and whitish scales on the labial palpus, legs and abdomen. In addition, this new species is somewhat variable in size: alar expanse 19.4–24.0 mm; body length 11.0–13.0 mm; forewing length 9.0–11.0 mm; antenna length 6.3–7.8 mm.



Fig. 14. Type locality of *Synanthedon losmanovi*, **sp.n.**: Russia, Chuvash Republic, Alatyr' Distr., env. Atrat', Prisurskiy Nature Reserve, plot 79, 54°58'40"N, 46°43'14"E, 12.VI.2024.

Рис. 14. Типовое местонахождение *Synanthedon losmanovi*, **sp.n.**: Россия, Республика Чувашия, Алатырский район, окрестности Атраги, Государственной природный заповедник «Присурский», кв. 79, 54°58'40" с.ш., 46°43'14" в.д., 12.VI.2024.

DIFFERENTIAL DIAGNOSIS. Both externally and in the structure of the male genitalia, *Synanthedon losmanovi*, **sp.n.** seems to be the closest to Nearctic *Synanthedon fatifera* Hodges, 1963 and *S. viburni* Engelhardt, 1925, but superficially, this new species is very similar to the Palaearctic *Conopia spheciiformis* ([Denis et Schiffermüller], 1775), and *Thamnosphesia pseudosciliaeformis* (Špatenka et Arita, 1992).

From the first species compared, *S. losmanovi*, **sp.n.** can be easily distinguished by the colouration of the frons (black with blue sheen in *S. fatifera*, *vs.* dark brown with bronze-violet sheen and narrow white stripe laterally in the new species) and abdomen ('blue black with pale yellow laterally on segments one and four' [Eichlin, Duckworth, 1988: 82] in the species compared, *vs.* black with greenish-violet sheen, tergites 1 and 2 each narrowly pale yellow to white laterally and tergite 4 with narrow pale yellow to white stripe distally in *S. losmanovi*, **sp.n.**). The two species also have quite significant differences in the male genitalia, especially in the size of the crista gnathi medialis (short and narrow in *S. fatifera*, *vs.* broad and long in the new species; *cf.* Figs 7 in this article with fig. 2 in Hodges [1963]) and valva (compare Fig. 8 in this article with fig. 2 in Hodges [1963] and fig. 21b in Eichlin & Duckworth [1988]).

From *S. viburni*, *S. losmanovi*, **sp.n.** clearly differs in the colouration of the vertex ('head often mixed with much pale yellow anteriorly' [Eichlin, Duckworth, 1988: 83] in the species compared, *vs.* dark brown to black with greenish-violet sheen throughout in *S. losmanovi*, **sp.n.**) and abdomen ('second segment of abdomen dorsally with very narrow, pale yellow band on posterior edge' [Eichlin, Duckworth, 1988: 83–84] in *S. viburni*, *vs.* tergites 1 and 2 each pale yellow to white laterally and segment 4 with narrow pale yellow to white band distally in the new species). There are also some differences in the structure of the valva in the male genitalia (*cp.* Fig. 8 in this article with fig. 21d in Eichlin & Duckworth [1988]).

From *C. spheciiformis*, this new species is distinguished by the colouration of the frons (dark brown to black with blue-violet sheen in *C. spheciiformis*, *vs.* dark brown with bronze-violet sheen and narrow white stripe laterally in *S. losmanovi*, **sp.n.**), patagia (dark brown to black with greenish sheen and small lemon-yellow spot laterally in the species compared, *vs.* dark brown to black with greenish-bronze sheen throughout in the new species), forewing ventrally (compare Fig. 24 in this article with fig. 24 in Gorbunov [2024d]) and abdomen (dorsally tergites 1 and 2 each narrowly pale yellow laterally; tergite 2 with narrow pale yellow stripe distally, and ventrally sternite 4 with pale yellow scales laterodistally in the species compared, *vs.* dorsally tergites 1 and 2 each narrowly pale yellow to white laterally, tergite 4 with pale yellow to white stripe distally and ventrally sternite 4 with pale yellow to white stripe distally; *cp.* Figs 1–6 in this article with figs 23–24 in Gorbunov [2024d]). These two species differ very well from each other in the structure of the male genitalia (compare Figs 7–11 in this article with figs 39–43 in Gorbunov [2024d]).

From *Th. pseudosciliaeformis*, *S. losmanovi*, **sp.n.** can be easily separated by the colouration of the abdomen (black with dark purple sheen, tergites 1–3 each narrowly pale yellow laterally, tergites 2 and 3 each with narrow pale yellow stripe distally and ventrally sternites 4 and 5 each with admixture of several pale yellow scales distally in *Th. pseudosciliaeformis*, *vs.* dorsally tergites 1 and 2 each narrowly pale yellow to white laterally, tergite 4 with narrow pale yellow to white stripe distally and ventrally sternite 4 with pale yellow to white stripe distally; *cp.* Figs 1–6 in this article with figs 11–14 in Gorbunov [2024c]) and male's genitalia (compare Figs 7–11 in this article with figs 7a–d in Gorbunov & Arita [1996]).

Synanthedon losmanovi, **sp.n.** differs very well from all other congeners both in the combination of various features of external morphology and in the structure of the male genitalia.

BIONOMICS. The larval host plant is unknown, but judging by the biotopes where they were collected, it may be *Alnus glutinosa* (L.) Gaerth. (Betulaceae). The males were collected in pheromone traps, and the female was found on a window in the laboratory of the Zvenigorod Biological Station of the M.V. Lomonosov Moscow State University. Imagoes fly from mid-June to early July.

HABITAT. The holotype and most of the paratypes were collected in a slightly swampy area next to a small temporary lake in mature deciduous forest with prevalence of *Alnus glutinosa* (L.) Gaerth., *Betula pendula* Roth, *Populus tremula* L., and *Fraxinus excelsior* L. The understory is formed by *Acer platanoides* L., *Corylus avellana* L., *Tilia cordata* Mill. (Fig. 14). Photographs of males (Figs 12, 13) were taken at the edge of a black alder grove of *Alnus glutinosa*. The laboratory of the Zvenigorod Biological Station, where the dead female was found, is located on the floodplain terrace of the Moscow River, where black alder is also common.

DISTRIBUTION. This new species is currently known from three localities in the Chuvash Republic (Upper Volga region) and from two localities in the Moscow Oblast' in European Russia.

ETYMOLOGY. This new species is named in honor of Vissarion Petrovich Losmanov [1935–2020], an entomologist, tireless naturalist, researcher of Lepidoptera of Chuvashia and other regions of the USSR, traveler and collector of butterflies of the world.

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The study was conducted using the equipments of the Electron Microscopy Room of the A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences (Moscow, Russia).

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