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Psyllids (Homoptera: Psylloidea) collected in Southern Norway

I. D. HODKINSON

Hodkinson, I. D. 1989. Psyllids (Homoptera: Psylloidea) collected in Southern Norway. *Fauna norv. Ser. B* 36, 97—99.

Distribution records are given for 31 species of Psylloidea from southern Norway, including seven additions to the fauna. The species are *Rhinocola aceris*, *Aphalara affinis*, *A. rumicicola aviculare*, *A. rumicicola rumicicola*, *Craspedolepta lator*, *C. sonchi*, *C. subpunctata*, *C. nervosa*, *Psyllopsis fraxinicola*, *Psylla alni*, *P. betulae*, *P. betulaenananae*, *P. fusca*, *Cacopsylla ambigua*, *C. brunneipennis klapaleki*, *C. hartigi*, *C. moscovita*, *C. myrtilli*, *C. nigrita*, *C. palmeni*, *C. propinqua*, *C. pyri*, *C. sorbi*, *Trioza abdominalis*, *T. cerastii*, *T. cirsi*, *T. tatrensis*, *T. urticae*, *Bactericera femoralis*, *B. striola*.

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INTRODUCTION

Lindberg and Ossiannilsson (1960) and Ossiannilsson (1952) provide detailed distribution records for the psyllid fauna of Finland and Sweden but by contrast the Norwegian fauna is poorly known. Ossiannilsson (1943) listed 13 species in the collections of the Tromsø Museum and later (Ossiannilsson, 1952) recorded 54 species for the whole of Norway. More recently, a survey of the psyllid fauna of the Hardangervidda revealed 22 species of which all except one had previously been recorded for Norway (Ossiannilsson, 1974). Heslop-Harrison (1951) also provides a few additional miscellaneous records and Klimaszewski (1973) recorded the Norwegian species within his Palaearctic check-list.

This paper records psyllids collected by the author in Norway during 1975, 1982 and 1988. Species for which no published Norwegian records exists are indicated by an asterisk.

Superfamily Psylloidea

Family Aphalaridae

Rhinocola aceris (L.)* A single ♀ from a spider's web on *Acer* sp. Oslo, Bogstad, 16. Aug. 1982.

Aphalara affinis (Zetterstedt)* A single ♀ by sweeping. Oppland, Gudbrandsdalen, nr. Sjoa 14 Aug. 1982.

Aphalara rumicicola ssp. *aviculare* Ossiannilsson* Common on *Polygonum aviculare*. Oppland, Ottadalen, Vagåmo, 13 Aug. 1982.

Aphalara rumicicola spp. *rumicicola* Ossiannilsson* Common on *Rumex acetosella*. Hordaland, Nesttun, nr. Bergen 31 Jul. 1975.

Craspedolepta lator Wagner* On *Artemisia vulgaris*. Oppland, Gudbrandsdalen, nr. Sjoa, 14—15 Aug. 1982 and Oslo, Bogstad, 16 Aug. 1982.

Craspedolepta nervosa (Förster) On *Achillea millefolium*, Sogn og Fjordane, Nes, nr. Gaupne 14. Aug. 1988.

Craspedolepta sonchi (Förster) On *Leontodon autumnalis*. Hordaland, Nesttun, nr. Bergen, 31 Jul. 1975. Recorded by Ossiannilsson (1952) as *C. flavipennis*.

Craspedolepta subpunctata (Förster) On *Epilobium angustifolium*. Buskerud, Hemmedal, 25 Jul. 1975.

Family Psyllidae

Psyllopsis fraxinicola (Förster) On *Fraxinus excelsior*. Oslo, Bogstad, 16 Aug. 1982.

Psylla alni (L.) On *Alnus incana*. Sogn og

- Fjordane, Jostedal, Gjerde, 11 Aug. 1982, nr. Alsmo 9 Aug. 1982, Laerdal 21 Jul. 1975, Gudvangen 8 Aug. 1982. Hornindal 7 Aug. 1988. Oppland, Gubrandsdalen nr. Sjoa 15 Aug. 1982. Hordaland, Voss, 6 Aug. 1982. Buskerud, Hemsedal, 25 Jul. 1975. Møre og Romsdal, Eidsdal, 9 Aug. 1988.
- Psylla betulae* (L.) On *Betula* spp. Buskerud, Hemsedal 25 Jul. 1975. Sogn og Fjordane, Jostedal, Niggardsbreen Valley 11 Aug. 1982, Hornindal 7 Aug. 1988. Oppland, Gubrandsdalen nr. Sjoa 15 Aug. 1982. Møre og Romsdal, Eidsdal 9 Aug. 1988.
- Psylla betulaenanae* Ossiannilsson Abundant on *Betula nana*. Buskerud, Hemsedal 25—26 Jul. 1975. Sogn og Fjordane, Jotunheim Rd (55) 1150—1200 m. 13 Aug. 1982. Oppland, Gubrandsdalen, Riddehova nr. Sjoa 15 Aug. 1982.
- Psylla fusca* (Zetterstedt) Common on *Alnus incana*. Buskerud, Hemsedal 25 Jul. 1975. Oppland, Gubrandsdalen, Sjoa 14—15 Aug. 1982. Hordaland, Voss 6 Aug. 1982. Sogn og Fjordane, Gudvangen 8 Aug. 1982 and Laerdal 26 Jul. 1975. Møre og Romsdal, Eidsdal 9 Aug. 1988.
- Cacopsylla ambigua* (Förster) On *Salix caprea*. Sogn og Fjordane, Laerdal, Revsnes, 26 Jul. 1975. Hordaland, Bergen, 31 Jul. 1975.
- Cacopsylla brunneipennis* Edwards form *klapaleki* Sulc. On *Salix* spp. Sogn og Fjordane, Jotunheim Rd (55) 1150—1200 m 13 Aug. 1982 and Jostedal, Niggardsbreen Valley, 11 Aug. 1982. Hordaland, Nesttun, nr. Bergen 31 Jul. 1975. Møre og Romsdal, Eidsdal, Øme Veien, 10 Aug. 1988.
- Cacopsylla hartigi* (Flor) On *Betula* sp. Oppland, Ottadalen, Vagåmo 13 Aug. 1982. Hordaland, Nesttun nr. Bergen. 31 Jul. 1975.
- Cacopsylla moscovita* (Andrianova)* On *Salix* sp. Buskerud, Hemsedal 26 Jul. 1975.
- Cacopsylla myrtilli* (Wagner) Common on *Vaccinium uliginosum*. Buskerud, Hemsedal 25 Jul. 1975 (several localities). Sogn og Fjordane, Jotunheim Rd (55) 13 Aug. 1982 (several localities). Hornindal 7 Aug. 1988. Oppland, Gubrandsdalen, Riddehova nr. Sjoa 15 Aug. 1982.
- Cacopsylla nigrita* (Zetterstedt) On *Salix* spp. Buskerud, Hemsedal 26 Jul. 1975. Oppland, Gubrandsdalen, Riddehova nr. Sjoa 13 Aug. 1982.
- Cacopsylla palmeni* (Löw) On *Salix* sp. Oppland, Gubrandsdalen, Sjoa 15 Aug. 1982 and Riddehova nr. Sjoa 15 Aug. 1982.
- Cacopsylla propinqua* (Schaefer) On *Salix* sp. Oppland, Gubrandsdalen, Sjoa 15 Aug. 1982, Riddehova nr. Sjoa 15 Aug. 1982, Ottadalen nr. Grotll 13 Aug. 1988. Sogn og Fjordane, Jostedal, Niggardsbreen Valley 11 Aug. 1982 and Jotunheim Rd. (55) 1150—1200 m 13 Aug. 1982. Møre og Romsdal, Eidsdal, Øme Veien 10 Aug. 1988. Recorded as *P. saliceti* by Ossiannilsson (1952).
- Cacopsylla pyri* (L.) On *Pyrus communis*. Møre og Romsdal, Eidsdal, 9 Aug. 1988.
- Cacopsylla sorbi* (L.) On *Sorbus aucuparia*. Sogn og Fjordane, Nes, nr. Gaupne 14 Aug. 1988. Møre og Romsdal, Eidsdal 9 Aug. 1988.

Family Triozidae

- Bactericera femoralis* (Förster) Swept from low mixed vegetation. Sogn og Fjordane, Laerdal 26 Jul. 1975. Oppland, Gubrandsdalen, Riddehova nr. Sjoa 15 Aug. 1982. On *Alchemilla alpina*, Møre og Romsdal, Eidsdal, Øme Veien, 10 Aug. 1988.
- Bactericera striola* (Flor) On *Salix* sp. Buskerud, Hemsedal 25 Jul. 1975. Sogn og Fjordane, Jostedal, Niggardsbreen Valley 11 Aug. 1982. Oppland, Gubrandsdalen, Sjoa, 14 Aug. 1982. Ottadalen, nr. Grotll 13 Aug. 1988. Møre og Romsdal, Eidsdal, Øme Veien 10 Aug. 1988.
- Trioza abdominalis* Flor On *Achillea millefolium*. Oppland, Ottadalen, Vagåmo 13 Aug. 1982 and Gubrandsdalen, Sjoa 15 Aug. 1982. Sogn og Fjordane, Nes, nr. Gaupne 14 Aug. 1988. Møre og Romsdal, Eidsdal 9 Aug. 1988.
- Trioza cerastii* (L.) On *Cerastium* sp. Oppland, Gubrandsdalen, Sjoa 15 Aug. 1982. Hordaland, Nesttun nr. Bergen 31 Jul. 1975.
- Trioza cirsii* Löw On *Cirsium arvensis*. Møre og Romsdal, Strandadalen, nr. Stranda 9 Aug. 1988.
- Trioza tatrensis* Klimaszewski* ♂ taken by sweeping. Oppland, Gubrandsdalen, Riddehova nr. Sjoa. This species has, in the past, been confused with *Trioza dispar* Low. Previous records of *T. dispar* may involve *T. tatrensis*. Heslop-Harrison

(1952) points out that Scandinavian *T. dispar* is racially distinct from the central European form.

Trioza urticae (L.) Common on *Urtica dioica*. Oppland, Ottadalen, Vagåmo, 13 Aug. 1982. Sogn og Fjordane, Balestrand, 29 Jul. 1975. Møre og Romsdal, Eidsdal, Øme Veien 10 Aug. 1988.

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Notonecta glauca L. (Hemiptera, Notonectidae) in Trøndelag, zoogeographical notes

DAG DOLMEN

Dolmen, D. 1989. *Notonecta glauca* L. (Hemiptera, Notonectidae) in Trøndelag, zoogeographical notes. *Fauna norv. Ser. B* 36, 101—102.

Notonecta glauca L. is reported from three localities in the Trondheim region. This is the northernmost records of the species in Norway. *N. glauca* has probably been introduced to one of the ponds with plants from more southern localities and has later dispersed naturally to the two other ponds.

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The northernmost records of *Notonecta glauca* L. in Norway up till now have been reported by Dolmen & Olsvik (1977) from Kristiansund N, Møre og Romsdal county (cf. Jastrej 1981, Olsvik 1981). During my fieldwork in the Trondheim region in 1984—86, however, three localities were found to house high numbers of *N. glauca*:

1) STI, Trondheim: *Madsjø pond*, Tunga, 12 August 1984: Several *Notonecta* larvae were recorded. Their size varied from about 3 mm to 6 mm, i.e. they were much too small to be *N. lutea* Müller, which is also known from this locality. During later investigations (15 September -84) the species was confirmed: A high number of *N. glauca* imagines and big larvae (nymphs) were collected.

2) This same date (15 September) the species was likewise recorded at STI, Melhus/Trondheim: *Udduvolløra* (ponds 1 and 3, see Dolmen, Sæther & Aagaard 1975), Gaulosen — also in great numbers of imagines and big larvae. One beat by the net through pond weed could catch as many as 10—20 specimens.

The next year, 1985, no *N. glauca* were observed in the shallow *Udduvolløra* ponds (25 June and 20 October). In *Madsjø*, however, in spring (14 May) one specimen was recorded — and more specimens were probably present. It had apparently survived the winter in this relatively deep pond. In the autumn (1 September and 19 October) again some specimens were observed/collected. In spring 1986 (before 11 May) the *Madsjø* pond was drained completely and has later been filled-in for road building purposes.

The fauna of ponds in the Trondheim region is fairly well known, and the abovementioned ponds have been studied for many years, the *Madsjø* pond practically every year during the last 30 years or so. Of notonectids only *N. lutea*, which is not uncommon in the district, had been found so far (*Madsjø*). *N. glauca* therefore is without doubt a new species to the region.

3) A third locality for *N. glauca* was also discovered in 1985, i.e. STI, Trondheim: the large pond of the University of Trondheim, in the *Botanical Garden* at Ringve. This locality has probably never before been investigated for insect life. Many small *Notonecta* sp. larvae were observed on 3 July -85; also on 29 June 1986 many larvae, of about 3—5 mm length, and also imagines, were seen. In late autumn (30 October) a great number of imagines were collected in the locality, and all specimens showed to be *N. glauca*.

This last mentioned pond, in the *Botanical Garden*, was dug out in 1976 (Arne Røsvik, pers.comm. 1985). Different plant species have later been introduced to the pond from e.g. Bergen, Oslo (Tøyen) and Central Europe. Since notonectids lay their eggs in living plant tissue (cf. e.g. Andersen 1965), it is reasonable to believe that eggs have been carried along with some of the plants, and that this is the origin of *N. glauca* in the Trondheim region. After the species had become established in the *Botanical Garden* pond, it could have dispersed naturally to the other localities. Since the species seems not to have survived in the *Udduvolløra* pond, and since *Madsjø* has been destroyed, the *Botanical*

Table 1. Localities for *Notonecta glauca* in the Trondheim region, with data on biotope quality.

Municipality	Loc.	UTM 32V NR	Distance to Bot. G. km	Alt. m	Size daa	Depth m	pH (1974)	K18 $\mu\text{S/cm}$ (1974)	Climate
Trondheim	Madsjø	737341	2.9 NW	60	2	>2	7.2	224	rel.mild
Melhus/Tr.h.	Udduvolløra	639219	16.8 NE	5	2 x 2	<2	7.3	295	cold winter
Trondheim	Bot. Garden	725365	—	30	>2	?	?	?	rel.mild

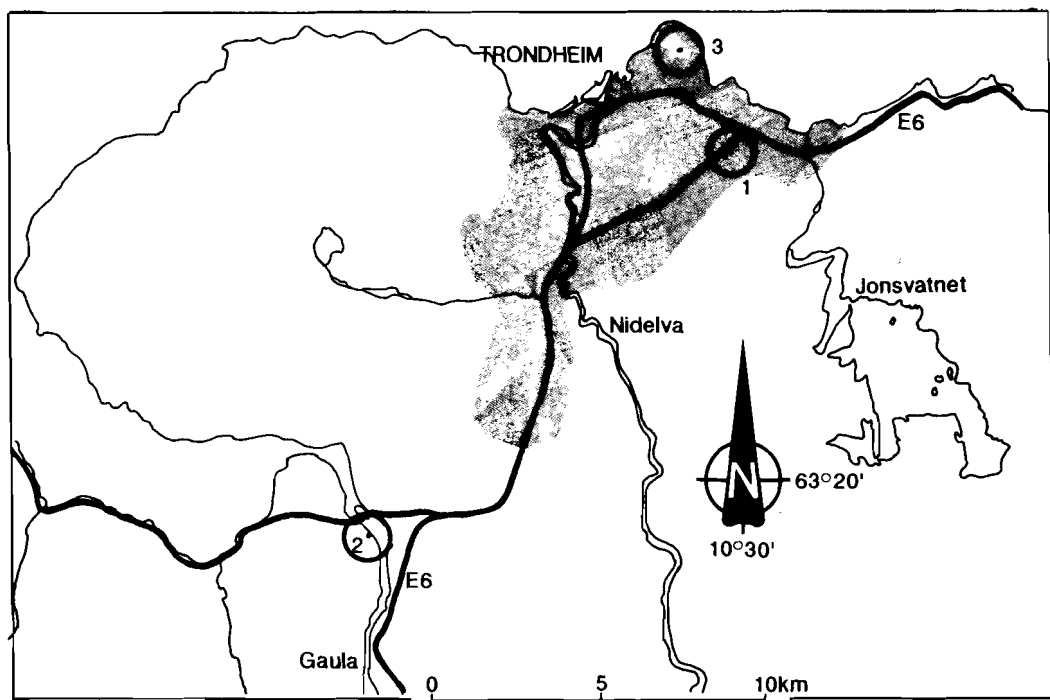


Fig. 1. Position of the three localities in the Trondheim area where *Notonecta glauca* was sampled in 1984—86. 1 = Madsjø pond, Tunga; 2 = Udduvolløra pond; 3 = Botanical Garden pond, Ringve.

Garden pond is the only known locality for the species in the Trondheim region for the moment. Table 1 shows the distances from the Botanical Garden to Madsjø and to the Udduvolløra pond, and also some quality data of the ponds. Fig. 1 shows the position of the ponds.

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Notonecta reuteri Hungerford (Hemiptera, Notonectidae) rediscovered in Norway

DAG DOLMEN

Dolmen, D. 1989. *Notonecta reuteri* Hungerford (Hemiptera, Notonectidae) rediscovered in Norway. *Fauna norv. Ser. B* 36, 103—104.

Notonecta reuteri Hungerford has been rediscovered in Norway. The species is reported from a very old pond near Råde Church, Østfold county, and from 13 localities in Aust-Agder/Telemark counties. The species has earlier been recorded once in Norway, by Th. G. Münster, but locality and date are unknown.

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In their survey on rare insects in Norway, Aagaard & Hågvar (1987) mention an old record of *Notonecta reuteri* Hungerford made by Th. G. Münster (dead 1938), insufficiently labelled «Vrd.ås» and with no date. This has been the only Norwegian find of the species up till now.

During extensive investigations of 32 ponds in Østfold county 1985, *N. reuteri* was found in one of them, i.e. in the Lundeby pond in Råde, about 60 m above sea level. Other notonectids were found in 30 of the ponds: *N. glauca* L. (alone) in 22, *N. glauca* and *N. lutea* Müller (together) in 7 ponds. In the Lundeby pond *N. reuteri* lived sympatric with *N. glauca*. Both species were fairly abundant, but *N. reuteri* possibly in majority.

The Lundeby pond is very old, probably from ca 1185 A.D. when the near by Råde Church was built (Lundeby, pers. comm. 1985). Sand/gravel/blocks had then been dug out from the moraine ground for church building purposes, leaving a hole which later filled with water. The area of the pond is about 1 daa, the depth is 1.5 m, and the vegetation is scanty. pH (in May) was 6.9 and specific conductivity (K_{25}) 86 $\mu\text{S}/\text{cm}$.

During investigations of 90 ponds and tarns in Aust-Agder/Telemark counties (district of Solhomfjell, Vegår and Moland/Froland) 1988, notonectids were recorded in 34 of the localities, of which *N. reuteri* was present in 13 of them. The species was usually (11 localities) found together with *N. lutea*, which is the more common species (28 localities). (The third species, *N. glauca*, was recorded in 3 localities, but never together with

N. reuteri.) The localities in question are all bog- or forest ponds/tarns situated from about 110 to 460 m above sea level and with scanty vegetation, apart from *Sphagnum* mosses. Their sizes vary from less than one daa to (one locality) almost 20 ha, depth being about 2 m and more. pH vary (early June) between 4.4 and 5.0, conductivity between 15.0 and 37.2 $\mu\text{S}/\text{cm}$.

Further information on the position of the *N. reuteri* sites and the number of specimens collected is presented in Table 1.

Adult specimens of *N. reuteri* were collected in July, August and September (18 specimens of both sexes). In May and June only larvae were found. The life cycle thus seems to be similar to that of *N. lutea* (cf. Dolmen & Aagaard 1973, Olsvik 1981) and dissimilar to that of *N. glauca*.

During the fieldwork *N. reuteri* was mistaken for *N. lutea*. Although *N. reuteri* is usually more strongly pigmented than *N. lutea*, morphologically the species are superficially very similar. However, they can easily be distinguished on the male copulatory organ or the last abdominal segment of the female (see also Gjerde & Hågvar 1985). Both species have a northern distribution in Eurasia (Stichel 1955). In Scandinavia *N. lutea* is a common species in all countries, while *N. reuteri* is more rare, in Sweden recorded only from Skåne, Småland and Dalarna (Dolmen & Aagaard 1973, Andersen & Gaun 1974, Coulianos & Ossianniilsson 1976, Jastrej 1981, Olsvik 1981).

N. reuteri thus seems to be quite common in parts of southern Norway. Its high simila-

Table 1. Position of sites, dates and numbers of *Notonecta reuteri* collected in 1985 and 1988.

County	Municip.	Loc.	UTM 32V	Date	No. of specim.
Østfold	Råde	Lundeby pond	PL 080802	July-Aug.-Sept. 1985	18
Telemark	Nissedal	Vehustjørna, Felle	ML 869316	20.07.1988	4
A-Agder	Gjerstad	Øygardstjørna, Solhomfj.	902348	18.07.1988	3
		2 bog pools ESE of Karitj.	902355/56	18.07.1988	1
		Lille Karitjørna	896352	18.07.1988	1
	Vegårshei	Ø. Ufsdalstjern	881156	22.07.1988	1
		tarn SW of Nipane	879152	22.07.1988	1
		tarn SE of Nipane	883152	22.07.1988	1
		Grunntjern	881146	22.07.1988	1
		Kvernavatnet	892162	22.07.1988	7
	Moland	Ubergstjern	MK 870933	21.07.1988	2
		tarn N of Ubergstj.	871939	21.07.1988	9
		tarn Mofjellet/Lauvåsen	878895	20.07.1988	1
	Froland	tarn E of Burås	845899	21.07.1988	2

rity to *N. lutea* has probably prevented the discovery of the species up till now.

The material is deposited at the University of Trondheim, The Museum.

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Libellula depressa L. (Odonata) rediscovered in Norway

DAG DOLMEN

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Libellula depressa L. has been rediscovered in Norway. Four new localities — of which at least two are breeding localities — are reported from Råde and Rygge, Østfold county. Earlier the species has not been recorded in Norway since 1896.

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According to Sømme (1937) and Aagaard & Hågvar (1987) the dragonfly *Libellula depressa* L. has earlier been recorded four times in Norway. All records, however, have been made before 1897, and Sømme (1937) was uncertain whether the species still existed in Norway. Tjønneland (1952) states that *L. depressa* can not be classified as «Norwegian» yet, i.e. not until new records have been made.

In 1977, during a period of fieldwork in Østfold county, one specimen, a male, of *L. depressa* was observed over the southern — most of two ponds at Sogn farm, Råde. The specimen was not caught, but identified from some distance. During extensive fieldwork (project: «Ponds in the countryside») in 1985 in the same area *L. depressa* was recorded at three more localities in Rygge and Råde municipalities. Both imagines and larvae were found (Table 1).

The four ponds in question are about 1—2.5 daa large and situated relatively close together; maximum distance between them is little more than 2 km. Water quality data are shown in Table 1. The ponds are almost devoid of higher vegetation and with bare, clayey banks. This is contrary to 28 other ponds investigated, where *L. depressa* was not found. Since 1977 the vegetation of the Sogn pond has also become much denser, and *L. depressa* was not rediscovered at the locality in 1985. When the male insects, having broad, fair blue abdomens, settle down on the bluegrey clay banks of the ponds, they are often hard to discern. This may be of selective value against predators and possibly one reason for the habitat preference of the species. The female have no outstanding colours.

At the Eskelund pond, where both sexes were observed, although in low numbers, copulation was seen, and also egg-laying by one

Table 1. Records of *Libellula depressa* and water quality of ponds in Rygge/Råde 1977 and 1985.

Municipality	Locality	UTM	Date	pH	K ₂₅ µS/cm	Imagines	Larvae
Råde	Sogn, southern pond	32V PL 019817	09 July 1977	6.4	320	1 ♂	—
Råde	Sandaker, northern pond	014817	10 July 1985	6.6	112	2 ♂♂	—
Rygge	Eskelund	008827	10 July 1985	7.3	137	♂♂♀♀	32 (May-Sept.)
Rygge	Goen	001830	03 Sept. 1985	7.2	270	—	1

female, with the male continuously hovering above and watching her against other males (typical behaviour).

L. depressa is probably among the most threatened insect species in Norway and should therefore be protected, and not collected any further. The material from «The pond project» is deposited at the University of Trondheim, The Museum.

ACKNOWLEDGEMENTS

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Limoniidae communities in alpine and boreal zones along the Atna River, South Norway (Diptera, Nematocera)

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Solem, J. O. & Mendl, H. 1989. Limoniidae communities in alpine and boreal zones along the Atna River, South Norway (Diptera, Nematocera). *Fauna norv. Ser. B* 36, 107–114.

The Limoniidae fauna along the Atna River (62°N, 9°45'E and 61°45'N, 10°45'E) is described. Five Malaise traps for collecting adults were run through the summer of 1986. Species composition differed considerably between alpine/subalpine and boreal communities. We recorded 23 species at three alpine/subalpine localities, and 42 at two boreal localities. A total of 48 spp. was identified. At one alpine site the terrestrial *Phylloclabris macroura* was dominant, while at two subalpine sites *Dicranota guerini*, which has predatory aquatic larvae, was dominant. In the alpine/subalpine zone and the highest site in the boreal zone one or two species outnumbered the remaining species. This was in contrast to the lowest site where the dominance was spread over six species.

Based on data from Sweden and Norway seven species, *Neolimnophila placida*, *Parilisia vicina*, *Archilimnophila unica*, *Melanolimonia morio*, *Limonia flavipes*, *L. tripunctata*, and *Metalimnobia 4-notata*, probably have an eastern distribution in Norway. Flight periods are given.

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INTRODUCTION

In Limnofauna Europaea, Mendl (1978) listed 403 species of Limoniidae. When comparing this number with the 207 species of Ephemeroptera, 387 species of Plecoptera, and 895 species of Trichoptera reported in Limnofauna Europaea, we get some idea of the importance of Limoniidae in freshwater ecosystems. Adult limoniids are usually found in low leafy vegetation alongside streams and ponds, and their larvae mostly inhabit shallow waters or wet habitats. Many aquatic limoniids feed on the organic detritus, such as decaying leaves, plant fragments, and associated micro-organisms, that accumulates on pond bottoms or in backwaters of streams. Some limoniid larvae, e.g. *Dicranota* spp. and *Limnophila* spp. are active predators. Mating and oviposition are the primary activities of the adults (Byers 1984).

Our studies at Atna River and Høylandet, North-Trøndelag are part of intensive biological and non-biological investigations which

will form the background for more detailed studies of the aquatic fauna.

The objectives of this paper are to present limoniid communities in alpine/subalpine and boreal habitats, and data on their phenology and abundance. The Limoniidae fauna of Norway is very poorly known, but through our studies on Dovrefjell (Mendl & Solem 1987), and other Scandinavian areas (Mendl & Solem 1972, Mendl 1974, 1979a, b, 1984, 1987) the collections along Atna River and at Høylandet, North-Trøndelag, will, we think, give a basis for zoogeographical views as well.

STUDY AREA AND METHODS

Atna River originates in the Rondane mountains and empties into the Gloma River. Our sampling sites ranged approximately 62°N, 9°45' E and 61°45'N, 10°45' E. We had five sampling sites along the river, and these were Vidjedalsbekken, Dovre county, elevation

1280 m; Skranglehaugan, Dovre county, 1120 m; Dørålsæter, Dovre county, 1060 m; Vollen, Folldal county, 710 m; and Solbakken, Storelvdal county, 380 m. It is about 80 km from the highest to the lowest sampling site along the river. Vidjedalsbekken is in the alpine zone, Skranglehaugan and Dørålsæter in the subalpine birch belt, and Vollen and Solbakken in the boreal coniferous zone. Atna River is a natural, not regulated watercourse, is very little contaminated, and has frequent short spates. The catchment area is oligotrophic and susceptible to acid precipitation. Water temperatures in the lower part reach about 20°C during summer time, and pH varied in 1986 between 5.4 and 7.0. At Vidjedalsbekken in the subalpine zone maximum water temperature reached 7.8°C in 1988, and at Dørålsæter a little further downstream, 10.4°C. At these sites the stream is cool for the entire year.

Sampling were done by two-sided Malaise traps, emptied weekly from June to September 1986.

NOTES ON LARVAL HABITATS

Larvae of the family Limoniidae may inhabit both terrestrial and aquatic environments. Many species are found in wet soil and sometimes it may be difficult to say whether a species belong to a terrestrial or an aquatic habitat. Of the species recorded along the Atna River there are only a few that have larvae in truly terrestrial habitats, but the larvae of *Phyllolabis macroura* and *Ula* spp. are unquestionably terrestrial, and so also may be *Metalimnobia* spp. *Limonia* spp. are not listed as aquatic species in Limnofauna Europeae (Mendl 1978), but *Limonia* spp. are regarded as having both aquatic and terrestrial larvae in North America (Byers 1984). Can it be that larvae of some of the European *Limonia* spp. live also in aquatic habitats? Here, we regard *Limonia* spp. as terrestrial. None of the *Limonia* spp. collected in this study, were among the dominant species, and therefore it is not a serious problem if our premisses about larval habitats of *Limonia* spp. are wrong, and it will not affect our conclusions.

RESULTS AND DISCUSSION

Longitudinal zonation and relative abundance of species along the river

We identified 48 species and five unidentified females. These unidentified females belong to the genera *Gonomyia* and *Dicranomyia*. In the alpine area at Vidjedalsbekken six species were caught (Tab. 1), four (or five?) aquatic and two (one?) terrestrial. Of the aquatic species *Ormosia fascipennis* was dominant, and *Phyllolabis macroura* of the two(?) terrestrial.

In the subalpine zone, at Skranglehaugen and Dørålsæter, 21 species were recorded. *Dicranota guerini* was the dominant species, and we regard *Ormosia fascipennis*, *Raphidolabis exclusa* and *Molophilus flavus* as subdominant in aquatic habitats. Of terrestrial(?) species *Limonia macrostigma* was caught in highest numbers. The species composition and relative abundance at the two sites collected were very similar.

In the northern coniferous boreal zone further down along the watercourse 43 species were recorded. There were great differences between the two sites, Vollen and Solbakken, which were sampled. *Parilisia vicina* outnumbered other aquatic species at Vollen, and so did *Limonia macrostigma* of those having terrestrial larvae. Of these last two mentioned species, only one and five specimen, respectively, were collected at Solbakken. The terrestrial *Dicranomyia modesta* was dominant at Solbakken and the aquatic(?) *Dicranomyia frontalis*, *Molophilus propinquus* and *Brachylimonia nemoralis* were subdominant. *Metalimnobia 4-notata* and *Rhiphidia duplicata* were subdominant among the terrestrial species.

Only three species were collected at all sites sampled, *Ormosia fascipennis*, *Dicranota guerini* and *Limonia macrostigma*. *Melanolimonia caledonica* was recorded at Vidjedalsbekken and Solbakken and it is likely that it may also inhabit the remaining sites.

Phenology

The flight periods of the limoniids at the Atna River in 1986 are shown in Tab. 2. In June we recorded 19 species, 38 species in July, 19 in August and four in September. At the end of June and in the first part of July, the weekly samples contained 26, 23 and 23 species. Typical spring species may be difficult to esta-

Table 1. Succession of Limoniidae species and their relative abundance along the Atna River. Data based on Malaisetrapping from June to September 1986.

	Vidje- dals- bekken	Skrangle- haugen	Dør- ål- seter	Vollen	Sol- bak- ken
<i>Orimarga attenuata</i>	1				
<i>Ormosia fascipennis</i>	14	38	6	1	1
<i>Dicranota guerini</i>	2	159	131	2	
<i>Phyllolabis macroura</i>	498	6	7		
<i>Limonia macrostigma</i>	3	4	18	162	5
<i>Melanolimonia caledonica</i>	1				1
<i>Paradicranota gracilipes</i>		1			
<i>Paradicranota subtilis</i>		1			
<i>Rhabdomastix parva</i>		1	3		
<i>Dicranota bimaculata</i>		2	4	1	
<i>Tricyphona immaculata</i>		4	5		1
<i>Rhaphidolabis exclusa</i>		15	13	1	1
<i>Rhipidia duplicata</i>		2	1	2	17
<i>Gonomyia</i> sp.		1			1
<i>Symplecta hybrida</i>		1	1	9	2
<i>Brachylimnophila nemoralis</i>		1	6		13
<i>Molophilus flavus</i>			14		
<i>Dicranomyia incisurata</i>			2		
<i>Erioconopa trivialis</i>			1		
<i>Ormosia ruficauda</i>			1		
<i>Dicranomyia distendens</i>			2	1	
<i>Idioptera macropteryx</i>			1	2	
<i>Euphyllidorea phaeostigma</i>			4	1	
<i>Paradicranota robusta</i>				1	
<i>Phyllidorea squalens</i>				1	
<i>Neolimnophila placida</i>				6	1
<i>Dicranomyia halterata</i>				3	
<i>Erioptera lutea</i>				1	
<i>Erioconopa diuturna</i>				1	
<i>Dicranomyia terraenovae</i>				1	2
<i>Parilisia vicina</i>				132	1
<i>Limonia sylvicola</i>				2	7
<i>Metalimnobia zetterstedti</i>				1	9
<i>Molophilus propinquus</i>					16
<i>Limonia flavipes</i>					5
<i>Dicranomyia</i> sp.					3
<i>Metalimnobia bifasciata</i>					5
<i>Metalimnobia 4-notata</i>					26
<i>Dicranomyia frontalis</i>					22
<i>Dicranomyia modesta</i>					38
<i>Ula mollissima</i>					1
<i>Ormosia staegeriana</i>					1
<i>Limonia tripunctata</i>					3
<i>Euphyllidorea fulvonervosa</i>					2
<i>Empeda cinerascens</i>					2
<i>Ula sylvatica</i>					4
<i>Archilimnophila unica</i>					1
<i>Melanolimonia morio</i>					1
<i>Melanolimonia rufiventris</i>					1
<i>Dicranomyia zernyi</i>					1

Table 2. Temporal succession of Limoniidae at the Atna River.

	June		July			August				Sept.		
	18	25	2	8	18	26	1	9	16	23	30	7
<i>Empeda cinerascens</i>	3											
<i>Paradicranota robusta</i>	1											
<i>Archilimnophila unica</i>	1											
<i>Metalimnobia 4-notata</i>	1	1	10	11	3							
<i>Ormosia fascipennis</i>	2	4	18	26	12	5	1					
<i>Ula sylvatica</i>	2	1			1			1				
<i>Dicranota guerini</i>	183	71	29	3	1	1	2	1	5			
<i>Rhipidia duplicata</i>	2	2	5		5	6	1	1				
<i>Symplecta hybrida</i>	4	2	4	1	1					1		
<i>Orimarga attenuata</i>	1											
<i>Gonomyia</i> sp.	2											
<i>Melanolimonia morio</i>	1											
<i>Metalimnobia zetterstedti</i>	2	8										
<i>Euphyllidorea phaeostigma</i>	1	2				2						
<i>Brachylimnophila nemoralis</i>	3	8	6	1		2						
<i>Tricyphona immaculata</i>	2	4	2	4		1	1					
<i>Parilisia vicina</i>	11	61	20	4		28	4	2				
<i>Molophilus propinquus</i>	2	9		1		3	1					
<i>Limonia macrostigma</i>	22	127	38	3				1	1			
<i>Erioptera lutea</i>			1									
<i>Melanolimonia caledonica</i>			1	1								
<i>Dicranomyia incisurata</i>			1	1								
<i>Idioptera macropteryx</i>			2	1								
<i>Dicranomyia halterata</i>			2	1								
<i>Dicranomyia</i> sp.			1	2								
<i>Rhabdomastix parva</i>			2	4	1							
<i>Molophilus flavus</i>			3	3	8							
<i>Neolimnophila (placida?)</i>			2	1	3	1						
<i>Metalimnobia bifasciata</i>			5	2	1							
<i>Limonia tripunctata</i>			1		2							
<i>Dicranota bimaculata</i>			3		1		1		2			
<i>Rhaphidolabis exclusa</i>			2	8	8	10	4	3	3			
<i>Paradicranota subtilis</i>				1								
<i>Phyllidorea squalens</i>				1								
<i>Dicranomyia frontalis</i>			2	12	2	2	6					
<i>Dicranomyia distendens</i>			1	1					1			
<i>Dicranomyia modesta</i>			3	11	12	12	6	2	3	1		
<i>Ula mollissima</i>					1							
<i>Eriocnopa trivialis</i>						1						
<i>Ormosia ruficauda</i>						1						
<i>Ormosia staegeriana</i>						1						
<i>Euphyllidorea fulvonervosa</i>						1		1				
<i>Melanolimonia rufiventris</i>								1				
<i>Limonia sylvicola</i>							3	3	2	1		
<i>Phyllolabis macroura</i>							1	29	191	52	181	52
<i>Dicranomyia zernyi</i>								1				
<i>Dicranomyia terraenovae</i>									2			1
<i>Eriocnopa diuturna</i>												1
<i>Paradicranota gracilipes</i>												1

blish from our data, but *Dicranota guerini* was most abundant in June, while *Empeda cinerascens*, *Paradicranota robusta* and *Archilimnophila unica* were only recorded in June, but in low numbers. We regard *Phyllobasis macrura*, *Dicranomyia terraenovae*, *Erioconopa diuturna*, and *Paradicranota gracilipes* as autumn species, and the remaining 40 species as summer species. Even though we sampled at 1280 m and at 380 m there were no detectable differences in the onset of the flight periods of the various species between these two sites. The flight period for most of the species overlap with data from Dovrefjell (Mendl & Solem 1987) and Abisko and Messaure, Sweden (Mendl 1974, 1979). However, some discrepancies occur and these are of interest. For instance, *Dicranomyia frontalis* and *Dicranomyia modesta* which are on the wing in August and September in Abisko and Messaure, are flying in July at the Solbakken site. The later flight period in North Sweden compared with the Solbakken site may be due to differences in latitude between the two, and this feature is commonly found among insects. But then, why does not *Molophilus propinquus* behave in a similar way? *M. propinquus* was recorded only at Solbakken, and *M. propinquus* had the same flight period at Solbakken and Messaure, North Sweden. (At Abisko, North Sweden, only a single specimen was caught). *M. propinquus* starts flying 2—3 weeks earlier than *D. frontalis* and *D. modesta*. Obviously the differences in latitude between Solbakken and Messaure does not affect *M. propinquus* in the same way as it does for several other insect species. We interpret the similar flight periods of *M. propinquus* at Solbakken and Messaure, as a result of some unknown external factor or life cycle characteristic, or life cycle strategy.

Zoogeography

Tab. 3 compares the list of species at the Atna River with other Scandinavian areas. Of the 48 species identified in this study, we have 32 in common with the alpine and subalpine area at Dovrefjell, South Trøndelag province, where a total of 45 species was recorded; 33 spp. in common with alpine and subalpine area at Abisko where 73 spp. were found; 27 spp. in common with the boreal area Høylandet, North Trøndelag province, where collections were made along streams

in a very little man-disturbed spruce forest and where 49 spp. and four unidentified spp. (females) were sampled; 29 spp. in common with the forest area Messaure, Sweden, where 93 spp. were registered; 35 spp. in common with the costal area Angerån, Sweden, where 84 spp. have been collected; and 24 spp. in common with data from Varanger, Finnmark province, North Norway, where 51 spp. were found. highest similarity is with the Dovrefjell area.

When comparing the species collected at alpine/subalpine areas at Rondane, Dovrefjell and Abisko with boreal areas at Atna River, Høylandet, Messaure, Angerån and Varanger (Tab. 3) our data show that *Ula mollissima*(?), *Dicranota incisurata*, *Phyllobasis macroura*, *Erioconopa diuturna*(?), *Melanolimonia caledonica*, *Cylindrotoma distinctissima*, *Symplecta scotica*, *Paradicranota pavida*(?), *Idioptera macropteryx*, *Molophilus flavus*(?) and *Sacandaga parva* are typically alpine/subalpine species.

There is only one species which has been sampled only in the boreal zone, *Euphyllidorea fulvonervosa*. We know sampling effort has been intensive at all sites compared, and based on these facts *E. fulvonervosa* seems to be a typical boreal species in Scandinavia, and it is widely distributed elsewhere in Europe.

Some species were sampled at all sites shown in Tab. 3; these were *Tricyphonia immaculata*, *Dicranota guerini*, *Paradicranota gracilipes*, *Limonia sylvicola*, *Brachylimnophila nemoralis*, and *Dicranomyia terraenovae*. They are certainly widely distributed and cover a variety of habitats.

The species lists of Limoniidae from Swedish localities show more species recorded here than at Norwegian localities sampled. Along Atna we got 49 spp. (and five unidentified females), at Dovrefjell 45 spp. and at Høylandet 49 spp. (and some unidentified females). At Abisko, Sweden 73 spp. were identified, at Messaure, Sweden 93 spp. and at Angerån, Sweden, 84 spp. An important question is then: is the lower number of species recorded at sites in Norway real or is it an artefact? A bias in the data could be that a lower intensity of sampling was carried out at the Norwegian sites. This may to some extent be true if we compare the Abisko and Dovrefjell/Rondane, where respectively 19, 11 and three sites were sampled in the alpine/subalpine zones. But, the same tendencies, lower

Table 3. Zoogeographical aspects of the Limoniidae from the Atna River. * = Sweden, + = present, — = not recorded.

	Dovre	Høy- landet	Abi- sko*	Mess- aure*	Anger- ån*	Var- anger
Pediciinae						
<i>Ula mollissima</i>	+	-	-	-	+	-
<i>Ula sylvatica</i>	+	-	+	+	+	+
<i>Tricyphona immaculata</i>	+	+	+	+	+	+
<i>Dicranota guerini</i>	+	+	+	+	+	+
<i>Dicranota bimaculata</i>	+	-	+	+	+	+
<i>Paradicranota robusta</i>	+	+	-	+	-	-
<i>Paradicranota subtilis</i>	-	-	-	-	-	+
<i>Paradicranota gracilipes</i>	+	+	+	+	+	+
<i>Rhaphidolabis exclusa</i>	+	+	+	+	-	+
Hexatominae						
<i>Phyllolabis macroura</i>	+	-	+	-	-	-
<i>Idioptera macropteryx</i>	+	-	-	-	+	+
<i>Euphyllidorea phaeostigma</i>	+	-	+	-	+	-
<i>Euphyllidorea fulvonervosa</i>	-	+	-	+	+	+
<i>Phyllidorea squalens</i>	+	+	-	-	-	-
<i>Archilimnophila unica</i>	-	-	+	+	+	-
<i>Brachylimnophila nemoralis</i>	+	+	+	+	+	+
Eriopterinae						
<i>Eriocnopa trivialis</i>	+	+	+	-	+	+
<i>Erioptera lutea</i>	-	+	+	+	+	-
<i>Eriocnopa diuturna</i>	+	-	+	-	-	+
<i>Symplecta hybrida</i>	+	+	+	-	+	-
<i>Ormosia fascipennis</i>	+	-	-	-	+	+
<i>Ormosia ruficauda</i>	+	+	+	-	+	+
<i>Ormosia staeegeriana</i>	+	+	+	-	+	+
<i>Rhabdomastix parva</i>	+	-	+	-	-	+
<i>Molophilus flavus</i>	+	+	+	+	-	+
<i>Molophilus propinquus</i>	-	+	+	+	+	+
<i>Parilisia vicina</i>	-	-	-	+	+	-
<i>Empeda cinerascens</i>	+	+	-	+	+	-
<i>Neolimnophila placida</i>	-	-	+	+	+	-
<i>Gonomyia</i> sp.						
Limoniinae						
<i>Orimarga attenuata</i>	+	+	+	+	-	-
<i>Limonia macrostigma</i>	+	-	+	+	+	+
<i>Limonia sylvicola</i>	+	+	+	+	+	+
<i>Limonia flavipes</i>	-	-	-	-	+	-
<i>Limonia tripunctata</i>	-	-	-	-	+	-
<i>Rhiphidia duplicata</i>	+	+	+	+	+	-
<i>Salebriella distendens</i>	-	+	-	-	-	-
<i>Dicranomyia</i> sp.						
<i>Dicranomyia distendens</i>	-	+	+	-	+	-
<i>Dicranomyia halterata</i>	-	+	+	-	-	-
<i>Dicranomyia terraenovae</i>	+	+	+	+	+	+
<i>Dicranomyia frontalis</i>	-	-	-	-	+	+
<i>Dicranomyia modesta</i>	+	-	+	+	+	+
<i>Dicranomyia zernyi</i>	-	+	+	+	+	-
<i>Dicranomyia incisurata</i>	+	-	-	-	-	-
<i>Metalimnobia zetterstedti</i>	+	+	-	+	+	-
<i>Metalimnobia bifasciata</i>	-	+	-	+	+	-
<i>Metalimnobia 4-notata</i>	-	-	+	+	+	+
<i>Melanolimonia morio</i>	-	-	+	+	-	-
<i>Melanolimonia rufiventris</i>	+	+	+	+	+	-
<i>Melanolimonia caledonica</i>	+	-	+	-	-	-

Table 4. The Limoniidae fauna in three alpine and subalpine areas and one northern boreal forest in Scandinavia. Numbers in percent.

1) Rondane		3) Abisko, Sweden	
<i>Phyllolabis macroura</i>	52.4	<i>Sphaeropyga stigmatica</i>	17.1
<i>Dicranota guerini</i>	29.9	<i>Rhaphidolabis exclusa</i>	10.2
<i>Ormosia fascipennis</i>	5.9	<i>Ula sylvatica</i>	9.8
<i>Rhaphidolabis exclusa</i>	2.9	<i>Dicranomyia lutea</i>	6.9
<i>Limonia macrostigma</i>	2.6	<i>Limonia macrostigma</i>	5.2
<i>Molophilus flavus</i>	1.4	<i>Phyllidorea glabricula</i>	4.8
<i>Tricyphona immaculata</i>	0.9	<i>Sphaeropyga halterella</i>	4.6
<i>Brachylimnophila nemoralis</i>	0.7	<i>Ormosia staegeriana</i>	4.5
<i>Dicranota bimaculata</i>	0.6	<i>Limonia maculicosta</i>	3.8
<i>Rhabdomastix parva</i>	0.4	<i>Phyllolabis macroura</i>	3.8
<i>Euphyllidorea phaeostigma</i>	0.4	<i>Dicranomyia distendens</i>	3.2
<i>Rhipidia duplicata</i>	0.3	<i>Eloeophila trimaculata</i>	3.3
<i>Symplecta hybrida</i>	0.2	<i>Metalimnobia quadrimaculata</i>	2.6
<i>Dicranomyia insisurata</i>	0.2	<i>Brachylimnophila nemoralis</i>	2.2
<i>Dicranomyia distendens</i>	0.2	<i>Austrolimnophila harperi</i>	2.1
<i>Orimarga attenuata</i>	0.1	<i>Limonia sylvicola</i>	1.6
<i>Melanolimonia caledonica</i>	0.1	<i>Tricyphona immaculata</i>	1.4
<i>Paradicranota gracilipes</i>	0.1	<i>Metalimonia caledonica</i>	1.4
<i>Paradicranota subtilis</i>	0.1	<i>Molophilus ater</i>	1.3
<i>Gonomyia</i> sp.	0.1	<i>Dicranomyia terraenovae</i>	1.1
<i>Erioconopa trivialis</i>	0.1	<i>Dicranomyia didyma</i>	1.1
<i>Ormosia ruficauda</i>	0.1	<i>Sphaeropyga murina</i>	1.0
<i>Idioptera macropteryx</i>	0.1	<i>Rhipidia duplicata</i>	1.0
2) Dovrefjell		4) Messaure, Sweden (boreal)	
<i>Phyllolabis macroura</i>	62.1	<i>Dicranomyia terraenovae</i>	49.8
<i>Dicranomyia hyalinata</i>	4.6	<i>Dicranomyia didyma</i>	28.9
<i>Sphaeropyga stigmatica</i>	4.5	<i>Paradicranota gracilipes</i>	4.7
<i>Idioptera macropteryx</i>	3.1	<i>Dicranota guerini</i>	3.3
<i>Tricyphona immaculata</i>	3.1	<i>Metalimnobia bifasciata</i>	1.0
<i>Molophilus flavus</i>	2.2	<i>Rhaphidolabis exclusa</i>	0.9
<i>Limonia sylvicola</i>	1.8	<i>Sphaeropyga halterella</i>	0.9
<i>Brachylimnophila nemoralis</i>	1.8		
<i>Rhaphidolabis exclusa</i>	1.2		
<i>Dicranomyia didyma</i>	1.0		
<i>Erioconopa trivialis</i>	1.0		
<i>Sphaeropyga stigmatica</i>	1.0		
<i>Erioconopa diuturna</i>	0.7		
<i>Dicranomyia incisurata</i>	0.6		
<i>Ormosia staegeriana</i>	0.6		

number of species in Norwegian mountains than in Swedish mountains, are also found in caddis flies (Trichoptera) (Solem 1985), and it may be a real fact. At present we do not know the reasons for the discrepancies.

When considering Tab. 3 we find seven species which may have an eastern distribution in Norway, *Neolimnophila placida*, *Pa-*

rilisia vicina, *Archilimnophila unica*, *Melanolimonia morio*, *Limonia flavipes*, *L. tripunctata* and *Metalimnobia 4-notata*. These species have been found at Swedish localities (*M. 4-notata* also in Varanger) and only at the boreal localities in the present study. They were not sampled at either Dovrefjell or Høylandet.

Limoniidae communities in alpine/subalpine and boreal areas in Scandinavia

By far the commonest limoniid species at Rondane and Dovrefjell is the terrestrial *Phyllolabis macroua* (Tab. 4). In this respect these two sites differ from the Abisko area and from other localities in Scandinavia where extensive sampling of limoniids has been carried out. At Abisko *Ula sylvatica* is the dominant terrestrial limoniid.

The aquatic habitats were dominated by *Dicranota guerini*, representing 29.9% of the total number of specimen, at Rondane (Tab. 4); at Abisko *Dicranomyia stigmatica* (17.1%) dominated in moist/wet environments. No aquatic species were really dominant at Dovrefjell, but *Dicranomyia hyalinata* was collected in highest numbers reaching 4.6% of the total number of specimens sampled, and *Dicranota guerini* was present at several alpine sites.

Trophic characteristics of Limoniid communities

The aquatic habitats at the sites investigated in the alpine/subalpine zones of the Rondane mountains are dominated by the predator *Dicranota guerini*. When excluding the terrestrial *Phyllolabis macroua*, *D. guerini* makes up 62.9% of the total Malaise trap catches at this altitude. This must be one of the larger aquatic insect carnivores in this area. When considering the species dominance data of limoniid communities at Dovrefjell and Abisko also, we find that the carnivore genus *Dicranota* represents a relatively high percentage of the aquatic limoniid communities in these mountains as well.

Ormosia fascipennis, which is a collector-gatherer, makes up 12.5% of the limoniid fauna having larvae in aquatic/wet/moist habitats. Of the typical shredder type we have only *Orimarga attenuata* that we know of, but our knowledge of the trophic relationships is poor and there are certainly more species in this community which are shredders.

In the boreal zone, at Vollen, *Parilisia vicina* outnumbered the other limoniid species living in aquatic/wet/moist habitats. We do not know the trophic characteristics of this species, but it belongs to the subfamily Eriopterinae which has several collectors-gatherers, and we predict that *P. vicina* is a collec-

tor-gatherer or a shredder. At the Solbakken site several species belong to the group of dominant species, and because we do not know their trophic relationship, it is more difficult to give predictions here.

Notes on species

Rhabdomastix parva Siebke, 1873. As we have noted earlier (Mendl & Solem 1987) only females of this species were collected and only females were found also in this study. This strengthens the view that this species is parthenogenetic.

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Additions and corrections to Lindroth, C. H. 1985-86. The Carabidae (Coleoptera) of Fennoscandia and Denmark

J. ANDERSEN, D. REFSETH, O. HANSSEN AND P. OTTESEN

Andersen, J., Refseth, D., Hanssen, O. & Ottesen, P. 1989. Additions and corrections to Lindroth, C. H. 1985-86. The Carabidae (Coleoptera) of Fennoscandia and Denmark, *Fauna norv. Ser. B* 36, 115-117.

Additions and corrections to the Carabidae part of *Fauna entomologica scandinavica* are reported. Most of these are mere errors whereas in some cases published information concerning ecology and distribution has been overlooked.

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In the present paper we report errors and additional information about the distribution and/or ecology, based on published literature which obviously has been overlooked, to the Carabidae part of *Fauna entomologica scandinavica*. In some cases, however, previously unpublished information is incorporated.

Plate 7 nr. 8. The correct name is obviously *Acupalpus exiguus*, not *Bradycellus (B.) exiguus*.

p. 54. *Carabus monilis*. The comparison with *violaceus* and *problematicus* is misleading. Lindroth had probably based his description and key on Central European specimens. Norwegian specimens (as well as certain Central European populations) are missing the tertiary elytral carinae and therefore resembles *C. cancellatus*. They differ from *cancellatus* in the colour of the first antennal segment (dark in *monilis*, rufous in *cancellatus*). Elytra of female of *C. cancellatus* is also deeply sinuate before apex whereas a subapical situation of elytra of the female of *C. monilis* barely exists. We propose the following alteration of the key on pp. 50 and 52:

- 4(3) First antennal segment rufous
- 18. *cancellatus* Illiger
- Antennae entirely black 4a
- 4a(4) Inner Carina reaching apical margin of elytra.
- Larger, 22—26 mm. 13. *monilis* Fabricius
- Inner carina not reaching apical margin of elytra.
- Smaller, 16—23 mm. 5
- 5(4a) The two

A number of recent records document that the species is well established around the towns Fredrikstad and Sarpsborg.

- p. 62 *Carabus violaceus*. In northern and alpine areas the adults which emerge in the summer hibernate and do not reproduce until the next spring. Thus the life cycle is biennial (Refseth 1984).
- p. 99 *Dyschirius angustatus* has scattered occurrences in Norway between 62°N (not 66°N) and 70°N.
- p. 109 *Miscodera* no doubt hibernates as larva (besides as imago) also in northern Scandinavia. Larvae which were

- collected in northern Norway in September and kept at room temperature had not pupated by the end of October (Andersen 1968).
- p. 114 *Patrobis atrorufus*. A few specimens with fully developed hind-wings have been found (unpublished data). The species has a variable phenology and reproduces in June-July in northern and subalpine areas (Refseth 1980).
- p. 132 14 (13) in the key. The species 97—100 can not be distinguished from the species in the subgenus *Plataphodes* merely by angulate shoulders. The key may be changed as follows:
 14 (13) Shoulders angulate: lateral bead of elytra forming a sharp angle against the abbreviated basal bead (Fig. 189). Preapical puncture usually free, not situated within a strongly deepened stria 15
 — Shoulders rounded (Fig. 190) or if angulate (Fig. 189), preapical puncture situated within a strongly deepened stria 18
- p. 136 3rd line from below. The number 46 should be changed to 47.
- p. 137 3rd line. The number 47 should be changed to 46.
- p. 139 5th line from below (in text). The number 60 should be deleted.
- p. 163 *B. schuppelii*. Larval hibernation is unlikely for this species and *B. petrosus* (cf. p. 196). A few may hibernate as pupae (Andersen 1983b).
- p. 182
 — 183 Generally *G. virens* and *B. hastii* stay more distantly away from water than *B. prasinum* and *B. hyperboreaorum* (Andersen 1983a).
- p. 184 *B. tibiale* was quite abundant within a small area in R during an investigation in 1972. The habitat coincided with the description (unpublished data).
- p. 186
 — 187 *B. mckinleyi*. The length given (4.5—5.0 mm) is too low. Measurements of more than 50 Norwegian specimens gave a mean length of 5.3 mm with extremes 4.8—6.0 mm (Andersen 1970, 1987). In a material of more than 100 specimens there were just a few having rufinistic elytra anteriorly. The species seems to hibernate exclusively as larva (Andersen 1983b).
- p. 189 Fig. 229 is *yukonum* (not *grapii*), Fig. 230 is *grapii*, not *yukonum*. The same corrections apply to the text on p. 188 (4th line from below) and p. 190 (first line from above).
- p. 191 In the northernmost part of its distributional area *B. lunatum* often have dark femora and very indistinct semilunar macula (Andersen 1980). The following additions should be made in the Catalogue (p. 206—223):
Carabus nitens F (n + ø) (Strand 1946).
Asaphidin pallipes Nn (Andersen 1980).
Bembidion obliquum TR, probably accidental (Andersen 1980).
Bembidion fellmanni Nn (Andersen 1980)
Bembidion lunatum Nn (Andersen 1980)
Bembidion petrosus Nn (Andersen 1980)
Bembidion saxatile F (n + ø) (Andersen 1980)
- p. 308 Line 12 and 13 from above: *Amara similata* has only been found in south Norway north to MR (Refseth 1987).
- p. 310 The body length of *Amara communis* is given to 6.0—6.8 mm. These figures seem to be too low. Hansen (1968) gives 6—7.5 mm, Lindroth (1974) and Freude (1976) give 6—8 mm.
- p. 311 First line from below is incorrect. The males of all the species from nr 241 (*strenua*) to 261 (*tibialis*) have metatibial pubescens, but not 262 (*erratica*) and 263 (*interstitialis*). Vide also text under subgenus *Amara* s.str. on p. 307.
- p. 406 The body length of *Chlaenius nitidulus* is given to 10—20 mm. This seems to be far too much. Hansen (1968), Lindroth (1974) and Freude (1974) all give the length as 8.5—11 mm.
- p. 419 Fig. 486 is *Lebia chlorocephala*, not *L. cyanocephala* (see Hansen (1968)). In the catalogue (p. 448—473) we have the following additions or corrections:
- p. 451 *Pterostichus adstrictus* F (n + ø) (Strand 1946)
- p. 458 *Amara torrida*. Delete ST.

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Six species of Lepidoptera new to Norway

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Hansen, L. O. 1989. Six species of Lepidoptera new to Norway. *Fauna norv. Ser. B* 36: 119—123.

The following six species of Lepidoptera are reported new to Norway: *Depressaria artemisiae* Nickerl, 1862; *Mompha divisella* Herrich-Schäffer, 1854; *Rhyacionia piniana* (Herrich-Schäffer, 1851) *Eupithecia expallidata* Doubleday, 1856; *Acronicta tridens* (Denis & Schiffermüller, 1775) and *Heliothis armigera* (Hübner, 1808). Distribution, ecology and taxonomical characters are briefly outlined. It is also discussed why the earlier Norwegian records of *D. artemisiae*, *M. divisella* and *A. tridens* later were deleted.

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INTRODUCTION

The present paper reports six species of Lepidoptera new to Norway, all collected in the Oslofjord area. The nomenclature is according to Svensson et al. (1987), botanical names are according to Lid (1985), EIS-grid numbers are according to J. Økland (1977) and localities are given in accordance with K. A. Økland (1981).

SYSTEMATIC LIST

Oecophoridae

Depressaria artemisiae Nickerl, 1862

D. artemisiae was listed as occurring in Norway by Haanshus (1933) from Sogn og Fjordane, but deleted by Opheim (1978) because the specimen was impossible to trace, and the record could not be verified.

D. artemisiae was collected on the following localities in 1987 and 1988: AK Bærum: Ostøya (EIS 28) 1 ♂ ex larva 7 June 1987 (leg. Kai Berggren); VE Våle: Langøya (EIS 19), 1 ♀ ex larva 16 June 1987 (leg. Lars Ove Hansen), 5 ♂♂ medio-ultimo Aug. 1987 (leg. Lars Ove Hansen), 1 ♂ ex larva 28 May 1988 (leg. Lars Ove Hansen) (Genital prep. 88103 Lars Ove Hansen); VE Sande: Killingholmen (EIS 19) 1 ♂ primo Sept. 1987 (leg. Lars Ove Hansen) (Genital prep. 88102 Lars Ove Hansen). The imagines were collected in light traps and the larvae of the bred specimens were all found in silken galleries in the anterior leaves of *Artemisia campestris* L. *D. ar-*

temisiae is considered as monophagous on *A. campestris* in Northern Europe (Benander 1928, Palm 1973). *A. campestris* prefers calcareous ground and the three localities mentioned are all on islands with a high content of limestone.

D. artemisiae is reported from Sweden north to Norrbotten (Nb), Denmark and Finland (Svensson et al. 1987), southwards through Central Europe down to Northern Italy (Toll 1964), France (Leraut 1980) and eastwards from European USSR to Mongolia (Lvovsky 1981). It is not reported from the British Isles.

The genitalia are figured by Lvovsky (1981).

Momphidae

Mompha divisella Herrich-Schäffer, 1854

M. divisella was first mentioned as Norwegian by Schøyen (1893) and again by Haanshus (1933), both referring to the same record: OS Sør-Aurdal (EIS 44), 14 July 1885 (leg. G. Sandberg). Opheim (1971) omitted it because the record could not be verified firmly.

The first reliable record of this species is from BØ Røyken: Hyggen, Kinnartangen, (EIS 28) 4 April 1985 (leg. Lars Ove Hansen) (Genital prep. AY1985 Leif Aarvik). *M. divisella* has later been reared from the following localities: BØ Røyken: Grimsrud (EIS 28) 6 ex. ex larvae on *Epilobium montanum* L. 24 June 1986 (leg. Lars Ove Hansen) (Ge-



Fig. 1. *Epilobium montanum* L. with two galls of *Mompha divisella*. The upper with the silk cocoon protruding through the exit hole.

nital prep. 88035 Lars Ove Hansen); BØ Røyken: Hyggen, Kinnartangen (EIS 28) 21 ex. ex larvae on *E. montanum* 30 Aug. 1987 (leg. Lars Ove Hansen); BØ Drammen: Åssiden, Underlia (EIS 28) 1 ex. ex larva on *E. montanum* 2 Sept. 1987 (leg. Lars Ove Hansen) (Genital prep. 88072 Lars Ove Hansen); VE Våle: Langøya (EIS 19) 4 ex. ex larvae on *E. montanum* medio Sept. 1987 (leg. Lars Ove Hansen) (Genital prep. 88071 Lars Ove Hansen); VE Sande: Killingholmen (EIS 19) 7 ex. ex. larvae on *E. montanum* 3 Sept. 1987 (leg. Lars Ove Hansen) (Genital prep. 88034 Lars Ove Hansen).

Seven out of nine populations of *E. montanum* investigated in 1987 were attacked by the species. The larva makes a gall in the stem and pupates inside the gall where it makes a

white silk cocoon. This is protruding through the exit hole in the gall (fig. 1). One plant may have from 1 to 9 galls ($\bar{x} = 1.59$, $n = 99$ plants). Affected plants often become stunted and more branched than usual. Emmet (1979) lists *E. montanum* and *E. palustre* L. as larval food-plants, while Riedl (1969) adds *E. augustifolium* (L.). Populations of *E. palustre* were investigated only a few metres from attacked *E. montanum* but had no signs of galls. Like many other *Mompha* spp., the adults of *M. divisella* hibernate.

M. divisella is recorded in Sweden north to Uppland (Up), Denmark and Finland (Svensson et al. 1987) and through most of Central and South Europe (Riedl 1969).

The genitalia are figured by Riedl (1969), but newly emerged specimens may be identified on the wing patterns. Imago and gall are figured in colour by Wakely (1944).

Tortricidae

Rhyacionia piniana (Herrich-Schäffer, 1851)

A male of this very rare species was caught in a light trap at BØ Røyken: Hyggen, Kinnartangen, (EIS 28) 13 July 1985 (leg. Lars Ove Hansen) (Genital. prep. BW1985 Leif Aarvik).

The larva of *R. piniana* lives in shoots in the top of old pines (*Pinus silvestris* L.) (Kennel 1908—21). The locality at Kinnartangen only has a few pines; spruce (*Picea abies* L.) and deciduous trees dominate the locality.

Only three specimens from two localities (Sm and Dr) are known from Sweden (Svensson 1974, 1986). Very few records exist from Finland, USSR and Poland through Central Europe down to France and Austria (Kennel 1908—21, Obratzsov 1964, Šulcs & Šulcs 1978, Leraut 1980).

The male genitalia are figured by Kuznetsov (1978), Šulcs & Šulcs (1978) and Svensson (1986).

Geometridae

Eupithecia expallidata Doubleday, 1856

One female was caught in a light trap at BØ Røyken: Hyggen, Kinnartangen (EIS 28), 11 August 1984 (leg. Lars Ove Hansen) Genital prep. B17 Kai Myhr). This record led to a check of the similar *E. absinthiata* (Clerck

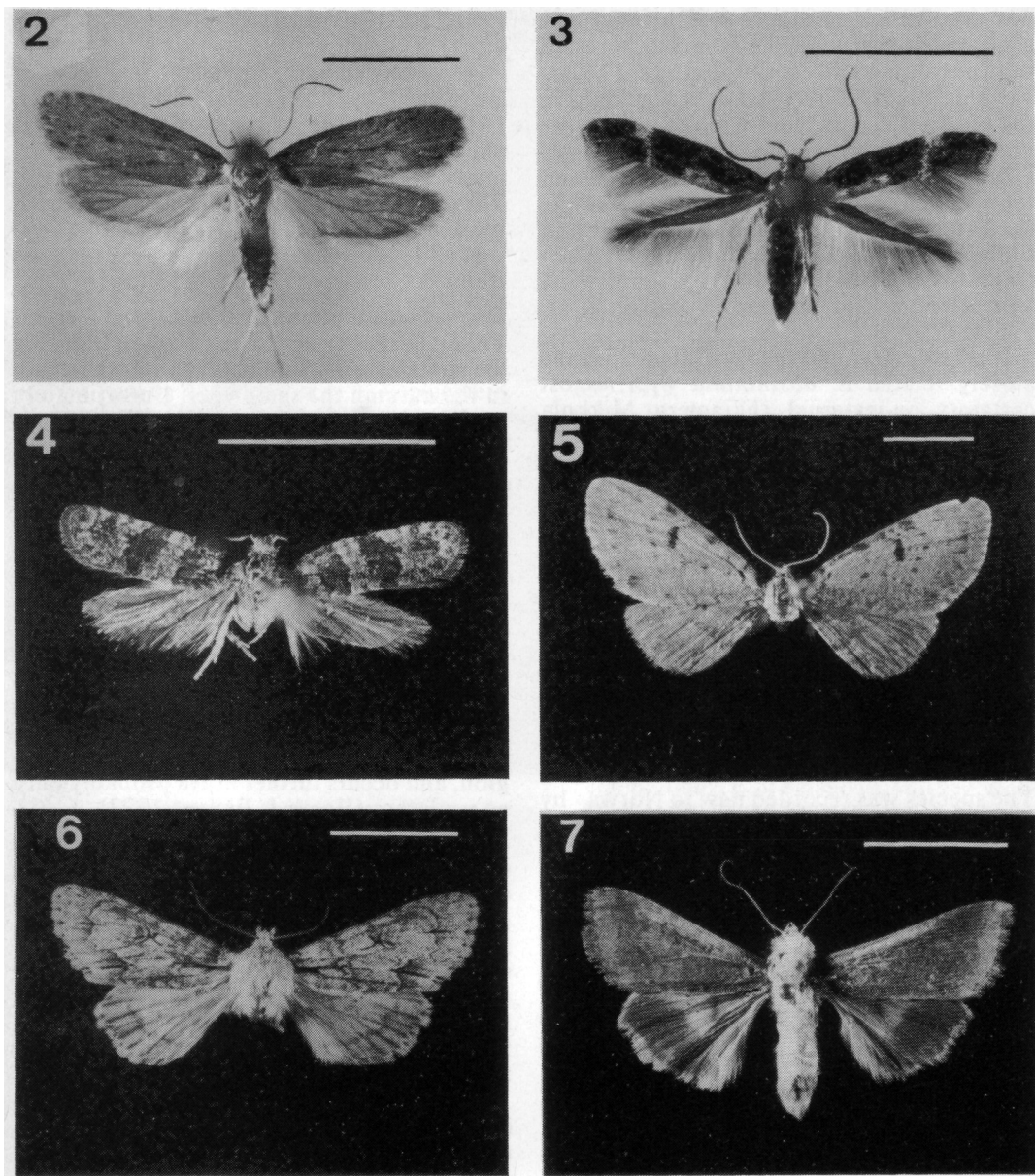


Fig. 2—7. -2. *Depressaria artemisiae* (scale 5 mm). -3. *Mompha divisella* (scale 5 mm). -4. *Rhyacionia piniana* (scale 5 mm). -5 *Eupithecia expallidata* (scale 5 mm). -6. *acronicta tridens* (scale 10 mm). -7. *Heliothis armigera* (scale 10 mm).

1759) in the collections of the Zoological museum of Oslo. Three of the specimens named as *E. absinthiata* proved to be *E. expallidata*, all collected at AK Nesoden: Spro (EIS 28), 1 ♂ 28 July 1919, 1 ♀ 5 Aug. 1913 and 1 ♀ 18 July 1918 (leg. K. Haanshus).

The larva feeds in August-September on flowers, fruits and leaves of *Solidago virgaurea* L. which is the only reported larval food-plant from northern Europe. The imago emerges in July-August and comes frequently to light (Mikkola 1982, Skou 1984).

The trap at Kinnartangen was located in a shady grove surrounded by a mixed forest of both deciduous and coniferous trees. The larval food-plant, *S. virgaurea*, is abundant in the area but occurs mainly in the open areas of the surroundings.

The distribution is restricted to Europe and the species is reported from Central Europe, the British Isles, Italy, Romania, USSR and Finland up to Savonia-Borealis (PS-sb) (Mikkola 1982, Skou 1984). No records exist from Denmark or Sweden (Svensson et al. 1987).

E. expallidata may be separated from the closely related *E. absinthiata* with almost certainty on external characters. Mikkola (1982) mentions several characters in addition to the genitalia, the most significant being the shape of the scales on the forewing discal spot. The three specimens from Spro were determined from these characters. The genitalia are figured by Skou (1984), but as pointed out by Mikkola (op.cit), they differ only slightly from those of *E. absinthiata*.

Noctuidae

Acrionicta tridens (Denis & Schiffermüller, 1775)

The species was recorded new to Norway by Haanshus et al. (1920) based on a specimen collected at AK Oslo: Ormøya, 1884 (leg. K. Haanshus). Opheim (1962) deleted it from the Norwegian list because the specimen was lost and hence impossible to verify.

On 21 June 1984 a female of this species was caught in a light trap in BØ Drammen: Brakerøya (EIS 28) (leg. Devegge Ruud) (Genital prep. 1655 Leif Aarvik). The locality is surrounded by mixed deciduous forest.

The larva feeds in July-August on several deciduous trees and shrubs. The hibernation is in the pupal stage. In northern Europe the species usually is univoltine, further south also with a second brood (Heath & Emmet 1983).

A. tridens has an Eurasiatic distribution and is common in Western Europe from Northern Spain up to Western Germany (Heath & Emmet 1983). The species is reported from Denmark, Sweden and Finland (Svensson et al. 1987), but has declined in Northern Europe during the last decades. From being very common in Finland in the beginning of this century, only two Finnish records exist

after 1960 (Mikkola 1979, Mikkola & Jalas 1979).

A. tridens may be separated from the similar *A. psi* (L., 1758) and *A. cuspis* (Hübner, 1813) on external characters, but the morphological differences are vague, and normally a genital determination is necessary. The genitalia of the three species are figured by Heath & Emmet (1983).

Heliothis armigera (Hübner, 1808)

One larva was found at BØ Hurum: Verket, Vollen (EIS 28) (leg. Tony Nágypal) during the summer 1984 and hatched into a female in the autumn the same year. Unfortunately neither the exact date nor the larval food-plant can be recalled.

The larva of *H. armigera* is polyphagous and occurs very often as a pest on crops in the tropics and subtropics. It bores into the fruit or stem of the host plant (Pinhey 1975).

H. armigera has a cosmopolitan distribution and is reported from Africa, many parts of Europe, Asia, Australia and America (Pinhey 1975). There are a few records from Denmark and Finland, and one from Sweden (Svensson et al. 1987). The main distribution is tropical and subtropical. In Europe the species is resident in the Mediterranean region, and occurs further north probably only as a migrant (Heath & Emmet 1983).

As the species is not resident in Norway (Heath & Emmet 1983), the larva may have originated from a fertile female immigrated earlier in the summer. Another possibility is that the female was brought in by a ship, because the fairway to one of the main harbours in Norway - Drammen, passes less than one km from the locality. Ships carrying fruit from Morocco, Israel, South-Africa, Argentina and USA pass frequently.

The male genitalia are figured by Pinhey (1975) but the species is easily identified using external characters.

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Description of the immature stages of *Delia fabricii* Holmgren (Diptera, Anthomyiidae)

TOR JACOB JOHANSEN

Johansen, T. J. 1989. Description of the immature stages of *Delia fabricii* Holmgren (Diptera, Anthomyiidae). *Fauna norv. Ser. B* 36, 125—128.

The immature stages of *Delia fabricii* Holmgren are described. The most distinctive characters are compared with descriptions of the corresponding characters of the closely related *Delia coarctata* Fallén. The larvae may be distinguished on the basis of the tubercles on the last segment. The third instar larva is the most characteristic, having a pair of black, sclerotized apical tubercles placed on a correspondingly sclerotized plate. The puparium carries the remains of these tubercles. The ecology of *D. fabricii* is briefly described. It resembles that of the univoltine, egg hibernating *D. coarctata*.

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INTRODUCTION

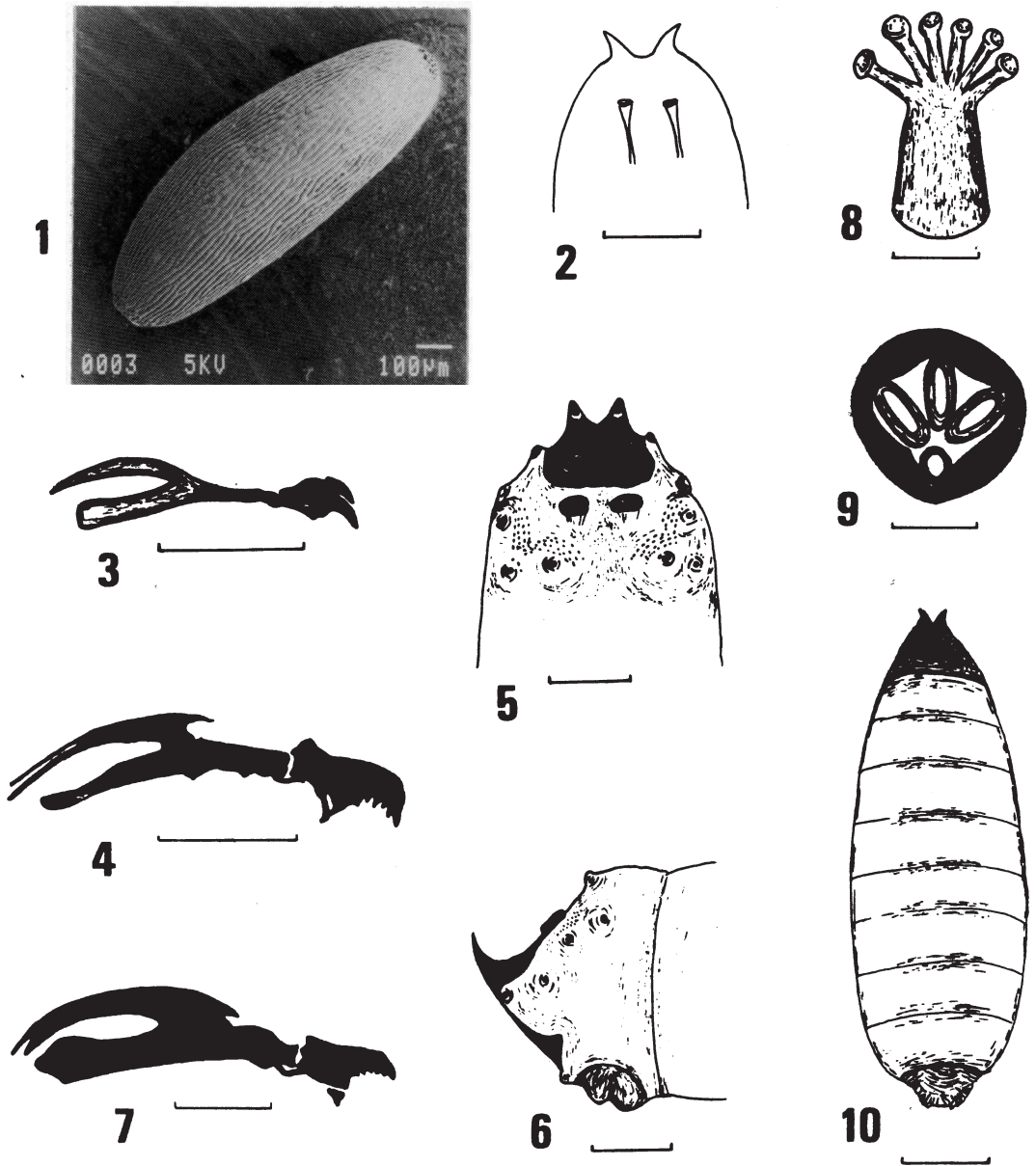
Delia fabricii Holmgren has a circumpolar high latitude distribution (cf. Hennig 1966—1976, Suwa 1977). It has recently been observed infesting the stems of *Poa pratensis* L. grown for seed production in Northern Norway (69°N). This initiated a morphological and ecological study with results presented in a thesis (Johansen 1988). The present paper is one revised part of this thesis.

Descriptions of the adult *D. fabricii* were first given by Holmgren (1873) and were later supplemented by Lundbeck (1901), Ringdahl (1949, 1959), Hockett (1953, 1965), Hennig (1966—1976) and Suwa (1977). Except for the closely related *Delia coarctata* Fallén (cf. Nye 1958, Dušek 1969), descriptions of the immature stages are lacking for *Delia* spp. that infest grasses. Therefore, this paper for the first time describes the immature stages of *D. fabricii* and compares the most distinctive characters with descriptions of the corresponding characters of *D. coarctata*. In particular, the following larval characters have been observed: The outer respiratory organs, represented by the anterior and posterior spiracles, the mouth organ, represented by the cephalo-pharyngeal skeleton and the tubercles on the last segment.

MATERIALS AND METHODS

All insect material was collected in stands of *P. pratensis* planted for seed production at Bardu (69°N), Northern Norway. Soil samples were taken in September, and eggs were separated from the soil by washing through meshes (Gemmill 1927). Larvae and pupae were reared in the laboratory from infested plants gathered in May. Samples from the basic material of each stage were reared until the adults emerged. Then the genitalia of the males were compared with Hennig's (1966—1976) description of *D. fabricii* in order to assure having pure samples.

The descriptions of the 1st, 2nd and 3rd instar larva were based on newly hatched larvae, on larvae just having changed from having 2 to 1 pair of mouth-hooks and on larvae which had entered the soil for pupation, respectively. The cephalo-pharyngeal skeletons were slide mounted according to Oldroyd (1958) and photographed to facilitate the drawing of the figures. The larva descriptions have been based on the terminology of Nye (1958). The comparisons with *D. coarctata* have been based on the descriptions and figures of Nye (1958) and Dušek (1969).



Figs. 1—10. *Delia fabricii* Holmgren. -1. Egg (SEM-photo). -2. Last segment of 1st instar larva, dorsal view. -3. Cephalo-pharyngeal skeleton of 1st instar larva. -4. Cephalo-pharyngeal skeleton of 2nd instar larva. -5. Last segment of 3rd instar larva, dorsal view. -6. Last segment of 3rd instar larva, profile view. -7. Cephalo-pharyngeal skeleton of 3rd instar larva. -8. Anterior spiracles of 3rd instar larva. -9. Posterior spiracles of 3rd instar larva. -10. Puparium (Scales: 2—4,7, 0.25 mm; 5—6, 0.5 mm; 8—9, 0.05 mm; 10, 1 mm)

DESCRIPTIONS

Egg stage

The egg (Fig. 1) is white, elongate, and with longitudinal, occasionally broken ribbing. There is no obvious distinction from *D. coarctata* eggs. Length (range, mean and standard deviation of 20 specimens (mm)): 1.26—1.50, 1.36, 0.06. Breadth: 0.46—0.50, 0.48, 0.02.

Larval stage

The 1st larval instar is about 1.5—2 mm long, shiny and transparent. The last segment has 1 pair of clearly visible tubercles (Fig. 2), which distinguish the larva from *D. coarctata* which has 3 pairs. The cephalo-pharyngeal skeleton (Fig. 3) has 2 pairs of strongly sclerotized mouth-hooks without serrations, with the smallest one above the other. The pharyngeal sclerites are weakly sclerotized.

The 2nd instar larva is yellow-white and about 2—4 mm long. The tubercles on the last segment resembles that of the 3rd instar, but they are not sclerotized. The cephalo-pharyngeal skeleton (Fig. 4) has 1 pair of mouth-hooks. Each hook has about 6 sharp teeth on the underside. The whole skeleton is heavily sclerotized, apart from the ventral wings of the pharyngeal sclerites.

The 3rd instar larva is yellow-white and about 7—8 mm long and 1.5 mm wide when fully grown. The apical ridge and most of the ventral truncated area of the last segment is covered by a black sclerotized plate with a pair of big hook-formed tubercles (Figs. 5—6). This plate clearly distinguishes *D. fabricii* from *D. coarctata* larvae. The other tubercles are wartlike and almost inconspicuous. The strongly sclerotized cephalo-pharyngeal skeleton (Fig. 7) seems to be more slender and has the dorsal and ventral wings of the pharyngeal sclerites more compressed than *D. coarctata*. Each mouth-hook has about 6 small, rounded teeth. The anterior spiracles (Fig. 8) are fan-like with 5—6 regular digits. They show no clear distinction from *D. coarctata*. Nor do the posterior spiracles (Fig. 9) which have their openings surrounded by a strongly sclerotized rim.

Pupal stage

The puparium (Fig. 10) is brown, with a smooth integument. It is thickest anterior to

the middle. Both ends are shrunken and wrinkled. The puparium is easily distinguished from *D. coarctata* by the remains of the posterior sclerotized tubercles from the last larval instar. Length (range, mean and standard deviation of 20 specimens (mm)): 5.3—6.0, 5.8, 0.23. Breadth: 2.0—2.2, 2.1, 0.11.

ECOLOGY

Smooth meadow-grass (*P. pratensis*) is probably the most important natural host plant for *D. fabricii* (Johansen 1988). The larvae feed inside the culms in the spring and pupate in the soil in the beginning of June. The adult flies emerge after midsummer. In the late summer and autumn the females deposit their eggs on the soil near the base of the host plants. The eggs enter diapause, hibernate, and hatch as grass growth starts the following year.

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Contribution to the pipunculid fauna of Scandinavia (Diptera, Pipunculidae).

MARC DE MEYER, THIERRY BACKELJAU & LUC JANSSENS

De Meyer, M., Backeljau, T. & Janssens, L. 1989. Contribution to the pipunculid fauna of Scandinavia (Diptera, Pipunculidae). *Fauna norv. Ser. B* 36, 129—132.

Scandinavian Pipunculidae in the collections of the University of Bergen; Museum of Zoology, Lund; and in the private collection of T.R. Nielsen, Sandnes, have been examined. 33 species were identified of which 7 were apparently not previously recorded from Scandinavia: *Nephrocerus scutellatus* (Macquart, 1834), *Pipunculus fonsecai* Coe, 1966, *Pipunculus tenuirostris* Kozánek, 1981, *Eudorylas jenkinsoni* Coe, 1966, *Eudorylas obscurus* Coe, 1966, *Dorylomorpha rufipes* (Meigen 1824), and *Tomosvaryella palliditarsis* (Collin, 1931). A list of the localities is presented. The genera *Chalarus* Walker and *Cephalops* Fallén are not included in this article.

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INTRODUCTION

Pipunculidae is a family of mainly small inconspicuous flies, closely related to hoverflies (Syrphidae), and they can easily be identified by large compound eyes. They are exclusively parasitic on Auchenorrhyncha (Homoptera) attacking the nymphal and/or adult stages (Waloff & Jervis, 1987).

The most comprehensive article on Scandinavian Pipunculidae is Collin's (1956). He listed 55 species including 7 new species or new names. Although fairly recent pipunculid records are known from Finland (Albrecht in Hackmann, 1980) and Denmark (Lyneborg, 1975; Rald, 1976, 1978), very few new data have been reported from the Scandinavian region.

Within the scope of a systematic revision of the West-Palaearctic species of the genus *Cephalops* the authors had the opportunity to study some additional Scandinavian pipunculid material. This proved to be very interesting and 33 species could be identified among which several noteworthy ones. Seven of these species have apparently not been mentioned earlier from Scandinavia.

MATERIAL AND METHODS

Material was kindly put at our disposal by the Zoological Museum of Lund (ZML), the University of Bergen (UOB) and T. B. Niel-

sen (TRN); comprising altogether about 240 specimens. Identifications were based on Bańkowska (1973), Coe (1966), Collin (1956) and Kozánek (1981). *Cephalops* data are not included here since they will be mentioned in a separate article which will discuss the distribution of this genus in Fennoscandia and Denmark. *Chalarus* spp. were omitted since they can not be identified with certainty at the present time. A revision of this genus is in progress by Jervis (Cardiff, Wales, U.K.). The localities where species have been collected are included in the systematic list as well as the institute or collection where the specimens are kept.

SYSTEMATIC LIST AND REMARKS

Verrallia aucta (Fallén, 1816)

NORWAY: Ry: Gjesdal; VAY: Lindesnes (TRN). SWEDEN: Šk: Kullaberg, Örupskärret; Sm: Bergkvara (ZML).

The most abundant species of this genus in Europe. The occurrence in the Nearctic region is doubtful (see Thompson, 1977). It seems to occupy a variety of habitats (Lauterer, 1981).

Verrallia pilosa (Zetterstedt, 1838)

SWEDEN: B1: Bröms (ZML).

Verrallia setosa Verrall, 1901
SWEDEN: Sk: Degeberga (ZML).

According to Lauterer (1981) a widespread species in Fennoscandia and Great Britain. In Czechoslovakia it is restricted to elevations from 300 to 1300 m. However in Belgium it is widespread all over the country including the lowlands and the coastal region (De Meyer & De Bruyn, 1985).

Verrallia villosa (Von Roser, 1840)
NORWAY: Nsy: Bodø (TRN).

Nephrocerus scutellatus (Macquart, 1834)
NORWAY: AK: Bærum Ostøya (TRN).

This seems to be the first record from Scandinavia for this species. *N. scutellatus* is mainly reported from West, Central, and South Europe. So far it has only been mentioned twice from northern Europe. The occurrence of *N. scutellatus* and the other European *Nephrocerus* spp. is discussed more in detail by Grootaert & De Meyer (1986).

Pipunculus calceatus Von Roser, 1840
SWEDEN: D1r: Rättvik; Hall: Enslöv Årnhilt (ZML).

Pipunculus campestris Latreille, 1804
NORWAY: AAy: Våje; AK: Bærum; Bv: Flå; Fø: Sørvaranger Kirkenes; HE: Raufjeld; Nnø: Evenes; Nnv: Lødingen; TEi: Sauherad; TR: Tromsø; Vay: Hamre, Kristiansand, Randesund (all in TRN, except material from Fla in UOB). SWEDEN: D1r: Gagnef, Rättvik, Leksand, Floda Sångtorpet; Go: Norrlanda, Hammars; Hall: Laxvik, Enslöv Årnhilt; Lu Lpm: Kvikkjokk, Vietasjokks. Ly Lpm: Sorsele; Nrk: Kvistbro, Mullhyttan. Ög: Nykil, Stensjöfall; Öl: Halltorps hage; Sk: Klagshamnssudde, Kullaberg, Torna Hällestad, Krankesjön, Sjödikena, Rövarkulan, Ålabodarna-Sundvik, Vomb, Måryd, Sandhammaren, Billebjär, Lillöviken, Sandby mosse (ZML).

One of the most common pipunculid species in Europe. It appears to be multivoltine and to have a wide range of hosts. *P. campestris* is reported from several provinces throughout Scandinavia and seems to be one of the very few pipunculid species than can be found in the boreal and even the arctic region.

Pipunculus fonscai Coe, 1966
NORWAY: STi: Trondheim (UOB). SWEDEN: Hall: Enslöv Årnhilt; Sk: Lund (ZML).

A rare species, only reported from Belgium, Great Britain and Czechoslovakia. Apparently not mentioned before from Scandinavia.

Pipunculus oldenbergi Collin, 1956
SWEDEN: B1: Brömsebro; Sk: Kullaberg (ZML).

A species, originally described from material collected in Berlin (Germany) but Collin (1956) mentions a female specimen from Sweden (Sk: Loderup) in his original description. So far, the distribution of this species is still largely unknown.

Pipunculus spinipes Meigen, 1830
NORWAY: Vay: Vrånes (TRN).

Pipunculus tenuirostris Kozánek, 1981
SWEDEN: B1: Brömsebro; Hall: Enslöv Årnhilt, Laxvik; Sk: Kullaberg, Revinge (ZML). New to Scandinavia. Only reported from Czechoslovakia and Belgium (De Meyer & De Bruyn, 1985). The first author has also seen a female specimen from Denmark (Sj: Sonderberg) in the collections of the Zoological Museum of Copenhagen.

Pipunculus thomsoni Becker, 1897
NORWAY: Bv: Flå; NSy: Bodø; Ry: Sandnes; Vay: Hamre, Kjevik, Lindesnes (all in TRN, except material from Flå and Bodø in UOB). SWEDEN: Ög: Landeryd; Öl: Borgehageskogen; Sk: Hallands Väderö, Hastad, Lund; Sm: Bergkvara (ZML).

Pipunculus varipes Meigen, 1824
NORWAY: STi: Trondheim (UOB); TEi: Sauherad Gvarv; Harpefoss (TRN). SWEDEN: Vg: Hornborgasjön.

Eudorylas fascipes (Zetterstedt, 1844)
SWEDEN: Sk: Kullaberg, Sturup; Lövsk (ZML).

Eudorylas fuscipes (Zetterstedt, 1844)
SWEDEN: Sk: Måryd; Öl: Halltorps hage (ZML).

Eudorylas fuscus (Zetterstedt, 1844)
NORWAY: STi: Trondheim (UOB). SWEDEN: D1r: Leksand, Rättvik; Öl: Halltorps hage; Sk: Bökeberg, Kullaberg, Stenshuvud; Sm: Almshult, Bergkvara, Tharyd, Växjö (ZML).

A small species that was well represented in

the collections Apparently it seems to occur mainly in northern and central Europe although it has been reported occasionally in Belgium.

Eudorylas jenkinsoni Coe, 1966

SWEDEN: Nb: N. Luleå (ZML).

New for Scandinavia. A rare species, only known a few western European countries as well as Bulgaria.

Eudorylas montium (Becker, 1897)

NORWAY: STi: Trondheim (UOB).

Eudorylas obscurus Coe, 1966

NORWAY: ÖI: Halltorps hage; Sk: Krankesjön (ZML).

New for Scandinavia. Only reported from Belgium and Great Britain.

Eudorylas subfascipes Collin, 1956

NORWAY: TEi: Gvarv (TRN). SWEDEN: D1r: Rättvik, Sk: Oved (ZML).

Eudorylas subterminalis Collin, 1956

SWEDEN: Gt1: Norrlanda Hammars; Hall: Enslöv Årnhilt; Sk: Övedskloster, Stenshuvud, Torna-Hällestad, Vomb (ZML).

Eudorylas zermattensis (Becker, 1898)

SWEDEN: Gt1: Gothem, Norrlanda; Sk: Krankesjön, Lund (TRN).

Eudorylas zonatus (Zetterstedt, 1849)

SWEDEN: Hall: Laxvix; Sm: Växjö (TRN).

Eudorylas zonellus Collin, 1956

SWEDEN: D1r: Rättvik; ÖI: Halltorps hage; Sk: Kullaberg, Sandby, Toppeladugård; Sm: Bergkvara Siggesbo, Växjö; Vg: Kinnekulle (ZML).

A relatively large and widespread species. *E. zonellus* has been reported from all main regions in Europe (cfr Lauterer, 1983).

Dorylomorpha beckeri Aczél, 1939

SWEDEN: Sk: Horrod; Klostershågen (ZML).

An uncommon species with mainly a northern distribution.

Dorylomorpha confusa (Verrall, 1901)

NORWAY: AAy: Tromøy Revesand (TRN); HO: Etne (UOB); Nsy: Bodø (TRN/UOB); VAy: Flekkefjord (TRN).

Considered as the most common *Dorylom-*

orpha species (Lauterer, 1981) distributed in the larger part of Europe.

Dorylomorpha maculata (Walker, 1834)

NORWAY: Nsy: Bodø; TRy: Tromsø (UOB). SWEDEN: D1r: Rättvik; Go: Norrlanda Hammars, Fårö; Hall: Enslöv; ÖI: Halltorps hage; Sk: Krankesjön (ZML).

Dorylomorpha rufipes (Meigen, 1824)

NORWAY: AK: Bærum Ostøya (TRN).

Although it is a widely distributed species and already known from Finland (Hackman, 1980), this seems to be the first record for Scandinavia. This might be due to fact that it has often been confused with other *Dorylomorpha* spp.

Dorylomorpha xanthopus (Thomson, 1869)

NORWAY: Nsy: Bodø (UOB). SWEDEN: Sk: Klagshamnssudde (ZML).

Tomosvaryella cilitarsis (Strobl, 1910)

SWEDEN: D1r: Floda Mosselbodarna; Jmt: Rätansbyn (ZML).

T. cilitarsis seems to have a boreomontane or boreoalpine distribution (Lauterer, 1981).

Tomosvaryella geniculata (Meigen, 1824)

SWEDEN: B1: Brömsebro; Go: Norrlanda Hammars; ÖI: Halltorps hage; Sk: Krankesjön (ZML).

Tomosvaryella palliditarsis (Collin, 1931)

SWEDEN: Go: Norrlanda Hamars; ÖI: Halltorps hage (ZML).

This species has only been found so far in Great Britain, Belgium and Czechoslovakia. New to the Scandinavian fauna.

Tomosvaryella sylvatica (Meigen, 1824)

NORWAY: HOi: Voss Mjølfjell; Nsy: Bodø; STi: Trondheim (UOB). SWEDEN: Ång: Junsele sn Hallby; Ås Lpm: Sänsjors; B1: Brömsebro; D1r: Ore Östanvik, Ore Bruket, Mora Bonäs; Hall: Enslöv Årnhilt; Jmt: Rätansbyn; Ly Lpm: Sorlese; Lu Lpm: Satisjaure, Sel vid Mellersta; ÖI: Halltorps hage; Sk: Fågeltofta, Krankesjön, Vomb, Stenshuvud, Sövde, Torna-Hällestad, Knäbäck shusen, Vitemölla; Sm: Bergkvara, Växjö, Påskallavik; T Lpm: Abisko, Kaisepakte, Stordalen. Vittangi (ZML).

A very common species distributed all over Europe. Widespread throughout Scandinavia.

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New Records of Norwegian Sciomyzidae (Diptera)

LITA GREVE AND BJØRN ØKLAND

Greve, L. & Økland, B. 1989. New Records of Norwegian Sciomyzidae (Diptera). *Fauna norv. Ser. B* 36, 133—137.

Records of 21 species of the family *Sciomyzidae* are given. *Pelidnoptera fuscipennis* (Meigen, 1830), *Antichaeta atriseta* (Loew, 1849) and *Antichaeta brevipennis* (Zetterstedt, 1846) are recorded for the first time from Norway. Several species hitherto recorded from few localities in Norway are probably common in the country.

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Rozkošný (1984) published a comprehensive study on the Norwegian Sciomyzidae in the fourteenth *Fauna Entomologica Scandinavica* volume. This survey included material up to 1984 from all major Norwegian museums of natural history. Still, only 47 species are recorded from Norway, compared to 78 in neighbouring Sweden, 71 species in Finland and 67 in Denmark (Rozkošný 1984; Rozkošný & Greve, 1984). There are also comparatively few provincial records from Norway.

Thus, the present publication is based on the identification of 373 specimens belonging to 21 species of Sciomyzidae. Three species, *Pelidnoptera fuscipennis* (Meigen, 1830), *Antichaeta atriseta* (Loew, 1849) and *Antichaeta brevipennis* (Zetterstedt, 1846), are new to the Norwegian fauna. Several of the species have been recorded from few localities in Norway. However, some of these species are not rare in the country, but they have probably been overlooked by collectors, or not looked after at all. The material is either deposited in ZMO (Zoological Museum, University of Oslo), in The Museum, Trondheim, or in the ZMB (Zoological Museum, University of Bergen).

Since the *Sciomyzidae* ought to be better investigated in Norway, we encourage our fellow entomologists to collect them to learn more of the distribution of the different species. Rozkošný (1984) in his introduction gives a good description of the flies belonging to this family.

The distributional records follow the revised Strand system (Økland, 1981).

MATERIAL

Pelidnoptera fuscipennis (Meigen, 1830)
New records: TEI 1129 Kviteseid: Kviteseid EIS 17 Light trap, 23—27 June 1988 2♀♀, 11—20 July 1988 1♂ 1♀ (ZMB).

P. fuscipennis is new to the fauna of Norway. This species is the first of the genus recorded from Norway. The trap was placed near a small stream in a mixed forest. The species is distributed in southern Fennoscandia, but is not common (Rozkošný, 1984). The biology of the Fennoscandian species of *Pelidnoptera* are virtually unknown.

Colobaea bifasciella (Fallén, 1820)
New records: VE 0923 Tjøme, Mostrandane EIS 19 20 July 1983 3 ♂♂ 1 ♀ (ZMB). TEY 1005 Porsgrunn: Brevik, Dammane EIS 11 31 July 1983 3 ♂♂ 1 specimen (ZMB).

C. bifasciella has only been recorded once from Norway; from Nordseter near Lillehammer in southern Oppland province. It is the only species of the genus known from Norway.

C. bifasciella has a characteristic wing pattern and is thus easy to recognize despite the small size. The species is fairly rare in the Fennoscandia and Denmark (Rozkošný, 1984).

Pherbellia albocostata (Fallén, 1820)
New records: BØ 0728 Hurum: Tofte EIS 28 Malaise trap 2—17 June 1985 1♂, 8 Aug.—1 Sept. 1985 1 ♀ (ZMB). TEY 1005 Porsgrunn: Brevik, Sandøy EIS 11 2—17 June 1986 1 ♀, 10 July 1986 1 ♂ (ZMB). TEI 1126 Tinn: Håkanes EIS 26 July 1984 1 ♂ (ZMB). VAY

1404 Flekkefjord: Store Eikås near Gyland EIS 4 VLK 703724 21 June—6 July 1982 1 ♀ (ZMB). HOY 1842 Samnanger: Ådland EIS 40 Malaise trap 14—28 May 1982 1 ♂ (ZMB); 1853 Osterøy: Marikovane EIS 39 27 June 1982 1 ♂ (ZMB); 1863 Lindås: Hodneli EIS 39 12 June 1988 1 ♂ (ZMB). HOI 1911 Etne: Nordelvi VLM 300185 EIS 23 26 June 1985 1 ♀ (ZMB). SFI 2121 Aurland: Near Botn EIS 51 VLN 977445 28 August 1987 1 ♀ (ZMB). NSY 2804 Bodø: Urskar, Storlitjern EIS 126 27 July 1986 1 ♀ (ZMB). NSY 2804 Bodø: Valnes, Sjøgand EIS 130 27 July 1987 1 ♀ (ZMB). NSY 2804 Bodø: Valnesvann, Ørnli EIS 130 15 July 1984 2 ♀♀ (ZMB). TRY 3217 Ibestad: Rolla, Sørrollnes EIS 145 18 Aug. 1983 1 ♀ (ZMB). FØ 2730 Sør-Varanger: Svanvik, Svanhovd EIS 169 28 June—4 Aug. 1986 1 ♂ 3 ♀♀ (ZMB).

P. albocostata is apparently a common species in most parts of Norway. Specimens have been caught from May to August. Rozkošný (1984) reports *P. albocostata* from mesic woods. Our material is from both deciduous and coniferous woods.

Phorbella dubia (Fallén, 1820)

New records: AK 0201 Oslo: Bygdøy Hengsen EIS 28 1 June 1984 1 ♂ 1 ♀ (ZMB); 0219 Bærum: Ostøya EIS 28 31 May 1984 1 ♂, 10 June—1 July 1984 1 ♂ 1 ♀ (ZMB); 0220 Asker: Bårdrudtjern EIS 28 4 July 1986 1 ♀ (ZMO). BØ 0728 Hurum: Tofte EIS 28 Malaise trap 17 June—17 July 1985 10 ♂♂ 8 ♀♀, 8 Aug.—1 Sept. 1985 1 ♀ (ZMB). HOY 1801 Bergen (Fana): Grimseid EIS 30 8 June 1983 1 ♀ (ZMB); 1801 Bergen (Åsane): Eidsvåg, Vollane Malaise trap 14—21 June 1986 2 ♂♂ 1 ♀, 21 June—10 July 1986 10 ♂♂ 27 ♀♀, 22—31 July 1986 3 ♂♂ 2 ♀♀, 31 July—16 Aug. 1986 3 ♂♂ (ZMB). HOI 1935 Voss: Mjølfjell VLN 864317 EIS 41 Malaise trap 29 June—6 Aug. 1986 2 ♀♀ (ZMB). SFY 2032 Førde: Rotenes EIS 58 2 July 1983 1 ♀ (ZMB).

P. dubia can occur in fairly high number of specimens. 37 specimens were collected in a Malaisetrapp in a garden in a suburb of Bergen. The Malaise trap at Mjølfjell was at app. 700 m a s l.

P. dubia is common and widespread in Norway (Rozkošný, 1984). Specimens have been caught from May until August, mostly in deciduous woods. At Tofte in Hurum *P. albocostata* was caught also.

Phorbella griseola (Fallén, 1820)

New records: VE 0923 Tjøme: Sandøy EIS 19 11 Aug. 1984 1 ♂ (ZMB). TEY 1005 Porsgrunn: Brevik, Dammane EIS 11 31 July 1983 1 ♂ (ZMB). NSY 2804 Bodø: Valnes, Sjøgand EIS 130 27 July 1987 3 ♂♂ 2 ♀♀ (ZMB).

P. griseola is reported as rather common and widespread in Fennoscandia and Denmark by Rozkošný (1984).

Phorbella pallidiventris (Fallén, 1820)

BØ 0728 Hurum: Tofte 17 July—8 Aug. 1985 EIS 28 Malaise trap 1 ♂ 1 ♀ (ZMB). HOY 1801 Bergen (Åsane): Eidsvåg, Vollane EIS 39 3 Aug. 1984 1 ♂ (ZMB). HOI 1935 Voss: Mjølfjell at Kårdal EIS 41 13 July 1985 1 ♀ (ZMB). SFY 2031 Jølster: Near Skei VLP 657280 EIS 59 4 July 1983 1 ♂ (ZMB). NSY 2804 Bodø: Valnesvann, Ørnli EIS 130 15 July 1984 2 ♂♂ (ZMB). NSI 2939 Beiarn: Moljord EIS 126 6 Aug. 1982 1 ♂ (ZMB).

Rozkošný (1984) assumed that *P. pallidiventris* was rather widespread in Norway, and the new records confirm this. Specimens have been caught in July and August. Localities varied from rich deciduous forests to birch forest at approximately 650 m a s l. The male from Vollane was taken from a net of the spider *Araneus umbraticus*.

Phorbella rozkosnyi Verbeke, 1967

HOY 1801 Bergen (Åsane): Vollane EIS 39 31 July—16 Aug. 1986 1 ♂ (ZMB).

The male was caught in Malaise trap in a garden. Probably a rare species, but earlier recorded twice from Hordaland province (Greve & Rozkošný, 1981).

Phorbella schoenherri (Fallén, 1826)

New records: AK 0214 Ås: Årungen søndre EIS 28 17 July 1970 1 ♂ (ZMB); 0230 Lørenskog: Kirkeruddalen EIS 29 6 March 1988 1 ♀ (ZMO). HEN 0429 Åmot: Renå N 17 July 1987 1 ♀ (ZMB). BØ 0728 Hurum: Tofte EIS 28 13—18 May 1985 1 ♂, 8 Aug.—1 Sept. 1985 1 ♂ 3 ♀♀ (ZMB). VE 0916 Våle: Mulvika EIS 19 5 Sept. 1985 2 ♂♂ (ZMB); 0923 Tjøme: Mostrand, sandtaket 8 July 1983 1 ♀ (ZMB); 0923 Tjøme: Torås EIS 19 6 July 1984 1 ♂ (ZMB). TEY 1005 Porsgrunn: Sandøy Ø EIS 11 10 JULY 1986 4 ♂♂ 2 ♀♀ (ZMB). NSY 2804 Bodø: Valnes, Sjøgand EIS 130 27 July 1987 1 ♀ (ZMB). TRY 3202 Tromsø: Lillemoen EIS 162 1 Sept. 1987 1 ♀ (ZMB).

A widespread and common species easily recognized on the characteristic wing pattern. Specimens were collected from May until September. Rozkošný (1984) refers to very early collecting dates which indicate overwintering in the adult stage, and one record 6 March confirms this view.

Antichaeta atriseta (Loew, 1849)

New records: TEI 1129 Kviteseid: Kviteseid EIS 17 Light trap 24—29 July 1988 1 ♂ (ZMB).

A. atriseta is new to the fauna of Norway, and as for *A. brevipennis* (see below) this is the first time the genus is recorded from Norway. The light trap was placed near a small stream in a mixed forest. Rozkošný (1984) considers *A. atriseta* a rare European species like some of the other species belonging to the genus *Antichaeta*.

Antichaeta brevipennis (Zetterstedt, 1846)

New records: BØ 0728 Hurum: Tofte EIS 28 Malaise trap 17 June—17 July 1985 3 ♂♂ 1 ♀, 17 July—8 August 1985 1 ♀ (ZMB).

A. brevipennis is new to the fauna of Norway. Together with *A. atriseta* (see above) this is the first time the genus is recorded from Norway. The Malaisetrapp at Tofte was run from 13 May to 1 Sept. 1985. It was emptied 6 times, but *A. brevipennis* was only collected between 17 June and 8 August. The species is distributed in southern Fennoscandia (Rozkošný, 1984). Tofte in Hurum is a rich deciduous forest.

Dichetophora finlandica Verbeke, 1964

New record: OS 0542 Nord-Aurdal: Strond 8 Aug. 1984 1 ♂ (ZMB).

A rare species in Norway. In addition to the locality mentioned by Rozkošný (1984) from Akershus (cf. Knutson & Berg, 1971), another locality from SFI is included by Rozkošný in his provincial lists. This male was netted in Vassbygda, Aurland community.

Thus, the species seems widely scattered, and apparently rare in Norway.

Ectinocera borealis Zetterstedt, 1838

New records: HOI 1935 Voss: Mjølfjell 32VLN 864317 EIS41 Malaise trap 8 June—13 July 1985 670 m a s l 4 ♂♂ 7 ♀♀ (ZMB). SFY 20 Naustdal: Naustdal EIS 58 28 May—3 July 1986 Malaise trap 1 ♂ (ZMB). NSY 2804 Bodø: Valnes, Sjøgand EIS 130 6 July

1981 1 ♂ (ZMB). TRI 3324 Målselv: Dividal EIS 154 Malaise trap 18—19 July 1987 1 ♂ (ZMB).

E. borealis has hitherto been recorded only from NTI and STI in Norway (Greve & Rozkošný, 1981). The new records are widely scattered in the country. The Malaise trap at Mjølfjell was situated in open terrain with some birch, pine and juniper. The trap was run from June to early October. It was emptied five times, but specimens were only found in the first period.

Elgiva cucularia (L. 1767)

New records: Ø 0111 Hvaler: Arekilen EIS 12 17 May 1986 2 ♀♀ (ZMO); 18 July 1987 2 ♂♂ 1 ♀ (ZMB). AK 0201 Oslo: Østensjøvann 6 July 1983 1 ♀ (ZMB); 0213 Ski: Midsjøvann 6 July 1983 1 ♀ (ZMB); 0214 Ås: Årungen EIS 28 6 May 1983 1 ♂ (ZMB); 0219 Bærum: Ostøya EIS 28 Malaise trap 28 April—12 May 1 ♀, 12 May—30 May 2 ♀♀, 30 May—10 June 1 ♂, 10 June—1 July 1 ♂, 1—24 July 1 ♀, all 1984 (ZMB); 0219 Bærum: Tjernerudmyra EIS 28 28 June 1986 1 ♂ (ZMB). HEN 0429 Åmot: Rena N EIS 55 1 July 1987 6 ♂♂ 1 ♀ (ZMB). VE 0923 Tjøme: Kynna 17 July 1983 2 ♂♂ 2 ♀♀ (ZMB). TEY 1006 Skien: Limitjern 15 June 1986 1 ♀ (ZMO).

E. cucularia has earlier been recorded from a few localities in AK and VE. Apparently it is common in South Eastern Norway. According to Rozkošný (1984) it is common in Denmark and the southern parts of Sweden. The Malaise trap at Ostøya collected specimens most of the summer. Sampling terminated in September. A description of this locality was given by Greve & Midtgaard (1986).

Ilione albiseta (Scopoli, 1763)

New records: VE 0923 Tjøme: Sønstegård, Hvasser EIS 19 9 July 1984 3 ♂♂ 1 ♀ (ZMB). HOY 1843 Os: Ulvenvann EIS 30 13 June 1982 2 ♀♀ (ZMB).

I. albiseta has been reported from the provinces Ø, Ak and R. In the other Scandinavian countries it is the most common and widespread species of the genus (Rozkošný, 1984), although the distribution is restricted to the southern parts of Finland, and to Umeå in Sweden.

Ilione lineata (Fallén, 1820)

New records: Ø 0111 Hvaler: Kirkøy, Arekilen EIS 12 18 July 1987 1 ♂ 2 ♀♀ (ZMB). VE

0916 Våle: Mulvika EIS 19 8 July 1983 1 ♂ (ZMB); 0923 Tjøme: Hvasser, Sønstegård EIS 19 9 July 1984 3 ♂♂ 7 ♀♀ (ZMB); 0923 Tjøme: Kynna 17 July 1983 9 ♂♂ 5 ♀♀ (ZMB); 0923 Tjøme: Moutmarka EIS 19 20 July 1983 3 ♂♂ 4 ♀♀ (ZMB).

I. lineata was recorded for the first time in Norway from Moutmarka in Vestfold province (Rozkošný & Greve, 1984). In addition to the new records mentioned here, specimens have been collected twice from the Moutmarka locality. The distribution known hitherto in Norway seems restricted to the South Eastern part. In Sweden and Finland *I. lineata* is also recorded from the northern parts.

Pherbina coryleti (Scopoli, 1763)

New records: AK 0201 Oslo: Østensjøvann EIS 28 2 July 1986 3 ♂♂ 1 ♀ (ZMO). VE 0916 Våle: Mulvika EIS 19 5 Sept. 1985 16 ♂♂ 6 ♀♀ (ZMB); 0923 Tjøme: Kynna EIS 19 17 July 1983 1 ♀ (ZMB); 0923 Tjøme: Mostranda EIS 19 22 July 1982 9 ♂♂ 8 ♀♀, 24 July 1982 4 ♂♂ 4 ♀♀, 20 July 1983 8 ♂♂ 7 ♀♀, 26 July 1984 1 ♂ 1 ♀ (ZMB); Moutmarka EIS 19 8 July 1983 4 ♂♂ 2 ♀♀ (ZMB). TEY 1005 Porsgrunn: Sandøy EIS 11 10 July 1986 4 ♂♂ 1 ♀ (ZMB). HOY 1843 Os: Mobergviki EIS 30 27 June 1982 2 ♂♂ (ZMB); 1847 Askøy: Marikovane EIS 39 27 June 1982 2 ♂♂ 1 ♀, Siglingevann 22 June 1982 2 ♂♂ 1 ♀ (ZMB); 1853 Osterøy: Fitjahellen EIS 39 25 June 1982 1 ♀, Kupefossen 26 June 1982 1 ♀ (ZMB).

P. coryleti has been recorded from three provinces in Norway viz. AK, VE and RY & RI. According to Rozkošný (1984) it is common in Denmark and in the southern and central parts of Sweden and Finland. Apparently, it is common in the southern parts of Norway. Specimens have been caught from late June until September. The localities are coastal marshy areas near lakes, — see also Rozkošný (1984).

Renocera pallida (Fallén, 1820)

New records: AK 0219 Bærum: Ostøya EIS 28 Malaise trap 12—30 May 1984 1 ♂ 1 ♀, 30 May—10 June 1984 1 ♂ 1 ♀ (ZMB); 0230 Lørenskog: Hammer EIS 29 9 June 1988 1 ♂ (ZMO). BØ 0728 Hurum: Tofte EIS 28 Malaise trap 2 June—18 Aug. 1985 1 ♂ (ZMB). BV 0832 Rollag: Rollag EIS 35 18 July 1984 1 ♂ (ZMB); HOY 1801 Bergen (Fana): Grimseidvann EIS 30 8 June 1983 1 ♂ (ZMB);

1801 Bergen (Arna) : N. Kråtjern EIS 40 VLN 153035 14 June 1985 1 ♂ 1 ♀ (ZMB). NTI 2743 Høylandet: Tverråa Malaise trap 18—25 June 1986 1 ♂ (The Museum, Trondheim).

Rozkošný (1984) reported only one record from Norway. The number of new records suggests that *R. pallida* might be common in Norway as it is in Sweden and Finland. Specimens have been caught from late May until August.

Renocera striata (Meigen, 1830)

New records: HEN 0429 Åmot: Storemyr 18 July 1987 1 ♂ (ZMB). HOY 1853 Osterøy: Herlandsnesjane 21 June 1987 2 ♂♂ 1 ♀ (ZMB). NTI 2743 Høylandet; Tverråa, Malaise trap 30 July 1986 1 ♂ (The Museum, Trondheim). NSY 2804 Bodø: Falkflaugvann EIS 130 23 July 1986 1 ♂ (ZMB).

R. striata has been recorded from a few places in northern Norway. These are the first records from Southern Norway. It is not common in Scandinavia (Rozkošný, 1984).

Renocera strobilii (Hendel, 1900)

New record: HEN 0429 Åmot: Rena N. EIS 55 17 July 1987 1 ♂ (ZMB).

Relatively rare, but widely recorded from the Nordic countries (Rozkošný, 1984).

Sepedon spegea (Fabricius, 1775)

New records: AK 0227 Fet: Hvalstjern EIS 29 5 June 1988 1 ♂ 1 ♀ (ZMO). HEN 0302 Kongsvinger: Kongsvinger 15 June 1983 1 ♂ (ZMB). HEN 0429 Åmot: Rena N EIS 55 17 July 1987 1 ♂ 1 ♀ (ZMB). VE 0923 Tjøme: Moutmarka S EIS 19 24 July 1982 1 ♂ (ZMB).

S. spegea is a rather common species in South Eastern Norway (Rozkošný, 1984), as well as in Denmark and parts of Fennoscandia.

Sepedon spinipes (Scopoli, 1763)

New records: Ø 0111 Hvaler: Tredalen EIS 12 17 May 1986 1 ♀ (ZMO); Arekilen 17 May 1986 1 ♂ (ZMO). AK 0201 Oslo: Østensjøvannet EIS 28 2 July 1986 1 ♀ (ZMO); 0213 Ski: Midtsjøvann 6 July 1983 1 ♂ 2 ♀♀ (ZMB). VE 0922 Nøtterøy: Strengdalsvann EIS 19 5 Sept. 1983 1 ♂ (ZMB); 0923 Tjøme: Kynna EIS 19 17 July 1983 9 ♂♂ 5 ♀♀ (ZMB). TEY 1006 Skien: Limitjern EIS 18 15 June 1986 4 ♀♀ (ZMO).

S. spinipes has been recorded from a few

localities in AK and VE, and apparently it is fairly common in South Eastern Norway.

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The genus *Chyliza* (Psilidae Diptera) in Norway

LITA GREVE & FRED MIDTGAARD

Greve, L. & Midtgaard, F. 1989. The genus *Chyliza* (Psilidae Diptera) in Norway. *Fauna norv. Ser. B* 36, 139—140.

Four species of the genus *Chyliza* (Diptera, Psilidae) were collected at the islands Håøya and Ostøya in inner Oslofjord (Norway) 1984. The collection was made with two Malaise traps at Håøya and three Malaise traps at Ostøya. *Chyliza leptogaster* (Panzer, 1798), *C. nova* Collin, 1944 and *C. vittata* Meigen, 1826 are reported from Norway for the first time. The fourth species, *C. annulipes* Macquart, 1835, has only been reported from Akershus province, Oslo earlier. Also included in this account is all material in Norwegian collections determined as *Chyliza*.

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INTRODUCTION

The small family *Psilidae* (Diptera) has not been subjected to any survey in Norway. Most of the species are not mentioned since the time of Siebke (1877), while others, species of importance as insect pests, are fairly well known.

The *Psilidae* numbers around thirty species in Scandinavia. The family comprises around 130 species (Soós, 1984).

The Norwegian species can be recognized on the wings where there is a distinct break in the costa some distance from the end of the subcostal vein. From this break a weak zone crosses the wing to the posterior edge (Collin, 1944). The other Norwegian *Psilidae* genera have a strongly retreating chin seen in profile. The genus *Chyliza* on the contrary has a face which is concave seen in profile forming an angle with the peristoma.

MATERIAL

During the summers 1982 and 1984 the islands Håøya and Ostøya in the inner part of the Oslofjord was subject to an insect survey. While the main objective has to registrate the fauna of Hymenoptera Symphyta, a high number of other interesting insects were sorted out from the material. Some of this material has been published already, and methods of collection as well as a description of the

localities are given in Greve & Midtgaard (1986).

Four species of the genus *Chyliza* were found on the islands. Three of these: *Chyliza leptogaster* (Panzer, 1798), *C. nova* Collin, 1944 and *C. vittata* Meigen, 1826 are new to the fauna of Norway. It was also decided to include all material determined as *Chyliza* in Norwegian collections.

Siebke (1877) published the only record of a *Chyliza* from Norway (see below). Collin (1944) and Lyneborg (1962) provide keys which can be used on the genus in Norway and Scandinavia.

The material is listed below. Where nothing is noted the material is deposited in Zoological Museum, University of Bergen. The geographical divisions follows Økland (1981). ZMO = Zoological Museum, University of Oslo.

Chyliza annulipes Macquart, 1835

(Syn. *fuscipennis* auct., nec Robineau-Desvoidy, 1830)

Published material: AK 0201 Oslo: Tøyen (EIS 28) 1 ♀ ZMO 11345. This is probably the material mentioned by Siebke (1877) from the botanical garden at Tøyen collected 1 June 1847. He collected also a male at the same time, but this specimen is not present in the collections of ZMO today. Siebke (1877) incorrectly credited Meigen as author.

Unpublished material: Ø 0101 Halden: Prestbakke EIS 12 9—30 June 1986 2 ♀♀. HOY 1801 Bergen: Isdalen EIS 39 3 June 1970 1 ♂. HOI 1924 Kvinnherad: Løfallstrand EIS 31 6 July 1966 1 ♂; Baroniet EIS 31 25 May 1968 1 ♂.

Chyliza leptogaster (Panzer, 1798)

(Syn. *scutellata* Fabricius, 1798)

Unpublished material: AK 0215 Frogn: Håøya EIS 28 Malaise trap A 27 June—22 July 1984 1 ♂; 0219 Bærum: Ostøya EIS 28 Netted 31 May 1984 1 ♂; Malaise trap B 1—24 July 1984 1 ♂. BØ 0728 Hurum: Tofte EIS 28 Malaise trap 2—27 June 1985 1 ♀. RY 1646 Tysvær: Kårstø EIS 14 14 July 1981 Netted 1 ♀.

This is the first record of *Chyliza leptogaster* from Norway. The larvae of this species live in the stem of *Spiraea* (Hennig, 1941).

Chyliza nova Collin, 1944

Unpublished material: AK 0215 Frogn: Håøya EIS 28 Malaise trap A 16—27 June 1984 1 ♂.

This is the first record of *C. nova* Collin, 1944 from Norway. *C. nova* is very similar to *C. leptogaster*—see the key in Lyneborg (1964). At present it has been recorded from Ireland, Great Britain, Denmark and adjacent European parts of USSR (Speight, Chandler, Irwin & de Courcy Williams 1986.) Lyneborg (1964) describes the species as very rare in Denmark.

Chyliza vittata Meigen, 1826.

Unpublished material: AK 0219 Bærum: Ostøya EIS 28 1—24 July 1984 Malaise trap A 1 ♀.

This is the first record of *C. vittata* from Norway. Lyneborg (1964) mentions *C. vittata* from five localities only in Denmark. Dr. W. Hackman, Helsingfors (pers. comm.) has informed me that the species is also rare in Finland.

DISCUSSION

C. annulipes, *C. leptogaster* and *C. vittata* are according to Soós (1984) found all over Europe. *C. vittata*, however, is clearly a rare species in Scandinavia, recorded from the southern parts only. Judged from the scanty material neither of the other two species are common in Norway, and all localities are situated near the coast or at fjords in southern parts.

The larvae of psilids are internal feeders on the tissues —stems/roots-of various low-growing plants, see Chandler (1975). See also Lyneborg (1987). Some records are from roots of *Orchidaceae*. Malaise traps seem to be a suitable method for catching the *Chyliza* imagines.

ACKNOWLEDGEMENTS

We are very grateful to Jan E. Raastad, Zoological Museum, University of Oslo for loan of material. We are indebted to Hugo Andersson, Lund who verified the determination of *C. nova* and *C. vittata*. We are also indebted to Mr. Haagen Oust for permission to operate the traps on Ostøya and to the Ministry of Environment for financial support.

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Short communications

CALLICORIXA CONCINNA (FIEBER) (HEMIPTERA, CORIXIDAE) NEW TO NORWAY

DAG DOLMEN & JAN HENRIK SIMONSEN

Callicorixa concinna (Fieber) is reported new to Norway. The species has been found in three localities, all of which are eutrophic ponds, in Østfold county, SE Norway.

Dag Dolmen University of Trondheim, The Museum, N-7004 Trondheim, Norway.
Jan Henrik Simonsen, Hutaheiti 1, N-4800 Arendal, Norway.

During fieldwork in Østfold county in 1983, 1985 and 1986 the water bug *Callicorixa concinna* (= *Sigara concinna*) (Fieber) was found in three of the investigated ponds. This species has not earlier been recorded in Norway.

The first record (1983, JHS) was made in a small eutrophic pond at Grønli, Jeløya, Moss municipality. The pond has an area of about 100 m², is 2 m deep, and the vegetation is dense. Other species of corixids were *Corixa dentipes* (Thoms.), *C. punctata* (Illig.), *Sigara distincta* (Fieber), *S. dorsalis* (Leach), *S. lateralis* (Leach), *Hesperocorixa linnei* (Fieber) and *Callicorixa praeusta* (Fieber).

The second record (1985, DD) was made in the northernmost of two ponds at Sandaker, Solberg in Råde municipality. The Sandaker pond has been dug out on clayey ground in 1959, and its area is about 2.5 daa, depth about 2 m, pH 6.6 (in May), and specific conductivity (K_{25}) 112 μ S/cm. The vegetation is very scanty, probably due to the low age of the pond, and also to grazing by cattle and heavy manipulation of the water level for watering purposes. Besides, carps *Cyprinus carpio* (L.) were present up till 1975. Many specimens (Table 1) of *C. concinna*, of both sexes, were present in the pond throughout the whole season. Other corixids present were *Sigara fossarum* (Leach), *S. distincta* and *S. limitata* (Fieber).

Table 1. Position of sites and number of specimens caught of *Callicorixa concinna*.

Locality	UTM (32V)	May	June	July	Aug.	Sept.
Grønli	NL 914893				4	
Sandaker	PL 014817	26	2	2	0	1
Kase	NL 906895				17	

The third record (1986, JHS) was made in a pond at Kase, Jeløya. This pond also had been made for watering purposes, forty years earlier, and has relatively dense vegetation. The area is about 1 daa and the depth 2 m. There was a small population of carp in the pond, which had been introduced a few years earlier. In this pond *C. concinna* was the dominating corixid. Other species of corixids were *Corixa dentipes*, *C. punctata*, *Sigara distincta*, *S. fossarum*, *S. lateralis*, *S. semistriata* (Fieber) and *Cymatia bonsdorffi* (C. Sahlb.).

Position of the ponds and the number of specimens caught are listed in Table 1.

In Sweden *C. concinna* is recorded in Skåne, Småland, Öland, Västergötland and Södermanland (Coulianos & Ossiannilsson 1976). On this background the three localities discovered in south-eastern Norway are not surprising.

The material from these investigations is deposited at the University of Trondheim, The Museum and with J. H. Simonsen.

ACKNOWLEDGEMENTS

Parts of the investigations were financed by Økoforsk.

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PSEUDOTEPHRITIS CORTICALIS (LOEW, 1873) (DIPTERA, OTITIDAE) NEW TO FENNOSCANDIA AND DENMARK

BJØRNAR BORGERSEN & LITA GREVE

Pseudotephritis corticalis (Loew, 1873) (Otitidae, Diptera) is reported from Fennoscandia and Denmark for the first time. One female was netted at Klova, near Pauler, Brunlanes community in Vestfold province on 5 July 1987.

Bjørnar Borgersen, Gonveien 61, N-3260 Østre Halsen.

Lita Greve, Zoological Museum, University of Bergen, Muséplass 3, N-5007 Bergen-University.

One female *Pseudotephritis corticalis* (Loew, 1873) was caught at Klova, near Pauler, in Brunlanes community, Vestfold province on 5 July 1987. The specific locality was not noted, but the

specimen was probably netted in the vegetation either near a small brook or near a storing area for timber. There is also possibility that the specimen was caught on some logs.

P. corticalis has a very distinct wing pattern which is easy to recognize among Fennoscandian and Danish Otitidae — see Hennig (1939). In the field it would undoubtedly be believed to be a Tephritidae thus the name *Pseudotephritis* is very fitting. The colour of the head, thorax and most of the abdomen is grey with dark brown spots, varying in size. The aculus is long and shining, the colour blackish-brown.

The biology of *P. corticalis* is unknown.

Soós (1971) made a survey of the distribution of *P. corticalis*. The nearest locality is in North-Western USSR, in the Leningrad area (Stackelberg, 1945). *P. corticalis* is not reported from other countries in Europe (Soós, 1984).

P. corticalis was originally described from the New York area in the USA as *Stictocephala corticalis*. It is difficult to say whether it is common or rare in the Nearctic; the United States National Museum has about 50 specimens in the collection (Allen L. Norrbom p.c.).

Hennig (1939) described a new species under the name *Myennis trypetoptera* based on material of *Pseudotephritis corticalis* from Northwest USSR. *M. trypetoptera* is thus a junior synonym for *P. corticalis*.

ACKNOWLEDGEMENTS

We wish to thank Dr. Allen L. Norrbom, Washington D. C., for information on *P. corticalis*.

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MICROMUS VARIEGATUS (FABRICIUS, 1793) (NEUROPTERA PLANIPENNIA: HEMEROBIIDAE) NEW TO THE FAUNA OF NORWAY

LITA GREVE

Micromus variegatus (Fabricius, 1793) (Neuroptera Planipennia: Hemerobiidae) is reported new to Norway. One male was netted on 24 August 1984 in the province of Aust-Agder / AAY, Grimstad: Eide (EIS 6).

Lita Greve, Zoological Museum, University of Bergen, Muséplass 3, N-5007 Bergen, Norway.

One male of *Micromus variegatus* (Fabricius, 1793) was netted in the province of Austagder / AAY near the city of Grimstad at Eide EIS 6 on 24 August 1984 by Svein Svendsen.

The genus *Micromus* has forewings without a recurrent humeral veinlet unlike the other Norwegian genera in the family *Hemerobiidae*. *M. variegatus* is recognized from the other two Norwegian *Micromus* sp. on the elongate and narrow wings. The wings are crossed by two dark grey fasciae and there are three dark spots in the apical part of the wings. There are three branches of wing ribs to the Radiussector (Rs), *M. variegatus* is the smallest of the genus (in Europe) with a wing-length varying from around five to seven mm.

M. variegatus has a wide distribution in Europe south of Scandinavia and has been recorded from large parts of Asia east to Japan. The distribution in Fennoscandia is distinctly southern. Hitherto *M. variegatus* has recorded from Sweden north to the province of Västergötland, it is wide-spread in Denmark, but not known from Finland (Aspöck, Aspöck & Hölzel, 1980).

During the last decades the lacewings and related group have been well collected in may parts of the south-east Norway. *M. variegatus*, however, has not turned up in these investigations, and there is good reasons to believe that it is rare in Norway. This new record probably represents the northern limit of the distribution in Europe.

The specimen is deposited in the Zoological Museum, University of Bergen.

ACKNOWLEDGEMENTS

I wish to express my gratitude to Svein Svendsen, Stangenes, Kristiansand who collected and gave me the material.

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Received 23 June 1988

**DICERCA AENEA L. (COL., BUPRESTIDAE)
GJENFUNNET I SKANDINAVIA**

KARL ERIK ZACHARIASSEN

The buprestid beetle *Dicerca aenea* (Linnaeus 1761) was captured near Kragerø, Norway, on July 20 1988. One specimen was found on aspen (*Populus tremulae*). The species has not been found in Scandinavia during the last 130 years.

Karl Erik Zachariassen, Zoologisk Institutt, Universitetet i Trondheim, 7055 Dragvoll, Norway.

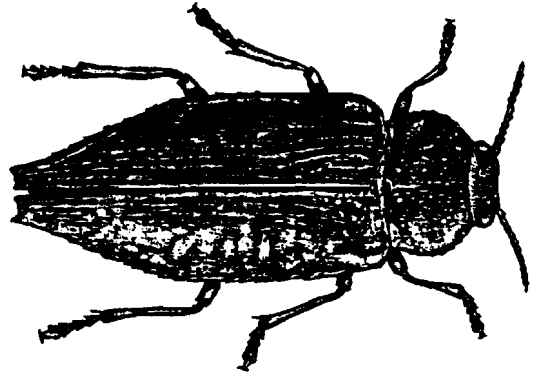
Praktbilen *Dicerca aenea* (Linnaeus 1761) er utbredt i Europa og Sør-Asia (Bily, 1982). Fra Skandinavia foreligger det bare noen få eldre funn: Tolv eksemplarer fra Bekkelaget ved Oslo og to fra Stockholm, alle fra ca. 1850. Dessuten foreligger det en usikker oppgave fra Eiker i Buskerud. De norske eksemplarene befinner seg ved Zoologisk Museum på Tøyen, mens de svenske er ved Museet i Lund (Bily, 1982). På grunn av den lange tiden som var gått siden arten sist var funnet i Skandinavia, var arten ikke oppført i *Catalogus Coleopterorum Fennoscandiae et Daniae* (Lindroth, 1960) og Kvamme & Hågvar (1985) poengterer at artens fortsatte eksistens i Norge trenger bekreftelse.

D. aenea utvikler seg i døde eller døende stammer og grener av osp (*Populus tremulae*) og *Salix* sp. Utviklingstiden er minst 4 år. De voksne billene svermer i mai til august på soleksponte trær (Bily 1982).

20. juli 1988 fant forfatteren et eksemplar av *D. aenea* ved Berg Museum ved Kragerø (TEY). Dyret lå i puppekammeret under bark på en tørr ospestamme. Stammen lå solekspontert, og var brukket ca. 20 cm over roten. Puppekammeret var anbragt bare noen centimetre ovenfor bruddstedet. Stammen var hard utvendig, men ganske morken inni.

Billen var en hunn med lengde 21 mm. Den er noe flatere og mer blankt kobberskinnende enn eksemplarene på Zoologisk Museum i Oslo. Karakterene passer med beskrivelsene gitt av Bily (1982) og av Freude *et al.* (1979), og det kan neppe være tvil om at det dreier seg om *D. aenea*.

Siden billen ble funnet som voksen i puppekammeret, dreier det seg ikke om et tilfeldig inn-



ført individ. At dyret var i puppekammeret i juli, tyder på at *D. aenea*, i likhet med våre andre *Dicerca*-arter, forpupper seg på sensommeren. De voksne billene av våre andre *Dicerca*-arter forlater puppekammeret i august og svermer neste sommer, og det er rimelig å tro at *D. aenea* har en lignende biologi.

Det kan være grunn til å tro at *D. aenea* er etablert rundt Oslo-fjorden, men at den har vært oversett siden funnene i Oslo ble gjort for mer enn 130 år siden. Videre leting på egnede lokaliteter kan høyst sannsynlig gi flere funn av denne svært sjeldne arten.

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Received 22 Nov. 1988

COLEOPTERA NYE FOR NORGE

BJØRNAR BORGENSEN

Athous mutilatus Rosenhauer 1847, *Ampedus cardinalis* Schiødte 1865 (fam. Elateridae), and *Grammoptera ustulata* Scaller 1783 (fam. Cerambycidae) are reported new to Norway.

Bjørnar Borgersen, Gonveien 61 b, N-3260 Østre Halsen, Norway.

Athous mutilatus ble funnet i VE, Larvik: Bøkeskogen, 16 juli 1985. Arten er knyttet til varmekjære trær. Den overvintrer kun som larve, og imago lever bare en kort tid. Arten er meget sky og er muligens et nattdyr (Hansen 1966 a). I følge litteraturen (Hansen 1966a) utvikler *A. mutilatus* seg i hule trær. Dette eksemplaret ble gravd ut av en morken stubbe, antagelig en bøkestubbe.

Ampedus cardinalis ble funnet i VE, Larvik (Burnlanes): Brekkeseter, 11 Juni 1988. I Danmark er denne arten knyttet til gamle og hule eiker. I Sverige er arten unntagelsesvis også funnet i lind og ask (Hansen 1966b). Dette eksemplaret ble funnet under løs bark på en stor eik. Eiken stod enslik på en solrik ås.

Grammoptera ustulata ble slaghåvet blant busker og kratt i en vestvendt skråning. Denne lokaliteten er nå forsvunnet da grunnen er brukt til boligfelt, men lignende lokaliteter finnes i nærheten.

Takk til Stig Lundberg, Sverige, Oddvar Hansen og Karl Erik Zachariassen for kontrollbestemmelse.

LITTERATUR

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NEPHROTOMA QUADRIFARIA (MEIGEN) (DIPT., TIPULIDAE) NEW TO NORWAY

TROND HOFVANG & LARS OVE HANSEN

The crane fly *Nephrotoma quadrifaria* is reported found in Norway for the first time. It was collected from two localities, on the island Langøya in the Oslofjord in 1987, and in Grimstad, Aust-Agder in 1988.

Trond Hofsvang, Norwegian Plant Protection Institute, Dept. of Entomology and Nematology, P. O. Box 70, N-1432 Ås-NLH, Norway.

Lars Ove Hansen, Biological Institute, Dep. of Zoology, University of Oslo, P. O. Box 1050, Blindern, N-0316 Oslo 3, Norway.

In August 1987 two males of *Nephrotoma quadrifaria* (Meigen, 1804) were collected (LOH) in a light trap on the island Langøya in the Oslofjord (Vestfold, Våle. EIS 19). Langøya is a small island of about 1 km², situated about 2 km from the coast, consisting of silurean sedimentary rocks of almost pure limestone and with a high content of fossils. The locality is an open calcareous dry meadow with some trees (*Fraxinus excelsior*, *Acer platanoides*, *Betula* sp., *Pinus sylvestris* and *Salix caprea*) and bushes (*Ligustrum vulgare*, *Crataegus* sp., *Rosa* spp., *Rubus* spp. and *Rhamnus catharticus*).

In 1988 the following specimens of *N. quadrifaria* were collected (TH) in a Malaise trap placed in a deciduous forest, dominated by oak (*Quercus* sp.) in the province Aust-Agder, Grimstad: Hesnes (EIS 6): 23 May—23 June: 1 ♂; 23—28 June 3 ♂♂ and 28 June—7 July: 2 ♂♂. The trap was checked several times later during July and August, but no more specimens of *N. quadrifaria* was recorded.

Including *N. quadrifaria*, 14 species of the genus *Nephrotoma* have been recorded in Norway so far. *N. quadrifaria* seems to have a southern distribution along the Oslofjord and along the coast of Sørlandet. The species is distributed throughout most of Europe, however, in the northern part it has so far only been reported from Denmark and southern Sweden (Skåne, Halland, Öland and Gotland) (Oosterbroek 1978, Tjeder 1955).

ACKNOWLEDGEMENTS

We are greatly indebted to Sigurd Hansen, Espen Bergsmark, Stein Halvorsen and Rolf Hermansen for assistance during the lighttrapping at Langøya.

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Mayr, E. 1913. *Animal species and evolution*. Harvard University Press. Cambridge, Mass.

Fittkau, E.J. 1962. Die Tanypodinae (Diptera, Chironomidae). Die Tribus Anatopyniini, Macropeloponi und Pentaneurini. *Abh. Larvalsystem. Insekten* 6: 453 pp.

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Whitman, I. 1951. The arthropod vectors of yellow fever, pp. 229—298 in: Strode, K. (ed.) *Yellow Fever*. Mc. Graw - Hill, New York & London.

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