

The Rhinophoridae or woodlouse-flies (Diptera) of Norway¹

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Rognes, K. 1986. The Rhinophoridae or woodlouse-flies (Diptera) of Norway. *Fauna norv.* Ser. B, 33, 64–68.

Rhinophorid material from Norway in the museum collections of the Universities in Bergen, Oslo and Tromsø and in author's collection has been revised and records of the 9 species known from Norway are presented.

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INTRODUCTION

The Rhinophoridae, termed woodlouse-flies by Crosskey (1977), is a very small family of calyptrate Diptera whose larval stages in general are endoparasitic in terrestrial isopods, although a Nearctic species, *Angioneura obscura* (Townsend), is reported as parasitic in snails (Reinhard 1929). It is the only Diptera group to parasitise crustaceans (Crosskey 1977). It occurs mainly in the Western Palaearctic Region (absent from Iceland), but there are representatives also in the Nearctic, Oriental and Afrotropical Regions, with an immigrant form in the Neotropical Region (Crosskey 1977). Crosskey (1977) lists 23 genera with about 85 species in the world fauna. The group has previously been listed in whole or in part as a subgroup of the Calliphoridae (Emden 1954, Herting 1961, Downes 1965) or the Tachinidae (Sabrosky & Arnaud 1965, Guimarães 1971), but has usually been given separate family status in recent times (Hennig 1973, Crosskey 1977, 1980, Kugler 1978).

In the North European fauna the Rhinophoridae can be separated from related calyprates with a row of setae on the meron (hypopleuron) by the following combination of characters: a small and tongue-like lower squama, the inner edge of which diverges from long axis of fly; posterior spiracle with lappets of subequal size; a weakly or undeveloped postscutellum; prosternum, propleuron, suprasquamal ridge, postalar wall, subalar bulla, basisternum (in front of hind coxae) bare; the bend of m_1 in the wing without appendix or fold; body colour not metallic blue or green.

The developmental stages of some European species have been described by Thompson (1934) and Bedding (1973).

Zetterstedt (1838, 1844), Siebke (1877), Storm (1896), Ringdahl (1944a, 1944b, 1952) and Rognes (1981) have given records of Rhinophoridae from Norway, and a total of 8 species have previously been recorded. The present revision lists 9 rhinophorids from Norway.

MATERIAL AND METHODS

The present study is based upon the examination of 134 specimens partly in my own collection and partly in the museum collections in Bergen, Oslo and Tromsø. I have not seen the Trondheim collection revised by Ringdahl (1944a). For identification of species I have used the works of Lundbeck (1927), Ringdahl (1954b), Emden (1954), Herting (1961) and Stackelberg (1970). The generic names adopted are those of Crosskey (1977), the specific ones those of Herting (1961). Specific synonyms, taken from Ringdahl (1954a) and Herting (1961), have been cited when based on types from Scandinavian localities or have been used in literature dealing with the Norwegian fauna. Recent information on host species has been cited for each species. Note that nothing is known about the biology of Rhinophoridae in this country. I have also given an indication of the world distribution in broad terms as well as information on the North European distribution. My sources for these data have been Lundbeck (1927), Ringdahl (1951, 1952), Herting (1961), Draber-Mońko (1966, 1971, 1978), Pont (1975)

1) Paper no. 5 in a series based on investigations financed by a grant («vikarstipend») from Stavanger Lærerhøgskole 1982–1983.

and Hackman (1980). For details regarding the presentation of the faunistical data, see Rognes (1984).

SYSTEMATIC LIST

1. *Angioneura acerba* (Meigen)

Medoria acerba Meigen, 1838; *Dexia pygmaea* Zetterstedt, 1844; *Angioneura acerba*: Herting 1961.

Material: AK, Ås: ?loc. 1♀ 27 April 1983 (F. Midtgaard) EIS 28.

Hosts: Unknown.

Distribution. Europe. British Isles. Finland, Sweden (Skåne, Öland, Gotland, Östergötland). Note. The present species is unique among Rhinophoridae in having a posteriorly broad calliphorid-like lower squama, the inner edge of which converges backwards with long axis of fly (Herting 1961, Crosskey 1977). My specimen also has the prosternum and basisternum prominently hairy and a distinctly operculate posterior spiracle, two further calliphorid-like features apparently overlooked so far. An operculate posterior spiracle has also been reported from *Banissa fascipennis* Kugler (Kugler 1978). I have also seen specimens of *Angioneura fimbriata* (Meigen) with hairs on the prosternum. Crosskey (1977) only lists *Melanomya* Rondani among the Rhinophoridae as exceptionally having a lateral hair on the posternum.

2. *Melanomya nana* (Meigen)

Dexia nana Meigen, 1826; *Musca minima* Zetterstedt, 1838; *Dexia minima*: Zetterstedt 1844; *Melanomya nana*: Herting 1961.

Note. *Musca minima* was described partly on the basis of a male from «Dovre» (Bohemian leg.) (ON, Dovre: ?loc., EIS 71?, probably Dovre mountains). I have not seen the type specimens which have been revised by Ringdahl (1945a). Material: AK, Oslo: Oslo 1♂ (Siebke). HES, Åsnes: Hof 1♂ (Siebke). OS, Lillehammer: near Gausa river by Flåkåli bru 5 km W of Fåberg 2♂ 14 July 1982 (K. Rognes). BØ, Ringerike: Norderhov 2♂ (Siebke). RY, Hå: Brusand 1♂ 3 July 1935 (Soot-Ryen). HOI, Ullensvang: Lofthus 2♂ 26 June 1935 (Soot-Ryen); Gravvin: Eide 1♂ 25 June 1935 (Soot-Ryen), Seim 1♂ 30 May 1936 (N. Knaben). SFI, Aurland: S of Skjerdal near river Volda 1♂ 20 July 1981 (L. Greve), Vassbygda 1♀ 18 June 1939 (N. Knaben), 3♂ 16 Aug. 1941 (N. Knaben). EIS 3, 28, 32, 36, 41, 47, 51, 54, 71?

Hosts: Unknown.

Distribution. Europe. North Kazakhstan. British

Isles. Finland, Sweden (north to Norrbotten). In Sweden also from above tree-line on Hamrafjället in Härdedalen (Ringdahl 1951).

3. *Morinia melanoptera* (Fallén)

Musca melanoptera Fallén, 1820; *Anthracomyia melanoptera*: Herting 1961.

Material: ON, Sel: Lårgård (?) 1♂ 1♀ 27 June 1861 (Siebke), 1♂ 3♀ 10 July 1873 (Siebke), ? date 3♀ (Siebke). EIS 71.

Hosts: Unknown.

Distribution. Europe. Not on the British Isles. Finland, Sweden (north to Lycksele Lappmark). Note. The postalar wall has a few long stiffish hairs in this species, a unique and previously overlooked character which suggests that the species in fact may belong in the Calliphoridae.

4. *Paykullia brevicornis* (Zetterstedt)

Leucostoma brevicornis Zetterstedt, 1844; *Euplesina ringdahli* Villeneuve, 1934; *Chaetostevenia brevicornis*: Herting 1961.

Material: ♂, Sarpsborg: ? loc. 1♀ Aug. 1865 (Grimsgaard leg., cf. Siebke 1866: 396, 406; Siebke 1877: 91). EIS 20.

Note. The specimen has been examined by Ringdahl and carries his identification label «*Plesina brevicornis* Zett.».

Hosts: Unknown.

Distribution. Previously only known from Sweden (Skåne, Småland, Östergötland).

5. *Paykullia maculata* (Fallén)

Ocyptera maculata Fallén, 1820; *Chaetostevenia maculata*: Herting 1961.

Material: See Rognes (1981:112). Additional material: VAY, Kristiansand: Stangenes 1♂ 27 July 1981 (Svendsen); Lindesnes: Jørgenstad 1♀ 23 July 1982 (T.R. Nielsen). RY, Stavanger: Sunde 1♀ 10 Aug. 1981 (K. Rognes, Malaise-trap), 1♀ 14 Aug. 1981 (A. Rognes, indoors), 1♂ 3–4 Aug. 1982 (K. Rognes, indoors). EIS 1, 2, 7.

Hosts: *Oniscus asellus*, *Porcellio scaber*, *Protracheoniscus politus* and *Tracheoniscus ratzeburgi* (sources in Herting 1961, see also Sutton 1972).

Distribution. Europe. British Isles. Denmark, Sweden (north to Bohuslän).

6. *Phyto cingulata* (Zetterstedt)

Tachina cingulata Zetterstedt, 1844; *Phyto cingulata*: Herting 1961.

Material: See Rognes (1981:112). EIS 20.

Hosts: Unknown.

Distribution. Europe. Not on the British Isles. Sweden (north to Bohuslän).

7. *Stevenia atramentaria* (Meigen)

Tachina atramentaria Meigen, 1824; *Stevenia atramentaria*: Herting 1961.

Material: See Rognes (1981:112). Additional material: ? loc. 1 ♂ (Siebke). EIS 28, 36.

Hosts: *Oniscus asellus*, *Tracheoniscus arcuatus*, *Philoscia affinis* (Herting 1961) and *Trachelipus rathkei* (Sutton 1972).

Distribution. Europe. British Isles. Finland, Sweden (north to Gästrikland).

8. *Stevenia umbratica* (Fallén)

Ocyptera umbratica Fallén, 1820; *Rhinophora lugubris* Zetterstedt, 1855; *Stevenia umbratica*: Herting 1961.

Material: See Rognes (1981:112). Additional material: AK, Oslo: «Kongshavn» (now in the city of Oslo) 1 ♂ 28 June 1851 (Siebke). VAY, Kristiansand: Flekkerøya 1 ♀ 17 June 1983 (Svendsen). SFI, Årdal: Utladalen in Øvre Årdal 1 ♀ 10 July 1939 (N. Knaben). EIS 2, 4, 28, 51? Hosts: Unknown.

Distribution. Europe. Not on the British Isles. Denmark, Sweden (north to Bohuslän).

9. *Tricogena rubricosa* (Meigen)

Tachina rubricosa Meigen, 1824; *Tachina trilobata* Meigen, 1824; *Tachina hirticornis* Zetterstedt, 1844; *Tachina nigritarsis* Zetterstedt, 1844; *Dexia tachiniformis* Zetterstedt, 1844; *Frauenfeldia rubricosa*: Herting 1961.

Material. See Rognes (1981:112). Additional material: AAY, Arendal: Hasselåsen 37 ♀ ♀ 15 June—15 Sept. 1981 (T. Solhøy, pitfall traps); Tromøy 1 ♀ 26 July 1935 (Soot-Ryen). VAY,

Mandal: Mandal 2 ♂ ♂ 11 July 1935 (Soot-Ryen); Flekkefjord: Dragøy (Hidra) 2 ♀ ♀ 5—12 Aug. 1981 (A.-J. Nilsen), Lindesnes: Ytre Jørgenstad 1 ♂ 6 Aug. 1981 (T.R. Nielsen & K. Rognes). RY, Stavanger: Sunde 1 ♂ 7 Aug. 1982 (Ø. Rognes, on dog faeces); Hå: Brusand 1 ♀ 3 July 1935 (Soot-Ryen); Randaberg: Børaunen 25 ♂ ♂ 4 ♀ ♀ 7 July 1981 (K. Rognes); Rennesøy: Vikevåg 2 ♂ ♂ 5 July 1983 (T. Jønassen). EIS 1, 2, 3, 4, 6, 7, 14.

Hosts: *Porcellio scaber* (Herting 1961, Sutton 1972), *Oniscus asellus* (Séguy 1941, error?, cf. Thompson 1934:380).

Distribution. Europe. British Isles. Denmark, Finland and Sweden (north to Södermanland).

DISCUSSION

Table 1 shows the distribution of the 15 North European species of Rhinophoridae. Two species, *Phyto discrepans* Pandellé and *P. melanoccephala* (Meigen), occur on the British Isles, but not in the Nordic countries. Four species, *Angioneura cyrtoneurina* (Zetterstedt), *A. fimbriata* (Meigen), *Melanophora roralis* (L.) and *Rhinophora lepida* (Meigen), occur in some Nordic countries, but have not yet been captured in Norway. Of these, *A. cyrtoneurina* and *M. roralis*, both of which are known north to Uppland in Sweden, very probably occur in Norway also. *R. lepida* (north to Skåne in Sweden) and *A. fimbriata* (Finland) may also ultimately turn up in this country, though with somewhat less probability.

Table 1. Distribution of North European Rhinophoridae. N = Norway, DK = Denmark, SF = Finland, S = Sweden, GB = British Isles. Sources are Lundbeck (1927), Hackman (1980), Ringdahl (1952) and Pont (1975) for DK, SF, S and GB, respectively.

1. *Angioneura acerba*

Angioneura cyrtoneurina (Zett.)
Angioneura fimbriata (Meig.)

2. *Melanomya nana*

Melanophora roralis (L.)

3. *Morinia melanoptera*

4. *Paykullia brevicornis*

5. *Paykullia maculata*

6. *Phyto cingulata*

Phyto discrepans Pand.
Phyto melanoccephala (Meig.)

Rhinophora lepida (Meig.)

7. *Stevenia atramentaria*

8. *Stevenia umbratica*

9. *Tricogena rubricosa*

Total

N	DK	SF	S	GB
x		x	x	x
	x		x	x
		x		
x		x	x	x
	x	x	x	x
x		x	x	x
x		x	x	x
x	x		x	x
x		x	x	x
x		x	x	x
x		x	x	x
x	x		x	x
x		x	x	x
x		x	x	x
9	6	7	12	10

Too few specimens have been captured in Norway to allow definitive statements as to the distribution of the species within the country. At present they are known mostly from the lowlands in the southern and south-eastern parts of the country. A few have also been taken in the lowlands in the inner parts of Western Norway.

ACKNOWLEDGEMENTS

Many thanks are due to Lita Greve Jensen, Museum of Zoology, Bergen, Jan Emil Raastad, Museum of Zoology, Oslo, and Arne Fjellberg, Tromsø Museum, for having made collections of calypterate Diptera available to me; to Terje Jonassen, Fred Midgaard, Tore R. Nielsen, Alf-Jacob Nilsen, and Svein Svendsen for gift of material; and to Benno Herting, Staatliches Museum für Naturkunde in Stuttgart, for the loan of material of the three Palaearctic species of *Angioneura* Brauer & Bergenstamm. The grant from Stavanger Lærerhøgskole is gratefully acknowledged.

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Received 17 Aug. 1984