

UDC 595.771(477)

NEW RECORDS OF SCIARID SPECIES (DIPTERA, SCIARIDAE) FROM UKRAINE. IV

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New Records of Sciarid Species (Diptera, Sciaridae) from Ukraine. IV. Babytskiy, A. I., Rubanovska, N. V., Bezsmertna, O. O. — Five species of black fungus gnats are recorded from Ukraine for the first time: *Bradysia forficulata* (Bezzi, 1914), *B. lobata* Hondru, 1968, *B. normalis* Frey, 1948, *B. urticae* Mohrig & Menzel, 1992 and *Lycoriella sativae* (Johannsen, 1912). Distributions of these species are summarized and their diagnoses are provided.

Key words: biodiversity, black fungus gnats, distribution, Europe, morphology, Sciaroidea.

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Introduction

The information about species diversity, distribution, and biological peculiarities of Sciaridae (Diptera) in Ukraine remains extremely scarce. The last version of the Sciaridae checklist (Babytskiy et al., 2022) contains 96 species from 17 genera in 168 localities, but we expect approximately 400 sciarid species to occur in Ukraine. The diversity of Sciaridae in Ukraine revealed only up to 25 % of the species number presumed to exist here (Babytskiy et al., 2018). Despite our research running from 2012 and covering almost all of the regions, the sciarid collections from the territory of Ukraine are still fragmentary.

In our previously published species list (Babytskiy et al., 2022), we gave a wrong locality for *Corynoptera inundata* Fritz, 1982 in the Transcarpathian Region, so this species was known for Ukraine only from Camaño Portela et al. (2008) publication without a specified location, and our later collection from Ternopil Region (Camaño Portela et al., 2008; Babytskiy et al., 2022). In this paper, we publish data on five sciarid species previously not registered in Ukraine, four in *Bradysia* Winnertz, 1867 and one in *Lycoriella* Frey, 1942. As the result, number 101 species in 17 genera of Sciaridae have been registered in Ukraine.

This article continues the series of papers presenting the first records of sciarid species from Ukraine (Babytskiy et al., 2019 b; Babytskiy et al., 2020; Babytskiy & Bezsmertna, 2021).

Material and methods

Material for this study was collected in expeditions and excursions carried out during the field seasons of the years 2016 and 2017. Adult sciarids were collected with a sweepnet, a Malaise trap set on the vegetable gardens or directly from the substrate with an aspirator. Collected gnats were stored in 5 ml vials containing 70 % ethanol. During preparation in the laboratory, the male specimens were dehydrated in absolute ethanol and then mounted on slides in Euparal.

The specimens were studied with MBS-9 and PZO Biolar microscopes equipped with Nikon D90 cameras; images were processed using NKRemote Version 2.2.1, AxioVision Version 4.6.3, Adobe Illustrator CC 2017 and Photoshop CC 2018 programs, and stacked using Helicon Focus 6.7.1 open-source software.

All of the material that was examined as a part of this study is kept in the funds of Schmalhausen Institute of Zoology NAS of Ukraine, Kyiv (SIZK) as Andriy Babytskiy's collections (PABK) and publicly available data is on the Ukrainian Biodiversity Information Network, UkrBIN (Babytskiy, 2018). Individual catalogue numbers of the vouchers in the UkrBIN are given (e. g., UkrBIN-795857). PABK collection numbers are also provided for all specimens (e. g., No. 158). Morphological terminology follows the handbook of Palaearctic sciarids by Menzel & Mohrig (1997). Diagnoses of the discussed species are generally based on examined specimens from Ukraine, in consideration of the keys, original descriptions, and re-descriptions by Johannsen (1912, 1929), Frey (1948), Tuomikoski (1960), Hondru (1968), Loudon (1978), Freeman (1983), Mohrig & Menzel (1992; 1993) and Menzel & Mohrig (2000). The taxonomy and nomenclature of *Bradysia* and *Lycoriella* follow Menzel & Mohrig (2000) and Vilkamaa & Menzel (2019).

Results

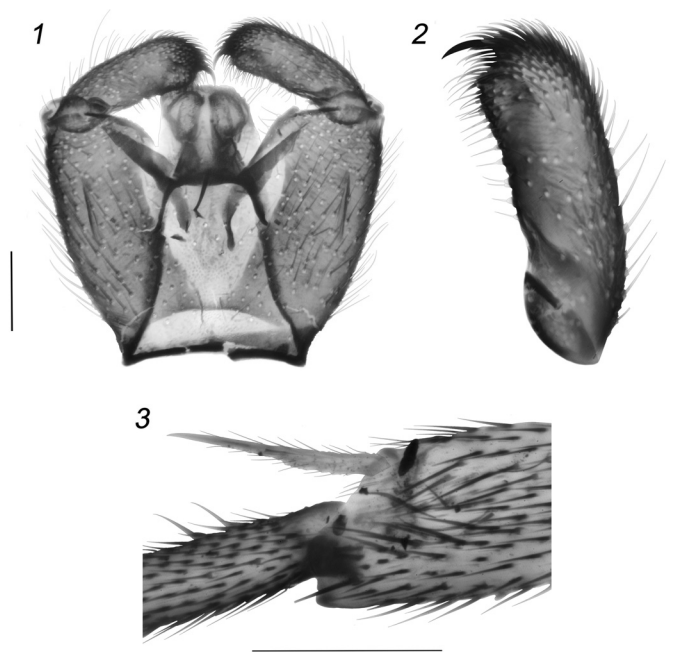
Bradysia Winnertz, 1867

Bradysia forficulata (Bezzi, 1914) (figs 1–3)

Material examined. Ukraine, Kyiv Region: Kyiv City, Koncha-Zaspa District, Holosiivskiy National Nature Park, 50.24597° N, 30.62059° E, ca. 100 m a. s. l., pine forest, sweeping, 09.04.2017, 1 ♂ (A. Babytskiy) (No. 158, UkrBIN-795857).

Distribution: Cosmopolitan. In Palaearctic is common and widely distributed in Europe: Austria, Belarus, Belgium, Bosnia and Herzegovina, Czech Republic, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Russia (European territory), Spain (mainland), Sweden, Switzerland, Ukraine (**first record**), United Kingdom. In Nearctic known from North America: Canada (Alberta, British Columbia), USA (Arizona, California, Georgia, Tennessee, Texas, Virginia). Outside Holarctic region only recorded from Gough Island (Gerbachevskaja-Pavluchenko, 1986; Menzel et al., 2013; Mohrig et al., 2013; Heller & Menzel, 2017; GBIF, 2022 a; this study).

Diagnosis. Male adults reach 4–5 mm in length. **Head** dark brown. Ocelli in a flattened triangle behind the eye bridge and separated from it by a distance greater than two diameters of the eye bridge. Eye bridge consists of 2–3 rows of ommatidia (facets), however middle ommatidia (a pair on each side) are not quite touching. Face dark brown with pale setae. Maxillary palpus brownish, 3-segmented. Basal palpal segment club shaped with sensory pit and several bristles, one of them longer. Sensory pit round, deepened, distinctly margined and dark. Middle palpal segment oval with several bristles, one of them longer. Terminal palpal segment narrow, twice as long as the 2nd segment. Antennae dark brown. Flagellum very long, reach 2.0–2.2 mm in length. Flagellomeres with short necks and setae quite longer than a half of flagellomeres width. The 4th flagellomere up to 5.0 times as long as wide (obviously, in the previous descriptions this measure includes the neck and body), length/width of 4th flagellomere of Ukrainian specimen = 3.5, with a basal node index of 2.51. **Thorax** with black sclerites. Anterior pronotum and prothoracic episternum with about 10 fine setae each. Mesonotum with pale brown setosity. Scutum with two irregular rows of acrostichal setae which extending the length of the scutum; acrostichal and dorsocentral setae black and short. Scutellum with 6 long bristles and several minor setae. **Wing** hyaline, 2.8–3.1 mm long and 1.2 mm wide, width/length of wing = 0.37–0.38. Membrane hyaline. M-fork narrow, stM indistinct, as long as M₁; stM/M-



Figs 1–3. *Bradysia forficulata* ♂: 1 — hypopygium, ventral view; 2 — gonostylus, ventral view; 3 — anterior apex of fore tibia (p_1) with tibial organ, prolateral view. Scale 0.1 mm.

fork = 0.87–0.91; $R_1 = R$, R_1 long, falls into C opposite or very slightly proximad of the M-fork base, R_1/R of Ukrainian specimen = 1.03–1.04; y longer than x, with 2–3 macrotrichia, x bare, $x/y = 0.77$ –0.97; CuA_1 slightly dented in the middle; CuA_2 smoothly arched; stCuA well recognizable, makes 0.66–1.00 x, stCuA/x of Ukrainian specimen = 0.61–0.85; $c = 0.66$ w, c/w of Ukrainian specimen = 0.75–0.77. Halter pale brown to yellow, with 10–15 black strong setae. **Legs.** Forelegs yellowish except only brown very base of fore coxae. Hindlegs pale brown with brown tarsus; hindtarsus black-brown from apical half of hindmetatarsus. Hindfemur = 1.1 mm; hindtibia = 1.4–1.5 mm; hindmetatarsus = 0.72 mm; hindtarsus = 1.55 mm. Trochanters blackened. Tibial organ of p_1 with yellowish long comb-like row of bristles (fig. 3). Meso- and hindtibia with two yellow spurs, which are a little longer than the diameter of the tibiae at the tip. Length of spur/width of tibia: $p_1 = 1.30$ –1.32, $p_2 = 1.62$ –1.77, $p_3 = 1.59$ –1.60. Length of metatarsus/length of tibia: $p_1 = 0.54$ –0.58, $p_2 = 0.58$ –0.59, $p_3 = 0.51$ –0.54. Tarsal claws small, without teeth. **Abdomen** brown, paler than thorax, with not rather short brownish setosity. **Hypopygium** (fig. 1) black-brown. Intergonocoxal area without differentiation or bristle group, only with short setae. Gonostylus (fig. 2) slightly clubby at the tip with a curved apical tooth, and thorny subapical setae basad of the tooth on the medial side of gonostylus reach its middle; gonostylar tip densely setose. Tegmen with subconical rounded apex and strongly sclerotised base. Aedeagus fairly long. Area of teeth narrow, teeth single-pointed (Johannsen, 1929; Tuomikoski, 1960; Mohrig & Menzel, 1993).

Bradysia forficulata belongs to the *B. pallipes* group which includes 36 Palearctic species, of which 6 are known only from the females. This species differs from the other species groups of *Bradysia* by the apically wide rounded, non-narrowed to pointed gonostylus with apical dark, dense, fur-like setae and a dense subapical group of spinose setae or short spines; medial side of gonocoxite often with long, strong setae that often extend to middle of genitalia and with 2 dense groups of setae on basal corner or with a group of strong setae or a lobe-like procession on inner membrane; sensory area on basal palpal segment with distinct margin in a deep pit; R and R_1 veins are usually long, joining C almost opposite or only slightly before the base of M-fork (Menzel & Mohrig, 2000;

Menzel & Heller, 2005). From the related species in this group, *B. forficulata* differs by the presence of only short setae on the intergonocoxal area, but the absence of the other differentiation or bristle groups on the ventral base of gonocoxite, and very long antenna in the cave-inhabiting form. *Bradysia forficulata* is similar to *B. pallipes* (Fabricius, 1787) in the structures of hypopygium, but differs by the width/length index of 4th flagellomere (in *B. pallipes* up to 2.8) and the body size (*B. pallipes* = 3.0–3.5 mm).

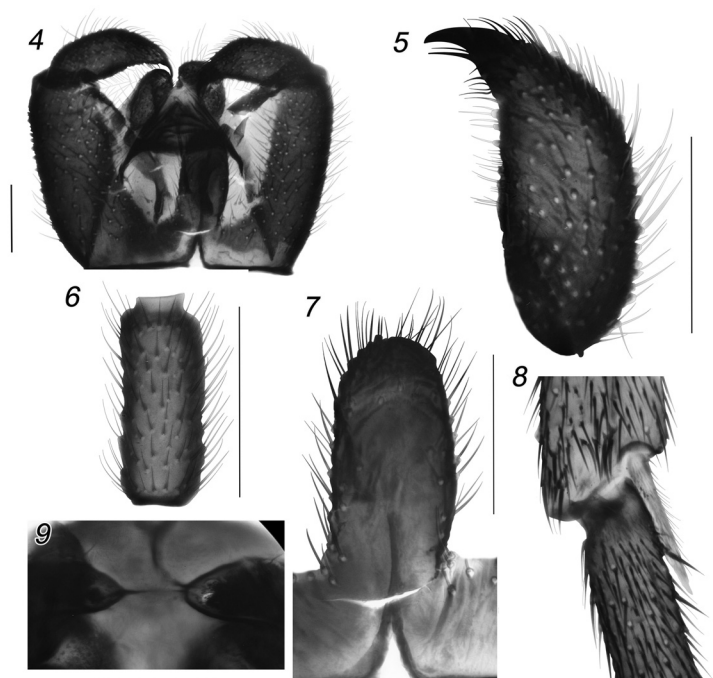
Note. Mohrig et al. (2013) stated that *B. forficulata* occurs in caves, woodlands, and agricultural habitats, and is also common in larger Central European caves. The cave-inhabiting form has unusually long flagellomeres in both sexes (4th flagellomere up to 5.0 times as long as wide), and the typical shape of male gonostylus (Mohrig et al., 2013). Johannsen (1929) also indicated that the cave specimens from Luray Cavern demonstrated antenna elongation: antenna length of specimens studied by him was about 0.8 of the wing length (Johannsen, 1929). In the other hand, the specimens described by Tuomikoski (1960) as '*Bradysia nocturna*' collected not in caves were characterized by distinctly shorter flagellomeres in both sexes (4th male flagellomere 3.0 times as long as wide). This tendency of extremities elongation of insects living in caves Mohrig with co-authors connected with darkness influence (Mohrig & Menzel, 1993; Mohrig et al., 2013). The Ukrainian male represents the '*B. nocturna* type' of *Bradysia forficulata*, which was collected in open area in the pine forest by sweeping over grasses and rotten pine trunks. Its antennae are not so long as those of the cave type, and has a similar width/length index of 4th flagellomere as described by Tuomikoski (1960).

Bradysia lobata Hondru, 1968 (figs 4–9)

Material examined. Ukraine, Ternopil Region: outskirts of Luchka, "Zapust" tract of Mykulyntsi forestry, 49.40547° N, 25.61313° E, ca. 350 m a. s. l., oak-hornbeam forest, old road on the bottom of wet ravine, sweeping, 07.05.2017, 1 ♂ (A. Babytskiy) (No. 185, UkrBIN-795882).

Distribution: Europe: Czech Republic, Germany, Ireland, Norway, Romania, Sweden, Ukraine (**first record**), United Kingdom (Gerbachevskaja-Pavluchenko, 1986; Heller & Menzel, 2017; GBIF, 2022 b; this study).

Diagnosis. Male adults reach 2.5–3.0 mm in length. **Head** black. Compound eyes black haired. Eye bridge (fig. 9) untypically narrowed in the middle, almost interrupted without any facets and only with thin sclerotized strip connecting the eye bridges between the antennal scapules. The ends of eye bridges near the constriction consist of 2 rows of ommatidia. Maxillary palpus yellowish-brown, 3-segmented, segments very short. Basal palpal segment spherical with sensory pit. Middle palpal segment bell-shaping, smaller than the 1st segment, with 4–5 setae. Terminal palpal segment small and elongated, with 5–6 setae. Antennae brown, 1.5–1.9 mm long. Flagellomeres with dense upward curving setae and short necks. The 4th flagellomere is 2.0–2.6 times as long as wide, length/width of 4th flagellomere of Ukrainian specimen (fig. 6) is 2.6, with a basal node index of 2.33. **Body** dark brown. **Thorax**. Notum setose. Posterior pronotum bare. Anterior pronotum with 4–6 setae. Scutum with short and weak acrostichal and dorsocentral setae. Scutellum with 3 thin setae. **Wing** is 2.3–2.8 mm long and 0.8–1.1 mm wide, width/length of wing = 0.37–0.39. Membrane yellowish-brown, without macrotrichia. Anterior and posterior veins distinct; stM longer than M_2 , stM/M-fork of Ukrainian specimen = 0.76–0.80; $R > R_1$, $R_1/R = 0.88–0.91$; R_1 with 6–7 macrotrichia, falls into C well before the base of M-fork; $x = 3.0 y$, x/y of Ukrainian specimen = 2.05–2.22, both bare; stCuA = 0.66 x, stCuA/x of Ukrainian specimen = 0.90–1.00; $c = 0.80 w$, c/w of Ukrainian specimen = 0.70. Halter yellowish-brown with 2 rows of 6–8 black setae. **Legs** brown, not clearly paler than thorax and abdomen. Forefemur = 0.6–0.7 mm; foretibia = 0.6–0.9 mm; foremetatarsus = 0.3–0.4 mm; foretarsus = 0.7–0.8 mm; midfe-



Figs 4–9. *Bradysia lobata* ♂: 4 — hypopygium, ventral view; 5 — gonostylus, ventral view; 6 — fourth flagellomere, lateral view; 7 — basal lobe, ventral view; 8 — anterior apex of fore tibia (p_1) with tibial organ, prolateral view; 9 — eye bridge, dorsal view. Scale 0.1 mm.

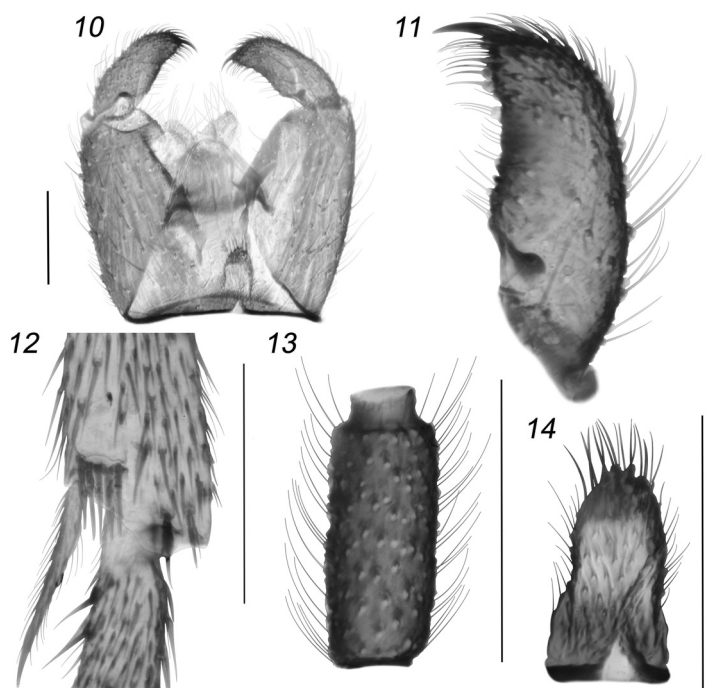
mur = 0.7–0.8 mm; midtibia = 0.7–1.0 mm; midmetatarsus = 0.3–0.5 mm; midtarsus = 0.7–0.9 mm; hindfemur = 0.7–1.0 mm; hindtibia = 0.9–1.2 mm; hindmetatarsus = 0.4–0.5 mm; hindtarsus = 0.8–1.0 mm. Tibial organ of p_1 (fig. 8) with comb-like row of 5–6 bristles. Length of spur/width of tibia: $p_1 = 1.24$, $p_2 = 1.20$ –1.31, $p_3 = 1.12$ –1.36. Length of metatarsus/length of tibia: $p_1 = 0.48$, $p_2 = 0.45$ –0.46, $p_3 = 0.43$. Tarsal claws without teeth. **Hypopygium** (fig. 4). Sclerotized parts black to dark brown, membranous parts light brown to dark yellow. Intergonocoxal area with a large tongue-shaped basal lobe reaching a half of gonocoxite length. Basal lobe (fig. 7) setose laterally and apically, with only scattered setae ventrally. Gonocoxite well developed, longer than gonostylus, covered with dense, dark setae. Gonostylus (fig. 5) relatively short, beak-shaped, with narrow apical tooth slightly longer than subapical spines. Tegmen triangular, with narrow truncated apex (Hondru, 1968).

Bradysia lobata belongs to the cognominal species group containing 7 Palearctic species which differ from the other groups of *Bradysia* in basal lobe, which overlaps the inner margin of gonocoxites. Basal lobe of these species is weaker sclerotized and additionally covered with finer bristles on the lobe surface, at least over apex. In addition, the gonostylar tooth is narrow, slightly longer than subapical spines (Menzel & Mohrig, 2000). *Bradysia lobata* differs from related species of the group by a very large intercoxal lobe and a specific structure of the eye bridge (see above).

Bradysia normalis Frey, 1948 (figs 10–14)

Material examined. Ukraine, Chernihiv Region: between Desna and Yevmyinka, swampy valley of Desna River, 50.84802° N, 30.79790° E, ca. 100 m a. s. l., swamp covered by sedges, *Caltha palustris* L. and scorched branches of willow and amorpha, sweeping, 09.07.2017, 1 ♂ (A. Babytskiy) (No. 258, UkrBIN-795951).

Distribution: Europe: Finland, Germany, Romania, Northern Ireland, Norway (mainland, Svalbard and Jan Mayen), Russia (North European part), Sweden, Ukraine



Figs 10–14. *Bradysia normalis* ♂: 10 — hypopygium, ventral view; 11 — gonostylus, ventral view; 12 — anterior apex of fore tibia (p_1) with tibial organ, prolateral view; 13 — fourth flagellomere, lateral view; 14 — basal lobe, ventral view. Scale 0.1 mm.

(**first record**), United Kingdom. North America: Canada (Ontario, Nova Scotia, Nunavut, Newfoundland, Labrador) (Gerbachevskaja-Pavluchenko, 1986; Heller, Menzel, 2017; GBIF 2022 c; this study).

Diagnosis. Male 1.3–2.1 mm long. **Head.** Eye bridge consisting of 2 rows of ommatidia. Face and clypeus pale brown to yellow, with pale setae. Maxillary palpus 3-segmented, all segments equally long. Basal palpal segment with 3 setae, one a little longer than others, and marginated sensory pit, not darker than palpal body. Flagellomeres with dense setosity; setae shorter than width of flagellomeres. The length/width of 4th flagellomere of the Chernihiv specimen (fig. 13) is 2.75, with a basal node index of 2.23–2.33. **Thorax** pale brown. Anterior pronotum and prothoracic episternum with a few weak and pale setae. Scutum with weak and pale acrostichal setae and stronger and darker dorsocentral setae. Scutellum with a few weak pale setae. **Wing** length 1.35–2.10 mm, width 0.65–0.67 mm, width/length index = 0.34–0.41. Membrane greyish. Anal lobe well-developed; M-fork the same length as stM or a little shorter; stM/M-fork of the Chernihiv specimen = 1.01–1.06; R_1/R = 0.75–0.79; x approximately equal y, x/y = 0.94–1.30, both bare; stCuA distinct, equal a half of x, $stCuA/x$ = 0.78–0.93; c/w = 0.60–0.61. Halter pale yellow, with up to 15 black strong setae. **Legs.** Foreleg pale brown, with darker tarsus and distal half of metatarsus, and dark spur. Tibial organ of p_1 (fig. 12) with dark brown, distinctly recognized comb-like row of 5 bristles. Meso- and hindtibia with two pale brown spurs, paler than spur of p_1 . Length of spur/width of tibia: p_1 = 1.43–1.44, p_2 = 1.70–1.72, p_3 = 1.45–1.65. Length of metatarsus/length of tibia: p_1 = 0.53, p_2 = 0.52, p_3 = 0.45–0.46. **Hypopygium** (fig. 10) pale brown. Intergonocoxal area with thumb-like large basal lobe completely covered with setae (fig. 14). Gonocoxite well developed, longer than gonostylus, covered with short and pale setae. Gonostylus (fig. 11) bean-shaped, pale brown, with long and narrow dark apical tooth and dense subapical group of lighter setae, shorter than the tooth. Tegmen trapezoid with roundish apex (Frey, 1948; Tuomikoski, 1960; Freeman, 1983).

Bradysia normalis belongs to the *B. lobata* group (see *B. lobata* diagnosis). From the related species of the group *B. normalis* differs in the structure of the intergonocoxal lobe and pale, marginated sensory pit.

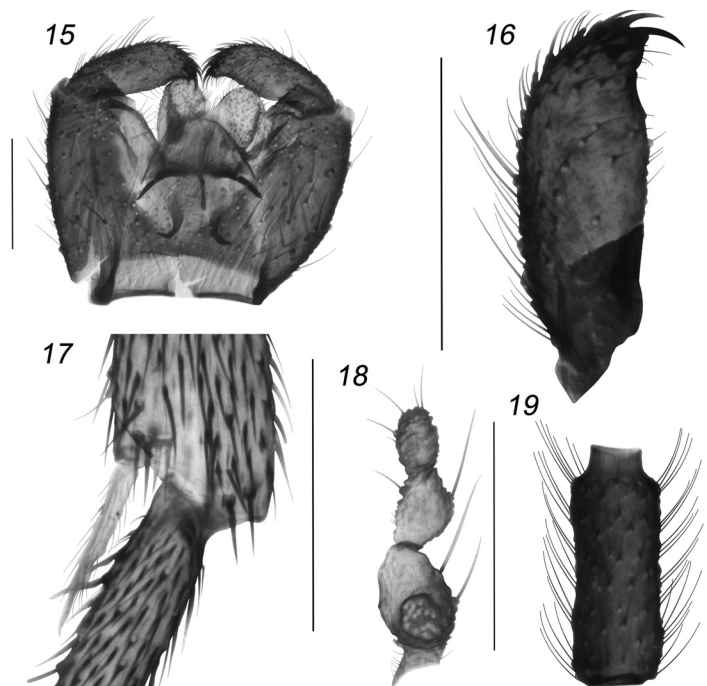
Note. Tuomikoski (1960) noted 3 rows of facets in the eye bridge. The studied specimen with the head seen in frontal view shows only 2 rows of ommatidia.

***Bradysia urticae* Mohrig & Menzel, 1992 (figs 15–19)**

Material examined. Ukraine, Ternopil Region: Mykulyntsi, 49.40126° N, 25.60140° E, ca. 300 m a. s. l., vegetable garden with potato and anion on the yard of detached house, Malaise trap, 19–21.06.2016, 1 ♂ (A. Babyskiy) (No. 114, UkrBIN-795827).

Distribution: Palaearctic: Austria, Bulgaria, Czech Republic, Germany, Russia (Central Altai, Taymyr Peninsula), Spain (mainland), Sweden, Ukraine (**first record**), United Kingdom. Nearctic: Canada (British Columbia, Ontario, Prince Edward Island, Quebec), USA (Virginia) (Mohrig & Menzel, 1992; Komarov, 2011; Heller & Menzel, 2017; GBIF, 2022 d; this study).

Diagnosis. Male adults reach 1.8 mm in length. **Head.** Eye bridge consisting of 2–3 rows of ommatidia (facets). The head of the Mykulyntsi specimen seen in frontal view and clearly has 2 rows of facets visible. Face with dense pale setae. Clypeus in the studied specimen with only 1 pale seta. Maxillary palpus 3-segmented (fig. 18). Basal palpal segment with deep sensory pit and 2–3 setae, one longer than others. Middle palpal segment short ovate, with ca. 5 long setae. Terminal palpal segment a little longer than the 2nd segment. Flagellomeres dark brown with well-separated necks and bristly setae (as long as segment width). The 4th flagellomere is 2.8 times as long as wide, length/width of 4th flagellomere of the Mykulyntsi specimen (fig. 19) is 2.73, with a basal node index of 2.31–2.39. **Thorax** brown. Mesonotum with black and strong central and lateral setae. Scutellum with 2 very long and strong and several shorter and thinner setae. **Wing** quite narrow, 1.5 mm long



Figs 15–19. *Bradysia urticae* ♂: 15 — hypopygium, ventral view; 16 — gonostylus, ventral view; 17 — anterior apex of fore tibia (p_1) with tibial organ, prolatral view; 18 — maxillary palpus, frontal view; 19 — fourth flagellomere, lateral view. Scale 0.1 mm.

and 0.6 mm wide, width/length of wing = 0.40–0.42. Membrane brownish, without macrotrichia. Anal lobe slightly developed. M-fork clearly diverging; stM indistinct, in the the Mykulyntsi specimen, stM/M-fork = 0.91–0.98; R_1 very short, falls into C well before the base of M-fork; R_1/R = 0.55–0.58; y shorter than x, both without macrotrichia, x/y = 1.49–1.56; stCuA relatively long and well recognizable, stCuA/x = 0.92–0.96; c = 0.66 w, c/w of = 0.60–0.63. Halter pale brown to yellow, with ca. 5 short black setae. **Legs** a little paler than thorax. Tibia, metatarsus and tarsus of foreleg concolor; in mid- and hindlegs tarsi and distal half of metatarsi a little darker than tibiae. Tibial organ of p_1 (fig. 17) with distinctly recognized comb-like row of 4 bristles. Length of spur/width of tibia: p_1 = 1.22–1.27, p_2 = 1.45–1.64, p_3 = 1.48–1.49. Length of metatarsus/length of tibia: p_1 = 0.52–0.53, p_2 = 0.47–0.49, p_3 = 0.47. **Abdomen** dark brown, almost concolor with thorax. **Hypopygium** (fig. 15). Intergonocoxal area without differentiation. Gonocoxite a little paler than thorax, well developed, longer than gonostylus. Gonostylus attenuated, with elongated and rounded tip (fig. 16). The 3–4 subapical spines long and unequal to each other, with shorter claw-like apical tooth on the ventral side (apical tooth indistinct, in some specimens very hard to detect). Tegmen trapezoid with truncate apex (Mohrig & Menzel, 1992).

Bradysia urticae belongs to the large *B. tilicola* group containing 34 Palearctic species, one of which is known only from a female. These species differ from the other *Bradysia* in trapezoid, membranous or weakly sclerotized tegmen with flattened apex and small, roundish, dark sensory area of basal palpal segment, located in a distinctly deep pit (Menzel & Mohrig, 2000; Menzel & Heller, 2005; Mohrig et al., 2013). *Bradysia urticae* is very similar to *B. trivittata* (Staeger, 1840), but differs, as a rule, by the darker colour of the body (darker forms of *B. trivittata* occur rarely) and shorter terminal palpal segments (3rd palpal segment of *B. trivittata* is clearly longer than the 1st and 2nd segment) (Mohrig & Menzel, 1992; Menzel & Mohrig, 2000).

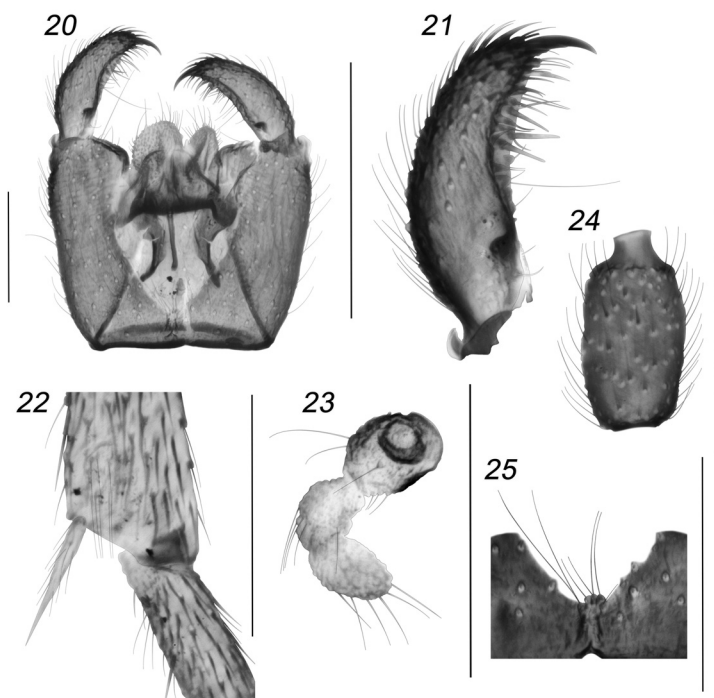
Lycoriella Frey, 1942

Lycoriella sativae (Johannsen, 1912) (figs 20–25)

Common synonyms: *L. castanescens* (Lengersdorf, 1940), *L. fucorum* (Frey, 1948), *L. agarici* Loudon, 1978.

Material examined. Ukraine, Odesa Region: Lebedivka, the bank of Black Sea, 45.82236° N, 30.14138° E, ca. 0 m a. s. l., sandy beach under cliff, with aspirator, 20.07.2016, 1 ♂ (A. Babytskiy) (No. 98, UkrBIN-795813); Ukraine, Ternopil Region: Mykulyntsi, 49.40126° N, 25.60140° E, ca. 300 m a.s.l., vegetable garden with potato and onion on the yard of detached house, Malaise trap, 19–21.06.2016, 1 ♂ (A. Babytskiy) (No. 116, UkrBIN-795828); Ukraine, Volyn Region: outskirts of Turiisk, 51.06994° N, 24.54540° E, ca. 170 m a. s. l., ecotone meadow with ruderal grasses between wet sedge meadow and hornbeam forest, sweeping, 05.07.2017, 1 ♂ (A. Babytskiy) (No. 303); Ukraine, Volyn Region: Turiisk, 51.07981° N, 24.52999° E, ca. 150 m a. s. l., vegetable garden and orchard on the yard of detached house, Malaise trap, 04–07.07.2017, 1 ♂ (A. Babytskiy) (No. 304).

Distribution: A common Holarctic species. Palearctic: Afghanistan, Austria, Bulgaria, China (Taiwan), Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Iceland, Iran, Ireland, Italy, Japan, Kazakhstan, Mongolia, Morocco, the Netherlands, Norway, Poland, Portugal (Azores and Madeira) Romania, Russia (European part, West Siberia (North Altai), Chukotka, Krasnoyarsk Region), Slovakia, Spain (Balearic and Canary Islands, Iberian Peninsula), Sweden, Switzerland, Turkmenistan, Turkey (Asian territory), Ukraine (**first record**), United Kingdom. Nearctic: Canada (British Columbia, Ontario, Prince Edward Island, Quebec), USA (Arizona, Hawaii, Idaho, Illinois, Kansas, New York, Oklahoma, Pennsylvania, Virginia). Outside of Holarctic region is known from Australia (Australian Capital Territory, Queensland, New South Wales, South Australia, Tasmania, Victoria), New Zealand, Tristan da Cunha Island, Norfolk Island, Subantarctic Islands (Loudon, 1978; Gerbachevskaja-Pavluchenko, 1986; Metzner & Menzel, 1996; Sataeva, 2006; Komarov, 2011; Mohrig et al., 2013, 2019; Menzel et al., 2013; Broadley et al., 2018; Menzel & Vilkamaa, 2021; GBIF, 2022 e; this study).



Figs 20–25. *Lycoriella sativae* ♂: 20 — hypopygium, ventral view; 21 — gonostylus, ventral view; 22 — anterior apex of fore tibia (p_1) with tibial organ, prolateral view; 23 — maxillary palpus, frontal view; 24 — fourth flagellomere, lateral view; 25 — intergonocoxal setae group, ventral view. Scale 0.1 mm.

Diagnosis. Male adults reach 2.0–2.6 mm in length. **Head** dark brown to black. Compound eyes with interfacetal hairs, as frequent as facets and extending one facet width beyond outer curvature of facets. Eye bridge consists of 2 or 3 rows of ommatidia (2 rows on Ukrainian specimens). Face with fine 18–28 setae, arranged approximately radially. Clypeus with 2 to 3 median setae and 2 lateromedian setae. Maxillary palpus (fig. 23) relatively short, 3-segmented. Basal palpal segment clavate, with deepened sensory pit and 4 to 7 setae dorsally, 2 or 3 of them significantly longer than others. Middle palpal segment ovate and 0.66 times as long as the other two, with four to five not long setae. Terminal palpal segment slender, cylindrical and subequal in length to basal segment, with 6 to 8 setae. Antennae 1.47 mm long and dark brown to black. Scape dark, with 5 to 6 setae placed ventrally. Pedicel dark. The 4th flagellomere is 2.50 times as long as wide with whitish yellow to brown setae 0.66 times as long as flagellomere width; length/width of the 4th flagellomere of Ukrainian specimen (fig. 24) = 2.43–2.47, with a basal node index of 1.59–1.62. Flagellomere neck 0.2 of its length; sharply delimited. **Thorax** dark brown to black, with whitish yellow to brown setae. Posterior pronotum bare. Anterior pronotum with one weak seta. Mesonotum sparsely setose, with few lateral, central and scutellar setae; marginal part of mesonotum blackened. Scutellum with long and short setae arranged symmetrically, subapical setae make 0.75 of scutellum medial length. Episternum with 9–10 setae anteriorly. **Wing** is 1.4–1.9 mm long and 0.5–0.7 mm wide, width/length of wing = 0.35–0.42. Membrane pale to slightly brown. Posterior veins distinct and like the wing membrane without macrotrichia. M-fork well developed and wide open, about as long as the stM, M_1 and M_2 only slightly diverging, M_1 more arcuated than M_2 ; stM/M-fork = 0.80–0.91; R_1 short, makes 0.33 R, and falls into C far before the base of M-fork, R_1/R of Ukrainian specimens = 0.44–0.65; x equal to y or $x = 1.5 y$, both bare, x/y of Ukrainian specimens = 1.58–1.82; stCuA short, makes 0.50–0.66 x, stCuA/x of Ukrainian specimens = 0.55–0.73; c = 0.60 w, c/w of Ukrainian specimens = 0.67–0.69. Halter yellow to pale brown with row of 9 to 11 dorsal setae. **Legs** yellow to pale brown. Tibial organ of p_1 (fig. 22)

marginated, with sparse patch of bristles. Mid- and hindtibia with 2 equals in length spurs. Length of spur/width of tibia: $p_1 = 1.09\text{--}1.16$, $p_2 = 1.10\text{--}1.28$, $p_3 = 1.20\text{--}1.31$. Length of metatarsus/length of tibia: $p_1 = 0.51\text{--}0.56$, $p_2 = 0.44\text{--}0.49$, $p_3 = 0.44\text{--}0.52$. Tarsal claws without teeth. **Abdomen** lighter than thorax, but distinctly browned. **Hypopygium** (fig. 20) about as tall as wide, pale to dark brown. Intergonocoxal area (fig. 25) with central dentate group of 6–7 setae. Gonocoxite yellow to pale brown, with short setae in the inner side. Gonostylus (fig. 21) evenly rounded on the outer side, tapered apically and with a strong, dark apical tooth; inner side more or less cut out and to 0.50–0.66 of the upper surface covered with usually 4 to 6 diverging spines. Tip and ventral inner edge of gonostylus densely setose, setae particularly strong above and below the apical tooth; long upward whiplash seta present on the lower third of the gonostylar inner side (fig. 21). Tegmen weakly sclerotized, broader than high with flat rounded tip. Aedeagus fairly long. Area of teeth large, about as high as wide, with single-pointed teeth (Johannsen, 1912; Loudon, 1978; Menzel & Mohrig, 2000).

According to Vilkamaa & Menzel (2019) and Menzel & Vilkamaa (2021), *Lycoriella* includes 39 species in the Palearctic Region. *Lycoriella sativae* is a very variable species with different variants of colour (dark and light forms), setosity, location of intergonocoxal setae, quantity and direction of gonostylar spines. This variation caused that different morphs of *L. sativae* were described as separate species. Now almost all of them have been synonymized (Menzel & Mohrig, 2000; Mohrig et al., 2013). The most reliable characters to recognize *L. sativae* are the intergonocoxal basal group of setae and gonostylar structure. *Lycoriella sativae* is a common pest in greenhouses and mushroom hothouses, where it breeds in the various agricultures, and thus having a considerable economic importance (Broadley et al., 2018). In Ukraine, the harmful impact of this species to the agriculture is unregistered because of the poor study of the local sciarid fauna (Babytskiy et al., 2019 a, 2022). *Lycoriella sativae* has cosmopolitan distribution and is widespread in the Holarctic (Mohrig et al., 2013). In Ukraine, it is registered mainly in anthropogenic ecosystems as vegetable gardens in Ternopil and Volyn Regions. Also, one specimen was collected on the sandy beach of Black Sea bank in Odesa Region. Frey (1948) indicated that adults of this species were collected in mass from seaweed at the sea edge on the Swedish coast. The information about this species development as a hydrophilic and saprophagous with enormous flood tolerance is given in Metzner & Menzel (1996) with reference to Fritz (1982). Thus, the wet and overflow habitats as a coastal seaweed overgrowth can be considered as favourable for *L. sativae*.

We consider it our pleasant obligation to express sincere gratitude to our colleagues and friends, who supported our work, among them, Valery Korneyev (I. I. Schmalhausen Institute of Zoology NAS of Ukraine, Kyiv, Ukraine) for his ongoing help, scientific guidance and valuable advice, and Frank Menzel (Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany) for his kind help in identification of the specimens. We also thank two anonymous reviewers for their valuable comments.

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Received 11 October 2022

Accepted 24 November 2022