

## A review of species and new rearing habitats of the family Milichiidae (Diptera) in Norway

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A short survey shows a lack of continuity in research on the dipteran family Milichiidae in Norway. One common species has several records from the last century, while little else is found before recent time and the new material presented in this article. The number of Norwegian species in Milichiidae is hereby raised to five, and in addition one possible new species. Comparisons with species numbers in neighbouring countries give an indication that undescribed species new to Norway still may be found. Rearing habitats for *Neophyllomyza acyglossa* (Villeneuve, 1920) and the possible new species *Leptometopa* sp. are presented for the first time.

### INTRODUCTION

Milichiidae is a moderately large family, found in all major zoogeographical regions. The number of Milichiidae species throughout the world is about 245 (Smith 1989), however less than ten species has been found in each of the Nordic countries (Hackman 1980, Soós & Papp 1984). The members of this family are small to very small, usually dark flies. The costal vein is broken just proximally to the end of vein  $R_1$ , and also broken or strongly constricted distally of the humeral vein. Milichiidae is close to Carnidae, and some authors have treated these families together (Hennig 1937). The larvae of Milichiidae are saprophagous in organic matter in a variety of niches (Ferrar 1987), however, the biology of many species is still unknown.

The family Milichiidae has been poorly studied in Norway. The only published records of Milichiidae from Norway includes one species, *Madiza glabra* Fallén, 1820 which was recorded by H. Siebke, E. Strand and

J.W. Zetterstedt in the period 1845-1903 (Siebke 1877, Hennig 1937). The present article gives a survey of Milichiidae species found in Norway, including a presentation of new rearing habitats for two of the species.

### METHODS

The survey is based on examination of literature, material in private and museum collections, and own rearing material presented for the first time in this publication. It includes old literature, such as Siebke (1877), Hennig (1937), Soot-Ryen (1943), Krogerus (1960), as well as modern literature (Soós & Papp 1984). Museum collections were contacted in Oslo (ZMO), Bergen (ZMB), Trondheim (VSM), Tromsø (TRMU) and Mo i Rana. (RAMU).

Own material comprised rearing records by eclector traps in several forest localities within three places: (1) Vestfold (VE) Larvik: Middagskollen 6 May-20 Aug. 1997, (2) Akershus (AK) Ås: Syverud 15 May-27 Aug. 1997, and (3) AK Ås: Danemark 13 May-26 Aug. 1997. Each eclector trap enclosed a section of dead wood or other substrates by means of a black cotton cloth. Space between the substrate and the textile was formed by arches of 3 mm wire inserted into the substrate surface. The ends of the cotton cylinder were closed by thin wire. Two glass collecting vials were attached to the lower part of each trap. Ethylene-glycol with a small amount of detergent was used as preservative in all trap models. A photo of the trap model is found as Figure 1C in Økland (1996).

### RESULTS

The survey gave altogether five species of Milichiidae in Norway, and in addition a possible new species which will need further examination. Previous records of three species in old literature were excluded because they have been moved to other families or could not be recognized as valid species in modern catalogues. Only one of the species in old literature, *Madiza glabra* Fallén, was kept as a valid species within Milichiidae. Four species are reported as new to the Norwegian fauna herein, eventually five if the possible new species of *Leptometopa* is included.

**List of species with information on distribution and ecology:****Subfamily Milichiinae:**

*Milichia ludens* (Wahlberg, 1847): **Distribution in Norway:** This species is reported as a new species for the Norwegian fauna. AK Ås: Danemark 13 V-26 VIII 1997, 6 females. **Distribution outside Norway:** This species has been collected in several countries in Northern and Continental Europe, including the neighbouring countries Sweden and Finland. **Ecology:** The present records from Ås were made by rearing from a soil-filled cavity of a big oak (*Quercus robur*) inhabited by *Lasius fuliginosus*. *M. ludens* is previously known to be a scavenger in nests of the ant *Lasius fuliginosus* (Donistorphe 1927, O'Toole 1978).

**Subfamily Madizinae:**

*Madiza glabra* Fallén, 1820: **Distribution in Norway:** *M. glabra* is apparently a common species found in northern as well as southern parts of Norway. This species is mentioned by Siebke (1877) from Christiania (former name of Oslo), Åsnes in Solør (Hedmark county) and Bjørkvik (north of Narvik in Nordland county). Hennig (1937) also mentioned the record from Bjørkvik (as a record made by Zetterstedt) and another record from Ål (Buskerud county) made by E. Strand in 1903. In the Zoological museum of Oslo (ZMO), Siebke has left seven specimens of *M. glabra* from Tøyen in Oslo collected in the period 1845-51, and one specimen from Hoff in Åsnes (Hedmark county). Furthermore, this museum has six specimens labelled "NORWAY (EIS 37) AK Sørum: Lørenfallet, May 1994. leg. L. O. Hansen & O. Sørlibråten (malaise trap)". In the zoological museum of Bergen (ZMB), there are 25-30 specimens of *M. glabra*, most of them from western Norway, Nordland county, and the eastern part of Finnmark county. **Distribution outside Norway:** Hennig (1937) mentioned southern Sweden (Skåne, Western Götland) as "Terra typica" for *M. glabra*. However, this species is widely distributed in most parts of the Palaearctic region from Europe to the Far East, and also in Africa and North America (Hennig 1937, Soós & Papp 1984). **Ecology:** *M. glabra* has been reared or collected from various types of decaying material (Ferrar 1987). Another species in that genus, *M. britannica* Hennig, 1937, has been reared from wood debris (Hennig 1937).

*Neophyllomyza acyglossa* (Villeneuve, 1920): **Distribution in Norway:** *N. acyglossa* is a new species to Norway, collected in VE Larvik: Middagskollen 6 V-20 VIII 1997, 15 ♂♂, 16 ♀♀. **Distribution outside Norway:** *N. acyglossa* has a wide distribution within the Palaearctic region, found in several countries in Europe and in Mongolia. In northern Europe it has previously been found in Finland (Hennig 1937, Soós & Papp 1984). **Ecology:** Even though *N. acyglossa* appears to be a common species, information about larval habitat has not been found in the literature. The present new records were made by rearing from a bark-free log and a cavity of a wind-broken tree of *Populus tremula*.

*Leptometopa* sp: A female specimen of *Leptometopa* could not be identified to an existing species and may belong to a new species (Irina Brake pers.com.?). The specimen was reared from dead wood of beech (*Fagus sylvatica*) infected by *Hypoxylon multiforme*. Label data: AK Ås: Syverud 15 V-27 VIII 1997, 1 ♀.

*Phyllomyza equitans* (Hendel, 1919): **Distribution in Norway:** *P. equitans* is a new species to Norway. The label data are AK Ås: Danemark 13 V-26 VIII 1997, 10 ♂♂ 11 ♀♀, VE Larvik: Middagskollen Middagskollen 6 V-20 VIII 1997, 3 ♂. **Distribution outside Norway:** This species has previously been found in various parts of Europe, but not in Fennoscandia. According to the Catalogue of Palaearctic Diptera (Soós & Papp 1984), the presence of *P. equitans* in the eastern part of the Palaearctic region is more uncertain. **Ecology:** The present specimens from Ås were reared from dead wood and a soil-filled cavity of big oak (*Quercus robur*) inhabited by *Lasius fuliginosus*, while at Middagskollen one specimen was reared from a log without bark and two specimens from a wind-broken tree of *Populus tremula*. It has previously been found in debris of beech (*Fagus sylvatica*) and also in nests of *Lasius fuliginosus* (Hennig 1937, O'Toole 1978).

*Phylomyza securicornis* Fallén, 1823: **Distribution in Norway:** Apparently, *P. securicornis* is published for the first time from Norway in the present article, based on one specimen in the collection of the zoological museum in Bergen (ZMO). **Distribution outside Norway:** It is recognized as a widely distributed species, found in Sweden, Finland, most parts of Europe, Far East and North America (Soós & Papp 1984) **Ecology:**

*P. securicornis* has been collected from ants nests of *Formica rufa* L. (Donisthorpe 1927).

*Previous not valid records of Milichiidae* from Norway: Siebke (1877) mentioned three species with genera names within Milichiidae: *Milichia ornata* Zett., *Madiza oscinina* Fall. and *Madiza palposa* Fall. *Milichia ornata* Zett. has been excluded since it is not found in the Catalogue of Palaearctic Diptera (Soós & Papp 1984) or in Die Fliegen der Paläarktischen Region (Hennig 1937). The other two species are refound under other genera and family names. *Madiza oscinina* Fall. is today a synonym of *Siphonella oscinina* (Fallén, 1820), and *Madiza palposa* Fall. is a synonym of *Fibrigella palposa* (Fallén, 1820), both in the family Chloropidae (Soós & Papp 1984).

## DISCUSSION

The lack of research on Milichiidae in Norway can easily be seen from the present results. The literature and material surveyed show a small material and a time gap between several records in the last century and more recent records. A short survey raised the number of Milichiidae species in Norway from one to five (ev. six).

Probably, there is still a potential for finding some new species of this family in Norway. Milichiidae species uses a large variety of niches as larval habitat, and creativity in choice of collecting method may yield new findings. A fairly good potential may also be indicated by a higher number of species in our neighbouring countries. The catalogued number of Milichiidae species in Sweden is seven, and in Finland eight. Also, international effort on taxonomy in this group may change status of the species numbers.

## ACKNOWLEDGEMENTS

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## SAMMENDRAG

### En oversikt over arter og nye klekkehabitater for familien Milichiidae (Diptera) i Norge

En kort oversikt viser et brudd i kontinuiteten av forskningen på tovingefamilien Milichiidae i Norge. En vanlig art er registrert flere ganger i forrige århundre, mens lite ellers er funnet før i de senere år og i det nye materialet presentert i denne artikkelen. Antallet norske arter av Milichiidae er herved økt til fem, og i tillegg en mulig ny art. Sammenligning med artsantall i naboland indikerer at det er fortsatt mulig å finne nye arter for Norge. Klekkehabitat for *Neophyllomyza acyglossa* (Villeneuve, 1920) og en mulig ny art *Leptometopa* sp. er presentert for første gang.

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