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NEW RECORDS OF HOVERFLIES (DIPTERA, SYRPHIDAE) FROM UKRAINE. II. BRACHYOPINI AND MERODONTINI

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New Records of Hoverflies (Diptera, Syrphidae) from Ukraine. II. Brachyopini and Merodontini. Prokhorov, A. V., Popov, G. V., Zaika, M. I. — Seven hoverfly species of the tribes Brachyopini and Merodontini (subfamily Eristalinae): *Brachyopa maculipennis* Thompson, 1980, *B. plena* Collin, 1939, *B. vittata* (Zetterstedt, 1843), *Myolepta obscura* Becher, 1882, *Orthonevra geniculata* (Meigen, 1830), *Merodon moenium* (Wiedemann in Meigen, 1822) and *Psilota atra* (Fallén, 1817) are recorded from Ukraine for the first time. Distributions of these species are summarized and diagnoses of the species are provided.
Key words: Diptera, Syrphidae, *Brachyopa*, *Myolepta*, *Orthonevra*, *Merodon*, *Psilota*, Ukraine.

Introduction

The representatives of genera *Brachyopa*, *Myolepta* and *Orthonevra* (all from the tribe Brachyopini) are widespread in Europe but are generally rare, at least in Ukraine. Eight species of *Brachyopa*, three species of *Myolepta* and seven species of *Orthonevra* are recorded nowadays in Ukraine (Popov & Prokhorov, in prep.). At least 25 species of Merodontini belonging to the genus *Merodon* and three species of the genus *Psilota* have been found to occur in Ukraine (Popov & Prokhorov, in prep.). Herein, we provide detailed data on the distribution of species recorded from Ukraine for the first time. The specimens were identified by the comparison with the descriptions and available voucher specimens of similar species. This article is continuing the series of papers with the first records of the hoverflies from Ukraine in the 2010s (Popov & Romanov, 2014; Prokhorov et al., 2017, 2018; Prokhorov & Popov, 2017).

Material and methods

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

We follow the most steady and cross-cutting morphological terminology of McAlpine (1981), Vockeroth & Thompson (1987), Thompson & Rotheray (1998), with some additions of Speight (1987). Diagnoses are generally based on the keys by Collin (1939), Stackelberg (1953), Reemer et al. (2005), Marcos-García et al. (2007), Smit & Vujić (2008), Van Veen (2010), and Speight & Sarthou (2017).

The 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) or Combine ZM and processed in Adobe Photoshop CS6 by A. V. Prokhorov.

Tribe Brachyopini
Subtribe Brachyopina

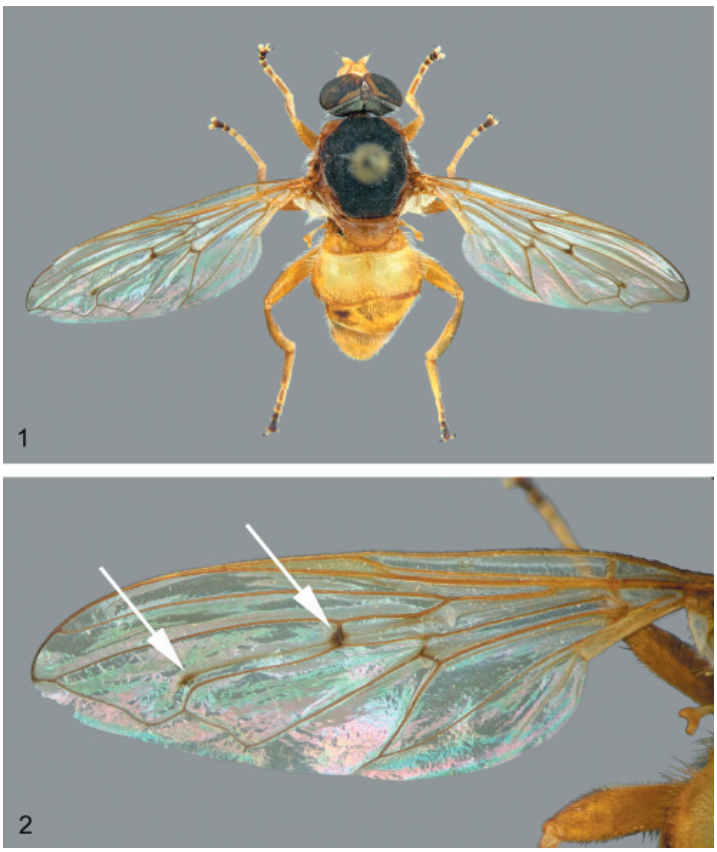
Brachyopa maculipennis Thompson, 1980 (figs 1, 2)

Popov, 2003: 47, 508: "*Brachyopa bicolor*" (misidentification).

Material examined. Ukraine. Kyiv Region: Kyiv, 9.06.2005 (M. Zaika); Crimea: Stary Krym, Zolotoy Klyuch [formerly Suv Baş], 45.10 N 35.05 E, 13.05.1951, 1 ♂ (I. Maltsev).

Distribution. Northern Germany, Austria, Poland, Czech Republic, Slovakia, northern Italy, Hungary, Romania, Serbia, Montenegro (Peck, 1988; Vujić, 1991; Holinka & Mazánek, 1997; Tóth, 2011; Speight, 2013, 2017; Mielczarek, 2018), Ukraine (**first record**). Our records are the easternmost for this very rare species.

Diagnosis. It can be easily differentiated from other species of the genus by the distinct dark maculae over crossvein r-m and at the apical end of the spurious vein (fig. 2).



Figs 1–2. Male of *Brachyopa maculipennis*: 1 — habitus, dorsal view; 2 — left wing (arrow shows the dark maculae around the crossvein r-m and at the end of the spurious vein).

Brachyopa plena Collin, 1939 (figs 3–5)

Material examined. Ukraine. Zakarpattia Region: Kamianytsia env., Uzh River valley (left bank), 48.70 N 22.43 E, road in deciduous forest, 10.05.2017, 1 ♀ (G. Popov).

Distribution. Austria, Serbia, Northern Greece (Vujić, 1991; Holinka & Mazánek, 1997; Speight, 2013, 2017), "Central European territory" of the former USSR (Peck, 1988), Ukraine (**first record**). Record from Czech Republic (Collin, 1939) actually refers to the locatity in Austria (Speight, 2017).

Diagnosis. **Female** differs from similar *B. pilosa* Collin, 1939 (figs 6–8) by the larger and more ventral sensory pit on the basoflagellomere (distance between ventral edge of the pit and ventral edge of the basoflagellomere less than the diameter of the pit, as on fig. 5) (in *B. pilosa*, distance between ventral edge of the pit and ventral edge of the basoflagellomere exceeds the diameter of the pit, as on fig. 8), and numerous black hairs on the lateral margin of the second tergite (in *B. pilosa* all hairs pale, but the males have some black hairs and its quantity is rather variable) (Collin, 1939; Speight, 2017). *Brachyopa plena* is similar to *B. scutellaris* Robineau-Desvoidy, 1844 in having basoflagellomere with ventral location of the sensory pit (distance between ventral edge of pit and ventral edge of antennal seg-

Figs 3–8. Females of *Brachyopa plena* (figs 3–5) and *B. pilosa* (from Kyiv Region) (figs 6–8): 3, 6 — habitus, dorsal view; 4, 7 — head, frontal view; 5, 8 — head, anterolateral view (arrow shows the sensory pit on the basoflagellomere).

Fig. 9. Male of *Brachyopa vittata*, dorsal view.

ment less than the diameter of the pit), differing by the rounded and smaller sensory pit (in *B. scutellaris*, basoflagellomere with normally kidney-shaped or c-shaped and larger sensory pit), and notopleuron with black and pale pile (in *B. scutellaris* usually with pale pile only) (Collin, 1939; Speight & Sarthou, 2017). Specimens from Ukraine have the notopleuron with a few black hairs.

Additional features. *Brachyopa plena* from Zakarpattia have vertex as wide as width of the basoflagellomere (fig. 4), whereas in *B. pilosa* (from Kyiv Region), vertex is 1.33 times as wide as basoflagellomere width (fig. 7). The specimen from Zakarpattia has the postpronotum yellowish-brown, whereas in *B. pilosa* it is at least dorsally black.

Note. Speight (2017) remarks that "…the shape of this pit varies, and occasional specimens may be found, among series of specimens of *B. scutellaris* from Western Europe, in which this pit is either oval or round, or of indeterminate shape". We still admit that the specimen on hand can be an aberrant *B. scutellaris* with rounded sensory pit (that species has not been recorded from Ukraine either).

Brachyopa vittata (Zetterstedt, 1843) (fig. 9)

Material examined. Ukraine. Ivano-Frankivsk Region: Elmy, 10 km WSW Yaremche, 48.43 N 24.43 E, h = 800 m, 13.08.2004, 2 ♂ (G. Popov).

Distribution. Norway, Sweden, Denmark, the Netherlands, Belgium, Germany, Switzerland, Austria, Slovenia, Poland, Czech Republic, Slovakia, Romania, Serbia and Montenegro, Hungary, Russia (North and Central European territory, Southern Siberia, Far East) (Peck, 1988; Vujić, 1991; Holinka & Mazánek, 1997; Tóth, 2011; Speight, 2013, 2017; Mielczarek, 2018), Ukraine (**first record**).

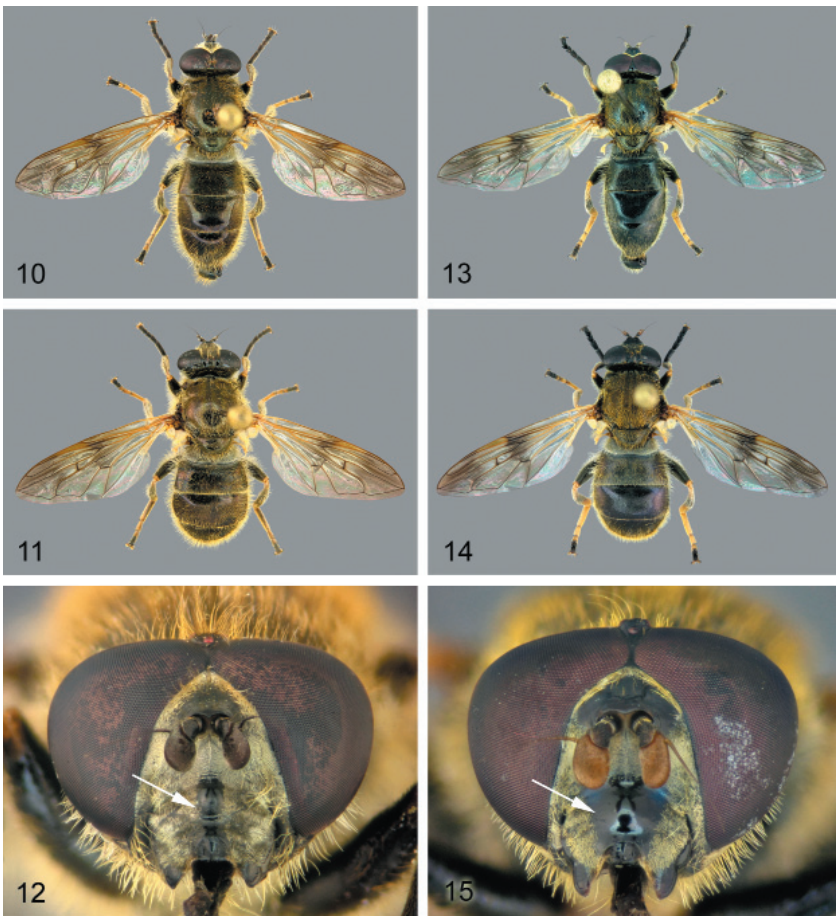
Diagnosis. It can be easily differentiated from other similar species by its bigger size and scutum "extensively brown/yellow-brown, at least laterally and anterior to the scutellum (elsewhere greyish-brown)" (Speight & Sarthou, 2017).

Myolepta obscura Becher, 1882 (figs 10–12, 16–18)

Material examined. Ukraine. Zakarpattia Region: Kamianytsia env., Uzh River valley (left bank), 48.70 N 22.43 E, roads in deciduous forest, 9–10.05.2017, 1 ♂, 1 ♀ (A. Prokhorov).

Distribution. Northern France, Germany, Switzerland, Northern Italy, Southern Austria, Slovenia, Serbia, Montenegro, Poland, Slovakia, Hungary, Romania, Azerbaijan (Peck, 1988; Reemer et al., 2005; Holinka & Mazánek, 1997; Tóth, 2011; Speight, 2013, 2017; Mielczarek, 2018), Ukraine (**first record**).

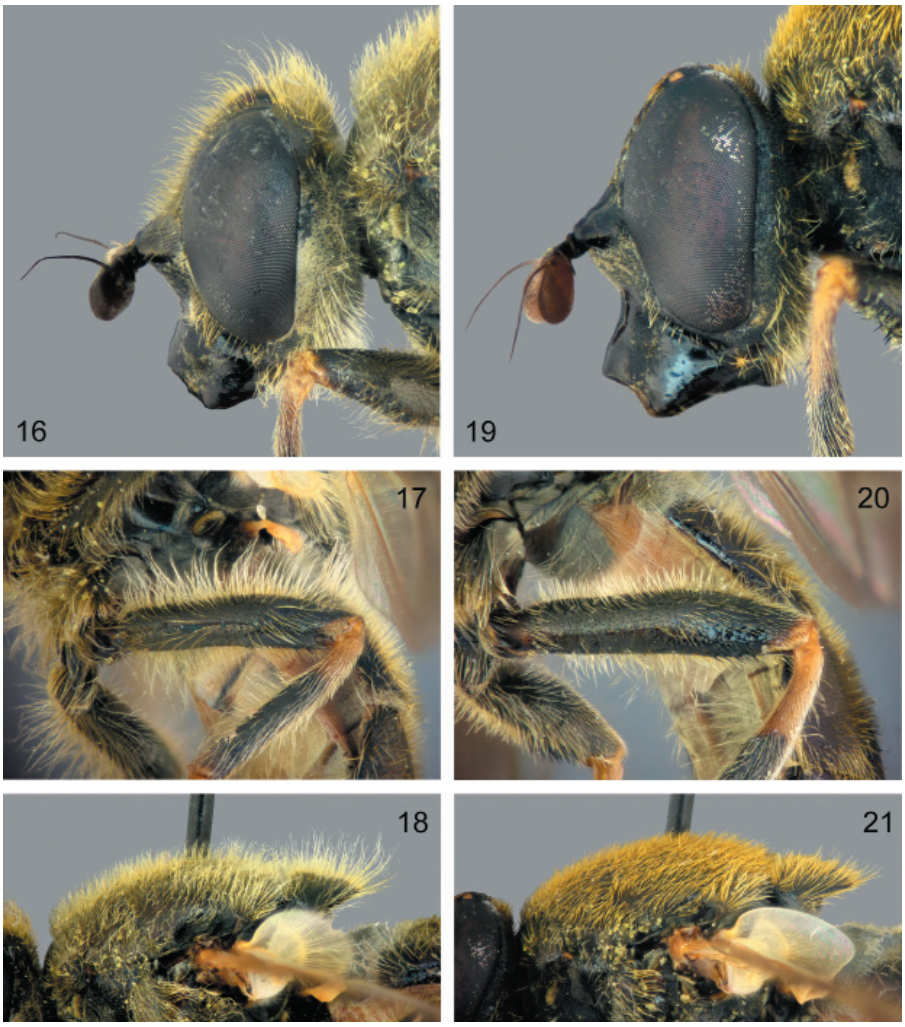
Diagnosis. Both sexes differs from similar *Myolepta vara* (Panzer, 1798) (figs 13–15, 19–21) by the scutum and scutellum with long wooly upstanding pile (fig. 18) (in *M. vara* with short reclined pile, as on fig. 21), hind margin of the scutellum with hairs as long as two thirds/three quarters the median length of the scutellum (fig. 18) (in *M. vara*



Figs 10–15. *Myolepta obscura* (figs 10–12) and *M. vara* (figs 13–15) from Zakarpattia: 10, 13 — habitus of the males, dorsal view; 11–14 — habitus of the females, dorsal view; 12, 15 — heads of the males, frontal view (arrow shows the shining median strip of the face).

with hairs half as long as the median length of the scutellum, as on fig. 21), pleurae entirely pollinose (in *M. vara*, pleurae shining except for proepimeron and anterior anepisternum), anterolateral surface of the hind femur with many hairs as long as the maximum width of the femur (fig. 17) (in *M. vara* with hairs half as long as the maximum width of the femur, as on fig. 20), metasternum bare (in *M. vara*, metasternum pilose). **Male** also differs from *M. vara* by narrow shining median facial strip (fig. 12) (in *M. vara*, shining median strip broadening from facial tubercle upwards to almost twice its width, as on fig. 15).

Additional features. Both sexes of *M. obscura* differs from *M. vara* by the frons, scutum and scutellum with pale yellowish hairs (in *M. vara*, all hairs distinctly golden, as on fig. 21), tibiae with numerous long hairs at least as long as width of the tibia (in *M. vara*, tibiae with hairs all shorter than the width of the tibia), the basoflagellomere dark (in *M. vara*, the basoflagellomere pale, as on fig. 15). **Male** of *M. obscura* differs from *M. vara* by the frons with numerous upstanding hairs (in *M. vara*, frons almost bare with a few semi-adpressed hairs), width of the dusting frons edge along eyes is equal to the width of the orbital strip (in *M. vara*, width of the dusting frons edge along eyes less then the width of the orbital strip), frons angle between eyes acute (frons angle slightly obtuse in *M. vara*). **Female** of *M. obscura* differs from *M. vara* by the frons with upstanding pile (in *M. vara* frons with semi-adpressed hairs aside from the median line of the frons).



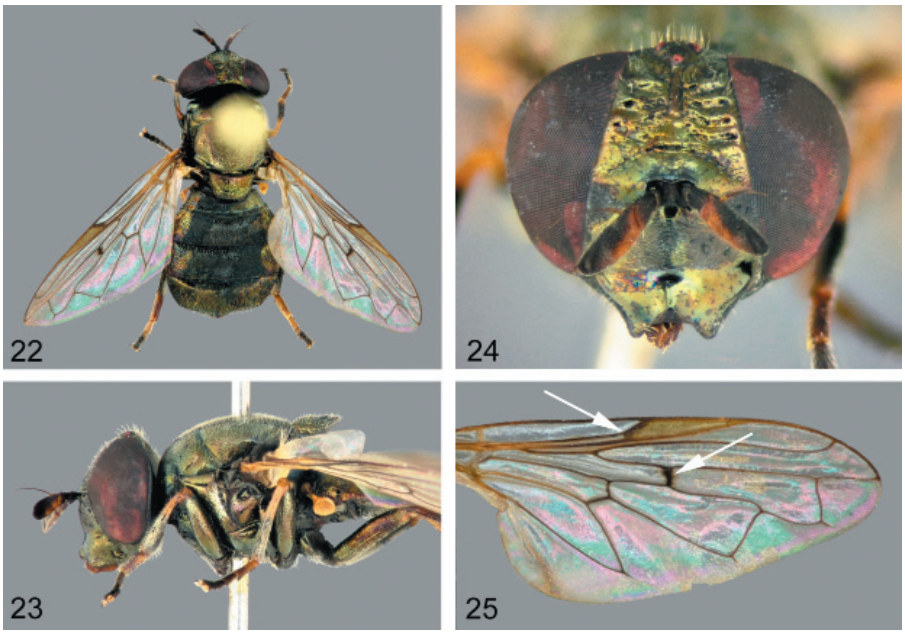
Figs 16–21. Females of *Myolepta obscura* (figs 16–18) and *M. vara* (figs 19–21) from Zakarpattia: 16, 19 — head, lateral view; 17, 20 — hind femur, anterolateral view; 18, 21 — scutum and scutellum, lateral view.

Orthonevra geniculata (Meigen, 1830) (figs 22–25)

Material examined. Ukraine. Kyiv Region: Dibrova env., 50.19 N 30.20 E, 3.05.2014, 1 ♀ (M. Zaika).

Distribution. Norway, Sweden, Finland, Ireland, Great Britain, Denmark, the Netherlands, Belgium, France, Northern Italy, Germany, Poland, Czech Republic, Slovakia, Hungary, Romania, Bulgaria, Russia (European territory, West and East Siberia, Far East) and Mongolia (Stackelberg, 1953; 1970; Peck, 1988; Holinka & Mazánek, 1997; Mutin & Barkalov, 1999; Tóth, 2011; Speight, 2017; Mielczarek, 2018), Ukraine (**first record**).

Diagnosis. **Female** differs from *Orthonevra erythrogona* (Malm, 1863) by legs with tibiae pale at least for basal 1/3 (almost half in the specimen from Kyiv Region, as on fig. 23), and the basoflagellomere about 3 times longer than wide (fig. 24) (in *O. erythrogona*, tibiae black with only knees pale, and the basoflagellomere twice as long as wide). From similar *Orthonevra elegans* (Wiedemann in Meigen, 1822) *O. geniculata* differs by eyes without dark stripe, and the basoflagellomere about 3 times longer than wide (in *O. elegans*, eyes with dark stripe, and the basoflagellomere about 4 times longer than wide). From similar



Figs 22–25. Female of *Orthonevra geniculata*: 22 — habitus, dorsal view; 23 — lateral view; 24 — head, frontal view; 25 — right wing (arrow shows the dark maculae on the basis of stigma and around the crossvein r-m).

O. intermedia Lundbeck, 1916 and *O. stackelbergi* Thompson & Torp, 1982 *O. geniculata* differs by the crossvein r-m brown infuscate and two-colored pterostigma (yellowish with dark part at base) (fig. 25), face on the level of the antennal sockets about 1.5–2 times as wide as width of an eye (fig. 24) (in *O. stackelbergi* and *O. geniculata*, the crossvein r-m clear, pterostigma unicolorous, the width of the face on the level of the antennal sockets less than the width of an eye) (Stackelberg, 1953; Van Veen, 2010).

Tribe Merodontini

Merodon moenium (Wiedemann in Meigen, 1822) (figs 26–29)

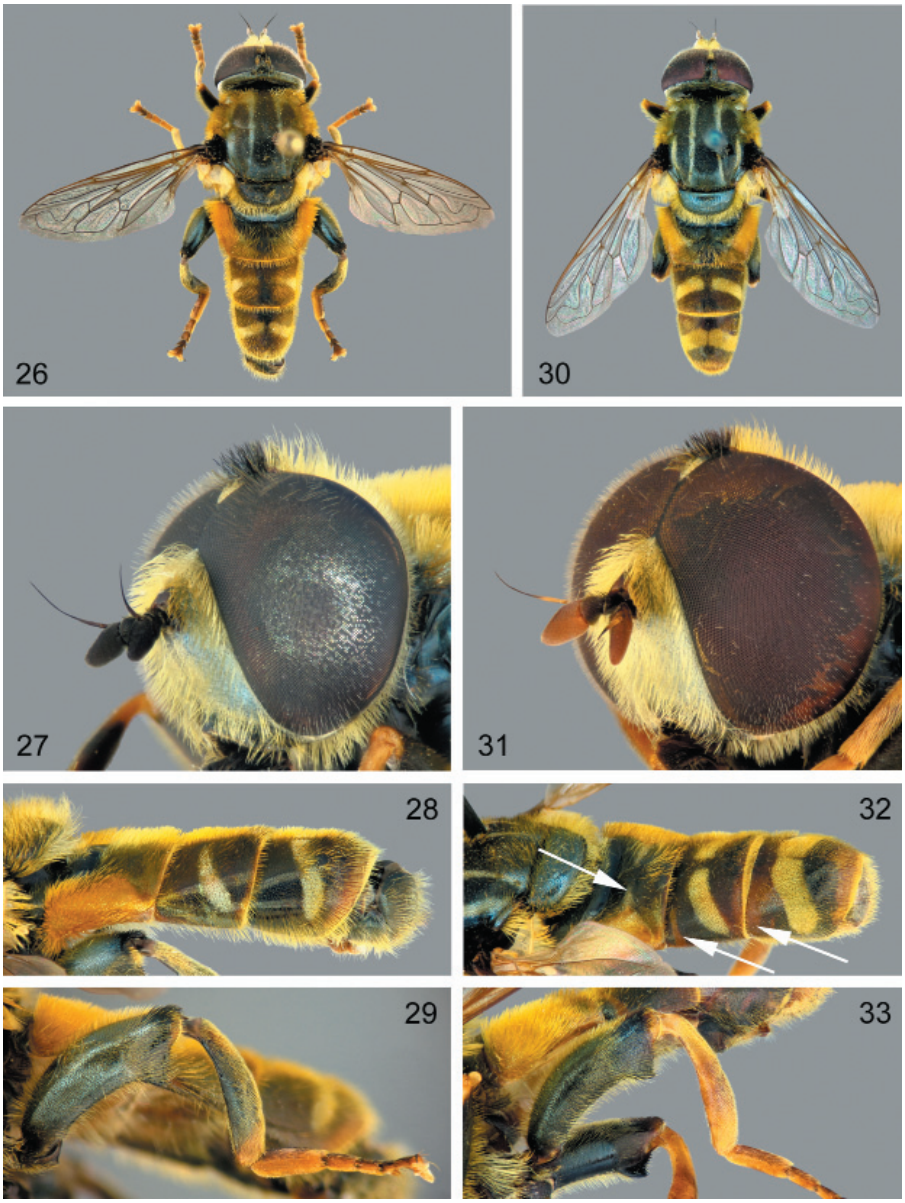
Material examined. Ukraine. Kyiv Region: Mali Dmytrovychi env., 50.22 N 30.52 E, grassy ravine among agricultural fields and mixed forest, 5.07.2017, 1 ♂, 13.07.2017, 3 ♂ (A. Prokhorov).

Distribution. Speight (2017) notes that the "occurrence of this taxon in various parts of Europe still requires confirmation, due to confusion with *M. avidus* and *M. ibericus*". Probably *M. moenium* is distributed from southern Sweden southwards to the Mediterranean and Northern Africa; from France through most of Central and Southern Europe to Turkey and European parts of Russia (ibid.), Ukraine (**first record**).

Diagnosis. Very similar to *M. avidus* (fig. 30–33), except tergite 2 shiny, the dust (whitish microtrichose) spots on the second tergite are lacking (in *M. avidus*, the dust spots on the tergite 2 are present, as on fig. 32); there are narrow microtrichose bands on tergites 3 and 4 (in *M. avidus*, these bands are wider, as on fig. 30); tergite 3 is black without reddish lateral spots (fig. 28) (in the female it is anterolaterally orange-red, but with a black posterior margin, in contrast with *M. avidus* where the posterior margin of tergites 2–4 in both sexes are paler, as on fig. 32); the tibiae are always partly dark (fig. 29) (in *M. avidus*, the hind tibia pale, as on fig. 33) and the body hairs longer, especially on the apical tergites (fig. 28) (Milankov et al., 2001, 2009; Marcos-García et al., 2007; Popović et al., 2015; Ačanski et al., 2016; Speight, 2017). No differences in male genitalia characters between these two taxa are found. *Merodon ibericus* Vujić, 2015 has similar characteristics with

M. moenium, but it inhabits only the Iberian Peninsula and cluster analysis of DNA barcoding sequences clearly separated that species (Popović et al., 2015).

Notes. In the Palaearctic Catalogue of Syrphidae (Peck, 1988) the name *M. moenium* is considered a synonym of *M. spinipes* (Fabricius, 1794). Later it became clear that in turn, *M. spinipes* is a juniour synonym of *M. avidus* (Rossi, 1790) (Hurkmans, 1993). During the molecular and morphological study of some *M. avidus* populations, Milankov et al. (2001, 2004, 2009) found cryptic species *M. avidus* A and *M. avidus* B among *M. avidus* complex. Marcos-García et al. (2007) also believe that *M. avidus* group of closely related species contains, in particular, two cryptic taxa namely "Mediterranean" *M. avidus* A and "mountainous" *M. avidus* B species (now *avidus*



Figs 26–33. Males of *Merodon moenium* (figs 26–29) and *M. avidus* (from Crimea, Karadag) (figs 30–33): 26, 30 — habitus, dorsal view; 27, 31 — head, anterolateral view; 28, 32 — abdomen, dorsolateral view (arrow shows the dust on tergite 2 and the red patterns on tergites 3–4); 29, 33 — hind leg, lateral view.

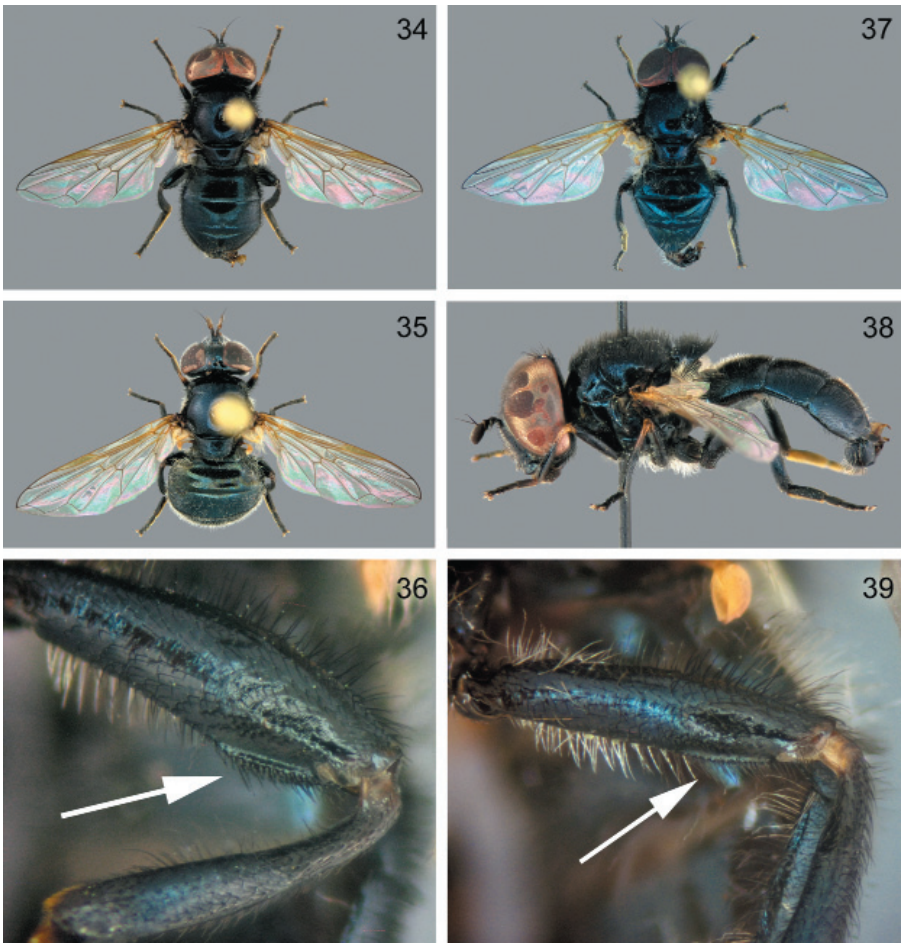
and *moenium*, correspondingly). In the study with the aim to delimitate cryptic taxa within the *M. avidus* complex, Popović et al. (2014) distinguished very close *M. avidus* and *M. moenium* "according to the diagnostic morphological characters, as well as to the season of their adult activity" (ibid.), the analysis of samples revealed also "the clear presence of two separate taxa" with integrative usage of allozyme (in this case it was more informative compared to the mtDNA marker) and morphological markers (ibid.). All the available genetic and ecological data confirmed a hypothesis that the *M. avidus* species complex consists of several sibling species and indicated their recent speciation (Popović et al., 2015). Designation of the neotypes of *M. avidus*, *M. spinipes* and the lectotype of *M. moenium* was an important step for solving this problem (Popović et al., 2015). Thus, the *M. avidus* complex includes four sibling species, namely *M. avidus*, *M. moenium*, *M. ibericus* and *M. megavidus* Vujić & Radenković, 2016 (Ačanski et al., 2016). Among them, two species are found in Ukraine, these are *M. avidus* (Hurkmans, 1993; Popov, 2003, 2010; Popović et al., 2015) and *M. moenium* (this study). The species of this complex have proven difficult to distinguish using traditional morphological characters (Ačanski et al., 2016; etc.), and in Ukraine, we were faced with these difficulties in the Crimean Peninsula where the species of *M. avidus*/*moenium* complex occur sympatrically (Popov, 2003). While we can not reliably indicate *M. moenium* for Crimea without additional study. At the same time in the Kyiv Region we found a morphologically "standard" population of *M. moenium*, which allowed us to record this species for Ukrainian fauna for the first time.

Psilota atra (Fallén, 1817) (figs 34–36, 38)

Material examined. Ukraine. Kyiv Region: Kyiv, Theophania Park, 50.34 N 30.48 E, 25.04.2016, 1 ♀ (M. Zaika); Kotsiubynske env., 50.47 N 30.30 E, clearing in mixed forest, 17.05.2017, on flowers of *Crataegus* sp., 1 ♂, 2 ♀ (A. Prokhorov).

Distribution. Norway, Sweden, Denmark, the Netherlands, Germany, Poland, through France to Spain and the Mediterranean, and in Central Europe to Northern Italy, Montenegro, Greece (including Crete), Romania and Cyprus, N Africa (Morocco) (Peck, 1988; Smit & Vujić, 2008; Speight, 2017; Mielczarek, 2018), Ukraine (**first record**).

Diagnosis. **Male** differs from similar *P. anthracina* Meigen, 1822 (fig. 37–39) by the distinctly swollen apical part of the hind femur (fig. 36) bearing a well-developed longitudinal ridge with setulae **posteroventrally** (in *P. anthracina* hind femur almost not swollen and "without a ridge **posteroapically**" (Speight & Sarthou, 2017), though this ridge is rather poorly developed but visible, as on fig. 39). Besides this, both species can be easily differentiated based on male genitalia. Genitalia of both species are prepared and compared with figures in Smit & Vujić (2008). Also it is necessary to pay attention that in the key (Speight & Sarthou, 2017) *P. atra* male with "1st basal cell of wing almost entirely devoid of microtrichia", while the specimens from Kyiv Region have the cell br of wing *c*. 20% covered with microtrichia. Morphological features of **females** of *P. atra* from Kyiv completely correspond with those in a brief description of this species by Smit & Vujić (2008). Is differs from *P. anthracina* females by the anepisternum predominantly with pale pile, at most some black hairs on anterior anepisternum (Smit & Vujić, 2008) (in *P. anthracina*, anepisternum predominantly with black pile, at most a few pale hairs at the posterior margin of anepisternum), but in *P. atra* this feature varies (Speight & Sarthou, 2017).



Figs 34–39. *Psilota atra* (figs 34–36, 38) and *P. anthracina* (from Zakarpattia) (figs 37, 39): 34, 37 — habitus of the males, dorsal view; 35 — habitus of the female, dorsal view; 38 — habitus of the male, lateral view; 36, 39 — hind femur of the male, anterolateral view (arrow shows the longitudinal ridge).

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