

An unusual diversity of Ulidiidae (Diptera) in a rich fen in Central Bohemia (Czech Republic)

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Abstract: Species of Ulidiidae (Diptera) have been studied in the Hrabanovská černava reserve, a well-preserved calcareous lowland rich fen situated in the Polabská nížina (Elbe river basin) near Lysá nad Labem, in Central Bohemia (Czech Republic). A total of 9 species have been recorded, including two representing the first records from the Czech Republic: *Herina oscillans* (Meigen, 1826) and *Euxesta notata* (Wiedemann, 1830), the latter being a recent invader from North America. *Herina scutellaris* Robineau-Desvoidy, 1830 has been confirmed in the Czech Republic and recorded from the northernmost known locality. The latter species, and particularly *H. oscillans*, are considered the most significant elements of this fen type. Due to their unique occurrence and association with a highly endangered biotope, it is proposed to consider them as endangered (EN) species in the Czech Republic. A second record of *Homalocephala biumbrata* (Wahlberg, 1839) from Bohemia is presented. The species richness of Ulidiidae in the fen under study and habitat association of all recorded species are discussed.

Keywords: Diptera, Ulidiidae, Czech Republic: Central Bohemia, rich fen, habitat association, distribution, faunistic, nature conservancy

Introduction

The picture-winged flies (Diptera: Ulidiidae) have been considered relatively well-studied in the Czech Republic (and in Bohemia in particular), especially thanks to numerous faunistic contributions published by the late Vladislav Martinek (*1926, †2005); for his bibliography see Mocek (2006). Since his decease only four more species have been added to the fauna of the Czech Republic (Merz & Roháček 2005, Roháček 2009, 2012, Roháček & Bílek 2012), including an invasive Nearctic species, *Callopistromyia annulipes* (Macquart, 1855) recorded from Bohemia by Dvořák (2017).

In 2024 a group of dipterists (J. Roháček, J. Ševčík, M. Tkoč) began to study the fauna of Diptera in the Hrabanovská černava reserve near Lysá nad Labem (Figs 1–9). This locality is well-known among botanists due to unique fen phytocoenoses and extreme diversity of plant taxa (cf. Husáková et al. 1988, Roleček et al. 2020). Our investigation of Diptera in this rich fen was initiated by Petr Kment, entomologist of the National Museum of the Czech Republic, who invited us to perform there an inventory of Diptera and provided many-sided support during our field work at his favourite locality.

This paper is the first contribution to the knowledge of Diptera Acalypterae occurring in the Hrabanovská černava fen and is aimed at presenting results of the study of the family Ulidiidae in the northern and western parts of the reserve (see below). The species-richness of representatives of this family was found to be unexpectedly high in the area under study, including two species hitherto unrecorded from the Czech Republic.

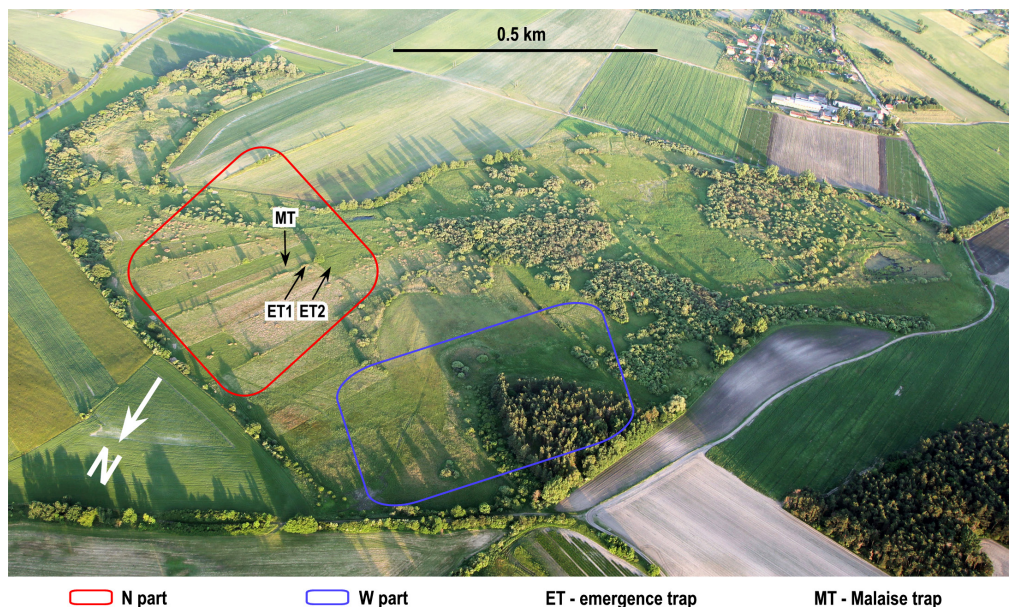


Fig. 1: Aerial photograph of the Hrabanovská černava fen with position of study plots and situation of Malaise and emergence traps. Photo by Z. Fiedler (7.vi.2012).

Material and methods

All the material examined is deposited in the Silesian Museum, Opava, Czech Republic (SMOC). It was identified by the author but the identity of some species has been verified by E. P. Kameneva and V. A. Korneyev (Kyiv, Ukraine). The material obtained by traps is preserved in 80% ethanol but selected series of specimens were dried and mounted on pinned triangular cards to be deposited as voucher specimens in the collection. In several specimens, genitalia preparations have been made; the dissected terminalia are preserved in glycerine in plastic microvials or tubes and each pinned below the respective specimen.

The specimens under study were obtained by means of several collecting methods: sweeping and netting (Fig. 3), suction sampling from under vegetation (Fig. 4), Malaise trap (Fig. 2) and two emergence (pyramidal) traps (Figs 5, 6). Traps were intentionally placed in stands of selected plant species: the Malaise trap was installed over graminoid growth with predominating sedges *Carex hostiana*, *C. flacca* and the grass *Sesleria uliginosa*; emergence trap ET1 was placed in a pure growth of the great fen-sedge (*Cladium mariscus*) and emergence trap ET2 in a growth of bog-rushes (*Schoenus ferrugineus* + *S. ×scheuchzeri*).

The faunistic inventory in the Hrabanovská černava National Nature Monument was carried out in accordance with the conditions applicable to this specially protected area and after proper notification to the relevant office of the Nature Conservation Agency of the Czech Republic (Administration of the Kokořínsko – Máchův kraj Protected Landscape Area).

Abbreviations used in text. Traps: ET = emergence trap, MT = Malaise trap, J. Roháček et al. leg. = J. Roháček, P. Kment, J. Ševčík and M. Tkoč leg.

Study area

The Hrabanovská černava reserve (55 ha; see aerial view on Fig. 1) is situated in the Polabská nížina (Elbe river basin), in Central Bohemia near Lysá nad Labem. It is probably the best preserved rich (calcareous) fen, unique within the whole of the Czech Republic (Roleček et al. 2020), protected already since 1933, currently as a National Nature Monument. The locality belongs to the Bohemian Thermophyticum (Skalický 1988) and is distinguished by



Figs 2–4: Collecting methods. 2 – Malaise trap in N part of the locality; 3 – sweeping graminoid vegetation (J. Roháček in foreground); 4 – suction sampling in tufts of *Schoenus ferrugineus* by P. Kment (all 13.vi.2024). Photo by J. Ševčík (3) and J. Roháček (others).



Figs 5–6: Collecting methods. 5 – emergence trap ET1 on *Cladium mariscus* with J. Ševčík installing its collecting bottle (10.v.2024); 6 – emergence trap ET2 on *Schoenus* spp. (8.vii.2024), both in N part of the locality. Photo by J. Roháček.

extremely rich plant diversity (for detail including a plant inventory and phytocenology see Husáková et al. 1988), with numerous species important both from the nature conservancy and biogeography point of view. A total of 538 plant taxa, including 16 critically endangered were listed by Husáková et al. (1988) from the reserve, *Potamogeton coloratus* (the only recent locality in the Czech Republic), *Calamagrostis stricta*, *Cladium mariscus*, *Schoenus ferrugineus* or *Utricularia vulgaris* are among the most significant of them. The majority of these plant species is associated with habitats of oligotrophic to mesotrophic calcareous fens, which have been present in this locality for a long time, and have probably survived here for the entire Holocene (Pokorný et al. 2010). This long habitat continuity is primarily caused by deep artesian springs, being a source of sufficient moisture and calcium. In addition, towards the end of the last glaciation, the draining of this spring area was dammed by a sand dune. This resulted in development of an extensive wetland with an open water surface, which was gradually silted and changed into a fen (Petr & Novák 2014). However, human activity also had an impact on the above process – there was a pond, the fen was mined for peat, a system of drainage ditches was built, meadows were mowed and ploughed in some places (Husáková et al. 1988). In spite of this, the preservation of the local fen communities of plants is surprisingly good, even though a number of important plant species have disappeared here since 1933 (Husáková et al. 1988, Roleček et al. 2020).

Two plots in the Hrabanovská černava reserve have been selected for study, one in the northern part (Figs 1, 7) the other in the western (more precisely north-western) part of the locality (Figs 1, 8, 9). All collecting methods, including Malaise and emergence traps listed above, were used in N part, while only sweeping, netting and suction sampling in W part. These plots are located (and specimens labeled) as follows (see Fig. 1):

(1) **Czech Republic:** C. Bohemia: Lysá nad Labem 2 km N, Hrabanovská černava res., N part, 50°13'08"N, 14°50'09"E, 186 m.

(2) **Czech Republic:** C. Bohemia: Lysá nad Labem 1.6 km N, Hrabanovská černava res., W part, 50°12'58"N, 14°49'39"E, 186 m

In the lists of the material examined (under each species presented below) these plots are abbreviated as Hrabanovská černava, N part and/or Hrabanovská černava, W part.

Synopsis of recorded species

ULIDIIDAE

A total of 30 species of this family have hitherto been known from the Czech Republic (Roháček 2009, 2012, 2015, Dvořák 2017). The one-season field work in the Hrabanovská černava reserve resulted in records of nine species (see below) including two additions to the fauna of the Czech Republic.

Otitinae

Ceroxys hortulana (Rossi, 1790)

Material examined: Hrabanovská černava, N part, MT, 31.v.-13.vi.2024, 1♀, 13.vi.-8.vii.2024, 1♀, J. Roháček et al. leg.

Remarks: A large species with distinctive wing pattern (see e.g. Galinskaya et al. 2014, fig. 7B).

Biology: An uncommon species, particularly in temperate Europe, mainly occurring in lowlands (Martinek et al. 2005). It is a hygrophilous species (Martinek 1999) occurring in wetlands. Only two females were captured by means of a Malaise trap (Fig. 2) in the northern part of the rich fen under study.

Distribution: A widespread Eurosiberian species but absent in the northern part of the Palaearctic Region (Kameneva 2008). It is infrequent in Central Europe but is known from lowlands of both Bohemia and Moravia (most records) in the Czech Republic (see Martinek 1978, 1985, 1999, Martinek et al. 2005, Martinek & Mocek 1995).

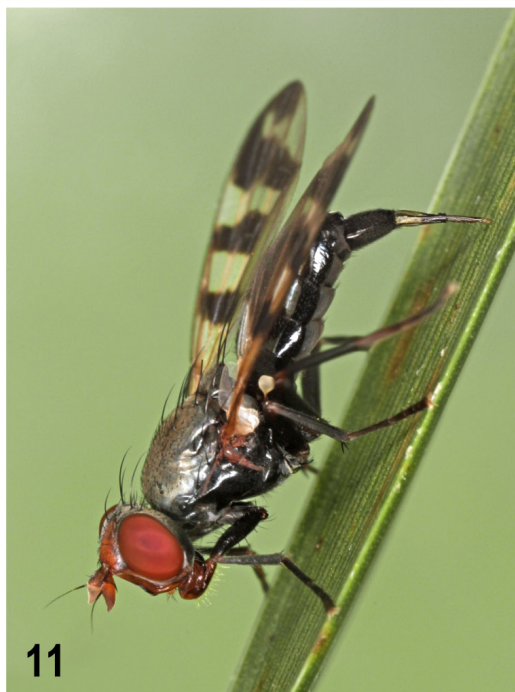
Ceroxys urticae (Linnaeus, 1758)

(Figs 10, 11)

Material examined: Hrabanovská černava, N part, ET1 (*Cladium mariscus*), 8.vii.-8.viii.2024, 1♀; MT, 13.vi.-8.vii.2024, 1♀, all J. Roháček et al. leg.; sweeping graminoids (with *Schoenus* spp. dominant), 8.vii.2024, 1♀, J. Roháček leg. – Hrabanovská černava, W part, sweeping (predominantly) graminoid vegetation in rich fen, 10.v.2024, 1♂1♀, 8.viii.2024, 1♂3♀, J. Roháček leg.



Figs 7–9: Habitats in study plots. 7 – rich fen habitat in N part of the locality, with *Schoenus* tufts in foreground, growth of *Cladium mariscus* in the middle and three traps (from left: MT, ET1, ET2) in background (13.vi.2024); 8 – xerotherm meadow in W part (8.vii.2024); 9 – margin of pine forest on sand dune in W part (with M. Tkoč collecting, 8.viii.2024). Photo by J. Roháček.



Figs 10–12: *Ceroxys urticae* (Linnaeus, 1758) and its habitat. 10 – male, on *Carex* leaf, right laterally; 11 – female, with ovipositor exposed, left laterally (documentary photos from N Moravia: Opava-Palhanec, 20.vii.2016); 12 – large *Carex* spp. (in foreground) and reed growth (in background) in the W part of the locality (8.viii.2024). Photo by J. Roháček.

Remarks: Another large species having a wing with an extended dark pattern, particularly on the apex (see Fig. 10).

Biology: A rather common species (most frequent representative of the genus in the Czech Republic) mainly associated with reed and other tall graminoids on wet meadows and water shores (Kabos & van Aartsen 1984). In the Hrabanovská černava fen a few specimens have been collected but in growths of various graminoid plants, most specimens in a growth of reed and large *Carex* species (Fig. 12).

Distribution: A widespread Palaearctic species ranging from Morocco (Ebejer et al. 2019) to China (Kameneva 2008). In the Czech Republic, it was recorded from several localities (mainly in lowland areas) in both Bohemia and Moravia (see Martinek 1978, 1988, 1996, 1999, Martinek et al. 2005, Martinek & Mocek 1995).

Herina frondescentiae (Linnaeus, 1758)

(Figs 13–15)

Material examined: Hrabanovská černava, N part, ET1 (*Cladium mariscus*), 31.v.-13.vi.2024, 21♂13♀, 13.vi.-8.vii.2024, 13♂20♀, 8.vii.-8.viii.2024, 14♂10♀, 8.viii.-5.ix.2024, 4♀; ET2 (*Schoenus* spp.), 10.v.-13.vi.2024, 2♂2♀, 13.vi.-8.vii.2024, 10♂14♀, 8.vii.-8.viii.2024, 16♂33♀, 8.viii.-5.ix.2024, 43♂37♀; MT, 31.v.-13.vi.2024, 2♂3♀, 13.vi.-8.vii.2024, 9♀, all J. Roháček et al. leg.; sweeping graminoids (with *Schoenus* spp. dominant) in rich fen, 8.vii.2024, 1♂1♀; sweeping graminoids (*Schoenus* and *Cladium* dominant) in rich fen, 8.viii.2024, 3♂5♀; sweeping graminoids (with reed) in rich fen, 8.vii.2024, 2♂3♀, all J. Roháček leg.; suction sampling from growth of *Schoenus ferrugineus*, 13.vi.2024, 1♂, 8.vii.2024, 1♀; suction sampling from growth of *Cladium mariscus*, 8.vii.2024, 1♂1♀; suction sampling from detritus on mud under graminoids, 5.ix.2024, 1♂; suction sampling from growth of *Phragmites australis*, 8.vii.2024, 2♂; sweeping and suction sampling from *Molinia caerulea*, 5.ix.2024, 3♂9♀ (1♂1♀ PHOTO), all P. Kment & J. Roháček leg. – Hrabanovská černava, W part, sweeping (predominantly) graminoid vegetation in rich fen, 10.v.2024, 3♂1♀, 13.vi.2024, 5♂4♀, 8.viii.2024, 3♂2♀, J. Roháček leg.; suction sampling from *Carex* tufts, 5.ix.2024, 1♀ P. Kment & J. Roháček leg.

Remarks: An easily recognizable species with distinctively dark-patterned wings (Fig. 13).

Biology: A very common species frequently occurring in various marshland habitats (such as boggy and reed meadows), more rarely also in dry poor meadows (Merz 1996) in May–September. It was most abundant species of Ulidiidae (except for samples from traps, only a part of specimens collected were retained for collection and listed above) and was found in both plots and all habitats in the fen under study including growths of *Cladium mariscus* (Figs 5, 23) which otherwise had the poorest fauna of Acalypttratae here.

Distribution: Widespread through Europe, ranging from Spain to North-east and Central European Russia (Kameneva 2007) and recently also recorded from Asia: Iran (Galinskaya et al. 2014) but hitherto unknown from North Africa. In the Czech Republic is known from a number of localities both in Bohemia and Moravia.

Herina oscillans (Meigen, 1826)

(Figs 16–18)

syn. *Ortalis apicalis* Zetterstedt, 1849, *Herina schlueteri* Becker, 1913 (Kameneva 2007).

Material examined: Hrabanovská černava, N part, ET2 (*Schoenus* spp.), 10.v.-13.vi.2024, 2♂, 13.vi.-8.vii.2024, 7♂7♀, 8.vii.-8.viii.2024, 5♂7♀, J. Roháček et al. leg.; sweeping graminoids (with *Schoenus* spp. dominant), 8.vii.2024, 1♂, J. Roháček leg.; suction sampling from growth of *Schoenus ferrugineus*, 13.vi.2024, 9♂4♀, 8.vii.2024, 4♂ (1♂ PHOTO), P. Kment & J. Roháček leg.

Remarks: A small, dark and shining species, with dark frons and reduced wing pattern (Figs 16, 18), distinguished by its dilated, triangular maxillary palpus, so differing from all other *Herina* species (Kameneva 2007).

Biology: A rather thermophilous species with poorly known biology. Merz (1996), based on a few records, reported it from wet meadows (including fens in England) but also dry grassland habitats. In the rich fen under study, *H. oscillans* almost exclusively occurred in the northern plot in tufts of bog-rushes, mainly *Schoenus ferrugineus* (Figs 7, 18). Almost all specimens were obtained by means of a suction sampler (Fig. 4) or emergence trap (Fig. 6), indicating that adults take shelter close to the ground. In Central Europe adults fly in May–September (combined data of Merz 1996 and Kameneva 2007), in the locality examined in (May) June–August.

Distribution: Widespread in the Mediterranean subregion (Europe: Spain incl. Balears, France incl. Corsica, Greece incl. Crete; W. Asia: Cyprus, N. Africa: Morocco, Algeria) but becoming rarer in temperate and northern Europe,



Figs 13–15: *Herina frondescentiae* (Linnaeus, 1758). 13 – male, right dorsolaterally; 14 – male, right laterally; 15 – female, left laterally (all 5.ix.2024). Photo by J. Roháček.



Figs 16–18: *Herina oscillans* (Meigen, 1826). 16 – male, on *Schoenus* stem, right laterally; 17 – ditto, left laterodorsally; 18 – male on flowering bog-rush (*Schoenus ferrugineus*), right laterally (all 8.vii.2024). Photo by J. Roháček.

with scattered records from Ireland, England, Belgium, Germany, Switzerland, Hungary and S. Sweden: Gotland (Merz 1996, Kameneva 2007) but is also known from Slovakia – Martinek (1993) reported a few specimens from Stankovany in N. Slovakia. The above records from Hrabanovská černava are the first from the Czech Republic.

Note. There is an additional material of *H. oscillans* from Slovakia, the same locality as cited above, deposited in SMOG and identified by V. Martinek, viz., Stankovany nr. Kral'ovany, saltmarsh [around a mineral travertine spring, 49°09'12"N, 19°09'08"E], sweeping over salty meadow, 25.vii.1985, 1♂4♀, 3.vii.1986, 9♂4♀, J. Roháček leg.

Herina palustris (Meigen, 1826)

(Figs 19, 20)

Material examined: Hrabanovská černava, N part, ET2 (*Schoenus* spp.), 13.vi.-8.vii.2024, 1♂, 8.vii.-8.viii.2024, 2♀, 8.viii.-5.ix.2024, 1♂1♀, J. Roháček et al. leg.; sweeping graminoids (with reed) in rich fen, 8.vii.2024, 2♀; sweeping graminoids (with *Schoenus* spp. dominant), 8.vii.2024, 5♂3♀ (2♀ PHOTO), sweeping graminoids (with *Schoenus* and *Cladium* dominant), 8.viii.2024, 4♂2♀, all J. Roháček leg.; suction sampling from growth of *Schoenus ferrugineus*, 8.vii.2024, 1♀; sweeping and suction sampling from *Molinia caerulea*, 5.ix.2024, 2♂, all P. Kment & J. Roháček leg. – Hrabanovská černava, W part, sweeping graminoid vegetation in rich fen, 13.vi.2024, 1♂, J. Roháček leg.

Remarks: A larger, dark but more grey microtomentose species, with reddish frons but dark face (Figs 19, 20), reduced wing pattern (but cross-veins darkened); male terminalia characterized by long, slender and curved gonostylus (Merz 1996: figs 42–44).

Biology: Merz (1996) found this species relatively often in various types of grassland (poor, hay, reed meadows) in May–September. In the rich fen in the Hrabanovská černava reserve *H. palustris* occurred in both plots under study, in various types of graminoid vegetation (June–September). Martinek (1984) collected it even on a steppe meadow. Obviously, this species is more habitat-tolerant than *H. oscillans* but both occurred syntopically in growths of *Schoenus* spp. (Figs 6, 7) in N part of the area under study.

Distribution: According to Merz (1996) this species is widespread in Europe but scattered and local in the north. Kameneva (2007) summarized its distribution as follows: Spain, France, Italy, England, Germany, Switzerland, Austria, Slovenia, Czech Republic, Poland, Slovakia, Hungary, Ukraine, W. Russia, Latvia, Sweden. In the Czech Republic it seems to be an uncommon species hitherto recorded from a few localities: Bohemia: Podchlumí (Martinek 1973), Lysá nad Labem-Dvorce (Martinek 1984), Choťovice, Libice nad Doubravou, Nový Hradec Králové, Vysoká nad Labem (Martinek & Mocek 1995); Moravia: Ochot (= Ochot) (Czižek 1910), Hobitschau (= Hlubočany) (Landrock 1910), Sedlec-Nesyt pond (Martinek 1978).

Herina scutellaris Robineau-Desvoidy, 1830

(Figs 21, 22)

Material examined: Hrabanovská černava, N part, ET1 (*Cladium mariscus*), 13.vi.-8.vii.2024, 5♂5♀, 8.vii.-8.viii.2024, 6♂11♀, 8.viii.-5.ix.2024, 2♂3♀; ET2 (*Schoenus* spp.), 10.v.-13.vi.2024, 1♀, 13.vi.-8.vii.2024, 1♂1♀, 8.vii.-8.viii.2024, 2♀, 8.viii.-5.ix.2024, 2♂; MT, 31.v.-13.vi.2024, 1♂1♀, 13.vi.-8.vii.2024, 1♀, all J. Roháček et al. leg.; sweeping graminoids (with reed) in rich fen, 8.vii.2024, 1♀; sweeping graminoids (with *Schoenus* spp. dominant), 8.vii.2024, 3♀ (1♀ PHOTO); sweeping graminoids (with *Schoenus* and *Cladium* dominant), 8.viii.2024, 1♀, all J. Roháček leg.; sweeping and suction sampling from *Molinia caerulea*, 5.ix.2024, 1♀, P. Kment & J. Roháček leg. – Hrabanovská černava, W part, sweeping graminoid vegetation in rich fen, 10.v.2024, 2♀, J. Roháček leg.

Remarks: A relatively robust species with heavily grey microtomentose thorax, orange frons, face and gena (Figs 21, 22), scutellum yellow to orange at least apically and wing with several small but distinct spots; male terminalia characterized by long, distally bilobed gonostylus (for redescription see Kameneva 2007).

Biology: A thermophilous species mainly living in the Mediterranean area (Merz 1996). Adults occur in March–September in southern Europe (data from Kameneva 2007). In the rich fen under study the majority of specimens were found in growths of *Cladium mariscus* and *Schoenus* spp. (most specimens taken by emergence traps, Figs 5, 6) which could be its preferred habitats in this locality. Interestingly, in the *Schoenus* microhabitat *H. scutellaris* co-occurred with all other species of *Herina* recorded in the locality but uncommonly, while in *Cladium mariscus* only with *H. frondescentiae*. In samples from emergence trap ET1, set on old growth of *Cladium mariscus*, (Figs 5, 23) the majority of *H. scutellaris* specimens were found while no adult was caught in young (regularly cut) stands of this sedge. Adults occurred in May–September.



19



20

Figs 19–20: *Herina palustris* (Meigen, 1826). 19 – female, right laterodorsally; 20 – female, left laterally (both 8.vii.2024). Photo by J. Roháček.



Figs 21–23: *Herina scutellaris* Robineau-Desvoidy, 1830 and its habitat. 21 – female, left laterally; 22 – female, left laterodorsally (both 8.vii.2024); 23 – flowering great fen-sedge (*Cladium mariscus*) in N part of the locality (13.vi.2024). Photo by J. Roháček.

Distribution: A generally Mediterranean species reaching to Central Europe. Kameneva (2007) summarized its distribution as follows: Spain, France, Italy, Croatia, Bosnia and Herzegovina, Romania, Cyprus, Turkey; in C. Europe, only Czech Republic, Slovakia and Hungary are given. In the second Check list of Diptera (Insecta) of the Czech Republic and Slovakia Martinek (1997) listed *H. scutellaris* for the first time from both Bohemia and Moravia and this fact has been also repeated in both subsequent checklists (Roháček 2006, 2009). However, I have not found any specific data dealing with this species published by V. Martinek (or other dipterists) prior to 1997 from the Czech Republic and, therefore, I believe the species was listed by him from „B M“ in error. Consequently, the above findings from the Hrabanovská černava res. are considered first records confirming the occurrence of *H. scutellaris* in the Czech Republic and currently representing the northernmost distribution limit of this species.

Ulidiinae

Euxesta notata (Wiedemann, 1830)

(Figs 24, 25)

Material examined: Hrabanovská černava, N part, ET1 (*Cladium mariscus*), 13.vi.-8.vii.2024, 1♂1♀, 8.vii.-8.viii.2024, 1♀; MT, 31.5.-13.6.2024, 7♂11♀, 13.vi.-8.vii.2024, 5♂5♀, J. Roháček et al. leg. – Hrabanovská černava, W part, sweeping over sandy meadow nr. pine forest, 8.viii.2024, 1♀ (PHOTO), J. Roháček leg.

Remarks: A species with metallic body colouration, in the female having the distal part of 5th tergum and base of ovipositor golden yellow (Figs 24, 25). The similar (also alien) species, *E. pechumani* Curran, 1938, differs from *E. notata* in a more extended basal (at pterostigma) spot on the wing (see Korneyev et al. 2018: figures on p. 32). *Euxesta pechumani* has hitherto not been recorded from the Czech Republic but is known from Slovakia (Zuska 1967).

Biology: Like other *Euxesta* species *E. notata* also has saprophagous larvae developing in rotting plant matter (Kameneva & Korneyev 2010). Adults were reared from rotten cherries in USA and a pair of specimens from a rotten onion in Switzerland (Kameneva & Korneyev 2017). In the rich fen under study, a series of specimens have been collected in a Malaise trap (Fig. 2), and, rather surprisingly, some also in an emergence trap set on *Cladium mariscus* (Fig. 5) and only one female has been swept from a xerotherm vegetation at the margin of a pine forest (Figs 9, 26). All these flies most probably originated from a nearby onion field (where they should be abundant) and were captured in these traps when they migrated over the fen.

Distribution: *Euxesta notata* is an invasive species, introduced recently from the Nearctic Region to the European continent (Korneyev et al. 2018). It was first recorded from Switzerland (Kameneva & Korneyev 2017: flies found in 2009) and subsequently from Slovenia (Seljak 2017), Austria (Zittra & Sehnal 2018), Ukraine (Dvořák et al. 2019), and Croatia (Kovac et al. 2022). First records from the Czech Republic.

Homalocephala biumbrata (Wahlberg, 1839)

Material examined: Hrabanovská černava, N part, MT, 31.v.-13.vi.2024, 1♀, J. Roháček et al. leg.

Remarks: A *Homalocephala* species recognized by whitish yellow halteres, shining black scutellum with 4 marginal setae, face, parafacialia and gena whitish, frons anteriorly orange, two large dark spots on wing (but that at pterostigma can sometimes be faded) and dark femora, see also Krivosheina & Krivosheina (1997) or Kameneva & Korneyev (2015). For photographs of living specimens of this species see Roháček & Bílek (2012: figs 1–3, 5).

Biology: Larvae of this species develop in wet bast under bark of relatively fresh fallen aspen, poplar and willow trunks (for more detail see Krivosheina & Krivosheina, 1995, Rotheray & Robertson 1998); 3rd instar larva and puparium were described by Rotheray & Robertson (1998). Only one female has been found in the rich fen under study, collected in a Malaise trap (Fig. 2). This specimen must have flown into the trap from an aspen stand on the edge of the site. Interestingly, Roháček & Bílek (2012) recorded and observed adult behaviour of *H. biumbrata* on a cut aspen trunk situated at the margin of a xerophilous meadow, also at low altitude (244 m).

Distribution: A Holarctic species (Krivosheina & Krivosheina 1995, 1997, Kameneva 2008), widespread in the northern belt but scarcely recorded from C. and W. Europe (see Kameneva 2008, Roháček & Bílek 2012). It is a rare species in the Czech Republic. There is only one previous record from Bohemia (Roháček & Bílek 2012: Na Plachtě res. near Nový Hradec Králové) and two from Moravia (Merz & Roháček 2005: Hrubý Jeseník Mts-Velká kotlina, Moravskoslezské Beskydy Mts-Lysá hora Mt.). Thus, both Bohemian records are from lowlands and indicate that *H. biumbrata* cannot be considered a boreo-montane species, at least in Czech Republic.



Figs 24–26: *Euxesta notata* (Wiedemann, 1830) and its collecting site. 24 – female with two red mites below haltere, right laterally; 25 – same specimen, dorsally; 26 – margin of pine forest in W part of locality where this specimen was captured (all 8.viii.2024). Photo by J. Roháček.

***Physiphora alceae* (Preyssler, 1791)**

syn. *Musca demandata* Fabricius, 1795

(Fig. 27)

Material examined: Hrabanovská černava, N part, MT, 31.v.-13.vi.2024, 1♂, J. Roháček et al. leg.

Remarks: A blackish species with variable metallic sheen on shagreened surface of thorax and abdomen (Fig. 27), wing with clear membrane and long acutely projecting anal cell, thus easily recognizable from other Ulidiidae in Central Europe.

Biology: A common, widely saprophagous species with tendency to synanthropy. Adults are attracted to various decaying matter (carrion, faeces, droppings of mammals, birds and reptiles, rotting fruit, compost) and occur within human settlements (Kameneva & Barraclough 2021), including factories of the food-processing industry but scarcely in free nature, at least in Central Europe (Zuska 1967). Therefore, only one, accidentally flown adult has been recorded during the investigation of the rich fen in Hrabanovská černava reserve.

Distribution: A virtually cosmopolitan species, widespread due to its synanthropy. It is common throughout Europe (Kameneva 2008) including the Czech Republic where it is known from numerous localities, both in Bohemia and Moravia (Zuska 1967).



Fig. 27: *Physiphora alceae* (Preyssler, 1791), male, subdorsally (documentary photo from W. Moravia: Třešť, 1.viii.2017). Photo by J. Roháček.

Discussion and conclusions

The field work performed in only one season (May–September, 2024) on rich fen in the Hrabanovská černava reserve and aimed at the study of Diptera Acalyptratae brought interesting results. This first contribution, dealing with species of Ulidiidae, revealed a total of

9 species of this family which is an unexpected diversity considering the fact that usually only 1–4 species can be ascertained in wetland localities of a similar extent in the Czech Republic (Roháček, unpublished results from the Šumava Mts, Jizerské hory Mts + Frýdlant region, Český ráj region, Hrubý Jeseník Mts, Hlučín region, Lednice region etc.).

Apart from the unusual species-richness the findings presented above are also remarkable as regards the species composition. We can see two groups of species: (1) group of taxa associated with graminoid vegetation in open habitats of the fen, comprising six species, all belonging to subfamily Otitinae; (2) group formed by three species originating from surrounding fields and/or tree growths.

The first group belong to the fly assemblage inhabiting plant communities dominated by sedges (also including bog-rushes and great fen-sedge, Figs 2–7) but also containing grasses (including reed, purple moor-grass, *Calamagrostis* spp. etc.) as a smaller component. Interestingly, only species of *Ceroxys* and *Herina* have been found, although in similar marshland habitats species of the genus *Melieria* Robineau-Desvoidy, 1830 could also be expected. However, at least one *Melieria* species is presupposed to be found in future but probably in other parts of the locality, particularly in those with communities containing asteraceous plants as a component. Thus, we can expect some additional species of Ulidiidae (Otitinae) to live in the open habitats of the Hrabanovská černava reserve.

Herina species proved to be the most characteristic element in this rich fen. Apart from the common wetland species, *H. frondescens*, inhabiting various plant communities, three other species proved to be most common in the northern part of the locality, particularly in growths of *Schoenus*, *Cladium* and smaller *Carex* species. The suction sampling yielded only single specimens of *H. palustris* and *H. scutellaris* from tufts of *Molinia caerulea* and none from reed growth or *Juncus* clumps. *Herina oscillans* has almost exclusively been collected in *Schoenus* tufts (either by suction sampling or by emergence trap) and proved to be the most stenotopic species. Judging from its occurrence in a travertine swamp in Slovakia (see records above) it can be presumed that this species is more dependent on calcium content in water and/or soil than are other, more habitat-tolerant species, *H. palustris* and, particularly, *H. frondescens*. On the other hand, *H. scutellaris*, another rare species, is distinctly thermophilous like *H. oscillans* but differs in also living in growths of *Cladium mariscus* (longest series obtained by ET set on this plant), i.e. in a habitat avoided by the majority of Acalyptatrae, including *Herina* species except for *H. frondescens*. Last but not least, the number of *Herina* species, four living here in a small area, is also considered important and indicating the high natural value of the site. None of the above species are included in the Red list of threatened “Otitidae” (Martinek & Barták 2005), it is true, but both *H. oscillans* and *H. scutellaris* should be considered at least endangered (EN) because they are known from a single locality in the Czech Republic and are associated with a relict and strongly threatened habitat.

The remaining three species of Ulidiidae, with almost all specimens collected by means of traps, are not directly associated with fen communities. Adults of *Euxesta notata* (an invader from North America) although first recorded from the Czech Republic, plausibly originated from an adjacent onion field to the west of the fen, where it had developed in rotten bulbs (cf. Kameneva & Korneyev 2017). It is strange that besides the series in the (open) Malaise trap (see Fig. 2) a few migrating adults were also caught in the closed emergence trap installed on *Cladium mariscus* (Fig. 5). Only one male of *Physiphora alceae*, also a widely saprophagous and partly synanthropic species, was caught. It is definitely just a random specimen

falling into the Malaise trap. The record of *Homalocephala biumbrata* is more interesting, not only because of being the second from Bohemia. Although it also is an accidental capture of a single specimen, it again confirmed the ability of this species to also live in warm lowland habitats (for previous lowland records in temperate Europe see e.g. Kameneva 2002, 2008, Roháček & Bílek 2012, Baugnée & Bisteau 2014). It is to note that there are some more alien species of Ulidiidae introduced to Europe (see Korneyev et al. 2018) which can also be expected in the Hrabanovská černava fen (at least in marginal parts), the most probable candidates being *Callopistromyia annulipes* (Macquart, 1855) which is already known from Bohemia (Dvořák 1917), or *Euxesta pechumani* Curran, 1939, recorded from Slovakia (Zuska 1967).

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Neobyklá druhová diverzita čeledi Ulidiidae (Diptera) na vápnitém slatiništi ve středních Čechách (Česká republika)

Druhy čeledi Ulidiidae (Diptera) byly studovány v rezervaci Hrabanovská černava, na unikátně zachovalém vápnitém nížinném slatiništi situovaném v Polabské nížině poblíž Lysé nad Labem ve středních Čechách (Česká republika). Bylo zde zaznamenáno celkem 9 druhů této čeledi, z nichž dva byly poprvé zjištěny v České republice: *Herina oscillans* (Meigen, 1826) a *Euxesta notata* (Wiedemann, 1830), přičemž posledně jmenovaný je invazivní druh nedávno zavlečený do Evropy ze Severní Ameriky. Teplomilný druh *Herina scutellaris* Robineau-Desvoidy, 1830 byl potvrzen v České republice, přičemž Hrabanovská černava je jeho nejsevernější známá lokalita. Oba jmenované druhy, a zejména *H. oscillans*, jsou považovány za nejvýznamnější prvky fauny dvoukrídleho hmyzu skupiny Acalypttratae na tomto typu slatinišť. Kvůli jejich ojedinělému výskytu a vazbu na vysoce ohrožený biotop a je navrženo považovat je v České Republice za ohrožené (EN) druhy. *Homalocephala biumbata* (Wahlberg, 1839) je podruhé hlášena z Čech. Je diskutována druhová diverzita čeledi Ulidiidae na studovaném slatiništi i vazba všech zaznamenaných druhů na slatiništní biotopy.

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