

# Diptera from rich fens and other habitats in eastern part of Innlandet, southeastern Norway. V. Phoridae

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Records of 34 species of Phoridae from Hedmark in the eastern part of Innlandet County, southeastern Norway, are presented mostly based on material collected in 2016 and 2017 during a survey of insects inhabiting rich fens in the region; a few older records are also included. Four species, *Megaselia albicaudata* (Wood, 1910), *M. coccyx* Schmitz, 1965, *M. kajaaniensis* Disney & Winqvist, 2018 and *Spiniphora strobli* (Becker, 1901) are recorded for the first time in Norway. However, *Megaselia coccyx* was also caught during the project in Finnmark in 2010 but was never published. The remaining 30 species are all recorded for the first time from southern and/or northern Hedmark.

Key words: Rich fens, Diptera, Phoridae, new records, Hedmark, Innlandet County, Norway.

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## Introduction

Phoridae is a large family of lower Cyclorrhapha, comprising 35 genera and about 605 described species in Europe (Oosterbrook 2006). The huge genus *Megaselia* Rondani, 1856 alone includes more species than all the other phorid genera combined. The species are mainly quite minute but occasionally medium-sized (0.4–6.0 mm). The body is more or less stout, with an arched thorax and a characteristic wing venation (Figure 1). The color varies from black through brown, orange and yellow to pale grey or white. The adults have a characteristic fast habit of running, and even tiny phorid species can relatively easily be spotted when sweep netted. The Phoridae show the greatest diversity of all families of Diptera when it comes to biology. Their larvae

are found in many terrestrial and aquatic habitats and they feed on various substances like organic detritus, fungi or plants. Some are also predators or parasites (Oosterbrook 2006).

Finland is the only Nordic country where a relatively recent checklist of Phoridae has been published, listing 224 ascertained species (Kahanpää 2014). However, during the seven subsequent years that figure has risen to about 300 species. In comparison, Elven & Søli (2016) state that only 114 species of Phoridae so far is known from Norway but suggest that the actual number is 340 species. During the last decades contributions to the Norwegian fauna have been given by Andersson (1971), Thunes *et al.* (2004), Gammelmo & Søli (2011), Disney (2015, 2020), and Disney & Jonassen (2021). According to Geir E. E. Søli (pers. com.) the number of species



**FIGURE 1.** Most Phoridae have a stout body, with an arched thorax as in the genus *Diplonevra*. Photo: Morten Angard Mjelde.

known from Norway today stands at 183 species.

In 2016 the project "Insects on rich fens in Hedmark, eastern Norway" was initiated aiming at increasing the knowledge of the insect fauna on rich fens in Norway (see Artsdatabanken 2016, Andersen & Hagenlund 2019). Rich fens are among our most vulnerable and threatened nature types. Five types of lowland rich fens are listed in the Norwegian Red List of Nature Types (Lindegaard & Henriksen 2011). These fens are rich in calcium and usually fed by ground water and a number of rare and red-listed plants grow on these fens. During the project insects were collected in nearly 100 localities (see Jonassen & Andersen 2020). The insect fauna on rich fens were the main target, but insects were also collected in a number of other habitats to get a better understanding of the habitat preferences of the different species.

Phoridae was by far the most abundant family of Cyclorrhapha in the samples collected during the project. Unfortunately, due to lack of funding we had limited time to study the samples and only a fraction of the material was identified. Below we thus present a list of only 34 species of Phoridae from Hedmark.

### Material and methods

The fieldwork was conducted during 2016 and 2017. The main part of the material was collected in Malaise traps, but adult Diptera were also collected with other methods like sweep nets, window traps, light traps and yellow pan traps. A total of 94 localities in Hedmark were visited during the project. Each locality is given a HeLoc number, using the abbreviation HeLoc for "Hedmark Locality". Although the fieldwork was focused on rich fens, a number of other habitats were also explored. In the species list rich fen localities are marked with an asterisk after the HeLoc number. All localities including HeLoc numbers are listed in Jonassen & Andersen (2020: Table 1).

During the field work the material was preserved in 75–80% ethanol, then brought to the Department of Natural History, University of Bergen, and sorted to family level. The material from the project is mainly stored in 75–80% ethanol, but a few specimens are pinned. It is housed in the entomological collection at the Department of Natural History, University Museum of Bergen (ZMBN).

In addition, a few older records are included. This material was collected by Asle Bruserud, Marit Hagenlund, and Kjell Magne Olsen and is stored in the entomological collection at the Department of Natural History, University Museum of Bergen or in Terje Jonassen's private collection.

All species from the project in Hedmark were identified by the senior author, a few additional species were identified by the second author. Although only partly covering the Scandinavian fauna, the two handbooks of British Phoridae (Disney 1983, 1989) still form the cornerstone of any serious study of European Phoridae. The old Danish publication on Phoridae by Lundbeck (1922) is very sparsely illustrated, but having thoroughly written descriptions of the species it is still in some cases a good additional help for identification, particularly in the genus *Megaselia*. So far there have not been any larger Scandinavian projects specifically focusing on Phoridae. However, the *Megaselia* collection at the National Natural History Museum in Stockholm is quite huge, which reflects the fact that the genus really is very diverse in Scandinavia. The more northern and remote areas are studied, the larger is the proportion of undescribed species encountered. Häggqvist *et al.* (2015) provide a novel approach by describing a couple of species based on accurate genital studies and point out that future taxonomists still have a lot of work to do with the genus. A few species of Phoridae from Finland were recently described by Disney & Winqvist (2018).

The former counties Oppland and Hedmark were merged into Innlandet County on the 1 January 2020. None of the municipalities in Hedmark were, however, altered or merged and the municipality boundaries are still as before 2020. All fieldwork was performed in the eastern part of Innlandet, i.e. the former Hedmark County, and we have used the biogeographical regions southern Hedmark (HES) and northern Hedmark (HEN) following the "Strand-system" (Endrestøl 2021).

## Results

### *Anevrina thoracica* (Meigen, 1804)

**Material.** HeLoc 17\*, 23 June–11 July 2016, 1♂, Malaise trap; HeLoc 34, 21 June–20 July 2017, 1♂, light trap; HeLoc 74\*, 23 June–11 July 2016, 1♂, Malaise trap.

**Remarks.** A large, striking and common species. Not previously recorded from northern Hedmark (HEN).

### *Anevrina unispinosa* (Zetterstedt, 1860)

**Material.** HeLoc 34, 21 June–20 July 2017, 3♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

### *Beckerina umbrimargo* (Becker, 1901)

**Material.** HeLoc 34, 21 June–20 July 2017, 5♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). The species has not been recorded from Sweden or Finland. In Norway there are a few previous records from the southwestern part of the country (Artsdatabanken 2017).

### *Borophaga agilis* (Meigen, 1830)

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). Recorded as new to Norway from Oslo, Akershus by Gammelmo & Søli (2011), and later found in Rogaland and Hordaland (Artsdatabanken 2017).

### *Conicera dauci* (Meigen, 1830)

**Material.** HeLoc 19, 21 July 2017, 1♂, sweep net.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

### *Conicera floricola* Schmitz, 1938

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Diplonevra glabra* (Schmitz, 1927)**

**Material.** HeLoc 34, 21 June–20 July 2017, 3♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). Previously only recorded from Lilleaker, Oslo by Øivind Gammelmo (Artsdatabanken 2017).

***Gymnophora quartomollis* Schmitz, 1920**

**Additional material.** HES, Ringsaker: Helgøya, Eiksåsen, N60.736872° E10.994616°, 285 m a.s.l., May 1990, 1♂, Malaise trap, leg. A. Bruserud (ZMBN-ENT-A-22530). HEN, Åmot: Deifjellia, N61.2843° E11.505°, 515 m a.s.l., 6 July–22 September 2018, 1♂, Malaise trap, leg. K.M. Olsen (in coll. T. Jonassen).

**Remarks.** Not previously recorded from southern and northern Hedmark (HES and HEN).

***Hypocera mordellaria* (Fallén, 1823)**

**Material.** HeLoc 17\*, 23 June–11 July 2016, 2♂♂, Malaise trap; HeLoc 34, 21 June–20 July 2017, 3♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia aequalis* (Wood, 1909)**

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia albicaudata* (Wood, 1910)**

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** New to Norway. The species is distributed in most parts of Europe including Finland and Sweden (Weber 2013).

***Megaselia barbulata* (Wood, 1909)**

**Material.** HeLoc 17\*, 23 June–11 July 2016, 1♂, Malaise trap; HeLoc 34, 21 June–20 July 2017, 2♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). Recorded as new to Norway from Hvaler in Østfold by Gammelmo & Søli (2011), and later reported from Stavanger, Rogaland (Artsdatabanken 2017).

***Megaselia coccyx* Schmitz, 1965**

**Material.** HeLoc 34, 21 June–20 July 2017, 4♂♂, light trap.

**Remarks.** Not previously recorded from Norway. However, the species was also collected in 2010 during the project in Finnmark: **FV**, Alta: Gargia fjellstue, N69.80525° E23.48937°, 120 m a.s.l., 10–23 July 2010, 2♂♂, Malaise trap (ZMBN). **FØ**, Sør-Varanger: Pasvik, Russevang, N69.44497° E29.89904°, 60 m a.s.l., 24 June–20 July 2010, 4♂♂, Malaise trap (ZMBN). The localities are described in Ekrem *et al.* (2012).

*Megaselia coccyx* is recorded from several European countries including Finland, Sweden, and Iceland (Weber 2013). In Finland it has been reported mainly from the northern part of the country (Laji.Fi. 2021).

***Megaselia eccoptomera* Schmitz, 1927**

**Material.** HeLoc 87, 26 July 2017, 1♂, sweep net.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia humeralis* (Zetterstedt, 1838)**

**Material.** HeLoc 13, 21 July 2017, 1♂, sweep net.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia kajaaniensis* Disney & Winqvist, 2018**

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** New to Norway. The species was only recently described from central Finland (Disney & Winqvist 2018).

***Megaselia latifemorata* (Becker, 1901)**

**Material.** HeLoc 34, 21 June–20 July 2017, 2♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia lutea* (Meigen, 1830)**

**Material.** HeLoc 34, 21 June–20 July 2017, 2♂♂, light trap.

**Remarks.** Not previously recorded from

northern Hedmark (HEN).

***Megaselia nigriceps* (Loew, 1866)**

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). Recorded as new to Norway by Thunes *et al.* (2004), and later reported from several localities north to southern Trøndelag (Artsdatabanken 2017). One of the most common and numerous *Megaselia* species in the Nordic countries.

***Megaselia obscuripennis* (Wood, 1909)**

**Material.** HeLoc 34, 21 June–20 July 2017, 2♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia pleuralis* (Wood, 1909)**

**Material.** HeLoc 03, 23 July 2017, 1♂, sweep net; HeLoc 09, 22 July 2017, 1♂, sweep net; HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from southern and northern Hedmark (HES and HEN). One of the most common and numerous *Megaselia* species in the Nordic countries.

***Megaselia pumila* (Meigen, 1830)**

**Material.** HeLoc 34, 21 June–20 July 2017, 3♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia pusilla* (Meigen, 1830)**

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia robusta* Schmitz, 1928**

**Material.** HeLoc 74\*, 23 June–11 July 2016, 1♂, Malaise trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). Recorded as new to Norway by Thunes *et al.* (2004), and later found in Rogaland (Artsdatabanken 2017). In Finland it

is mainly distributed in the northern half of the country (Laji.Fi 2021).

***Megaselia ruficornis* (Meigen, 1830)**

**Material.** HeLoc 07, 22 July 2017, 1♂, sweep net; HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from southern and northern Hedmark (HES and HEN). The species was recorded from Horten in Vestfold by Disney (2020), and is also found in Rogaland, Hordaland and southern Trøndelag (Artsdatabanken 2017).

***Megaselia rufipes* (Meigen, 1804)**

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Megaselia sordida* (Zetterstedt, 1838)**

**Material.** HeLoc 34, 21 June–20 July 2017, 1♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). The species was listed for Norway by Disney (1991), and is recently recorded from Sandnes, Rogaland (Artsdatabanken 2017).

***Metopina galeata* (Haliday, 1833)**

**Additional material.** HES Ringsaker: Helgøya, Eiksåsen, N60.736872° E10.994616°, 285 m a.s.l., 1–30 July 1990, 1♀, Malaise trap, leg. A. Bruserud (ZMBN-ENT-A-22529).

**Remarks.** Not previously recorded from southern Hedmark (HES). The species was recorded from Horten in Vestfold by Disney (2020), and is also found in Rogaland, (Artsdatabanken 2017).

***Phora dubia* (Zetterstedt, 1848)**

**Material.** HeLoc 74\*, 23 June–11 July 2016, 2♂♂, Malaise trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN).

***Spiniphora dorsalis* (Becker, 1901)**

**Material.** HeLoc 34, 21 June–20 July 2017,



2♂♂, light trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). The species was listed for Norway by Disney (1991), and is recently recorded from Stavanger, Rogaland (Artsdatabanken 2017).

### *Spiniphora maculata* (Meigen, 1830)

**Additional material.** HEN, Åmot: Deifjellia, N61.2843° E11.505°, 515 m a.s.l., 5 May–6 July 2018, 1♂, Malaise trap, leg. K.M. Olsen (coll. T. Jonassen).

**Remarks.** Not previously recorded from northern Hedmark (HEN).

### *Spiniphora strobli* (Becker, 1901)

**Material.** HeLoc 87, 26 July 2017, 1♂, sweep net.

**Remarks.** New to Norway and Scandinavia. According to Weber (2013) the species is distributed in Central Europe.

### *Triphleba intermedia* (Malloch, 1908)

**Additional material.** HEN, Stor-Elvdal: Evenstad, Høgskolen i Innlandet, N61.4244977° E11.077615°, 251 m a.s.l., 3–10 June 2011, 2♂♂, Malaise trap, leg. M. Hagenlund.

**Remarks.** Not previously recorded from northern Hedmark (HEN). The species was listed for Norway by Disney (1991), and is recently recorded from Rogaland (Artsdatabanken 2017).

### *Triphleba subcompleta* Schmitz, 1927

**Material.** HeLoc 17\*, 23 June–11 July 2016, 1♂, Malaise trap.

**Remarks.** Not previously recorded from northern Hedmark (HEN). The species was recorded from Stryn in Sogn og Fjordane by Disney (2020), and is also found in Rogaland (Artsdatabanken 2017).

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