New records of lower Diptera (”Nematocera”) from Finnmark, northern Norway

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Records of 15 species of the nematocerous Diptera families Ptychopteridae, Dixidae, Thaumaleidae, Bibionidae and Canthyloscelidae from Finnmark are presented. Eight species, *Ptychoptera hugoi* Tjeder, 1968, *Dixa nebulosa* Meigen, 1830, *Dixella borealis* (Martini, 1928), *Dixella dyari* (Garret, 1924), *Dixella obscura* (Loew, 1849), *Thaumalea truncata* Edwards, 1929, *Bibio clavipes* Meigen, 1818 and *Synneuron annulipes* Lundström, 1910 are recorded for the first time from Finnmark. The taxonomy of *Thaumalea truncata* is commented on.

Key words: Ptychopteridae, Dixidae, Thaumaleidae, Bibionidae, Canthyloscelidae, distribution, Finnmark, Norway.

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Introduction

During the summer of 2010, the Norwegian Taxonomy Initiative funded a large-scale inventory of aquatic insects in Finnmark, northern Norway (Ekrem *et al.* 2012). Mainly adult specimens were collected, and the fieldwork yielded a large material of many different groups. Until now, five contributions have dealt with various Diptera families from this inventory (Andersen & Kvifte 2012; Kvifte 2012, 2013; Kvifte & Andersen 2012; Søli & Rindal 2012). In these papers, many new records have been given, and more than 80 species have been identified as new to science (Ekrem *et al.* 2012; Salmela *et al.* 2012; Søli & Rindal 2012).

The present paper contributes further records of lower Diptera of five families previously regarded as belonging to the suborder ”Nematocera”. This group is, however, paraphyletic with respect to the Brachycera, and a new classification is under development based on modern phylogenetics. The classification in the present paper follows Amorim & Yeates (2006).

Material and methods

Most of the material was collected in Malaise traps, but a few specimens were also taken in light traps or with sweep nets. Ekrem *et al.* (2012) described the sampling methods and the localities in detail. For Bibionidae, some additional, older material is also included. The Ptychopteridae were identified

by Trond Andersen and Linn K. Hagenlund, the Dixidae by Øyvind Håland, the Thaumaleidae by Gunnar M. Kvifte, the Bibionidae by John Skartveit and the Canthyloscelidae by Linn K. Hagenlund and Gunnar M. Kvifte. The biogeographical regions follow Økland (1981). All material is preserved in the Department of Natural History, University Museum of Bergen (ZMBN).

Results

Suborder PTYCHOPTEROMORPHA
Family Ptychopteridae

The Ptychopteridae, or phantom crane flies, are slender and rather large flies that superficially resemble crane flies. The larvae are adapted to living in mud and detritus in the margins of rivers, ponds, lakes and streams (Andersson 1997). Seven species of this family are known from Norway, all in the genus *Ptychoptera* Meigen, 1803 (Willassen 1996a).

Ptychoptera hugoi Tjeder, 1968

Material. FV, Alta: Storeng, N69.82277° E23.47884°, 90m a.s.l., 11–26 June 2010, 2♂♂; 26 June–10 July 2010, 32♂♂15♀♀; 10–23 July 2010, 4♂♂; 23 July–7 August 2010, 2♂♂, Malaise trap; **FN,** Porsanger: Rørkulpen, N70.15215° E24.76686°, 28m a.s.l., 2–17 July 2010, 1♂, Malaise trap.

Remarks. The species was described by Tjeder (1968); the type locality is Gratangen in Troms (Norway). The species has also been recorded from northern Sweden (Andersson 1997). Elsewhere, it is distributed in the Eastern Palaearctic and in the Nearctic region (Zwick 2013).

The Swedish specimens have been collected at a small pool with *Carex* on a mountain slope with grassland at about 800m a.s.l. and at a small stream in a Pine forest (Andersson 1997). The specimens from Storeng were collected at a lake-like portion of the River Gargia with sandy riverbed and a broad vegetation zone with sedges, mainly *Carex*. The male from Rørkulpen was collected at a moderately fast flowing, 10m wide river with stony bed and bank with willow (*Salix*) and alder (*Alnus*).

Ptychoptera minuta Tonnoir, 1919

Material. FV, Alta: Storeng, N69.82277° E23.47884°, 90m a.s.l., 26 June–10 July 2010, 4♂♂; 10–23 July 2010, 1♂1♀; 23 July–7 August 2010, 1♀, Malaise trap; **FI,** Kautokeino: Lahpoluoppal, N69.20992° E23.757661°, 320m a.s.l., 25 June–9 July 2010, 1♂, Malaise trap; Nahpoljohka, N69.21029° E23.76200°, 320m a.s.l., 25 June–9 July 2010, 1♀, Malaise trap; **FØ,** Sør-Varanger: Russevann, N6944497° E29.89904°, 60m a.s.l., 24 June–20 July 2010, 2♀♀, Malaise trap.

Remarks. *Ptychoptera minuta* is the most widely distributed pthychopterid species in Fennoscandia. In Norway, it is distributed north to Finnmark (Willassen 1996a). It lives in ponds, lakes, rivers, ditches, swamps, marshes and bogs from the lowland to high altitude localities (Andersson 1997).

Suborder CULICOMORPHA
Family Dixidae

The Dixidae, or meniscus midges, are slender flies associated with streams and ponds, where the larvae develop. The Norwegian Dixidae fauna is comparatively well known; 17 species belonging to the two European genera *Dixa* Meigen, 1818 and *Dixella* Dyar *et* Shannon, 1924 are recorded (Håland 1996, 2011; Olsen 2008).

Dixa nebulosa Meigen, 1830

Material. FV, Alta: Gargia Fjellstue, N69.80525° E23.48937°, 120m a.s.l., 26 June–10 July 2010, 1♀; 23 July–7 August 2010, 22♂♂3♀♀; 24–30 August 2010, 53♂♂ 4♀♀, Malaise trap; Storeng, N69.82277° E23.47884°, 90m a.s.l., 11–26 June 2010, 4♀♀; 7–24 August 2010, 50♂♂11♀♀; 24–30 August 2010, 5♂♂, Malaise trap; **FN,** Porsanger: Rørkulpen, N70.15215° E24.76686°, 28m a.s.l., 15 June–2 July 2010, 1♀, Malaise trap; Baukop, N70.20469° E24.90605°, 26m a.s.l., 7–25 August 2010, 1♀; 25 August–3 September 2010, 1♂4♀♀, Malaise trap.

Remarks. *Dixa nebulosa* is previously recorded north to Nordland (Håland 1996). The

species usually inhabits streams and small rivers.

***Dixella aestivalis* (Meigen, 1818)**

Material. FV, Alta: Storeng, N69.82277° E23.47884°, 90m a.s.l., 7–24 August 2010, 1♂, Malaise trap.

Remarks. Three records of this species from Porsanger in Finnmark are displayed on Artskart (2013). This is our most common *Dixella* species distributed all over the country and usually found in moderately eutrophic ponds and lakes.

***Dixella borealis* (Martini, 1928)**

Material. FØ, Sør-Varanger: Svanhovd Research Station, N69.45403° E30.04057°, 46m a.s.l., 10 August 2010, 1♂, leg. R.J.D.I. Voith; 6–7 September 2010, 1♂, light trap.

Remarks. *Dixella borealis* is previously recorded north to Troms (Håland 1996). The species is usually found in shaded ponds.

***Dixella dyari* (Garret, 1924)**

Material. FV, Alta: Storeng, N69.82277° E23.47884°, 90m a.s.l., 7–24 August 2010, 1♂, Malaise trap; **FI,** Kautokeino: Lahpoluoppal, N69.20992° E23.757661°, 320m a.s.l., 24 July–6 August 2010, 1♂1♀, Malaise trap. **FØ,** Sør-Varanger, Vuolit Nieidajavri, Svartakslavatnet, N69.71095° E30.13530°, 17m a.s.l., 5 September 2010, 1♂, sweep net.

Remarks. This alpine species has previously been reported from southern Norway (Håland 1996). It is usually found in ponds and small lakes with *Carex* above the tree-line.

***Dixella hyperborea* (Bergroth, 1889)**

Material. FV, Alta: Storeng, N69.82277° E23.47884°, 90m a.s.l., 7–24 August 2010, 2♀♀, Malaise trap.

Remarks. *Dixella hyperborea* has previously been taken in eastern Finnmark (Håland 1996). The species is usually found in ponds, which dry out during summer, but fill up quickly in the autumn, allowing for a second generation.

***Dixella obscura* (Loew, 1849)**

Material. FV, Alta: Storeng, N69.82277° E23.47884°, 90m a.s.l., 11–26 June 2010, 11♂♂8♀♀; 6–10 July 2010, 5♂♂3♀♀; 7–24 August 2010, 3♀♀; 24–30 August 2010, 2♂♂, Malaise trap; **FI,** Kautokeino: Lahpoluoppal, N69.20992° E23.757661°, 320m a.s.l., 20 June–9 July 2010, 2♂♂1♀, Malaise trap; **FØ,** Sør-Varanger: Svanhovd Research Station, N69.45403° E30.04057°, 46m a.s.l., 6–8 September 2010, 3♂♂6♀♀, light trap.

Remarks. The species is previously recorded north to Nordland (Håland 1996). It is found in ponds and pools with *Carex* above the tree-line.

Family Thaumaleidae

The Thaumaleidae, or trickle midges, are stout and rather small flies associated with hygropetric habitats (Wagner 2002). Because of their specialized life style, general collectors rarely encounter adults and the family is often underrepresented in museum collections. Four species are recorded from Norway (Willassen 1996b).

***Thaumalea truncata* Edwards, 1929**

? Syn.: *Thaumalea tricuspis* Tjeder, 1949: 107
? Syn.: *Thaumalea cebennica* Vaillant, 1977: 702

Material. FN, Porsanger: Baukop, N70.20469° E24.90605°, 26m a.s.l., 25 August–3 September 2010, 2♂♂, Malaise trap.

Additional material examined. OS, Ringebu: Ringebu, 2 km N, N61.53978° E10.09393°, 30 August 1996, 1♂, leg. Ø. Håland; **ON,** Nord-Fron: Byrebekken, N61.60593° E9.73991°, 6 September 1996, 1♂, leg. Ø. Håland; **Finland, (Le),** Enontekiö: Havgajohka, N68.908° E20.984°, 17 July–24 August 2007, 1♂, Malaise trap, leg. J. Salmela; (**Li),** Utsjoki: Skalvejavri, 21 July–28 August 2007, 1♂, Malaise trap, leg. J. Salmela.

Remarks. There is some confusion regarding the taxonomy of the *Thaumalea truncata* species group. Wagner (2002) re-described and figured two species as occurring in Northern Europe; *Thaumalea truncata* Edwards, 1929 and *T. cebennica* Vaillant, 1977. The two species are most reliably separated on the shape of the paired inner parameres of the male genitalia (Wagner 2002).

All examined Fennoscandian specimens of this group have parameres with a lateral ”tooth”

as in Figure 1, corresponding closely to Wagner's (2002) illustration of *T. cebennica*. This shape is also observed in British populations of *T. truncata* (see e.g. Disney 1999, fig. 44D). The holotype of *T. truncata* was collected in the British Isles, and we therefore deem it probable that Disney's (1999) interpretation of the species is more accurate than that of Wagner (2002).

A third species in this group, *Thaumalea tricuspis,* was described from Sweden by Tjeder (1949), but was soon synonymized with *T. truncata* by Collart (1950). Martinovský & Rozkošný (1976) examined the type material of both *T. tricuspis* and *T. truncata* and could not find any differences. Wagner (2002) did not mention *T. tricuspis* at all, but considered it a synonym of *T. truncata* in Fauna Europaea (Wagner 2013). This is an inconsistency, as Tjeder's (1949) illustrations of the parameres of *T. tricuspis* are identical to our specimens and closely resemble those of *T. cebennica* in Wagner (2002). Because the British specimens are of the *cebennica* type, we regard the synonymy as correct and consider *T. truncata* the only valid species in the *T. truncata* group recorded from Scandinavia (e.g. Håland 1990, 2011; Salmela 2003).

We deem it likely that the species described and figured as *T. truncata* by Wagner (2002) is either an aberrant form or an unnamed species. This, as well as the possible synonymy of *T. cebennica* Vaillant, 1977 with *T. truncata* Edwards should be confirmed by a study of the type material of all three species.

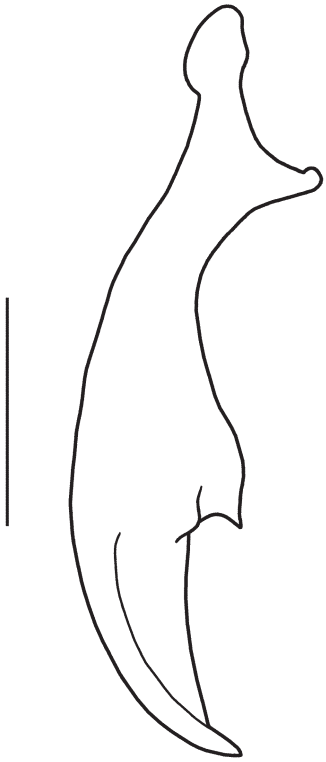

FIGURE 1. *Thaumalea truncata* Edwards, 1929, male, right paramere. Scale bar = 100 μm.

Suborder BIBIONOMORPHA
Family Bibionidae

The Bibionidae, or march flies, are strongly built, setose flies with stout antennae and marked sexual dimorphism (Skartveit 2004). Keys and checklists for the 17 Norwegian species can be found in Skartveit (1995, 1996, 2004).

***Bibio brunnipes* (Fabricius, 1794)**

Syn.: *Bibio fulvipes* (Zetterstedt, 1838)

Material. FI, Kautokeino: Nahpoljohka, N69.21029° E23.76200°, 320m a.s.l., 24 July–6 August 2010, 2♂♂, Malaise trap.

Remarks. *Bibio brunnipes* is a boreoalpine species common in mountainous areas in most parts of Europe, Northern Asia and North America (Skartveit 2004). Skartveit (1995) listed it under its synonym, *Bibio fulvipes* (Zetterstedt, 1838), from six localities in Finnmark.

***Bibio clavipes* Meigen, 1818**

Material. FØ, Sør-Varanger: Svanhovd Research Station, N69.45403° E30.04057°, 46m a.s.l., 6–8 September 2010, 13♂♂ 3♀♀; 29 September–11 October 2010, 4♂♂ 3♀♀, leg. R.J.D.I. Voith, light trap; Russevann, N6944497° E29.89904°, 60m a.s.l., 10–21 August 2010, 1♀, Malaise trap.

Remarks. *Bibio clavipes* is a widespread and common species found all over Norway. It is not previously recorded from Finnmark, but its occurrence there is not surprising, as it has been found in northern Troms (Skartveit 1995).

***Bibio nigriventris* Haliday, 1833**

Additional material. FV, Alta: Kronstad, N69.96600° E23.38306°, 28 June 2005, 8♂♂1♀ sweep net, leg. T.R. Nielsen; **FI,** Kautokeino: Áidejávre, N68.75407° E23.30769°, 1 July 2005, 1♀, sweep net, leg. T.R. Nielsen; Šuoššjávre, N69.37580° E24.25697°, 3 July 2005, 1♀, sweep net, leg. T.R. Nielsen; **FN,** Porsanger: Børselv, N70.30882° E26.52476°, 6 July 2005, 3♂♂, sweep net, leg. T.R. Nielsen; Skoganvarre, N60.87691° E25.07394°, 5 July 2005, 1♀, sweep net, leg. T.R. Nielsen; **FØ,** Sør-Varanger: Pasvik, Fagermo, N69.35410° E29.62480°, 28 June 2006, 1♂1♀, sweep net, leg. T.R. Nielsen; Pasvik, Skogmo, N69.35233° E29.61328°, 29 June 2006, 1♂, sweep net, leg. T.R. Nielsen.

Remarks. The species is distributed throughout Norway and has previously been recorded from three localities in Finnmark (Skartveit 1995). Skartveit (1995, 2004) considers it the most common bibionid in Norway and lists it as a rather eurytopic species.

***Bibio pomonae* (Fabricius, 1775)**

Material. FV, Alta: Storeng, N69.82277° E23.47884°, 90m a.s.l., 23 July–7 August 2010, 2♂♂1♀; 7–24 August 2010, 3♂♂, Malaise trap; **FN,** Porsanger: Baukop, N70.20469° E24.90605°, 26m a.s.l., 25 August–3 September 2010, 1♀, Malaise trap.

Remarks. This species is also among the most common bibionids in Norway and occurs in several types of habitats, especially in subalpine and low-alpine habitats (Skartveit 1995, 2004). Skartveit (1995) recorded it from eight localities in Finnmark.

***Dilophus femoratus* Meigen, 1804**

Additional material. FV, Alta: Kronstad, N69.96600° E23.38306°, 28 June 2005, 2♀♀, sweep net, leg. T.R. Nielsen; Kvalsund: Skaidi, N70.43271° E25.50184°, 10 July 2005, 1♂, sweep net, leg. T.R. Nielsen; **FN,** Porsanger: Skoganvarre, N60.87691° E25.07394°, 5 July 2005, 7♂♂2♀♀, sweep net, leg. T.R. Nielsen; **FØ,** Sør-Varanger: Pasvik, Fagermo, N69.35410° E29.62480°, 28 June 2006, 2♂♂, sweep net, leg. T.R. Nielsen; Skogmo, N69.35233° E29.61328°, 29 June 2006, 5♂♂4♀♀, sweep net, leg. T.R. Nielsen.

Remarks. The species is common and occurs in all parts of Norway below the tree-line (Skartveit 1996, 2004). Previous records from Finnmark are from Alta (Skartveit 1996).

Family Canthyloscelidae

The family Canthyloscelidae is superficially very similar to the Scatopsidae, but can be separated on the palp with multiple segments and the wing lacking an anal lobe (Oosterbroek 2006). Only three species occur in northern Europe (Haenni 2013).

***Synneuron annulipes* Lundström, 1910**

Material. FØ, Sør-Varanger: Russevann, N6944497° E29.89904°, 60m a.s.l., 19–24 June 2010, 1♀, Malaise trap; Sametijohka near Sameti, N69.40106° E29.71923°, 43m a.s.l., 19–24 June 2010, 1♂, Malaise trap.

Remarks. The genus *Synneuron* Lundström is sometimes placed in a family of its own, but Synneurinae is now mostly considered a subfamily of Canthyloscelidae (Haenni 1997; Amorim 2000). One species, *Synneuron annulipes* Lundström, 1910 is currently recognized from Europe. It was first recorded from Norway (Akershus) by Søli *et al.* (1994). The present records are the first from Finnmark, and to our knowledge the northernmost localities known for the species.

Discussion

The project in Finnmark was directed towards insects inhabiting freshwater and humid habitats (Ekrem *et al.* 2012). The larvae of Bibionidae live in the soil eating decomposing plant material, roots etc. and the catches of this family cannot be expected to be representative for the fauna in Finnmark. Further, the larvae of Canthyloscelidae are also terrestrial, living in rotting wood. However, the remaining three families treated in this article all have larvae inhabiting freshwater habitats and the records of these families should be more representative for the fauna in the region.

In Table 1, we list all species of the five

Table 1. Distribution of Ptychopteridae, Dixidae, Thaumaleidae, Bibionidae and Canthyloscelidae in Finnmark, northern Norway based on the revised Strand-system (Økland 1981). For previously published records the publications or source are referred to by numbers as follows: [1]Willassen (1996a), [2]Håland (1996), [3]Artskart (2013), [4]Skartveit (1995), [5]Skartveit (1996). Black dots indicate that new records are given for the sub-region, open dots the record is based on previously published records only.

	FV	FI	FN	FØ
Family Ptychopteridae				
Ptychoptera hugoi Tjeder, 1968	●		●	
Ptychoptera minuta Tonnoir, 1919	●	●[1]	○[1]	●
Family Dixidae				
Dixa nebulosa Meigen, 1830	●		●	
Dixella aestivalis (Meigen, 1818)	●		○[3]	
Dixella borealis (Martini, 1928)				●
Dixella dyari (Garret, 1924)	●	●		●
Dixella hyperborea (Bergroth, 1889)	●			○[2]
Dixella obscura (Loew, 1849)	●	●		●
Family Thaumaleidae				
Thaumalea truncata Edwards, 1929			●	
Family Bibionidae				
Bibio brunnipes (Fabricius, 1794)	○[4]	●[4]		○[4]
Bibio clavipes Meigen, 1818				●
Bibio nigriventris Haliday, 1833	●[4]	●	●[4]	●
Bibio pomonae (Fabricius, 1775)	●[4]		●[4]	○[4]
Bibio rufipes (Zetterstedt, 1838)		○[4]		
Bibio siebkei Mik, 1887	○[4]	○[4]		
Dilophus femoratus Meigen, 1804	●[5]		●	●
Family Canthyloscelidae				
Synneuron annulipes Lundström, 1910				●

families treated here, which are known to occur in Finnmark. Seventeen species are listed, of which eight are not previously recorded from Finnmark, and we add 22 new records for the subregions.

The Ptychopteridae is represented by two species in the material from Finnmark, one of them previously not found in the region (Willassen 1996a). Based on the distribution of the other Ptychopteridae species occurring in Fennoscandia they might be the only species that are likely to occur this far north (see e.g. Andersson 1997).

Six species of Dixidae were collected in Finnmark, of which only two have been recorded from Finnmark previously. However, particularly some *Dixella* species require special habitats and we might have missed some of these species. A few more species might thus be expected. *Dixella amphibia* (De Geer, 1776), *D. laeta* (Loew, 1849), and *D. naevia* (Peus, 1934) have all been recorded from northern Finland (Salmela 2003, 2008) and might possibly also be found in Finnmark.

The Thaumaleidae species are small and

difficult to collect as they are usually exclusively found close to their hygropetric habitats (Wagner 1997). The knowledge of this family in Norway is scanty and it is difficult to predict if more species are present in Finnmark. However, one or two more species might occur in the region as *Thaumalea edwardsi* Tjeder, 1949 has been reported from mountainous areas in southern Norway and *T. verralli* Edwards, 1929 is known from Iceland (Wagner 2013).

Seven species of Bibionidae are now known to occur in Finnmark, of which we add new records of five species. Of these, *Bibio clavipes* Meigen seems not to have been found in Finnmark before, the northernmost previous records are from Troms. In addition to the five species recorded in here, Skartveit (1995) further recorded *Bibio rufipes* (Zetterstedt, 1838) and *Bibio siebkei* Mik, 1887 from Finnmark. In addition, it is likely that *Dilophus borealis* Skartveit, 1993 might occur as well, as the species is distributed in northern Fennoscandia and has been recorded from northern Troms (Skartveit 1996, 2013).

Only one more species of Canthyloscelidae is known from Norway, *Hyperoscelis eximia* (Boheman, 1858) which is taken in western Buskerud in southern Norway (Greve 1993). In addition, *H. veternosa* Mamaev *et* Krivosheina, 1969 is known to occur in boreal habitats in northern Fennoscandia (Hutson 1977) and both species might also occur in similar habitats in eastern Finnmark.

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