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NEW RECORDS OF *BRADYSIA* SPECIES (DIPTERA, SCIARIDAE) FROM UKRAINE

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New Records of *Bradysia* Species (Diptera, Sciaridae) from Ukraine. Babytskiy, A. I., Bezsmertna, O. O., Moroz, M. S., Pavliuk, S. D., Honcharenko, B. V. — Five species of black fungus gnats of the genus *Bradysia* Winnertz, 1867, *B. brevispina* Tuomikoski, 1960, *B. microspina* Mohrig & Krivosheina, 1989, *B. cinerascens* (Grzegorzek, 1884), *B. angustocularis* Mohrig & Krivosheina, 1989 and *B. polonica* (Lengersdorf, 1929) are recorded from Ukraine for the first time. Distributions of these species are summarized and diagnoses of the species are provided.

Key words: Sciaroidea, Sciaridae, black fungus gnats, distribution, morphology.

Introduction

Bradysia Winnertz, 1867 is one of the species richest genera in the family Sciaridae (black fungus gnats). *Bradysia* species are very variable in size and this genus includes both small to large species (2–7 mm in body length). These sciarids are widespread in the world and occur in all regions of the Earth except the Arctic and Antarctica. In temperate regions, they most often inhabit shaded forests and wet meadows. Their larvae feed on plant remains permeated by fungal hyphae and play an important role as detritophages, facilitating the decay of wood and decaying leaf-litter. However, some *Bradysia* species can develop as synanthropes and belong to the dangerous pests, especially for crops in greenhouses (Babytskiy, Moroz et al., 2019).

In the last revision of black fungus gnats by Menzel & Mohrig (2000) 262 *Bradysia* species were recorded from the Palaearctic Region. The European sciarid fauna currently includes 171 described *Bradysia* species (Menzel & Heller, 2013). The *Bradysia* diversity of Ukraine remains poorly studied. In the literature, only 15 *Bradysia* species have been recorded in Ukraine from one or two localities by far. Basically, 5 species were recorded from Crimea (Bukowski & Lengersdorf, 1936): *B. alpicola* (Winnertz, 1867), *B. placida* (Winnertz, 1867), *B. nervosa* (Meigen, 1818), *B. vernalis* (Zetterstedt, 1851), and *B. fungicola* (Winnertz, 1867). Four species were recorded from Transcarpathia (Krivosheina, Mohrig, 1986; Mohrig et al., 1989 a, b): *B. alpicola* (Winnertz, 1867), *B. fungicola* (Winnertz, 1867), *B. longispina* Mohrig & Mamaev, 1989, and *B. leucopeza* Mohrig & Mamaev, 1989. Two species are registered from “Galicia” by Nowicki (1864): *B. bicolor* (Meigen, 1818) and *B. nitidicollis* (Meigen, 1818). Winnertz (1868) recorded two species from “Podolia”: *B. vagans* (Winnertz, 1868) and *B. procera* (Winnertz, 1868). *Bradysia pilistriata* Frey, 1948 has been recorded as a serious pest of mushrooms in Odesa Region (Nepomyashcha & Uzhevskaya, 2010), but the identification of this species needs confirmation. Additional three species were listed in the literature without specified localities: *B. fenestralis* (Zetterstedt, 1838), *B. rufescens* (Zetterstedt, 1852), and *B. trivittata* (Staeger, 1840) (Gerbachevskaja-Pavluchenko, 1986).

There is no consensus among researchers on the systematic position and the number of species of the genus *Bradysia*. In this paper, we follow Menzel & Mohrig’s (2000) concept of *Bradysia* sensu lato, which includes 20 species groups.

This article continues the series of papers presenting the first records of the sciarids from Ukraine (Babytskiy, Zuieva et al., 2019) and shows 5 species of the genus *Bradysia* previously unknown here.

Material and methods

Material was collected during expeditions and excursions from 2013 to 2018. Adult males were collected with a Malaise trap, by sweep-netting, or with an aspirator directly from the substrate. Collected gnats were kept in 5 ml vials with 70 % ethanol. During the preparation in the laboratory, they were dehydrated in absolute ethanol and mounted on slides in Euparal.

The morphology was studied with MBS-9 and Biolam D11 microscopes equipped with Nikon D90 camera; images processed using NKRemote Version 2.2.1, AxioVision Version 4.6.3 and Photoshop CC 2018 programs; pictures stacked by Helicon Focus 6.7.1 open source software.

All of the studied material is kept in Andriy Babytskiy’s private collection, Kyiv (PABK) and mostly deposited to the public on the Ukrainian Biodiversity Information Network, UkrBIN (Babytskiy, 2018). Individual catalogue numbers of the vouchers in the UkrBIN are given (e. g., UkrBIN-795774). There are also the PABK collection numbers are provided to all of the specimens (e. g., No. 225). The nomenclature and systematics follow the revision of Palaearctic Sciaridae (Menzel & Mohrig, 2000). Diagnoses of the discussed species are generally based on examined specimens from Ukraine, in consideration of the keys, original descriptions, and re-descriptions by Menzel & Mohrig (1997, 2000), Mohrig et al. (1989 a, b), Freeman (1983), Tuomikoski (1960), Frey (1948), Lengersdorf (1928–1930) and Grzegorzek (1884).

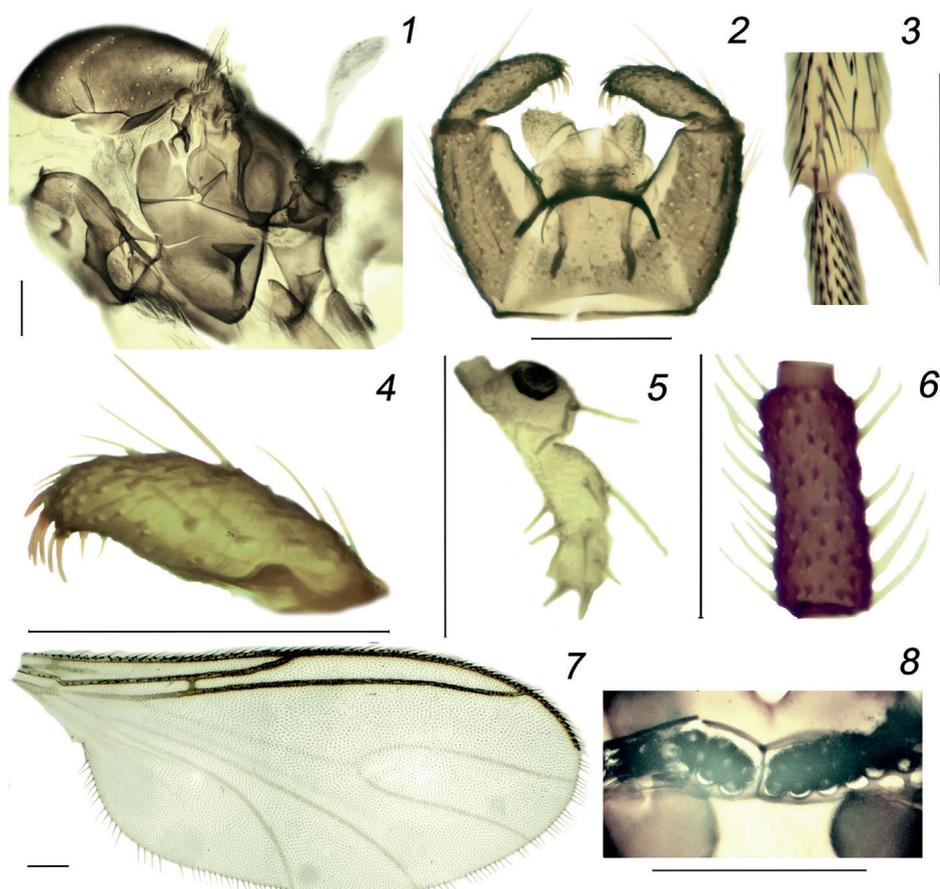
Results

Bradysia brevispina Tuomikoski, 1960 (figs 1–8)

Material examined. Ukraine, Volyn Region: outskirts of Sokyrychi, Kivertsi National Park “Tsumanska Pushcha”, 50.87516 N, 025.51393 E, ca. 210 m a. s. l., hornbeam forest with an admixture of pine and old larches, 28.06.2017, 1 ♂, leg. A. Babytskiy (No. 225, UkrBIN-795922).

Distribution: Austria, Bulgaria, Czech Republic, Denmark (mainland), Finland, French (mainland), Germany, Italy (mainland), Lithuania, Norway (mainland), Slovenia, Spain (mainland, Balearic Is.), Sweden, Switzerland, The Netherlands (Menzel & Heller, 2013), Kazakhstan (Sataeva, 2006), Ukraine (**first record**), and United Kingdom (Menzel et al., 2006). Also known from Romania, northern European Russia (Gerbachevskaja-Pavluchenko, 1986), and West Siberia (Altai Region) (Komarova, 2003).

Diagnosis. Eyes clearly hairy. Eye bridge consists of 2–3 rows of ommatidia (facets), on the side of the eye 12 facet rows present (fig. 8). Maxillary palp dirty yellow, consists of 3 palpomeres. Basal palpomere with only 1 subapical, strong seta or with 1 extra short seta (fig. 5). Sensory area dark, in deep pit, sharply framed on all circle. Flagellum 1.2 mm in length, the 4th flagellomere 2.5 times as long as thick; the neck $\frac{1}{8}$ – $\frac{1}{7}$ of the body length (fig. 6). The length of the longest setae 2 times exceeds the thickness of the flagellomere body (fig. 6). Thorax and abdomen black. All setosity of notum (dorsal exoskeleton of



Figs 1–8. *Bradysia brevispina*, male: 1 — thorax, lateral view; 2 — hypopygium, ventral view; 3 — anterior apex of fore tibia (t_1) with tibial organ, lateral view; 4 — gonostylus, ventral view; 5 — maxillary palp, lateral view; 6 — fourth flagellomere, lateral view; 7 — wing; 8 — eye bridge, frontal view. Scale bars: 0.10 mm.

the thorax) yellowish-white, including the longer notopleural and 2 long scutellar setae (fig. 1). Abdomen quite long, sparsely and pale setose. Legs pale brown, but forelegs paler, yellowish. Spurs of t_2 and t_3 1.5 times as long as width of the end of tibiae. The length of femur 3 = 0.65 mm, tibia 3 = 0.80 mm, tarsus 3 = 0.75 mm, metatarsus 3 = 0.35 mm. Wing wide, 1.7 mm in length. Wing membrane glassy, with very weakly colored hind veins, $c/w = 0.7-0.8$, subcostal vein short, $R_1/R = 0.5$, R_1 falling into C at the middle of the wing clearly in front of the base of M-fork; R_5 ventrally naked or almost naked, ends before the top of M_2 and roughly opposite the border between the 2nd and 3rd thirds of M_1 ; y naked or almost naked; M-fork almost equally wide, $stM/M\text{-fork} = 1$; $stCuA$ weakened, $stCuA/x = 0.5$ (fig. 7). Halter pale yellow (fig. 1). Hypopygium dark, pretty narrow; ventral base of gonocoxites U-shaped, with short marginal setae in the proximal part, the rest of the margin glabrous (fig. 2). Gonostylus elongate with short and strong, bluntly pointed apical tooth and subapical group of slightly curved hyaline spines, at least 2 times as long as tooth (fig. 4) (Tuomikoski, 1960).

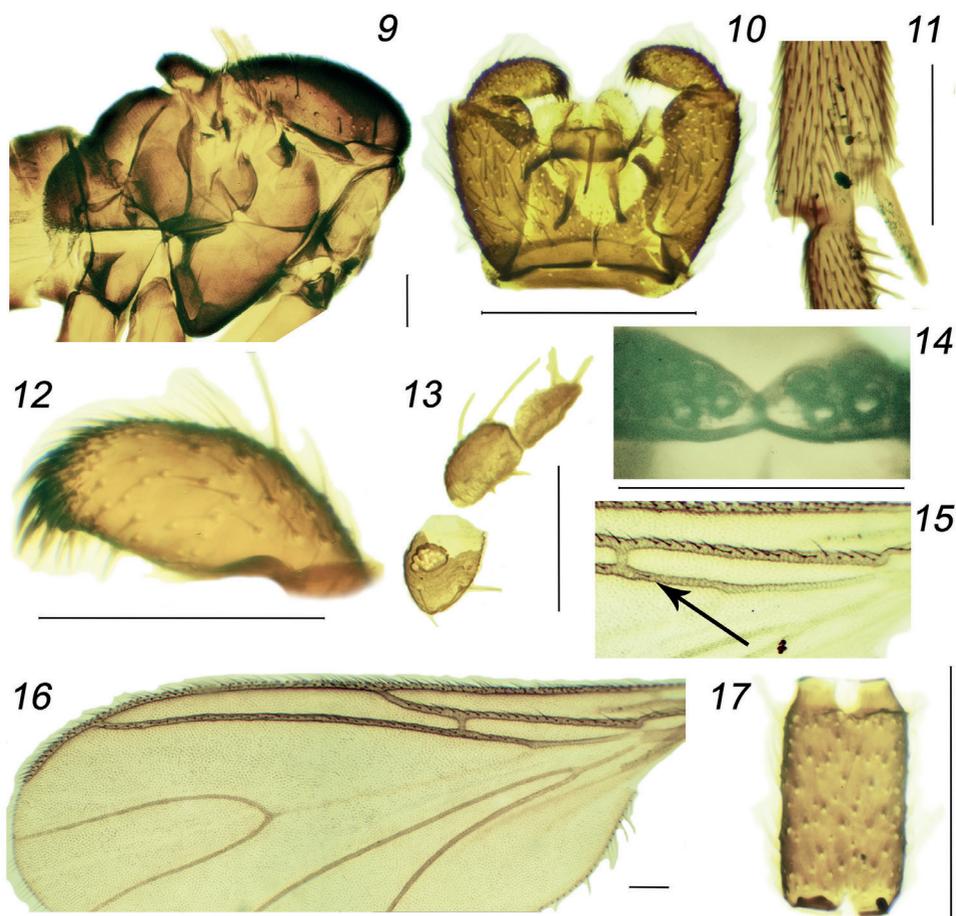
Bradysia brevispina belongs to the large *B. tilicola* group contains 32 species, which differ from the other *Bradysia* by trapezoid, membranous or weakly sclerotized tegmen with flattened apex and small, roundish, dark sensory area of basal palpomere, located in a distinctly deep pit (Menzel & Mohrig, 2000; Menzel & Heller, 2005). From the other

species of this species group *B. brevispina* differs by dark thorax and abdomen, yellow-white halteres and body setosity, the value of the 4th flagellomere length/width index 2.5 and by the structure of hypopygium (U-shaped ventral base of gonocoxites and elongate gonostylus with short and strong, bluntly pointed apical tooth, and subapical group of slightly curved spines, at least 2 times as long as tooth).

Note. Tibial organ of t_1 in present specimen consists of 6 pale setae in comb-like row (fig. 3). Studied male imago 1.8 mm in length, wing 1.3 mm in length and 0.6 mm in width, y bare (fig. 7). Biometric indexes of studied specimen: width/length of wing = 0.46; stM/M-fork = 1.04–1.05; R_1/R = 0.75–0.78; x/y = 1.36–1.38; stCuA/x = 0.65–0.67; c/w = 0.69–0.72. Length of spur/width of tibia: leg 1 = 1.46–1.51, leg 2 = 1.74; leg 3 = 1.25–1.40. Length of metatarsus/length of tibia: leg 1 = 0.50–0.51, leg 2 = 0.49, leg 3 = 0.50. Length of tibia 3/length of thorax 0.73.

***Bradysia microspina* Mohrig & Krivosheina, 1989 (figs 9–17)**

Material examined. Ukraine, Poltava Region, Velyki Budyshcha, 49.85513 N, 034.58102 E, ca. 170 m a. s. l., on a bus window, collected with aspirator, 17.09.2015, 1 ♂, leg. A. Babytskiy (No. 103, UkrBIN-795817).



Figs 9–17. *Bradysia microspina*, male: 9 — thorax, lateral view; 10 — hypopygium, ventral view; 11 — anterior apex of fore tibia (t_1) with tibial organ, lateral view; 12 — gonostylus, ventral view; 13 — maxillary palp, lateral view; 14 — eye bridge, frontal view; 15 — 1 distal macrotrichia on y (black arrow shows); 16 — wing, dorsal view; 17 — fourth flagellomere, lateral view. Scale bars: 0.10 mm.

Distribution: Tajikistan (Mohrig et al., 1989b), Ukraine (**first record**).

Diagnosis. Male imagoes reach 2 mm in length. Eye bridge consists of 2–3 rows of ommatidia (fig. 14). The 4th flagellomere barely twice as long as wide, with a very short neck and short setose (significantly shorter than the flagellomere width, fig. 17). Maxillary palp consists of 3 palpomeres. Basal palpomere (p_1) big with clearly deepened sensory pit and 3 setae (one longer and stronger than the others); p_2 and p_3 together slightly longer than p_1 (fig. 13). Thorax, gonocoxite and legs almost the same dark color. Mesonotum quite coarse and dark setose, with very strong lateral and 2 scutellar setae (fig. 9). Wing slightly brown; c longer than a half of w ; y shorter than a half of x , with 1–2 macrotrichia; M-fork very short; posterior wing veins indistinct (fig. 16). Hypopygium short, dark and heavily setose (fig. 10). Gonostyli relatively small with weak and dorsal strong setae — claw-like dorsal spines, 7–9 loosely standing coarse subapical setae and 2–3 loosely standing awl shaped setae on the end of the apical third (fig. 12). Tegmen wider than its length, with a large field of multi-tipped teeth (Mohrig et al., 1989).

Bradysia microspina is a small species with very small dorsal spines, which are similar to those of *B. nitidicollis* (Meigen, 1818). From *B. nitidicollis* it differs by the much smaller dorsal spine, pressed setosity of flagellomeres and well distinguished shorter M-fork (Mohrig et al., 1989 b).

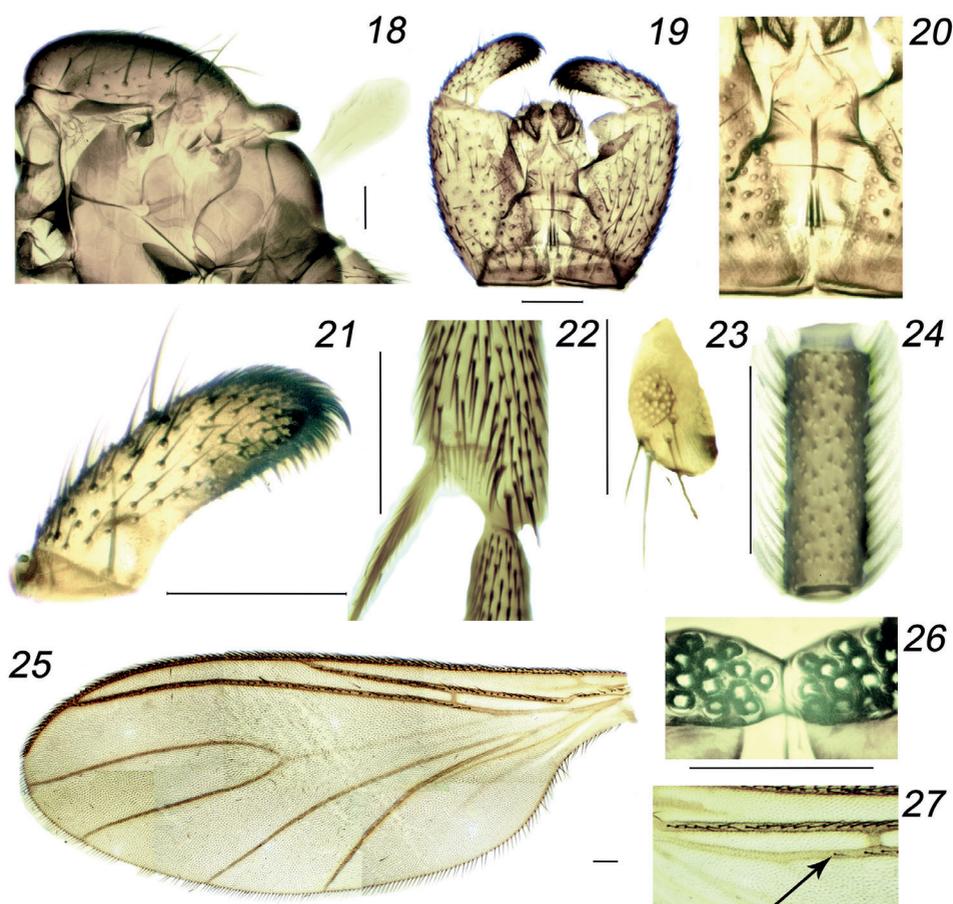
Note. The length of y in the studied specimen exceeds a half of length of x , which does not agree with the original description (see above). Tibial organ of t_1 in present specimen consists of 6 setae in comb-like row (fig. 11). Studied male imago 2.3 mm long, wing 1.8 mm long and 0.7 mm wide, y of one wing with 5 macrotrichia (fig. 16), but the other wing bears only 1 macrotrichia on y (see black arrow on fig. 15). Biometric indexes of studied specimen: width/length of wing = 0.41; stM/M -fork = 1.05–1.07; R_1/R = 0.48–0.55; x/y = 1.41–1.47; $stCuA/x$ = 0.66–0.67; c/w = 0.61–0.62. Length of spur/width of tibia: leg 1 = 1.14–1.22, leg 2 = 1.32–1.36; leg 3 = 1.25–1.38. Length of metatarsus/length of tibia: leg 1 = 0.49–0.50, leg 2 = 0.45–0.49, leg 3 = 0.44–0.46. Length of tibia 3/length of thorax 1.24–1.25.

Bradysia cinerascens (Grzegorzek, 1884) (figs 18–27)
= *Bradysia lanicauda* Tuomikoski, 1960

Material examined. Ukraine, Lviv Region, outskirts of Stare Selo, 49.21899 N, 024.40241 E, ca. 340 m a. s. l., beech forest, on a forest road near a glade with beech undergrowth and blackberry, sweeping, 13.08.2016, 1 ♂, leg. A. Babytskiy (No. 88, UkrBIN-795805); Ukraine, Volyn Region, outskirts of Klubochyn, Kivertsi National Park “Tsumanska Pushcha”, 50.96447 N, 025.77727 E, ca. 210 m a. s. l., hornbeam forest with birch admixture, plot with 3 trees of *Betula obscura* A. Kotula, sweeping above the grass and undergrowth, 27.06.2017, 1 ♂, leg. A. Babytskiy (No. 198, UkrBIN-795895); Ukraine, Volyn Region, outskirts of Klubochyn, Kivertsi National Park “Tsumanska Pushcha”, 50.96230 N, 025.83071 E, ca. 210 m a. s. l., hornbeam-oak forest, sweeping above the grass and undergrowth and around the rotten trunks, 27.06.2017, 1 ♂, leg. A. Babytskiy (No. 207); Ukraine, Cherkasy Region, outskirts of Vyhraiv, the left bank of Ros River, 49.42680 N, 031.13279 E, ca. 120 m a. s. l., coastal forest with pine, alder and *Acer negundo* L. as dominants with admixture of hawthorn, pear and poplar, sweeping, 14.07.2016, 1 ♂, leg. A. Babytskiy (No. 126, UkrBIN-795835).

Distribution: Austria, Czech Republic, Finland, Germany, Greek (mainland), Hungary, Ireland, Italy (mainland), Latvia, Poland, Portugal (mainland), Slovakia, Spain (mainland), Sweden, Switzerland, The Netherlands (Menzel & Heller, 2013), Romania (Gerbachevskaja-Pavluchenko, 1986), Ireland and United Kingdom (Menzel et al., 2006), Ukraine (**first record**). Also known from Russia: Central European part (Menzel & Heller, 2013), northern European part (Gerbachevskaja-Pavluchenko, 1986), West Siberia (Altai Region) (Komarov, 2011).

Diagnosis. Very dark species, with paler halteres and legs. Eye bridge consists of 3–4 rows of ommatidia (fig. 26). Four facial setae strong and long, also several shorter setae on the sides. The low part of the face iridescent pale-gray. Antenna black-brown, its length 2.1 mm and reach $\frac{3}{4}$ of the body length. The setae on the flagellum do not exceed $\frac{1}{3}$ of the flagellomere diameter (Tuomikoski, 1960). Flagellomeres 1.5–2.0 times as long as thick, with



Figs 18–27. *Bradysia cinerascens*, male: 18 — thorax, lateral view; 19 — hypopygium, ventral view; 20 — base of hypopygium with basomedial group of bristles on inner membrane, ventral view; 21 — gonostylus, ventral view; 22 — anterior apex of fore tibia (t_1) with tibial organ, lateral view; 23 — basal palpomere of maxillary palp, lateral view; 24 — fourth flagellomere, lateral view; 25 — wing, dorsal view; 26 — eye bridge, frontal view; 27 — medial macrotrichia on y of specimen no. 207 (black arrow shows). Scale bars: 0.10 mm.

gray pubescence (Grzegorzek, 1884). The 4th flagellomere about 2.5 times as long as thick (Tuomikoski, 1960). Maxillary palp black-brown, consists of 3 palpomeres. Basal palpomere (p_1) with one long subapical seta and 3 shorter setae (fig. 23); p_3 long. Thorax black. Notum with black setae (fig. 18). Scutum black with three rows of streaky black-brown or black-gray, short setae and longer black-brown setae on the sides. Scutellum with 2 (4) longer black-brown setae on the top. Abdomen matt black-brown, black setae. Legs pitchy-brown, with paler femur and darker tarsi. The length of femur 3 = 1.30 mm, tibia 3 = 1.75 mm, tarsus 3 = 1.95 mm, metatarsus 3 = 0.90 mm. Wing 3.2 mm in length; membrane bright-gray, veins brown. Membrane and posterior veins without macrotrichia; R_1 long, falling into C in front of the M-fork base; $c/w = 0.75$, R_s joins C a bit before the end of M_2 ; stM weak, but recognizable, slightly longer than M_1 ; M-fork straight, equally wide; $stCuA/x = 0.67$ (fig. 25). Gonocoxite ventrally marginal fine, long and dense setose, partly with pale setae (on both inner sides of the cleavage, fig. 19). Base of hypopygium with a basomedial group of strong setae on inner membrane, consist with 7 setae (fig. 20). Gonostylus apically wide rounded, with apical dark, fur-like, dense setae, dense subapical group of spinose setae and claw-like tooth on the apex (fig. 21).

Bradysia cinerascens belongs to the large *B. pallipes* group containing 32 species, which differ from the other species groups of *Bradysia* by apically wide rounded, not narrowed to a point gonostyles with apical dark, dense, fur-like setae and dense subapical group of spinose setae or short spines; inner side of gonocoxites mostly 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 lobe-like procession on inner membrane; sensory area on basal palpomere with distinct margin in a deep pit; R and R₁ veins usually long, joining C almost opposite or only slightly before the base of M-fork (Menzel & Mohrig, 2000; Menzel & Heller 2005). The shape of gonostylus and structures on the apex of *B. cinerascens* are similar to *B. confinis* (Winnertz, 1867) from the *B. rufescens* group (Frey, 1948; Tuomikoski, 1960), but they differ ventrally in the setosity of inner margin of gonocoxites and the intergonocoxal differentiation at the base of hypopygium (*B. cinerascens*: hypopygium short setose on inner margin of gonocoxites and with a basomedial group of setae on inner membrane; *B. rufescens*: hypopygium with long, strong setae on inner margin of gonocoxites and a sclerotized basal lobe, which only has coarse setae on the margin). *Bradysia cinerascens* differs also from *B. confinis*, by presence of more than 4 long, strong scutellar setae that differs all species of *B. pallipes* group from *B. rufescens* species, the last ones bear only 2 strong marginal setae on scutellum. Moreover, *B. cinerascens* is larger in body size, with broader genitalia and narrower gonostyli.

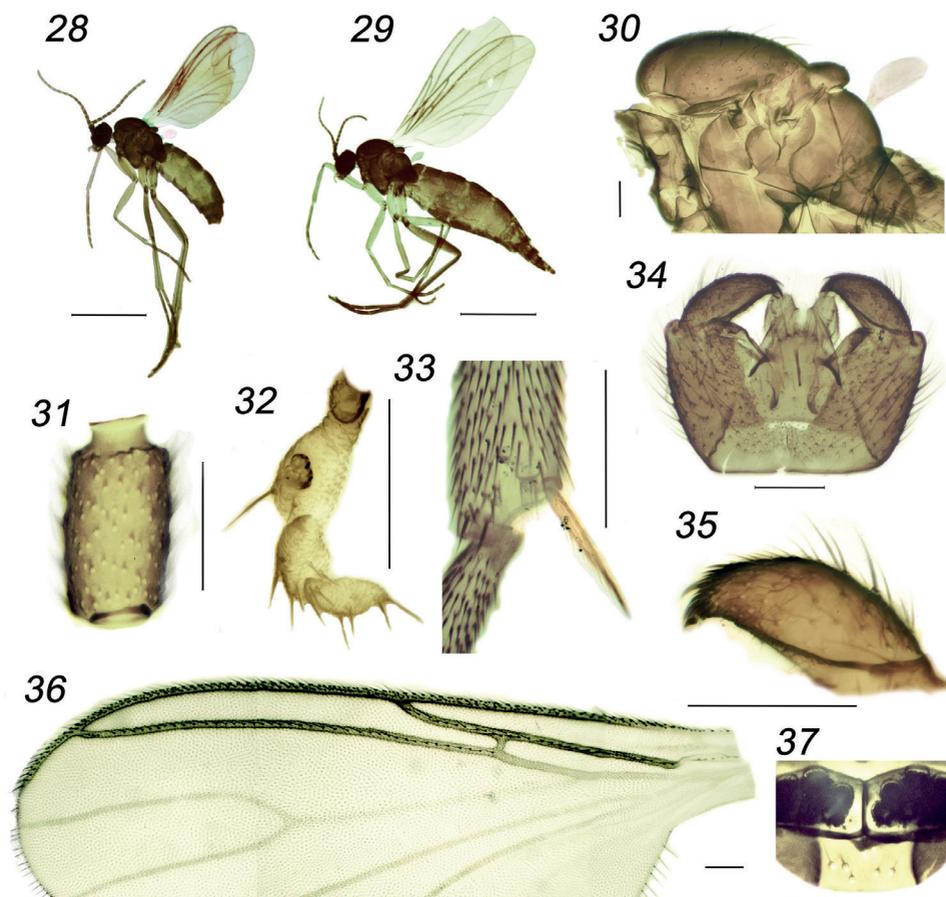
Note. Tibial organ of t₁ in present specimens consists of ca. 10 setae in comb-like row (fig. 22). Studied male imagoes reach 3.0–3.2 mm in length, wing 2.3–2.8 mm long and 0.9–1.1 mm wide; y bears 2–5 macrotrichia (sometimes 1 macrotrichia present in the middle of almost bare y, far before the neighbor macrotrichia, black arrow shows on fig. 27). Grzegorzec indicated in the original description that the flagellomeres are 1.5–2.0 times as long as thick, Tuomikoski in his redescription noted the value of the 4th flagellomere length/width index as 2.5, but in studied specimens this index was ca. 3.2 (fig. 24). The length of the setae on the studied flagella exceeds a half of flagellomere width that disagrees with Tuomikoski's statement (see description above). Biometric indexes of studied specimens: width/length of wing = 0.38–0.41; stM/M-fork = 0.80–0.90; R₁/R = 1.07–1.29; x/y = 1.02–1.48; stCuA/x = 0.53–0.89; c/w = 0.67–0.72. Length of spur/width of tibia: leg 1 = 1.49–1.86, leg 2 = 1.90–2.14; leg 3 = 1.79–2.11. Length of metatarsus/length of tibia: leg 1 = 0.57–0.60, leg 2 = 0.56–0.59, leg 3 = 0.50–0.52. Length of tibia 3/length of thorax 1.31–1.41.

Bradysia angustocularis Mohrig & Krivosheina, 1989 (figs 28–37)
= *Bradysia luteocoxa* Mohrig & Krivosheina, 1989

Material examined. Ukraine, Volyn Region, Turiisk, 51.079814 N, 024.530391 E, ca. 190 m a. s. l., country yard of private house, near the living trunk of *Juglans regia* L. with the remains of a rotten branch, collected with aspirator, 03.05.2015, 2 ♂, leg. A. Babytskiy (No. 154-5, UkrBIN-795853-4); Ukraine, Volyn Region, Turiisk, 51.079814 N, 024.530391 E, ca. 190 m a.s.l., wet weather, country yard of private house, near the living trunk of *J. regia* in the remains of a rotten branch, collected with aspirator, 01.05.2015, 4 ♂, 1 ♀, leg. A. Babytskiy (No. 156-7, UkrBIN-795855-6); Ukraine, Volyn Region, Turiisk, 51.079814 N, 024.530391 E, ca. 190 m a. s. l., country yard of private house, near the living trunk of *J. regia* with the leavings of the rotten branch, collected with aspirator, 04.05.2015, 2 ♂, 2 ♀, leg. A. Babytskiy (No. 161, UkrBIN-795860); Ukraine, Volyn Region, Turiisk, 51.079814 N, 024.530391 E, ca. 190 m a. s. l., country yard of private house, near the living trunk of *J. regia* in the remains of rotten branch, collected with aspirator, 02.05.2015, 1 ♂, leg. A. Babytskiy (No. 163, UkrBIN-795862).

Distribution: Germany (Menzel & Heller, 2013), Finland (Roskov et al., 2019), Kyrgyzstan (Mohrig et al., 1989a), United Kingdom (Menzel et al., 2006), Ukraine (**first record**).

Diagnosis. Male imagoes reach 2.5–4 mm in length (fig. 28). Eye bridge narrow, consists of 2 facet rows (fig. 37). Face very wide — the distance from the eye bridge to ocelli large. Antenna long, flagellomeres with a sharply neck and dense, pale and pressed setae;



Figs 28–37. *Bradysia angustocularis*, imagoes: 28 — habitus of male, lateral view (terminalia removed, see fig. 34); 29 — habitus of female, lateral view; 30 — thorax, lateral view; 31 — fourth flagellomere, lateral view; 32 — maxillary palp, lateral view; 33 — anterior apex of fore tibia (t_1) with tibial organ, lateral view; 34 — hypopygium, ventral view; 35 — gonostylus, ventral view; 36 — wing, dorsal view; 37 — eye bridge, frontal view. Scale bars: 28–29 — 1.0 mm; 30–37 — 0.10 mm.

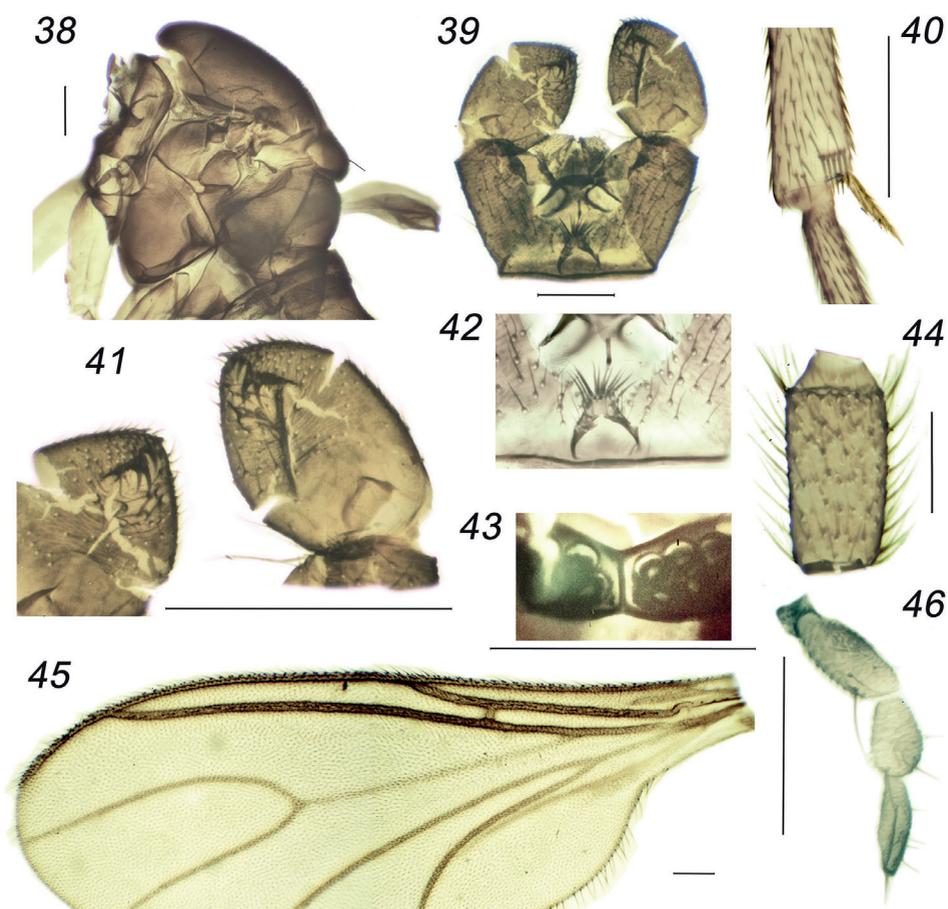
the length/width of the 4th flagellomere 2.6 (fig. 31). Maxillary palp consists of 3 palpomeres; basal palpomere with a slightly deepened sensory pit and one external seta (sometimes with another shorter seta); p_2 and p_3 strong, almost equal in length or p_2 a bit shorter (fig. 32). Thorax dark, gonocoxites and legs slightly paler. Mesonotum with fine pale setae, lateral and scutellar setae stronger (fig. 30). Wing membrane bright; $R_1 = 0.5R$; $c = 0.5w$; $y = x$, both naked or y with 1–2 macrotrichia; M-fork narrow; posterior wing veins well developed (fig. 36). Halter bright (figs 28–30). Tarsal claws without teeth. Hypopygium massive; outer side of gonocoxite with long setae, inner side shortly setose (fig. 35); gonostylus compact, with a big claw-like tooth on the tip, 1–2 spines located behind the tooth, on dorsal side of gonostylus, and subapical group of 4–5 slightly curved dark spines (fig. 35); tegmen broadly rounded, apically cut, with large field of fine teeth; aedeagus short (Mohrig, Krivosheina, & Mamaev, 1989 a, b).

Bradysia angustocularis belongs to the large *B. fungicola* group and contains 33 species, which differ from the other *Bradysia* by distinctly paler gonocoxites, legs and halteres than thorax, inner sides of the gonocoxite cleavage without basal differentiation, at least basal part of distal flagellomeres with scarred and often transverse wrinkled surface, necks of basal flagellomeres usually unicolourous dark, apical segments very often with bicoloured bands (with paler base and slightly smoky ring along apical margin), apex of gonostylus

with relatively dense setae, with or without short, claw-like apical tooth (Menzel & Mohrig, 2000). *Bradysia angustocularis* a large and dark species, well recognizable by the strikingly wide face with a narrow eye bridge, the construction of the gonostyli and the fine body setosity (Mohrig et al., 1989 a). *Bradysia angustocularis* similar to *B. praemonticola* Mohrig & Krivosheina, 1989, but differs from it by the stubby gonostyli, shorter flagellomeres, darker thorax and paler halteres (Mohrig et al., 1989 b).

Note. The body length of studied imagoes reach from 2.3–2.7 mm (males) to 3.1–3.3 mm (females). Wing of male 1.8–2.1 mm long and 0.8–0.9 mm wide; y naked or bears 1–2 macrotrichia. Tibial organs of t_1 in present specimens consist of ca. 4 setae in comb-like row (fig. 33). Biometric indexes of studied specimens: width/length of wing = 0.42–0.48; stM/M-fork = 1.00–1.07; R_1/R = 0.52–0.63; x/y = 1.04–1.33; stCuA/x = 0.33–0.60; c/w = 0.63–0.72. Length of spur/width of tibia: leg 1 = 1.08–1.38, leg 2 = 1.27–1.54; leg 3 = 1.21–1.58. Length of metatarsus/length of tibia: leg 1 = 0.52–0.60, leg 2 = 0.50–0.54, leg 3 = 0.45–0.48. Length of tibia 3/length of thorax 1.06–1.17.

Bradysia polonica (Lengersdorf, 1929) (figs 38–46)
= *Bradysia edwardsi* Freeman, 1983



Figs 38–46. *Bradysia polonica*, male: 38 — thorax, lateral view; 39 — hypopygium, ventral view; 40 — anterior apex of fore tibia (t_1) with tibial organ, lateral view; 41 — gonostyli, ventral view; 42 — base of hypopygium with basal lobe, ventral view; 43 — eye bridge, frontal view; 44 — fourth flagellomere, lateral view; 45 — wing, dorsal view; 46 — maxillary palp, lateral view.

Scale bars: 0.10 mm.

Material examined. Ukraine, Ternopil Region, outskirts of Mykulyntsi, the right bank of Seret River, 49.403088 N, 25.608273 E, ca. 280 m a. s. l., coastal overgrowth of adventive synanthrops (*Acer tataricum* L., *Humulus lupulus* L., *Urtica dioica* L.), collected with aspirator, 28.06.2014, 2 ♂, leg. A. Babytskiy (No. 27-8); Ukraine, Ternopil Region, outskirts of Stinka, the left bank of Dniester River, Dniester Canyon National Nature Park: 48.91482 N, 025.23508 E, ca. 200 m a. s. l., coastal beech-hornbeam forest, sweeping, 09.08.2016, 1 ♂, leg. A. Babytskiy (No. 75, UkrBIN-795797).

Distribution: Austria, Bulgaria, Czech Republic, Finland, Germany, Hungary, Ireland, Italy (mainland), Poland, Romania, Sweden, Switzerland, The Netherlands, United Kingdom (Menzel et al., 2006; Menzel & Heller, 2013), Kazakhstan (Sataeva, 2006), Ukraine (**first record**).

Diagnosis. Male imagoes reach 2 mm in length. Eye bridge narrow, consists of 2 facet rows (fig. 43). Flagellum, halter and hypopygium brown, legs, necks of the flagellomeres and stalks of the halter yellow-brown. Maxillary palp rather short, consists of 3 palpomeres, all segments subequal or p_3 slightly elongated; no dark sensory area on p_1 (fig. 46). The length/width of the 4th flagellomere 2.5–3 (fig. 44). Thorax black-brown; setae blackish and not contrasting with dark body (fig. 38). Femur $3\frac{5}{6}$ of tibia 3. Wing length 1.8–2.0 mm; all veins wide, anterior ones well recognizable, posterior – somewhat vaguely limited; R_1 short, falling into C well before the base of M-fork; R_5 falling into C well before the end of M_2 , the distance between the ends of R_5 and M_1 large and approximately equal to distances M_2 – Cu_1 and Cu_1 – Cu_2 ; the length of stM approximately equal to the length of M-fork; M_1 and M_2 run almost parallel, M_2 weak S-shaped curved, M_1 slightly bent; stCuA slightly longer than x, in distal part both run almost parallel, in proximal part converge; $c/w = 0.6$ (fig. 45). The knob of the halter longer than the stalk, with long and short setae. Hypopygium with tapered basal lobe (fig. 39); basal lobe highly sclerotized, with strong setae as a crest at apex, some fine setae laterally (fig. 42). Gonostylus with notch in distal part, very short apical tooth and 2 equal subapical spines (fig. 41) (Lengersdorf, 1928–1930; Gerbachevskaja, 1969; Freeman, 1983).

Bradysia polonica belongs to the *B. polonica* group, which contains only 6 Holarctic species, differing from the other *Bradysia* species by the presence of the basal lobe on ventral base of genitalia, gonostylus without apical tooth, tegmen widely rounded with circular area of fine teeth, and sensory area on basal palpomere simple or with weak margin (Menzel & Mohrig, 2000). *Bradysia polonica* is characterized by the wide, somewhat indistinctly limited posterior wing veins. Tuomikoski (1960) suggested that such a wing structure can be connected with reduction of flight capacity. He indicated similar wing venation of other small *Bradysia* species. The most similar to *B. polonica* are *B. rectinervis* Frey, 1948 and *B. crassinervis* Frey, 1948, both of which belong to the *B. angustipennis* group. *Bradysia rectinervis* differs from *B. polonica* by the wider (3-row) eye bridge, and *B. crassinervis* by the remarkably thick anterior veins, of which R_5 is almost straight (weakly but clearly curved in *B. polonica*) (Tuomikoski, 1960). Also the male of *B. polonica* is easily recognizable by the structure of the gonostylus and can also be separated from both species by the structure of sensory area on basal palpomere that distinguish species of *B. polonica* group (undifferentiated sensory area) from species of *B. angustipennis* (distinctly margined) (Menzel & Mohrig, 2000). Moreover, the description of *B. crassinervis* was based on a female and this species is a *nomen dubium* that cannot be recognized with modern keys based mostly on male genitalia characters. In gonostylus structure, *B. polonica* resembles *B. strigata* (Staeger, 1840), but differs by much bulkier gonostylus, with a thicker, stronger, shorter tooth and two subsidiary spines (Freeman, 1983).

Note. Studied male imagoes reach ca. 2.0 mm in length, wing is 1.6–1.8 mm in length and 0.7 mm in width; y naked or bears 1 mesial macrotrichia. Tibial organs of t_1 in present specimens consist of 5 bristles in a comb-like row (fig. 40). Biometric indexes of studied specimens: width/length of wing = 0.39–0.40; stM/M-fork = 0.89–1.04; R_1/R = 0.45–0.51; $x/y = 0.94$ –1.45; stCuA/x = 0.86–1.07; $c/w = 0.63$ –0.67. Length of spur/width of tibia: leg 1 =

1.06–1.34, leg 2 = 1.06–1.37; leg 3 = 1.23–1.48. Length of metatarsus/length of tibia: leg 1 = 0.51–0.59, leg 2 = 0.49–0.55, leg 3 = 0.48–0.55. Length of tibia 3/length of thorax 1.09–1.18.

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