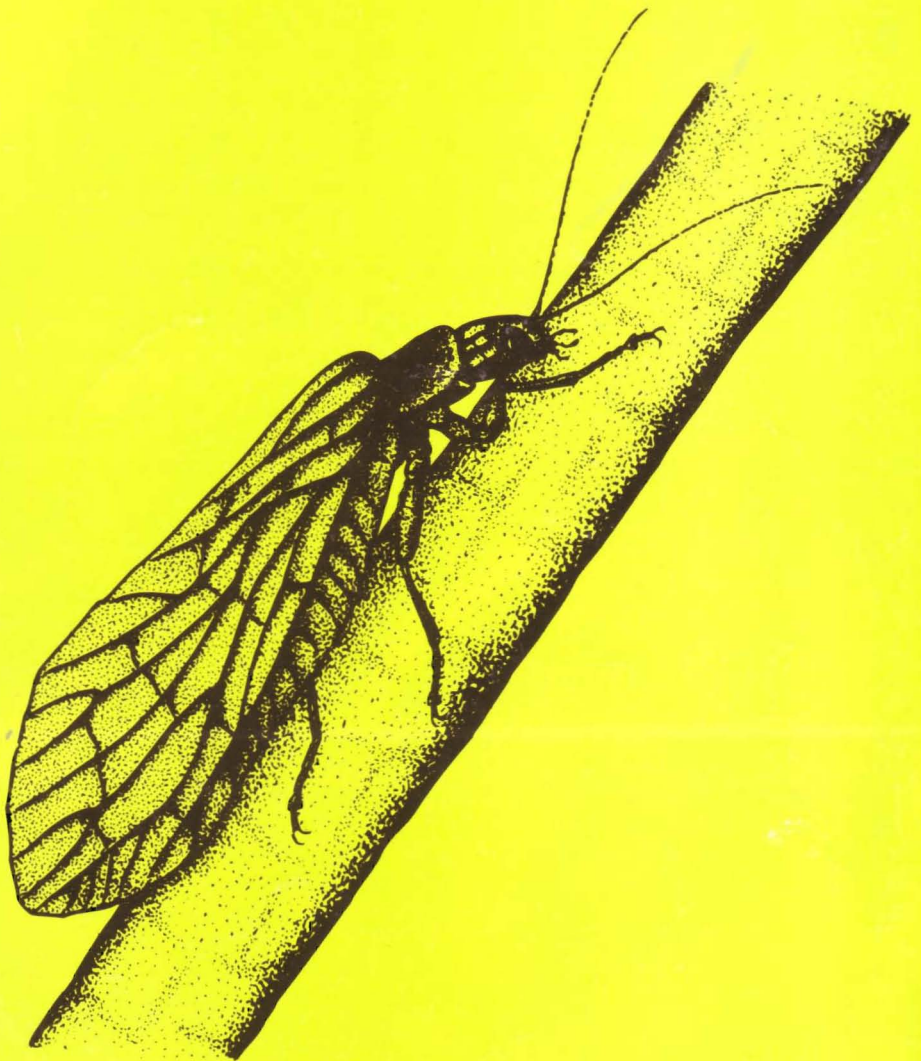


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Faunistic note about Norwegian Scatopsidae (Diptera), with description of a new species

Jean-Paul Haenni & Lita Greve

Haenni, J.-P. & Greve, L. 1995. Faunistic note about Norwegian Scatopsidae (Diptera), with description of a new species. - Fauna norv. Ser. B 42: 71-82.

The 19 species of Scatopsidae recorded till now from Norway are listed, with distributional and ecological comments, on the basis of an examination of recent material and a review of published data. Nine species, *Anapausis rectinervis* Duda, *Apiloscatopse flavicollis* (Meigen), *A. subgracilis* sp. n., *Colobostema infumatum* (Haliday), *C. nigripenne* (Meigen), *Coboldia fuscipes* (Meigen), *Rhexoza richardsi* Freeman, *Swammerdamella genypodis* Cook and *S. sp. (acuta* Cook / *adercotris* Cook) are new records for the Norwegian fauna. One species, *Apiloscatopse subgracilis* sp. n. (Norway, Scotland, Switzerland), is described and figured as new to science. The hitherto unknown female of *Rhexoza richardsi* Freeman is figured and characterized. The Norwegian fauna of the family is briefly discussed and compared with that of neighbouring countries.

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INTRODUCTION

The Scatopsidae are a small family of rather inapparent, minute, black flies with about 85 species in 20 genera recorded from the Palaearctic (Krivoshchina & Haenni, 1986), but many species remain undescribed, even in comparatively well known regions like Europe. Their identification require the study of genital characters. Their uniform external appearance and the presence in many genera of very similar species have resulted in the past in numerous confusions and misidentifications. Accordingly, except for few well recognizable species, most of ancient literature records are not reliable unless relevant material can be checked in museum collections.

Little attention has been given to this family in Norway up to now and old records are very few. One species is recorded by Zetterstedt (1838). Three species are mentioned by the

same author (Zetterstedt, 1850), whose collection was revised recently by Andersson (1978). Siebke (1877) lists 7 species taken by himself or mentioned by Zetterstedt. Later Schøyen (1889) and Lundström (1913) added each one species to the previous lists. More recently, Cook (1974) mentioned the presence of one species in Norway in the course of his revision of Palaearctic species of the family. The most important paper for our knowledge of Norwegian Scatopsidae is the review of Swedish species by Andersson (1982): the presence of 6 species in Norway is documented mainly on the base of material collected by this author, while 2 additional species are cited, apparently from literature sources.

The present paper is a preliminary list based mainly on newly collected material, assembled from varied sources - see acknowledgements - by LG. Although limited in number, this material has significantly increased the

number of species recorded from Norway. Furthermore it includes a species of genus *Apiloscatopse* new to science and the until now unknown female of *Rhexoza richardsi* both of which are described below. In addition, the specimens of Scatopsidae in Siebke's collection have been revised, allowing us to check most of the published records of the family from Norway.

MATERIAL

Most of the material upon which this study is based is deposited in the collections of the Zoological Museum, University of Bergen (ZMB), while the Siebke collection is housed in the Zoological Museum, University of Oslo (ZMO). A few additional specimens from the collections of Museum d'histoire naturelle de Neuchâtel, Switzerland (MHNN) and Michael von Tschirnhaus, Bielefeld, GFR (TSMC) were studied. Identification was carried out by JPH. Literature records from the papers by Andersson (1978: Zetterstedt collection, 1982: Andersson collection ANHS) concern Norwegian material deposited in the Museum of Zoology, Lund, Sweden (MZLU) and identified by Hugo Andersson.

RESULTS

Systematic list

Species recorded as new for the Norwegian fauna are marked with an asterisk (*).

Aspistinae

Arthria analis Kirby, 1837

AK Enebakk: Ekeberg EIS 29, (Pkt 89, window tr.). 60♂ 30♀ ca. 24.5-24.6.1991, B. Økland, ZMB; AK

Enebakk: Vangen EIS 29, (Pkt 85, window tr.), ca. 100♂ 100♀ ca. 26.5-26.6.1991, B. Økland, ZMB. NTI Lierne: Limannvikåsen EIS 108, (Malaise tr.), 1♂ 1♀ 10-27.6.1986, O. Hanssen, ZMB; NTI Verdal: Østre Nes EIS 98, 1 ex. 8.7.1840, J.W. Zetterstedt (Siebke, 1877, under the synonym name *Aspistes borealis*). Andersson (1978) saw 1♀ from Norway in coll. Zetterstedt (MZLU) under the latter name. NSI Mo i Rana, EIS 123, 1♂ 1♀ 25-26.6.1956, H. Andersson, ANHS (Andersson, 1982).

A boreal species recorded from Fennoscandia, Siberia and North America. Already mentioned from Norway by Zetterstedt (1850) and by Siebke (1877). *A. analis* is a rarely collected species, but it was caught in unusually large numbers by means of window traps at Ekeberg and Vangen during the end of May / beginning of Jun., in 10-15 years old conifer stands. These localities are the southernmost European records of the species.

Aspistes berolinensis Meigen, 1818

HES Elverum: Grundset EIS 55, 1♀, H. Siebke, ZMO. The date of capture is 8.8.1870, according to Siebke (1877). Norway, no other data (Andersson, 1982, most probably after Siebke, 1877).

A species bound to sandy areas and distributed over all Europe, including South of Fennoscandia.

Psectrosciarinae

* *Anapausis rectinervis* Duda, 1928

AK Enebakk: Ekeberg EIS 29, (Pkt 89, window tr.), 2♂ ca. 24.5-24.6.1991, B. Økland, ZMB; AK Enebakk: Ekeberg EIS 29, (Pkt 90, window tr.), 8♂ 8♀ ca. 25.5-25.6.1991, B. Økland, ZMB; AK Enebakk: Vangen EIS 29, (Pkt 85, window tr.), 1♂ ca. 26.5-26.6.1991, B. Økland, ZMB; AK Enebakk: Vangen EIS 29, (Pkt 87/6, window tr.), 1♂ ca. 24.5-24.6.1991, B. Økland, ZMB; AK Enebakk: Vangen EIS 29, (Pkt 86/7, window tr.), 1♀ ca. 24.5-

24.6.1991, B. Økland, ZMB; AK Enebakk: Vangen EIS 29, (Pkt 86/5, window tr.), 1♀ ca. 24.5-24.6.1991, B. Økland, ZMB; AK Lørenskog: Losby EIS 29, (Pkt 91/4, window tr.), 1♂ ca. 27.5-27.6.1991, B. Økland, ZMB.

A North and Central European species, in the latter area often restricted to peat-bogs and other marshy grounds, but appearing more widely distributed in the North.

Scatopsinae

Rhegmoclema halteratum (Meigen, 1838)

MRY Smøla: EIS 90, 1♂ 6.8.1849, H. Siebke, ZMO. Mentioned by Siebke (1877) from this locality ("in insula Smølen") under the name *Scatopse halterata* Loew. FN Porsanger: Lakselv EIS 174, 1♀ 5.7.1956, H. Andersson, ANHS (Andersson, 1982).

The commonest of the species of this genus which are usually encountered in marshy or at least wet habitats. *Rh. halteratum* has been recorded from most parts of Europe, including Fennoscandia and Denmark. An older Norwegian record by Zetterstedt (1850) refers in fact to *Rhegmoclema verralli* (Andersson, 1982). Also mentioned from Oslo by Siebke (1877) but specimen no more present in his collection.

Rhegmoclema verralli (Edwards, 1934)

NTI Verdal: Tynes EIS 98, 3♂ 2♀, MZLU (in coll. Zetterstedt, sub nom. *Scatopse halterata* Mg. in Zetterstedt, 1850) (Andersson, 1982). Norway, no other data, MZLU (in coll. Zetterstedt, sub nom. *Scatopse leucopezza* Meig. in Zetterstedt, 1850) (Andersson, 1978).

A North and Central European species, including Fennoscandia.

Rhegmoclemina vaginata (Lundstroem, 1910)

FN Porsanger: Lakselv EIS 174, 6♂ 17♀ 5.7.1956, H. Andersson, ANHS (Andersson, 1982).

A boreal species, known from Fennoscandia and northern North America.

Scatopse lapponica Duda, 1928

FN Porsanger: Lakselv EIS 174, 2♂ 2.7.1956, H. Andersson, ANHS (Andersson, 1982).

A boreal species known from North Eurasia (including Fennoscandia and Scotland) and Canada.

Scatopse notata (Linnaeus, 1758)

Ø Halden: near city of Halden EIS 20, 1♂, H. Siebke, ZMO. VE Tjøme: Tjøme EIS 19, 1 ex. 18.9.1964, 1 ex. 7.5.1965, A. Fjellberg, ZMB. AK Oslo: Christiania [Oslo] EIS 28, 1♀, H. Siebke, ZMO (This specimen was placed under the heading *Scatopse geniculata* Zett. in the collection Siebke. It is obviously the specimen mentioned by Schøyen (1889) under this name); AK Oslo: Oslo (Tøyen) EIS 28, 1♂ 9.1845, 2♀ no date, 1♀ 27.5.1847, 1♂ 30.8.1849, H. Siebke, ZMO. ON Dovre: Fokstua EIS 71, 1♀ 19.8.1849, H. Siebke, ZMO; ON Dovre: loc ? EIS 71 ?, 7♂, H. Siebke, ZMO. BV Rollag: Veggli EIS 35, 1 ex. 5.8.1993, B. A. Sagvolden, ZMB. TEI Tinn: Kalhovd EIS 34, 2 ex. 19.9.1993, B. A. Sagvolden, ZMB. VAI Kvinesdal: Gjemlestad EIS 4, 1 ex. 20.4.1935, N. Knaben, ZMB. RY Finnøy: Sevheim EIS 14, (yellow tr.), 2♂ 1♀ 21.4-3.5.1992, 2♂ 3♀ 8-14.5.1992, 2♀ 28.5-5.6.1992, 2♂ 2♀ 5-17.6.1992, 1♀ 29.7-15.8.1992, 2♂ 21.8-14.9.1993, J. Skartveit; ZMB; RY Finnøy: Sevheim EIS 14, (light tr.), 1♂ 27.5-4.6.1992, J. Skartveit, ZMB; RY Finnøy EIS 14, (Malaise tr.), 1♂, 1♀ 14.9-23.10.1993, J. Skartveit; ZMB; RY Finnøy: Kvitveit EIS 14, (Malaise tr.), 1♂ 23.10-30.11.1993, J. Skartveit; ZMB; RY Sandnes: Lauvåsvåg EIS 7, 1 ex. 22.5.1991, L. Greve, ZMB; RY Bjerkreim: Nedrebø EIS 7, 2 ex. 30.6.1945, N. Knaben, ZMB. RI Forsand: Forsand EIS 7, 1 ex. 24.6.1945, N. Knaben, ZMB. HOY Lindås: Heltveit EIS 40, ex *Fomes fomentarius* 3 years, 1♂ 1♀ 26.4-3.5.1991, K. H. Thunes, ZMB; HOY Askøy: Herdla

EIS 39, 1 ex. 4.6.1936, N. Knaben (?), ZMB. HOI Voss: Mjølfjell EIS 41, 2♂ 29.9-20.10.1991, K. H. Thunes, ZMB; HOI Voss: Mjølfjell, Solbakken EIS 41, 670 m, inside cabin with biological toilet, 3♂ 27.6.1993, L. Greve, ZMB; HOI Voss: Mjølfjell, Solbakken EIS 41, (Malaise tr.), 1♀ 25.7-5.8.1991, L. Greve, ZMB; HOI Ullenvang: Lofthus EIS 32, 1 ex. 28.5.1951, A. Løken, ZMB. SFY Gulen: Indre Takle EIS 49, 2 ex. 27.6.1944, S. Johnsen, ZMB. SFI Leikanger: Hermannsverk EIS 50, 1♀ Summer 1990, S. Røkenes, ZMB; SFI Lærdal: Borgund EIS 51, 1 ex. 23.6.1938, N. Knaben (?), ZMB. TRY Gratangen: EIS 146, 1♀ 29.6.1956, H. Andersson, ANHS (Andersson, 1982); TRY Tromsø: Ramfjordnes EIS 162, garden, 1♂ 9.1991, H. Larsen, ZMB. Norway, no other data, MZLU (in coll. Zetterstedt) (Andersson, 1978).

This unmistakable species was the first to be recorded from Norway (Finnmark and Dovre) by Zetterstedt (1838). Siebke (1877) quotes several localities: Fredrikshald, Christiania, Land, Gudbrandsdal, Filefjeld (Nystuen), Dovre, Romsdal (Veblungsnæs) and Smølen island (Nordmøre) and the quite numerous specimens kept in his collection in ZMO under this name all belong to this species.

A common, cosmopolitan species, often occurring under anthropogenic conditions. Larvae can develop in a wide variety of decaying organic material, both vegetal or animal. The commonest scatopsid species in Norway, widespread, especially in the southern half of the country.

Reichertella geniculata (Zetterstedt, 1850)

SFI Balestrand: Balestrand EIS 50, 1♂ 28.7.1954 (Cook, 1974).

A species largely distributed in Europe, including South of Fennoscandia and Denmark. The species is mentioned by Schøyen (1889) as having been caught by Siebke near Christiania, but this record is obviously based upon a wrong identification since the specimen under the name *Scatopse*

geniculata Zett. from this locality in the collection Siebke is a female of *Scatopse notata*. Depository of the specimen mentioned by Cook (1974) not known.

* *Apiloscatopse flavicollis* (Meigen, 1818)

AK Nesodden: Fagerstrand EIS 28, edge of forest (light tr.), 1♂ 31.8-1.9.1994, 1♂ 1♀ 5-6.9.1994, 5♂ 2♀ 6-7.9.1994, 1♀ 21-22.9.1994, S. Kobro, ZMB.

A widely distributed and common European species, generally bound to deciduous forests. In Northern Europe, already mentioned from Sweden, Finland and Denmark.

[*Apiloscatopse scutellata* (Loew, 1846)]

Recorded by Lundström (1913) from BØ Krødsherad (coll. Strand), but this is a dubious record. Although not present in recent material, this species which is largely distributed in Europe might possibly occur in Norway, since it has been found in Southern Sweden (Andersson, 1982).

* *Apiloscatopse subgracilis* sp. n. (Figure 1-7)

Type locality. Norway, STI Oppdal: near Sprænbekken EIS 79, 1300 m.

Type-specimens. Holotype ♂ (ZMBN 221), allotype ♀, and 47 paratypes (15♂♂ and 32♀♀), 19-22.8.1992, John Skartveit leg. Holotype and allotype slide mounted, paratypes preserved in alcohol, all in ZMB, apart from 2♂♂ and 2♀♀ paratypes in coll. JPH, MHNN. Other paratypes: STI Oppdal: Kongsvoll (Dovre fjell national Park) EIS 79, 900 m, (Malaise tr.), 1♀ 22-28.7.1992, . Skartveit, ZMB; STI Oppdal: S. Knutshø (Dovre fjell National Park) EIS 79, 1080 m, (yellow tr.), 1♀ 15-19.8.1992, J. Skartveit, ZMB; STI Oppdal: Sprænbekkskardet EIS 79, ca. 1500 m, 1♂ 1♀ in coitu 27.7.1992, J. Skartveit, ZMB; STI Oppdal: near Sprænbekken EIS 79, 1250 m, (yellow tr.), 1♂ 1♀ 7.8.1992, J. Skartveit, ZMB; STI Oppdal: near Sprænbekken EIS 79, ca. 1200 m, (yellow tr.), 1♀ 15-19.8.1992, J. Skartveit, ZMB; STI Oppdal: near

Sprænbekken EIS 79, 1300 m, (yellow tr.), 1 ♀ 19-22.8.1992, J. Skartveit, ZMB; STI Oppdal: near Sprænbekken EIS 79, 1440-1460 m, (yellow tr.), 2 ♂ 23-27.7.1992, J. Skartveit, ZMB; STI Oppdal: near Sprænbekken EIS 79, 1400-1450 m, 3 ♂ 4 ♀ 19.8.1992, J. Skartveit, ZMB.

Other material examined:

HOI Ulvik: Finse, Kvannjolsnut EIS 42, ca. 1250-1300 m, lower middle alpine area, (Malaise tr.), 4 ♂ 2 ♀ ca. 28.8.1991, C. Ihlebæk & S. Kjøberg, ZMB; HOI Ulvik: øst Mjølfjell, near Langvasstø EIS 41, 795 m, 4 ♂ 15.8.1993, L. Greve, ZMB. SFI Aurland: near Østerbø EIS 42, 820 m, near birch forest (Malaise tr.), 1 ♂ 8-12.8.1994, L. Greve, ZMB; SFI Aurland: Upsete station EIS 41, 820 m, flowering meadow (Malaise tr.), 5 ♂ 3 ♀ 31.7-21.8.1994, 11 ♂ 79 ♀ 21.8.- 4.10.1994, L. Greve, ZMB. MRY Haram: Løvøya, Farstad EIS 83, herbage of beech and hazel, (Malaise tr.), 1 ♂ 21.6-5.7.1991, E. Amundsen, ZMB. TRI Målselv: Kirkedalen, Bjørkås-setra EIS 147, 425 m, birch forest, ca. 40 ♂ 400 ♀ ca. 25.8-12.9.1992, J.O. Solem, ZMB; TRI Målselv: Kirkedalen, Lappskaret EIS 147, 870 m, above tree border, 1 ♀ 25.8-12.9.1992, J.O. Solem, ZMB; TRI Målselv, Kirkedalen, Lappskaret EIS 147, ca. 870 m, alpine zone, (Malaise tr.), 2 ♀ 12-25.8.1992, J.O. Solem, ZMB. Scotland, Grampian: 3.5 km NW Balmoral, River Dee, Crathie Burn (3°16'6W/57°3'54N), 545 m, heath with *Carex*, *Juncus*, *Sphagnum*, *Vaccinium*, 4 ♂ 14.8.1987, M. Schneider, TSMC (L1012). Switzerland, VS: Oberwald, 1820 m, 2 ♂ 1 ♀ 13-15.8.1975, G. Bächli, ZMZ/MHNN.

Diagnosis. Among species of *Apiloscatopse* with entirely dark notum and scutellum, *A. subgracilis* sp. n. can be recognized in male by shape and transverse position of gonostyles, and shape of posterior projections of epandrium; in female, by rather quadrate shape of lateral lobes of tergite 8.

Description. Head, thorax and abdomen shining black, with notum entirely dark except for the usual pair of postalar light spots; legs dark except basal 2/5 of fore and mid tibiae lighter, reddish-brown, hind tibia generally reddish-brown except for a submedian darker ring,

first tarsomere lighter. Pilosity light, denser on notum and legs. Wings hyaline, very slightly tinged with brownish, anterior veins brownish. Halteres white, with yellowish stem. Male. Head. Antennae twice as long as height of head, appearing 10-segmented with 2 basal segments longer than high, flagellomeres wider than long, except last one more than 1.5 time as long as wide, rounded at apex. Palp elongate, rounded at apex, with a long complex upper subapical sensorial pit. Labellum twice as long as palp.

Thorax as usual in genus. Wings (**Figure 1**) 2.5-3 mm long. Legs simple, as usual in genus, hind femora strongly sinuous (**Figure 2**).

Abdomen. Tergites 1-7 well sclerotized, 1-3 practically entirely devoid of pilosity except on posterior margin, 4-5 pilose on posterior half, 6-7 more largely pilose; T₁ deeply divided medially by a longitudinal weakly sclerotized line; T₇ (**Figure 3**) strongly sclerotized, evenly rounded posteriorly with a pair of lateral somewhat rounded weakly marked lobes. Sternite 1 unsclerotized, 2-7 sclerotized, with sparse pilosity on whole surface; st₇ slightly asymmetrical (**Figure 3**), strongly emarginate posteriorly, with a median weakly sclerotized zone; spiracles 1-6 on phragma, 7 on extreme margin of tergite (**Figure 3**).

Genitalia (**Figure 4-6**) capsule-like as usual in genus, rotated 180°, with so deeply modified pieces that some homologies remain obscure; epandrium (**Figure 4-5**) ending into a rounded posterior pilose projection adorned by a narrow beak-like projection; gonostyles (**Figure 4-5**) strongly sclerotized, acute at apex, at right angle to long axis of genital capsule; penis valves (**Figure 6**) large, jointed by a bridge of fibrous tissue and apparently articulated with a pair of lateral bristled appendages; penis (**Figure 4**) bifurcate, with shorter branch bearing the genital aperture, hook-like, enlarged subapically.

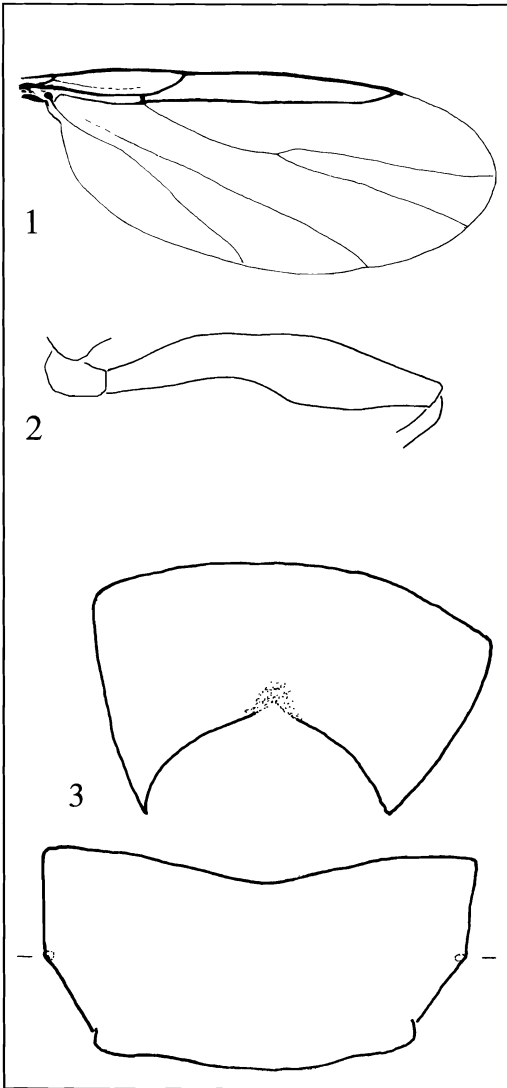


Figure 1-3
Apiloscatopse subgracilis sp. n. ♂ - 1. Wing. - 2. Left hind femur. - 3. Outline of pregenital segment: sternite 7 (above), with weakly sclerotized area (stippled) and tergite 7 (below) with location of spiracles.

Female. Very similar to male in all aspects. Abdomen. Tergites with short and sparse pilosity, denser on last tergite; T_1 with a median weakly sclerotized line nearly reaching posterior margin; T_7 longer than preceding tergite,

symmetrical, posteriorly with a weakly sclerotized median indentation. Sternites 1-2 narrow, hardly sclerotized, 3-7 well sclerotized, with pilosity becoming denser on last segments; st_7 (Figure 7) emarginate posteriorly.

Genitalia (Figure 7). Tergite 8 transversely divided, as usual in genus, bearing a pair of dorsal sublateral spiracles; cerci normally developed; sternite 8 (Figure 7) entirely divided, with lobes large and quadrate, square angled at inner apex; a pair of strongly sclerotized transverse folds may represent the valvifers 8; valvifers 9 a pair of densely pilose triangular lobes. Spermatheca somewhat elongated, regularly ovate.

Derivation of name. The adjective *subgracilis* refers to the affinity of the new species with *A. gracilis* (Duda).

Distribution. Presently known only from Norway (HOI, SFI, MRY, STI and TRI), Scotland (Grampian) and Switzerland (VS). Should possibly also occur in Sweden (see discussion below).

Ecology. *A. subgracilis* is apparently quite widely distributed at high altitudes in Norway, generally in the vicinity of the forest border-line, sometimes lower as in Østerbø, sometimes much higher, as in Kongsvoll and Finse. In this respect, the low altitude record from Løvøya, an island with mild winter and wet summer, is rather surprising but the unique specimen taken in this locality is similar in all respects, including genital characters, to material from other localities. According to its altitude, the only record from Central Europe (Alps of Switzerland) should also concern the forest border-line.

Discussion. The genital characters of *A. subgracilis* sp. n. are very distinctive in both male and female sex and there is no doubt concerning the validity of this taxon. It clearly

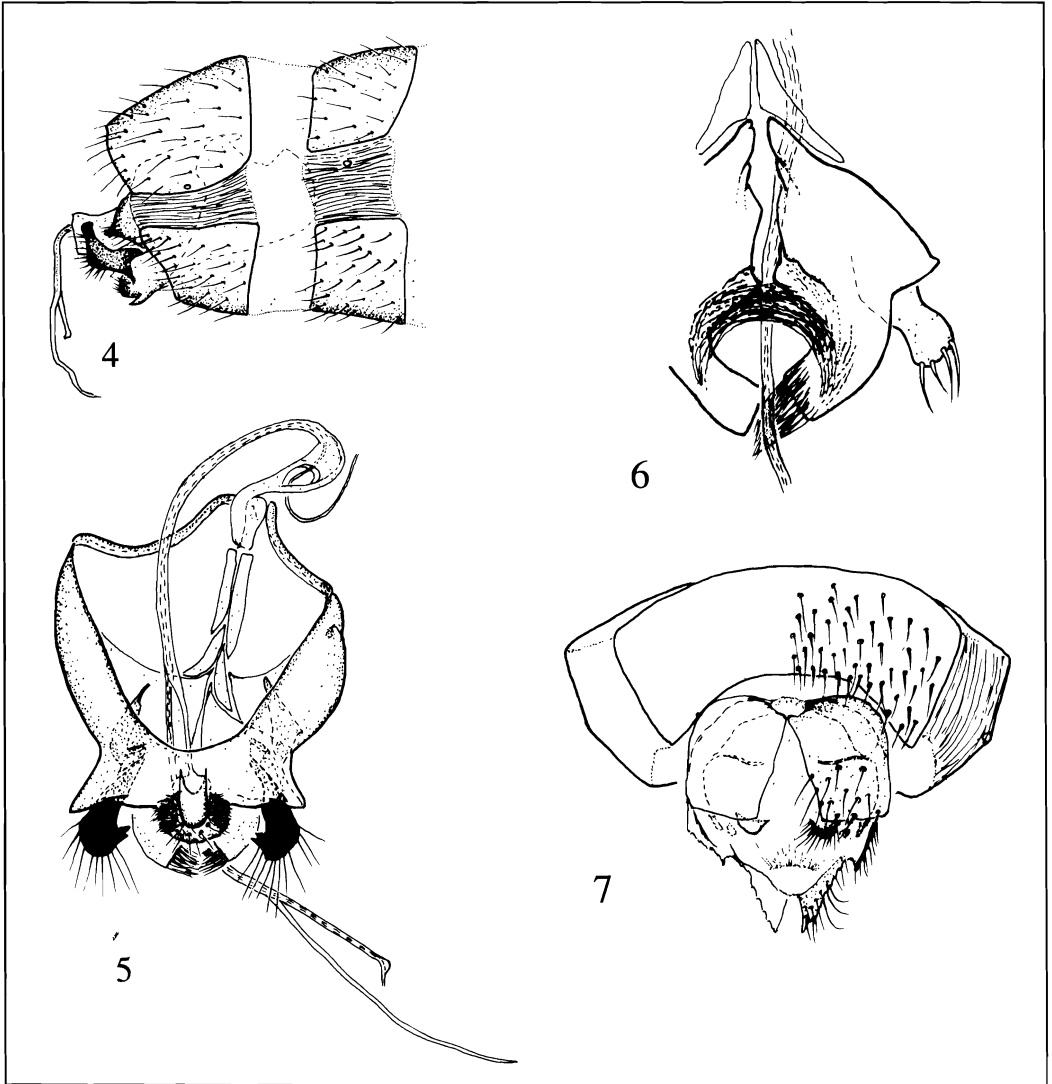


Figure 4-7

Apiloscatopse subgracilis sp. n. - 4. Tip of abdomen of ♂ (side view, macerated). - 5. Genital capsule ♂ (dorsal aspect, ventral view). - 6. Detail of penis valves of ♂ (ventral). - 7. Last segment and genitalia of ♀ (ventral view).

belongs to the group of European species with entirely dark notum and scutellum, symmetrical or hardly asymmetrical segment 7 in male, tergite 8 deeply divided in large lateral lobes in female. The new species is closely related to *A. fuscohalterata* (Duda), *A. gracilis* (Duda) and a still undescribed species from

the French Pyrenees collected by JPH and to be described elsewhere. It is also related to a lesser extent to *A. flavocincta* (Duda) and *A. styriaca* (Enderlein). In the key to the Palearctic species of *Apiloscatopse* by Cook (1974), it runs to *A. fuscohalterata* (in male sex). In the monograph by Duda (1928), the

species keys out to *Scatopse gracilis*. Thus, the Swedish record of this species from Vadvettjåkko in Abisko National Park (Edwards, 1937) might rather apply to *A. subgracilis*, since *A. gracilis* is apparently an exclusively Central European species.

***Cookella albitarsis* (Zetterstedt, 1850)**

RY Finnøy: Sevheim EIS 14, (yellow tr.), 1♂ 1♀ 29.7-15.8.1992, J. Skartveit, ZMB.

Also caught by Siebke (1877) in the vicinity of Oslo, but this is a dubious record.

A widespread European species, already known from South of Fennoscandia (Sweden and Finland).

*** *Colobostema infumatum* (Haliday, 1833)**

AK Lørenskog: Losby EIS 29, (Pkt 95/6 window tr.), 1♀ ca. 28.5-28.6.1991, B. Økland, ZMB. RY Finnøy: Sevheim EIS 14, (light tr.), 1♂ 27.5-4.6.1992, J. Skartveit, ZMB. NTI Lierne: Kveskallen EIS 108, 350 m, spruce forest (10 m high), (Malaise tr.), 2♂, 380 m, old parts of tree stumps and twigs in 3 years old felling area, 1♂ 27.6-15.7.1986, O. Hanssen, ZMB. FØ Pasvik: Kobbfoss (5 km NW) EIS 160, marshy meadow in birch wood, 1♂ 4.7.1991, M. von Tschirnhaus, TSMC (X746).

C. infumatum has long been synonymized with *C. nigripenne* but it is a very distinct and well recognizable taxon (Haenni, in press). It is a North and Central European species, and possibly myrmecophilous. It is restricted to peat-bogs and heath-land in the southern part of its distribution. In the North, it seems largely distributed in various biotopes.

*** *Colobostema nigripenne* (Meigen, 1830)**

AK Lørenskog: Losby EIS 29, (Pkt 97/2 window tr.), 1♀ ca. 29.5-29.6.1992, B. Økland, ZMB; AK Lørenskog: Losby EIS 29, (Pkt 92/1 window tr.),

1♂ ca. 27.5-27.6.1991, B. Økland, ZMB; AK Nesodden: Fagerstrand EIS 28, border of mixed deciduous forest, (light tr.), 1♂ 3-4.7.1991, ♂ 28-29.7.1991, S. Kobro, ZMB. HOY Bergen: Starefoss EIS 39, 1♀ 10.5.1935, N. Knaben, ZMB.

The commonest species of the genus, distributed over all Europe. Probably myrmecophilous.

*** *Coboldia fuscipes* (Meigen, 1830)**

AK Nesodden: Fagerstrand EIS 28, 1♀ 5-6.8.1991, 1♂ 7-8.8.1994, S. Kobro, ZMB. RY Finnøy: Sevheim EIS 14, (light tr.), 1♀ 15-28.8.1992, J. Skartveit, ZMB; RY Finnøy: Sevheim EIS 14, (yellow tr.), 2♂ 28.5-5.6.1992, 1♂ 5-17.6.1992, 6♂ 4♀ 29.7-15.8.1992, J. Skartveit, ZMB. NSY Bodø: Løding EIS 130, marshy zone at sea shore, on Umbelliferae, 11♂ 8♀ 1.8.1981, J.-P. Haenni, MHNN.

A very common and widespread cosmopolitan species, often occurring under anthropogenic conditions. Larvae develop in a wide variety of media, including all kind of decaying organic material.

*** *Rhexoza richardsi* Freeman, 1985 (Figure. 8-9)**

AK Enebakk: Vangen EIS 29, (Pkt 86/9 window tr.), 1♀ ca. 24.5-24.6.1991, B. Økland, ZMB; AK Enebakk: Vangen EIS 29, (Pkt 86 window tr.), 1♂ 24.6-29.7.1991, B. Økland, ZMB; AK Lørenskog: Losby EIS 29, (Pkt 91/5 window tr.), 1♀ ca. 28.5-28.6.1991, B. Økland, ZMB.

A rare and poorly known species, only recorded till now from the type locality in England (Freeman, 1985).

This recently described species was known only by the male holotype. The male from Vangen fits well with the original short description and drawings of tip of abdomen and genitalia. The female is very similar to the male in all respects. Wing length 1.6-1.8 mm.

Pregenital segment unmodified. Spermatheca oval, elongate. The female genitalia, which are very distinctive, are figured here for the first time, on the base on the 2 specimens from Vangen and Losby (**Figure 8-9**).

***Swammerdamella brevicornis* (Meigen, 1830)**

AK Oslo: EIS 28, 1♂, H. Siebke, ZMO; AK Oslo: Tøyen EIS 28, 1♀ 10.8.1851, H. Siebke, ZMO; AK Oslo: Bekkelaget EIS 28, 1♂ 3.7.1852, H. Siebke, ZMO; records of *Scatopse brevicornis* Meig. from these localities by Siebke (1877); AK Enebakk: Ekeberg EIS 29, (Pkt 88/7 window tr.), 1♂ 26.5-26.6.1991, B. Økland, ZMB; AK Enebakk: Vangen EIS 29, (Pkt 86/5 window tr.), 2♂ 1♀ ca. 24.5-24.6.1991, B. Økland, ZMB; AK Nesodden: Fagerstrand EIS 28, (light tr.), 1♀ 22-23.8.1991, S. Kobro, ZMB. ON Sel: Lårgård EIS 71, 1♂ 18.7.1853, H. Siebke, ZMO. HOY Lindås: Heltveit EIS 40, ex *Fomes fomentarius* 3 years, 1♀ 8-20.6.1991, K. H. Thunes, ZMB; HOY Os: Åsen EIS 31, ex *Piptoporus betulinus* 2 years, 1♀ 8-20.6.1991, K. H. Thunes, ZMB; HOY Bergen: Nattland, EIS 30, 1♂ 4♀ 7.8.1936, 1♂ 8.8.1936, N. Knaben, ZMB. SFI Leikanger: Hermannsverk EIS 50, Njøs forsk gård., (window tr.), 1♂ 20.6.1990, S. Røhenes, ZMB. MRY Haram: Løvøya, Sethdammen EIS 83, (Malaise tr.), 1♀ 5-18.7.1992, E. Amundsen, ZMB. NSY Bodø: Løding EIS 130, marshy zone at sea shore, on Umbelliferae, 1♀ 1.8.1981, J.-P. Haenni, MHNN.

A common and widespread species, distributed over all Western Palaearctic. Life-cycle not known but the larvae probably develop in various organic media. The specimens from Lindås reared from two different species of Polyporaceae are apparently the first records of this species from fungi.

* ***Swammerdamella genypodis* Cook, 1972**

HES Ringsaker: Helgøya, Hovindsholm EIS 45, near deciduous forest, (Malaise tr.) 1♀ 29.6-27.7.1991, A. Bruserud, ZMB.

A rare species, recorded in the literature only from Finland and Sweden, but unpublished

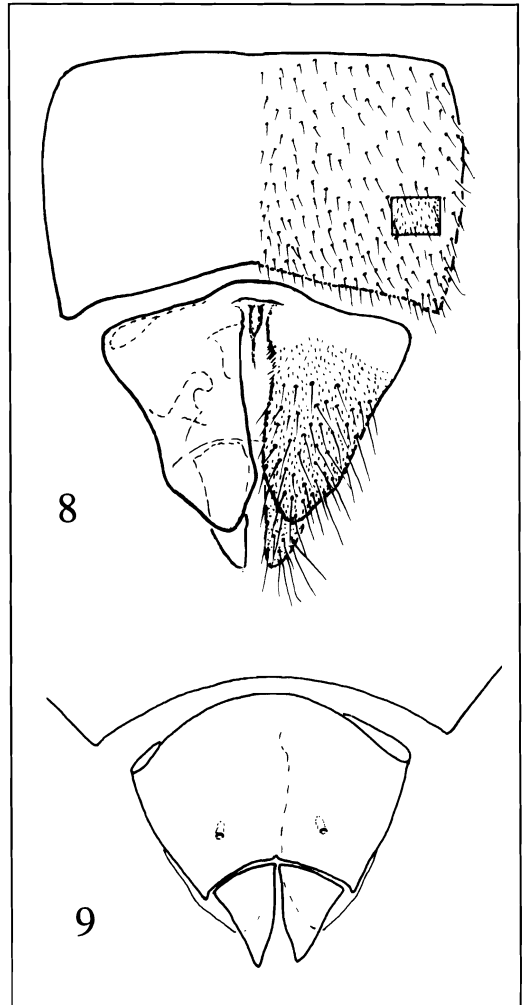


Figure 8-9

Rhexoza richardsi Freeman, 1985, ♀. - 8. Ventral view. - 9. Diagrammatic dorsal view.

material originating from different Central European countries in collection of JPH. Possibly myrmecophilous.

* ***Swammerdamella* sp. (*acuta* Cook, 1956 or *adercotris* Cook, 1972)**

HOY Tysnes: near river Vevatn EIS 31, 1♀ 1.7.1992, L. Greve & G. Bakkerud, ZMB.

Both species are quite largely distributed in North and Central Europe, but apparently rare. The presence of a second new species (*S. adercotris*, in male only) in the type series of *S. acuta* does not make it possible to identify with certainty the female described as *S. acuta*. None of these two species have earlier been recorded from Norway.

[*Scatopse leucopeza* Meigen, 1818]

This species has never been recognized clearly and the name has been tentatively attributed to specimens belonging to various scatopsid species by subsequent authors. Siebke (1877) mentions the record of a specimen from Oslo Botanical Garden of what he considers could be "*Scatopse leucopeza* Meig. ?, Zett.". However, the specimen present under this name in his collection in ZMO does not belong to Scatopsidae, but to Ceratopogonidae. This name must therefore be deleted from the list of Norwegian Scatopsidae.

DISCUSSION

It should be stressed that all the material dealt with in this study has not been systematically collected for Scatopsidae, but on the contrary has been sorted out from material collected for other purposes. In this connection, it is interesting to note that trapping by window-traps in the forest project by B. Økland produced many specimens. Malaise traps and yellow trays are also very effective but sorting out of Scatopsidae from the huge amount of insects collected by these traps is very time consuming.

With only 19 species (plus 1 only known from old dubious record) of Scatopsidae, Norway appears to be poor in contrast to Sweden (37 species, Andersson, 1982) or even to Finland (26 species, Hackmann, 1980). However, this low number probably reflects mainly lack of

collecting effort. There is little doubt that study of more extensive material would result in the discovery of a series of presently unrecorded species, especially in the southern part of the country. The total number of species to be expected from Norway is around 30.

The southern provinces (south of Trøndelag) are considerably richer than the rest of country. Fifteen species have been recorded so far from this part, while there are only six from the central and northern provinces. Five species are now known from all parts of Norway, i. e. *Arthria analis*, *Scatopse notata*, *Apiloscatopse subgracilis*, *Colobostema infumatum* and *Swammerdamella brevicornis*. Eight species seem exclusively southern (*Aspistes berolinensis*, *Anapausis rectinervis*, *Reichertella geniculata*, *Cookella albitarsis*, *Colobostema nigripenne*, *Swammerdamella genypodis*, *Sw. sp.* and *Rhexozia richardsi*). Only 2 species, *Rhegmoclemina vaginata* and *Scatopse lapponica*, show a restricted northern distribution. Nevertheless, these figures are probably biased by the still uncomplete prospection of the country, since *A. rectinervis* for example has a much wider distribution in Sweden (Andersson, 1982).

From a zoogeographical point of view, the composition of the Norwegian fauna is as follows. Three species, *Arthria analis*, *Rhegmoclemina vaginata* and *Scatopse lapponica* are boreal species with holarctic distribution. Five species, *Anapausis rectinervis*, *Rhegmoclema verralli*, *Colobostema infumatum*, *Swammerdamella genypodis* and *Swammerdamella sp.* are European species with main distribution in the North and extensions into Central and sometimes Western Europe. The new species *Apiloscatopse subgracilis* could also belong to this group, unless it is a true boreo-alpine element, but present records are still too scanty to make a decision. The following 7 species, *Aspistes berolinensis*, *Rhegmoclema halteratum*, *Reichertella geniculata*, *Cookella albitarsis*, *Colobostema nig-*

ripenne, *Apiloscatopse flavicollis* and *Swammerdamella brevicornis* have a large distribution including all parts of Europe, the latter with a still more wider distribution extending over the whole of West Palaearctic. One species, *Rhexosa richardsi*, presently known from 2 localities only, in Norway and Great Britain, is still insufficiently known. The 2 remaining species, the cosmopolitan *Scatopse notata* and *Coboldia fuscipes* are practically worldwide in distribution.

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SAMMENDRAG

Faunistisk rapport om norske Scatopsidae (Diptera), med beskrivelse av en ny art

Det ergite en oversikt over funn av gjødselmygg (Scatopsidae, Diptera) i Norge, med beskrivelse av en ny art *Apiloscatopse subgracilis* sp. n. og beskrivelse av den hittil ubeskrevne hunnen av arten *Rhexosa richardsi* Freeman, 1985. I alt er det funnet 19 arter og

av disse er 9 nye for landet, *Anapausis rectinervis* Duda, *Apiloscatopse flavicollis* (Meigen), *A. subgracilis* sp. n., *Colobostema infumatum* (Haliday), *C. nigripenne* (Meigen), *Coboldia fuscipes* (Meigen), *Rhexosa richardsi* Freeman, *Swammerdamella genypodis* Cook og *S. sp. (acuta* Cook / *adecotris* Cook). Den norske faunaen av gjødselmygg er kort diskutert og sammenlignet med faunaen i naboland.

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Distribution and flight periods of *Bibio* Geoffroy, 1762 species (Diptera, Bibionidae) in Norway, with a key to the species

John Skartveit

Skartveit J. 1995. Distribution and flight periods of *Bibio* Geoffroy, 1762 species (Diptera, Bibionidae) in Norway, with a key to the species. - Fauna norv. Ser. B 42: 83-112.

The distribution and flight periods of species of the genus *Bibio* Geoffroy in Norway is given and discussed. Previous literature is referred to and a key to the species is presented. Fourteen species occur in Norway, and they can be divided into widely distributed, eurytopical species, boreoalpine species and southern coastal species. Maps of records are given for each species.

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INTRODUCTION

The genus *Bibio* is an almost cosmopolitan group of flies that is most diverse in the Palaearctic and Nearctic regions. Many of the species are quite common where they occur and may form conspicuous mass aggregations. Most species are inhabitants of meadows and other grass-covered areas but some are found mainly in forests. Flies of the genus *Bibio* are common inhabitants both of coastal sand dunes (Hüsing and Koopmann 1988) and of alpine areas. The larvae live mostly on decaying plant material in the upper layers of the soil. Some species may occasionally damage crops by eating roots, seeds and seedlings (Bovien 1932, Bollow 1954, Savage 1977), but they do not normally cause any harm.

The distribution of the genus *Bibio* as a whole in Norway has not been considered since Siebke (1877). This article reviews all material available in Norwegian museums, and the collections of the Museum of Zoology, Uppsala, Sweden and the Central Museum of Natural History, Helsinki, Finland, in addition to some material collected by the author.

PREVIOUS RECORDS

Zetterstedt (1838,1850) mentioned nine species of *Bibio* from Norway, of which two are not considered to be good species today. Siebke (1853) recorded two species from Gudbrandsdalen, Eastern Norway. Siebke (1864) listed three species from the Dovrefjell mountains, one of which was described as a new species, *Hirtea femoralis* Siebke. The currently valid name is *Bibio siebkei* Mik. Siebke (1877) listed thirteen species names, among them two that are not now thought to be good species, in his catalogue of the Norwegian Diptera. Schøyen (1884) recorded mass occurrences of *Bibio pomonae* (Fabricius) on two occasions. All these early authors used the name *Hirtea* Fabricius for *Bibio*.

Storm (1907) recorded three species as present near Trondheim. Lundström (1913) gave some new records, *B. lanigerus* Meigen being recorded from Norway for the first time.

Greve et al. (1984) listed four named species from the Dovrefjell mountains, and also two

species that they felt unable to identify with certainty. They also considered the species' flight periods in that area. Greve (1986) recorded *Bibio marci* (L.) as new to Norway. Greve et al. (1987) identified one of their previously unidentified species as *Bibio nigriventris* Haliday. The Norwegian distribution of this species was dealt with by Greve (1987). Greve and Haenni (1994) treated the Norwegian records of *Bibio lautaretensis* Villeneuve.

MATERIAL AND METHODS

Collections by the author were mainly carried out at RY, Finnøy (EIS 14) and STI, Oppdal: Kongsvoll (EIS 79). Most specimens were collected with Malaise traps and yellow water trays but a number of specimens were also sweep-netted, hand-picked from vegetation or bred from field-collected larvae and pupae. A mercury vapour light trap was also operated one summer at RY, Finnøy, this, however caught just a few specimens of *Bibio*. More scattered collection and observations of behaviour were carried out in the vicinity of HOY, Bergen (EIS39/40).

Most records were based upon specimens deposited in various museum collections. The bulk of the material examined originate from the collection of Museum of Zoology, Bergen, Norway (ZMB). In the lists of material examined, specimens are from this collection unless otherwise stated. Other collections are abbreviated as follows: CNC: Canadian National Collection of Arthropods, Ottawa, Canada; ITZA: Institute of Taxonomic Zoology, Amsterdam, The Netherlands; JS: author's collection; KR: private collection of Knut Rognes, Stavanger, Norway; NPPI: Norwegian Plant Protection Institute; Ås, Norway; RM: Rana Museum, Mo i Rana, Norway; TJ: private collection of Terje Jonassen, Sjernarøy, Norway; VMT:

Vitenskapsmuseet, Trondheim, Norway; TM: Tromsø Museum, Norway; ZMH: Central Museum of Natural History, Helsinki, Finland; ZML: Museum of Zoology, Lund, Sweden; ZMO: Zoological Museum, Oslo, Norway; ZMU: Museum of Zoology, Uppsala, Sweden. *Bibio* species can be identified solely by external characters and no additional processing of the specimens was necessary for identification. The specimens were identified according to Duda (1930) except that *Bibio lepidus* Loew and *Bibio marci* (L.) were considered to be good species and not merely varieties as stated by Duda. Distributional maps were plotted as presence or absence of records in EIS-grid (modified 50 x 50 km) squares (Økland 1976). A key to the species was constructed, based upon the keys of Duda (1930) and Freeman and Lane (1985) with some modifications.

RESULTS

The Norwegian material was found to consist of fourteen species of *Bibio*. Distributions and flight periods of each species is treated separately in the following part.

The *Bibio* species can be recognized from *Dilophus* species by their thick protibiae with two apical spurs, and by their lack of rows of spines on the thorax. *Bibio* and *Dilophus* are the only bibionid genera occurring in Norway.

Key to the Norwegian species of *Bibio*

1. Cross-vein r-m short, about half the length of the basal part of vein R_{4+5} . (**Figure 1**) **2**
 - Cross-vein r-m considerably longer than half the length of the basal part of vein R_{4+5} . (**Figures 2-3**) **3**
2. Femora red *pomonae* (Fabricius)
 - Femora black *marci* (L.)

(*Bibio hortulanus* (L.) will also key out here. It can be distinguished from *B. marci* as follows: Male abdominal pleurae with long, white pilosity in *B. hortulanus*, short and black in *B. marci*. Female mesonotum mostly red in *B. hortulanus*, entirely black in *B. marci*. Female wing membrane clear in *B. hortulanus*, blackish in *B. marci*).
3. Hind femorae of male slender in the basal half, expanding more distally. Legs of male all black, hind basitarsus conspicuously swollen (**Figures 4-5**). Legs of female long and slender. **4**
 - Hind femora of male not both slender in the basal half and black. Hind basitarsus of male not as conspicuously swollen (**Figures 6-10**). Legs of female of moderate length. **5**
4. Pterostigma large and brown, extending well into costal cell (**Figure 3**). Wings clear. Male hind basitarsus more than three times as long as wide in lateral view (**Figure 5**). Female mesonotum all black. *lepidus* Loew
 - Pterostigma inconspicuous and pale, not pigmented in the costal cell (**Figure 2**). Wings milky-white. Male hind basitarsus less than three times as long as wide in lateral view (**Figure 4**). Female mesonotum usually lighter, in parts not black. *clavipes* Meigen (s. str.)
5. Antenna seven-segmented, a very small eighth segment occasionally present. *nigriventris* Haliday
 - Antenna at least clearly eight-segmented. **6**
6. Male legs all black, female tibiae and/or tarsi black. **7**
 - Male legs not entirely black. Female tibiae and tarsi not black. **8**
7. Wings fumose, smoky brown or blackish *ferruginatus* (L.)
 - Wings hyaline (clear) *fulvicollis* Gimmerthal
 - Wings lightly fumose, brownish *varipes* Meigen
8. Small species, body length approximately 4 mm. Femorae conspicuously thick (**Figure 7**). Antenna eight-segmented. *lautaretensis* Villeneuve
 - Larger species, body length at least 5 mm. Femorae not conspicuously thick (**Figure 6**). If conspicuously small then antenna nine-segmented (small specimens of *B. johannis*). **9**
9. Boreoalpine species. Hind femorae basally thin, expanding at about one third their length (**Figure 8**) **10**
 - Southern coastal species in Norway. Hind femorae expanding even in the basal part (**Figure 6**) **12**

10. Antenna distinctly ten- or indistinctly eleven-segmented. Wings grayish-brown fumose, posterior veins darker than membrane.....*rufipes* (Zetterstedt)
- Antenna eight-, nine- or indistinctly ten-segmented. Wings not grayish-brown fumose, posterior veins same colour as membrane.11
11. Antenna slender, nine- or indistinctly ten-segmented. Wings yellow. Male hind tibiae yellowish-brown without a dark tip, female thorax partly reddish, female coxae reddish.....*fulvipes* (Zetterstedt)
- Antenna stouter, eight- or nine-segmented. Wings milky-white. Male hind tibiae with a dark tip, female thorax and coxae black.....*siebkei* Mik
12. Body of male with strong black setae even on the pleura and abdomen. The field carrying sensillae on the hind tibia of the male dark (**Figure 6**), contrasting against the rest of the tibia. Pterostigma of both sexes blackish.*johannis* (L.)
- Setae on thorax and abdomen of male not all black. Sensilla-carrying field on male tibia same colour as the rest of the tibia. Pterostigma of both sexes brownish.13
13. Setae on mesonotum of male black. Male hind basitarsus not swollen (**Figure 10**). Middle part of mesonotum in both sexes coarsely sculptured, not shiny. Female abdomen yellowish ventrally.....*varipes* Meigen
- Setae on mesonotum of male white. Male hind basitarsus somewhat swollen (**Figure 9**). Middle part of mesonotum of both sexes finely sculptured, more shiny. Female abdomen entirely black.*lanigerus* Meigen

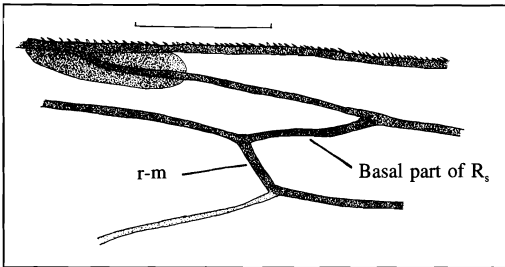


Figure 1
Bibio pomonae, anteriomedian part of wing. Scale = 1 mm.

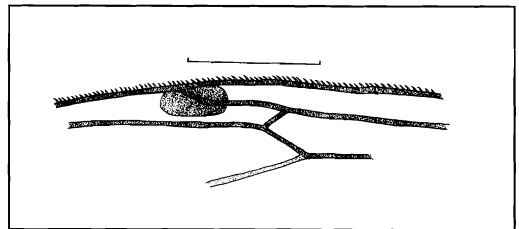


Figure 3
Bibio lepidus, anteriomedian part of wing. Scale = 1 mm.

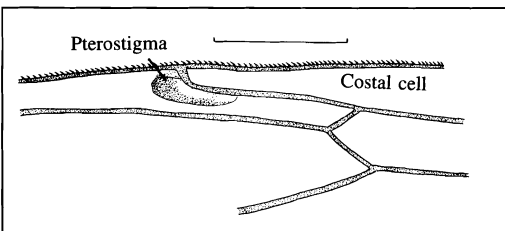


Figure 2
Bibio clavipes, anteriomedian part of wing. Scale = 1 mm.

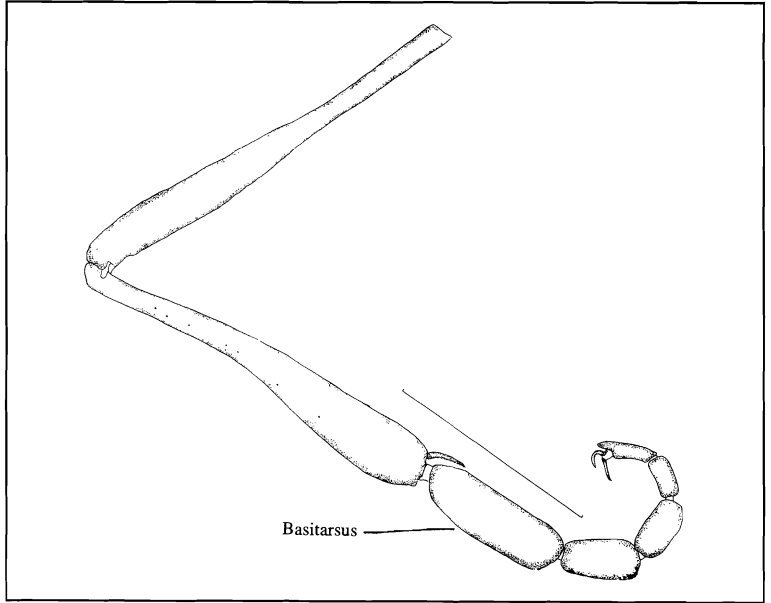


Figure 4
Bibio clavipes, male
hind leg. Scale = 1 mm.

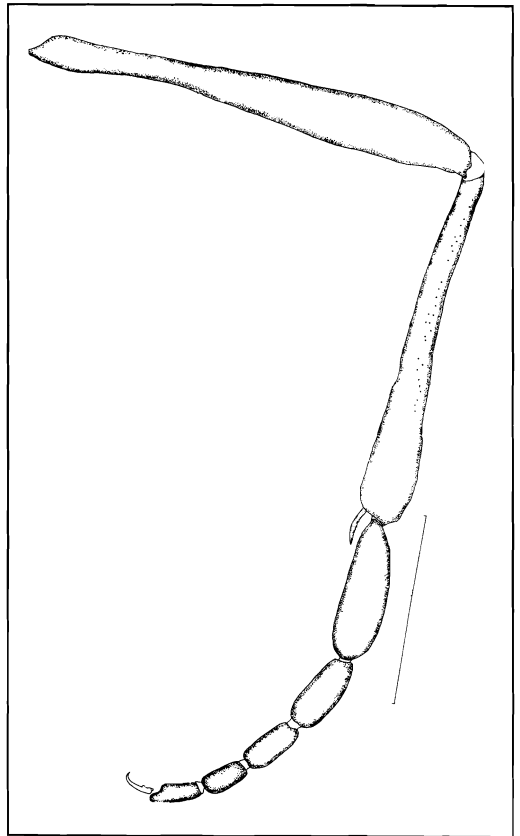


Figure 5
Bibio lepidus, male
hind leg. Scale = 1 mm.

Figure 6
Bibio johannis, male hind leg.

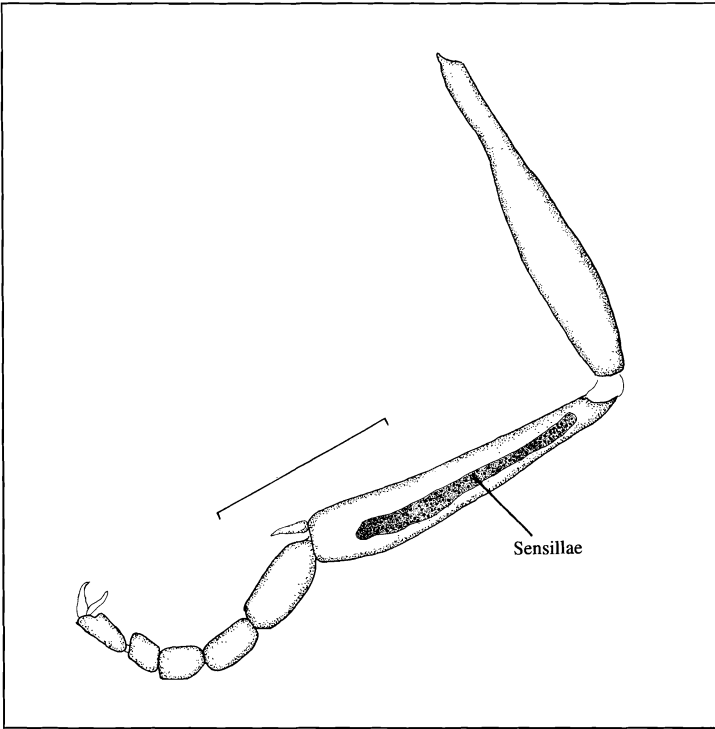


Figure 7
Bibio lautaretensis, male hind leg.
Scale = 1 mm.

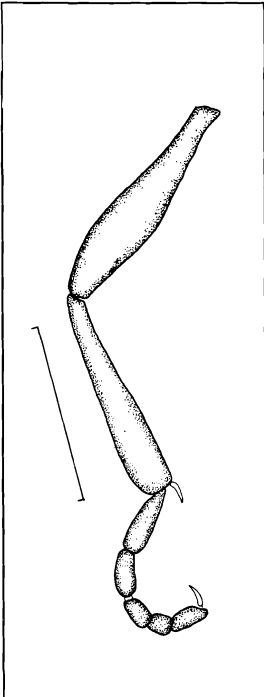
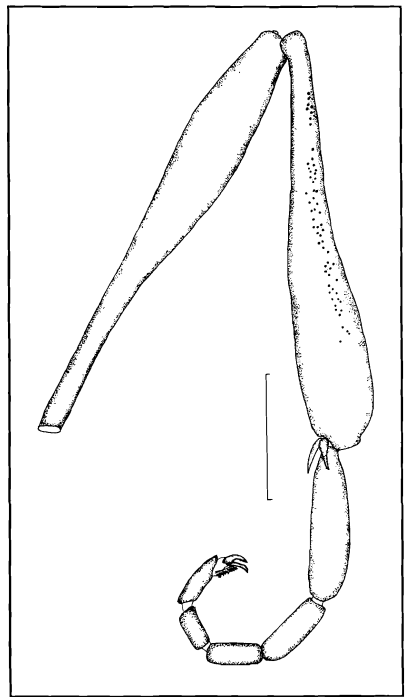


Figure 8
Bibio fulvipes, male hind leg.
Scale = 1 mm.



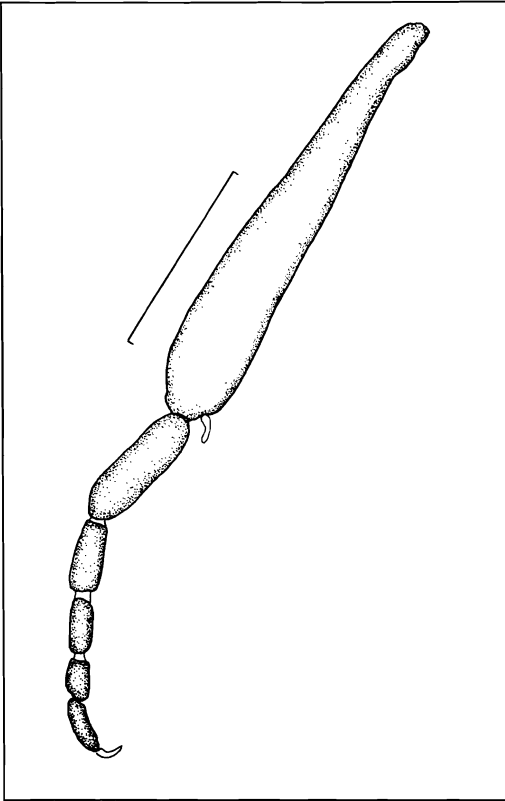


Figure 9
Bibio lanigerus, male hind tibia and tarsus.
Scale = 1 mm.

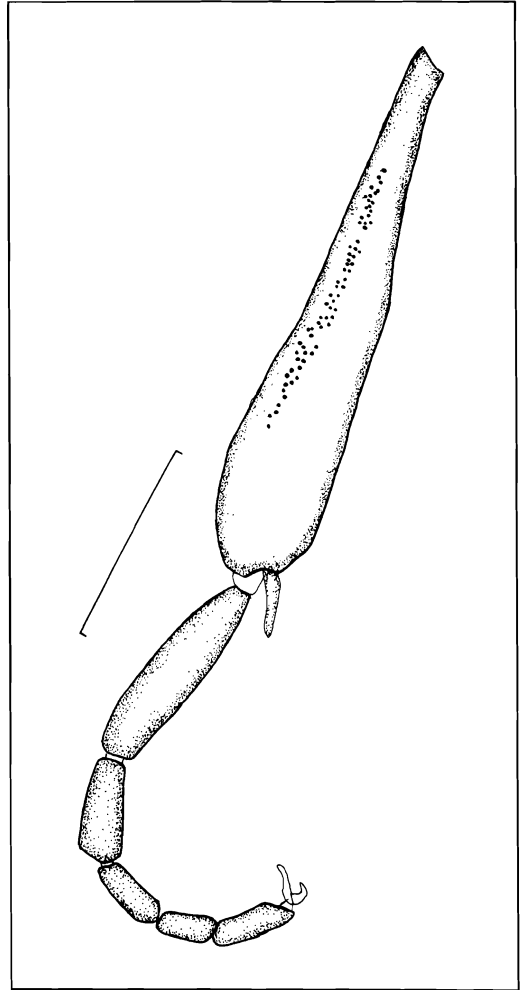


Figure 10
Bibio varipes, male hind tibia and tarsus.
Scale = 1 mm.

THE SPECIES

***Bibio clavipes* Meigen, 1818.(s.str.)**
Syn. *Bibio dorsalis* Meigen, 1818; *Hirtea*
***ephippium* Zetterstedt, 1838.**

Previous records: AK, Oslo(Kristiania) 4♂♂ 6 ♀♀ (ZMO, Siebke 1877), 1♂ 1♀ (ZMT, Siebke 1877), Tøyen 1♂ 9♀♀ (ZMO, Siebke 1877). BØ, Krødsherad (Lundström 1913, not seen). HES, Åsnes: at Kjølén (Siebke 1877, not seen, probably lost). HEN, Åmot: Åset (Siebke 1877, not seen, probably lost). STI,Oppdal: Kongsvoll at Blesbekken 1000 m 19 ex., Kongsvoll at Blesbekken

1200 m 10 ex., Kongsvoll at Raubekken 900 m 26 ex., Kongsvoll at Raubekken 1200 m 10 ex., at Jerosbekken 900 m 79 ex., Stroplsjøen 1289 m 1 ex. (Greve et al. 1984, not seen, VMT).

Revised record: OS/ON: "Fron" 1♀ (ZMO, Siebke 1853). Recorded as *Hirtea lacteipennis* Zetterstedt.

New records: Ø, Aremark: Bøensætra (T. J. Olsen pers. comm.). AK, Nesodden: Fagerstrand

225 ♂♂ 38 ♀♀; Bærum: Ostøya 2 ♂♂ 4 ♀♀; Oslo: Gjelleråsen 1 ♀; Frogn: Håøya 16 ♂♂ 7 ♀♀, Degerud Sollia 1 ♀ (TM); Vestby: Såner 2 ♂♂ 2 ♀♀. BØ, Hurum: Tofteholmen 1 ♀, Tofte 1 ♀; Røyken: Hyggen Kinnartangen 2 ♂♂ 1 ♀; Nedre Eiker: Ryggsetra 1 ♂ 4 ♀♀ (ZMO). Ringerike: N of Snyta 1 ♂, W of Sollihøgda Skaret 2 ♂♂, at Oppland border 1 ♂, Utøya 1 ♂. BV, Uvdal: Geitsjøen 4 ♀♀; Rollag: Rollag 1 ♂ 1 ♀, Veggli 2 ♂♂ 3 ♀♀; Hol: Haugastøl station 3 ♂♂, Geilo 1 ♂ 1 ♀; Gol: Engene 4 ♀♀. VE, Tjøme: Mostrand 66 ♂♂ 9 ♀♀, Sandøy Hvsaver 1 ♂. TEI, Notodden: Lisleherad 2 ♂♂; Rjukan: north side of Gaustatoppen 5 ♂♂ 2 ♀♀ (ZMU). TEY, Porsgrunn: Oksum 2 ♂♂ 10 ♀♀. AAI, Evje: Stjernebyen 1 ♂ 1 ♀ (KR). RI, Forsand: at Songesand school 1 ♂ (TJ), Fosså 1 ♀. RY, Karmøy: Skår 1 ♂, Slettevatnet 2 ♂♂; Finnøy: Sevheim 3 ♂♂. HOI, Kvinnherad: Askgård Hatlestrand 1 ♀, Rosendal 6 ♂♂ 2 ♀♀; Ullensvang: Ullensvang 1 ♂ 2 ♀♀, Djønno 88 ♂♂ 90 ♀♀; Eidfjord: Halnefjorden 1 ♂; Ulvik: Bruvik Gullbrå 3 ♂♂, Nedre Djønno 1 ♀, Osastøl 1 ♂ 1 ♀; Voss: Mjølfjell Solbakken 13 ♂♂ 12 ♀♀. HOY, Stord: Sjoalemyrene reservate 3 ♂♂ 3 ♀♀, Storsøy 2 ♂♂ 1 ♀; Bergen (Fana): Myravatn 2 ♀♀, Lønninge. 2 ♂♂; Samnanger 1 ♂; Bergen (Åsane): Vollane 2 ♀♀; Sund: Klokkarvik 1 ♂; Askøy: Florvåg 1 ♂; Vaksdal (Bruvik): Eidslandet 1 ♂ 1 ♀; Vaksdal: Dalekvam-Helle 1 ♂; Osterøy: Njåstad 2 ♂♂ 1 ♀. SFI, Aurland: at Tero 1 ♂ 2 ♀♀. OS, Gran: Skute 1 ♂, Teslo N. of Brandbu 12 ♂♂ 6 ♀♀; Vestre Toten: Einavoll at water 1 ♂; Østre Toten: Breili 2 ♂♂, Kapp 1 ♂. ON, Lom: Lom 1 ♂. HES, Ringsaker: Furnes Sandvold 36 ♂♂ 69 ♀♀, Helgøya Eiksåsen 2 ♂♂ 1 ♀. HEN, Rendalen: Ytre Rendal 1 ♂ (ZMO). MRY, Hareid: Hareidlandet at Kråkholen 1 ♂; Tustna: Ertvågøy Foldfjorden 1 ♀. MRI, Norddal: Fjøra 4 ♂♂ 1 ♀. STI, Oppdal: Kongsvoll 900 m 43 ♂♂ 36 ♀♀, Kongsvoll at Sprænbekken 1060 m 13 ♂♂ 5 ♀♀, Kongsvoll at Sprænbekken 1100 m 2 ♂♂, Kongsvoll at Sprænbekken 1150 m 3 ♂♂ 3 ♀♀, Lønset 1 ♂ 2 ♀♀. NTI, Stjørdal: Vikan 2 ♂♂ 6 ♀♀; Høylandet: Skiftesåa 1 ♂ 7 ♀♀. NSY, Bodø: Ørnliia Valnesvatnet 9 ♂♂ 10 ♀♀; Nesna: Langset 1 ♂ (RM no. 1741). NSI, Rana: Krokstrand Dunderlandsdalen 1 ♂ (TM), Selfors 1 ♀ (RM no. 1746), Utskarpen 1 ♂ (RM no. 1653). NNV, Ibestad: Sørrollnes on Rolla 1 ♂ 1 ♀. TRI, Balsfjord: Skjåvikør 2 ♀♀ (TM). TRY, Harstad: Kanebogen 7 ♂♂ 1 ♀; Tromsø: Tromsø Folkeparken 1 ♂ (TM), Ramfjordnes 7 ♂♂ 6 ♀♀.

This species is quite similar to *B. lepidus* and some authors (for instance Duda (1930)) regard them as merely two forms of the same species. They are, however, generally regarded as separate in more recent works (for instance Freeman and Lane (1985)). The larvae are also different (described by Krivosheina (1962) and Brindle (1962)). It is possible that *B. clavipes* and *B. lepidus* are distinct species in parts of their common distribution but form hybrid zones or even merge completely in other parts. All characters given for separation are to some extent variable, but there is no evidence that they form mixed populations in Norway. They can, however, be found on localities close to each other at approximately the same time. I choose in this paper to regard them as separate species. The great variability of this species has led to quite a few synonyms, of which those mentioned above have been used on Scandinavian material.

Distribution (Figure 11)

B. clavipes is distributed all over Europe and large parts of Asia (Duda 1930).

In Norway the species is generally distributed and seemingly common over large parts of the country. The northernmost record is from TRY, Tromsø (EIS 162). *B. clavipes* has been recorded up to 1200 m. a.s.l. in Central Norway (Greve et al. 1984). It also occurs at the coast, for instance at RY, Finnøy.

This seems to be the most common autumn-flying *Bibio* in eastern Norway, while *B. lepidus* predominates in western Norway. *B. clavipes* is also most common in the Swedish material that I have seen.

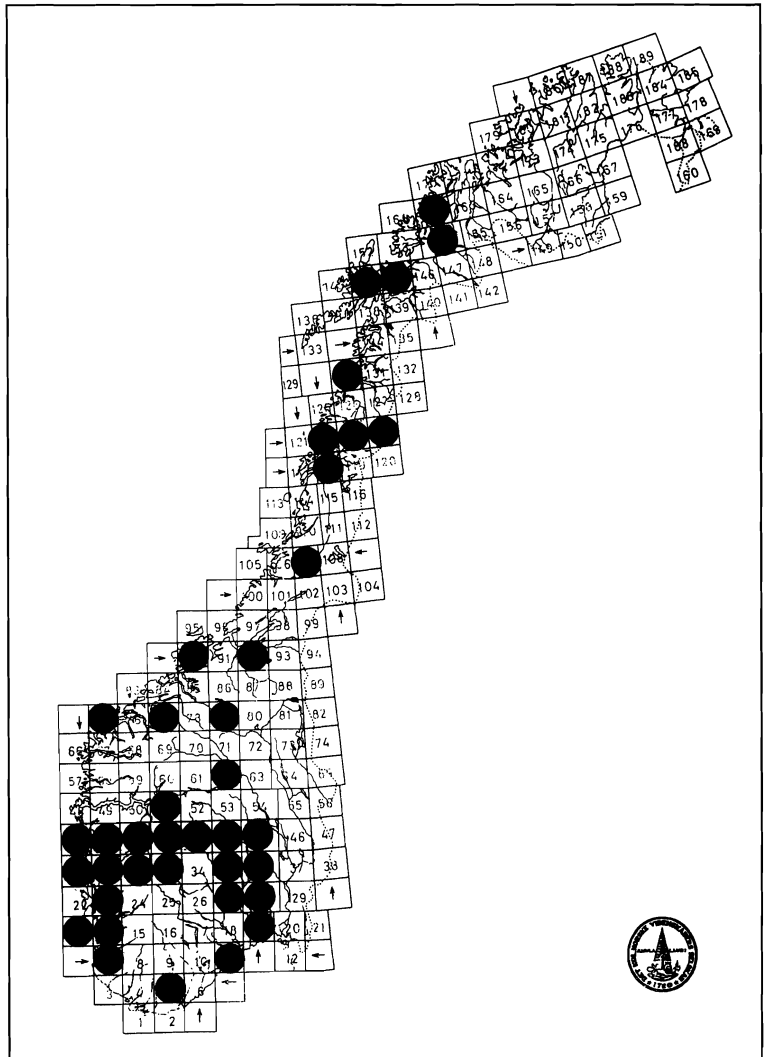


Figure 11
Records of *Bibio clavipes* in Norway. Open circle: not seen by the author.

Flight period

Siebke (1877) gives the flight period as Jun. to Sept.. The species is, however, almost strictly autumnal in its flight period in Scandinavia. Some authors from continental Europe state that the species may also fly in spring (for instance Verbeke (1971) from Belgium), but one female (from BØ, Hurum: Tofte between 18 May and 2 Jun. 1985) is the only specimen collected in spring in the Norwegian material examined. All the rest of the material is collected between 10 Aug. and 10 Nov., except one record from ON,

Lom on 9-10 Dec. 1970, made on a night with a temperature of 7-9 degrees C which is very mild for the season and locality.

The number of records peaks at about 10 Sept. but remains high until approximately 10 Oct. There are apparently no differences between the flight periods in different parts of the country.

The species has frequently been collected in light-traps and is thus active even at night.

Bibio lepidus Loew, 1871

New records: VE, Sem: Jarlsberg park 7 ♂♂, Valløy 2 ♂♂ 1 ♀; Tjøme: Mostrandra 38 ♂♂ 8 ♀♀; Tønsberg: Slottsfjellet 3 ♂♂ 1 ♀. RY, Karmøy: Sandhåland 4 ♂♂ 1 ♀; Utsira: Utsira 100 ♂♂; Finnøy: Kyrkjøy 3 ♂♂, Sevheim 4 ♂♂ 2 ♀♀, Ladsteinvatnet 306 ♂♂ 38 ♀♀, Sevheimsheia 28 ♂♂ 2 ♀, Kvitevik 3 ♂♂. HOY, Bergen (Hamre): Fyllingsneset 8 ♂♂ 2♀; Bergen (Fana): Kristianborgsvatn 4 ♂♂, Lønninghavn 2 ♀♀; Bergen: Fløyen 26 ♂♂ 5 ♀♀, Fløyen-Rundemanen 16 ♂♂, Rundemanen 3 ♂♂, at Skansen 7 ♂♂ 2

♀♀, Blåmanen 78 ♂♂ 9 ♀♀; Osterøy: Kleppe south 48 ♂♂ 2 ♀♀. SFI, Aurland: at Tero 1 ♀. NTI, Stjørdal: Vikan 4 ♂♂.

This species has been regarded a form of *B. clavipes*, see discussion under this species. It is not previously recorded from Norway but has been found in Great Britain, Ireland, Austria and Finland according to Krivosheina (1986).

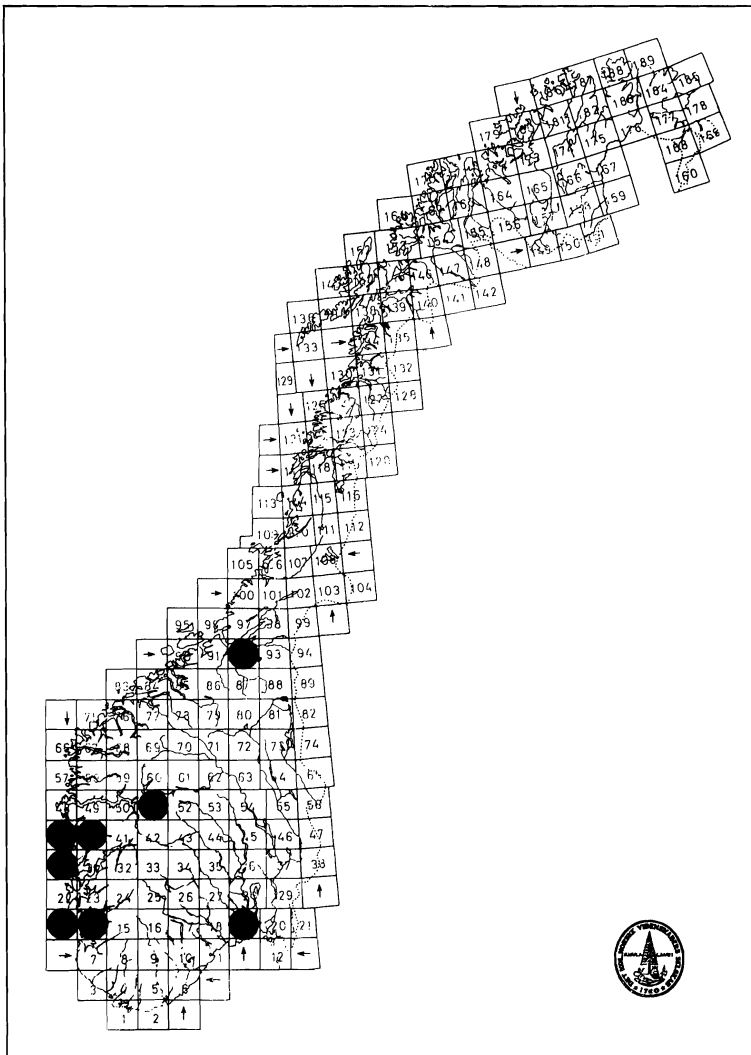


Figure 12
Records of *Bibio lepidus* in Norway.

Distribution (Figure 12)

The species seems to be the most common autumn-flying *Bibio* in western Norway and has also been collected in Vestfold and Nord-Trøndelag.

Flight period

B. lepidus has not been recorded earlier than Sept.. The number of records peaks in early Oct. and the latest known records are from early Nov.. It occurred in large numbers in the hills near Bergen in the autumns of 1991-1993, between approximately 10 Sept. and 25 Oct. each year. At this time the species swarmed only in sunny weather, but occasionally in air temperatures as low as 3-4 °C, on one occasion just half an hour after a small snowfall. During brief overcast periods males crawled rapidly over vegetation and initiated copulations with females sitting on it.

Bibio pomonae (Fabricius, 1775)

Previous records: AK, Oslo (Christiania) 2 ♂♂ 1 ♀ (Siebke 1877, ZMO, ZMT); Enebakk (Siebke 1877, not seen, probably lost). BØ, Krødsherad (Lundström 1913, not seen). RI, Hjelmeland: Erfjord (Lundström 1913, not seen). HOI, Kvam: Tangerås 1 ♂ (Siebke 1877, ZMO). OS, Lillehammer (Siebke 1853, not seen, probably lost); "Land" (Siebke 1877, not seen, probably lost); "Aurdal" (Siebke 1877, not seen, probably lost). Ringebu (Siebke 1853, not seen, probably lost). HES, Stange (Siebke 1877, not seen, probably lost); "Odalen" (Schøyen 1884, not seen). STI, Oppdal: Drivdalen and Drivstua 2 ♂♂ (Siebke 1864, ZMO), Kongsvoll at Raubekken 900 m (Greve et al. 1984, not seen, VMT), Kongsvoll at Blesbekken 1000 m 15 ex. (Greve et al. 1984, not seen, VMT), Kaldvella 1220 m 1 ex. (Greve et al. 1984, not seen, VMT). NTL, Verdal: Tynes, Nes (Zetterstedt 1850, not seen). NSI, Skjerstad: Skjønstuen (Schøyen 1884, 1 ♀ labeled "Saltalen" in ZMO probably represents this record). TRY, Skjervøy : "Raschstind" (Zetterstedt 1838, not seen); Kvænangen: "Gamstind" (Zetterstedt 1838, not seen). FV, Alta: Talvik (Zetterstedt 1838, not seen).

New records: Ø, Fredrikstad: Gansrød (T. J. Olsen pers. comm.). AK, Oslo: Tøyen 2 ♂♂ 1 ♀ (ZMO), Vestre Aker 66 larvae 1 ♂ pupa (NPPI); Enebakk 1 ♀ (ZMO); Nesodden: Fagereng 1 ♂. BØ, Kongsberg: Hvitvingfoss 1 ♂ (KR). BV, Rollag: Stærnesskogen 2 ♂♂, Rollag 1 ♀; Hol: Haugastøl Litlevatn 1 ♀, Slaatto between Geilo and Ustaoset 1 ♂, Ustaoset 1 ♀ (ZMO); Hemsedal 1 ♂ (ZMO). VE, Hedrum: Vestmarka 1 ♂; Stokke 1 ♂. TEI, Kviteseid: Kviteseid 1 ♂; Vinje: at Haukeliset 2 ♂♂. AAI, Evje: Stjernebyen 1 ♀ (KR). VAI, Sirdal: Lindeland 1 ♂ (KR). VAY, Flekkefjord (Bakke): Ersdal 2 ♂♂; Flekkefjord (Sira): Sira 1 ♀. RI, Forsand: at Songesand school 1 ♂ (TJ), Songesandsstølen 1 ♂ 1 ♀ (TJ). RY, Sokndal: Heskjestad at Ljosvatn 1 ♀; Gjesdal: Madland Brekka 1 ♀; Sandnes: Høyland 2 ♂♂ 1 ♀, Stølsfjell N of Nordland 1 ♂ (KR); Sola: Gimra 1 ♂; Randaberg: Tananger 3 ♀♀ (TM); Rennesøy: Vikevåg 1 ♂ (TJ); Finnøy: Sevheimshøia 1 ♀, Kyrkjøy 1 ♂ (TJ). HOI, Kvinnherad: Berget 1 ♂ 1 ♀, Ljosmyr 1 ♂, Rosendal 3 ♂♂, Rosendal Gamlestølen 1 ♂, Rosendal Prestvatnet 2 ♀♀, Seumsfoss 1 ♂; Kvam: Omastrand 1 ♀; Eidfjord: Halnefjorden 1 ♂, Hjølmo 2 ♂♂, Vivali 2 ♂♂, Øvre Eidfjord 1 ♂; Kinsarvik: Djonno 1 ♀, Stavali area 9 ♂♂; Ullensvang: Kinsekvelv area 1 ♀, Måge 1 ♀, Vivali area 1 ♂; Granvin: Vindal 4 ♂♂; Ulvik: Askjellalsvatn 8 ♂ 4 ♀♀, Litle Askjellalsvatn 1 ♀, Fagerdalsvatn 1110 m 2 ♂♂ 1 ♀, at Langvasstøl 795 m 5 ♂♂ 5 ♀♀, Finse 3 ♂♂, Finse Jomfrunut on snow 1 ♂, Finse Kvannjolnut 1 ♂, Finse Nordnut 1 ♂, Finse Sandalsnut 2 ♂♂, Finse towards Blåisen 1 ♂ 1 ♀, Hestebotvatn 2 ♂♂, Slondal 8 ♂♂ 1 ♀; Voss: Mjølfjell 2 ♀♀, Vesetfjell 1 ♂, Volavatn at dam 1 ♂. HOY, Bømlo: Finnås 1 ♀; Stord: Iglatjødn reservate 1 ♂ 2 ♀♀; Bergen (Fana): Banntveit 1 ♀; Bergen: Bergen 3 ♂♂, Årstadvollen 1 ♂, Kong Oscarsgate 1 ♂, Museum of Zoology 1 ♀, Grønnestølen 5 ♂♂ 1 ♀ (KR); Bergen (Åsane): Kistebakkane 1 ♀; Fjell: Ølveset 3 ♂♂, Landro 1 ♂; Askøy: Herdla 2 ♂♂; Lindås: Kålås 1 ♂ 2 ♀♀; Radøy: Rossnes 1 ♂; Modalen: Skjerjevatn 11 ♂♂ 9 ♀♀; Osterøy: Kleppe 2 ♂♂; Samnanger: Børdalsfjell 1 ♂, Høyseter 1 ♀; Austrheim: at bridge Fonnastraumen 2 ♂♂. SFI, Aurland: Flåm 3 ♂♂, Flåmsdalen 1 ♂ 1 ♀, Hornsvatn 1 ♂, Kvammadalen 2 ♂♂, Uppsete-Jernhusvatn 850-1000 m 9 ♂♂, Vassbygda 1 ♀, Vatnahalsen 4 ♂♂ 1 ♀ (ZMB) 1 ♀ (ZMH) 3 ♂♂ (NPPI), Østerbø 1 ♀; Luster: Fåbergsstølsgrandane 1 ♂, Veitastrond Eldedalen 2 ♂♂; Vik: Arnafjell Raudberg 1 ♂, Grønelli Målset

1 ♂, Halskardvatnet 1 ♀, Rappen 1 ♂, Vik 1 ♂; Lærdal (Borgund): Årbergseter 1 ♂; Gloppen (Bruland): Utvik 1 ♀. SFY, Førde 1 ♀ (ITZA); Jølster: Vassenden 1 ♂ (ITZA); Naustdal: Naustdal 1 ♀; Vågsøy: Nord Vågsøy 2 ♀♀. OS, Sør-Fron: Vestfjellet 5 ♂♂. ON, Otta 1 ♀ (ZMO). HES, Nord-Odal: Gardvik 1 ♀ (NPPI); Ringsaker: Furnes Sandvold 1 ♂. HEN, Rendalen: Renådalen Sæter 1 ♀ (ZMO no. 12482), Ytre Rendal 2 ♂♂ (ZMO), Ytre Rendal Renåskarven 1 ♀ (ZMO), Tyldal 1 ♂ 2 ♀♀ (ZMO). MRI, Surnadal: Naustadalsvatn 2 ♂♂ 3 ♀♀, at Indredalshytta 19 ♂♂ 7 ♀♀, Trollheimshytta 1 ♂ 2 ♀♀. MRY, Hareid: Hareidlandet at Kråkhølen 1 ♀. STI, Oppdal: Kongsvoll 900 m 17 ♂♂ 4 ♀♀, South Knutshø 1080 m 1 ♂, Kongsvoll at Sprænbekken 1000 m 4 ♂♂, Kongsvoll at Sprænbekken 1100 m 1 ♂, Kongsvoll at Sprænbekken 1250 m 31 ♂♂, Kongsvoll at Sprænbekken 1300 m 8 ♂♂, Kongsvoll at Sprænbekken 1350 m 2 ♂♂, Rise 2 ♀♀ (ZMO); Klæbu: Målsjøen 1 ♂. STY, Trondheim: Horg Benna 1 ♀. NTI, Stjørdal, Værnes 1 ♂; Lierne: Limnansåsen 8 ♂♂ 12 ♀♀, Storbekken 2 ♂♂. NSI, Hattfjelldal, *Geranium sylvaticum*-meadow 6 ♂♂ 1 ♀ (ZML); Rana: Mo 1 ♂ (ZML), Kamplia 3 ♂♂ (ZML), Storforshei 1 ♂ (ZMU); Saltdal: N of Semska st 1 ♂; Beiarn: Rønnåga 1 ♂. NSY, Gildeskål: Sørfugløy 1 ♂; Bodø: Falkflaug Indre Dalsvatn 1 ♀, Valnes Sannes 1 ♂; Rødøy: Rødøy 1 ♀ (TM). NNV, Leknes: at Grønlivvatn S of Borge 1 ♂, Kartfjord at Strømmen 1 ♀, Stamsund 1 ♂, Stamsund at Svarholt 1 ♂; Moskenes: Å in Lofoten 1 ♂. NNØ, Ballangen: Myrbakk 1 ♂. TRI, Målselv: Bjørkåssæter 1 ♀, Dividal Sletta 1 ♀, Kirkesdalen 253 ♂♂ 542 ♀♀, Kirkesdalen Kjosvoll 24 ♂♂ 15 ♀♀, Kirkesdalen Lappskardet 126 ♂♂ 358 ♀♀, Læddø 2 ♂♂ 8 ♀♀, Skardet 1 ♀; Storfjord: Signaldalen 1 ♀ (TM), Vasdal 1 ♀ (TM). TRY, Tromsø: Tromsdalen 1 ♀ (TM), Fagerfjell Ramfjord 1 ♂ (TM), Brattfjellet Oldervik 1 ♂ (TM), Fløyfjell 1 ♀ (TM); Skjervøy: Vaddas 1 ♀; Karlsøy: Måsvær 1 ♀ (TM), Måkeskjær 2 ♂♂ 1 ♀ (TM), Vanna 1 ♂ (TM). FV, Alta: Gargia 1 ♀, Stengelse 1 ♂ 2 ♀♀ (TM); Måsøy: Hjelmsøya 1 ♀ (TM). FN, Vadsø: Andersby 1 ♀ (TM), Vadsø 3 ♂♂ (NPPI); Tana (CNC). FØ, Sør-Varanger 3 ♂♂ 1 ♀ (ZMO), Jarfjord 1 ♂ 2 ♀♀ (TM), Kirkenes 2 ♂♂ (TM). RUSSIA, Kola peninsula: Boris Gleb 2 ♂♂ (TM). This locality falls within the Norwegian EIS-grid system.)

In northern Norway the species is some places known as "krigsflue" ("war-fly") and it was believed that large swarmings of it predicted a coming war (E. Hauge pers. comm.). Another Norwegian trivial name is "russeflue" ("Russian fly"), probably so called because the species was believed to have migrated in from Russia during mass occurrences. The flies can sometimes be seen swarming over water (Schøyen (1884), E. Hauge, S. Bretten pers. comm.), and are quite conspicuous due to their large size and bright red femorae.

The species occurs all over Europe except the extreme south, but only in highland areas in continental Europe (Pecina 1965).

Distribution (Figure 13)

The species is generally distributed and common throughout Norway. The northernmost record in this survey is from FV, Måsøy: Hjelmsøya (EIS 186), quite near the North Cape. The species probably reaches its maximum abundance in the subalpine birch forest but often extends its distribution well into the lower alpine zone. The highest altitude from which the species has been collected in Norway is 1440 m a. s. l. at HOI, Ulvik: Sandalsnut, Finse. It is, however, likely that this specimen may have been blown up from a lower altitude. At STI, Oppdal: Sprænbekken near Kongsvoll, the species was seen swarming at altitudes of up to 1360 m. a. s. l. Mass-occurrences of the species have been noted recently on several localities, for instance HOI, Voss: Mjølfjell 1980ies (L. Greve pers. comm.); STI, Oppdal: at Stropplsjøen (S. Bretten pers. comm.); STI, Oppdal: Vinstradalen (A. Bretten pers. comm.) and TRI, Målselv: Kirkesdalen 1992 (Malaise-trap material collected by J. O. Solem).

Flight period

Greve et al. (1984) reported the species as flying from late Jul. to early Sept. in the Dovrefjell mountains. Further data suggest

that the species flies from early Jul. to mid-Sept., with the number of records peaking in mid-Aug.. Except for one record from Apr. (HOY, Osterøy: Kleppe 11 Apr. 1956), the earliest records of *B. pomonae* in Norway are from 28 Jun.: FV, Alta: Gargia in 1989 and Ø, Fredrikstad: Gansrød in 1991 (the latter T. J. Olsen pers. comm.). The latest known record is from 12 Oct., RI, Gjesdal:Brekka, Madland 1986. The species flies somewhat later in

high-altitude areas, but there seems to be no difference in flight period between southern and northern Norway.

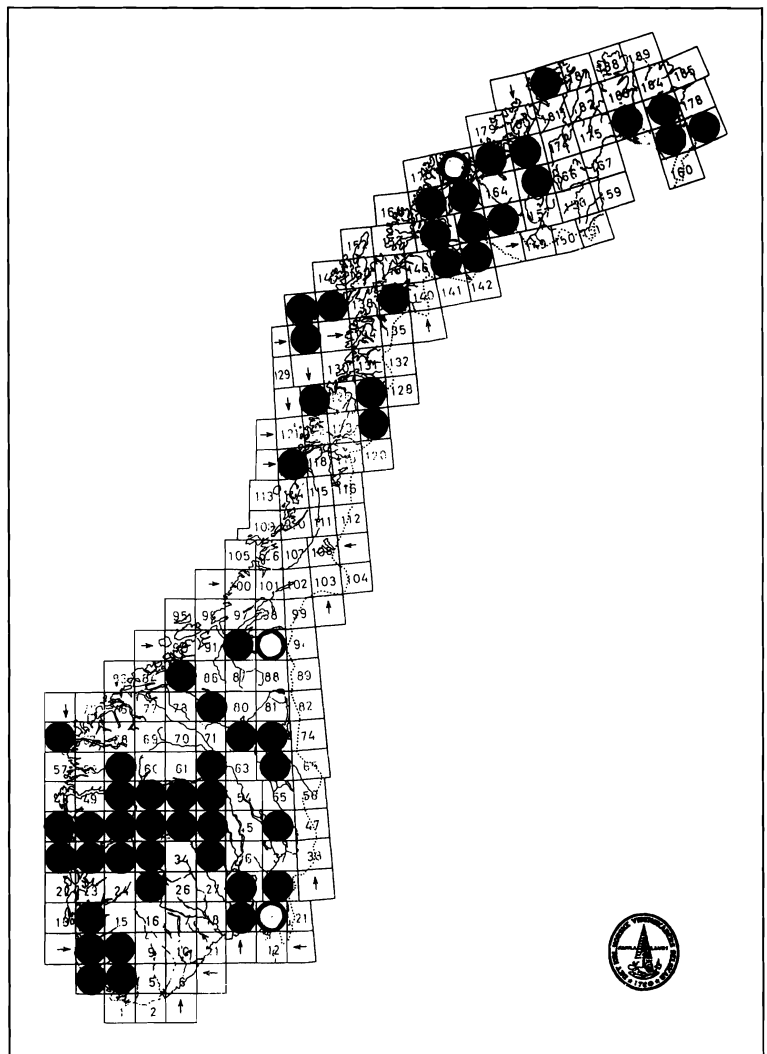


Figure 13
Records of *Bibio pomonae* in Norway.
Open circle: not seen by the author.

Bibio marci (L.,1758)

Previous records: VE, Tjøme: Fyn Hvasser 1 ♂ 1 ♀, Mostrand 3 ♂♂ 1 ♀ (Greve 1986).

New records: VE, Sem: Karlsvik 1 ♂; Tjøme: Fyn Hvasser 4 ♂♂, Moutmarka 8 ♂♂ 5 ♀♀. TEY, Kragerø: Jomfruland 62 ♂♂ 20 ♀♀.

The species was recorded for the first time from Norway by Greve (1986). It is distrib-

ed all over Europe except in the extreme north, and also found in Algeria and the Canary Isles (Krivosheina 1986). Duda (1930) and writers following him consider this species to be merely a variety of *B. hortulanus* (L.). More recent authors, however, generally consider them two distinct species, belonging to a species complex with numerous rather similar species in Southern Europe. There are no problems in differentiating the species in Northern European material. Specimens from

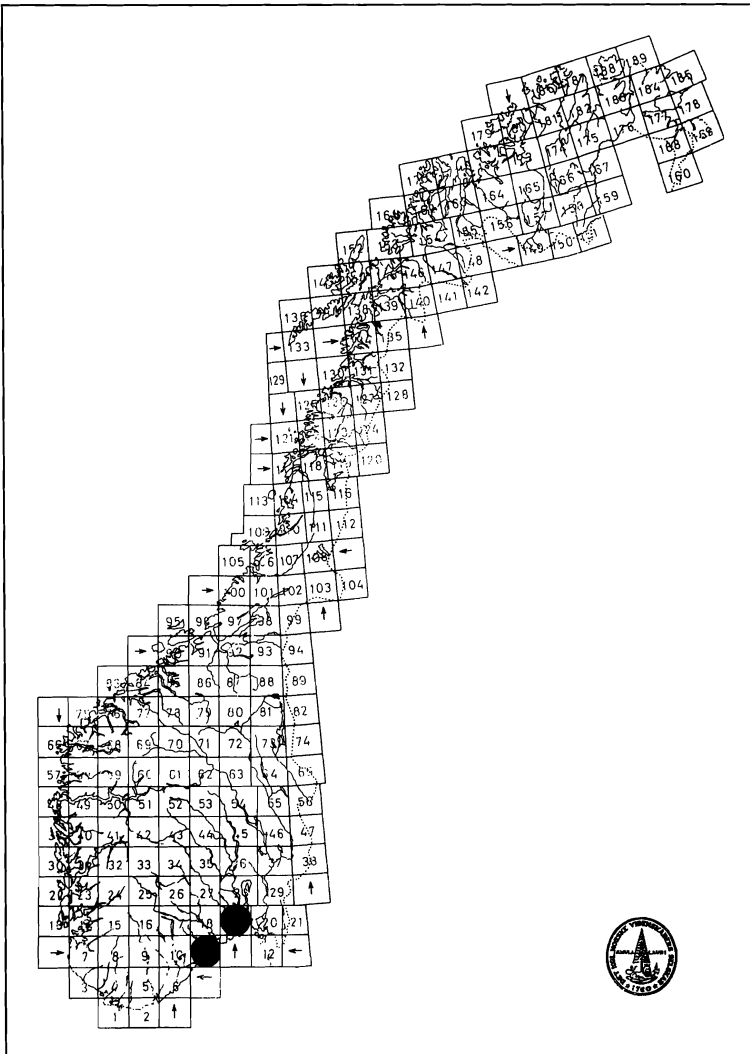


Figure 14
Records of *Bibio marci*

the Jomfruland population are peculiar in having nine-segmented antennae. The Tjøme specimens and all other specimens seen by the author have ten-segmented antennae, this is also the case for European specimens of the “*B. hortulanus*-group” (Duda 1930).

Distribution (Figure 14) and flight period

The species has only been recorded from Vestfold and Telemark districts, and the single specimen from Sem, which could possibly have blown in from the islands outside, is the only record from mainland Norway. However, the species is very abundant at some localities on the islands Tjøme and Jomfruland. Like *B. pomonae*, this is a rather conspicuous species. All localities seen by the author are at or next to seaside meadows. It is possible that this species, which is rather eurytopical in Central Europe, becomes a habitat specialist at the northern edge of its distribution. The species occurs in Sweden as far north as Uppland district (Wahlgren 1919) and in southern Finland (Lundström 1910), in both countries considerably further north than the Norwegian localities.

All the known records at present are from between 10 and 30 May, but the material is far too small for any conclusions to be drawn. Freeman and Lane (1985) state the flight period to be Apr. to Jun. in Great Britain.

***Bibio hortulanus* (L., 1758) (s. str.)**

Siebke (1877) reported this species (as *Hirtea hortulana*) as collected in the Botanical Garden, Tøien, Christiania (= AK, Oslo) on 7 Jun 1850. There is one male bearing these data in the collection of the Museum of Zoology, Oslo. This specimen does, however, not belong to *B. hortulanus* but to the superficially similar *B. varipes*. As no further record has been made, this species should be deleted from the Norwegian species list. The species

occurs in Scania (Zetterstedt 1850), but is rather uncommon (H. Andersson pers. comm.). Occurrence of *B. hortulanus* in south-east Norway is possible but not likely. It is quite conspicuous and flies in May-Jun., when activity of collectors is frequently high, so this species is not as likely to be overlooked as are many other bibionids.

***Bibio nigriiventris* Haliday, 1833.**

***Syn Hirtea lacteipennis* Zetterstedt, 1838.**

Previous records: See Greve (1987). In addition: TRY, Kvænangen: “Gamstind” 1 ♂ (Zetterstedt 1838, ZML. This is a paralectotype of *Hirtea lacteipennis* Zetterstedt).

New records: Ø, Halden: Prestebakke 1 ♀; Onsøy: Lervik (T. J. Olsen pers. comm.); Tune: Tunevannet (T. J. Olsen pers. comm.). AK, Enebakk: Ekeberg 270 ♂♂ 239 ♀♀, Vangen 40 ♂♂ 31 ♀♀; Lørenskog: Losby 123 ♂♂ 97 ♀♀, Aamodtdammen 1 ♂♂ 5 ; Vestby: Såner 1 ♂; Rælingen: Losby 11 ♂♂ 6 ♀; Frogn: Håøya south 5 ♂♂ 4 ♀♀, Sønderstøa Degerud 1 ♀ (TM); Nesodden: Fagerstrand 6 ♂♂; Oslo (Kristiania) 1 ♀ (ZMO), Tøyen 1 ♂ (ZMO), Høvik 1 ♀ (TM). BØ, Drammen: Åssiden Underlia 1 ♀; Røyken: Hyggen Kinnartangen 1 ♂; Nedre Eiker: Ryggsetra 1 ♀ (ZMO). VE, Tjølling: Bisfjord-Heggedal 1 ♂ (KR); Sande: Kommersøya 2 ♂♂; Tjøme: Sandø 1 ♀, Gon. TEI, Kviteseid: Kviteseid 21 ♂♂, Skredi 1 ♀ (KR). TEY, Porsgrunn: Dammane Brevik 1 ♀ AAY, Birkenes: Sennestad 2 ♀♀. VAI, Audnedal: Sveindal farm 5 ♂♂ 2 ♀♀. RI, Suldal 1 ♂ (TM). RY, Stavanger: Sunde 1 ♂ (K. Rognes' collection); Finnøy: Aubø 1 ♂ 1 ♀ (TJ), Kyrkjøy 2 ♂♂ (TJ), Sevheim 77 ♂♂ 68 ♀♀, Sevheimsheia 2 ♂♂ 1 ♀, at Ladsteinvatnet 6 ♂♂ 3 ♀♀; Utsira: Utsira 1 ♀. HOI, Røldal: Breifonn 1 ♀ (TM); Kvinnherad: Rosendal 9 ♂♂; Eidfjord: Fjellberg 2 ♂♂ 2 ♀♀, Hjølmodalen 4 ♂♂ 1 ♀, Isdalen 3 ♂♂ 3 ♀♀; Kinsarvik: Veivatn area 1150 m 6 ♀♀; Ulvik (Evanger): Eksingedal Gullbrå 1 ♀; Voss: Ørneberget, Mjølfjell Solbakken 2 ♀♀. HOY, Os: Drange 1 ♂ 2 ♀♀, Mobergsviki 1 ♂ 1 ♀; Bergen (Fana): Espeland 1 ♀, St Mildehaugen 3 ♂♂, at Mildevatn 1 ♂; Bergen: Martensgården 5 ♂♂, Sandviken 1 ♂, Bergen 1 ♀ (TM), Bergen

Botanical garden 1 ♀; Øygarden: Hjelme S of church 3 ♂♂; Samnanger: Ådland 1 ♂. SFI, Luster (Gaupne): Fåbergsstølen 1 ♂, Jostedalen Styggvatn 2 ♀♀, Jostedalen Spengdalen 1 ♂, Øyastrondi Fåbergsstølgrandane 4 ♂♂ 1 ♀; Leikanger: Hella 1 ♂ 1 ♀. SFY, Gulen: Brekke 1 ♀. ON, Lom: Bøverdalen-Leirvassbu 1 ♂ (CNC). HES, Ringsaker: Helgøya Hovindsholm 7 ♂♂ 4 ♀♀, Sandvold 3 ♂♂ 2 ♀♀, Næroset Gurivangen 1 ♀. MRY, Hareid: Hareidlandet at Kråkhølen 3 ♂♂ 1 ♀. STI,Oppdal: Kongsvoll 930 m 1 ♀, Kongsvoll at Blesbekken 1150 m 1 ♀, Kongsvoll W of Driva 950 m 1 ♂, Kongsvoll at Sprænbekken 1360 m 1 ♂,

Lønset 1 ♂ 1 ♀; Trondheim: Dragsvoll 7 ♂♂ 1 ♀. NTI, Høylandet: Skiftesåa 1 ♀. NSY,?: Svartisen 3 ♀♀ (TM). NNØ, Sørfold: Kobvd. 1 ♀ (TM). TRI, Bardu: Setermoen 1♂; Målselv: Bardufoss 1 ♂ 1 ♀ (JS), Kirkesdalen 30 ♀♀, Kirkesdalen Kjosvoll 5 ♂♂ 49 ♀♀, Kirkesdalen Lapps-kardet 1 ♂ 6 ♀♀, L Rostavatn 1 ♀, Sørgård Dividalen 1 ♂ 1 ♀ (TM), Dividalen 1 ♀ (TM); Balsfjord: Fisklaustind 1 ♀ (TM), Skjåvikør 1 ♂ (TM). TRY, Tromsø: Ramfjord 1 ♀ (TM), Ramfjord Fagernes 1 ♀ (TM), Ramfjordnes 1 ♂, Tromsø 4 ♂♂ 6 ♀♀ (TM), Prestvatnet 5 ♂♂ 2 ♀♀ (TM); Karlsøy: Vanna 2 ♂♂ 1 ♀(TM). FV, Hasvik: Sørvær 4 ♂♂ 3 ♀♀;

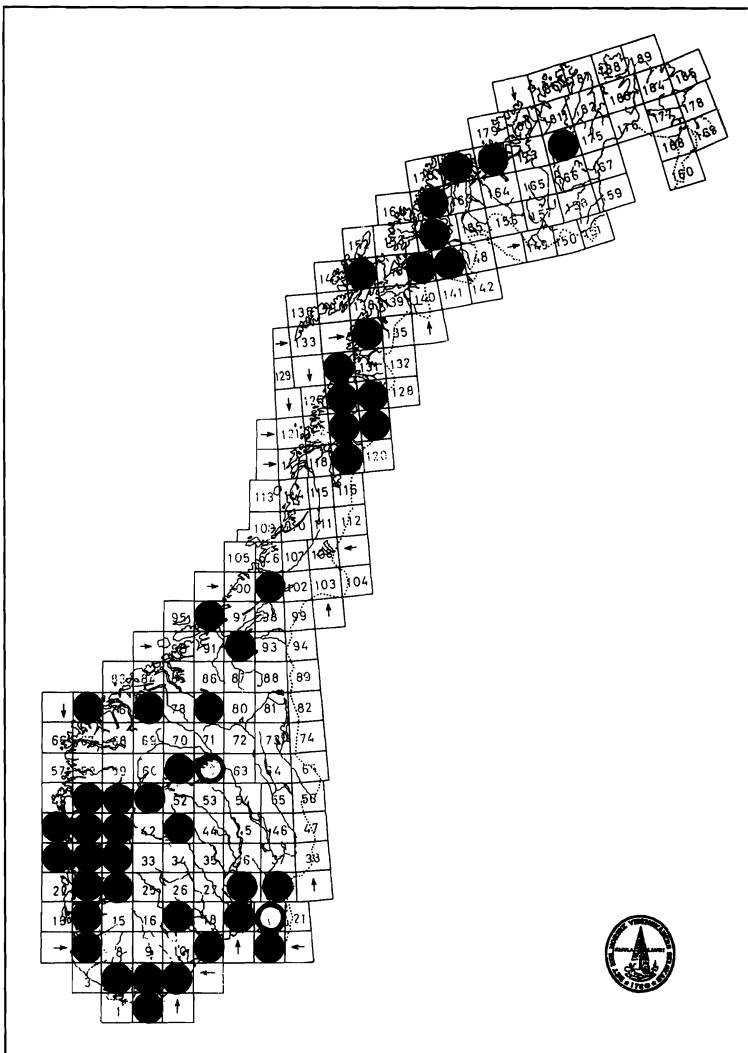


Figure 15
Records of *Bibio nigri-ventris* in Norway. Open circle: not seen by the author.

Alta: Jotkajavre 1 ♀ TM). FN, Porsanger: Fæstningsstuen 1 ♂ (TM).

The Norwegian distribution of this species was evaluated by Greve (1987). Since this paper was published, quite a few new records of it have been made. A female was collected at Sprænbekken near Kongsvoll, STI, Oppdal, at 1350 m a.s.l. on 21 Jul. 1992. This is far higher than any of the records given by Greve.

Distribution (Figure 15)

This species is widely distributed throughout Norway and probably our commonest *Bibio* species. It occurs from the coast to the mid-alpine zone and has been recorded from all districts. It is rather eurytopical, but perhaps has a preference for forest localities.

Flight period

The species flies from late May until mid-Jul. in Southern Norway and mid-Jun. until early Aug. in Northern Norway, and in Jul. in the mountains (Greve 1987). There is one single record from Oct.. The species is usually not found in as large numbers as many other bibionids, but may also occasionally have mass occurrences.

***Bibio johannis* (L., 1767)**

Previous records: AK, Asker/Bærum: Lysaker (Siebke 1877). NTI, Verdal: Tynes (Zetterstedt 1850, not seen, probably an error).

New records: BØ, Hurum: Tofte 8 ♂♂ 11 ♀♀. VE, Sem: Karlsvik 59 ♂♂; Tjøme: Gon 8 ♂♂ 6 ♀♀, Mostrand 39 ♂♂ 2 ♀♀, Sandø 5 ♂♂, Sandøysund 36 ♂♂; Tønsberg: Frodeåsen 106 ♂♂, Stenmalen 153 ♂♂. TEY, Kragerø: Jomfruland 4 ♂♂. RY, Hå: Ognå 1 ♂; Klepp: Orresanden 1 ♂ (KR); Sandnes: Lutsi 1 ♀ (KR); Stavanger: Stavanger 1 ♂, Krossberg at Tasta 12 ♂♂ (KR); Finnøy: at Hauskjevnet 1 ♀, Kvitevik 23 ♂♂ 6 ♀♀, Nordre Vignes 3 ♂♂ 8 ♀♀, Sevheim 3206 ♂♂ 82 ♀♀ 64 larvae, at Sevheimsvatnet 3 ♂♂ 2

♀♀, at Sevheimsvågen 2 ♂♂, at Ladsteinvatnet 1 ♂, Sevheimsheia 1 ♀; Karmøy: Visnes 2 ♂♂.

Zetterstedt (1850) mentioned a record of the species from "Thynäs Norwegiæ". Siebke listed this locality as "Thynæs Værdalæ" and added one record of his own from Lysaker near Christiania (AK, Asker/Bærum). Greve (1987) believed that a specimen of *B. nigri-ventris* from this locality in Siebke's collection at the Museum of Zoology, Oslo (ZMO no. 11293) on 27 Jun. 1873 was identical to this record. However, there is an unlabeled female in the Siebke collection (ZMO no. 11292) that probably belongs to *B. johannis*. This specimen is, however, too badly damaged for a certain identification.

Distribution (Figure 16)

The species is common on grasslands over most of Europe and possibly also occurs in the Far East (Krivoshina 1986). It has been recorded with certainty from two areas in Norway: Rogaland district in south-western Norway and the Oslofjord area in the east. It is very common and abundant in both these areas. The total absence of records from the extreme south seems peculiar, the species is, however, probably easily overlooked due to its early flight period. The species might have a disjunct distribution in Norway, but considerably more collecting effort in the Agder districts early in the season is needed until such a conclusion can be drawn. All the known localities are coastal, none being more than a few kilometres from the sea. The species is found only in and adjacent to agricultural landscapes.

Flight period

This is the earliest flying of the Norwegian bionid species. The flight periods seem to be clearly different in the two areas in which it is known to occur in Norway. The Rogaland records span from mid-Apr. to mid-May. When collecting at RY, Finnøy maximum

abundances were recorded on 2 May, 29 Apr. and 9 May in 1992, 1993 and 1994, respectively. The period of high activity lasted less than one week in all three years. Peak abundance was very high, with over 1000 specimens being collected in one yellow water trap during one day at one occasion.

In the Oslofjord area, on the other hand, the flight period seems to be somewhat later. The majority of the specimens were caught on 15-

25 May, and none earlier than early May, but swarming bibionids probably belonging to this species were seen at VE, Tjøme in Apr. 1993 (A. Fjellberg pers. comm.). The difference probably corresponds to the difference in spring progress between the regions in Apr. and May. The species is known occasionally to do some damage to cereals (Savage 1977) but is not considered a major pest. No damages to grass crops were recorded at Finnøy despite high abundances in the fields.

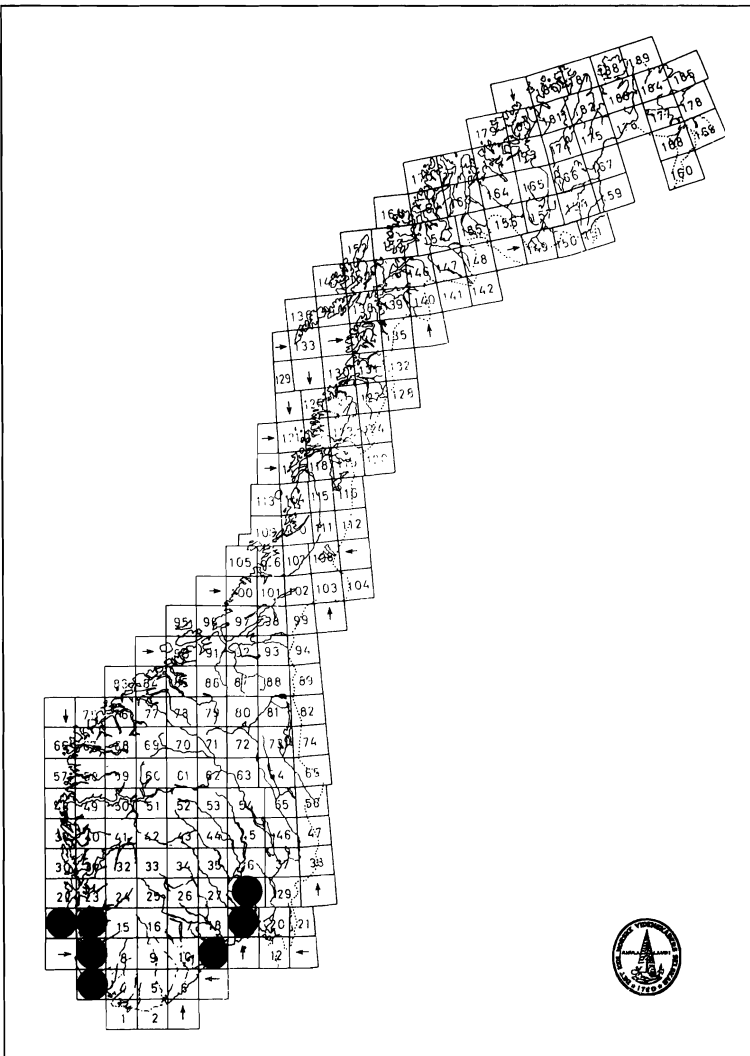


Figure 16
Records of *Bibio johannis* in Norway.

***Bibio varipes* Meigen, 1830.**

Previous records: AK, Oslo: Homansby, Botanical Garden (Siebke 1877, not seen).

Revised record: AK, Oslo: Tøyen 7 Jun. 1850 1 ♂ (Siebke 1877, recorded as *Hirtea hortulana*, ZMO).

New records: Ø, Tune: Råkil (T. J. Olsen pers. comm.). AK, Frog: Håøya 5 ♂♂ 9 ♀♀; Oslo: Tøyen 1 ♂ (ZMO). BØ, Hurum: Mølen 1 ♂, Tofte 5 ♂♂ 1 ♀, Tofteholmen 14 ♀♀. BV, Rollag 1 ♀.

VE, Sem: Jarlsbergparken 1 ♀, Karlsvik 1 ♂; Nøtterøy: Herstad 3 ♂♂; Tønsberg: Frodeåsen 5 ♂♂ 3 ♀♀; Tjøme: Gon 6 ♂♂ 5 ♀♀, Mostranda 15 ♂♂ 11 ♀♀, Moutmarka 1 ♂, Sandø 2 ♀♀, Fyn Hvasser 1 ♂ 1 ♀. TEY, Kragerø: Jomfruland 19 ♂♂ 13 ♀♀. AAY, Grimstad (Landvik): Skiftesnes 20 ♂♂ 9 ♀♀; Tromøy: Færøvik in the garden 1 ♂ (TJ), Solli 3 ♂♂ (1 ♂ TJ). VAY, Lindesnes: Jørgenstad 1 ♂ 1 ♀; Stangenes 3 ♂♂; Søgne: at Søgne folkehøgskule 22 ♂♂ 9 ♀♀. RY, Klepp: Øksnevad 1 ♂; Sandnes: Dale 1 ♂, Lutsi 3 ♂♂ (KR); Stavanger: Krossberg at Tasta 3 ♂♂ (KR), Ullandhaug 1 ♂ 1 ♀ (KR); Randaberg: Hålands-

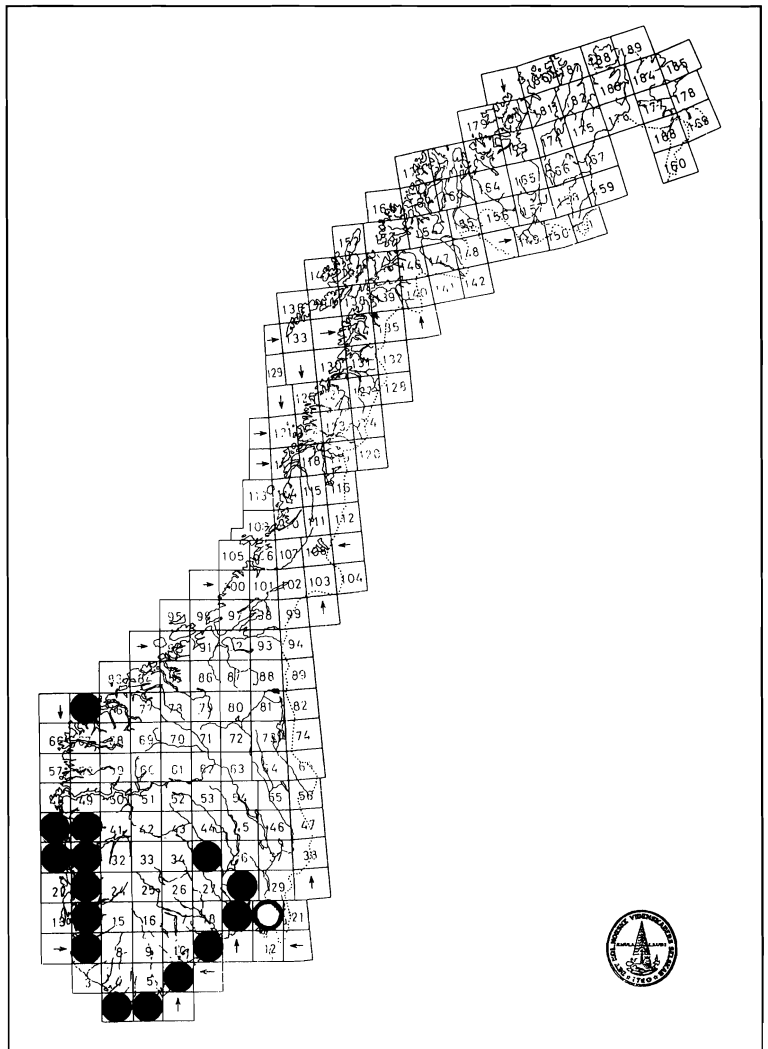


Figure 17
Records of *Bibio varipes* in Norway. Open circle: not seen by the

vatn 1 ♀ (KR); Finnøy: Harås 1 ♀ (JS), at Hauskjevvatnet 1 ♂ 1 ♀, Sevheim 1274 ♂♂ 665 ♀♀, at Sevheimsvatnet 1 ♂ 1 ♀, Sevheimsheia 1 ♂ 3 ♀♀, at Ladsteinvatnet 123 ♂♂ 3 ♀♀, Kvitevik 2 ♀♀, Kyrkjøy 2 ♂♂ 1 (TJ). HOI, Kvinnherad: Ask 6 ♂♂ 3 ♀♀, Løfallsstrand 2 ♂♂ 1 ♀, Rosendal 1 ♂ 5 ♀♀, Varaldsøy 2 ♂♂, Varaldsøy Vardheiane 2 ♀♀, Ænesdalen 1 ♂. HOY, Stord: Storsøy 1 ♀; Tysnes: Ånuglo 3 ♂♂ 2 ♀♀; Os: Drange 1 ♀, Hagavik 2 ♀♀; Bergen (Fana): Stend 1 ♂; Bergen: Fløyen 2 ♂♂, Sandviken 3 ♂♂ 3 ♀♀, Neevengården 1 ♂; Bergen (Åsane): Vollane 2 ♀♀; Samnanger: Ådland 1 ♀; Meland: Holsnøy Brakstad 1 ♂ 1 ♀. MRY, Hareid: Hareidlandet at Kråkhølen 1 ♂.

This species was listed from Homansby and the Botanical Garden, Christiania (AK, Oslo) by Siebke (1877). His species identification, however, remains doubtful and cannot be confirmed by any material available at present (Greve 1987). However, the specimen mentioned above listed by Siebke (1877) as *Hirtea hortulana* does belong to *B. varipes*.

Distribution (Figure 17)

Its Norwegian distribution is distinctively coastal, all known localities except one (BV, Rollag, EIS 35) are very close to the coast. It has been collected from most EIS-grid squares along the Norwegian coast north to the Bergen area, but at just one locality farther north (MRY, Hareid:Hareidlandet). *B. varipes* is usually found in forest habitats, especially in deciduous forest. It is distributed over most of continental Europe (Krivosheina 1986).

Flight period

The species flies between early May and mid-Jun. in Norway, the highest number of records being made approximately 20 May. My collecting at RY, Finnøy have revealed maximum abundances between 10-20 May, but the period of high abundance is longer than that of *B. johannis*. *B. varipes* can be found in large numbers for a period of two to three weeks.

***Bibio lanigerus* Meigen, 1818.**

Previous records: Ø, Hvaler 1 ♂ (Lundström 1913, ZMH). BØ, Krødsherad (Lundström 1913, not seen).

New record: VE, Tjøme 1 ♂.

Distribution (Figure 18)

Lundström (1913) recorded the species from Ø, Hvaler and BØ, Krødsherad. There is a specimen from Hvaler in Museum of Zoology, Helsinki. The only more recent record is a male collected at VE, Tjøme on 22 May 1965, A. Fjellberg leg. The species occurs in Southern Sweden (Wahlgren 1919). *B. lanigerus* is distributed all over Europe except in the northern parts (Krivosheina 1986).

Flight period

The Tjøme specimen is the only Norwegian specimen for which date of collection is noted. Duda (1930) states that the species flies from Mid-Apr. to Mid-May in Germany, together with *B. johannis* and *B. varipes*.

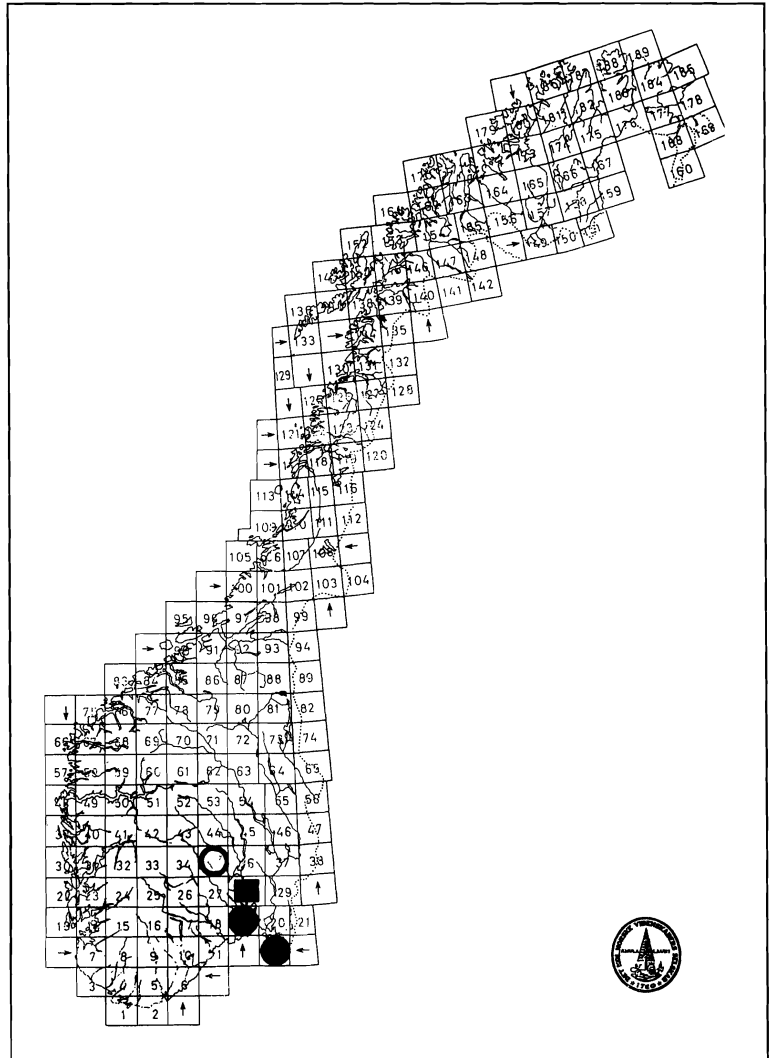


Figure 18

Records of *Bibio lanigerus* (circles) and *Bibio ferruginatus* (square) in Norway. Open symbols: not seen by the author or locality identity uncertain.

***Bibio ferruginatus* (L., 1767).**

Previous record: AK, Oslo: at Christiania (Siebke 1877, see discussion).

New record: AK, Oslo: Bestum 1 ♀ (NPPI).

Distribution (Figure 19) and flight period

Siebke (1877) listed the species as having been collected at Christiania (AK, Oslo) (Figure 18) but gave no further dates. In the Museum of Zoology, Oslo, there is one female

labeled "Dovre" and on another label "Siebke". The labels are typewritten, probably not by Siebke himself. I suspect that the labels are erroneous and the specimen identical to that recorded by Siebke. This species should be easily identified due to its very dark general habitus. It occurs in Sweden as far north as Gästrikland (Wahlgren 1919) and in southern Finland (Lundström 1910). The Bestum specimen was collected on 2 Jun 1967, Swedish records are from May and Jun..

***Bibio fulvicollis* Gimmerthal, 1842.**
***Syn Hirtea festinans* Zetterstedt**

nos. 12511-12513, 12520-12523), Tyldal 1 ♀ (ZMO no. 12524).

Previous records: AK, Oslo: Ormøya 1 ♀ (Siebke 1877, ZMO no. 12519), Tøyen 2 ♂♂ 3 ♀♀ (Siebke 1877, ZMO nos. 12503, 12504, 12508-12510). ON, Sel: Laurgård 1 ♂ (Siebke 1877, ZMO no. 12502); ON, Vågå 4 ♂♂ 3 ♀♀ (Siebke 1877, ZMO nos. 12501, 12506, 12507, 12514, 12518) 1 (TM).

New records: SFI, Lærdal: Kvamme 2 ♀♀. HEN, Rendalen: Ytre Rendal 2 ♂♂ 5 ♀♀ (ZMO

Distribution (Figure 19)

The number of older specimens in ZMO suggests that *B. fulvicollis* was at least moderately common in Norway in the nineteenth century. Later records of the species are, however, few. The most recently collected specimens were collected at SFI, Lærdal: Kvamme in 1938 and HEN, Rendalen: Ytre Rendal in

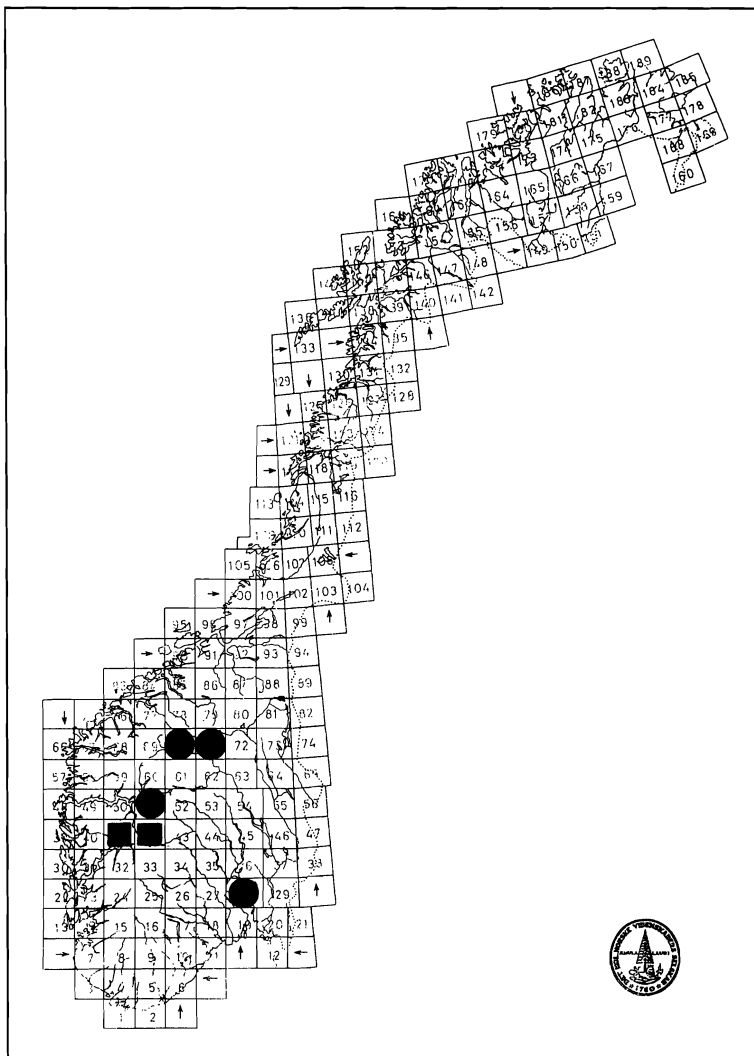


Figure 19
 Records of *Bibio fulvicollis* (circles) and *Bibio lautaretensis* (squares) in Norway.

1939. The total lack of more recent records is peculiar, considering that the majority of the specimens of other species included in this survey generally have been collected in the last twenty-five years. It might possibly indicate that this species is extinct from Norway, or at least has declined considerably. The distribution of the species is Scandinavia, the Baltic countries and the western part of Russia according to Krivosheina (1986).

Flight period

Those specimens that carry a date are all collected between 26 Jun. and 10 Jul. except for one specimen (ZMO no. 12519) labeled "Ormø 8.-72. Siebke". This is consistent with record dates of Swedish and Finnish specimens.

***Bibio lautaretensis* Villeneuve, 1925. *Syn Bibio crassipes* Duda, 1930.**

Previous records: BV, Hol: Nygård 1000 m 1 ♀. HOI, Voss: Mjølfjell Solbakken 8 ♂♂ 8 ♀♀ (both Greve and Haenni, 1994).

Distribution (Figure 19)

This species is treated by Greve and Haenni (1994). It is quite rare, being known from only two localities in Norway. It has been recorded from mountain areas in Central Europe, and from Finland (Greve and Haenni 1994), and is considered a subalpine-alpine species. The Norwegian records are from Jun. and Jul..

***Bibio fulvipes* (Zetterstedt, 1838). *Syn Hirtea umbellatarum* Zetterstedt, 1838; *Bibio fulvus* Lundström, 1910 .**

Previous records: STI, Oppdal: Kongsvoll, 25 Jul. 1832, 2 ♂♂ 1 ♀ (Zetterstedt 1838, ZML, Lectotype and paralectotypes of *Hirtea umbellatarum* Zetterstedt), Kongsvoll at Raubekken 172 ♂♂ 8 ♀♀ (Greve et al. 1984), Kongsvoll Kaldvella 3 ♂♂ (Greve et al. 1984), Kongsvoll at Jerosbekken 1 ex.

(Greve et al. 1984, VMT, not seen); Trondheim: near Trondheim (Siebke 1877. Not seen, dubious record). FV, Alta: Talvik 1 ♂ (Zetterstedt 1838, ZML, Paralectotype of *Hirtea fulvipes* Zetterstedt), Bossekop (Zetterstedt 1838, not seen. Zetterstedt (1850) recorded altogether seven specimens from Talvik and Bossekop, collected in 1821).

New records: BV, Uvdal: Geitsjøen 1 ♂. TEI, Vinje: Haukelister-Holmevasshytta 1 ♂, Haukeli-seter 1 ♂. HOI, Kinsarvik: Stavali area 22 ♂♂ 4 ♀♀, Veivatn area 2 ♂♂ 1 ♀; Ullensvang: Omkjellvatn area 1 ♀; Eidfjord: 1.1 kms SSE of Stigstuv tourist hut 2 ♂♂ 10 ♀♀, at Langavatn N of Sandhaug 1 ♂; Ulvik: Finse 6 ♂♂ 1 ♀ (1 ♂ KR), Finse Jomfrunet 3 ♂♂ 1 ♀ (3 ♂ KR), Finse Sandåvatn 5 ♂♂ 4 ♀♀, Sandalsvatn Finsesåta 1 ♀. SFI, Aurland: Hednedalsvatn 1 ♂. MRI, Surnadal: Naustådal at Naustådalvatn 4 ♂♂, Geithetta 1 ♂. ON, Sel: Laurgård 1 ♂ (ZMO). ON/STI, "Dovre" 1 ♂ (TM). HEN, Alvdal: at Vesle Sølsjøen 7 ♂♂. STI, Oppdal: Spriketjønni 2 ♂♂, Kongsvoll 38 ♂♂ 1 ♀, Kongsvoll at Sprænbekken 900-1370 m 113 ♂♂ 11 ♀♀, South Knutshø 1250 m 26 ♂♂ 3 ♀♀, Salen 1200 m 1 ♀, at Heimtjørni near Knutshø 1200 m 36 ♂♂ 11 ♀♀. TRI, Målselv: Kirkesdalen 6 ♂♂ 1 ♀, Kirkesdalen Lappskardet 7 ♂♂ 3 ♀♀, Dividalen 1 ♂ (TM), Frihetsli 1 ♂ (TM). FV, Måsøy: Hjelmsøya 3 ♂♂ (TM); Alta 2 ♂♂ (CNC). FI, Kautokeino: Avzze 1 ♂ (TM), Masi 1 ♂ (ZMO); Karasjok: Ravnastuen 1 ♀ (TM). FØ, Sør-Varanger 1 ♂ (ZMO).

Distribution (Figure 20)

This is a boreoalpine species in Norway. Except for Siebke's record from Trondheim, which is not possible to confirm and thus rather dubious, all specimens from Southern Norway have been collected at high-altitude locations. It is rather common on Hardangervidda and in the Dovrefjell mountains. It has also been collected from FV, Måsøy: Hjelmsøya (EIS 186), quite close to the North Cape. Zetterstedt's Norwegian type localities are Talvik and Bossekop in Alta, Finnmark province (*Hirtea fulvipes*) and Dovrefjell at Kongsvoll (*Hirtea umbellatarum*). The types of both nominal species are still in Museum in Zoology, Lund, Sweden in good condition. The maximum altitude from which the species

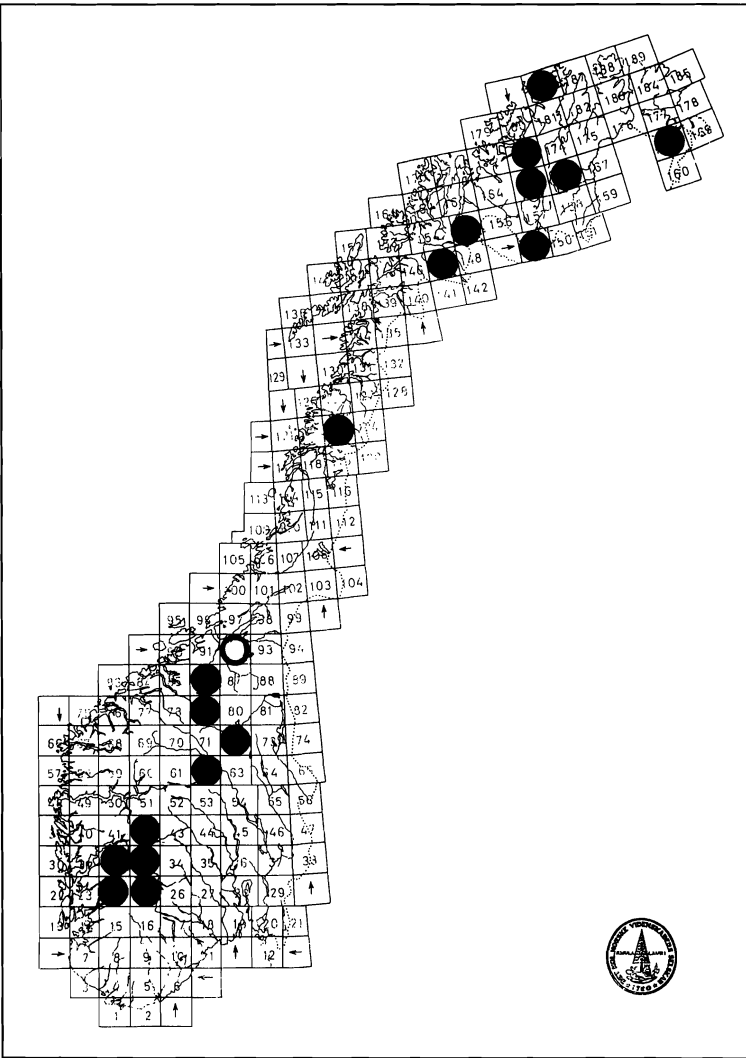


Figure 20
Records of *Bibio fulvipes* in Norway. Open circle: not seen by the author.

has been collected is 1460 m a. s. l. at STI,Oppdal: Sprænbekken near Kongsvoll. *B. fulvipes* is also common in the subalpine birch forest at Kongsvoll. According to Krivosheina (1986) the species occurs in Scandinavia and in the mountains of Central Europe, that is Transylvania (Duda 1930), the Alps (Duda 1930) and the Tatras (Pecina 1965). It is also known from Russia east to Kamchatka (Duda 1930).

Flight period (Figure 25)

Greve et al. (1984) found that the flight period in the Dovrefjell mountains lasted from mid-Jul. to mid-Aug.. That survey is based upon Malaise trap collections through four seasons (1980-83) on different localities near Kongsvoll. Altogether 262 specimens were caught. The total range of collection dates is between mid-Jul. and early Sept., but the species has been collected only sparingly after

mid-Aug.. There is no clear difference in flight period between southern and northern Norway.

***Bibio rufipes* (Zetterstedt, 1838).**

Previous records: ON, Dovre: Fokstua 5 Jul. 1861 4 ♂♂ 1 ♀ (Siebke 1864, ZMO). STI, Oppdal: at Drivstua Jul. 1853 (Siebke 1864, not seen), Kongsvoll 1 ♂ (Siebke 1877, ZMO), Kongsvoll at Blesbekken 1200 m 1 ex (Greve et al. 1984, not seen), Kongsvoll at Raubekken 900 m 51 ex., 1200 m 3 ex. (Greve et al. 1984, not seen), at Stropplsjøen 1289m (Greve et al. 1984, not seen).

New records: BV, Uvdal: Solheimsstul at Krukjetjønn 1140 m 2 ♂♂, Øvre Hein 1100-1125 m 7 ♂♂ 2 ♀♀. HOI, Eidfjord: 1.1 km SSE of Stigstuv tourist hut 179 ♂♂ 23 ♀♀; Ulvik: Finse Jomfrunut/Sandalsnut 4 ♂. HEN, Føllidal: Settaldalen Småbakken 1 ♂. STI, Oppdal: Kongsvoll at Sprænbekken 1100 m 1 ♂, 1350 m 1 ♂, South Knutshø 1080 m 5 ♂♂, South Knutshø 1150 m 326 ♂♂ 9 ♀♀, South Knutshø 1300 m 1 ♀, at Heimtjørni near Knutshø 1200 m 15 ♂♂, at Stropplsjøen 1289 m 14 ♂♂ 2 ♀♀. NSI, Rana: Krokstrand Dunderlandsdalen 3 ♂♂ (TM). TRI, Målselv: Kirkesdalen Lappskardet 1 ♂. FV, Alta: Jotkajavre 10 ♂♂ 1 ♀ (TM). FI, Karasjok: Ravnastuen 1 ♂ (TM).

***Distribution* (Figure 21)**

This species has been collected from several mountain areas in Southern and Northern Norway. There are fewer records of this species than of *B. fulvipes*, indicating that it is less common. However, the ranges of the two species seem to be approximately similar. All localities for the species seen by the author are very wet (mires or wet willow brushes). It is possible that *B. rufipes* is a stenotopic mire species. Near Kongsvoll it has been collected at altitudes between 900 and 1290 m a.s.l. The species occurs in Scandinavia and northern Russia (Krivoshina 1986).

Flight period

Greve et al. (1984) found that the species flew mostly during Aug. in the Dovrefjell mountains, with a few specimens being caught in early Sept.. Siebke (1877) stated that the flight period is Jul.. Five specimens were also collected in Barber (pitfall) traps between 3 and 16 Jun. 1971, at HOI, Eidfjord: near Stigstuv tourist hut. It is possible that *B. rufipes* has a distinct early flight period just after snowmelt. The available data except for Siebke's specimens indicate that the main flight period is in Aug., however some specimens have been collected until mid-Sept..

***Bibio siebkei* Mik., 1887.**

***Syn* *Hirtea femoralis* Siebke, 1864 (this is a junior homonym of *Bibio femoralis* Meigen, 1838).**

Previous records: ON, Dovre: Fokstua at Kringluttjern 8 Jul. 1861 4 ♂♂ (Siebke 1864, ZMO, 1 holotype and 3 paratypes of *Hirtea femoralis* Siebke), Hjerkin 16 Jul. 1861 2 ♂♂ (Siebke 1864, ZMO, paratypes)

Revised records: FI, Kautokeino: Kautokeino 1 ♂ (Zetterstedt 1838, ZML. Recorded as *Hirtea albipennis* var b.). STI, Oppdal: Kongsvoll Blesbekken 1 ♀, Kongsvoll Raubekken 1200 m 10 ♂♂ 1 ♀, Kongsvoll Kaldvella 1220 m 9 ♂♂ 1 ♀ (Greve et al. 1984, recorded as *Bibio* sp.).

New records: HOI, Kinsarvik: Veivatn area 1150 m 10 ♂♂ 1 ♀; Ullensvang: Tresfonn 1350-1600 m on snow 1 ♂; Eidfjord: 2.2 km SE Stigstuv tourist hut 445 ♂♂ 15 ♀♀; Ulvik: Sandalsvatn Finsesåta 1 ♂, Finse Jomfrunut/Sandalsnut 1 ♀. SFI, Aurland: Steinbergdalen 1000 m 1 ♂. ON, Nord-Fron: Jotunheimen Randsverk 2 ♂♂; Vågå: Bessvatnet 1380 m 1 ♂; Lesja: at Djuptjønn 1300 m 1 ♂; . MRI, Surnadal: Geithetta 1300 m 11 ♂♂. ON/STI, "Dovre" 3 ♂♂ (ZMO). STI, Oppdal: South Knutshø 1400 m 1 ♀, Mid Knutshø 1400 m 20 ♂♂ 4 ♀♀, Nystuguhø 1500 m 5 ♂♂. FV, Måsøy: Hjelmsøya 2 ♂♂ (TM); Alta 2 ♂♂ (CNC).

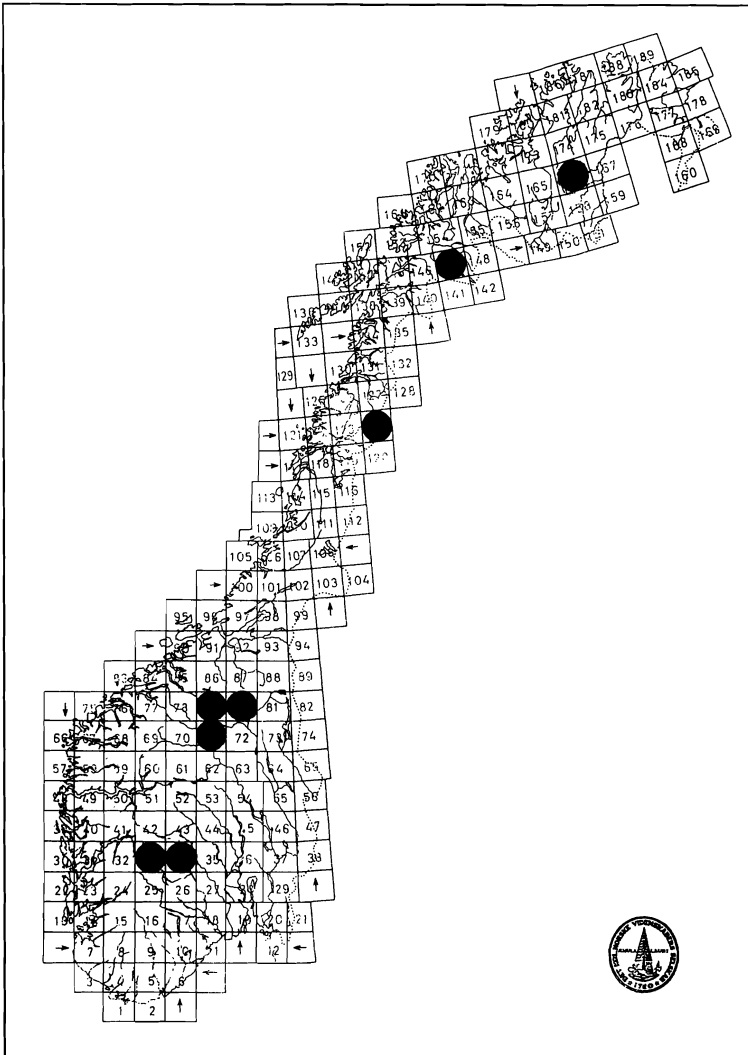


Figure 21
Records of *Bibio rufipes* in Norway.

Distribution (Figure 22)

Most of the specimens listed by Greve et al. (1984) as *Bibio* spp. belong to this species. It has been recorded in several mountain areas in southern Norway as well as in northern Norway. *B. siebkei* has also been recorded from a coastal locality near the North Cape (FV, Måsøy, Hjelmsøya, EIS 186). All localities in Southern Norway except Siebke's type locality (900 m a.s.l., subalpine zone) are in the alpine zones, most about 1300 m a.s.l.

The species has rarely been collected or recorded in large numbers in Norway and seems to be rather uncommon compared to *B. pomonae*, *B. fulvipes* and *B. rufipes*. More than four hundred specimens were, however, collected in Barber traps on a lichen heath near HOI, Eidfjord: Stigstuv tourist hut. The available records indicate that this species prefers higher altitudes than most other insects in Norway and it may have been missed by collectors for this reason. Localities seen by the

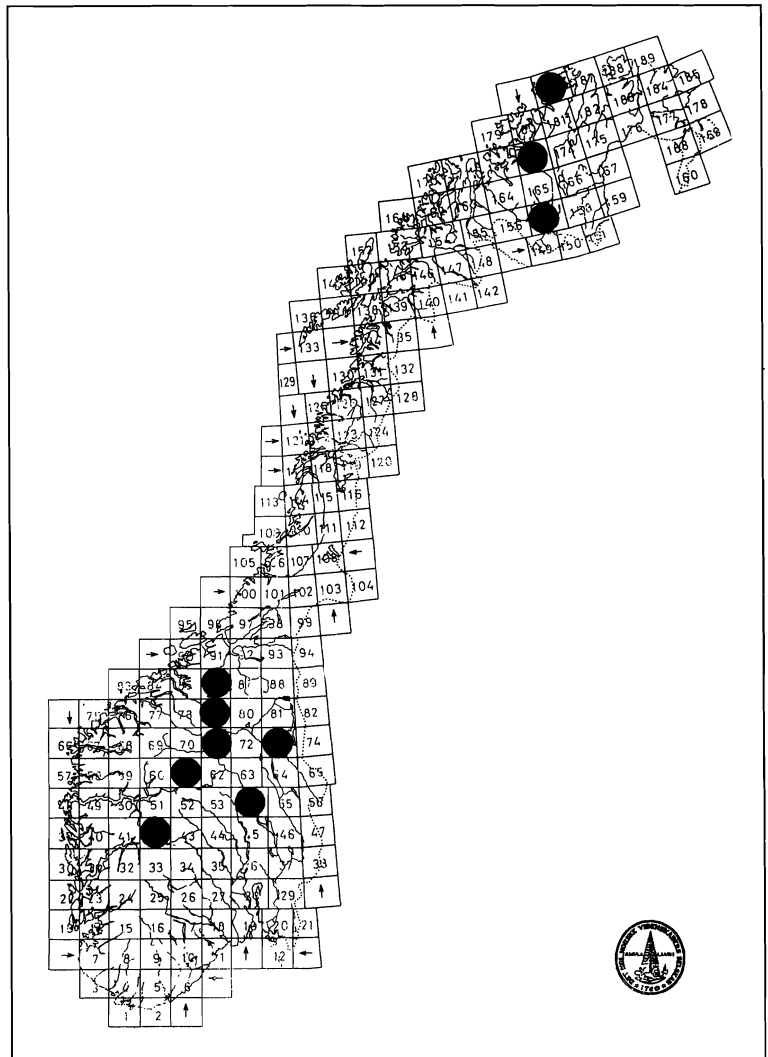


Figure 22
Records of *Bibio siebkei* in Norway.

author are rather dry meadows at altitudes 1400-1500 m a.s.l., with sparse vegetation of grasses and sedges. The species is known from northern Scandinavia and northern Russia (Duda 1930, Krivosheina 1986). In TM there is a specimen from Novaja Zemlya, indicating that this species extends its range quite far north.

Flight period

Most of the specimens included in this survey have been collected in Jul. but there are also some collected in Aug.. The sparse available material indicates a flight period approximately similar to that of *B. fulvipes*.

GENERAL DISCUSSION

No systematic collecting of bibionids have taken place over large areas in Norway, and the records herein presented originate from a large number of different collection sources. Specimens deposited in museum collections frequently reflect the distribution of collectors more clearly than the distribution of insect species. Bibionids are easily collected and are often rather abundant in insect trap samples, but it will depend upon the interests of the collector whether they are sorted out and preserved. Because of the large amount of work involved I have not attempted to examine the unsorted samples of insects deposited in Norwegian University Museums. In the material examined the following areas seem to be reasonably well covered: Vestfold and Akershus districts in Eastern Norway, Rogaland and Hordaland districts in Western Norway, the Hardangervidda and Dovrefjell mountain areas, and Troms district in Northern Norway. Records from the rest of Norway are sparse and scattered, however these areas probably include most of the landscape types available in Norway in which bibionids can be found. Additional collecting in the Agder districts in South Norway and in the central part of Eastern Norway could improve the completeness of the record considerably. Systematic collecting of bibionids is, however, relatively laborious as the species have short and non-overlapping flight periods and repeated (or continuous) sampling is needed to give a representative picture of which species occur in a given area.

No *Bibio* species not recorded from Norway have been recorded from Sweden outside of the southern Scania/Blekinge area. All species recorded from Finland (Lundström 1910) occur in Norway as well. On this basis I would not expect that any *Bibio* species except those here recorded occur in Norway.

ACKNOWLEDGEMENTS

I wish to thank the following people for making collection material available to me: Jeff Cumming, Ottawa; Roy Danielsson, Lund; Jac. Fjelddalen, Ås; Lita Greve, Bergen; Terje Jonassen, Sjernarøy; Sten Jonsson, Uppsala; Arne C. Nilssen, Tromsø; Knut Rognes, Stavanger; John O. Solem, Trondheim; Inger-Karin Steen-Hansen, Bergen; Per Straumfors, Mo i Rana; Karsten Sund, Oslo and Pekka Vilkkamaa, Helsinki. Arne Bretten, Simen Bretten, Arne Fjellberg, Erling Hauge and Thor Jan Olsen contributed information on records and on swarming activity. Lita Greve, Bergen, Torstein Solhøy, Bergen and an anonymous referee are acknowledged for constructive criticism on the manuscript. Anne Marie Skartveit, Finnøy, gave me valuable assistance with operation of traps. I also want to thank the Norwegian Research Council for supporting me through grant no. 100719/410.

SAMANDRAG

Utbreiing og flygetid hos arter i slekta *Bibio* Geoffroy, 1962 (Diptera, Bibionidae) i Noreg, med i en nøkkel til artane

Artikkelen omhandlar utbreiing og flygetid for dei norske artane av slekta *Bibio* Geoffroy (Diptera, Bibionidae). Ein nøkkel til artane vert presentert og tidlegare arbeid som har omtalt gruppa refererte til. Fjorten artar av *Bibio* har sikre funn frå Noreg. *Bibio hortulanus* (L.) vart registrert frå Noreg på grunnlag av ei feilbestemming og bør strykast frå lista. Artane *B. clavipes*, *B. pomonae* og *B. nigri-ventris* er utbreidde over så godt som heile landet. *B. lepidus*, *B. marci*, *B. johannis* og *B. varipes* finst berre langs den sørlege kyststripa, men er ofte talrike der dei finst. *B. fulvipes*, *B. rufipes* og *B. siebkei* er boreoalpina artar som finst frå den subalpine bjørkeskogen og oppover. Artane *B. lautaretensis*, *B. ferru-*

ginatus og *B. lanigerus* er sjeldne i Noreg, den fyrste er truleg ein boreoalpin art medan dei to siste er sørlege artar. *B. fulvicollis* har ikkje vorten registrert frå Noreg etter 1939, men det finst ein del eldre funn. Denne arten kan no moglegvis vera utdødd i Noreg.

Bibio johannis, *B. varipes* og *B. marci* (truleg også *B. lanigerus*) flyg i mai, *B. johannis* også i april i Rogaland. *Bibio nigriventris* og *B. ferruginatus* flyg i mai-juni i låglandet. Dei boreoalpine artane, også *B. nigriventris* i fjellet, flyg frå midten av juli og utover. *Bibio pomonae* er aktiv mellom juli og oktober. Dei nærtslekta artane *Bibio clavipes* og *B. lepidus* flyg om hausten, frå slutten av august til slutten av oktober.

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Invasion of Camberwell Beauty *Nymphalis antiopa* L. and Red Admiral *Vanessa atalanta* L. (Lepidoptera: Nymphalidae) in North Norway

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Strann, K.-B., Nilssen, A. C. & Straumfors, P. 1995. Invasion of Camberwell Beauty *Nymphalis antiopa* L. and Red Admiral *Vanessa atalanta* L. (Lepidoptera: Nymphalidae) in North Norway. - Fauna norv. Ser. B 42: 113-124.

In 1989, 1990 and 1991, a mass occurrence of the Camberwell Beauty *Nymphalis antiopa* L. occurred all over North Norway. In 1989, most observations were done in Aug., whereas the records in 1990 and 1991 were done between 8 Jun. and 20 Aug. The appearance in 1989, being the year of invasion, and all individuals observed probably were migrants from southern areas. The individuals registered in 1990 and 1991 were mainly descendents from the migrants of 1989. In these two years, the earliest observations (in Jun.) were hibernators, whereas the latest ones (in Aug.) could be offspring produced the same year in the area, or new immigrants. In 1992, only 4 observations were done (in the southernmost part of the area) and none in 1993, suggesting an abrupt decline in the population. Thus, *N. antiopa* was only established 3-4 years after the invasion. The Red Admiral *Vanessa atalanta* L. was observed at 16 sites in North Norway from Jun. to 23 Sept. in 1992, with 69° 45'N as the northernmost record. Some were probably one year old long-range immigrants from the south, whereas those observed in Aug. or Sept. were fresh individuals produced in the area. In contrast to *N. antiopa*, this species is unable to hibernate in a Nordic winter climate, and a mass appearance in 1993 was then not expected as a consequence of the 1992 invasion. This was the case. We did not get any observations of the species in 1993 from North Norway.

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INTRODUCTION

Nymphalis antiopa is widely distributed throughout most of Europe, temperate Asia and North-America (Higgins and Riley 1970, Bakke 1975). It is known as a strong flier and may migrate great distances (Kaaber 1984). It has occasionally been found all over Fennoscandia, including single individuals in northernmost Norway (Bakke 1975, Aagaard and Gulbrandsen 1976). The local populations in Fennoscandia fluctuate considerably, possibly also the northern limits for breeding, which are not exactly known. The species ovi-

posits on various deciduous trees (*Betula* spp. and *Salix* spp.), and the larvae feed on the leaves of these trees. In California it has been suggested that *N. antiopa* undergoes regular seasonal up- and downslope movements (Shapiro 1986).

Vanessa atalanta is also a strong migrant (Roer 1991), and its distribution includes temperate Europe, northern Africa, parts of Asia, North-America, Haiti and New Zealand (Higgins and Riley 1970). In Europe, the species does not survive the Nordic winter climate. Consequently, the individuals found in

northern Europe in spring/early summer have all migrated from southern regions (Bakke 1975). Warm summers generally seem to promote migration tendencies (Anonymous 1989). The species is, however, capable of producing offspring in a northern climate, and therefore newly eclosed butterflies may be found north to mid-Norway (Lid 1977a). Parts of this new generation probably migrate southwards (Lid 1971, 1977a, Roer 1991, Adrian and Riley 1992), while those trying to hibernate in the north probably perish due to cold winters. Thus, *V. atalanta* has seasonal migrations similar to many birds.

Northern Europe has in recent years experienced exceptionally mild winters. Some environmentalists and meteorologists have speculated that this is the first sign of the well-known greenhouse effect. Anyway, a warmer climate, especially milder winters, will have a marked effect on the fauna. Birds and mobile insects have a potential of an almost instantaneous reaction to such climatic changes by extending the northern limits of their distribution. Detection of such changes in distribution is not equally likely for all groups of animals. Among insects, butterflies are easily recognizable, also by the common public. Therefore, changes in the lepidopteran fauna would be expected to be detected very soon.

In this paper we describe a spectacular invasion of two well known Lepidoptera species in North Norway that may be connected to climatic changes.

MATERIAL AND METHODS

Most of the records are given to the authors by observant people from all parts of North Norway. Some records are based on observations only, others by collected specimens sent to us for identification. Some observations were made by the authors. In addition, many

records were found in newspaper articles, some with photographs. When only observations were available, we have only included those that we were certain could verify the species identification. This study includes the years 1989-1993.

RESULTS

Figure 1 summarizes the records for the years before 1975 and each of the years 1989-92 of *N. antiopa* based on earlier records in Norway. **Table 1** gives details on the records. In 1989, the first record was done on a particular warm day in Lofoten as early as 15 Apr. The rest of the records that year were from late Jul. towards the end of Aug. In 1990, the observations started in early Jun. and continued to 16 Aug. In 1991, observations were made in Jul. or Aug. except for two records primo Apr. and primo Jun. The few records in 1992 were all in Jul. or Aug. In most cases, 1 - 3 individuals were seen each time (**Table 1**), but in some sites more (**Figure 1**). One particular observation worth mentioning is the one from inner Troms primo Jul. 1990 (**Table 1b**), where > 20 individuals were observed simultaneously!

From the maps in **Figure 1** it is evident that the species was distributed all over North Norway, including inland valleys and coastal areas, and as far north as 71°N.

No observations seem to have been made in 1988, and apart from one single observation in Apr. (see above), all observations in 1989 started from late Jul.. The records were most numerous in 1990, decreased somewhat in 1991, and were very few in 1992 and restricted to the southern part. In 1993 no observations were reported to us from North Norway.

Figure 2 and **Table 2** show the records of *V. atalanta* in 1992, the only year so far with

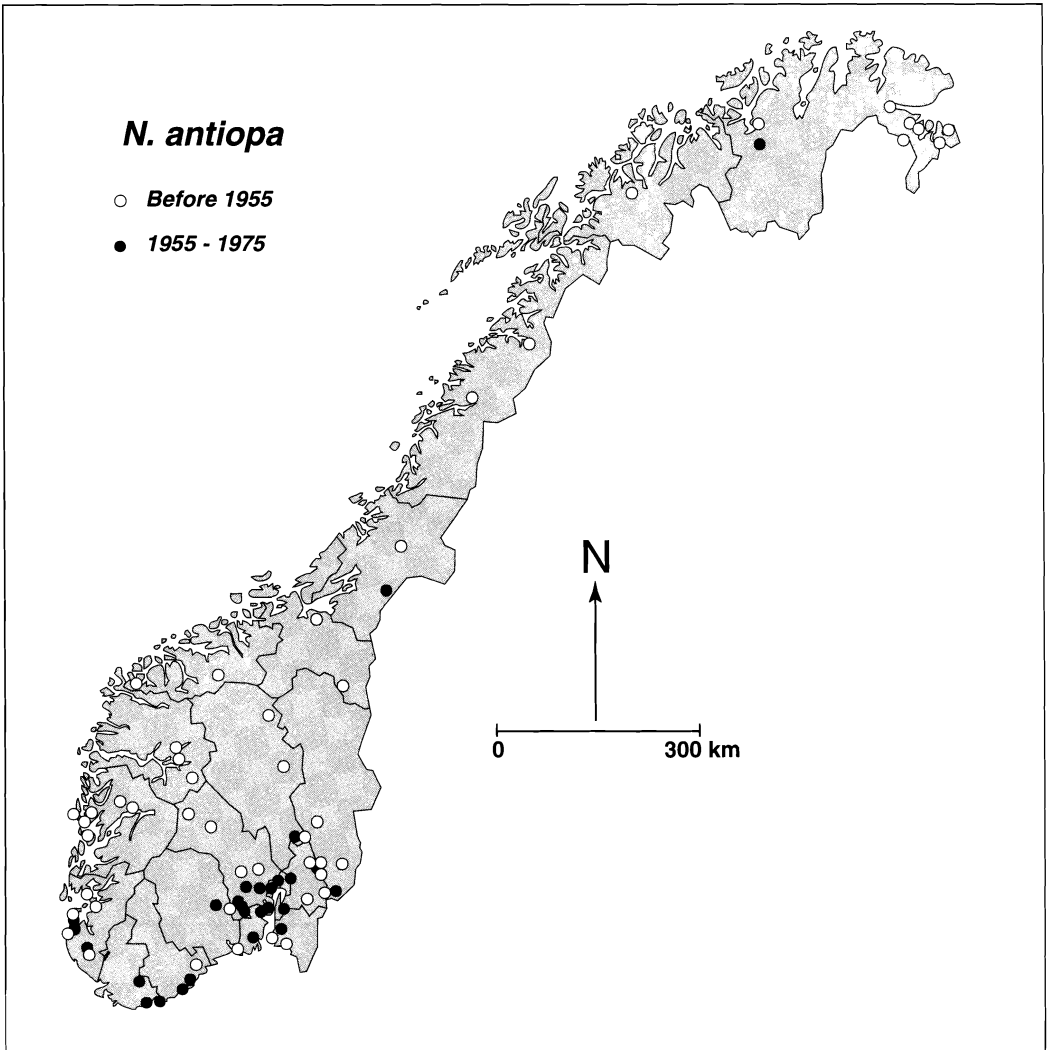


Figure 1

Observations of Camberwell Beauty *Nymphalis antiopa* L. in Norway until spring 1975 (after Aagaard & Gulbrandsen 1976).

observations. The species was first observed in May, but all other records were from Aug. and Sept., the last one 29 Sept. Up to 5 individuals were seen at the same time. The north-

ernmost observation was Tromsø (69° 45'N). Beyond that, all observations were done in the county of Nordland (**Figure 2**).

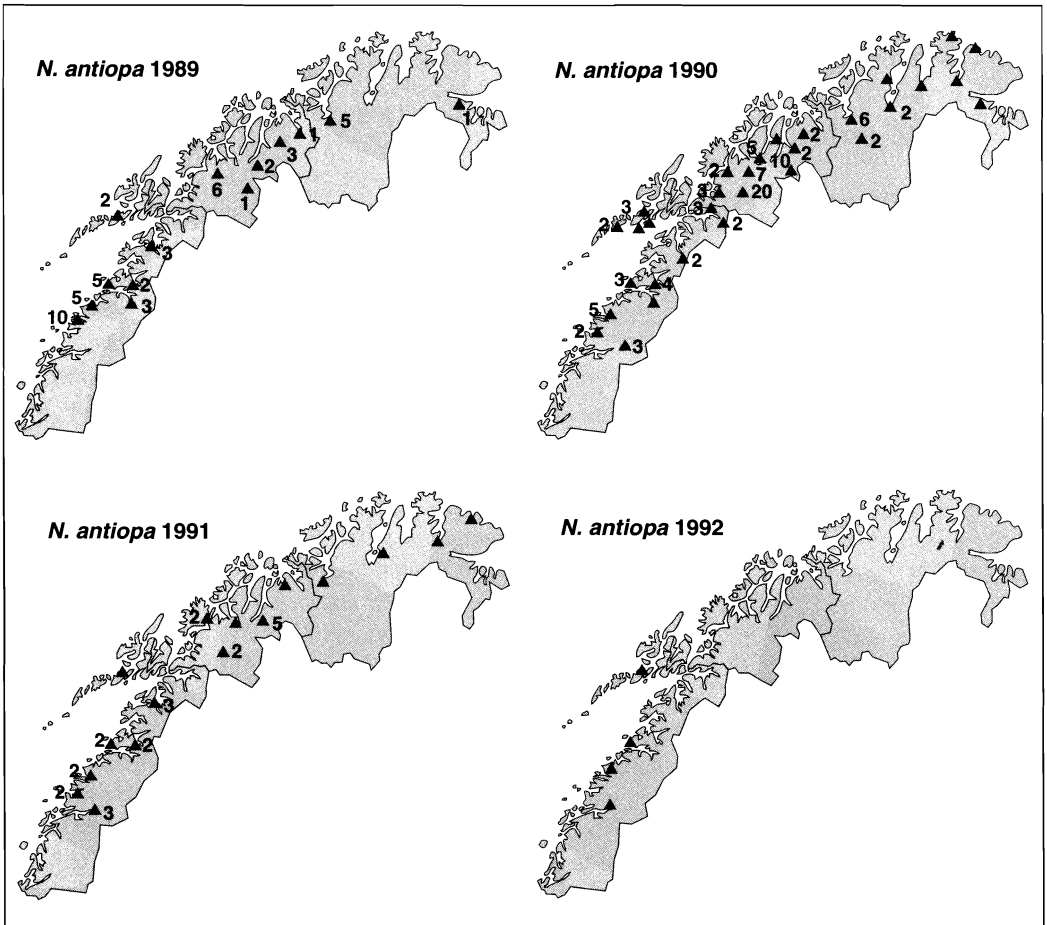


Figure 1b-e
Observations of Camberwell Beauty *Nymphalis antiopa* L. in subarctic Norway in the years 1989 - 1992. Numbers outside triangles give the numbers of individuals observed.

Table 1a. Observations of *Camberwell Beauty* *Nymphalis antiopa* L. in subarctic Norway in 1989.

Date	Source	Site	N
28.07	K.-B. Strann	Ørnes, Meløy	2
01.08	K.-B. Strann	Ørnes, Meløy	2
02.08	K.-B. Strann	Reipå, Meløy	2
03.08	B. Schultz	Spildra, Meløy	1
06.08	J.Å. Iversen	Mesøy, Meløy	1
10.08	H. Kolvik	Marken, Meløy	2
03.08	Nordlandsposten	Inndyr, Gildeskål	2
15.08	Nordlandsposten	Sunds fjord, Gildeskål	1
19.08	Nordlands Framtid	Sandhornøy, Gildeskål	2
06.08	T. Sundsfjord	Vatn-vatn, Bodø	1
15.08	Nordlands Framtid	Soløyvatn, Bodø	2
21.08	A. Hansen	Bodø	1
25.08	Helge Hansen	Bodø	1
10.08	K.-B. Strann	Søbbesva, Fauske	1
17.08	T. Horn	Fauske	1
02.08	T. Venseth	Rognan, Saltdal	1
09.08	P. Engan	Medby, Saltdal	2
10.08	K.-B. Strann	Innhavet, Hamarøy	1
16.08	Nordlands Framtid	Skutvik, Hamarøy	1
21.08	Per Stormo	Kråkmo, Hamarøy	1
15.04	F. Sortland	Laukvik, Vågan	1
15.08	F. Sortland	Laukvik, Vågan	1
01.08	Tor Nymo	Andselv, Målselv	1
06.08	Karl Grønli	Dividal, Målselv	1
07.08	E. M. Skjelstad	Moen, Målselv	1
11.08	K.-B. Strann	Olsborg, Målselv	1
12.08	P. Bjørklund	Andselv, Målselv	1
14.08	E. Setereng	Rostad bru, Målselv	1
20.08	J. Nyrud	Buktamoen, Målselv	1
16.08	K.-B. Strann	Oteren, Storfjord	1
21.08	J. P. Jensen	Kvesmenes, Storfjord	1
11.08	A. Nyrud	Snømyr, Nordreisa	1
15.08	T. Andersen	Storslett, Nordreisa	1
19.08	T. Andersen	Storslett, Nordreisa	1
16.08	A. Fredriksen	Kvænangsbøtn, Kvænangen	1
13.08	P. Buvik	Elvebakken, Alta	2
16.08	T. Olsen	Tverrelva, Alta	2
21.08	O. Bull	Bossekop, Alta	1
06.08	T. Ness	Bugøyfjord, Sør-Varanger	1

Table 1b. Observations of *Camberwell Beauty* *Nymphalis antiopa* L. in subarctic Norway in 1990.

Date	Source	Site	N
21.06	T. Hanssen	Krokstrand, Rana	1
02.07	F. Bjerga	Rossvoll, Rana	1
28.06	A. Enga	Tjongsfjord, Rødøy	2
14.07	G.-A. Strann	Mosvolddalen, Meløy	1
23.07	M. Hansen	Fore, Meløy	1
25.07	K.-B. Strann	Ørnes, Meløy	2
02.08	M. Fagerli	Spildra, Meløy	1
21.06	R. Andersen	Jensvoll, Bodø	2
04.07	G.-A. Strann	Bodø	1
20.06	Arne Stormo	Valvatn, Fauske	2
10.07	A. Setså	Fauske	1
01.08	Per Moen	Rødвика, Fauske	1
July	Per K. Bjørklund	Saltdal	1
12.07	T. Engum	Hellemobotn, Tysfjord	2
11.07	Erna Sivertsen	Rombaken, Narvik	2
28.07	H. Våge	Leknes, Vestvågøy	2
20.06	F. Sortland	Laukvik, Vågan	2
June	F. Sortland	Store Molla, Vågan	1
June	F. Sortland	Skrova, Vågan	1
13.07	T. Lunde	Strønstad, Hadsel	1
20.07	A. Nohr	Bogen, Ofoten	3
12.07	G. Gunnberg	Sørreisa	2
13.07	A. Hole	Bardufoss, Målselv	2
19.07	V. ellefsen	Heggelia, Målselv	2
01.08	E. Åsen	Elverum, Bardu	2
July	Per K. Bjørklund	Vesleala, Bardu	20
10.08	T. Fagereng	Sundlia, Målselv	1
20.06	S. Helgesen	Tennes, Balsfjord	2
02.07	I. Lamark	Storsteinnes, Balsfjord	2
17.07	P. Markussen	Hølen, Balsfjord	1
08.06	K.-B. Strann	Signalidal, Storfjord	6
09.08	K.-B. Strann	Signalidal, Storfjord	1
15.08	K.-B. Strann	Signalidal, Storfjord	3
23.07	O. Pedersen	Lyngseidet, Lyngen	1
18.07	A. Fredriksen	Kåfjorddalen, Kåfjord	2
03.07	H. Hansen	Sarelv, Nordreisa	1
16.07	F. Gravem	Snømyr, Nordreisa	1
15.07	G. Bangjord	Masi, Alta	2
03.07	P. Buvik	Mathisdalen, Alta	2
23.07	Paul Hansen	Bossekop, Alta	3
12.08	Tore Mathiesen	Elvebakken, Alta	1
13.08	Petter Murnes	Snekkernes, Porsanger	1
16.08	Truls Ranheim	Gjøkenes, Porsanger	2
02.07	M. Kimber	Kunes, Lebesby	1
27.06	R. Rae	Slettnes, Gamvik	1
09.07	T. Miethinen	Berlevåg	1
18.07	J. Nilssen	Tana bru, Tana	1
18.07	P. Paulsen	Neiden, Sør-Varanger	1
31.08	Rana Museum	Kongsvegen, Rana	1

Table 1c. Observations of *Camberwell Beauty* *Nymphalis antiopa* L. in subarctic Norway in 1991 and 1992.

Date	Source	Site	N
1991			
05.04	Asbjørn Pedersen	Røvassdalen, Rana	1
01.06	Kjell A. Meyer	Hammerneset, Rana	1
23.07	A. Kilvik	Enga, Meløy	2
29.07	K.-B. Strann	Ørnes, Meløy	2
16.07	Harald Bakke	Søløyvatn, Bodø	2
20.07	Trude Larsen	Fauske	2
02.08	Erik Alter?	Storfjord, Tysfjord	3
24.07	F. Sortland	Laukvik, Vågan	1
11.08	E. Gunvaldsen	Silsand, Lenvik	2
July	Per K. Bjørklund	Ala, Bardu	2
02.08	B. Kjosvatn	Tømmernes, Balsfjord	1
15.07	K.-B. Strann	Signalldal, Storfjord	3
13.08	K.-B. Strann	Signalldal, Storfjord	1
20.08	K.-B. Strann	Oteren, Storfjord	1
06.08	F. Eriksen	Storslett, Nordreisa	1
13.08	S. Methi	Kvernmoen, Alta	1
12.07	R. rae	Børselv, Porsanger	1
13.07	A. Ballo	Tana bru, Tana	1
16.07	S. Morheim	Båtsfjord	1
25.09	Rana Museum	Alteren, Rana	1
1992			
12.06	F. Sortland	Laukvik, Vågan	1
12.07	T. Hansen	Rossvoll, Rana	1
25.07	K.-B. Strann	Oterstrand, Gildeskål	1
13.08	T.E. Hansen	Bertnes, Bodø	1

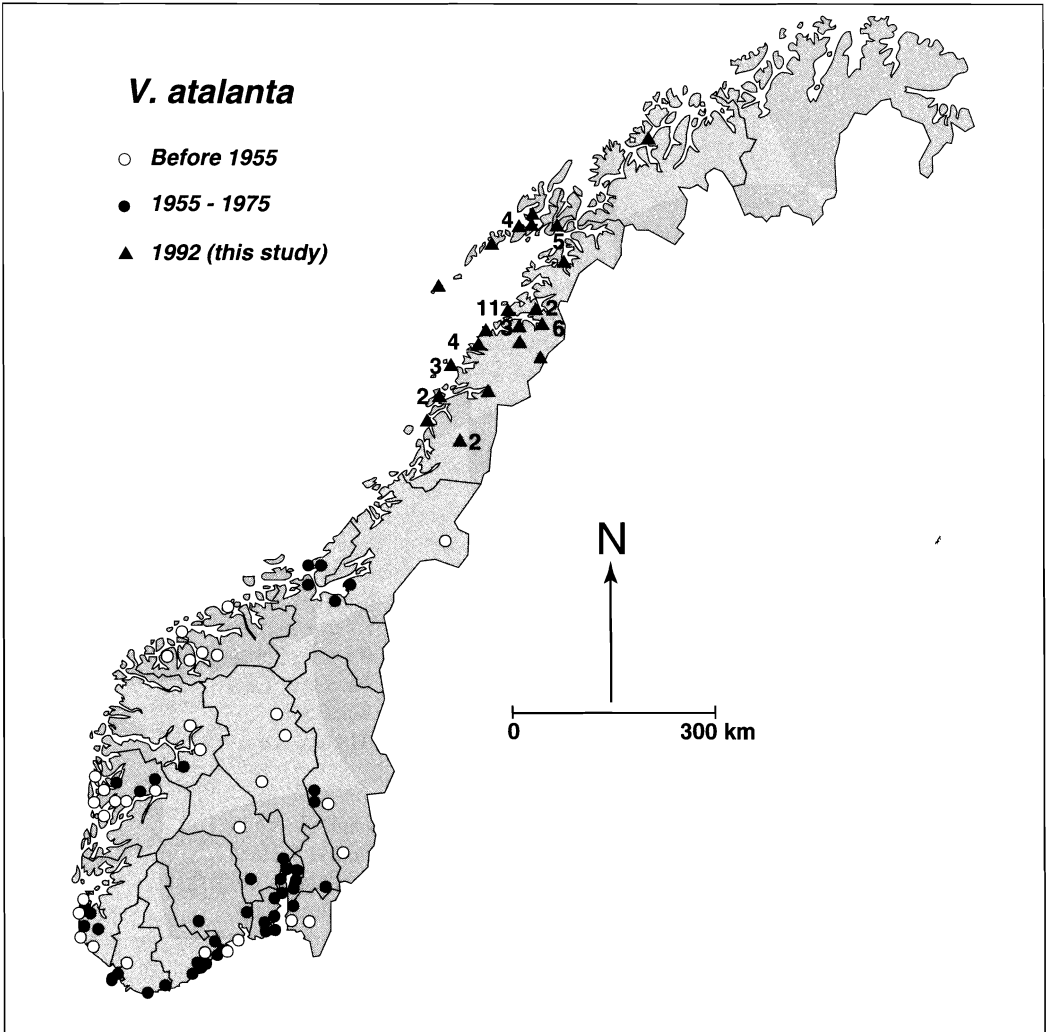


Figure 2
Observations of Red Admiral *Vanessa atalanta* L. in Norway (circles) before spring 1975 (after Aagaard & Gulbrandsen 1976), and in subarctic Norway in 1992 (triangles). Numbers outside triangles give the numbers of individuals observed.

Table 2. Observations of Red Admiral *Vanessa atalanta* L. in subarctic Norway in 1992.

Date	Source	Site	N
27.05	Johan Åge Asphjell	Høyjarfallmoen, Saltdal	1
28.05	Rolf Dørum	Beismoen, Rana	1
28.05	Odd H. Larsen	Fauske	1
28.05	Jon Inge Karlsen	Neverdal, Meløy	1
30.05	Lovise Gårdvik	Tjøtta, Alstadhaug	1
June	Espen Sandbukt	Tromsø	1
02.06	Trond Steen	Strand, Beiarn	1
24.06	Gunnar Lydersen	Kuna, Lurøy	1
July	F. Sortland	Laukvik, Vågan	1
August	Espen Sandbukt	Lødingen	5
August	Gunnar Lindvik	Mesøy, Meløy	1
August	F. Sortland	Laukvik, Vågan	3
August	Lofotposten	Røst	1
10.08	K.-B. Strann	Ørnes, Meløy	2
19.08	R. Jensen	Fauske	1
25.08	E. Henriksen	Innhavet, Hamarøy	1
27.08	Nordlandsposten	Skjerstad	2
21.08	Aud B. Olsen	Seines, Bodø	5
01.09	P. Strumfors	Selfors, Rana	1
02.09	G.-A. Strann	Bodø	4
02.09	Stig Lundmo	Utskarpen, Rana	1
05.09	Aud B. Olsen	Ljønes, Skjerstad	1
07.09	Johan Åge Asphjell	Rognan, Saltdal	2
07.09	Jan Sande	Korgen, Hemnes	1
12.09	Johan Åge Asphjell	Høyjarfallmoen, Saltdal	3
12.09	Aud B. Olsen	Junkerdal, Saltdal	1
13.09	Steinar Vikingstad	Hunstad, Bodø	1
20.09	Martin Sand	Hadselsand, Hadsel	1
20.09	Kjell A. Meyer	Aldra, Lurøy	1
20.09	H. Våge	Fygle, Vestvågøy	1
21.09	H. Våge	Fygle, Vestvågøy	1
23.09	Evelyn Sand	Strønstad, Hadsel	1
27.09	H. Våge	Fygle, Vestvågøy	1
27.09	Aud B. Olsen	Kjerringøy, Bodø	1
28.09	Aud B. Olsen	Sørarnøy, Gildeskål	1
29.09	Elfrida Rondestveit	Finneidfjord, Hemnes	1
September	Anne Isaksen	Hestmona, Rødøy	3

DISCUSSION

The records of both species are far beyond their common distribution. *N. antiopa* has, however, been found throughout North Norway as far north as eastern Finnmark (before 1955) (Aagaard and Gulbrandsen 1976, see **Figure 1**). The main invasion obviously started in 1989, and all records that year, except the observation done as early as 15 Apr. (**Table 1**), may represent individuals that had migrated from southern areas. A migration from the east (Sweden and Finland) is also possible, but it is reported from Finland (Anonymous 1989) that *N. antiopa* occurred in usually low numbers in 1988, making a mass migration from this area less likely.

The individual observed on 15 Apr. 1989 (**Table 1**) had most probably hibernated near the site of the observation. This is probably also the case of the specimens emerging in May 1992. Most individuals observed in 1990, at least the earliest ones, may also have been hibernators produced from migrants arrived in the area the preceding summer. The sometimes high number observed at one particular site (**Table 1**) makes it probable that they were procreated there instead of being a collection of long distance migrants. Also the butterflies observed in 1991 and 1992 were most probably produced in the area, even if one cannot exclude the possibility of a certain proportion of new immigrants. To distinguish between newly emerged butterflies and migrants is only possible if the individuals are collected for examination of wing wear and other characteristics of age. In the present case, most records were based on observations by a variety of persons that did not collect or were trained to observe such characteristics.

The number of *N. antiopa* observed was obviously highest in 1990, declined gradually in 1991 and drastically in 1992 ending up with no observations in 1993. The explanation for

this decline is difficult to assess. Large variations in the number of some butterfly species, including *N. antiopa*, have been observed in Finland, the reason ascribed to the summer climate (Anonymous 1989). The present study area is far north of the normal distribution of the species. Even if it can survive one or a few years as a breeding species due to occasional good summers, there will be more normal summers that may knock down the populations. Jul. 1992 in North Norway was very cold and rainy, a factor that must have been detrimental for a species adapted to a far warmer climate. In other words, the colonization and establishment was of a short duration.

The *V. atalanta* invasion occurred only in 1992 (**Table 2, Figure 2**). The individuals observed may be a mixture of immigrants and fresh individuals produced in the area. Larvae of this species have recently been observed in late Aug. at 70° N in Finnmark (Ness 1990), showing that breeding is possible in a subarctic climate. The strength of the invasion of *V. atalanta* in 1992 is further shown by the fact that the species was observed in high numbers in the two counties of Trøndelag (62° 30' N to 65° N). As many as up to some twenty individuals were seen in some gardens in the region of Trondheim and observations of singles and up to 4-5 were quite common in late summer 1992 (K. Aagaard & R.T. Kroglund, pers. comm.). Therefore, some of the individuals observed late in 1992, and those cases where several individuals were observed together, most probably were produced in Mid or North Norway. But in contrast to *N. antiopa*, this species is not able to hibernate in northern Europe. Observations in following years therefore rely on new migrations, at least in the northernmost part of Norway.

A large-scale invasion of *V. atalanta* took place in the Faroe Islands in late May 1992 when hundreds of individuals reached the southern parts of the islands (Kaaber et al. 1993). This

invasion was explained by strong southerly winds which favoured the northward migration of the species. A strong larval generation was also described from the islands during the 1992 summer.

Invasions of *V. atalanta* have been observed many times in Great Britain (Campbell 1970, Radford 1975, Zonfrillo 1990) and Denmark (Kaaber 1984). In Norway mass migration were observed in 1963 (Lid 1971) and 1976 (Lid 1977a, b). The mass migration in 1976 is well described (Lid 1977a, b): The earliest record was 25 May and the last 11 Oct. Larvae were also found, and they mostly eclosed during Aug. A southward mass migration of individuals produced in Norway was observed in Aug. and Sept. The northernmost observations in 1976 were in Nord-Trøndelag (64°N), whereas the northernmost ones in 1992 (**Table 2, Figure 2**) were Tromsø (69° 45'N). Some individuals are, however, able to reach "the end" of the continent (> 70° N) as reported by Ness (1990).

Although *V. atalanta* and *N. antiopa* both appear as long-range migrants in this subarctic region, the result of such immigrations is different. *V. atalanta* is not able to hibernate here, and a continuation of a population in this area is dependent on new immigration every year. As such long distance migrations obviously are rare events, *V. atalanta* will be rare species also in the future. If, however, the mild winters in continental Europe continue, their northern range for hibernation may extend northwards. The migration distance to reach Fennoscandia may therefore become shorter, resulting in higher frequency of visitors of this kind.

Because of its ability to survive the Nordic winter climate *N. antiopa* is a potential colonist. A year of successful mass migration, as seen in 1989, may lead to breeding and multiplying of the species. A further continuation

of the species in this area depends probably on the summer climate. Cold and rainy conditions in critical periods of one summer (such as in 1992 and 1993) are enough to exterminate the population. Unless the summer climate changes permanently to the better, a permanent establishment is not possible. In the present episode, the establishment lasted only 3-4 years before the whole population was wiped out.

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We are grateful to Kaare Aagaard for constructive criticism of the manuscript to R.T. Barrett for improving the English and to the many observers who sent in their records.

SAMMENDRAG

Invasjon av sørgekåpe *Nymphalis antiopa* L. og admiral *Vanessa atalanta* L. (Lepidoptera: Nymphalidae) i Nord-Norge.

I somrene 1989 til 1991 opptrådte dagsommerfuglen sørgekåpe *Nymphalis antiopa* L. i stort antall over hele Nord-Norge. I 1989 forekom de fleste observasjonene i august, mens det i årene 1990 og 1991 var flest mellom 8 juni og 20 August. Ut fra dette antar vi at invasjonen skjedde i 1989 og at alle de observerte individene kom trekkende fra sørligere områder. Derimot var de fleste individene som ble registrert i 1990 og 1991 avkom fra 1989-invasjonen. I disse to årene var de tidlige observasjonene (i juni) etter all sannsynlighet overvintretere, mens de siste (i august.) var avkom klekket i regionen eller nye individ som kom trekkende sørfra. Kun to observasjoner ble gjort i 1992 og ingen i 1993, noe som tyder på en brå nedgang i populasjonen. Dette betyr at sørgekåpen bare holdt stand 3-4 år etter invasjonen.

Fra juni til 23 september. 1992 ble admiral *Vanessa atalanta* L. observert på 16 lokaliteter i Nord-Norge. Den nordligste observasjonen var på 69° 45'N. Noen av disse var sannsynligvis ett år gamle individer som hadde gjennomført et langt trekk fra sørlige breddegrader, mens de som ble observert i august. og september. var nye individ som var klekket lokalt. I motsetning til sørgekåpa er admiralen ikke i stand til å overvintre i et nordisk vinterklima. I det påfølgende året (1993) var det derfor ikke forventet mange observasjoner med admiral som en direkte konsekvens av invasjonen i 1992. Dette holdt da også stikk. Det ble ikke innrapportert noen observasjoner av admiral fra Nord-Norge i 1993.

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Norwegian Moth Flies (Diptera: Psychodidae)

Trond Andersen & Øyvind Håland

Andersen, T. & Håland, Ø. 1995. Norwegian Moth Flies (Diptera : Psychodidae). - Fauna norv. Ser. B 42: 125-130.

Twenty-six species of Psychodidae are listed from Norway, belonging to the subfamilies Sycorasiinae, Trichomyiinae and Psychodinae. *Trichomyia urbica* Haliday in Curtis, 1839, *Satchelliella trivialis* (Eaton, 1893), *Pericoma rivularis* Berdén, 1954, *P. formosa* Nielsen, 1964, *Bazarella neglecta* (Eaton, 1893), *Psychoda cinerea* Banks, 1894, *P. gemina* (Eaton, 1904), *P. lobata* Tonnoir, 1940, *P. minuta* Banks, 1894, *P. setigera* Tonnoir, 1922, *P. surcoifi* Tonnoir, 1922, *Trichopsychoda hirtella* (Tonnoir, 1919) and *Philosepedon humeralis* (Meigen, 1918) are not previously recorded from Norway. Previous Norwegian records of *Satchelliella palustris* (Meigen, 1818), *Pericoma trifasciata* (Meigen, 1818), *Psychoda crassipennis* Tonnoir, 1940 and *P. pusilla* Tonnoir, 1922 are regarded as doubtful and are not included in the list.

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INTRODUCTION

The first records of Norwegian Psychodidae were given by Zetterstedt (1850), who described *Psychoda albipennis* Zetterstedt, 1850 based on material from Oslo. Zetterstedt (1850) also recorded *Psychoda calceata* Meigen, 1818 from "Næs Værdaliæ", a species which is regarded as a doubtful species by Wagner (1990). Later Siebke (1877) included 8 Psychodidae species in his list of Norwegian Diptera. Among these, Siebke (1877) also recorded another species which is regarded as a doubtful species by Wagner (1990), namely *Psychoda nervosa* Schrank, 1803, listed as "*Ps. nervosa* Meig.", in addition to *P. calceata*. Many Northwest European species have been described after Siebke (1877) published his list, and as most Psychodidae species are separated on minute details in the male genitalia we do not include the records given by Siebke (1877) in the present list. Two of the species recorded by Siebke (1877) might, however, well be mem-

bers of the Norwegian fauna, namely *Satchelliella palustris* (Meigen, 1818), which according to Wagner (1990) is distributed in most parts of Europe north up to Denmark, Sweden and Finland, and *Pericoma trifasciata* (Meigen, 1818) which according to Wagner (1990) is distributed in most parts of Europe north to Denmark.

Georges (1961) recorded 9 species of Psychodidae from Norway based on material collected by dr. J. Clastrier during 1957 and 1958. Only one record has an exact locality, while most localities are given as e.g. between Trondheim and Namsos ("entre Trondheim et Namsos"). Apart from Norway, dr. Clastrier also collected in Sweden, Finland, Belgium, France, Switzerland and Algeria, and even this material was treated by Georges (1961). Most of the species recorded from Norway by Georges (1961) have also been taken by us. However, for two species, *Psychoda crassipennis* Tonnoir, 1940 ("entre Andalsness et Oppdal") and *P. pusilla* Tonnoir, 1922 ("entre

Tromsø et Alta”), the records given by Georges (1961) are the only Norwegian records. Neither species have been taken elsewhere in Scandinavia and we think that these records should be confirmed before the two species are included in a Norwegian list. One of the species recorded by Georges (1961), *Psychoda severini* Tonnoir, 1940, is now regarded as a synonym of *P. albipennis* (see Withers 1988)

Nielsen (1965) recorded 5 species from northern Norway, all included in the present list. *Lobulosa pollex* (Berdén, 1954) described in *Pericoma* by Berdén (1954) is redescribed by Nielsen (1965) based on material from Inner Troms. In the catalogue of palaeartic Psychodidae Wagner (1990) included a record of *Satchelliella stammeri* (Jung, 1954) from Norway. Recently Andersen (1992) recorded *Sycorax silacea* Haliday in Curtis, 1839 as new to Norway.

MATERIAL AND METHODS

The material have either been netted or collected in light traps, Malaise traps or window traps. If not otherwise stated the material is collected by the authors.

Most of the material have been preserved in alcohol and later mounted as slides in Canada-balsam.

The species are listed according to Wagner (1990).

THE SPECIES

Subfamily Sycoracinae

Sycorax silacea Haliday in Curtis, 1839

Recorded from HOY, Tysnes: Ånuglo (EIS 23) (Andersen 1992).

According to Wagner (1990) the species is distributed in most parts of Europe north to Denmark and Sweden.

Subfamily Trichomyiinae

Trichomyia urbica Haliday in Curtis, 1839

SFI, Leikanger: Grinde (EIS 50) 25 Apr.-21 Sept. 1991 17♂♂ 4♀♀ J. Anonby.

According to Wagner (1990) the species is distributed in most parts of Europe north to Denmark and Sweden.

Subfamily Psychodinae

Tribe Pericomini

Berdeniella freyi (Berdén, 1954)

Recorded from NNØ, Sørfold: Røssvik (“Rössvik”) (EIS 131) (Nielsen 1965).

According to Wagner (1990) the species is distributed in most parts of Europe northwards to Denmark, Sweden and Finland.

Satchelliella mutua (Eaton, 1893)

HOY, Os: Raudli (EIS 31) 4-11 Jul. 1991 6♂♂, 25 Jul.-1 Aug. 1991 1♂ G. A. Halvorsen; Tysnes: Ånuglo (EIS 23) 7 Jun. 1990 1♂. SFI, Leikanger: Grinde (EIS 50) 13 Jun.-11 Jul. 1991 12♂♂ 3♀♀ J. Anonby. NSY, Alstadhaug: Sandnessjøen (EIS 117) 23 Jun. 1986 1♂.

Recorded from NNØ, Sørfold: Røssvik (“Rössvik”) (EIS 131) (Nielsen 1965).

According to Wagner (1990) the species is distributed in most parts of Europe north to Denmark and Finland.

***Satchelliella stammeri* (Jung, 1954)**

HEN, Tynset: Tronfjellet, Tron Ungdomssenter (EIS 72) 19-21 Jun. 1990 3♂♂ 1♀.

Recorded from Norway by Wagner (1990).

According to Wagner (1990) the species is distributed in most parts of Europe north to Denmark and Sweden.

***Satchelliella trivialis* (Eaton, 1893)**

Ø, Halden: Askefoss (EIS 20) 14 Aug. 1990 1♂, Berby (EIS 12) 14 Aug. 1990 1♂, Engene (EIS 12) 14 Aug. 1990 1♂. AK, Nittedal: Rus (EIS 36) 6 Aug. 1990 2♂♂. BØ, Kongsberg: Reineelva (EIS 19) 30 Jul. 1990 1♂, Komnes (EIS 19) 7 Aug. 1990 1♂. VE, Borre: Falkenstein (EIS 19) 2 Aug. 1993 2♂♂. HOI, Voss: Møn (EIS 41) 24 Aug. 1979 2♂♂ P. Andersen; Kvinnherad: Hatlestrand Hjortlandsvann (EIS 31) 25 Aug. 1990 5♂♂.

According to Wagner (1990) the species is distributed in most parts of Europe north to Denmark, Sweden and Finland.

***Pericoma rivularis* Berdén, 1954**

SFI, Leikanger: Grinde (EIS 50) 9-24 Jul. 1991 1♂ J. Anonby.

According to Wagner (1990) the species is previously only known from Sweden and Finland.

***Pericoma blandula* Eaton, 1893**

BØ, Øvre Eiker: Skjelbred (EIS 27) 30 Jul. 1990 1♂.

Recorded by Georges (1961) from "entre Oppdal et Trondheim", which is in STI.

According to Wagner (1990) the species is distributed in all parts of Europe and in North Africa.

***Pericoma formosa* Nielsen, 1964**

Ø, Halden: Berby (EIS 12) 14 Aug. 1990 22♂♂; Hobøl: Nesa (EIS 29) 19 Aug. 1990 18♂♂. AK, Nittedal: Rønnes (EIS 36) 6 Aug. 1990 24♂♂; Hurdal: Gjødinglelva (EIS 36) 30 Jun. 1990 1♂.

According to Wagner (1990) the species is previously only taken in Denmark and France.

***Lobulosa pollex* (Berdén, 1954)**

Recorded from TRI, Gratangen: Gratangen (EIS 146); Storfjord: Storfjord (EIS 155) (Nielsen 1965).

According to Wagner (1990) the species is only taken in Norway and Sweden and in northern parts of Russia.

***Clytocerus ocellaris* (Meigen, 1818)**

AK, Oslo: Østensjøvannet (EIS 28) 3 Sept. 1983 2♂♂. HES, Eidskog: Malmer (EIS 38) 2 Jul. 1991 1♂. VE, Tjøme: Mostranda (EIS 19) 12 Aug. 1992 1♂; Borre: Falkenstein (EIS 19) 2 Aug. 1993 2♂♂. NSY, Alstadhaug: Sandnessjøen (EIS 117) 16 Jun. 1987 1♂.

According to Wagner (1990) the species is distributed in most parts of Europe north to Denmark and Finland.

***Bazarella neglecta* (Eaton, 1893)**

ON, Øystre Slidre: Øvre Heimdalsvann (EIS 62) 9 Jul. 1985 1♂.

According to Wagner (1990) the species is previously only taken in Austria, France and in Great Britain.

Tribe Psychodini

***Psychoda albipennis* Zetterstedt, 1850**

syn.: *P. severini* Tonnoir, 1940

Ø, Spydeberg: Lysern (EIS 29) 30 May 1989 2♂♂ S. Ligaard. AK, Oslo: Gjelleråsen (EIS 36) 19 Sept. 1992 1♂ J. Kjærandsen; Nesodden: Fagerstrand (EIS 28) 23 Jun. 1991 1♂, 12 Jul. 1991 3♂♂, 17

Aug. 1991 3♂♂, 9 Oct. 1991 4 ♂♂9 Jun. 1992 1♂
19 Sept. 1♂. Kobro. HEN, Engerdal: Femunden (EIS
73) 23-28 Aug. 1992 2♂♂ K. Frafjord. BØ, Øvre
Eiker: Steinbruelva (EIS 28) 31 Jul. 1990 1♂♂. BV,
Rollag: Rollag (EIS 35) 28-29 Jul. 1989 3♂♂, 22
Sept. 1989 1♂ B. A. Sagvolden; Hol: Egilstølen (EIS
34) 10 Aug. 1991 2♂♂ S. Kobro. HOY, Vaksdal:
Ekse (EIS 41) 18 Aug. 1988 1♂ Ø. Schnell. HOI,
Voss: Møn (EIS 41) 24-30 Aug. 1979 6♂♂ P.
Andersen; Kvinnherad: Rosendal Baroniet (EIS 31) 5
Aug. 1990 20♂♂. SFI, Leikanger: Grinde (EIS 50)
May-Sept. very common J. Anonby. NSY,
Alstadhaug: Sandnessjøen (EIS 117) 5 Jun. 1986 1♂.

Described by Zetterstedt (1850) based on
material collected by Siebke in AK, Oslo:
Tøyen (EIS 28), the type locality is given as:
“in Scandinavia boreali; in Töien prope
Christianiam Norwegiæ”. Georges (1961)
recorded the species from “entre Lom et Oye”
and “entre Andalsness et Oppdal”. If Oye
refers to Øye in Norangsfjorden in Møre and
Romsdal, the first record is either from ON,
SFI, MRI or MRY, the latter is either from
MRI or STI. Georges (1961) also recorded *P.
severini severini* Tonnoir from “Norvège :
Sandvenseter”, a locality which might refer to
Sandvenseter Hotell in Kvamskogen in
Hordaland (HOI, Kvam: Sandvenseter (EIS:
31)). *P. severini* is now regarded as a syno-
nym of *P. albipennis* (see Withers 1988).

According to Wagner (1990) the species is
distributed in most parts of Europe north as far
as Denmark, Norway and Sweden.

***Psychoda brevicornis* Tonnoir, 1940**

HOI, Kvinnherad: Rosendal Baroniet (EIS 31) 5
Aug. 1990 1♂.

Recorded by Georges (1961) from “entre
Trondheim et Namsos”, a record which could
be either from STI, NTI or NTY.

According to Wagner (1990) the species is
previously recorded from Germany, France
and Great Britain.

***Psychoda cinerea* Banks, 1894**

VE, Tjøme: Mostrand (EIS 19) 4 Aug. 1993
4♂♂.

According to Wagner (1990) the species has a
cosmopolitan distribution.

***Psychoda gemina* (Eaton, 1904)**

HOI, Kvinnherad: Rosendal Baroniet (EIS 31) 5
Aug. 1990 1♂.

According to Wagner (1990) the species is
distributed in most parts of Europe north to
Denmark.

***Psychoda grisescens* Tonnoir, 1922**

HEN, Engerdal: Femunden (EIS 73) 23-28 Aug.
1992 1♂ K. Frafjord. HOY, Os: Raudli (EIS 31) 25
Jul.-1 Aug. 1991 1♂ G. A. Halvorsen. HOI,
Kvinnherad: Rosendal Baroniet (EIS 31) 5 Aug.
1990 1♂. STI, Tydal: Stugusjøen (EIS 88) 23-31
Aug. 1992 1♂ K. Frafjord.

Recorded by Georges (1961) from “entre
Oppdal et Trondheim”, located in STI.

According to Wagner (1990) the species is
distributed in central and southern parts of
Europe and in North Africa.

***Psychoda lobata* Tonnoir, 1940**

HEN, Engerdal: Femunden (EIS 73) 23-28 Aug.
1992 3♂♂ K. Frafjord. VE, Tjøme: Mostrand (EIS
19) 4 Aug. 1993 3♂♂. HOY, Os: Raudli (EIS 31)
11-18 Jul. 1991 1♂, 25 Jul. - 1 Aug. 1991 1♂ G. A.
Halvorsen. HOI, Kvinnherad: Rosendal Baroniet
(EIS 31) 5 Aug. 1990 2♂♂.

According to Wagner (1990) the species is
distributed in central and southern parts of
Europe.

***Psychoda minuta* Banks, 1894**

AK, Nesodden: Fagerstrand (EIS 28) 17 Aug. 1991
1♂ S. Kobro. HOY, Os: Raudli (EIS 31) 4-11 Jul.
1991 1♂, 11-18 Jul. 1991 1♂ G. A. Halvorsen.

HOI, Kvinnherad: Rosendal Baroniet (EIS 31) 5 Aug. 1990 2♂♂.

According to Wagner (1990) the species has a cosmopolitan distribution.

***Psychoda phallaenoides* (Linnaeus, 1758)**

BV, Rollag: Rollag (EIS 35) 22 Sept. 1989 1♂ B. A. Sagvolden; Uvdal: Gjuvbekken (EIS 34) 27 Jul. 1991 1♂. HOY, Os: Raudli (EIS 31) 4-11 Jul. 1991 1♂, 25 Jul.-1 Aug. 1991 1♂ G. A. Halvorsen. HOI, Kvinnherad: Rosendal Hattebergselva (EIS 31) 27 Aug. 1990 2♂♂, Baroniet (EIS 31) 5 Aug. 1990 38♂♂. SFI, Leikanger: Grinde (EIS 50) May - Sept. very common J. Anonby.

Georges (1961) gave several records from Norway: "entre Oppdal et Trondheim" (STI), "entre Trondheim et Namsos" (STI, NTI or NTY), "entre Namsos et Brekkvasselv" (NTY or NTI), "entre Brekkvasselv et Mo i Rana" (NTI or NSI), "entre Tromsø et Alta" (TRY, TRI or FV), "entre Hammerfest et Banak" (FV or FN). The species is also recorded from TRI, Gratangen: Gratangen (EIS 146) (Nielsen 1965).

According to Wagner (1990) the species has a cosmopolitan distribution.

***Psychoda setigera* Tonnoir, 1922**

HOY, Os: Raudli (EIS 31) 16-23 May 1991 1♂ G. A. Halvorsen. HOI, Kvinnherad: Rosendal Baroniet (EIS 31) 4-5 Sept. 1990 1♂. SFI, Leikanger: Grinde (EIS 50) 13 Jun.-19 Oct. 1991 12♂♂, 11-27 May 1992 8♂♂ J. Anonby.

According to Wagner (1990) the species has a cosmopolitan distribution.

***Psychoda surcoufi* Tonnoir, 1922**

BV, Rollag: Rollag (EIS 35) 29 Jul. 1989 1♂ B. A. Sagvolden. HOI, Voss: Møn (EIS 41) 24 Aug. 1979 2♂ P. Andersen. SFY, Høyanger: Bjordal (EIS 49) 17-19 Aug. 1980 8♂♂ H. Bjordal.

The species is previously taken in Belgium, France and Great Britain (Withers 1988, Wagner 1990).

***Psychoda trinodulosa* Tonnoir, 1922**

HOI, Kvinnherad: Rosendal Hattebergselva (EIS 31) 27 Aug. 1990 4♂♂, Baroniet (EIS 31) 27 Aug.-8 Sept. 1990 20♂♂.

Recorded by Georges (1961) from "entre Trondheim et Namsos", which can be either in STI, NTI or NTY.

According to Wagner (1990) the species has a cosmopolitan distribution.

Tribe Telmatoscopini

***Telmatoscopus similis* Tonnoir, 1922**

Recorded from TRI, Gratangen: Gratangen (EIS 146) (Nielsen 1965)

According to Wagner (1990) the species is distributed in central and northern parts of Europe including Denmark, Sweden and Finland.

***Trichopsychoda hirtella* (Tonnoir, 1919)**

AK, Nesodden: Fagerstrand (EIS 28) 10 Jul. 1991 1♂, 12 Jul. 1991 3♂♂, 24 Jul. 1991 1♂, 29 Jul. 1992 1♂ S. Kobro.

According to Wagner (1990) the species is distributed in southern and central parts of Europe northwards to Germany and Great Britain.

***Philosepedon humeralis* (Meigen, 1818)**

Ø, Eidsberg: Lundebyvann (EIS 29) 30 Aug. 1989 1♂; Rakkestad: Vatvedt (EIS 20) 28 Aug. 1989 7♂♂. AK, Nesodden: Fagerstrand (EIS 28) 12 Jul. 1991 1♂, 29 Jul. 1991 1♂, 9 Jun. 1992 1♂ S. Kobro. HES, Kongsvinger: Kongsvinger (EIS 38) 8 May 1990 1♂ 1♀. HOI, Kvam: Nordheimsund (EIS 31) 21 Aug. 1991 1♀. SFI, Leikanger: Grinde (EIS 50) May-Sept. common J. Anonby.

According to Wagner (1990) the species is distributed in most parts of Europe northwards to Denmark.

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SAMMENDRAG

Norske sommerfuglmygg (Diptera: Psychodidae)

Tilsammen 26 arter av sommerfuglmygg tilhørende underfamiliene Sycoracinae, Trichomyiinae og Psychodinae er listet opp for Norge, basert både på publiserte og på egne funn. *Trichomyia urbica* Haliday in Curtis, 1839, *Satchelliella trivialis* (Eaton, 1893), *Pericoma rivularis* Berdén, 1954, *P. formosa* Nielsen, 1964, *Bazarella neglecta* (Eaton, 1893), *Psychoda cinerea* Banks, 1894, *P. gemina* (Eaton, 1904), *P. lobata* Tonnoir, 1940, *P. minuta* Banks, 1894, *P. setigera* Tonnoir, 1922, *P. surcoufi* Tonnoir, 1922, *Trichopsychoda hirtella* (Tonnoir, 1919) og *Philosepedon humeralis* (Meigen 1818) rapporteres for første gang fra Norge. Publiserte funn av *Satchelliella palustris* (Meigen, 1818), *Pericoma trifasciata* (Meigen, 1818), *Psychoda crassipennis* Tonnoir, 1940 og *P. pusilla* Tonnoir, 1922 ansees som tvilsomme og er ikke tatt med i listen.

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***Pseudopomyza atrimana* (Meigen, 1830) (Diptera, Pseudopomyzidae); new family and species to the Norwegian fauna**

Lita Greve & Terje Jonassen

Greve L. & Jonassen T. 1995. *Pseudopomyza atrimana* (Meigen, 1830) (Diptera, Pseudopomyzidae); new family and species to the Norwegian fauna. - Fauna norv. Ser. B 42: 131-133.

Two males of the fly *Pseudopomyza atrimana* (Meigen, 1830) (Diptera, Pseudopomyzidae) were collected in a Malaise trap at Underlia, Drammen in eastern Buskerud province in the beginning of June. 1993 by Lars Ove Hansen. This is the first record of the family Pseudopomyzidae from Norway. *P. atrimana* is a rare fly reported from scattered localities in central and northern Europe.

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INTRODUCTION

The Pseudopomyzidae is a fly-family of worldwide distribution, however, with two genera only. The Pseudopomyzidae is related to the Cypselosomatidae and these two families share many characters. McAlpine (1987) considers Pseudopomyzidae a subfamily in the family Cypselosomatidae, while Krivosheina (1984) treat the Pseudopomyzidae as a separate family. Krivosheina's view, also shared by Andersson (1976) is followed here.

Chandler (1983) lists the characters of the Pseudomyzidae and the more important traits are as follows: The Pseudopomyzidae are stout, though often small, flies with relatively robust legs. Fronto-orbitals in a row, reclinate. Antennae with rounded third segment, and arista with at most short pubescence. Strong vibrissae present. Proboscis short and stout. Costa is broken twice.

The genus *Pseudopomyza* is the only genus in the family known from Europe, and this genus

has one species only, viz. *Pseudopomyza atrimana* (Meigen, 1830) reported here.

The head of the flies in genus *Pseudopomyza* Strobl, 1893 has three pairs of fronto-orbital bristles, four pairs of dorsocentrals and two pairs of scutellars. The face is bare between the antennae, mesepleuron is bare and costa is without spines.

The species *P. atrimana* (Meigen, 1830) is a small fly less than 3 mm. Colour mainly black with parts of head and legs yellow. The antennae are yellow basally while most of the third segment is greyish-brown. The third segment and arista with short hairs. The vibrissae is long and strong and there are several short, scattered hairs behind. Some longer erect bristles at lower margin of occiput. In the wing subcosta is well developed, approaching Radius 1. Short Cubitus 1 and Anal rib which do not reach the hind margin. Thorax compact, scutellum short. 1 + 3 dorsocentrals bristles. Abdomen broad and longer than thorax.

The males in this species are very easy to recognize on account of the large and special male postabdomen which is shown on **Figure 1**. This figure is drawn from one of the males collected at Underlia. The males of *P. atrimana* stand out among the many other small flies which can occur for instance in Malaise trap material. The females have abdomen broader and longer than thorax, the end, an ovipositor, is tapered and elongate with small cerci. The females are, however, not extraordinary and as they are small and dark coloured flies easily overlooked in collected material.

For a very detailed description of the female, as well as for the genus and family, see Chandler (1983). Chandler's article has also a discussion of the position of the family Pseudopomyzidae.

Two males of *P. atrimana* were collected in a Malaise trap at the locality of Underlia, community of Drammen in eastern Buskerud province (BØ) UTM 32 VNM 661254, by Lars Ove Hansen. The material was collected in June 1993. The locality is southfaced hillside with mixed forest.

P. atrimana is obviously a rare fly. Even if *P. atrimana* is a small fly, the male postabdomen (extended) is striking and males are thus easily seen among material from Malaise traps; females on the other hand could be overlooked.

The type-locality for *P. atrimana* is probably Aachen, Germany. Chandler (1983) mentions scattered records from Austria; Romania; Russia; Finland and Slovakia. It has been reported twice from the British Isles, from London (Chandler, 1983) and from the Isle of Skye (Godfrey, 1994). Godfrey (1994) also mentions some additional records from Hungary and a second record from Czech Republic/Slovakia. A third record from Slovakia is noted by Rohàček (1987). Frey

(1952) collected the species in abundance over fallen tree trunks, one male has been swept from decayed vegetation, undergrowth in deciduous forest with an abundance of rotting tree logs (Rohàček, 1987).

The family is mentioned in Ottesen (1993) on page 27 where *P. atrimana* fills an empty space.

P. atrimana has a position in the British Red Data book as Status 1, and the species should be considered an interesting addition to the Norwegian fauna of rare insect species.

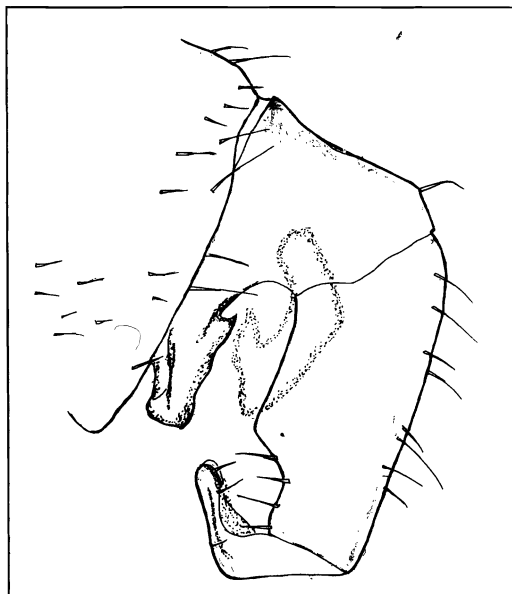


Figure 1
Pseudopomyza atrimana (Meigen, 1830), genitalia.

ACKNOWLEDGEMENTS

We are very grateful to Lars Ove Hansen, Oslo, who ran the Malaise trap during the summer 1993 and collected the two males.

SAMMENDRAG

Pseudopomyza atrimana (Meigen, 1830) (Diptera, Pseudopomyzidae); ny familie og art for Norge

To hunner av fluearten *Pseudopomyza atrimana* som tilhører fluefamilien Pseudopomyzidae, ble fanget i en Malaisefelle i Underlia, Drammen i østre Buskerud i juni 1993 av Lars Ove Hansen, Oslo. Hverken arten eller familien er tidligere registrert i Norge. *P. atrimana* er regnet som sjelden i hele sitt utbredelseområde, som er Nord- og Mellom-Europa. Arten er listet med "Status I" i den britiske "Red Data Book".

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Short communications

Notes on Norwegian Coleoptera. 2

Lars Ove Hansen & Bjørn A. Sagvolden

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INTRODUCTION

The Norwegian beetle-fauna is far from fully investigated, and surprisingly «new» species are still encountered. The present account is a survey of some new and interesting species caught in SE Norway in the period 1990–93. The following four species of Coleoptera are reported from Norway for the first time: *Lesteva sicula* Erichson, 1840 (Staphylinidae), *Hylis cariniceps* (Reitter, 1902) (Eucnemidae), *Hymenalia rufipes* (Fabricius, 1792) (Tenebrionidae) and *Anisoxya fuscata* (Illiger, 1798) (Melandryidae). A new record of *Hylis procerulus* (Mannerheim, 1823) (Eucnemidae) is also given. Notes on distribution and biology are briefly discussed for each species.

THE RECORDS

The nomenclature follows Silfverberg (1992). The format for the faunistic records follows Økland (1981). European Invertebrate Survey (EIS) grids are also included (Økland 1977).

Staphylinidae

Lesteva sicula Erichson, 1840

1 ♂ AK, Asker: Semsvannet (EIS 28), 1 April 1990, Roy A. Lanto leg. (under a log); 1 specimen AAY, Tromøy: Skottjern (EIS 6), 1 June 1990, BAS leg.; 1 specimen VAY, Mandal:

Ormestad (EIS 2), 1 June 1993, Sindre Ligaard leg.

L. sicula lives in wet mosses close to waterfalls and rapid running brooks, sometimes in the middle of the water spray (Lohse 1964), but may also be found close to stagnant water, which is in accordance with the Norwegian records. The species is in Sweden only reported from Skåne (Sk), Halland (Ha) and Bohuslän (Bo). It is also reported from Denmark, but not from Finland or the Baltic countries (Lundberg 1986). Lohse (1964) considered the species very rare in Central-Europe, where it is only known from the northwestern areas. Silfverberg (1992) indicates that the Fennoscandian and Danish specimens of *L. sicula* belong to ssp. *heeri* Fauvel, 1872.

Eucnemidae

Hylis procerulus (Mannerheim, 1823)

1 specimen BØ, Røyken: Hyggen, Kinnartangen (EIS 28), July 1991, LOH leg. (-light-trap) in mixed forest dominated by spruce (*Picea abies*), birch (*Betulus* sp.), birdcherry (*Prunus padus*), hazel (*Corylus avellana*) and alder (*Alnus* spp.). *H. procerulus* has previously only been reported from AK, Ås: Syverud (EIS 28) July 1968, Alf Bakke leg. (Strand 1969). The larvae develop in decaying wood of spruce, hornbeam (*Carpinus betulus*) and beech (*Fagus sylvatica*) (Palm 1950, Lohse 1979). The species is reported from Central- and South-Sweden and Finland, but not from Denmark (Lundberg 1986). It is widely distributed in Europe (Lohse 1979).

Hylis cariniceps (Reitter, 1902).

8 specimens BØ, Hurum: Tofteholmen (EIS 19), May–August 1991, LOH leg. (malaise- and window-traps) in old spruce forest (*Picea abies*) mixed with deciduous trees (e.g. lime (*Tilia cordata*), ash (*Fraxinus excelsior*)). Due to the rocky ground at the locality, taller trees die in dry periods, hence the forest has a high abundance of both fallen and standing dead trees.

The island, which is protected as nature reserve, is more extensively described by Hansen (1989) and Hansen & Ligaard (1992). The larvae develop in decaying wood of spruce, hawthorn (*Crataegus* sp.) and ivy (*Hedera* sp.) (Palm 1950, Lohse 1979). The species is reported from Central- and South-Sweden and Finland, but not from Denmark (Lundberg 1986). It is widely distributed in Europe (Lohse 1979). The Scandinavian species of *Hylis* are sparsely represented in collections. Palm (1955) considered them as «Urwaldtiere» (primeval forest animals) and therefore rare.

Tenebrionidae

Hymenalia rufipes (Fabricius, 1792)

1 specimen Ø, Moss: Jeløy (EIS 19), 12 July 1990, Sindre Ligaard leg. (in mixed forest); 3 specimens BØ, Hurum: Tofteholmen (EIS 19), July 1991, LOH leg. (malaise-trap). *H. rufipes* is associated with forest where the larvae develop in decaying twigs of deciduous trees (Kaszab 1969a). However, *Artemisia campestris* has also been suggested as larval foodplant (Hansen 1945), and this plant is found abundant at Tofteholmen. The adult beetles are night-active and may sometimes come to light. *H. rufipes* has previously been reported from eight Swedish regions north to Uppland (Up), and from Denmark, but not from Finland or the Baltic countries (Lundberg 1986). It is widely distributed in Europe (Kaszab 1969a).

Melandryidae

Anisoxya fuscata (Illiger, 1798)

1 ♂ TEY, Kragerø: Jomfrulund (EIS 11), 20 June 1993, BAS leg. (on twigs of birch (*Betulus* sp.) on a beach). The larvae develop in dry twigs of different deciduous trees such as poplar (*Populus* sp.), oak (*Quercus* sp.), hazel (*Corylus* sp.) and apple (*Malus* sp.) (Hansen 1945, Kaszab 1969b). The adult beetles are night-active. In Sweden the species is only reported from the southern regions: Skåne (Sk), Blekinge (Bl), Småland (Sm) and

Öland (Öl). It is also known from Denmark, but not from Finland or the Baltic countries (Lundberg 1986). The species is widely distributed in Central-Europe, but considered rare (Kaszab 1969b).

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SAMMENDRAG

Notiser vedrørende norske biller. 2

Følgende fire arter av Coleoptera rapporteres herved fra Norge for første gang: *Lesteva sicula* (Erichson, 1840) (Staphylinidae), *Hylis cariniceps* (Reitter, 1902) (Eucnemidae), *Hymenalia rufipes* (Fabricius, 1792) (Tenebrionidae) og *Anisoxya fuscata* (Illiger, 1798) (Melandryidae). Ett nytt funn av *Hylis procerulus* (Mannerheim, 1823) (Eucnemidae) er også angitt. Anmerkninger angående utbredelse og biologi er kort angitt for hver art.

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Recent records of rare flies from Norway (Diptera: Lauxaniidae, Fanniidae, Tachinidae)

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During examination of various Diptera collections I have recently encountered a few noteworthy species from Norway. Details of the records are given below. Species new to Norway are marked with an asterisk (*). Museum abbreviations: ZMB - Zoologisk Museum, Universitetet i Bergen; ZMO - Zoologisk Museum, Universitetet i Oslo; KR - author's private collection.

Family Lauxaniidae

* *Peplomyza litura* (Meigen, 1826)

Ø, Rygge: Ekeby, Telemarkslunden, EIS 19, 1 ♀ 24 Aug.-16 Oct. 1992, malaise-trap, L. O. Hansen & G. Walberg leg. (ZMO). AK, Nesodden: Fagerstrand, EIS 28, 1 ♀ 6-7 Oct. 1993, light-trap, S.Kobro leg. BØ, Hurum: Tofteholmen, EIS 28, 1 ♂ 31 July-1 Sept. 1991, malaise-trap, L. O. Hansen leg. (A-22706); same locality, 1 ♂ 1 Sept.-26 Oct. 1991, malaise-trap. L. O. Hansen leg. (A22710). TEY, Kragerø: Kjøllebrønn, EIS 11, 1 ♂ 26 June 1982, B. A. Sagvolden leg.; same locality, 1 ♀ 7 Sept. 1983, B. A. Sagvolden leg. AAY, Risør: Risøyholmen, EIS 11, 1 ♀ 8 July 1976, L. Greve leg.; VAY, Kristiansand: Stangenes, EIS 2, 1 ♀ 27 July 1984, S. Svendsen leg.; Lyngdal: Nakkestad (UTM: 32V MK870380), EIS 1, 1 ♂ 9 July 1978, L. Greve leg.; Mandal: v/Nomevatn (UTM: 32V NK155472), EIS 2, 1 ♀ 5 July 1978, L. Greve leg.; Malmø, Eskelandsmyra, 1 ♀ 8 June-21 July 1982, A.-J. Nilsen leg. (A 16986); same locality, 1 ♀ 6-11 Aug. 1982, A.-J. Nilsen leg. (A 17144) (all ZMB). Some specimens have been identified by Lita Greve, ZMB.

P. litura has been known from various European countries (Papp 1984), but not from Scandinavia. Collin (1948: 231) says it is 'not uncommon from June to Oct. in at least the

southern half of England, and Ireland'. A related species, *P. discoidea* (Meigen, 1830), which lacks setae on the vein r_{4+5} on the upper surface of the wing, has been recorded from Finland (Hackman 1980). Lauxaniidae usually breed in decaying vegetable matter, but no breeding records are known for *P. litura*.

Family Fanniidae

* *Piezura boletorum* (Rondani, 1866)

(= *Platycoenosia miki* Strobl, 1894)

Ø, Sarpsborg: Råkil i Tune, EIS 20, 1♂ 16 July 1993, 1♀ 22 June 1994, Thor Jan Olsen leg. (ZMO).

These are the first records of this species from Scandinavia. Pont (1986) catalogs it from several European countries, including Great Britain, and also from the Nearctic region. Chillcott (1961) described the third instar larva and reported the species as having been reared from *Coprinus atramentarius* (grå blekksopp) and "fungus in soil".

Family Tachinidae

Subclytia rotundiventris (Fallén, 1820)

Ø, Sarpsborg: Råkil i Tune, EIS 20, 1♂ 22 July 1994, Thor Jan Olsen leg. (ZMO).

This species is rare and was included in my check-list on Norwegian Tachinidae (Rognes 1986) on the basis of two specimens only, one collected near Tretten in Gudbrandsdalen (OS, Øyer: Breivegen bru, EIS 54, 4-18 Aug. 1979, S. Andersen leg.) and another by Lysefjorden in Rogaland (RI, Forsand: Daladalen, EIS 8, 1♀ 7 Aug. 1983, T. Jonassen leg.) (both in KR). No further material is known from Norway. It is distributed over most of the Palaearctic region (Herting & Dely-Draskovits 1993). It is reported to be a parasite of *Elasmucha grisea* L. (bjørketege) (Acanthosomidae) and other hemipterans of the Pentatomoidea (Tschorsnig & Herting 1994).

Siphona ingerae Andersen, 1982

AK, Sørum: Lørenfallet, Egner, EIS 37, 1♂ May

1994, 1♀ May 1994, malaise-trap, L. O. Hansen & O. Sørlibråten leg. (ZMO).

This remarkable species, originally described from Denmark, is very rare and is known from Denmark, Sweden and England (Tschorsnig & Herting 1994). Records from other countries in Herting (1984) and Herting & Dely-Draskovits (1993) seem to be based on records of a related species - *S. hungarica* Andersen, 1984 - not included in either catalogue. The only previous capture of this species in Norway has been reported by Andersen (1994) (HOY, Bergen: Hauglandsdalen, EIS 31, 1♀, 17 Apr.-2 May 1982, A. J. Nilsen leg., ZMB). Some *Siphona* species are parasites of Tipulidae larvae, but the host of *S. ingerae* is not known.

ACKNOWLEDGEMENTS

Thanks to Stig Andersen, Lars Ove Hansen, Lita Greve Jensen and Thor Jan Olsen for gift of material, information and help.

SAMMENDRAG

Nyfunn av sjeldne fluer i Norge (Diptera: Lauxaniidae, Fanniidae, Tachinidae)

Det er gitt opplysninger om funn av **Peplomyza litura* (Meigen, 1826) (Lauxaniidae), **Piezura boletorum* (Rondani, 1866) (Fanniidae), *Subclytia rotundiventris* (Fallén, 1820) og *Siphona ingerae* Andersen, 1982 (Tachinidae). De to første (merket med *) er ikke tidligere publisert fra Skandinavia.

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- A noctuid moth, *Lasionycta skraelingia* (Herrich-Schäffer, 1845), is reported new to Norway. One specimen was captured at Sætermyra (UTM: 32VPP451694) near lake Isteren, Engerdal, in Hedmark, SE Norway, on 6 July 1994.
- Ett eksemplar av *Lasionycta skraelingia* (Herrich-Schäffer, 1845) ble fanget på Sætermyra (UTM: 32VPP451694) på vestsiden av Isteren, Engerdal i Hedmark, ved solnedgang den 6. juli 1994. Funnstedet er en oligotrof, delvis åpen myr bevokst med starr (*Carex* sp.). Myra ligger ca. 650 m o.h. og er omkranset av fjellfuru (*Pinus sylvestris*) og dvergbjørk (*Betula nana*). Individet ble fanget mens det svermet langs furutrærne i utkanten av myra. På lokaliteten fløy dessuten *Erebia embla* og *Oeneis jutta*.
- Lasionycta skraelingia* er kjent fra det nordligste Japan, det østlige Sibir og Fennoskandia (Skou 1991), men er trolig utbredt i store deler av det nordlige Palearktisk. I Skandinavia må arten regnes som sjelden. I Finland er det hittil fanget fire eksemplarer i Inari Lappland (Koponen et al. 1982, Skou 1991), mens arten i Sverige er svært lokal og bare et fåtall eksemplarer er fanget på myrer fra Dalarna nordover til Torne Lappmark (Ehnström & Waldén 1986). *L. skraelingia* er i følge Skou (1991) knyttet til myrer med dvergbjørk (*B. nana*) i gammel, høyereliggende barskog.

Det hevdes også (Skou 1991) at arten flyr mot nord bare i like år og mot syd bare i ulike år. Funnet fra Sætermyra er omtrent like langt syd som de sydligste funnene i Dalarna i Sverige og viser at *L. skraelingia* også flyr i like år i den sydlige delen av sitt utbredelsesområde i Skandinavia.

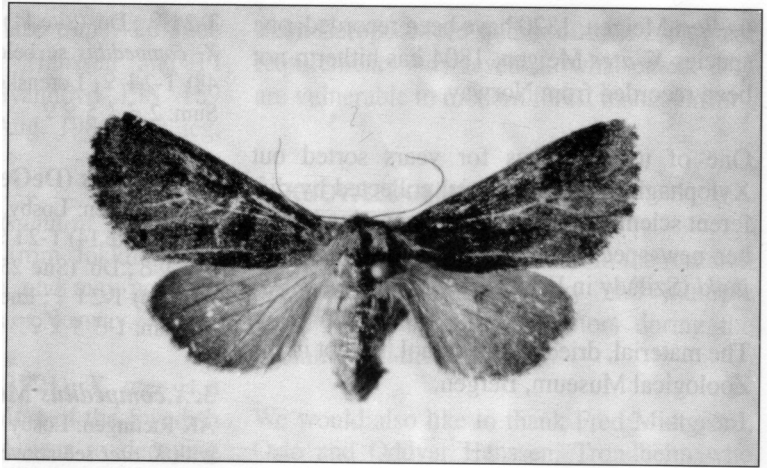
***Lasionycta skraelingia* (Herrich-Schäffer, 1845) (Lep., Noctuidae), ny art for Norge**

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TAKK

En stor takk til Bjørn Fjellstad og Harald Hjelde som har kontrollert bestemmelsen av *L. skraelingia*.



Figur
Lasionycta skraelingia,
 2X naturlig størrelse.

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***Xylophagus ater* Meigen, 1804 and *X. junki* (Szilady in F. Dahl, 1932) (Diptera; Xylophagidae) new to the Norwegian fauna**

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Two species of the genus *Xylophagus* (Dipt., Xylophagidae) are reported as new to Norway: *Xylophagus ater* Meigen, 1804 and *X. junki*

(Szilady in F.Dahl 1932). Only few specimens were recorded despite a relatively large sampling effort. A list of *Xylophagus* species from Norway, and information on biology and distribution are given.

INTRODUCTION

The fly family Xylophagidae is a small family of Brachycera represented by few species in NE Europe. Until recently, this family was overlooked, and has been represented with few specimens in collections of Norwegian museums.

Greve, Olsen & Solem (1984) and Greve, Solem & Bretten (1987) gave information on two species from Norway viz. *Xylophagus cinctus* (DeGeer, 1776) and *X.compeditus* Meigen, 1820. Hedström (1991) recorded five species of *Xylophagus* from Sweden.

During an extensive study of forest areas in Akershus, SE Norway (690 window traps in 69 sites), so far 21 specimens of Xylophagidae have been sorted out.

Three species viz. *Xylophagus ater* Meigen, 1804; *X. cinctus* (DeGeer, 1776) and *X. com-*

peditus Meigen, 1820 have been recorded, one species *X. ater* Meigen, 1804 has hitherto not been recorded from Norway.

One of us (LG) has for years sorted out Xylophagidae from material collected by different scientists. This material contained another new species to Norway, e.i. *Xylophagus junki* (Szilády in F. Dahl, 1932).

The material, dried from alcohol, is kept in the Zoological Museum, Bergen.

SYSTEMATICS

The family Xylophagidae includes one genus with 13 species of rather big flies (Krivosheina & Mamaev 1988). Five species occur in the NW of Europe, and they have all been recorded from Sweden (Hedström 1991). Hedström (1991) presents a key to species level, and the key includes all species presented here.

It should be noted that the nomenclature of *Xylophagus* has varied during the last decenniums. Collin (1962) used *X. ater* Meigen, 1804 as name for *X. compeditus* Meigen, 1820. In recent Scandinavian literature Hedström (1986) followed the nomenclature of Collin. However, both Hedström (1991) and the present article follow the nomenclature used by Krivosheina & Mamaev (1988). Accordingly, the species referred to as *X. compeditus* Wiedemann, 1851 in both Greve, Olsen & Solem (1984) and Greve, Solem & Bretten (1987) is the same as *X. compeditus* Meigen, 1820 used here.

The larvae of this family usually live under bark of living and decaying trunks and roots of deciduous and coniferous trees.

The material:

1. *Xylophagus ater* Meigen, 1804

AK Rælingen: Losby (Site 1) T-2 1 ♀; Do. (Site 11)

T-2 1 ♀; Do. (Site 11) T-3 2 ♂♂ 1 ♀ (together with *X. compeditus* see below); Enebakk: Vangen (Site 48) T-2 1 ♀; Lørenskog: Losby (Site 93) T-2 1 ♀. Sum: 2 ♂♂ 5 ♀♀.

2. *X. cinctus* (DeGeer, 1776)

AK Rælingen: Losby (Site 3) T-2 1 ♀; Lørenskog: Losby (Site 14) T-2 1 ♀; Enebakk: Vangen (Site 22) T-2 1 ♂; Do. (Site 25) T-2 1 ♀; Enebakk: Vangen (Site 26) T-2 1 ♀; Enebakk: Vangen (Site 86) T-2 1 ♀. Sum: 1 ♂ 5 ♀♀.

3. *X. compeditus* Meigen, 1820

AK Rælingen: Losby (Site 11) T-3 2 ♂♂ (together with *X. ater* see above); Enebakk: Vangen (Site 25) T-3 2 ♂♂; Lørenskog: Losby (Site 44) T-2 1 ♀; Enebakk: Ekeberg (Site 53) T-2 1 ♀; Lørenskog: Kirkerud (Site 63) T-2 1 ♀; Lørenskog: Losby (Site 97) T-2 1 ♂. SUM: 5 ♂♂ 3 ♀♀.

Most specimens of all species were trapped in sites of old spruce forests with high densities of decaying wood (Sites 1, 3, 11, 14, 22, 25, 26). The largest number of specimens were collected at Site 11 which included large amounts of decaying aspen (*Populus tremula* L.). More unusually, some specimens were trapped in clearcuts (Site 86) and young stands of spruce (*Picea abies* L.) (Sites 93 and 97).

The total number of specimens (21) was relatively low compared to the large sampling effort. In comparison, Greve, Olsen & Solem (1984) reported 17 specimens of one species, *X. compeditus* Meigen, 1820 collected from two localities in 1980 and 1981.

Many specimens are associated with decomposing timber of deciduous trees or conifers (Krivosheina & Mamaev 1972) and adults are usually found on tree-trunks (Krivosheina & Mamaev 1988). The development of *X. ater* takes place in deciduous trees only.

A fourth Norwegian species, *X. junki* (Szilády in F. Dahl 1932), is represented by only two specimens and were collected at: NTI Lierne:

Kveskallen EIS 103 Malaise trap 7-26 June 1986 1 ♀ leg. Oddvar Hanssen and FI Sørvaranger: Svanvik, Svanhovd EIS 169 Malaise trap 20 June-4 Aug. 1986 1 ♀ leg. Fred Midtgaard.

A fifth species, *X. matsumurai* Miyatake, 1965 has been recorded from Jokkmokk in Sweden (Hedström 1991), and may possibly occur in the northern parts of Norway.

According to Hedström (1991), *X. ater* is a rare species in Sweden. Most of the Swedish specimens were collected near to decaying deciduous trees, often with fungi. This species is also recorded from Finland, parts of the former Soviet, Germany and Austria.

X. junki is considered to be endangered in United Kingdom (Falk 1992). One specimen was recorded from Scotland in 1913, and it has not been collected from this region since. The species is classified as rare in Sweden (Hedström 1991). Two specimens from Sweden were collected in pitfall traps close to standing trees of *Populus tremulus*, *Betula* sp. and decaying pine and spruce (Hedström 1991). It is assumed to develop in old pine trees, dead trees or dead wood (Falk 1992). The locality in Lierne (Kveskallen) contained 10 m tall pine trees, many rotten stumps of spruce, and some dead birch with poliphorus fungi.

X. cinctus is referred to as "rare" in the British isles (Falk 1992). In the United Kingdom it is recorded only from the Scottish highlands. *X. cinctus* is not a common species in Norway.

X. ater Meigen 1804 and *X. junki* (Szilády in F. Dahl, 1932) may be classified as rare in Norway, because (1) only few specimens have been found despite relatively large sampling effort, and (2) they are classified as rare in our neighbouring countries. These two species appear to be connected with the forest environments which have been declining in nor-

thern Europe. More studies of their ecological requirements may reveal to what extent they are vulnerable to modern forest management.

ACKNOWLEDGEMENTS

The material of *X. ater* was from the research programme "Forest ecology and multiple use". We thank all contributors during the planning and the field work.

We would also like to thank Fred Midtgaard, Oslo and Oddvar Hanssen, Trondheim who collected the two females of *Xylophagus junki*.

SAMMENDRAG

***Xylophagus ater* Meigen, 1804 og *X. junki* (Szilády i F. Dahl, 1932) (Diptera; Xylophagidae) nye for Norge**

To fluearter av slekten *Xylophagus* som tilhører familien Xylophagidae, "vedfluer", er rapporterte som nye for Norge: *Xylophagus ater* Meigen, 1804 og *X. junki* (Szilády i F. Dahl 1932). Få individer av disse artene ble funnet til tross for en relativt stor innsamlingsintensitet. Denne artikkelen presenterer alle de arter av slekten *Xylophagus* som hittil er omtalt fra Norge, og gir i tillegg informasjon om biologi og utbredelse.

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Bokanmeldelse

Ole Fogh Nielsen : Danmarks guldsmede - Natur og Museum 34. årgang nr. 2, juni 1995, 32 sider. Naturhistorisk Museum, Bygning 210, Universitetetsparken, DK- 8000 Danmark. Heftepris kr 42 (danske).

Det er gjennom årene kommet en rekke fine og tiltalende orienteringshefter om planter og dyr i den danske serien Natur og Museum. Nå har øyestikkerne eller guldsmedene som danskene litt forvirrende for en nordmann kaller gruppen, fått et eget hefte. Hefte tar for seg i korte oppslag "Slægtskabsforhold", "Udviklingshistorie" og "Livssyklus". Videre omtales morfologi og levested til den voksne øyestikkeren og til larvene, levesteder og trusler mot disse. Til sist følger avsnitt om Danmarks øyestikkerearter og bestemmelse av disse. Omtalen av artene er samlet i ulike "bokser" for slekter eller slektsgrupper og for hver art er det angitt størrelse i mm, litt om hvor vanlig den er i Danmark og hvilke levesteder den finnes i. Videre

er utviklingstid og flygetid angitt. I alt 28 arter er avbildet på tre fargetavler og en god del tekstfigurer angir artsforskjeller. Det er ti -femten gode fargefotos i heftet som viser arter eller levesteder. Den danske faunaen på 51 arter dekker så godt som alle norske, bare et par nordlige arter mangler.

I utgangspunktet er dette en delikat trykksak som burde "selge" godt. Dessverre må jeg si at de tilgjengelige 32 sider kunne vært brukt ennå bedre. Som forfatteren sier i innledningen er det forrige danske verket over øyestikkere fra 1910. Dette heftet forsøker muligens derfor både å tilfredsstille dem som ønsker en kortfattet generell kunnskap om øyestikker og dem som kunne ønske seg en oppgradering av bestemmesboken fra 1910. De første får en kanskje litt for kortfattet innføring illustrert med vakre fotos. De mer spesielt interesserte får et hefte som nesten er en komplett "Fauna" med fargetavler, strektegninger og en kortfattet tekst som både skal gjøre det mulig å kunne bestemme artene og angi utbredelse, habitat og flygetid.

Tekstfigurene, boksene og fargetavlene gjør det sannsynligvis mulig for både forfatteren og anmelderen å bestemme hvilken art vi har fanget. Men vil en som ikke har bestemt øyestikkere før klare det? Jeg tror en pedagogisk godt tegnet bildenøkkel, slik en kan finne i flere moderne europeiske øyestikkerbøker, ville vært bedre enn den fremstilling som er valgt og det uten å ta mere plass enn de ti sider som nå går med. Små utbredelseskart for artene i Danmark ville også gitt informasjon som hadde vært verdifull for oss nordiske naboer.

Videre ville jeg ha droppet mye eller alt av stoffet om slektskapsforhold, utviklingshistorie og morfologi til fordel for flere sider om artenes levesteder i Danmark og bevaringsbiologiske forhold. Det er mulig at jeg tar feil, men jeg tror at flere av dem som vil lese dette heftet er opptatt av å bevare disse vakre insektene og deres levesteder enn av hvilken utforming ribbenettet og thorax har.

Hefte gir mye tatt den lave prisen i betraktning. Spørsmålet er imidlertid om ikke både danske og andre nordiske odonatologer kunne fått enda mer for pengene dersom innholdet hadde vært redigert litt annerledes.

Kaare Aagaard

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