

New data on *Leiomyza* Macquart, 1835 (Diptera, Asteiidae) in Norway and Sweden, including the first records of *L. scatophagina* (Fallén, 1823) from Norway and of *L. birkheadi* Gibbs, 2007 from Sweden

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The known distributions in Norway and Sweden for all Scandinavian species of *Leiomyza* Macquart, 1835 are updated. The first national records are reported for *Leiomyza scatophagina* (Fallén, 1823) from Norway (Innlandet and Møre og Romsdal) and for *Leiomyza birkheadi* Gibbs, 2007 from Sweden (Öland and Östergötland). After revision of museum specimens, *L. laevigata* (Meigen, 1830) is now known only from Skåne in Sweden.

Key words: Diptera, Asteiidae, *Leiomyza scatophagina*, *Leiomyza birkheadi*, first record, Norway, Sweden, distribution.

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Introduction

Leiomyza Macquart, 1835 is a genus in family Asteiidae, with tiny, glossy black flies with pale legs, developing in fruiting bodies of various fungi. The genus has been poorly known in Norway and the first published record appeared as late as 2013 when Kvifte (2013) reported *Leiomyza curvinervis* (Zetterstedt, 1838) and *L. dudai* Sabrosky, 1956. The first published record of an asteiid from the country appeared only a few years earlier (Gammelmo & Søli (2011), reporting *Asteia*

amoena (Meigen, 1830)). *Leiomyza* spp. and other asteiids have been better studied in Sweden. Two species, now placed in *Leiomyza*, were described from the country already at the beginning of the 19th century. Eight species of asteiids and four of these *Leiomyza* spp., were reported from Sweden in the most recent treatment of Swedish Asteiidae (Andersson 1991).

In this publication *Leiomyza scatophagina* (Fallén, 1823) is added to the fauna of Norway and *Leiomyza birkheadi* Gibbs, 2007 to the

fauna of Sweden. The known distributions in the two countries of previously known species are updated.

Leiomyza spp. can be determined from the key in Gibbs & Papp (2007) or from the online-key by Beuk (2022). Older keys, e.g. Chandler (1978) and Andersson (1991) work in most cases but one species now known to occur in Scandinavia (*L. birkheadi* Gibbs, 2007) is missing. The different species are very similar and the key features to separate them are the colour of the halteres (black or pale) and the position of the single pair of strong dorsocentral setae. Anterior to the strong dorsocentrals there is a line of minute dorsocentral setulae that usually can be seen even if the strong setae are broken off (often the case on pinned specimens). Examination of the male terminalia is essential for separation of *L. birkheadi* and *L. laevigata* (Meigen, 1830) and these two species can only be determined with certainty in the male sex. Examination of terminalia is usually not needed for the other species.

The different species of *Leiomyza* seem to be polyphagous on fungi, but are most often found on lignicolous gill fungi (Chandler 1978). Especially *Ceriporus squamosus* (Huds.) Quél. is often associated with *Leiomyza* spp. (Andersson 1991, own observations). Frequently, more than one species of *Leiomyza* have been found together on the same fruiting body. In addition, one record exists of facultative myiasis of *L. scatophagina* on amur sturgeons *Acipenser schrenckii* Brandt, 1869; this is however probably a very rare occurrence (Sidorenko & Shedko 2010).

Material and methods

Leiomyza specimens were studied from Biological Museum at Lund University (MZLU), University Museum of Bergen (ZMBN), UIT The Arctic University Museum of Norway and the private collections of Sven Hellqvist and Jørn R. Gustad.

For distribution in Sweden the records from Andersson (1991) are used, added with more recent records seen by us and reliable records reported online on Artportalen, the Swedish species observation system (Artdatabanken

2022). Distribution in Norway is according to published records (Kvifte 2013), as well as material collected by us and reliable records reported online on Artskart, the Norwegian species observation system (Artsdatabanken 2022). Faunistic provinces in which the respective species have been found are listed from south to north. Detailed information is only given for more interesting records.

The Swedish faunistic provinces are abbreviated as follows: Sk (Skåne), Bl (Blekinge), Ha (Halland), Sm (Småland), Öl (Öland), Go (Gotland), Ög (Östergötland), Vg (Västergötland), Bo (Bohuslän), Ds (Dalsland), Nä (Närke), Sö (Södermanland), Up (Uppland), Vs (Västmanland), Vr (Värmland), Dr (Dalarna), Gä (Gästrikland), Hs (Hälsingland), Me (Medelpad), Hr (Härjedalen), Jä (Jämtland), Ån (Ångermanland), Vb (Västerbotten), Nb (Norrbotten), Ås (Åsele lappmark), Ly (Lycksele lappmark), Pi (Pite lappmark), Lu (Lule lappmark), and To (Torne lappmark).

The Norwegian relevant faunistic provinces are abbreviated as follows: VE (Vestfold), HEN (Hedmark, northern), HES (Hedmark, southern), MRY (Møre og Romsdal, coastal), TRI (Troms, interior), FI (Finnmark, interior), and FØ (Finnmark, eastern).

Results

Leiomyza birkheadi Gibbs, 2007

Material: SWEDEN. Öl: Halltorps hage, 21 July 1976, 1♂, leg. Hugo Andersson (MZLU); Ög: Landeryd 1 km syd Slattefors, 26 June 1985, 1♂, leg. Hugo Andersson (MZLU); Omberg, 28 May–25 August 2021, 45 specimens, leg. Kjell Antonsson (3♀♀4♂♂ in coll. Sven Hellqvist).

Distribution: SWEDEN: Öl, Ög; NORWAY: Not found.

Remarks: First records from Sweden. The specimens from Halltorps hage and Landeryd were previously determined as *L. laevigata* and reported under that name (Andersson 1991, Andersson & Danielsson 1980). The species is very similar to *L. laevigata* and only males can be determined with certainty. *Leiomyza birkheadi* was described from

England and Hungary and when describing the species, Gibbs & Papp (2007) speculated that the species would be found widely in Europe. Roháček & Máca (2010) revised museum specimens of *L. laevigata* from the Czech Republic and found that an overwhelming majority of them in fact were *L. birkheadi*. All specimens from Ög: Omberg were trapped in window-traps on trunks of dead or living broadleaved trees (*Quercus robur*, *Ulmus glabra*, *Salix caprea*). From Sweden we have also seen a female *L. birkheadi/laevigata* from Me: Indalsdeltat, 24 August–15 September 2021, leg. Stina Welander, coll. Sven Hellqvist, far north of the known distribution of *L. birkheadi* and even further away from the nearest Swedish sites with confirmed *L. laevigata*. Probably it belongs to *L. birkheadi*, but as it is a female it cannot be determined to species with certainty.

Leiomyza curvinervis (Zetterstedt, 1838)

(Figure 1)

Material: NORWAY: HEN: (EIS 65), Engerdal: Åsen 61.885861°N 11.782833°E, window trap, 15 July–18 September 2016, 1♀, leg.

Rikmyrprosjektet/det. Gunnar Mikalsen Kvifte & Linn Katrine Hagenlund/coll. ZMBN, no RIKDIP15.

Distribution: SWEDEN: Vs, Me, Jä, Vb, Ås, Ly, Lu, To; NORWAY: HEN, TRI (4 specimens 20 July 2016 (coll. Natural History Museum of Oslo, reported in Artskart)), FI, FØ.

Remarks: A Holarctic species, described from Swedish Lapland, with a northern distribution in Scandinavia. Andersson (1991) reported the species only from the interior parts of northern Sweden, from Jä to To, but recent records have expanded the known distribution considerably. The southernmost record is from Vs: Hallfallsmossenområdet, 2018 (Hansson & Hellqvist 2020) and the species is also known from coastal sites in Me and Vb. In Finland the species is known from all over the country (Suomen Lajitietokeskus 2022).

Leiomyza dudai Sabrosky, 1956

Distribution: SWEDEN: Sk, Bl, Sm, Öl, Go, Vg, Sö, Up, Me, Ån, Vb; NORWAY: VE (2 specimens 17 July 2018 (leg. Isabella Børja &



FIGURE 1. *Leiomyza scatophagina* (Fallén, 1823) 18 September 2017 at Rokset, Averøy, Møre og Romsdal, Norway. Photo: Jørn R. Gustad.

Jan Svetlik, det. Kaj Winqvist, coll. Norwegian Institute of Bioeconomy Research, reported in Artskart)), HES.

Remarks: Reported by Andersson (1991) north to Sö in Sweden but the species is now known to have a much larger distribution. The northernmost records are from Vb: Umeå (several records, leg. & coll. S. Hellqvist). In Finland the species is known from the southern half of the country (Suomen Lajitietokeskus 2022).

Leiomyza laevigata (Meigen, 1830)

Material: SWEDEN. Sk: Lund, Stadsparken, 18 August 1973, 9♂♂, leg. Hugo Andersson (MZLU); Kullaberg, 6 August 1975, 1♂, leg. Hugo Andersson (MZLU); Dalby, Ö Mölla, 22 July 1992, 1♂, leg. Roy Danielsson (MZLU), Lund, UB-parken, 7 July 1995, 1♂, leg. Hugo Andersson (MZLU).

Distribution: SWEDEN: Sk; NORWAY: Not found.

Remarks: Andersson (1991) reported the species from the Swedish provinces Sk, Sm, Öl and Ög. When it was found that the similar species *L. birkheadi* is present in Sweden, museum specimens of *L. laevigata* were revised, including most of the specimens mentioned by Andersson. Specimens from Öl and Ög were found to be *L. birkheadi* while all males from Sk were true *L. laevigata*. The only specimen from Sm (Kullebo säteri) mentioned by Andersson (1991) has not been checked and the presence of *L. laevigata* in Sm is thus uncertain. The present data suggest that the species' distribution in Sweden may be restricted to the southernmost province Skåne. However, *L. laevigata* is recorded from Finland (Kahanpää 2014), with records from the south and as far north as from Ostrobothnia media (Suomen Lajitietokeskus 2022). If correctly identified, this indicates that the species may have a larger distribution in Sweden.

Leiomyza scatophagina (Fallén, 1823)

Material: NORWAY: HEN: (EIS 65), Engerdal: Åsen 61.885861°N 11.782833°E, malaise trap, 27 July–4 August 2016, 1♂, leg. Rikmyrprosjektet/det. Gunnar Mikalsen Kvifte & Linn Katrine Hagenlund/coll. ZMBN, no

RIKDIP16. MRY: (EIS 84), Averøy: Rokset, Kvernesveien 1283, 62.9830°N 7.6695°E, 9. July 2017, 1♂, 6. August 2017, 1♀ (deposited in the collection of Tromsø University Museum), 31. August 2017, 1♀, 18 September 2017, 1♂ and 27 August 2018, 1♀, all specimens leg. Jørn R. Gustad.

Distribution: SWEDEN: Sk, Ha, Sm, Ög, Sö, Vs, Dr, Ån, Vb, Ly; NORWAY: HEN, MRY.

Remarks: First records from Norway. The Hedmark site is 700 meters above sea level. The habitat is after Winqvist & Andersen (2021): "Small (18 daa), fragmented, extremely rich fen in upland area, close to a larger rich fen. At the sampling site the fen is gently sloping with a mix of scattered conifers and deciduous trees (see Løvhuskjølen: <https://faktaark.naturbase.no/?id=BN00026820>)". A photo of the specimen is available at BOLD: https://www.boldsystems.org/pics/_w300/ZMBN/IBOL_RIKDIP16%2B1495216926.JPG. At the site in Møre og Romsdal all specimens from 2017 were observed and photographed on a window inside a barn, the specimen from 2018 was sitting on a Robinson light trap (with 125 W Mercury lamp). The locality is in close association with a swamped deciduous forest, with a variety of fungi present, 30 meters above sea level. At the very same locality the fungivorous moth *Dryadula heindeli* (Gaedike and Scholz, 2008) was found in 2017 (Gustad & Aarvik 2017).

Two specimens in the collection of UIT The Arctic University Museum of Norway, collected by Tron Soot-Ryen and labelled as *L. scatophagina*, were checked and found to be wrongly determined (both were Anthomyziidae).

Probably the most common and widespread species of *Leiomyza* in Sweden. Northernmost record: Ly: Gammplatsen, Lycksele, 2013, leg. Per Löfgren, coll. Sven Hellqvist. In Finland the species is known from the southern half of the country (Suomen Lajitietokeskus 2022).

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