

Additions to the Norwegian fauna of fungus gnats (Diptera, Mycetophilidae)

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Fiftythree species are reported new to Norway, and their distribution and biology are commented on. Among the new Norwegian species, *Anatella alpina* Plassmann, 1977 and *Trichonta tristis* (Strobl, 1898) are also new to the Nordic region. The total number of species of Mycetophilidae in Norway is thus increased to 575. The majority of the species added forms an extension of the boreal taiga fauna into Norway, including nine more or less mountainous species, while only three species display a southern nemoral to boreonemoral distribution.

Key words: Diptera, Mycetophilidae, Norway, new records.

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INTRODUCTION

With 942 species, fungus gnats of the family Mycetophilidae (s.s.) is the third most species rich family of nematoceros Diptera in Europe, only outnumbered by Cecidomyiidae and Chironomidae (Fauna Europaea Web Service 2004). Within the Palaearctic region, Mycetophilidae appears to be particularly common and rich in species in the boreal zone (Jakovlev et al. 2006, Kjærandsen et al. 2007a), and research on Nordic fungus gnats has been greatly revitalized the last decade or so, after a period with relative little activity. Ongoing large-scale faunistic and taxonomic projects in Russian Karelia (A. Polevoi, Karelian Forest Research Institute), Finland (J. Jakovlev, Finnish Forest Research Institute / PUTTE program) and Sweden (J. Kjærandsen, the Swedish Taxonomy Initiative) have resulted in the majority of the European species now being known from the Nordic region.

Currently some 800 species have been reported, and the Nordic region has been estimated to hold about 900 species (1000 species including the other families of Mycetophilomorpha, see Kjærandsen & Bengtson 2005). A Nordic zoogeographic (sub)region was defined by Kjærandsen et al. (2007a) to include Iceland, The Faroes, Denmark, Norway, Svalbard, Sweden, Finland, and the northwestern Russian provinces including Karelia (hereafter called NW Russia).

Mycetophilids are probably among the best studied groups of nematoceros Diptera in Norway, even so, compared to the situation in Sweden and Finland, the Norwegian fauna must be characterized as poorly investigated. Norwegian large-scale inventories, like the ones in Karelia, Finland and Sweden, are still wanting, and for most species we still have only a fragmented picture of their total distribution. The first check list covering Norwegian Mycetophilidae (s.s.)

was published in 2006 (Gammelmo & Søli 2006), and included 473 species. One year later, Kjærandsen & Jordal (2007) added 48 more species based on a study in Northwest Norway, and Kjærandsen (2007) described a new species of the genus *Allodia* from Norway. The number of currently published species is thus 522 in Norway, while it is approximately 525 in Karelia (mainly Polevoi 2000), 635 in Finland (Jakovlev et al. 2006; more additions in progress (J. Jakovlev pers. com.), 679 in Sweden (Kjærandsen et al. 2007a), 388 in Denmark (Petersen & Meier 2001, many unconfirmed), 39 in Iceland (Kjærandsen et al. 2007b) and 17 in the Faroes (Kjærandsen & Jørgensen 1992).

There are good reasons to suppose the Norwegian fauna to hold a comparatively high number of species as that found in Sweden and Finland. The presence of certain nemoral species in southern Sweden, or eastern boreal species in Finland, are likely to be compensated by species with an Atlantic, arctic or alpine distribution in Norway. With this in mind, we have scanned our collections from new and potentially interesting areas (mainly along the southern and western coast, the mountain area around Kongsvoll, and the subarctic area around Alta), and compile here a list of 53 species new to Norway. It still requires much effort to fill in all the pieces of the puzzle, but it is not unlikely that Norway inhabit most of the Nordic species. We expect therefore a substantial number of new species will be added to the Norwegian fauna also in the years to come.

SPECIES NEW TO NORWAY

Species new to Norway are listed alphabetically within each of the subfamilies Sciophilinae (s.l.) and Mycetophilinae. Data on distribution is taken from Chandler (2005) and Kjærandsen et al. (2007a) where nothing else is stated. The suggested Nordic distribution patterns follow that developed for Sweden by Kjærandsen et al. (2007a). The material is kept in the following collections: NHMO – Natural History Museum, University of Oslo, Norway. MZLU – Museum of Zoology, Lund University, Sweden. MZHF – Zoological

Museum, University of Helsinki, Finland.

FAMILY MYCETOPHILIDAE

SUBFAMILY SCIOPHILINAE (s.l.)

***Boletina atridentata* Polevoi & Hedmark, 2004.**

Material: **NTI**, Lierne: Østborg, 14–20 August 1996, 30♂♂, A. Bakke leg (Malasie trap) [NHMO].

Nordic distribution: Boreal.

World distribution: Nordic, a little known, probably strictly boreal species, recorded from NW Russia, Sweden and Norway only.

Habitat/biology: Tallherb spruce and moist mixed stands (Polevoi & Hedmark 2004). Biology unknown.

***Boletina cordata* Polevoi & Hedmark, 2004**

Material: **NTI**, Lierne: Østborg, 6 June–14 August 1996, 18♂♂, 1♀, A. Bakke leg (Malasie trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Nordic, a little known species recorded from NW Russia, Finland, Sweden and Norway only.

Habitat/biology: Coniferous stands of *Myrtillus* type (Polevoi & Hedmark 2004). Biology unknown.

***Boletina hedstroemi* Polevoi & Hedmark, 2004**

Material: **FV**, Alta: Detsika, Boulamalia, in sandy slope, 6 August–25 September 1996, 10♂♂, L. O. Hansen & H. Rinden (Malaise trap) [NHMO].

Nordic distribution: Boreal.

World distribution: Nordic, recorded from NW Russia, Finland, Sweden and Norway only.

Habitat/biology: Spruce dominated forest of *Myrtillus* type and old, embogged *Carex globularis* forest (Polevoi & Hedmark 2004). Biology unknown.

***Boletina nitiduloides* Zaitzev, 1994**

Material: **FØ**, Sør-Varanger: Pasvik valley, Myggbekken N Vaggatem, <100 m a.s.l., 20 June–10 July 2003, 6♂♂, M. & C. Jaschhof leg (sweep

net) [MZLU].

Nordic distribution: Boreal.

World distribution: Palaearctic; in Europe recorded only from NW Russia, Finland, Sweden and Norway.

Habitat/biology: A little known, probably strictly boreal species, with unknown biology.

***Boletina sahlbergi* Lundström, 1906**

Material: **ON**, Nord-Fron: Haugen, 9 July 1988, 1♂, T. Andersen & G. Søli leg (sweep net) [NHMO]. **STI** Oppdal: Kongsvoll, 940 m a.s.l., 19–26 July 1995, 1♂, J. Skartveit leg (Malaise trap) [ZMLU]; Sprenbekken, 980 m a.s.l., 16 August–19 September 1994, 1♂, J. Skartveit leg (Malaise trap) [ZMLU]. **FV** Alta, Detsika, Boulamalia, in sandy slope, 6 August–25 September 1996, 2♂♂, L. O. Hansen & H. Rinden leg. (Malaise trap) [NHMO].

Nordic distribution: Boreal-alpine.

World distribution: Palaearctic; in Europe recorded from NW Russia, Finland, Sweden, Norway, Austria, Switzerland and Italy.

Habitat/biology: A little known, possibly boreal-mountainous species, with unknown biology.

Remarks: The species has been confused with *B. erythrogyga* Holmgren, 1883 and there still remain uncertainties concerning distribution data (Zaitzev & Polevoi 2001).

***Greenomyia stackelbergi* Zaitzev, 1982**

Material: **AK**, Oslo: Hengsenga, 8 August–7 September 2007, 6♂♂, A. Endrestøl leg. (Malaise trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: A rare Palaearctic species, described on material from South Primorje in the Russian Far East, and later recorded from one locality only, in Vuollerim, Sweden (Kjærandsen et al. 2007a).

Habitat/biology: Interestingly, both Nordic localities are semi-urban. In Sweden a small but stable population of the species is known from the garden compost of M. Karström in the village of Vuollerim. Karström is mycologist and discard various fungi collected in the nearby area in his compost, and may in this way have brought home some larvae of *G. stackelbergi*. Garden compost

may also be a possible habitat for the specimens caught in the semi-urban area near Oslo. Biology unknown.

***Mycomya (Cymomya) circumdata* (Staeger, 1840)**

Material: **NTI**, Lierne: Østborg, 14–20 August 1996, 4♂♂, A. Bakke leg (Malaise trap) [NHMO].

Nordic distribution: Wide.

World distribution: Palaearctic; widely distributed in most of Europe.

Habitat/biology: The species have been reared from *Leccinum scabrum* (Fr.) S F Grey (Boletaceae) in Finland (Väisänen 1984).

***Mycomya (Mycomya) digitifera* Edwards, 1925**

Material: **TEY**, Porsgrunn: Gravastranda, 13 June–12 July 1988, 1♂, G. Søli (Malaise trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

Distribution. Western Palaearctic; known from Finland, Norway, Denmark, Great Britain, Germany, Poland, Switzerland, Italy and Bulgaria.

Habitat/biology: Type material collected with light at a bog site (Väisänen 1984).

***Mycomya (Mycomyopsis) fennica* Väisänen, 1979**

Material: **HOY**, Stord: Sjoalemyr, 19 July–28 August 1989, 7♂♂, L. Greve leg (Malaise trap) [NHMO].

Nordic distribution: Wide.

World distribution: Western Palaearctic; only recorded from Norway, Finland, Estonia, NW Russia, Germany and Austria.

Habitat/biology: The Finnish specimens were recorded in a bog (Väisänen 1984), as were the present specimens.

***Mycomya (Mycomya) fuscata* (Winnertz, 1863)**

Material: **STI**, Oppdal: Kongsvold, Sprenbekken, 1100 m a.s.l., 10 August–7 September 1994, 9♂♂ 1♀(?), J. Skartveit leg (yellow trays) [NHMO]. **FV**, Alta: Detsika, Boulamalia, 6 August–25

September 1996, 1♂, L. O. Hansen & H. Rinden leg (Malaise trap) [NHMO].

Nordic distribution: Boreal-alpine.

World distribution: Holarctic; in Western Palaearctic recorded from NW Russia, Finland, Sweden, Norway, Great Britain (Scotland), Germany, Austria, Switzerland and Italy.

Habitat/biology: Biology unknown.

Mycomya (Mycomya) heydeni

Plassmann, 1970

Material: **AK**, Oppegård: Strandskogen, 4 June 2007, 1♂, G. Søli (sweep net) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Western Palaearctic; recorded from NW Russia, Finland, Sweden, Norway, Estonia, Germany and Switzerland.

Habitat/biology: Collecting localities include coniferous forest and *Sphagnum* bog (Väisänen 1984).

Mycomya (Mycomya) hians (Lundström, 1912)

Material: **TEY**, Porsgrunn: Gravastranda, 13 June–12 July 1988, 1♂, G. Søli (Malaise trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Western Palaearctic; recorded from NW Russia, Finland, Norway, Latvia, Estonia, Germany and Austria.

Habitat/biology: Biology unknown.

Sciophila varia (Winnertz, 1863)

Material: **TEI**, Kviteseid: Øvre Landsverk, 1 June–15 July 1999, 2♂♂, L. O. Hansen & D. Wisland (Malaise trap) [NHMO]. **RY**, Tysvær: betw. Knapphus and Solheim, 3 October 1990, 2♂♂2♀♀ J. Kjærandsen (reared from *Hydnum repandum*) [MZLU]. **HOY** Bømlø: Vorland, Langevåg, 11 February 2002–12 February 2003, 18♀♀, J. Kjærandsen leg (Malaise trap) [MZLU].

Nordic distribution: Wide.

World distribution: Palaearctic; widely distributed in Europe.

Habitat/biology: Reared from fruiting bodies in various epigeal and wood-decaying fungi, but mainly associated with *Hydnum repandum* (Falk

& Chandler 2005, Sevcik 2006).

SUBFAMILY MYCETOPHILINAE

Allodia (Brachycampta) grata (Meigen, 1830)

Material: **AK**, Oppegård: Prosted, 9–10 June 2007, 1♂, G. Søli (sweep net) [NHMO].

Nordic distribution: Wide.

World distribution: Palaearctic; widely distributed in Europe.

Habitat/biology: Fruiting bodies of various agarics, mostly epigeal species (Jakovlev et al. in print).

Allodia (Brachycampta) protenta Laštovka & Matile, 1974

Material: **FV**, Alta: Elvestrand, 18 July–16 September 1996, 2♂♂, H. Rinden leg (light trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Holarctic; northwesterly in Europe.

Habitat/biology: Unknown.

Anatella alpina Plassmann, 1977

Material: **STI**, Oppdal: Kongsvoll, 920 m a.s.l., 8–27 July 1992, 1♂, J. Skartveit leg (yellow trays) [MZLU].

Nordic distribution: First record in the Nordic region, boreal–alpine.

World distribution: Palaearctic, recorded only from Great Britain, Germany, Austria and Norway.

Habitat/biology: The alpine Norwegian record fits well with the type locality at 930 m a.s.l. in the German Alps, while the British localities include lowland moist woodland, bog and fen sites (Falk & Chandler 2005). Biology unknown.

Anatella bremia Chandler, 1994

Material: **SFI**, Luster: Jostedal, Øyastrondi, 20 August–11 September 1988, 1♂, G. Søli leg (Malaise trap) [MZLU].

Nordic distribution: Boreal-mountainous.

World distribution: Palaearctic, known from NW Russia, Finland, Sweden, Norway, Germany and Great Britain.

Habitat/biology: Known from a variety of wetland

locations, biology unknown (Falk & Chandler 2005).

Remarks: Published from Jostedal as *Anatella* sp. C by Søli (1994).

***Anatella emergens* Caspers, 1987**

Material: **SFI**, Luster: Jostedal, Øyastrondi, 20 August–11 September 1988, 1♂, G. Søli leg (Malaise trap) [MZLU]. **SFY**, Høyanger: Bjordal, 3–6 August 1980, T. Andersen leg (light trap) [MZLU].

Nordic distribution: Boreal-mountainous.

World distribution: Palaearctic; in Europe recorded from Russia N, Sweden, Norway, Germany, Switzerland and Great Britain.

Habitat/biology: Biology unknown.

Remarks: Published from Jostedal as *Anatella* sp. A by Søli (1994).

***Anatella maritima* Ostroverkhova, 1979**

Material: **SFI**, Luster: Jostedal, Øyastrondi, 20 August–11 September 1988, 60♂♂, G. Søli leg (Malaise trap) [MZLU].

Nordic distribution: Boreal-mountainous.

World distribution: Palaearctic; in Europe known from NW Russia, Finland, Sweden and Norway only.

Habitat/biology: Biology unknown.

Remarks: Published from Jostedal as *Anatella* sp. B by Søli (1994), determination according to Zaitzev (2003).

***Anatella novata* Dziedzicki, 1923**

Material: **TEY**, Porsgrunn: Gravastranda, 13 June–12 July 1988, 1♂, G. Søli (Malaise trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

Habitat/biology: Biology unknown.

World distribution: Palaearctic; in Europe recorded from Finland, Sweden, Norway, Germany, the Czech Republic, Serbia and Montenegro.

***Brevicornu beatum* (Johannsen, 1912)**

Material: **HOY**, Stord: Sjoalemyr, 19 July–28 August 1989, 1♂, L. Greve leg (Malaise trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Holarctic; in Europe recorded

from NW Russia, Finland, Sweden, Norway and Estonia.

Habitat/biology: Biology unknown.

***Brevicornu bellum* (Johannsen, 1912)**

Material: **STI**, Oppdal: Kongsvoll, 1080 m a.s.l., 15–22 July 1992, 9♂♂, J Skartveit leg (Malaise trap) [ZMLU].

Nordic distribution: Boreal-alpine.

World distribution: Holarctic; in Europe known from NW Russia, Finland, Sweden, Norway, Estonia and Switzerland.

Habitat/biology: Biology unknown.

***Cordyla nitidula* Edwards, 1925**

Material: **FV**, Alta: Kåfjord, Möllernes, 21 June–4 August 1996, 2♂♂, L. O. Hansen & H. Rinden leg (Malaise trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; widely distributed in Europe.

Habitat/biology: Fruiting bodies of various boleti and agarics, chiefly *Russula* (Ševčík 2006, Jakovlev et al. *in print*).

***Exechia bicincta* (Staeger, 1840)**

Material: **AAI**, Bygland: Heddevika, 4 July–31 August 1997, 1♂, K. Berggren leg [NHMO].

Nordic distribution: Nemoral–boreonemoral.

World distribution: Holarctic; widely distributed in Europe.

Habitat/biology: Fruiting bodies of various agarics and boleti (Yakovlev 1994, Ševčík 2006).

***Exechia chandleri* Caspers, 1987**

Material: **RY**, Finnøy: Ladsteisvatnet (EIS 14), 21 August–23 October 1993, 1♂2♀♀, J. Skartveit leg. (Malaise trap) [MZLU]; 3–24 September 1994, 2♂♂, J. Skartveit leg (Malaise trap) [NMHO]. Sevheimshiea, 28 August–17 October 1992, 2♂♂1♀; 14 September–23 October 1993, 11♂♂7♀♀, J. Skartveit leg. (Malaise trap) [MZLU]. Sevheimsvatnet, 28 August–17 October 1992, 1♂2♀♀, J. Skartveit leg. (Malaise trap) [MZLU].

Nordic distribution: Boreonemoral.

World distribution: European, known from Slovakia, Slovenia, Austria, Germany, Great

Britain, Sweden and Norway.

Habitat/biology: This little known species seems to be confined to open wetlands like marshy ground or damp woodland (Falk & Chandler 2005), which corresponds well to the Norwegian records and the Swedish records from Öland (Kjærandsen et al. 2007a).

***Exechia micans* Laštovka & Matile, 1974**

Material: **STI**, Oppdal: Kongsvoll, 920 m a.s.l., 8–27 July 1992, 1♂, J. Skartveit leg (yellow trays) [ZMLU]; Sprenbekken, 1100 m a.s.l., 10 August–7 September 1994, 5♂♂, J. Skartveit leg (yellow trays) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; in Europe recorded from NW Russia, Sweden, Norway, Iceland and Germany.

Habitat/biology: Biology unknown, but it is interesting to note that this otherwise scarcely found species was found to be common and widespread in Iceland (Kjærandsen et al. 2007b).

***Exechia pseudofestiva* Lackschewitz, 1937**

Material: **RY**, Finnøy: Ladsteinsvatnet, 3–24 September 1994, 1♂, J. Skartveit leg (Malaise trap) [NHMO]; Sevheim, 21 August–14 September 1993, 1♂, J. Skartveit (Malaise trap) [MZLU]. Sevheimsvatnet, 28 August–17 October 1992, 2♂♂1♀; 27 April–11 May 1993, 1♂, J. Skartveit leg. (Malaise trap) [MZLU].

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; northwesterly in Europe, incl. Sweden (Kjærandsen et al. 2007a) and Iceland (Kjærandsen et al. 2007b).

Habitat/biology: Biology unknown.

***Exechia styriaca* Strobl, 1898**

Material: **NNØ**, Evenes: at Evenes airport, 21 July 1991, 1♂1♀, J. Kjærandsen leg (sweep net) [MZLU]. **TRY**, Tromsø: Granheim, Breivikeidet, 2 September 1987, 1♂, G. Søli leg (sweep net) [MZLU].

Nordic distribution: Boreal.

World distribution: Palaearctic; scattered distribution in Europe.

Habitat/biology: Known from broadleaved

woodland in Britain (Falk & Chandler 2005), biology unknown.

***Exechia unifasciata* Lackschewitz, 1937**

Material: **AK** Oslo: Ljabru, 19 May 2007, 1♂, G. Søli leg (sweep net) (NHMO)

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; in Europe mainly in the northeast, incl. Sweden and Finland.

Habitat/biology: The larvae develop in the fruiting bodies of *Suillus* and *Russula* (Yakovlev 1994).

***Exechiopsis (Exechiopsis) dimitrescae* (Burghel-Balacesco, 1972)**

Material: **FV**, Alta: Detsika, Boulamalia, in sandy slope, 6 August–25 September 1996, 1♂, L. O. Hansen & H. Rinden leg. (Malaise trap) [NHMO].

Nordic distribution: Wide.

World distribution: Palaearctic; widely distributed in Europe.

Habitat/biology: Reared from undetermined Xylotropic Agaricales (Zaitzev 2003).

***Exechiopsis (Exechiopsis) patula* (Plassmann, 1978)**

Material: **STI**, Oppdal: Kongsvoll, Knutshø, Sprenbekken, 1300 m a.s.l., 12–22 August 1992, 25♂♂35♀♀; 1350 m a.s.l., 12–22 August 1992, 3♂♂8♀♀; 1360 m a.s.l., 19–22 August 1992, 1♀; 1450 m a.s.l., 23–27 July 1992, 2♀♀, J. Skartveit leg (yellow trays) [MZLU]; 1380 m a.s.l., 10 August–7 September 1994, 1♂, J. Skartveit leg (yellow trays) [NHMO].

Nordic distribution: Boreal-alpine.

World distribution: Palaearctic; previously known from Sweden and Switzerland only.

Habitat/biology: Probably a boreal-mountainous species with a disjunct distribution in central Europe. The Norwegian records are all alpine, while it is known from boreal forests in northern Sweden (Kjærandsen et al 2007a).

***Exechiopsis (Xenexechia) stylata* Lastovka & Matile, 1974**

Material: **SFI**, Luster: Jostedalen, Øyastrondi, 12 July–17 August 1988, 2♂♂1♀(?), G. Søli leg (Malaise trap) [MZLU].

Nordic distribution: Boreal.

World distribution: Palaearctic; in Europe known from Finland, Sweden, Norway and Italy.

Habitat/biology: Probably a boreal-mountainous species with disjunct distribution in central Europe. Biology unknown.

Remarks: Published from Jostedal as *Exechiopsis (Xenexechia) crucigera* (Lundström, 1909) by Søli (1994).

***Mycetophila boreocruciator* Sevcik, 2003**

Material: **STI**, Oppdal: Kongsvoll, Sprenbekken, 980 m a.s.l., 16 August–19 September 1994, 1♂, J. Skartveit leg (Malaise trap) [ZMLU].

Nordic distribution: Boreal-boreonemoral.

World distribution: European, known only from Norway, Sweden, Estonia and Slovakia.

Habitat/biology: Biology unknown.

***Mycetophila cingulum* Meigen, 1830**

Material: **FV**, Alta: Elvestrand, 18 July–16 September 1996, 1♂, H. Rinden leg (light trap) [NHMO].

Nordic distribution: Wide.

World distribution: Holarctic; mainly northwesterly in Europe, including NW Russia and southern Sweden.

Habitat/biology: Reared from *Polyporus squamosus* (Zaitzev 2003).

***Mycetophila haruspica* Plassmann, 1990**

Material: **FV**, Alta: Elvestrand, 18 July–16 September 1996, 5♂♂, H. Rinden leg (light trap) [NHMO].

Nordic distribution: Boreal.

World distribution: Nordic, probably strictly boreal, only known from northern Sweden and Norway.

Habitat/biology: Biology unknown.

***Mycetophila lunata* Meigen, 1804**

Material: **ON**, Nord-Fron: Haugen, 9 July 1988, 1♂, T. Andersen & G. Søli leg (sweep net) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; recorded from most of Europe.

Habitat/biology: The species have been reared from *Coniophora puteana* (Schumach.) P. Karst.

(1868) (Boletales, Coniophoraceae) (Chandler 1977).

***Mycetophila morosa* Winnertz, 1863**

Material: **ON**, Nord-Fron: Haugen, 9 July 1988, 1♂, T. Andersen & G. Søli leg (sweep net) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Holarctic; recorded from most of Europe.

Habitat/biology: Biology unknown.

***Mycetophila pseudoforcipata* Zaitzev, 1998**

Material: **VE**, Re: Haugrud (59°23.196'N 10°18.552'E), 2 August 2007, 1♂, G. Søli leg. (sweep net) [NHMO]

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; in Western Palaearctic previously recorded from Finland, Sweden, Russia C, Germany and the Czech Republic.

Habitat/biology: The larvae are found in sporophores of *Piptoporus betulinus* (Bull.) P. Karst., 1881 (Polyporales, Fomitopsidaceae) (Zaitzev 2003).

***Mycetophila sublunata* Zaitzev, 1998**

Material: **AK**, Opegård: Strandskogen, 4 June 2007, 1♂, G. Søli leg (sweep net) [NHMO]; Oslo: Østmarka, Skullerudåsen, 15 July 2007, 1♂, G. Søli leg (sweep net) [NHMO]; Østmarka, Lutdalen, 2♂♂, 8 August 2007, G. Søli leg (sweep net) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; a northern distribution, known from NW Russia, Finland, Sweden and Norway.

Habitat/biology: Biology unknown.

***Notolopha brachycera* (Zetterstedt, 1852)**

= *Allodiopsis (Notolopha) tuomikoskii* Zaitzev & Maximova, 2000

Material: **STI**, Rennebu: Gisnås, 7 July 1988, 9♂♂2♀♀, T. Andersen & G. Søli leg (sweep net) [NHMO]. **TRI**, Målselv: Dividalen, Devdis, 26 June 1989, 2♂♂, A. Fjellberg (sweep net) [MZLU]. **NNV**, Vågan: Rørvik, 27 June 1956,

1♂, H. Andersson leg (sweep net) [MZLU].

Nordic distribution: Boreal.

World distribution: Palaearctic; probably strictly boreal, in Europe recorded only from Finland, Sweden and Norway.

Habitat/biology: Biology unknown.

Remarks: *Notolopha cristata* (Staeger, 1840) was split into three species by Zaitzev & Maximova (2000), based on shape and distribution of setae on the mesoscutum and on details of the male terminalia. *N. brachycera* is a rather common but largely overlooked species, commonly found together with *N. cristata*.

***Notolopha sibirica* Zaitzev & Maximova, 2000**

Material: FØ, Sør-Varanger: Pasvik valley, E Nilsrud, <100 m a.s.l., 20 June–10 July 2003, 1♂, M. & C. Jaschhof leg (Malaise tent) [MZLU].

Nordic distribution: Boreal.

World distribution: Palaearctic; northern in Europe known only from Finland (Jakovlev et al. 2006), Sweden and Norway.

Habitat/biology: A little known, probably strictly boreal species, also often collected together with *N. cristata* and *N. brachycera*. Biology unknown.

***Phronia electa* Dziedzicki, 1889**

Material: HOY, Bømlo: Vorland, Langevåg (59°36'27"N, 005°12'40"E), 26 March–1 April 2002, 2♂♂, J. Kjærandsen leg. (Malaise trap) [MZLU].

Nordic distribution: Boreonemoral.

World distribution: Palaearctic, scattered records in Europe.

Habitat/biology: More or less damp broad-leaved woodland (Falk & Chandler 2005), biology unknown.

***Phronia forcipula* Winnertz, 1863**

Material: ON, Nord-Fron: Haugen, 9 July 1988, 1♂, T. Andersen & G. Søli leg (sweep net) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Holarctic; widespread in Europe.

Habitat/biology: The larvae are found on the surface of sporophores of *Corticium* sp. (Edwards

1925).

***Phronia sudetica* Dziedzicki, 1889**

Material: ON, Nord-Fron: Haugen, 9 July 1988, 1♂, T. Andersen & G. Søli leg (sweep net) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Holarctic; northern and central in Europe.

Habitat/biology: Most finds by streams in broad-leaved woodland (Falk & Chandler 2005), biology unknown.

***Pseudexechia canalicula* (Johannsen, 1912)**

Material: TRY, Kvaenangen: Kvaenangen, 25 July 1965, 1♂, R. Tuomikoski (sweep net) [MZHF].

Nordic distribution: Boreal.

World distribution: Holarctic; in the Palaearctic region known only from Finland, Sweden and Norway.

Habitat/biology: A little known, probably strictly boreal species, with unknown biology.

***Rymosia acta* Dziedzicki, 1910**

Material: HOY, Lindås: Vollom, 22 October–7 November 1989, 1♀, L. Greve & G. Søli leg (Malaise trap) [MZLU]. SFI, Luster: Jostedalen, Øyastrondi, 24 June–12 July 1988, 1♂, 12 July–17 August 1988, 1♂2♀♀, 20 August–11 September 1988, 2♂♂, G. Søli leg (Malaise trap) [MZLU]. STI, Oppdal: Kongsvoll, W E6 at path to Reinheim, 900–1140 m a.s.l., 1♂, 17–27 July 1992, J. Skartveit leg (yellow trays) [MZLU]. NNV, Hadsel: Melbu, 20 July 1991, 2♀♀, J. Kjærandsen leg (sweep net) [MZLU].

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; a scattered distribution in Europe.

Habitat/biology: Broad-leaved or mixed woodland (Falk & Chandler 2005), biology unknown.

Remarks: Published from Jostedalen as *Rymosia* sp. (cf. *acta*) by Søli (1994).

***Rymosia armata* Lackschewitz, 1937**

Material: SFI, Luster: Jostedalen, Øyastrondi, 20 August–11 September 1988, 2♂♂, G. Søli leg (Malaise trap) [MZLU]. STI, Oppdal: Kongsvoll,

N Kaldvella, 1120 m a.s.l., 8–15 July 1992, 1♂, J. Skartveit leg (yellow trays) [MZLU]; S. Knutshø, 1150 m a.s.l., 15–22 August 1992, 2♂♂, J. Skartveit leg (yellow trays) [MZLU]. **TRY** Kvaenangen: Kvaenangen, 8 July 1964, 1♂, R. Tuomikoski leg (sweep net) [MZHF].

Nordic distribution: Boreal.

World distribution: European; known only from Norway, Sweden, Latvia, Austria, Germany and Great Britain.

Habitat/biology: Bog or fen in more or less wooded areas (Falk & Chandler 2005), biology unknown.

***Rymosia istræ* Zaitzev, 1993**

Material: **FV**, Alta: Elvestrand, 18 July–16 September 1996, H. Rinden leg (light trap) [NHMO].

Nordic distribution: Boreal.

World distribution: European; known only from C and NW Russia, Sweden and Norway.

Habitat/biology: A little known, probably strictly boreal species, with unknown biology.

***Rymosia setiger* Dziedzicki, 1910**

Material: **HOY**, Bømlo: Andal, 11 July 2004, 2♀♀, J. Kjærandsen leg (sweep net) [MZLU]. **STI** Oppdal: Kongsvoll, Knutshø, Sprenbekken, 1300 m.a.s.l., 15–19 Aug 1992, 1♀, J. Skartveit leg (yellow trays) [MZLU]. **FV** Kvalsund: Skaidi, 7 July 1964, 1♂, R. Tuomikoski leg (sweep net) [MZHF]; **FN**, Porsanger: Børselv, Silfarfossen, 20 July 1965, 1♀, R. Tuomikoski leg (sweep net) [MZHF].

Nordic distribution: Boreal-boreonemoral.

World distribution: European; widely distributed.

Habitat/biology: Reared from a wide range of epigeal fungi (Falk & Chandler 2005).

***Sceptonia longisetosa* Ševčík, 2004**

Material: **HOY**, Bømlo: Vorland, Langevåg, 1–8 July 2002, 1♂, 2–9 Sep 2002, 1♂, J. Kjærandsen leg (Malaise trap) [MZLU].

Nordic distribution: Boreal-boreonemoral.

World distribution: European; recorded from the Czech Republic (type), Finland (Jakovlev et al. 2006), Sweden and Norway.

Habitat/biology: Biology unknown.

***Stigmatomeria obscura* (Winnertz, 1863)**

Material: **STI**, Oppdal: Kongsvoll, Sprenbekken, 980 m a.s.l., 16 August–19 September 1994, 6♂♂, J. Skartveit leg (yellow trays) [MZLU].

Nordic distribution: Wide.

World distribution: European; confirmed from Norway, Sweden and Germany.

Habitat/biology: Biology unknown.

Remarks: Reinstated as separate from *Stigmatomeria crassicornis* (Stannius, 1831) by Kjærandsen et al. (2007a); probably widespread and common.

***Synplasta pseudingeniosa* Zaitzev, 1993**

Material: **STI**, Oppdal: Kongsvoll, 980 m a.s.l., 8–27 July 1992, 1♂, J. Skartveit leg (yellow trays) [MZLU].

Nordic distribution: Boreal-boreonemoral.

World distribution: European; known only from NW Russia, Sweden, Norway and Estonia.

Habitat/biology: Biology unknown.

***Trichonta tristis* (Strobl, 1898)**

Material: **TEY**, Porsgrunn: Gravastranda, 13 June–12 July 1988, 1♂, G. Søli (malaise trap) [NHMO].

Nordic distribution: Boreal-boreonemoral.

World distribution: Palaearctic; in Europe previously recorded from Austria and Switzerland only.

Habitat/biology: Biology unknown.

Remarks: Outside Europe, the species has been recorded from the Altai Mountains in Siberia and from the Sakhalin Island (Zaitzev 2003). The specimen from Porsgrunn from was found together with the closely related species *T. vulcani* (Dziedzicki, 1889). As these two species may easily be confused, it can be added that the outline of the genitalia in the two species correspond to the drawing given by Zaitzev (2003) for *T. tristis*, and by Gagné (1981) for *T. vulcani*.

DISCUSSION

Most of the species here added to the Norwegian fauna have a northern distribution or are widespread in the Nordic region. The majority of them seem to form an northwestern expansion

of the boreal taiga fauna, of which eight species probably are strictly boreal, viz. *Boletina atridentata*, *B. hedstroemi*, *B. nitiduloides*, *Mycetophila haruspica*, *Notolopha brachycera*, *N. sibirica*, *Pseudexechia canalicula* and *Rymosia istrae*. Nine species seem to be partly or entirely confined to mountainous or alpine areas, among them *Anatella alpina*, which is new to the Nordic region. Only three species display a southern nemoral to boreonemoral distribution, viz. *Exechia bicincta*, *E. chandleri* and *Phronia electa*.

As most fungus gnats are likely to be vulnerable to modern forestry practice, being dependent on virgin, undisturbed forests (Økland 1996, Falk & Chandler 2005), they were surveyed for the Norwegian 2006 Red Data List (Kålås et al. 2006). A total of 963 species of Diptera were evaluated for listing, of which 564 species were chosen for a detailed Red List assessment (Gammelmo et al. 2006). In all, 233 species of Diptera are found on the 2006 Red List, among them 126 species of fungus gnats. In comparison, 55 species are included in the British Red List (Falk & Chandler 2005) and only 8 in the Swedish Red list (Gårdenfors 2005, only family Keroplatidae evaluated). As pointed out by Kjærandsen & Jordal (2007), the number of red listed fungus gnats in the Norwegian list, is probably too high as a result of insufficient knowledge about their Norwegian distribution, above all due to poor sampling. As mentioned, our knowledge about the Nordic fungus gnat fauna has improved considerably during the last years. Hence, new findings reported by individuals and data achieved through the Swedish Taxonomy Initiative, will undoubtedly ensure a more accurate evaluation of the various red list categories in forthcoming editions of the Norwegian Red Data List. Nevertheless, several of the fungus gnat species on the Norwegian 2006 Red List (Kålås et al. 2006) are also represented in the British Red List (Falk & Chandler 2005), and their populations should be followed carefully also in Norway.

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REFERENCES

- Chandler, P. J. 1977. Studies of some fungus gnats (Diptera: Mycetophilidae) including nine additions to the British list. *Syst. Entomol.* 2, 67–93.
- Chandler, P. J. 2005. Fauna Europaea: Mycetophilidae. In de Jong, H. (ed.): *Fauna Europaea: Diptera, Nematocera*. Fauna Europaea, version 1.2. Available from: <http://www.faunaeur.org> (accessed 5 January 2008).
- Edwards, F. W. 1925. British Fungus-Gnats (Diptera, Mycetophilidae). With a revised Generic Classification of the Family. *Trans. R. Entomol. Soc. Lond.* 73, 505–670.
- Falk, S. J. & Chandler, P. J. 2005. Species Status. No. 2. A review of the scarce and threatened flies of Great Britain. Part 2: Nematocera and Aschiza not dealt with by Falk (1991). *Species status No. 2*: 1–189. Joint Nature Conservation Committee, Peterborough.
- Fauna Europaea Web Service. 2004. Fauna Europaea version 1.1, Available online at <http://www.faunaeur.org> (accessed 13 January 2008).
- Gammelmo, Ø., Nielsen, T. R., Falck, M., Greve, L. & Søli, G. E. E. 2006. Tovinger Diptera. pp. 285–296. in J. A. Kålås, Å. Viken and T. Bakken (eds), *Norsk Rødliste 2006 – 2006 Norwegian Red List*. Artsdatabanken, Norway
- Gammelmo, Ø. & Søli, G. E. E. 2006. Norwegian fungus gnats of the family Mycetophilidae (Diptera, Nematocera). *Norw. J. Entomol.* 53, 57–69.
- Gårdenfors, U. (Ed.) 2005. Rödlistade arter i Sverige 2005 – The 2005 Red List of Swedish species. *ArtDatabanken, SLU, Uppsala*. 496 pp.
- Hedmark, K. 2000. Svampmyggor i tajgan – nya arter för Sverige i ett fennoskandiskt perspektiv (Diptera: Sciaroidea exkl. Sciaridae). *Ent. Tidskr.* 121, 73–89. [in Swedish with English summary]
- Jakovlev, J., Kjærandsen, J. & Polevoi, A. 2006. Seventy species of fungus gnats new to Finland (Diptera, Mycetophilidae). *Sahlbergia* 11, 22–39.
- Jakovlev, J., Kjærandsen, J. & Viklund, B. [in

- print]. Fungus gnats (Diptera: Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae & Mycetophilidae) from Tyresta National Park and Nature Reserve in Sweden. *Sahlbergia* 13, [in print].
- Kålås, J.A., Viken, Å. & Bakken, T. (Eds) 2006. Norsk Rødliste 2006 – 2006 Norwegian Red List. Artsdatabanken, Norway.
- Kjærandsen, J. 2007. Two new species of *Allodia* subgenus *Brachycampta* Winnertz from Norway and Sweden (Diptera: Mycetophilidae). *Entomol. Fenn.* 18, 17–23.
- Kjærandsen, J. & Bengtson, S.-A. 2005. Svampmyggor - artrik insektsgrupp som trivs så in i Norden. *Fauna Flora (Stockh.)* 100, 26–34. [in Swedish]
- Kjærandsen, J. & Jordal, J. B. 2007. Fungus gnats (Diptera: Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae) from Møre og Romsdal. *Norw. J. Entomol.* 54, 147–171.
- Kjærandsen, J. & Jørgensen, L. L. 1992. Fungus-gnats from the Faroes (Diptera, Mycetophilidae). *Entomol. Medd.* 60, 85–87.
- Kjærandsen, J., Hedmark, K., Kurina, O., Polevoi, A., Økland, B. & Götmark, F. 2007a. Annotated checklist of fungus gnats from Sweden (Diptera: Bolitophilidae, Diadocidiidae, Ditomyiidae, Keroplatidae and Mycetophilidae). *Insect Syst. Evol., Suppl.* 65, 1–128.
- Kjærandsen, J., Kurina, O. & Ólafsson, E. 2007b. The fungus gnats of Iceland (Diptera, Keroplatidae & Mycetophilidae). *Insect. Syst. Evol. Suppl.* 64, 61–96.
- Miller, G. 2005. Linnaeus's Legacy Carries On. *Science* 307, 1038–1039.
- Økland, B. 1996. Unlogged forests: Important sites for preserving the diversity of mycetophilids (Diptera: Sciaroidea). *Biol. Conserv.* 76, 297–310.
- Petersen, F. T. & Meier, R. 2001. A preliminary list of the Diptera of Denmark. *Stenstrupia* 26, 119–276.
- Polevoi, A. V. 2000. Fungus gnats (Diptera: Bolitophilidae, Ditomyiidae, Keroplatidae, Diadocidiidae, Mycetophilidae) in Karelia. Karelian Research Centre, Russian Academy of Sciences, Petrozavodsk. 84 pp. [In Russian.]
- Polevoi, A. V. & Hedmark, K. 2004. New species of the genus *Boletina* Winnertz (Diptera, Mycetophilidae) from Fennoscandia. *Entomol. Fenn.* 15, 23–33.
- Ševčík, J. 2006. Diptera associated with fungi in the Czech and Slovak Republics. *Casopis Slezského zemského muzea, Série A, Vedy přírodní (Opava)* 55 [supplement 2], 1–84.
- Søli, G. E. E. 1994. Fungus gnats from Jostedal, West Norway (Diptera; Diadocidiidae and Mycetophilidae). *Fauna Norv. Ser. B* 41, 1–2.
- Väisänen, R. 1984. A monograph of the genus *Mycomya* Rondani in the Holarctic region (Diptera, Mycetophilidae). *Acta Zool. Fenn.*, 177, 1–346.
- Yakovlev, E. B. 1994. Palaeartic Diptera associated with fungi and myxomycetes. 127 pp. Karelian Research Center, Russian Academy of Sciences, Forest Research Institute, Petrozavodsk. [In Russian, with English summary.]
- Zaitzev, A. I. 2003. Fungus gnats (Diptera, Sciaroidea) of the fauna of Russia and adjacent regions (Part II). *Int. J. Dipterol. Res.* 14 (2-4), 77–386.
- Zaitzev, A. I. & Maximova, Y. V. 2000. The Palaeartic species of subgenus *Notolopha* Tuomik. (Diptera, Mycetophilidae). *Int. J. Dipterol. Res.* 11, 175–179.
- Zaitzev, A. I. & Polevoi, A. V. 2001. Holarctic species of the *Boletina erythropyga*-group (Diptera, Mycetophilidae). *Studia dipt.* 8, 639–644.

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