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NEW RECORDS OF HOVERFLIES (DIPTERA, SYRPHIDAE) FROM UKRAINE. V

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New Records of Hoverflies (Diptera, Syrphidae) from Ukraine. V. Summary. Prokhorov, A. V., Popov, G. V., Shparyk, V. Yu., Vasilyeva, Yu. S. — Ten additional species of hoverflies of the subfamilies Eristalinae and Syrphinae are recorded from Ukraine for the first time: *Cheilosia bergenstammi* Becker, 1894, *C. fraterna* (Meigen, 1830), *C. nebulosa* Verrall, 1871, *C. pascuorum* Becker, 1894, *C. uviformis* Becker, 1894, *Pelecocera scaevoides* (Fallén, 1817), *Dasysyrphus pauxillus* (Williston, 1887), *Epistrophe cryptica* Doczkal and Schmid, 1994, *Melangyna quadrimaculata* (Verrall, 1873), and *Xanthogramma dives* (Rondani, 1857). Distributions of these species are summarized and species diagnoses are provided. An updated key to *Cheilosia* males of the group D sensu Becker (1894), which have tibiae with pale parts, is provided.

Key words: flower flies, *Cheilosia*, *Dasysyrphus*, *Epistrophe*, *Melangyna*, *Pelecocera*, *Xanthogramma*, new records, Ukraine.

Introduction

While compiling the checklist of Ukrainian syrphids several hoverfly species of the subfamilies Eristalinae and Syrphinae previously unknown from Ukraine were collected by the authors or were found in the collection of the Institute of Zoology, Kyiv.

Five species of the predominantly phytophagous genus *Cheilosia* Meigen, 1822, are recorded from Ukraine for the first time. Also one species of each of the following genera *Pelecocera* Meigen, 1822 (preimaginal stages undescribed, but possibly phytophagous (Kuznetsov, 1992; Speight, 2020)), and aphidophagous *Dasysyrphus* Enderlein, 1938, *Epistrophe* Walker, 1852, *Melangyna* Verrall, 1901, and *Xanthogramma* Schiner, 1860 (Rotheray, 1994; Speight, 2020) are recorded for the first time for Ukraine.

The genera *Cheilosia* and *Pelecocera* belong to the tribe Rhingiini (Ståhls et al., 2004; Vujić et al., 2018). *Cheilosia* is a highly speciose genus with 446 species primarily distributed in the Holarctic Region (Vujić et al., 2018). After the Catalogue of Palaearctic Syrphidae (Peck, 1988), where *Chamaesyrrhus* Mik, 1895 was accepted in a generic status, it was considered for many years to be a subgenus of *Pelecocera* followed by Thompson & Rotheray (1998) and Ståhls et al. (2004). Recently, the supraspecific taxonomy of these taxa has been critically revised by Vujić et al. (2018), and, in particular, this study treated *Chamaesyrrhus* as a subgenus of *Pelecocera*.

Within Syrphinae, the genera *Dasysyrphus* Enderlein, 1938, *Epistrophe* Walker, 1852, *Melangyna* Verrall, 1901 and *Xanthogramma* Schiner, 1860 belong to the tribe Syrphini *sensu stricto* (Mengual et al., 2008). The genera *Dasysyrphus*, *Epistrophe* and *Melangyna* were represented in Ukraine by seven, eight and five species, respectively (Lezhenina, 1993; Popov, 1994; Prokhorov et al., 2017, 2018 c). According to the current data, eight European *Xanthogramma* species are known (Nedeljković et al., 2018; Speight, 2020); four of them have been found in Ukraine (Lezhenina, 1993; Popov, 1994; Prokhorov et al., 2018 c; Lezhenina et al., in prep.). In this paper, we provide new records of the fifth species, *X. dives* (Rondani, 1857), from Ukraine. After Nedeljković et al. (2018), where the new species concepts were supported by morphological and molecular evidence, it turned out that at least in Polissia (Northern Ukraine) this species is the most common among species of *Xanthogramma*. Distributional ranges of Ukrainian *Xanthogramma* species emphasize the predominantly nemoral character of our fauna, while the other species of the genus are distributed in the Mediterranean region: *X. aeginae* Ricarte, Nedeljković & Vujić, 2018 and *X. pilosum* Nedeljković, Ricarte & Vujić, 2018 in Greece only, and *X. marginale* (Loew, 1854) from Morocco and Portugal to Italy (Nedeljković et al., 2018; Speight, 2020).

This article continues the series of papers reporting the first records of the hoverflies from Ukraine (Prokhorov & Popov, 2017; Prokhorov et al., 2017, 2018 a–c, 2020).

Material and methods

All the specimens are deposited in the collection of the I. I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine, Kyiv (Ukraine).

We follow mainly the morphological terminology of Cumming & Wood (2017), and partly of Speight (1987). Diagnoses are generally based on the keys by Bartsch et al. (2009 a, b), Van Veen (2010), Vujić et al. (2013) and Speight & Sarthou (2017).

All photographs were taken using a Canon PowerShot A640 camera mounted on Carl Zeiss Stemi 2000 binocular microscope; all images were subsequently combined with Helicon Focus (version 6.0.18) and processed in Adobe Photoshop CS6 by A. V. Prokhorov.

Subfamily Eristalinae

Tribe Rhingiini

Subtribe Cheilosina

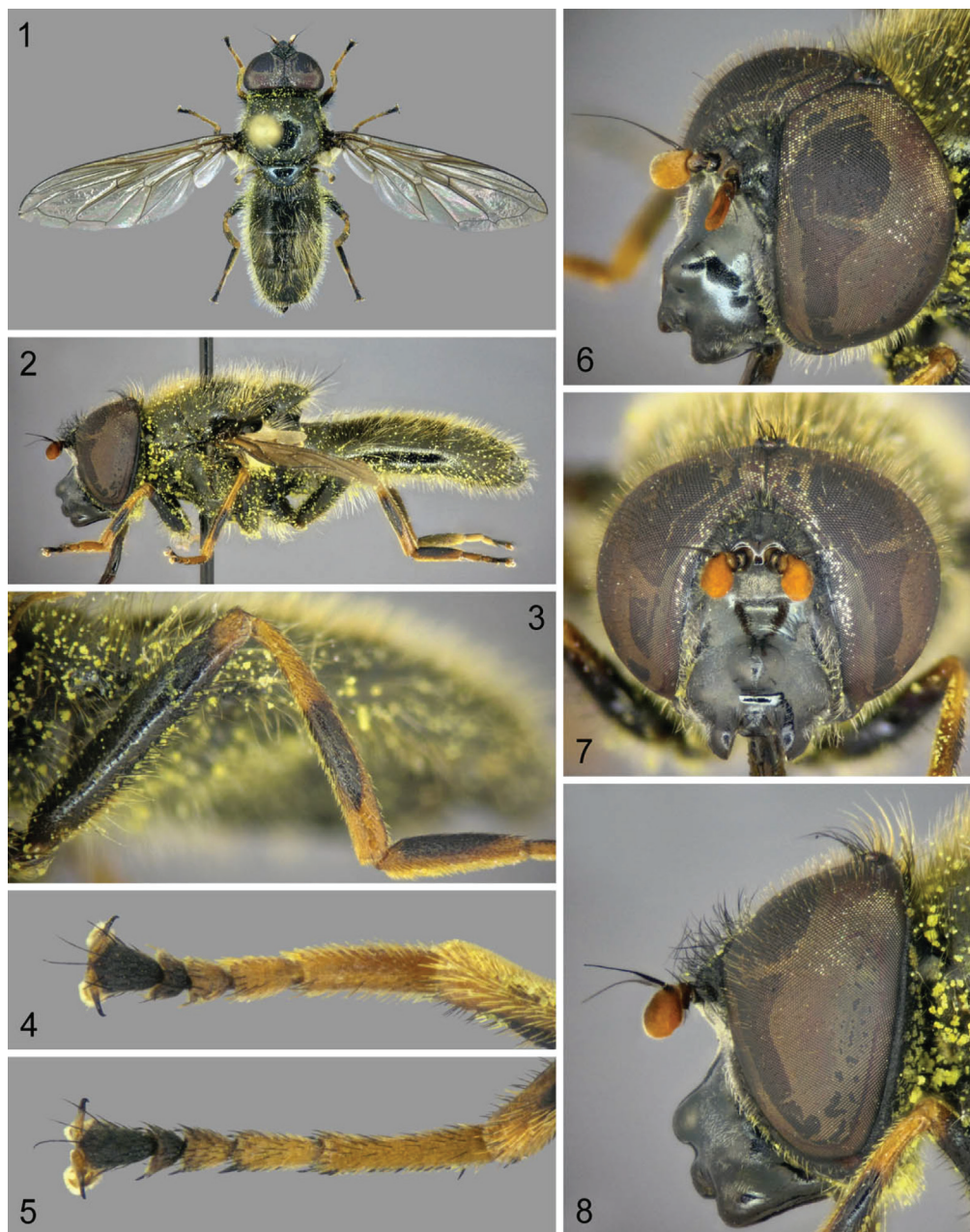
Cheilosia (*Cheilosia*) *bergenstammi* Becker, 1894 (figs 1–8)

Material examined. Ukraine. Volyn Region: Kholopychi env., 50.808819 N 24.749204 E, 16.07.2019, 1 ♂ (V. Kavurka); Rivne Region: Bushcha env.: 50.295 N 26.284 E, Zbytnyka River floodplain, 11.05.2018, 1 ♂; Myzotskyi Kriazh, 50.30 N 26.30 E, deciduous forest, 17.05.2019, 1 ♂ (A. Prokhorov).

Distribution: Austria, Belarus, Belgium, Bosnia and Herzegovina, the Czech Republic, Denmark, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Liechtenstein, Luxembourg, Montenegro, the Netherlands, Norway, Poland, Romania, southern European Russia, Serbia, the Slovak Republic, Northern Spain, Sweden, Switzerland; Transcaucasia (the Republic of Georgia) (Bańkowska, 1963; Peck, 1988; Kuznetzov, 1993; Verlinden, 1991; Maibach et al., 1992; Dirickx, 1994; Belcari et al., 1995; Vujić, 1996; Holinka & Mazánek, 1997; Wolff, 1998; Nielsen, 1999; Carrières, 2001a; Stubbs & Falk, 2002; Stănescu & Pârnu, 2005; Mielczarek, 2009–2020; Reemer et al., 2009; Tóth, 2011; Borodin & Borodina, 2014; Ricarte & Marcos-García, 2017; Barkalov & Mutin, 2018; Speight et al., 2018; Mengual et al., 2020; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. *Cheilosia bergenstammi* belongs to the species group D of *Cheilosia* (*sensu* Becker, 1894), which is characterized by the compound eye pilose (entirely or partly), lower part of face without pile, legs with yellow (at least tibiae yellow on both sides), posterior edge of scutellum with pile and setae. The **male** of *C. bergenstammi* is most similar to *C. fraterna* (Meigen, 1830) (figs 9–16), and somewhat similar to *C. carbonaria* Egger, 1860,

C. cynocephala Loew, 1840, *C. sootryeni* Nielsen, 1970, and *C. vernalis* (Fallén, 1817) in having facial width (just below antennal sockets) not exceeding eye width at the same level, katepisternum with upper and lower patches of pile widely separated, at least tibiae with pale parts, hind femur ventrally with numerous thick setae, and hypopygium with pale pile. *Cheilosia bergenstammi* differs from the last four species by: compound eye with yellowish or light brown pile, at the lower part of eye without pile (figs 6–8) (in others, eye entirely covered in dark pile, except *C. sootryeni* with light brown pile and lower part of eye almost bare); fore and mid tarsi with tarsomeres 1–3 yellow (figs 4, 5), at most first tarsomere of



Figs 1–8. *Cheilosia bergenstammi* male: 1 — habitus, dorsal view; 2 — habitus, lateral view; 3 — hind femur and tibia, lateral view; 4 — fore tarsus, dorsal view; 5 — mid tarsus, dorsal view; 6 — head, anterolateral view; 7 — head, frontal view; 8 — head, lateral view.

the fore tarsus may be darkened dorsally (in others, fore and mid tarsi entirely black; in *C. vernalis*, first tarsomere (rarely tarsomere 2 also) of mid leg may be yellow or brownish, sometimes only at the base); tergites 2 and 3 with only pale and mostly erect pile (in others, at least tergite 3 and usually tergite 2 with a central patch of black pile or seta-shaped macrotrichia, which are often adpressed or semi-adpressed).

Cheilosia bergenstammi also differs from *C. carbonaria* by: abdomen elongated-oval with almost parallel sides of tergite 3 (in *C. carbonaria*, abdomen elongated, expanding to posterior margin of tergite 3, with the largest width in this place); wing hyaline with yellowish tint (fig. 1) (in *C. carbonaria*, wing distinctly darkened along the front edge and in the middle); hind tibia with distinct black ring occupying almost half of the tibia (fig. 3) (in *C. carbonaria*, hind tibia almost black with only brownish base).

Cheilosia bergenstammi also differs from *C. cynocephala* by: mesonotum black with bronze tinge (in *C. cynocephala*, mesonotum black with bluish tinge); tibiae yellow with black ring occupying not more than half of the tibia (fig. 2) (in *C. cynocephala*, tibiae with black ring occupying usually more than half of the tibia); mesopleura with pale pile (in *C. cynocephala*, mesopleura with pale and black pile mixed).

Cheilosia bergenstammi also differs from *C. sootryeni* by: tibiae with yellow apex occupying not less than 1/4 of the tibia (fig. 2) (in *C. sootryeni*, tibiae with yellow apex occupying not more than 1/8–1/6 length of the tibia); mesopleura with pale pile (in *C. sootryeni*, mesopleura with pale and black pile mixed).

Cheilosia bergenstammi also differs from *C. vernalis* by: lower part of face more elongated, so that the facial tubercle usually extends beyond first flagellomere (basoflagellomere) (in *C. vernalis*, lower part of face less elongated, so that the facial tubercle doesn't extend beyond the first flagellomere). Unfortunately, *C. vernalis* is one of the most variable species of the genus, and listed characters may be completely different.

The *Cheilosia bergenstammi* male is also similar to the male of *C. fraterna* (figs 9–16), in addition to the above characters, in having compound eye with lower part bare, wing hyaline with yellowish tint, and tergites 2 and 3 with only pale pile. From *C. fraterna* it can be separated by: scutellum with pile and setae at least as long as scutellum (fig. 2) (in *C. fraterna*, scutellum with pile and setae half or slightly more than half as long as scutellum (fig. 10), scutellum often without setae); abdomen elongated-oval with almost parallel sides of tergite 3 (fig. 1) (in *C. fraterna*, abdomen wide oval, distinctly with largest width at the posterior edge of tergite 2, as in fig. 9); fore and mid tarsi with tarsomeres 1–3 pale (figs 4, 5), at most first tarsomere of the fore tarsus darkened dorsally (in *C. fraterna*, fore tarsus black dorsally (fig. 12) with at least tarsomeres 1+2 pale laterally, mid tarsus (fig. 13) with first tarsomere usually pale and tarsomeres 2–5 darkened dorsally); hind tibia (fig. 3) with distinct black ring occupying almost half of tibia (in *C. fraterna*, hind tibia with weak, incompletely developed dark ring (fig. 11), which may be reduced).

Genitalia of *C. bergenstammi* have been prepared and compared with figures in Stubbs & Falk (2002: Plate H, fig. 1, a–c) and Barkalov (1993: figs 156–158).

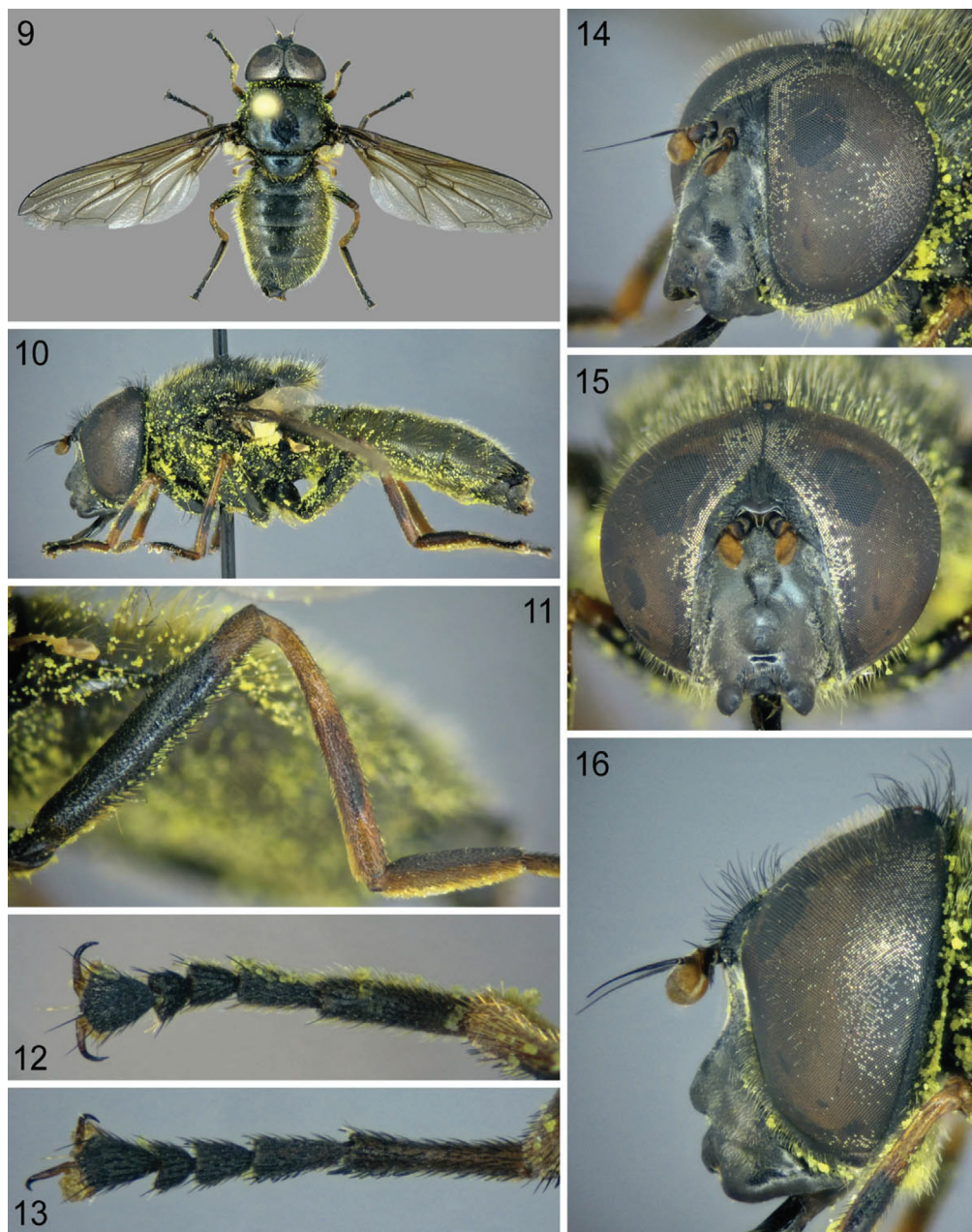
***Cheilosia (Cheilosia) fraterna* (Meigen, 1830) (figs 9–21)**

Material examined. Ukraine. Rivne Region: Bushcha env.: 50.29 N 26.28 E, Zbytnyka River floodplain, 11.05.2018, 1 ♂, 1 ♀, 19.05.2019, 1 ♀; 50.30 N 26.24 E, Zbytnyka River floodplain forest, 12.05.2018, 2 ♀, 18.05.2019, 1 ♂ (A. Prokhorov).

Distribution: Austria, Belarus, Belgium, Bosnia and Herzegovina, the Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, European Russia, Serbia, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland; Transcaucasia (the Republic of Georgia) (Bańkowska, 1963; Peck, 1988; Verlinden, 1991; Maibach et al., 1992; Kuznetsov, 1993; Dirickx, 1994; Belcari et al., 1995; Vujić, 1996; Ho-

linka & Mazánek, 1997; Wolff, 1998; Nielsen, 1999; Carrières, 2001 a; Stubbs & Falk, 2002; Stănescu & Pârnu, 2005; Pakalniškis et al., 2006; De Groot & Govedič, 2008; Bartsch et al., 2009 b; Mielczarek, 2009–2020; Reemer et al., 2009; Tóth, 2011; Van Eck, 2011; Van Steenis et al., 2013; Borodin & Borodina, 2014; Haarto & Kerppola, 2014; Ricarte & Marcos-García, 2017; Barkalov & Mutin, 2018; Speight et al., 2018; Mengual et al., 2020; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. *Cheilosia fraterna* is most similar to *C. bergenstammi* (see above). The male of *C. fraterna* (figs 9–16) is also similar to *C. sootryeni* in having lower part of com-



Figs 9–16. *Cheilosia fraterna* male: 9 — habitus, dorsal view; 10 — habitus, lateral view; 11 — hind femur and tibia, lateral view; 12 — fore tarsus, dorsal view; 13 — mid tarsus, dorsal view; 14 — head, anterolateral view; 15 — head, frontal view; 16 — head, lateral view.



Figs 17–21. *Cheilosia fraterna* female: 17 — habitus, dorsal view; 18 — habitus, lateral view; 19 — mesonotum, lateral view; 20 — head, anterolateral view; 21 — head, frontal view.

pound eye bare (figs 14–16) (in *C. sootryeni*, lower part of compound eye may be bare or with a single pile); from *C. sootryeni* it can be distinguished by: tergites with mostly pale pile (in *C. sootryeni*, tergites 2 and 3 with black short macrotrichia posteromedially); tibiae with yellow apices occupying almost 1/3–1/4 length of tibia (fig. 10), at that hind tibia may be entirely yellow (in *C. sootryeni*, tibiae with yellow apices occupying not more than 1/8–1/6 length of tibia); fore tarsus black dorsally (fig. 12) with at least tarsomeres 1+2 pale laterally, mid tarsus (fig. 13) with first tarsomere usually pale and tarsomeres 2–5 darkened dorsally (in *C. sootryeni*, all tarsi black dorsally).

Genitalia of *C. fraterna* have been prepared and compared with figures in Stubbs & Falk (2002: Plate I, fig. 1, a–d).

The female (figs 17–21) of *C. fraterna* is very similar to *C. chloris* (Meigen, 1822) and *C. bracusi* Vujić & Claussen, 1994. From *C. chloris* it can be separated by: arista black at the base (fig. 20) (in *C. chloris*, arista yellow at the base); compound eye with the lower part (almost half of the eye) bare (figs 20–21) (in *C. chloris*, eye with the small lowest part bare or with single pile).

***Cheilosia (Cheilosia) nebulosa* Verrall, 1871 (figs 22–25)**
= *langhofferi* Becker, 1894

Material examined. Ukraine. Zakarpattia: Kamianytsia env., 48.70 N 22.43 E, Uzh River valley (left bank), 6.05.2017, 1 ♀ (G. Popov); Kyiv Region: Mygalky env., 50.655 N 29.495 E, Teteriv River floodplain, 17.04.2020, 1 ♂, 1 ♀ (A. Prokhorov).

Distribution: Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, Montenegro, Norway, Poland, Romania, Serbia, the Slovak Republic, Slovenia, Sweden, Switzerland; Russia (northern and central European part, Western and Central Siberia) (Bańkowska, 1963 (also as *langhofferi*); Peck, 1988; Verlingen, 1991; Maibach et al., 1992; Kuznetsov, 1993; Dirickx, 1994; Belcari et al., 1995; Vujić, 1996; Holinka & Mazánek, 1997; Nielsen, 1999; Stubbs & Falk, 2002; Stănescu & Pârnu, 2005; Pakalniškis et al., 2006; Bartsch et al., 2009 b; Mielczarek, 2009–2020; Tóth, 2011, 2014 (also as *langhofferi*); Ball & Morris, 2014; Borodin & Borodina, 2014; Haarto & Kerpola, 2014; Barkalov & Mutin, 2018; Miličić et al., 2018; Speight et al., 2018; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. *Cheilosia nebulosa* belongs to *Cheilosia* species group C (Claussen & Speight, 1988; Bartsch et al., 2009 b). It has following characters: compound eye at least partly pilose, lower part of the face without pile, posterior edge of scutellum without setae. This species is similar to *C. chrysocoma* (Meigen, 1822) and *C. subpictipennis* Claussen, 1998 in having wing darkened in the middle, at least around crossvein r-m.

From *C. chrysocoma*, the **female** of *C. nebulosa* differs by: first flagellomere with rounded apex (fig. 25) (in *C. chrysocoma*, first flagellomere with angular apex, sometimes it may be poorly noticeable); face more or less parallel-sided (fig. 24) (in *C. chrysocoma*, face distinctly expands down); mesonotum with short yellowish pile (fig. 23) (in *C. chrysocoma*, mesonotum with long reddish pile); katapisternum with lower and upper parts of pile widely separated (in *C. chrysocoma*, katapisternum with lower and upper parts of pile more or less confluent); abdomen with not so dense, yellowish pile, shorter than thickness of the femur (figs 22, 23) (in *C. chrysocoma*, abdomen with dense, usually reddish pile, longer than thickness of the femur); (Bartsch et al., 2009 b, Van Veen, 2010).



Figs 22–25. *Cheilosia nebulosa* female: 22 — habitus, dorsal view; 23 — habitus, lateral view; 24 — head, frontal view; 25 — head, anterolateral view.

Cheilosia nebulosa can be separated from *C. subpictipennis* Claussen, 1998 by first flagellomere with dorsal margin and apex dark (fig. 25) (in *C. subpictipennis*, first flagellomere entirely pale) (Van Veen, 2010).

Specimens of this species with unmarked wing (as our specimen on fig. 22) have also appeared in literature under the name *C. langhofferi* Becker, 1894 (Speight, 2020). This taxon has been synonymized with *C. nebulosa* by Claussen & Speight (1988).

Note. In Great Britain, this species is listed under the UK Biodiversity Action Plan and qualifies as Nationally Scarce (Ball & Morris, 2014).

Cheilosia (Cheilosia) pascuorum Becker, 1894 (figs 26–29)

Material examined. Ukraine. Kyiv Region: Mali Dmytrovychi env., 50.22 N 30.52 E, ravine, 23.04.2018, 3 ♂; Mygalky env.: 50.66 N 29.50 E, mixed forest near Teteriv River floodplain, 28.04.2018, 1 ♂; 50.655 N 29.495 E, Teteriv River floodplain, 23.04–6.05.2020, 3 ♂, 2 ♀ (A. Prokhorov).

Distribution: Austria, Bosnia and Herzegovina, Croatia, the Czech Republic, France, Germany, Greece, Montenegro, North Macedonia, Poland, Romania, central European Russia, Serbia, the Slovak Republic, Sweden, Switzerland (Bańkowska, 1963; Peck, 1988; Dirickx, 1994; Vujić, 1996; Holinka & Mazánek, 1997; Wolff, 1998; Stănescu & Pârvu, 2005; Mielczarek, 2009–2020; Vujić et al., 2013; Barkalov & Mutin, 2018; Speight et al., 2018; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. This species belongs to *Cheilosia proxima* group (Vujić et al., 2013) and is most similar to *Cheilosia balkana* Vujić, 1994 in having first flagellomere black to blackish-brown, margin of upper calypter with short pale pile, frons not swollen, abdomen (including pregenital segments) covered in pale macrotrichia (Vujić et al., 2001). The *Cheilosia pascuorum* **male** can be separated from the male of *C. balkana* by: tergite 3 dull medially (in *C. balkana*, tergite 3 shiny); vein M_1 meeting vein R_{4+5} at right or obtuse angle (fig. 26) (in *C. balkana*, vein M_1 meeting vein R_{4+5} at an acute angle); arista bare (fig. 29) (in *C. balkana*,



Figs 26–29. *Cheilosia pascuorum* male: 26 — habitus, dorsal view; 27 — habitus, lateral view; 28 — head, frontal view; 29 — head, anterolateral view.

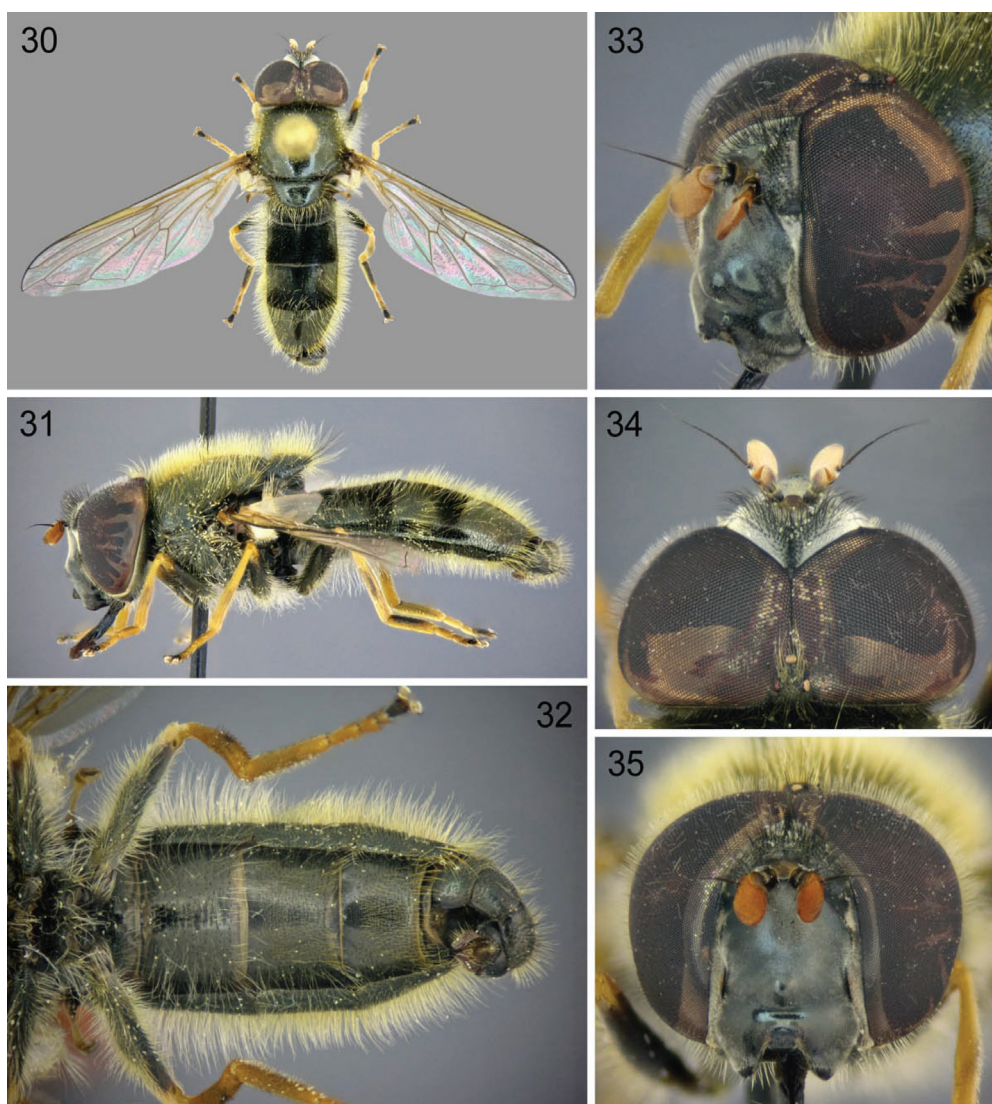
arista with short microtrichia); dorsal lobe of gonostylus very broad basally (in *C. balkana*, dorsal lobe of gonostylus basally narrowed) (Vujić et al., 2001). From the similar species *C. proxima* (Zetterstedt, 1843) and *C. gigantea* (Zetterstedt, 1838), *C. pascuorum* can be separated by: abdomen entirely with pale macrotrichia (figs 26, 27) (in others, abdomen partly with black macrotrichia, at least pregenital segments with a few black macrotrichia). Additionally, from *C. proxima* it differs by its larger size, usually not smaller than 10 mm (*C. proxima* is smaller, usually 7–9 mm). Genitalia of these species are different by the shape of the dorsal lobe of the gonostylus (Vujić et al., 2001).

The genitalia of *C. pascuorum* have been prepared and compared with figures in Vujić et al. (2001).

Note. This species is regarded as generally endangered in Europe (Vujić et al., 2001).

***Cheilosia (Cheilosia) uviformis* Becker, 1894 (figs 30–35)**

Material examined. Ukraine. Kyiv Region: Kyiv, Muromets Is. on Dnipro River, 50.5058 N 30.5443 E, on flowers of *Acer platanoides*, 6.04.2017, 1 ♂, 18.04.2018, 1 ♂ (A. Prokhorov).



Figs 30–35. *Cheilosia uviformis* male: 30 — habitus, dorsal view; 31 — habitus, lateral view; 32 — abdomen, ventral view; 33 — head, anterolateral view; 34 — head, dorsal view; 35 — head, frontal view.

Distribution: Belgium, Denmark, Great Britain, Finland, France, Germany, Ireland, Italy, Lithuania, the Netherlands, Norway, Serbia, Slovenia, Sweden, Switzerland (Peck, 1988; Verlinden, 1991; Maibach et al., 1992; Dirickx, 1994; Vujić, 1996; Nielsen, 1999; Stubbs & Falk, 2002; Pakalniškis et al., 2006; De Groot & Govedič, 2008; Bartsch et al., 2009 b; Reemer et al., 2009; Haarto & Kerppola, 2014; Speight et al., 2018; Speight, 2020; Verlinden, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. The *Cheilosia uviformis* **male** looks like the males of *C. urbana* (Meigen, 1822) and *C. psilophthalma* Becker, 1894, and it can also be confused with small specimens of *C. rufimana* Becker, 1894.

From *C. urbana* and *C. psilophthalma* it can be distinguished by: frons densely covered in microtrichia (fig. 34) (in others, frons covered in faint microtrichia, weakly shiny except the edges along the eyes); face almost entirely with fine but distinct pruinescence including the facial tubercle, only lowest edge of face shiny (in others, frons with facial tubercle and upper mouth-edge distinctly shiny, rarely the facial tubercle may also be finely pruinose); all tibiae entirely yellow or with very vague brownish smudge on each side of tibia (fig. 31) (in others, all tibiae yellow with black incomplete ring); abdomen entirely with pale pile, tergites 2 and 3 without short semi-adpressed macrotrichia posteromedially (in others, abdomen usually at least with a few black macrotrichia, tergites 2 and 3 with short semi-adpressed macrotrichia posteromedially); sternites 2–4 dull (fig. 32) (in others, sternites 2–4 shiny).

Cheilosia uviformis can be easily distinguished from *C. rufimana* by katapisternum with upper and lower patches of pile widely separated (in *C. rufimana*, katapisternum with upper and lower patches of pile confluent).

Morphological characters of our specimens are completely consistent with those in Speight & Claussen (1987: as *Cheilosia argentifrons* Hellen, 1914). Genitalia of both specimens have been prepared and compared with figures in Speight & Claussen (1987: fig. 2, f, g) and Stubbs & Falk (2002: Plate M, fig. 1, a–c).

Note. In Great Britain this species is listed under the UK Biodiversity Action Plan and qualifies as Data Deficient (Ball & Morris, 2014).

Here we offer an updated key to Ukrainian *Cheilosia* males of the group D *sensu* Becker (1894), which have tibiae with pale parts.

Key to males of Ukrainian *Cheilosia* species group D (tibiae with pale parts)

- | | | |
|---|---|--|
| 1 | Katapisternum with upper and lower patches of pile confluent. | 2 |
| — | Katapisternum with upper and lower patches of pile widely separated. | 3 |
| 2 | Face width at the level of the antennal sockets exceed eye width at the same level. | |
| | <i>C. morio</i> (Zetterstedt, 1838) | |
| — | Face width at the level of the antennal sockets less than eye width at the same level. | |
| | <i>C. proxima</i> species group | |
| 3 | Tergites covered in grey patches of microtrichia, which usually look like maculae. | 4 |
| — | Tergites entirely black. | 5 |
| 4 | Compound eye with pale pile. | <i>C. semifasciata</i> Becker, 1894 |
| — | Compound eye with dark pile. | <i>C. fasciata</i> Schiner & Egger, 1853 |
| 5 | Compound eye entirely pilose (lower part sometimes more sparsely). | 6 |
| — | Lower part of compound eye bare or with a single pile. | 12 |
| 6 | Frons densely covered in pale-grey microtrichia (fig. 34) as well as orbital strip (this is clearly visible against the general background of the face); sternites 2–4 dull (fig. 32). | <i>C. uviformis</i> Becker, 1894 |
| — | Frons shiny or with faint pruinescence (mostly along eye margins), also faintly pruinose on orbital strip; sternites 2–4 shiny. | 7 |
| 7 | Compound eye with pale pile; abdomen slender, with almost parallel sides. | 8 |
| — | Compound eye with dark pile; abdomen oval, usually wider. | 10 |
| 8 | Arista with distinct short microtrichia. | <i>C. mutabilis</i> (Fallén, 1817) |
| — | Arista seems bare (with very short microtrichia). | 9 |

- 9 Claws with yellow bases. *C. urbana* (Meigen, 1822)
 — Claws black. *C. psilophthalma* Becker, 1894
 10 Abdomen with the largest width at the posterior margin of tergite 3; tergite 4 with adpressed short black seta-shape macrotrichia along central axis; legs dark, fore and mid tibiae with weak brown bases and apexes, hind tibia black with indistinct brown base. *C. carbonaria* Egger, 1860
 — Abdomen with the largest width at the posterior margin of tergite 2; tergite 4 with erect and (or) semi-adpressed macrotrichia along central axis; all tibiae yellow or pale brown with dark ring, or mostly black with yellow or brown bases and apexes. 11
 11 Mesonotum black, usually with a bluish tinge, predominantly with black pile; tergite 5 dull in contrast with shiny tergite 4. *C. cynocephala* Loew, 1840
 — Mesonotum black, usually without a bluish tint, predominantly with pale pile or with black and pale pile mixed; tergite 5 shiny as well as tergite 4. *C. vernalis* (Fallén, 1817)
 12 Tibiae black with pale parts; tarsomeres of all tarsi black dorsally and laterally.
 *C. sootryeni* Nielsen, 1970
 — Tibiae pale with black parts (sometimes entirely pale); fore and mid tarsi not entirely black. 13
 13 Scutellum with pile and setae half or slightly more than half as long as scutellum (fig. 10), at that scutellum often without setae; abdomen more oval, distinctly with largest width at the posterior edge of tergite 2 (fig. 9); fore tarsus black (fig. 12) (tarsomeres 1+2 pale laterally and ventrally), mid tarsus black except first tarsomere usually pale (fig. 13); hind tibia with weak, incompletely developed dark ring (fig. 11), which may be reduced. *C. fraterna* (Meigen, 1830)
 — Scutellum with pile and setae at least as long as scutellum (fig. 2); abdomen more slender, elongated-oval with almost parallel sides of tergite 3 (fig. 1); fore and mid tarsi with tarsomeres 1–3 entirely pale (figs 4, 5) (first tarsomere of fore tarsus may be darkened dorsally); hind tibia usually with distinct black ring occupying almost half of tibia (fig. 3). *C. bergenstammi* Becker, 1894

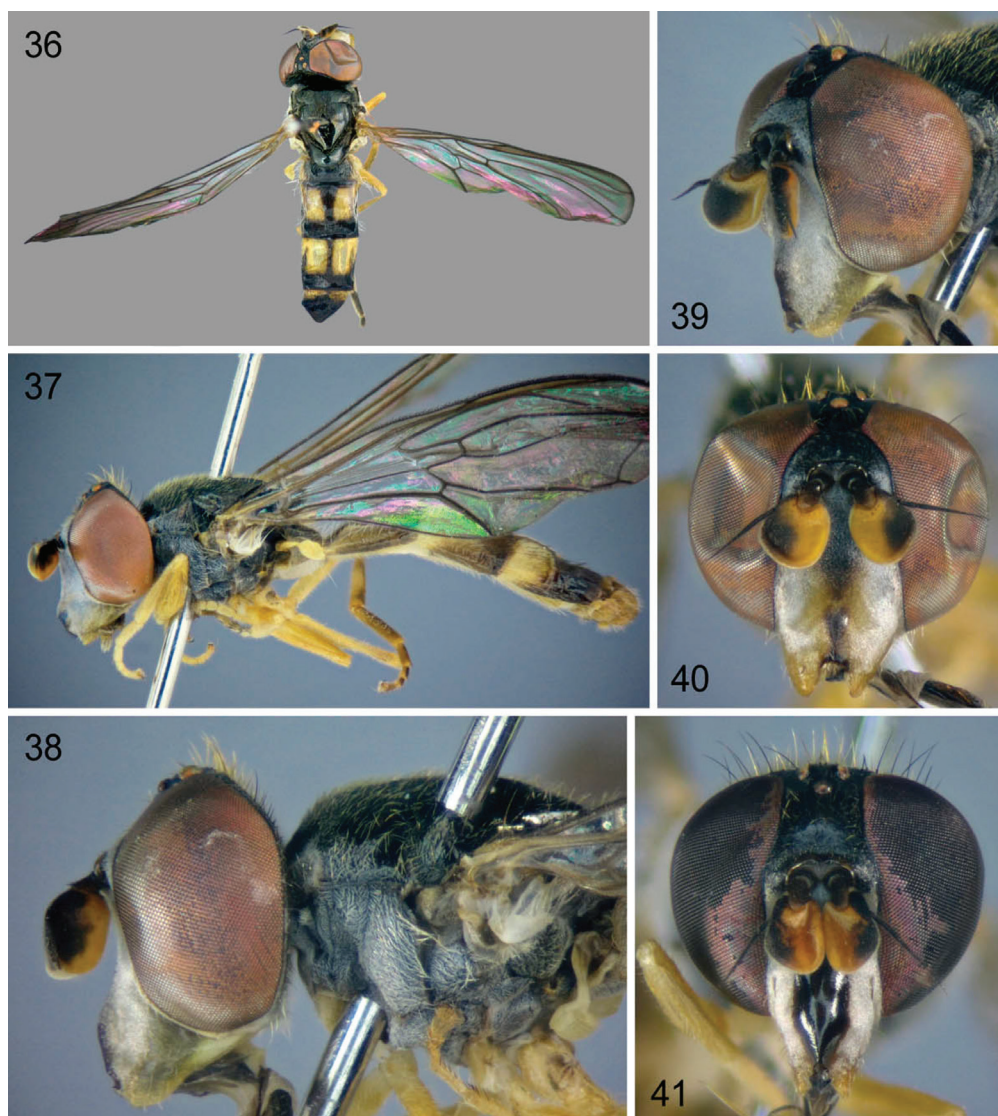
Subtribe Pelecocerina

Pelecocera (Chamaesyrrhus) scaevoides (Fallén, 1817) (figs 36–41)

Material examined. Ukraine. Ivano-Frankivsk Region: Zelena env., 48.413701 N 24.379997 E, alpine meadow, 20.06.2018, 3 ♂, 5 ♀ (V. Shparyk).

Distribution: Andorra, Austria, Belgium, Bulgaria, Croatia, the Czech Republic, Estonia, Finland, France, Germany, Great Britain (Scotland), Greece, Hungary, Italy, Latvia, Liechtenstein, Luxembourg, Moldova, Montenegro, the Netherlands, Norway, Poland, Romania, Serbia, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland; Russia (European part, Yakutia, the Far East); Transcaucasia (the Republic of Georgia), Turkey (Bańkowska, 1963; Peck, 1988; Verlinden, 1991; Maibach et al., 1992; Kuznetsov, 1993; Dirickx, 1994; Belcari et al., 1995; Holinka & Mazánek, 1997; Wolff, 1998; Nielsen, 1999; Carrières, 2001 b; Stubbs & Falk, 2002; Stănescu & Pârvu, 2005; Gammelmo & Nielsen, 2008; Mielczarek, 2009–2020; Reemer et al., 2009; De Groot et al., 2010; Tóth, 2011, 2014; Williams et al., 2011; Haarto & Kerppola, 2014; Saribiyik, 2014; Ricarte & Marcos-García, 2017; Barkalov & Mutin, 2018; Miličić et al., 2018; Speight et al., 2018; Mengual et al., 2020; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. Both sexes of *P. scaevoides* are similar to *P. caledonica* (Collin, 1940) in sharing the following characters: anterodorsal portion of anepisternum without pile or setae, at most with thick microtrichia; frons, at the level of the antennal sockets, narrower than the width of an eye at the same level (figs 40, 41); propleural and mesopleural sclerites entirely covered in grey microtrichia (fig. 38); lateral arms of the lunule (extending round the dorsal edge of the antennal sockets) entirely shining, or entire lunule shining. From the male *P. caledonica* the male of *P. scaevoides* differs by: face entirely covered in microtrichia (figs 39, 40) (in *P. caledonica*, face with median black vitta shining); the length of postocular orbits is dorsally, at the inner end of the eye, shorter than a posterior ocellus (in *P. caledonica*, the length of the postocular orbits is dorsally, at the inner end of the eye, longer than a posterior ocellus); wing entirely covered in microtrichia (in *P. caledonica*, basal medial



Figs 36–41. *Pelecocera (Chamaesyphus) scaevoides*: 36 — male habitus, dorsal view; 37 — male habitus, lateral view; 38 — male head and thorax, lateral view; 39 — male head, anterolateral view; 40 — male head, frontal view; 41 — female head, frontal view.

(*bm*) and posterior cubital cells (*cup*) of the wing each with an area bare of microtrichia); tarsomeres 3+4 of fore and mid tarsi entirely pale, as well as the tibiae (fig. 37) (in *P. caledonica*, tarsomeres 3+4 of fore and mid tarsi brown, darker than the tibiae); lunule with median triangle entirely, or partly, covered in dense, grey microtrichia (in *P. caledonica*, lunule entirely undusted, brightly shining) (Speight & Sarthou, 2017).

The **female** of *Pelecocera scaevoides* (fig. 41) can be separated from the female of *P. caledonica* by: at the inner corner of the eye, on the dorsal surface of the head, the distance between the posterior margin of the eye and the posterior margin of the head is slightly greater than the length of a posterior ocellus, but distinctly less than 1.5x as long as a posterior ocellus (in *P. caledonica*, the distance between the posterior margin of the eye and the posterior margin of the head is slightly greater than 1.5x the length of a posterior ocellus); wing entirely covered in microtrichia (in *P. caledonica*, basal medial (*bm*) and posterior cubital cells (*cup*) of the wing each with an area bare of microtrichia) (Speight & Sarthou, 2017).

Note. In Great Britain this species is listed under the UK Biodiversity Action Plan and qualified as Nationally Scarce (Ball & Morris, 2014).

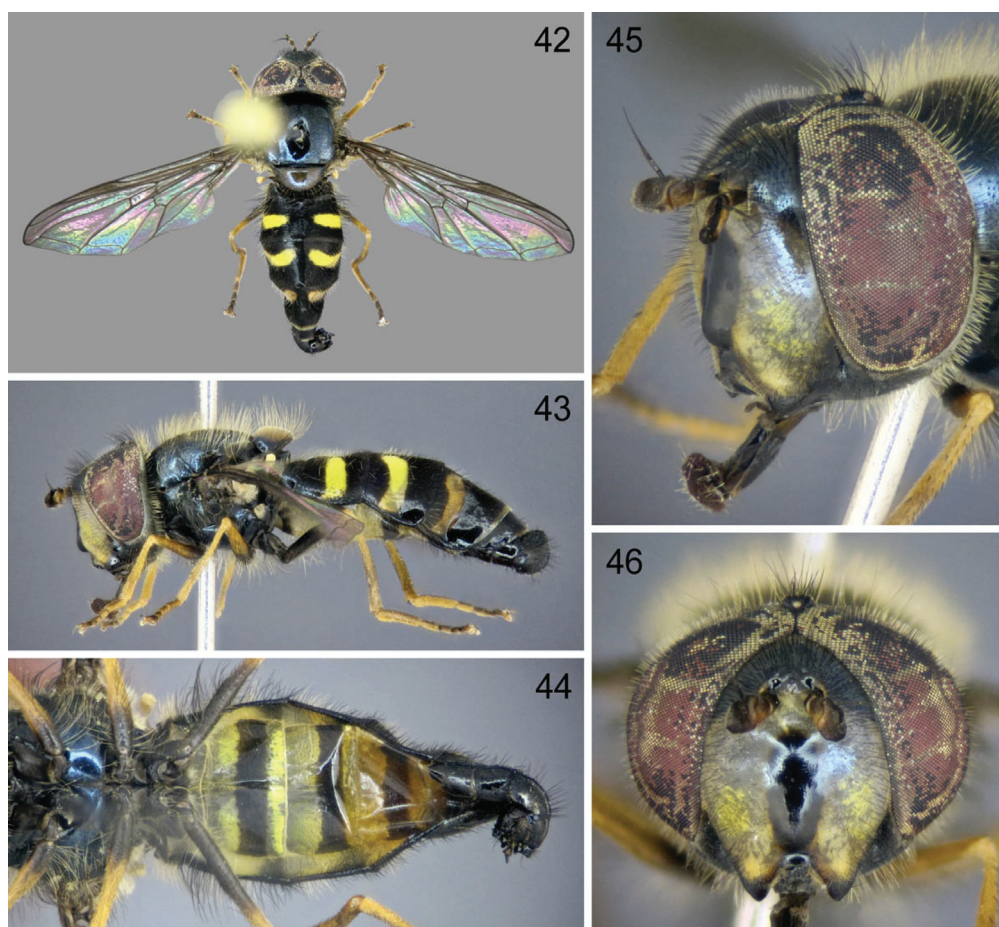
Subfamily Syrphinae

Dasysyrphus pauxillus (Williston, 1887) (figs 42–46)

Material examined. Ukraine. Kyiv Region: Dibrova env., 50.194443 N 30.203628 E, 25.04.2010, 1 ♂ (M. Zaika); Irpin env., 50.50 N 30.28 E, Lyubka River floodplain forest, 20.04.2019, 1 ♂ (A. Prokhorov).

Distribution: Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Italy, North Macedonia, the Netherlands, Norway, Poland, Romania, Serbia, the Slovak Republic, Spain, Sweden, Switzerland; Russia (European part, Siberia); Nearctic Region (from Alaska to California and across to New York) (Doczkal, 1996; Holinka & Mazánek, 1997; Nielsen, 1999; Stănescu & Pârnu, 2005; Bartsch et al., 2009 a; Krpač et al., 2009; Mielczarek, 2009–2020; Reemer et al., 2009; Ball et al., 2011; Williams et al., 2011; Locke & Skevington, 2013; Haarto & Kerppola, 2014; Ricarte & Marcos-García, 2017; Barkalov & Mutin, 2018; Speight et al., 2018; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. *Dasysyrphus pauxillus* is very similar in appearance to *D. lenensis* Bagatshanova, 1980, *D. nigricornis* (Verrall, 1873) and *D. pinastri* (De Geer, 1776) in having yellow paired maculae on tergites 3+4 not reaching the lateral margin of tergites (fig. 43). The



Figs 42–46. *Dasysyrphus pauxillus* male: 42 — habitus, dorsal view; 43 — habitus, lateral view; 44 — abdomen, ventral view; 45 — head, anterolateral view; 46 — head, frontal view.

male of *D. pauxillus* differs from the males of *D. lenensis* and *D. pinastri* by: mesonotum predominantly covered in pale pile (fig. 43) (in others, mesonotum predominantly covered in black pile); the lower part of the face is covered in black pile (figs 45, 46), or with pale and black pile mixed (in others, the lower part of the face is covered in pale pile); last antennal segment yellowish ventrally, antenna completely dark in *D. lenensis* and *D. pinastri*, tergite 2 with black macrotrichia on the side margin (in others, tergite 2 with pale macrotrichia on the side margin, only with black ones at the hind corners of the tergite) (Bartsch et al., 2009 a; Van Veen, 2010). The genitalia of *D. pauxillus*, *D. lenensis* and *D. pinastri* are clearly different in the structure of the gonostylus and aedeagus (Doczkal, 1996: figs 15–22).

Dasysyrphus pauxillus differs from *D. nigricornis* by: frons with an angle of approximation of eyes blunt (fig. 42) (in *D. nigricornis*, frons with an angle of approximation of eyes acute); eyes meeting over a distance distinctly shorter than the frons length (fig. 46) (in *D. nigricornis*, eyes meeting over a distance not shorter than the frons length) (Bartsch et al., 2009 a).

Genitalia of our specimen with a triangular projection of distiphallus, projecting ventrally even more than shown in the figures in Doczkal (1996: fig. 16), Bartsch et al. (2009 a: page 190) and Locke & Skevington (2013: fig. 14D).

Note. There are many Holarctic species that have a habitus similar to *pauxillus* and their concepts are even more confusing (Locke & Skevington, 2013).

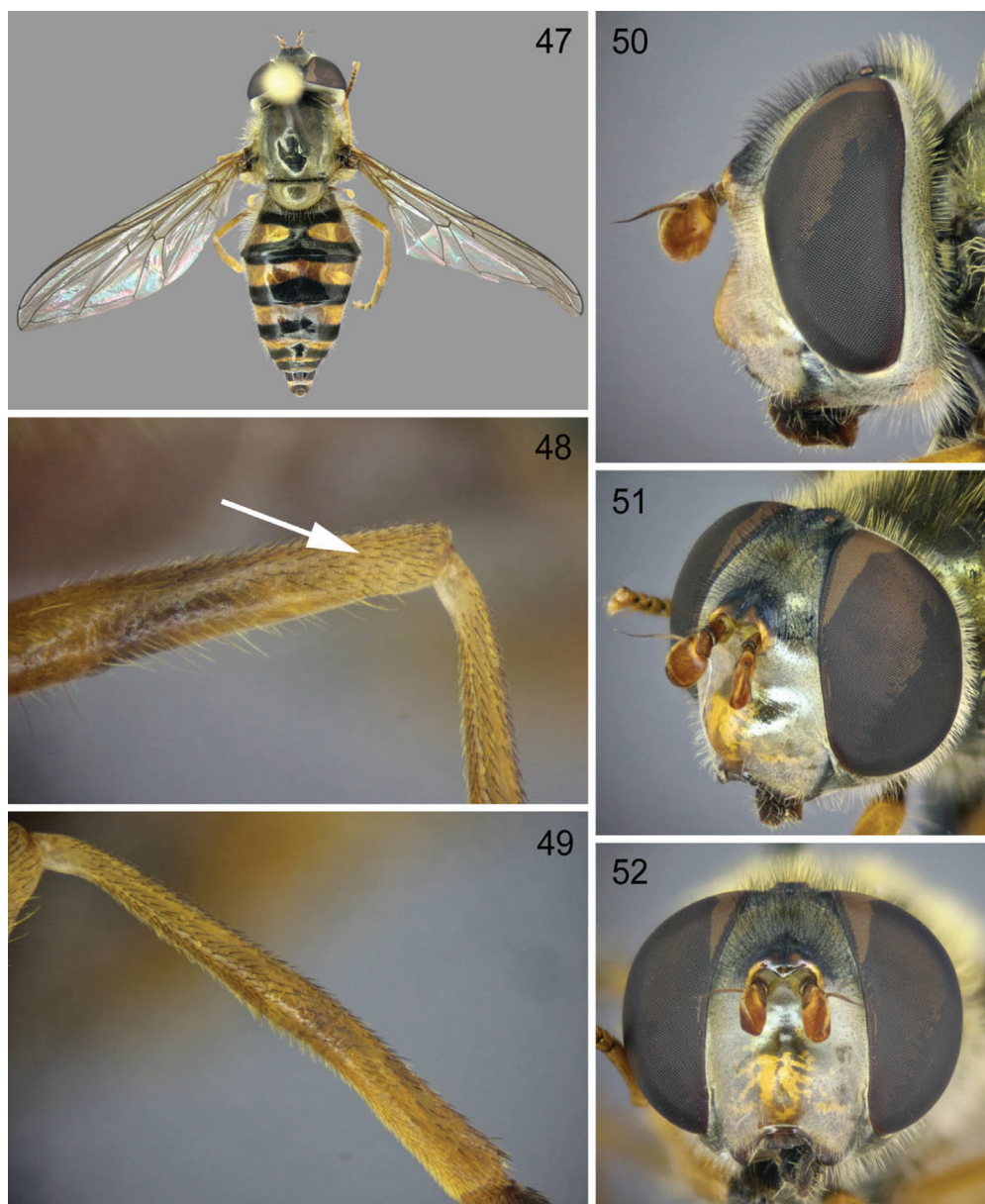
Epistrophe cryptica Doczkal and Schmid, 1994 (figs 47–52)

Material examined. Ukraine. Ivano-Frankivsk Region: Khom'yakivka env., 48.861022 N 24.819297 E, edge of deciduous forest, 26.05.2019, 1 ♀ (V. Shparyk).

Distribution: uncertain, due to confusion with other related species until recently. Confirmed from Austria, Belgium, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, the Netherlands, Norway, Poland, ?Serbia, Sweden, Switzerland; Russia (European part, Siberia, the Far East); Japan (Holinka & Mazánek, 1997; Nielsen, 1999; Mielczarek, 2009–2020; Reemer et al., 2009; Tóth, 2011; Haarto & Kerppola, 2014; Barkalov & Mutin, 2018; Speight et al., 2018; Van Steenis et al., 2019; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. The *Epistrophe cryptica* **female** is most similar to the female of *E. obscuripes* (Strobl, 1910) (figs 53–58) in sharing the following characters: basal medial (*bm*) cell of wing entirely covered in microtrichia; mesoscutum mostly brightly shining, without distinct pruinescence dorsally; tergite 5 partly black; scutellum with only yellow macrotrichia or with just a few black macrotrichia along hind margin; frons entirely black (figs 51, 52, 57, 58); anterior side of hind tibia entirely or partly with yellow macrotrichia (figs 49, 55). *Epistrophe cryptica* can be distinguished from *E. obscuripes* by: arista yellow, at least in basal half (fig. 51) (in *E. obscuripes*, arista entirely black, as in fig. 57); anterior side of hind femur with black macrotrichia apically (fig. 48) (in *E. obscuripes*, anterior side of hind femur almost only with yellow macrotrichia, as in fig. 54); anterior side of hind tibia covered in a mixture of black and yellow macrotrichia (fig. 49) (in *E. obscuripes*, anterior side of hind tibia entirely covered in yellow macrotrichia, as in fig. 55).

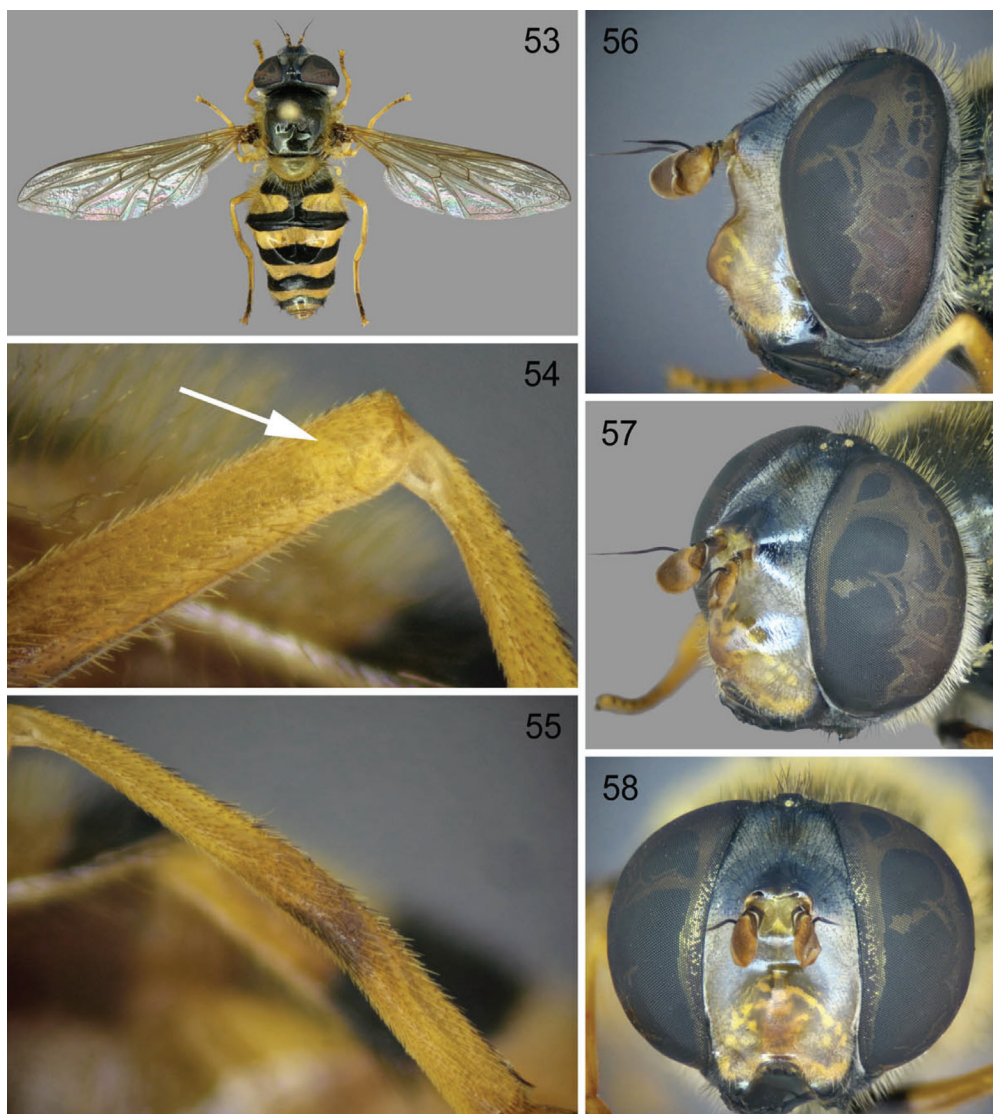
The species is also very similar in appearance to *E. melanostoma* (Zetterstedt, 1843), *E. nitidicollis* (Meigen, 1822) and *E. olgae* Mutin, 1990. From *E. nitidicollis* and *E. olgae* it differs by: wing entirely covered in microtrichia (in others, wing with basal medial (*bm*) cell 20% or more bare of microtrichia); scutellum with only yellow macrotrichia or with just a few black macrotrichia along hind margin (in others, at least one third of the scutellum with black macrotrichia); frons entirely black with gray pruinescence that do not look like separate maculae (figs 51, 52) (in others, frons with yellow anterior part and usually with two well developed yellowish-gray or golden-yellow maculae of pruinescens; in *E. olgae*, frons entirely with dense pruinescence except for the anterior part, and the maculae



Figs 47–52. *Epistrophe cryptica* female: 47 — habitus, dorsal view; 48 — apex of the hind femur, lateral view (arrow shows black macrotrichia); 49 — hind tibia, lateral view; 50 — head, lateral view; 51 — head, anterolateral view; 52 — head, frontal view.

along the compound eye margin often merge almost into a continuous band). Additionally, *E. cryptica* differs from *E. nitidicollis* by the yellow arista, at least in basal half (fig. 51) (in *E. nitidicollis*, the arista is black, rarely it can be brownish or yellowish).

Epistrophe cryptica is very similar to *E. melanostoma* in having: wing entirely covered in microtrichia; scutellum with only yellow macrotrichia or with just a few black macrotrichia along the hind margin; anterior surface of hind femur with black macrotrichia on apical third or more of its length (fig. 48). From *E. melanostoma* it can be separated by: frons entirely black (figs 51, 52) (in *E. melanostoma*, frons with yellow anterior part); hind tibia with the anterior side covered in a mixture of black and yellow macrotrichia (fig. 49) (in *E. melanostoma*, anterior side of hind tibia entirely with black macrotrichia).



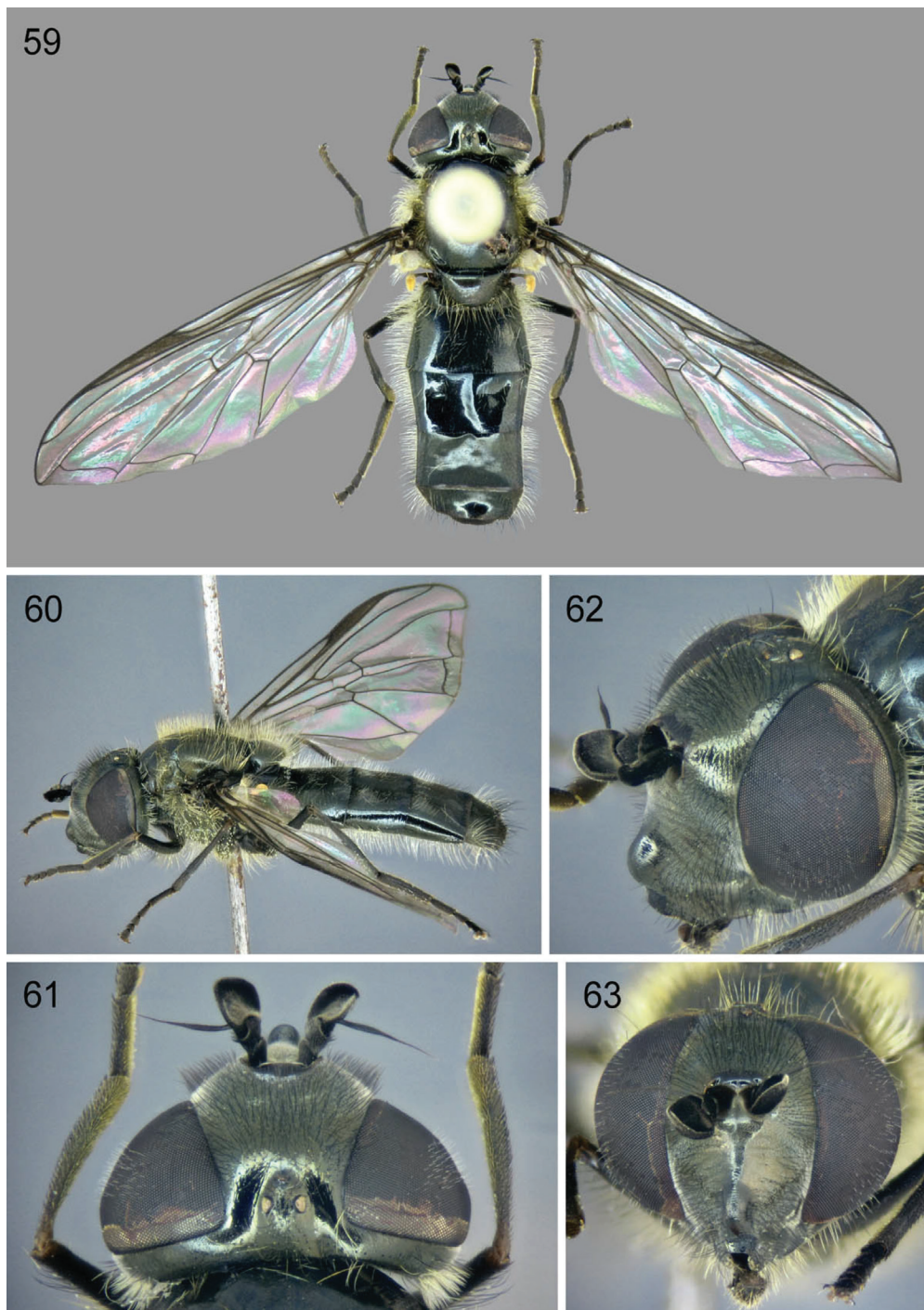
Figs 53–58. *Epistrophe obscuripes* female (Moscow Region, Russia): 53 — habitus, dorsal view; 54 — apex of the hind femur, lateral view (arrow shows yellow macrotrichia); 55 — hind tibia, lateral view; 56 — head, lateral view; 57 — head, anterolateral view; 58 — head, frontal view.

***Melangyna quadrimaculata* (Verrall, 1873) (figs 59–63)**

Material examined. Ukraine. Kyiv Region: Kyiv, 50.351462 N 30.481535 E, Theophania Park env., edge of deciduous forest, 28.03.2016, on flowers of *Salix* sp., 1 ♀ (M. Zaika).

Distribution: Belarus, Belgium, Bulgaria, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, Latvia, Lithuania, the Netherlands, Norway, Poland, Romania, the Slovak Republic, Slovenia, Sweden, Switzerland; Russia (European part, Eastern Siberia, the Far East); Japan (Bańkowska, 1963; Peck, 1988; Verlinden, 1991; Kuznetsov, 1993; Dirickx, 1994; Belcari et al., 1995; Holinka & Mazánek, 1997; Wolff, 1998; Nielsen, 1999; Stubbs & Falk, 2002; Stănescu & Pârnu, 2005; Pakalniškis et al., 2006; De Groot & Govedič, 2008; Mielczarek, 2009–2020; Reemer et al., 2009; Tóth, 2011, 2014; Borodin & Borodina, 2014; Haarto & Kerppola, 2014; Barkalov & Mutin, 2018; Speight et al., 2018; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).

Diagnosis. The *Melangyna quadrimaculata* female is similar to the female of *M. barbifrons* (Fallén, 1817) by its shining frons without pruinescence (figs 61–63), or with only rudimentary pruinescence. It can be separated from *M. barbifrons* by tergites without pale maculae, uniformly dark except for patches of paler pruinescens (fig. 59) (tergite 3, at the



Figs 59–63. *Melangyna quadrimaculata* female: 59 — habitus, dorsal view; 60 — habitus, lateral view; 61 — head, dorsal view; 62 — head, anterolateral view; 63 — head, frontal view.

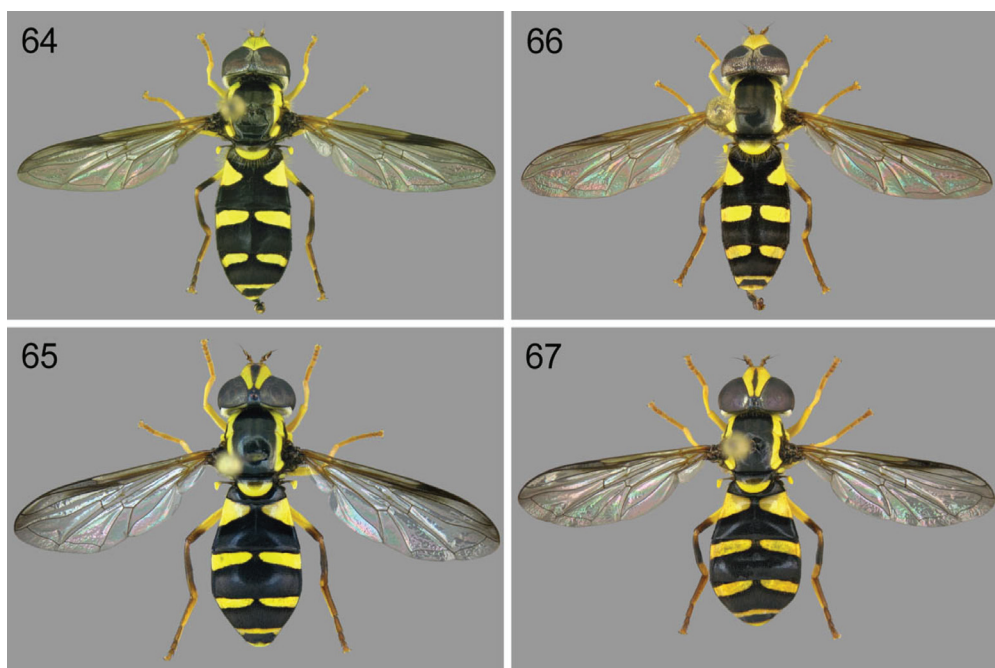
most, with a pair of vestigial pale maculae) (in *M. barbifrons*, tergites 2–4 each with a pair of pale maculae (Bartsch et al., 2009 a; Speight & Sarthou, 2017).

Melanistic females of *M. lasiophthalma* (Zetterstedt, 1843) are frequently misidentified as females of *M. quadrimaculata* (Speight, 2020).

Xanthogramma dives (Rondani, 1857) (figs 64–65)

Material examined. Ukraine. Zakarpattia: Kamianytsia env., 48.70 N 22.43 E, deciduous forest, 11.05.2017, 1 ♀; Vynogradiv env., 48.144001 N 23.071348 E, 26.06–18.07.2018, Malaise trap, 2 ♀ (A. Varga); Rivne Region: Bushcha env.: Mizotskyi Kriazh, 50.30 N 26.30 E, deciduous forest, 20–22.05.2019, 2 ♀; Illyashivka env., 50.277 N 26.281 E, 21.05.2019, edge of deciduous forest, 2 ♂; Kyiv Region: Potashnia env., 50.688 N 29.736 E, mixed forest, 9.05.2016, on flowers of *Sorbus aucuparia*, 1 ♂; Mygalky env., 50.66 N 29.50 E, edge of mixed forest near Teteriv River floodplain, 21–22.05.2016, 6 ♂, 2 ♀, 20.05.2017, 2 ♂, 1 ♀, 27.05.2018, 1 ♀; Irpin env.: 50.51 N 30.27 E, edge of mixed forest along the railway, 5.06.2015, 1 ♀, 25.06.2017, 1 ♀, 26.06.2018, 1 ♀; 50.51 N 30.26 E, edge of mixed forest near Irpin River floodplain, 23.08.2016, 1 ♂; Kotsiubynske env., 50.47 N 30.30 E, clearing in mixed forest, 17.05.2017, 2 ♂; Lisnyky env., Golosiivskyi National Nature Park, 50.29 N 30.54 E, deciduous forest, 17.08.2017, 1 ♀; 50.296 N 30.535 E, 3.05.2019, 2 ♂; Zavorychi env., 50.68 N 31.09 E, deciduous forest, 16.07.2015, 1 ♂, 1 ♀ (A. Prokhorov); Chernihiv Region: Nizhyn, 51.05 N 31.88 E, Hrafskyi Park, 10.05.2018, 1 ♂ (V. Kavurka); Morivsk, 51.088 N 30.882 E, in the garden, 14.07.2018, 1 ♂ (A. Prokhorov).

Distribution: at present uncertain, due to confusion until recently with both *X. pedisequum* and *X. stackelbergi*, but known from Andorra, the Czech Republic, France, Germany, Greece, Hungary, Italy, Montenegro, the Netherlands, Norway, Poland, Portugal, European Russia, Serbia, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland; Transcaucasia (the Republic of Georgia) (Belcari et al., 1995; Doczkal et al., 2002; De Groot & Govedič, 2008; Mielczarek, 2009–2020; Tóth, 2011; Van Eck, 2011; Van Steenis, 2011; Ssymank, 2012; Van Steenis et al., 2015; Ricarte & Marcos-García, 2017; Nedeljković et al., 2018; Speight et al., 2018; Prokhorov, 2019; Van Steenis et al., 2019; Mengual et al., 2020; Speight, 2020; Wakkie, 2020); Ukraine (**first record**).



Figs 64–67. *Xanthogramma dives* from Chernihiv (64) and Kyiv (65) Regions, and *X. stackelbergi* (66, 67) from Zakarpattia, habitus, dorsal view: 64, 66 — males; 65, 67 — females.

Diagnosis. Within the genus *Xanthogramma*, *X. dives*, *X. pedissequum* and *X. stackelbergi* are very similar in appearance. They share the following characters: tergite 2 wider than long; alula entirely covered in microtrichia; eye pilosity very sparse, shorter than the diameter of the anterior ocellus; hind femora black on the apical fourth. *Xanthogramma adives* can be easily separated from *X. pedissequum* by the thorax with more than two yellow maculae laterally (in *X. pedissequum*, thorax with one or two yellow maculae laterally). From the most similar *X. stackelbergi* (figs 66, 67), both sexes of *X. dives* can be distinguished by wing cells r_1 and r_{2+3} darkened in the apical part (figs 64, 65) (in *X. stackelbergi*, wing cells r_1 and r_{2+3} hyaline in the apical part, as on figs 66, 67). These characters are based on Nedeljković et al. (2018). Additionally, *X. dives* female differs from *X. stackelbergi* by a black median vitta on the frons that usually expands towards the lunule (fig. 65) (in *X. stackelbergi*, a black median vitta on the frons usually tapers towards the lunule, as on fig. 67) (according Speight & Sarthou, 2017).

Note. Until recently, *X. dives* was erroneously confused with the two similar species *X. pedissequum* (Harris, 1776) and *X. stackelbergi* Violovitsh, 1975, and this taxon was not included in the most of European species lists before Speight & Sommaggio (2010), who designated the *X. dives* lectotype.

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