

FAUNA NORVEGICA

No. 1
1982

SER. B VOL. 29 NO. 1
Norwegian Journal of Entomology



PUBLISHED BY
NORSK ZOOLOGISK TIDSSKRIFTSENTRAL
OSLO

Fauna norvegica Ser. B

Norwegian Journal of Entomology

Norsk Entomologisk Forenings tidsskrift

Appears with one volume (two issues) annually
Utkommer med to hefter pr. år.

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ISSN 0332-7698

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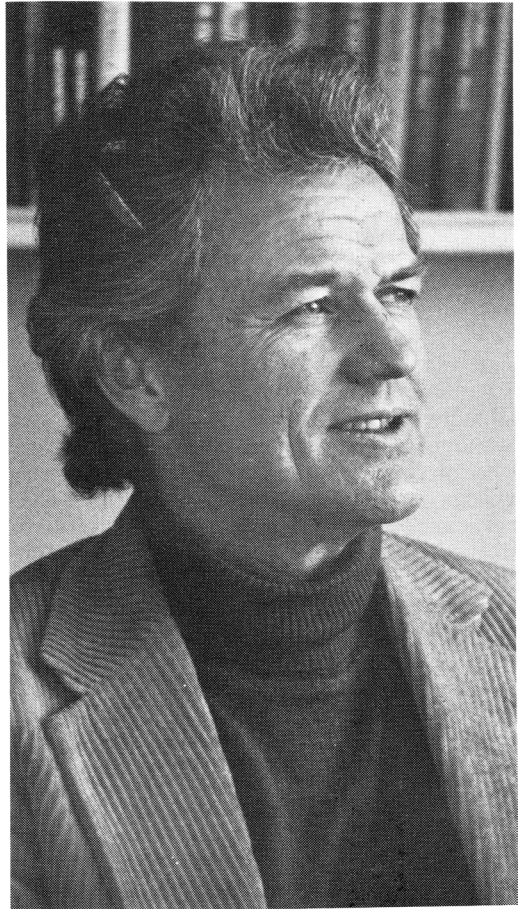
Dosent dr. philos. Lauritz Sømme 50 år

Den 1. mars 1981 fylte dosent dr. philos. Lauritz Sømme 50 år. Lauritz Sømme tok realartium ved Berg Gymnas i Oslo i 1948, matematisk-naturvitenskapelig embedseksamen ved Universitet i Oslo våren 1958 og ble i januar 1968 kreert til doctor philosophiae ved samme universitet etter å ha disputert over et arbeide med tittelen «Studies on Cold-Hardiness in Insects». I 1971 ble han utnevnt til dosent i entomologi ved Universitetet i Oslo.

Lauritz Sømme har en betydelig vitenskapelig produksjon, som spenner over såvel entomologiske som ikke-entomologiske emner. Han har også publisert et høyt antall populærvitenskapelige artikler, noe som viser at han også føler ansvaret for å informere en bredere almenhet om det som skjer innenfor de forskningsfelter der han er aktiv.

Hovedfagsoppgaven hadde tittelen «Det kvantitative forhold mellom husfluer, stikkfluer og andre arter av familien Muscidae i fjøs og grisehus på Østlandet og resistens mot klorerte insektmidler hos husfluen og stikkfluen». Etter å ha avlagt embedseksamen, arbeidet han i en årrekke med forskningsstipendium fra Norges Landbruksvitenskapelige Forskningsråd ved Statens Plantevern med problemer i forbindelse med kontroll av skadeinsekter. Arbeidet omfattet både generelle biologiske forhold og effekter av insektmidler, herunder blant annet insekters resistens mot insektmidler, et emne som idag er kommet sterkt i søkelyset. Hans første publikasjon kom ut i 1958. Den var basert på en undersøkelse han allerede som hovedfagsstudent hadde utført ved Long Island Biological Association, New York. Etter denne fulgte raskt en rekke publikasjoner fra arbeidet med skadeinsekter og insektmidler.

Med tiden har arbeidene dreid i mer fysiologisk retning. Det ble særlig insekters evne til å overleve lave temperaturer som kom til å oppta hans oppmerksomhet, og det er vel først og fremst dette feltet som forbindes med Lauritz Sømme's navn i vitenskapelige kretser verden over. Hans arbeide innen dette feltet fikk «flying start» da han tilbragte ett år hos professor Salt ved Canada Department of Agriculture, Alberta, i 1962/63. Fra dette oppholdet kom det en rekke arbeider, hvorav flere er blitt «klassikere», som det nesten alltid refereres til av andre forfattere



innen feltet. I de senere år har han viet særlig stor oppmerksomhet til kuldetoleranse-studier på polare og alpine collemboler og midd. En vesentlig del av disse studier er blitt utført under feltforhold på ekspedisjoner til fjerne deler av verden. Således har han deltatt i to norske og to britiske ekspedisjoner til Antarktis, en norsk ekspedisjon til Mount Kenya og en rekke kortere ekspedisjoner, bl.a. til de østerrikske alper. Fra flere av disse ekspedisjonene er det også kommet arbeider over andre dyr enn insekter, for eksempel over fugl i Antarktis.

Lauritz Sømme har vært og er stadig en meget produktiv forsker. Som forsker i samme felt har jeg i en årrekke hatt faglig kontakt og samarbe-

ide med Lauritz Sømme, og jeg vet å verdsette hans faglige dyktighet og soliditet. Jeg vet at hans arbeider er høyt respektert og verdsatt blant fagfolk verden over, noe som ikke minst kommer til uttrykk gjennom hans mange og gode internasjonale kontakter. Et aktuelt uttrykk for dette er at han i skrivende stund befinner seg i Antarktis, som invitert deltager i en ekspedisjon arrangert av British Antarctic Survey. Lauritz Sømme er også jevnlig benyttet som «referee» av en rekke utenlandske tidsskrifter og institusjoner.

Lauritz Sømme ble medlem av Norsk Entomologisk Forening i 1955, og var foreningens sekretær fra 1958 til 1962. Fra 1966 til 1978 var han redaktør for Norsk Entomologisk Tidsskrift, som han forsøkte å gjøre til et tidsskrift med internasjonal profil. Denne målsetning var langt på vei oppfylt, da NAVF i 1978 vedtok å legge tidsskriftet ned i dets daværende form. Lauritz Sømme har også vært foreningens representant i redaksjonskomiteen for Entomologica Scandinavica. Utenom dette har Lauritz Sømme vært medlem av en rekke offentlige og private utvalg og komitéer med tilknytning til skadedyrbekjempelse. Han er videre medlem av det amerikanske Society for Cryobiology og British Society for Cryobiology.

Som formann i Norsk Entomologisk Forening, som kollega og ikke minst som venn vil jeg ønske Lauritz Sømme tillykke med de første femti år. Jeg vil samtidig uttrykke det håp at hans faglige laurbær ikke kjennes så behagelige at han vil legge seg til og hvile på dem.

Karl Erik Zachariassen

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On the Norwegian thrips fauna (Thysanoptera)

ANDERS OLSEN AND JOHN O. SOLEM

Olsen, A. & Solem, J.O. 1982. On the Norwegian thrips fauna (Thysanoptera). *Fauna norv. Ser. B*, 29, 5—16.

Up to present, a total of 88 species of thrips are recorded from Norway. Of these, 40 species are reported for the first time.

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INTRODUCTION

The knowledge of the Norwegian thrips fauna has mainly been based on specimens found in connection with agricultural researches or collections made by foreign entomologists on short visits to Norway. Published records are few and scattered, and often difficult to locate when included as small notes in large works or old publications.

The most comprehensive work on the Norwegian thrips fauna was published by Herstad (1960), who reported 24 species from Norway. This survey was mainly based on informations obtained from notes made by V.M. Schøyen (years 1882—1912), and T.H. Schøyen (years 1919—29), and from the correspondence and card file of the Norwegian Plant Protection Institute through the years 1940—60. However, as early as 1826, Zetterstedt described *Taeniothrips picipes* (Zetterstedt) (as *Thrips picipes* Zetterstedt) from material which according to Ahlberg (1917) was partly collected in Bjerkvik in Nordland, and Bagnall (1911—1933) reported 14 species from Norway. More recently, Fjeldalen (1963), Kock (1966), Kjellsen (1975), and Palmer (1975) contributed records, and zur Strassen (1978, 1980) added 6 species to the Norwegian faunal list. In addition Priesner (1925, 1926—28) and Jacot Guillarmod (1970—75) listed several species recorded from Norway, without giving any further data.

The purpose of the present work is a summary of our knowledge of the Norwegian thrips fauna, and thereby make a foundation for further investigations. We have therefore included all published thrips records we have been able to trace, and the locality and corresponding EIS square number for each record are given. However, no revision of the identifications regarding previous records has been carried out, and

some of these records may be invalid. Request to various museums in northern Europe revealed that unpublished material, identified to species, from Norway, occurred only in the collections of Zoological Museum, Bergen, and British Museum. Their data were most kindly put to our disposal. In addition, Chr. Stenseth and J. Fjeldalen, The Norwegian Plant Protection Institute, added their unpublished records. The remaining data are based on slide-mounted and alcohol preserved material kept in the collections of the Royal Norwegian Society of Sciences and Letters, the Museum, Trondheim. This material was mainly collected by Anders Olsen through the years 1977—80, and is identified by him.

In total, we list 88 species, referring to 33 genera. Of the species, 40 seem previously not to have been reported from Norway. These species are marked with an asterix. New records are given locality, EIS square number, date, and eventually the number of specimens collected, sex, and habitat/host plant. Because of the difficulties in determining thrips larvae, only adult specimens are cited.

The nomenclature follows Mound et al. (1976) with a few exceptions, where we have adopted the interpretation of Priesner (1964) and Schliephake (1979). This apply to: *Thrips menyanthidis* Bagnall which is regarded as a true species and not a form of *Thrips fuscipennis* Haliday; *Haplothrips leucantheми* (Schrank) and *Haplothrips niger* Osborn which are considered to be separate species; and *Haplothrips* Amyot & Serville, 1943 and *Xylaplothrips* Priesner, 1925 which are interpreted as separate genera.

ABBREVIATIONS

PS — Per Sveum, CS — Christian Stenseth, GT — Gudmund Taksdal, RB — R.S. Bagnall, LM

— L.A. Mound, EO — Else Ofstad, JM — J.R. Metcalf, HT — H. Thams-Lyche, NO — Nils Olsen, EK — Ellen Kjellsen, TS — Torstein Solhøy, JF — Jack Fjelddalen, LG — Lita Greve Jensen, UO — U. Ohde, RS — R. zur Strassen, BM — British Museum, DKNVSM — Royal Norwegian Society of Sciences and Letters, the Museum, ZMB — Zoological Museum, Bergen, wt — water trap.

SYSTEMATIC LIST

TEREBRANTIA

Aeolothripidae

**Aeolothrips albicinctus* Haliday, 1836.

EIS 28: Oslo June 1909, 1 ♀. RB leg., in coll. BM.

Aeolothrips ericae Bagnall, 1920.

The only previous record is a single female specimen swept from meadow in Oslo (EIS 28) (zur Strassen 1978). New records: EIS 28: Oslo 15 Aug. 1979, 1 ♀ nominate PS leg. EIS 79: Kongsvoll 11 July 1977, 1 ♀ f. *mülleri* Priesner on *Erica* sp. EIS 92: Börsa 8 July 1979, 3 ♀ ♀ f. *mülleri* on *Trifolium pratense*; 16 June 1980, 6 ♀ ♀ f. *mülleri* 1 ♂ on *Lotus corniculatus*. EIS 131: Leivset nr Fauske 30 June 1980, 2 ♀ ♀ f. *mülleri* on *L. corniculatus*.

Aeolothrips faciatus L., 1758.

Previously recorded from *Helianthus annuus* in Asker (EIS 28) (Herstad 1960). New records: EIS 7: Stavanger Ramsberg 5 Aug. 1979, 1 ♀ swept from bog herbage. EIS 19: Tjome Mostranda 19 Aug. 1978, 1 ♀. EIS 28: Oslo Ekeberg 18 Aug. 1978, 5 ♀ ♀ 1 ♂ on *Sedum maximum*. EIS 78: Kongsvoll 18 July 1977, 1 ♂ on *Taraxacum* sp. The species is very difficult to separate from *A. intermedius* Bagnall in the female sex (Quick 1979, Schliephake 1979, Mound pers. comm.), and some of the determinations may be doubtful. According to Priesner (1964) and Schliephake (1979), the two species may be separated by the width/length ratio of the third antennal segment, the coloration of the third segment, and the more deeply red mesodermal pigmentation in *A. faciatus*. All the specimens in the DKNVSM's collections possess a pigmentation in agreement with *A. faciatus*, but the measurements of the antennal segments varies considerably and seem to be of little value as diagnostic characters.

**Aeolothrips intermedius* Bagnall, 1934.

EIS 28, Asker Sem 4 July 1973, 1 ♀ on *Malus* sp., GT leg., in coll. BM.

**Aeolothrips melaleucus* Haliday, 1852.

EIS 28: Oslo Ekeberg 18 Aug. 1978, 1 ♀ on *Berberis vulgaris*, Sem Plum 10 May 1974, 1 ♀, GT leg., in coll. BM.

Aeolothrips versicolor Uzel, 1895.

Aeolothrips tiliae Bagnall (= *A. versicolor* Uzel sensu Jacot-Guillarmod (1970)) was originally

described from specimens from lime in Oslo Bygdøy (EIS 28) (Bagnall 1913a, b).

Aeolothrips vittatus Haliday, 1836.

Bagnall (1912) reported this species from South Norway, where he found females on *Pinus* sp. Locality was not specified.

Thripidae

Heliothrips haemorrhoidalis (Bouche, 1833).

A greenhouse species recorded from Haugesund (EIS 7) on *Camellia* sp.; Porsgrunn (EIS 18) and Moss (EIS 19) on *Azalea* sp.; Fredriksværn (EIS 19) on *Araucaria* sp.; Sandefjord (EIS 19) on *Senecio cruentus*; Fredrikstad (EIS 20) on *Azalea* sp. and *Dianthus* sp.; Asker (EIS 28) on *Prunus persica*; Drammen (EIS 28) on *Hedera helix*; Lier (EIS 28) on *Cyclamen* sp.; Oslo (EIS 28) on *Azalea* sp., *Cissus antarctica*, *Senecio cruentus* and bracken; Grefsen and Toyen in Oslo (EIS 28) on *Azalea* sp.; Grimo in Hardanger (EIS 32) on *Rhoicissus rhomboidea*; Vikersund (EIS 36) on *Calseolaria* sp.; Løfgren nr Gjøvik (EIS 45) on *H. helix*; Jønsberg in Stange (EIS 46) on *S. cruentus* and *Calseolaria* sp.; Lillehammer (EIS 54) on *Citrus sinensis* and *Sinningia* sp.; and unknown localities on *Amaryllis* sp. and *Geranium* sp. (Herstad 1960).

Parthenothrips dracaenae (Heeger, 1854).

A greenhouse species previously recorded from Eidsvoll (EIS 27) on *Hedera colchica*; Oslo (EIS 28) on *H. colchica* and *Citrus* leaves; and Flisa (EIS 47) on *Impatiens sultani* (Herstad 1960, Fjelddalen 1963). New records: (EIS 28: Oslo 21 Aug. 1978, 5 ♀ ♀ on *I. sultani*. Ås NLH 29 Sep. 1972, 4 ♀ ♀ on *Aralia* sp. in glasshouse, CS leg., in coll. BM; 10 May 1973, females on *Aralia* sp. in glasshouse, CS leg., LM det. Ås 1965, on *Aralia chinensis*, CS leg., on *Fatsyhedera lizei*, JF leg.; 1979, on *Chrysanthemum hort.*, JF leg., on *Hoya bella*, JF leg. EIS 54: Lillehammer 1976, on *Dracaena marginata*, JF leg., on *Aralia elegans*, JF leg., on *Chamedora elegans*, JF leg. EIS 92: Kval Jan. 1980, 44 ♀ ♀ on *I. sultani*, EO leg.

**Dendrothrips degeeri* Uzel, 1895.

EIS 28: Sem Plum 20 May 1974, 1 ♀, GT leg., in coll. BM.

Dendrothrips ornatus (Jablonowski, 1894).

Reported (as *Dendrothrips tiliae* Uzel = *D. ornatus* Jablonowski sensu Jacot-Guillarmod 1971) from Oslo (EIS 28) (Bagnall 1910, 1911). One specimen in coll. BM.

Scirtothrips longipennis (Bagnall, 1909).

A greenhouse species recorded from Ekheim nr Sandefjord (EIS 19), Sandefjord (EIS 19), Bakhus nr Halden (EIS 20), Asker (EIS 28), and Oslo (EIS 28) on *Begonia* sp.; Torvik in Hardanger (EIS 31); and Gjøvik (EIS 45) (Herstad 1960).

**Drepanothrips reuteri* Uzel, 1895.

EIS 19: Tjome Mostranda 19 Aug. 1978, 6 ♀ ♀ 1 ♂ on *Quercus* sp. leaves.

**Sericothrips abnormis* (Karny, 1909).

EIS 43: Geilo 28 June 1973, 1 ♀ on *Lotus*, LM leg., in coll. BM. EIS 92: Börsa 9 July 1980, 11 ♀ ♀ 3 ♂ ♂ swept from meadow herbage (*Lotus corniculatus*, *Trifolium*, grass etc.). EIS 146: Lavangen Reite 27 June 1980, 3 ♀ ♀ on *L. corniculatus*, 1 ♀ swept from meadow herbage.

**Sericothrips gracilicornis* Williams, 1916.

EIS 19: Tjømø Mostranda 20 Aug. 1978, 10 ♂ ♂ on *Vicia* sp. EIS 28: Oslo Malmöya 19 Aug. 1978, 1 ♂ on *Convallaria majalis*. PS leg. EIS 79: Kongsvoll 26 June 1977, 1 ♀ on *Astragalus alpinus*; 12 July 1977, 7 ♀ ♀ 1 ♂ on *A. alpinus*, 21 ♀ ♀ on *A. frigidus*. All the specimens from Kongsvoll were found in the subalpine birch belt, about 1000 m a.s.l. EIS 140: Rombakken 30 June 1980, 3 ♀ ♀ 1 ♂ on *Vicia cracca*.

**Chirothrips hamaticus* Trybom, 1825.

EIS 79: Kongsvoll (abt. 900 m a.s.l.) 29 July 1979, 1 ♀ on grass. EIS 92: Börsa June 1980, 1 ♀ on *Alopecurus pratensis*. Heimdal June 1977, 159 ♀ ♀ on *Phleum* sp. Trondheim Voll 5 June 1978, 73 ♀ ♀ 1 ♂ on *A. pratensis*; June/July 1978, 13 ♀ ♀ in wt.

Chirothrips manicatus Haliday, 1836.

Previously reported (as *Chirothrips similis* Bagnall = *C. manicatus* Haliday sensu Jacot-Guillarmod (1971)) from Oslo Bygdøy (EIS 28) (Bagnall 1927, Maltbæk 1932). More recently, Herstad (1960) reported *C. manicatus* from Oslo Maridalen (EIS 28). New records: EIS 7: Sandnes Aug. 1979, 1 ♀. Stavanger Ramsberg 5 Aug. 1979, 4 ♀ ♀ swept from *Hieracium* sp. etc. EIS 19: Tjømø Mostranda 19 Aug. 1978, 4 ♀ ♀ 1 ♂ on *Phragmites communis*; 20 Aug. 1978, 11 ♀ ♀ 32 ♂ ♂ swept from grass etc., PS leg., 1 ♀ 4 ♂ ♂ on grass. Tjømø Vasser 20 Aug. 1978, 2 ♀ ♀ on grass. Tönsberg 20 Aug. 1978, 1 ♂. EIS 28: Oslo Ekeberg 18 Aug. 1978, 2 ♀ ♀ on *Spergula arvensis*; 15 Aug. 1979, 4 ♀ ♀, PS leg. Oslo Dælivatn 20 Aug. 1978, 1 ♂ on *Calluna vulgaris*, PS leg., 1 ♀ on grass. Oslo Maridalen 17 Aug. 1978, 6 ♀ ♀ 21 ♂ ♂ swept from grass etc., PS leg. EIS 79: Kongsvoll 8 July 1977, 1 ♀ in a suction trap abt 900 m a.s.l. EIS 91: Orkanger 27 July 1980, 1 ♀ 4 ♂ ♂ swept from herbaceous plants. Eidet nr Fannrem 15 July 1980, 3 ♀ ♀ on *Hieracium* sp. EIS 92: Börsa 9 July 1980, 4 ♀ ♀ 11 ♂ ♂ swept from meadow herbage. Byneset 16 Aug. 1979, 9 ♂ ♂ swept from meadow herbage. Gaulosen 20 Aug. 1979, 3 ♀ ♀ 16 ♂ ♂ swept from grass on beach meadow. Heimdal 20 Aug. 1979, 1 ♂ on grass. Ringvål 18 July 1978, 1 ♀ on grass, 1 ♀ on *Rosa* sp. Trondheim Voll 5 June 1978, 2 ♀ ♀ on *A. pratensis*; June/July 1978, 14 ♀ ♀ in wt. EIS 98: Röra 1 June 1979, 1 ♀ on *Taraxacum* sp. EIS 123: Mo i Rana Ö. Gruben June 1980, 1 ♀. EIS 131: Leivset nr Fauske 30 June 1980, 1 ♀ on *Vicia cracca* on beach. EIS 140: Rombakken 30 June 1980, 7 ♀ ♀ on *V. cracca*, 1 ♀ on *Potentilla anserina*.

Limothrips cerealium Haliday, 1836.

Recorded from Tvedestrand (EIS 11) on *Triticum aestivum*; Borre (EIS 19) on *Secale cereale*; Ö. Aker (EIS 28) on *Pisum* sp.; Vestby (EIS 28) on *Avena sativa*; and Telemark on *T. aestivum* (Herstad 1960).

Limothrips denticornis Haliday, 1836.

Previous records from Jæren Vigestad (EIS 7) on *Triticum aestivum*; Jæren (EIS 7) and Setesdal Langerak (EIS 9) on *Hordeum* sp.; Jelöya (EIS 19) and Väle (EIS 19) on *Secale cereale*; Oslo Maridalen (EIS 28); Ås (EIS 28) on *Hordeum* sp.; Aurskog Lierfoss (EIS 29) on *Phleum pratense*; Hedmark Nes (EIS 45), Raufoss (EIS 45), Hedmark Hjøllund (EIS 46), Søgnald (EIS 50), Storelvdal (EIS 64), Lom (EIS 70), Horg (EIS 92), Meråker (EIS 93), Sunnan (EIS 98), Verdal (EIS 98), and Sandnessjøen (EIS 117) on *Hordeum* sp.; Korgen (EIS 118) on *Secale cereale*; Mo i Rana (EIS 123), Bodin (EIS 130), Melbu (EIS 137), and Kvæfjord (EIS 144) on *Hordeum* sp.; Telemark on *Hordeum* sp. and *T. aestivum*; and Sør-Trøndelag on *Hordeum* sp. (Herstad 1960). New records: EIS 28: Oslo Bogstad 18 Aug. 1979, 1 ♀, PS leg. Oslo Dælivatn 20 Aug. 1978, 5 ♀ ♀ swept from meadow herbage. PS leg., 1 ♀ on *Galium triflorum*, 70 ♀ ♀ on *Agrostis* sp. Oslo Kolås 19 Aug. 1979, 4 ♀ ♀, PS leg. Oslo Malmöy 19 Aug. 1978, 1 ♀ swept from meadow. Oslo Maridalen 18 Aug. 1978, 2 ♀ ♀ on *Centaurea scabiosa*. Ås NLH 18 Aug. 1978, 5 ♀ ♀ on *Secale cereale*. EIS 45: Totten Lena 23 Aug. 1973, CS leg., LM det. EIS 92: Börsa Sep. 1979, 4 ♀ ♀ on grass tussocks. Gaulosen 16 Aug. 1979, 1 ♀ on dead *Hippophaë rhamnoides*; 20 Aug. 1979, 8 ♀ ♀ swept from beach meadow, 3 ♀ ♀ on *Humulus lupulus*. Heimdal 5 June 1978, 2 ♀ ♀ in wt. Målsjøen 13 July. 1 ♀ in wt. Ringvål 11 May 1978, 1 ♀ on *Gagea lutea*. Trondheim Voll 5 June 1978, 1 ♀ on *Alopecurus pratensis*; June/July/Aug. 1978, 22 ♀ ♀ 14 ♂ ♂ in wt. EIS 98: Röra 1 June 1979, 1 ♀ on *Taraxacum* sp. Stiklestad 29 July 1978, 1 ♀ 1 ♂ on *Trifolium pratense* at field side, 20 ♀ ♀ 9 ♂ ♂ on *Secale cereale*.

**Anaphothrips badius* Williams, 1913.

EIS 19: Tjømø Mostranda 19 Aug. 1978, 1 ♀ on *Phragmites communis* in a damp area.

**Anaphothrips obscurus* (Müller, 1776).

The specimens in the DKNVSM's collections are macropterous when not otherwise stated. EIS 28: Oslo Bygdøy 27 June 1909, 2 ♀ ♀ on leaves of *Tilia* sp., RB leg., in coll. BM. Ås NLH 18 Aug. 1978, 3 ♀ ♀ on *Trifolium pratense* nr rye field, 1 ♀ on *Matricaria inodora* nr rye field, 6 ♀ ♀ on *Secale cereale*. EIS 92: Gaulosen 20 Aug. 1979, 2 ♀ ♀ swept from beach meadow. Lade 14 Sep. 1978, 1 ♀ on grass. Ringvål 18 July 1979, 1 ♀ on grass. Svea 18 Aug. 1979, 1 ♀ on grass. Trondheim Voll 2 July 1978, 4 ♀ ♀ in wt. EIS 115: Ravasseng nr Mosjøen 1 July 1980, 2 ♀ ♀ swept from *Carex* sp. in pond. EIS 123: Bjerka 26 Aug. 1978, 1 ♀ f. microptera in damp deciduous

forest. EIS 131: Leivset nr Fauske 30 June 1980, 1 ♀ swept from grass on beach meadow.

Anaphothrips orchidaceus Bagnall, 1909.

A greenhouse species reported from Norway by Bagnall (1926). No additional data are available.

Apterothrips secticornis (Trybom, 1896).

Previously reported from Stigstuv on Hardangervidda (EIS 33) (as *Anaphothrips secticornis* Trybom) (Kjellsen 1975). 29 tubes in coll. ZMB. New records: EIS 79: Kongsvoll June 1977, 2 ♀ ♀ on *Caltha palustris* abt. 900 m a.s.l.; 8 July 1977, 1 ♀ on *Pedicularis oederi*; 12 July 1977, 4 ♀ ♀ on *P. oederi*, 1 ♀ on *Barbisia alpina*; 21 July 1977, 1 ♀ on *P. oederi*. The last seven specimens were found on marshy ground above the tree border abt. 1100 m a.s.l.

**Aptinothrips elegans* Priesner, 1924.

EIS 19: Tjome Vasser 20 Aug. 1978, 1 ♀ swept from herbage, PS leg. EIS 28: Oslo Dælivatn 20 Aug. 1978, 2 ♀ ♀ on *Galium triflorum*. Oslo Malmöya 18 Aug. 1978, 4 ♀ ♀ swept from herbage on dry meadow.

Aptinothrips rufus (Haliday, 1836).

Previously recorded from Setesdal Bygland (EIS 9) on *Phleum pratense*; Jeløya (EIS 19) and Våle (EIS 19) on *Secale cereale*; Tistedalen (EIS 20) on *Trifolium pratense*; Kalnes (EIS 20) and Eidfjord (EIS 41) on *P. pratense*; and Romedal (EIS 46) on *T. pratense* (Herstad 1960). New records: EIS 7: Sandnes Aug. 1979, 1 ♀ swept from herbage. Ålgård 17 Oct. 1978, 3 ♀ ♀ on grass. EIS 19: Tjome Mostranda 20 Aug. 1978, 5 ♀ ♀ swept from grass in a damp area. EIS 28: Oslo Malmöya 18 Aug. 1978, 2 ♀ ♀ swept from herbage on a dry meadow. EIS 92: Trondheim Lade 14 Sep. 1978, 1 ♀ on grass.

Aptinothrips stylifer Trybom, 1894.

Previously reported from Norway by Palmer (1975), who seems to refer to eight female specimens collected 24 June 1973 on Ustaoset (EIS 42), LM leg., in coll. BM. In addition, Kjellsen (1975) reported the species from Stigstuv on Hardangervidda (EIS 33); 52 tubes in coll. ZMB. New records: EIS 7: Sandnes Aug. 1979, 3 ♀ ♀ swept from herbage. Ålgård 17 Oct. 1978, 6 ♀ ♀ on grass. EIS 19: Tjome Mostranda 20 Aug. 1978, 8 ♀ ♀ swept from grass in a moist area. EIS 28: Oslo Malmöya 18 Aug. 1978, 1 ♀ swept from herbage on dry meadow. EIS 79: Kongsvoll 29 July 1979, 1 ♀ on grass, 1 ♀ on *Galium boreale* abt. 1100 m a.s.l. EIS 91: Aunhagen nr. Fannrem 19 Aug. 1979, 3 ♀ ♀ swept from herbaceous plants. EIS 92: Börsa Sep. 1979, 18 ♀ ♀ on grass tussocks. Börsa Hestvollvegen 14 Aug. 1979, 4 ♀ ♀ swept from meadow. Gaulosen 20 Aug. 1979, 3 ♀ ♀ swept from grass on beach meadow. Heimdal 20 Aug. 1979, 1 ♀ on grass; 3 July 1978, 1 ♀ on *Trifolium pratense*. Målsjøen July 1978, 2 ♀ ♀ in wt in spruce forest. Trondheim Lade 2 July 1978, 1 ♀ on *Rosa* sp.; 14 Sep. 1978, 18 ♀ ♀ 1 ♂ on grass. Trondheim Voll July 1978, 2 ♀ ♀ in wt. EIS 118: Bjerka 26 Aug. 1978, 1 ♀ on grass

in deciduous forest. EIS 131: Leivset nr Fauske 30 June 1980, 1 ♀ swept from beach meadow. EIS 146: Lavangen Kjeiprød 17 Sep. 1978, 24 ♀ ♀ on grass; 29 June 1980, 1 ♀ on *Alopecurus pratensis*. *Pezothrips frontalis* (Uzel, 1895).

Bagnall (1926) reported the find of a single specimen between Fevik (EIS 6) and Arendal (EIS 6).

**Belothrips acuminatus* (Haliday, 1836).

EIS 79: Kongsvoll 1 July 1979, 30 ♀ ♀ 3 ♂ ♂ on *Galium boreale* abt. 900 m a.s.l. EIS 92: Börsa Hestvollvegen 16 June 1980, 25 ♀ ♀ on *G. boreale*. Målsjøen 2 July 1978, 4 ♀ ♀ on *G. boreale*. *Chaetanaphothrips orchidii* (Moulton, 1907).

Bagnall (1926) reported this glasshouse species from Norway. No additional data were given.

**Oxythrips ajugae* Uzel, 1895.

EIS 6: Fevik 1909?, 2 ♀ ♀ on *Pinus*. RB leg., in coll. BM. EIS 79: Kongsvoll 14 June 1978, 1 ♀ f. *bicolor* Uzel. EIS 92: Heimdal 15 May 1978, 2 ♀ ♀ f. *bicolor* on male *Salix* catkins; 20 May 1978, 5 ♀ ♀ nominate on *Larix decidua*: June/July 1978, 3 ♀ ♀ nominate 2 ♀ ♀ f. *bicolor* in wt. Målsjøen June/July 1978, 3 ♀ ♀ nominate 5 ♀ ♀ f. *bicolor* in wt in spruce forest, 5 ♀ ♀ nominate 4 ♀ ♀ f. *bicolor* in wt in mixed forest. Trondheim Voll 2 July 1978, 2 ♀ ♀ nominate 1 ♀ f. *bicolor* in wt. EIS 98: Røra 1 June 1979, 1 ♀ f. *bicolor* on *Pinus sylvestris*. EIS 123: Mo i Rana Ö. Gruben 22 June 1979, 2 ♀ ♀ nominate on *Picea abies*.

**Oxythrips bicolor* (Reuter, 1879).

EIS 6: Fevik July 1909, 2 ♀ ♀ on *Pinus* sp., RB leg., in coll. BM. EIS 79: Driva 25 May 1978, 1 ♀ on *Ribes rubrum*. EIS 91: Meldal 1 May 1980, 15 ♀ ♀ 10 ♂ ♂ on *Pinus sylvestris*. EIS 92: Heimdal 15 May 1978, 3 ♀ ♀ on male *Salix* catkins; 17 May 1971, 1 ♀ on *Larix decidua*; 20 May 1978, 1 ♀ on *L. decidua*; 20 June 1978, 1 ♀ in wt. Målsjøen June/July 1978, 11 ♀ ♀ in wt in spruce forest, 1 ♀ in wt in mixed forest. EIS 98: Røra 1 June, 14 ♀ ♀ on *P. sylvestris*.

**Baliothrips dispar* Haliday, 1836.

All the females cited are macropterous or hemimacropterous, the males are micropterous. EIS 91: Eidet nr Fannrem 15 July 1980, 4 ♀ ♀ on *Potentilla* sp., PS leg. Hemnekjølen 15 July 1980, 25 ♀ ♀ 3 ♂ ♂ swept from bog herbage, 107 ♀ ♀ 15 ♂ ♂ on *Calamagrostis* sp. EIS 92: Börsa Sep. 1979, 6 ♀ ♀ on grass. EIS 118: Bjerka 26 Aug. 1978, 15 ♀ ♀ 5 ♂ ♂ on grass in moist deciduous forest.

Ceratothrips ericae (Haliday, 1836).

Previously reported (as *Taeniothrips ericae* Haliday) from *Calluna* sp. from Aust-Agder. Locality not specified (Herstad 1960). New records: EIS 4: Kvinesdal 9 Aug. 1978, 1 ♀ on *Calluna vulgaris*. UO leg., RS det. EIS 7: Ramsberg nr Stavanger 5 Aug. 1979, 28 ♀ ♀ on *C. vulgaris* on bog. Sandnes Aug. 1979, 1 ♀ swept from herbage. EIS 28: Oslo Ekeberg 18 Aug. 1978, 6 ♀ ♀ on *C. vulgaris*. EIS 79: Kongsvoll 8 Aug. 1978, 1 ♀ 1 ♂ on *C. vulgaris* abt. 1000 m a.s.l. Kongsvoll Grønbak-

ken 1 Aug. 1977, 4 ♀♀ on *C. vulgaris*, 3 ♀♀ on *Bartsia alpina*: 21 July 1978, 8 ♀♀ 1 ♂ on *C. vulgaris*: 21 July 1979, 1 ♀ on *Astragalus frigidus*. EIS 91: Hemnekjölen 15 July 1980, 1 ♀ swept from herbage on bog. Vinjeöra 15 July 1980, 1 ♀ in spruce forest, PS leg. EIS 92: Börsa Hestvollvegen 14 Aug. 1979, 2 ♀♀ on *C. vulgaris*, 11 ♀♀ swept from herbage on bog. Heimdal 30 July 1978, 5 ♀♀ on *C. vulgaris*.

Frankliniella intonsa (Trybom, 1895).

Previously recorded from Westby (EIS 28), Nord-erhov nr Hønefoss (EIS 36), and Brumundal (EIS 54) on *Avena sativa*: and from Örandal (EIS 96) on *Hordeum* sp. (Herstad 1960). New records: EIS 6: Fevik nr Arendal 1909, 1 ♀ on *Pedicularis palustris*, RB leg., in coll. BM. EIS 19: Tjømø Mostrand 19 Aug. 1978, 1 ♀ on *Artemisia* sp.: 20 Aug. 1978, 5 ♀♀ swept from meadow, PS leg., 8 ♀♀ 1 ♂ swept from grass in a moist area. EIS 28: Ås Vollebakk 14 July 1954, 1 ♀. HT leg., in coll. BM.

Frankliniella tenuicornis (Uzel, 1895).

Previously recorded from Skedsmo Hellerud (EIS 37) on *Triticum aestivum*: and Frosta (EIS 97) on *Avena sativa* (Herstad 1960). New records: EIS 19: Tjømø Vasser 20 Aug. 1978, 1 ♀ swept from grass in a moist area, 1 ♀ on *Berteroa incana*. Tønsberg 20 Aug. 1978, 2 ♀♀. EIS 28: Oslo Dælivatn 20 Aug. 1978, 2 ♀♀ on *Agrostis* sp., 2 ♀♀ swept from meadow, PS leg., 1 ♀ swept from *Calluna vulgaris*. PS leg. Oslo Malmøya 18 Aug. 1978, 1 ♀ on the beach, 1 ♀ swept from grass on dry meadow. Oslo Maridalen 17 Aug. 1978, 1 ♀ on *Vicia cracca*. Ås NLH 18 Aug. 1978, 4 ♀♀ 1 ♂ on *Trifolium pratense* nr rye field, 2 ♀♀ on *Achillea millefolium* nr rye field, 26 ♀♀ 2 ♂♂ on *Secale cereale*. EIS 45: Toten Lena 23 Aug. 1973, specimens, CS leg., LM det. EIS 33: Hardangervidda Stigstuv 1969–70, 1 tube, EK leg. det., in coll. ZMB. EIS 79: Kongsvoll 8 July 1979, 1 ♀ in suction trap abt. 900 m a.s.l. EIS 92: Gaulosen 20 Aug. 1979, 1 ♀ swept from beach meadow. Trondheim Voll July/Aug. 1979, 2 ♀♀ 14 ♂♂ in wt. EIS 98: Stiklestad 29 July 1978, 9 ♀♀ 1 ♂ on *Secale cereale*.

Kakothrips robustus (Uzel, 1895).

The species has been recorded from Moss (EIS 19) on leguminous plants; Ås (EIS 19), Hurum (EIS 28), Høvik (EIS 28), Oslo (EIS 28), Røyken (EIS 28), Ö. Aker (EIS 28), and Ås NLH (EIS 28) on *Pisum sativum*; Bryn (EIS 28), Oslo (EIS 28), and Årnes (EIS 28) on *Pisum* sp.; Hvalstad (EIS 28) on leguminous plants; Rosendal (EIS 31) on *P. sativum*; Jessheim (EIS 37) on leguminous plants; and Östlandet on *Pisum* sp. (Herstad 1960).

**Mycterothrips latus* Bagnall, 1912.

EIS 28: Oslo Dælivatn 20 Aug. 1978 3 ♀♀ 2 ♂♂ on *Betula pubescens*. EIS 42: Ustaoset 25 June 1973, 6 ♀♀ on *Betula* sp., LM leg., in coll. BM. EIS 79: Kongsvoll 25 May 1978, 12 ♀♀ on *B. pubescens* abt. 900 m a.s.l.; Sep. 1979, 2 ♀♀ swept from herbage abt. 900 m a.s.l. EIS 92: By-

neset 12 May 1978, 16 ♀♀ on *B. pubescens*. Målsjøen June/July/Aug. 1978, 4 ♀♀ in wt in mixed forest, 1 ♀ in wt in coniferous wood. Heimdal July/Aug. 1978, 2 ♀♀ in wt. Trondheim 30 Aug. 1978 1 ♀ on *Jasmine*, PS leg. EIS 146: Lavangen Kjeiperöd 17 Sep. 1978, 2 ♀♀ on *B. pubescens*. All the specimens in the DKNVSM's collection belong to f. *hiemalis* Titschak.

**Mycterothrips salicis* (Reuter, 1878).

EIS 92: Byneset 18 July, 1 ♀ swept from herbaceous plants in deciduous forest, 1 ♂ on *Solidago virgaurea* in the same locality.

Odontothrips biuncus John, 1921.

U. Quick (pers.comm.) and Jacot-Guillarmod (1975) state the species found in Norway, but we have not any further data. New records: EIS 28: Oslo Maridalen 17 Aug. 1978, 7 ♀♀ on *Vicia cracca*. EIS 92: Börsa 8 July 1979, 2 ♀♀ on *V. cracca*. EIS 96: Agdenes Hambåra 2 July 1979, 1 ♀, PS leg. EIS 131: Leivset nr Fauske 30 June 1980, 19 ♀♀ on *V. cracca* on beach meadow. EIS 140: Rombakken 30 June 1980, 5 ♀♀ on *V. cracca* on beach meadow.

Odontothrips loti (Haliday, 1852).

A series of this species from Geilo (EIS 43), 10 ♀♀ 2 ♂♂, LM leg., in coll. BM, is according to U. Quick (pers. comm.) a published record, but we have not been able to trace the publication. New records: EIS 28: Oslo Maridalen 17 Aug. 1978, 1 ♀ on *Vicia cracca*. EIS 92: Byneset 16 Aug. 1978, 1 ♀ on *Trifolium pratense*: 18 Aug. 1978, 1 ♀ on *T. pratense*, 5 ♀♀ on *Lotus corniculatus*. Börsa 8 July 1979, 2 ♀♀ on *T. pratense*. Börsa Hestvollvegen 16 June 1980, 14 ♀♀ 2 ♂♂ on *L. corniculatus*: 9 July 1980, 4 ♀♀ 3 ♂♂ swept from different herbaceous plants. Heimdal 3 July 1978, 12 ♀♀ on *T. pratense*. Ringvål 18 July 1978, 3 ♀♀ on *T. pratense*. Trondheim Lade 3 July 1978, 3 ♀♀ on *T. pratense*. EIS 115: Ravasseng nr Mosjøen 19 June 1978, 1 ♀ on *Taraxacum*, sp. EIS 131: Leivset nr Fauske 30 June 1980, 30 ♀♀ 4 ♂♂ on *L. corniculatus* on beach meadow, 2 ♀♀ on *V. cracca*.

Taeniothrips inconsequens (Uzel, 1895).

Priesner (1926–28) and Jacot-Guillarmod (1975) listed this species as recorded from Norway, and Herstad (1960) reported the following records: Borgestad (EIS 18) on apples; Ostereid nr Bergen (EIS 21), Utåker (EIS 23), Hvalstad (EIS 28), Lier (EIS 28), and Ås NLH (EIS 28) on pears; Hardanger on apples, pears, *Prunus avium*, *Prunus cerasus*, *Sorbus aucuparia*, and *Sorbus* sp., and with the localities specified as Hardanger, Indre Hardanger, Oystese (EIS 31), Aga (EIS 32), Børve (EIS 32), Espå (EIS 32), Lofthus (EIS 32), Nå (EIS 32), Sörfjorden (EIS 32), Ullensvang (EIS 32), Utne (EIS 32), Eidfjord (EIS 41), Granvin (EIS 41), and Ulvik (EIS 41); Sogndal (EIS 50) on pears; and Luster (EIS 60) on *P. avium*. New records: EIS 28: Asker Sem 15 May 1973, 27 ♀♀ on *Malus* sp., GT leg., in coll. BM; 5 June 1973,

- 11 ♀♀ on *Malus* sp., GT leg., in coll. BM. EIS 92: Börsa 1 June 1978, 1 ♀ in wt. Ringvål 12 May 1978, 1 ♀ on *Anemone nemorosa*. EIS 92: Paradisbukta nr Langstein 7 May 1978, 2 ♀♀ on *Hepatica nobilis*.
- Paeoniolrips picipes* (Zetterstedt, 1828).
Zetterstedt (1840) described the species partly from material collected in Bjerkvik in Nordland (EIS 146), and according to Ahlberg (1918) this is a replication of the original description. More recently, Herstad (1960) reported the species from *Anemone nemorosa* in Oslo (EIS 28). New records: EIS 28: Oslo June 1909, 1 ♀, RB leg., in coll. BM. EIS 43: Geilo 26 June 1973. LM leg., in coll. BM. EIS 79: Kongsvoll 12 July 1977, 1 ♀ on *Gymnadenia conopsea* in birch forest abt. 950 m a.s.l., 2 ♀♀ on *Astragalus frigidus*, 4 ♀♀ on *Bartsia alpina*, 9 ♀♀ on *Pedicularis oederi*, the last three finds above the tree border, abt. 1100 m a.s.l.; 6 July 1978, 1 ♀ swept from grass etc. in birch forest abt. 1000 m a.s.l.; Nov. 1978, 2 ♂♂ in litter beneath snow, abt. 1000 m a.s.l. EIS 92: Målsjøen June/July, 1 ♀ in wt in coniferous wood, 4 ♀♀ in wt in mixed forest. Ringvål 12 May 1978, 15 ♀♀ 2 ♂♂ on *A. nemorosa* in deciduous forest: 1 June 1978, 3 ♀♀ 5 ♂♂ on *A. nemorosa*. EIS 92: Paradisbukta nr Langstein 7 May 1978, 4 ♀♀ 5 ♂♂ on *Hepatica nobilis*. EIS 123: Mo i Rana Ö. Gruben 22 June 1979, 5 ♀♀ on *Taraxacum* sp. EIS 146: Lavangen Reite 28 June 1980, 1 ♀ swept from meadow herbage.
- Thrips atratus* Haliday, 1836.
Zur Strassen (1978) reported the species from flowering grass in Åndalsnes (EIS 77). New records: EIS 19: Tjøme Mostranda 20 Aug. 1978, 2 ♀♀ 1 ♂ on yellow Scrophulariaceae. EIS 28: Asker Sem 10 May 1974, 1 ♀, GT leg., in coll. BM. Oslo Dælivatn 20 Aug. 1978, 1 ♀ swept from *Calluna* etc., PS leg., 1 ♀ on *Cirsium vulgare*. Oslo Ekeberg 18 Aug. 1978, 1 ♀ on *Campanula rotundifolia*. Oslo Maridalen 17 Aug. 1978, 8 ♀♀ 2 ♂♂ on *Centaurea scabiosa*, 6 ♀♀ 2 ♂♂ on *Vicia cracca*. Oslo Tøyen (Botanical garden) 17 Aug. 1978, 1 ♂ on *Blumenbachia hieronymi*, 1 ♀ 5 ♂♂ on *Hesperis matronalis*, 1 ♀ 1 ♂ on *Phlox subulata*, 4 ♀♀ 1 ♂ on *Saponaria officinalis*. EIS 33: Stigstuv area on Hardangervidda 1969–70, 1 tube, EK leg. det., in coll. ZMB. EIS 92: Byneset 18 July 1978, 1 ♂, Gaulosen 20 Aug. 1979, 2 ♂♂ swept from herbage on beach. Heimdal 30 July 1978, 1 ♀ on *Calluna vulgaris*; June/July 1978, 3 ♀♀ 1 ♂ in wt in garden. Ringvål 7 May 1978, 2 ♀♀ on *Anemone nemorosa*; 12 May 1978, 3 ♀♀ on *A. nemorosa*; 18 July 1978, 1 ♀ on *Campanula latifolia*; 2 ♀♀ on *Trifolium pratense*. Trondheim Lade 14 Sep. 1978, 3 ♀♀ 1 ♂ on *C. rotundifolia*, 1 ♀ on *T. pratense*. Trondheim Voll 4 June 1974, 1 ♀ on *Taraxacum* sp.; June/July/Aug. 1978, 16 ♀♀ 7 ♂♂ in wt. EIS 98: Stiklestad 28 July 1978, 1 ♀ on *Chrysanthemum leucanthemum*, 15 ♀♀ 8 ♂♂ on *T. pratense*.
- **Thrips brevicornis* Priesner, 1920.
EIS 28: Asker Sem 10 May 1974, 1 ♀ GT leg., in coll. BM. Oslo Ekeberg 18 Aug. 1978, 6 ♀♀ 4 ♂♂ on *Sedum maximum*, 22 ♀♀ on *Solidago virgaurea*. Oslo Malmöya 18 Aug. 1978, 13 ♀♀ 2 ♂♂ on *S. virgaurea*.
- Thrips calcaratus* Uzel, 1895.
Previously reported from *Tilia* sp. in the Oslo area (EIS 28) (Fjelddalen 1963). New record: EIS 92: Heimdal 20 June 1978, 1 ♀ in wt in garden.
- **Thrips conferticornis* Priesner, 1922.
EIS 19: Tjøme Vasser 20 Aug. 1978, 1 ♀ hemimacropterous swept from meadow herbage, PS leg.
- **Thrips dilatatus* Uzel, 1895.
The specimens in the DKNVSM's collections are micropterous when not otherwise stated. EIS 43: Geilo 28 June 1973, 1 ♀ swept, LM leg., in coll. BM. EIS 79: Kongsvoll Grønbakken 1 Aug. 1977, 3 ♀♀ 1 ♂ on *Bartsia alpina*. EIS 91: Orkanger 27 July 1980, 2 ♀♀ swept from herbage nr sea. EIS 92: Börsa Hestvollvegen 16 June 1980, 1 ♂ on *Lotus corniculatus*; 9 July 1980, 43 ♀♀ microptera 2 ♀♀ macroptera 25 ♂♂ swept from meadow herbage (grass, *L. corniculatus*, *Trifolium pratense* etc.). Målsjøen 20 June 1978, 2 ♀♀ 1 ♂. Byneset 16 Aug. 1979, 1 ♂ swept from herbage along the roadside.
- Thrips flavus* Schrank, 1776.
Previously recorded from Sandnes (EIS 7) on *Dianthus* sp.; Hvaler (EIS 12) on apple buds; Porsgrunn (EIS 18) on *Prunus avium*; Dilling (EIS 19) on *Dianthus* sp.; Aker (EIS 28); Drammen (EIS 28) on apple leaves; Oslo Bekkelaget (EIS 28) and Stabekk (EIS 28) on apple buds; Asker (EIS 28) on buds of apple and *P. avium*; Røyken Nærnes (EIS 28) on plum flowers; and Leikanger (EIS 50) and Førde (EIS 58) on *P. avium* flowers (Herstad 1960). New records: EIS 19: Tønsberg 20 Aug. 1978, 2 ♀♀. EIS 28: Oslo Dælivatn 20 Aug. 1978, 1 ♀ on *Cirsium vulgare*, 10 ♀♀ 2 ♂♂ swept from *Calluna vulgaris*, PS leg. Oslo Ekeberg 18 Aug. 1978, 73 ♀♀ 52 ♂♂ on *C. vulgaris*, 17 ♀♀ 12 ♂♂ on *Campanula rotundifolia*, 2 ♀♀ 1 ♂ on *Galium verum*, 7 ♀♀ 12 ♂♂ on *Sedum maximum*, 9 ♀♀ 6 ♂♂ on *Solidago virgaurea*. Oslo Malmöya 18 Aug. 1978, 52 ♀♀ 15 ♂♂ swept from grass, *S. virgaurea* etc., PS leg. Oslo Maridalen 17 Aug. 1978, 1 ♀ on *Artemisia vulgaris*, 2 ♀♀ on *Centaurea scabiosa*, 1 ♀ on *Hieracium* sp. Oslo Tøyen (Botanical garden) 17 Aug. 1978, 2 ♀♀ 1 ♂ on *Hesperis matronalis*, 1 ♀ on *Spiraea* sp. Ås NLH 18 Aug. 1978, 1 ♀ on *Trifolium pratense*. EIS 92: Byneset 18 July 1978, 7 ♀♀ 1 ♂ on *Cirsium* sp., 1 ♀ on *Lotus corniculatus*, 26 ♀♀ 14 ♂♂ on *S. virgaurea*, 2 ♀♀ on *T. pratense*, Heimdal 15 May 1978, 1 ♀ on male *Salix* catkins; 2 July 1978 3 ♂♂ on *T. pratense*. Ringvål 18 July 1978 1 ♀ 1 ♂ on *T. pratense*, 2 ♀♀ on *Valeriana sambucifolia*. Trondheim 30 Aug. 1978, 4 ♀♀ on *Jasmine*, PS leg., 1 ♀ on *Ribes nigrum*, PS leg. Trondheim Lade 2 July

1978, 1 ♀ on *Rosa* sp.; 3 July 1978, 3 ♀ ♀ on *T. pratense*; 14 Sep. 1978, 1 ♀ on *T. pratense*. 1 ♀ 1 ♂ on *Matricaria inodora*.

**Thrips funebris* Bagnall, 1924.

EIS 19: Tjømø Mostrand 19 Aug. 1978, 1 ♀ f. microptera swept from herbage in a boggy area near the beach.

Thrips fuscipennis Haliday, 1836.

Previously recorded from roses in Dommersmo nr Grimstad (EIS 6); flower buds in Stavanger (EIS 7); *Rosa multiflora* in Buens nursery on Borgestad (EIS 18); roses in Sandefjord (EIS 19), Vestfossen (EIS 27), and Thorstveds nursery in Hurum (EIS 28); and flower buds in Aker (EIS 28) (Herstad 1960). New records: EIS 19: Slagen 12 July 1976, in glasshouse, CS leg., BP det.

Stokke 9 July 1976, in glasshouse, CS leg., BP det. EIS 28: Asker Sem 15 May 1973, 8 ♀ ♀ on *Malus* sp., GT leg., in coll. BM; 5 June 1973, 6 ♀ ♀ on *Malus* sp., GT leg., in coll. BM; 4 July 1973, 12 ♀ ♀ 8 ♂ ♂ on *Malus* sp., GT leg., in coll. BM. Lier 9 July 1976, in glasshouse, CS leg., BP det.

**Thrips hukkineni* Priesner, 1937.

EIS 28: Oslo Maridalen 17 Aug. 1978, 1 ♀ on *Hieracium* sp. EIS 79: Kongsvoll Grønbakken 11 July 1977, 3 ♀ ♀ on *Hieracium* sp. EIS 91: Aunhaugen nr Fannrem 19 Aug. 1979, 3 ♀ ♀ swept from herbage. Eidet nr Fannrem 15 July 1980, 1 ♀ on *Hieracium* sp. EIS 92: Byneset 12 May 1978, 2 ♀ ♀ on *Taraxacum* sp.; 18 July 1978, 1 ♀ on *Solidago virgaurea*. Børsa 8 July 1979, 11 ♀ ♀ 1 ♂ on *Taraxacum* sp. along the road, 12 ♀ ♀ 15 ♂ ♂ on *Trifolium pratense* in the same locality; 9 July 1980, 1 ♀ swept from herbaceous plants on the meadow. Heimdal 21 May 1978, 1 ♀ on *Taraxacum* sp.; 3 July 1978, 105 ♀ ♀ 11 ♂ ♂ on *Taraxacum* sp., 1 ♀ on *Trifolium pratense*. Trondheim Lade 2 July 1978, 3 ♀ ♀ 6 ♂ ♂ on *T. pratense*; 3 July 1978, 13 ♀ ♀ 5 ♂ ♂ on *T. pratense*; 14 Sep. 1978, 1 ♀ 3 ♂ ♂ on *Campanula rotundifolia*, 1 ♂ on *Matricaria inodora*, 2 ♂ ♂ on *T. pratense*. EIS 98: Røra 1 June 1979, 36 ♀ ♀ on *Taraxacum* sp. Stiklestad 29 July 1978, 1 ♀ on *Chrysanthemum leucanthemum*, 2 ♀ ♀ on *Secale cereale*. EIS 123: Mo i Rana Ö Gruben 22 June 1979, 7 ♀ ♀ on *Taraxacum* sp. EIS 140: Rombakken 20 June 1980, 1 ♂ on *Vicia cracca* on the beach. EIS 146: Lavangen Kjeiprød 17 Sep. 1978, 1 ♂ on *Achillea millefolium*.

Thrips juniperinus L., 1758.

Mound et al. (1976) reported this species from Norway, but no collection data were given. Possibly, the information refers to material in the BM's collections (see below). New records: The specimens have been collected from *Juniperus communis* when not otherwise stated: EIS 7: Ramsberg nr Stavanger 5 July 1979, 3 ♀ ♀. EIS 41: Voss Reimegrend 13 Aug. 1978, 1 ♀ UO leg., RS det. EIS 42: Ustaoset 26 June 1972, 10 ♀ ♀ JM leg., in coll. BM; 24 June 1973, 12 ♀ ♀ # LM leg., in coll. BM. EIS 71: Dovregubbens hall 25 July 1978, 5 ♀ ♀. EIS 79: Kongsvoll 24 May

1978, 1 ♀ on *Pinus silvestris* abt. 950 m a.s.l.: 6 July 1978 10 ♀ ♀ abt. 1100 m a.s.l., 27 July 1978, 1 ♀ abt. 1100 m a.s.l.; 29 July 1979, 3 ♀ ♀ abt. 1100 m a.s.l.; Sep. 1979, 18 ♀ ♀ abt. 900 m a.s.l. EIS 92: Byneset 8 April 1979, 25 ♀ ♀.

Thrips linariae (Priesner, 1928).

Kock (1966) reported this species (as *Taeniothrips linariae* Priesner) from *Linaria vulgaris* in different localities in Norway, north to abt. 65°N (locality data not given).

**Thrips major* Uzel, 1895.

EIS 19: Tjømø 19 Aug. 1978, 51 ♀ ♀ 11 ♂ ♂ on *Cirsium* sp., 3 ♀ ♀ on *Phragmites communis* in a pond, 20 ♀ ♀ 9 ♂ ♂ on undet. flower; 20 Aug. 1978, 3 ♀ ♀ swept from herbage nr a pond. Tjømø Vasser 20 Aug. 1978, 1 ♀ 1 ♂ on *Berteroa incana*, 1 ♂ on *Campanula rotundifolia*, 1 ♀ 1 ♂ on *Cardamine pratensis*, 1 ♀ on *Sedum maximum*, 10 ♀ ♀ on grass. Tønsberg 20 Aug. 1978, 1 ♀ EIS 28: Oslo 1 Aug. 1974, CS leg., BP det. Oslo Dælivatn 20 Aug. 1978, 1 ♀ on *Betula pubescens*, 195 ♀ ♀, 5 ♂ ♂ on *Cirsium vulgare*, 28 ♀ ♀ 5 ♂ ♂ swept from *Calluna vulgaris*, PS leg., 1 ♀ 1 ♂ on grass, 6 ♀ ♀ on *Agrostis* sp., 8 ♀ ♀ swept from herbage on meadow, PS leg., 21 ♀ ♀ on *Galium triflorum*, 165 ♀ ♀ on *Lysimachia vulgaris*, 48 ♀ ♀ 7 ♂ ♂ on *Potentilla anserina*, 3 ♀ ♀ on *Tilia* leaves, 91 ♀ ♀ 8 ♂ ♂ on *Trifolium* sp. Oslo Ekeberg 18 Aug. 1978, 38 ♀ ♀ swept from *Calluna vulgaris*, PS leg., 15 ♀ ♀ 22 ♂ ♂ on *C. rotundifolia*, 2 ♀ ♀ on *Galium verum*, 4 ♀ ♀ 1 ♂ on *S. maximum*, 4 ♀ ♀ on *Solidago virgaurea*, 4 ♀ ♀ on *Spergula arvensis*. Oslo Ila 20 Aug. 1978, 17 ♀ ♀ on dead *Picea abies*, 24 ♀ ♀ 4 ♂ ♂ on *Rhamnus frangula*. Oslo Malmøya 18 Aug. 1978, 5 ♀ ♀ 1 ♂ swept from grass and *S. virgaurea*. Oslo Maridalen 17 Aug. 1978, 7 ♀ ♀ 20 ♂ ♂ swept from *Achillea*, grass etc., 1 ♀ on *Acer platanoides*, 3 ♀ ♀ 1 ♂ on *Artemisia vulgaris*, 1 ♀ on *Carex nigricans*, 3 ♀ ♀ on *Centaurea scabiosa*, 1 ♀ on *Hieracium* sp., 1 ♀ on *Vicia cracca*. Oslo Tøyen (Botanical garden) 17 Aug. 1978, 2 ♀ ♀ on *Blumenbachia hieronymi*, 3 ♀ ♀ on *Hesperis matronalis*, 12 ♀ ♀ 13 ♂ ♂ on *Phlox subulata*, 3 ♀ ♀ 4 ♂ ♂ on *Saponaria officinalis*, 2 ♂ on *Potentilla transcaspicax*. Ås NLH 18 Aug. 1978, 67 ♀ ♀ 38 ♂ ♂ on *Matricaria inodora*, 1 ♀ 1 ♂ on *Secale cereale*, 30 ♀ ♀ 2 ♂ ♂ on *Trifolium pratense*. Vestby 18 Aug. 1978, 35 ♀ ♀ 2 ♂ ♂ on *Urtica dioica*. EIS 79: Driva 26 May 1978, 2 ♀ ♀ on *Prunus padus*, 1 ♀ on *Ribes rubrum*. Kongsvoll 6 July 1978, 5 ♀ ♀ on *Betula nana* abt. 1100 m a.s.l.; 12 July 1978, 1 ♀ on *Astragalus alpinus* abt. 1000 m a.s.l.; 8 Aug. 1978, 1 ♀ 1 ♂ on *C. vulgaris*; 29 July 1979, 1 ♀ 6 ♂ ♂ on *B. nana*. Kongsvoll Grønbakken 11 July 1977, 2 ♀ ♀ on *Astragalus frigidus*. EIS 91: Eidet nr Fannrem 15 July 1980, 2 ♀ ♀ swept from *Carex* sp. on bog, 3 ♀ ♀ on *Hieracium* sp. EIS 92: Byneset 12 May 1978, 1 ♀ on male *Salix* catkins; 18 July 1978, 1 ♀ 3 ♂ ♂ on *Cirsium* sp., 4 ♀ ♀ 6 ♂ ♂ on *Lotus corniculatus*, 30 ♀ ♀

- 38♂♂ on *S. virgaurea*, 1♀ on *T. pratense*, 1♂ swept from herbaceous plants; 16 Aug. 1979, 5♀♀ swept from herbage in deciduous wood. Børsa Hestvollvegen 14 Aug. 1979, 14♀♀ 22♂♂ swept from *C. vulgaris*, 2♀♀ 6♂♂ swept from grass etc. on bog; 9 July 1980, 1♀ swept from meadow herbage. Gaulosen 13 July 1978, 1♀ on *Valeriana sambucifolia*. Heimdal 15 May 1978, 2♀♀ on male *Salix* catkins; 3 July 1978, 6♀♀ on *Ranunculus acris*, 1♀ on *T. pratense*, 4♀♀ on *U. dioica*; 30 July 1978, 1♀ on *C. vulgaris*. 31 July 1978, 1♀ in wt. Målsjøen 2 July 1978, 1♀ 7♂♂ on *Achillea millefolium*, 1♀ 1♂ on *Galium boreale*, 1♀ on *Geranium silvaticum*; June/July 1978, in wt in coniferous forest, 1♀ 1♂ in wt in mixed wood. Ringvål 18 July 1978, 1♀ 2♂♂ on *Cirsium* sp., 2♀♀ on *Comarum palustre*. 1♀ on *Plantago major*, 2♀♀ 3♂♂ on *T. pratense*. 48♀♀ 50♂♂ on *V. sambucifolia*. Trondheim Lade 3 July 1978, 1♀ on *T. pratense*. Trondheim Voll 31 July 1978, 1♀ in wt. Trondheim Bymarka 29 July 1979, 1♀ PS leg. EIS 98: Røra 1 June 1979, 1♀ on *P. padus*. Stiklestad 29 July 1978, 2♀♀ on *Chrysanthemum leucanthemum*, 10♀♀ on *Filipendula ulmaria*, 2♀♀ on *T. pratense*. EIS 101: Snåsa, 9♀♀ 1♂ on *F. ulmaria*. EIS 140: Rombakken 30 June 1980, 1♀ 1♂ on *Potentilla anserina*, 2♀♀ 1♂ on *Vicia cracca*.
- **Thrips menynathidis* Bagnall, 1923.
EIS 71: Fokstumyra 11 Aug. 1977, 3♀♀ on *Caltha palustris* in a swampy area. EIS 92: Børsa Hestvollvegen 14 Aug. 1979, 17♀♀ 3♂♂ on *Menyanthes trifoliata* along the edge of a pond. Males of this species seem not to have been previously recorded (Schiephake 1979).
- **Thrips minutissimus* L., 1758.
EIS 28: Asker Sem 15 May 1973, 6♀♀, GT leg., in coll. BM.
- Thrips nigropilosus* Uzel, 1895.
Previously recorded from *Cineraria* sp. in Sandefjord (EIS 19); *Chrysanthemum* sp. in Fredrikstad (EIS 20); cucumber house in Lier nr Drammen (EIS 28); *Cineraria* sp. and *Chrysanthemum* sp. in Oslo (EIS 28); and on *Cineraria* and cyclamen in Hamar (EIS 46) (Herstad 1960). New records: EIS 28: Lier 9 July 1976, in glasshouse, CS leg., BP det.
- Thrips palustris* Reuter, 1899.
Bagnall (1913c) reported the species from *Pedicularis palustris* in Norway. Locality was not specified.
- Thrips physapus* L., 1758.
Previously recorded from tomato flowers in Lena (EIS 45) (Herstad 1960). New records: EIS 19: Tjøme Mostranda 19 Aug. 1978, 7♂♂ on *Cirsium* sp., 1♀ on undet. flower; 20 Aug. 1978, 1♀ 1♂ swept from meadow herbage, PS leg. Tjøme Vasser 20 Aug. 1978, 1♀ on yellow Scrophulariaceae. EIS 28: Oslo Ekeberg 18 Aug. 1978, 1♂ on *Campanula rotundifolia*, 2♀♀ on *Solidago virgaurea*. Oslo Malmøya 18 Aug. 1978, 1♀ swept from meadow herbage. Oslo Maridalen 17 Aug. 1978, 1♀ on *Acer platanoides*, 2♀♀ on *Centaurea scabiosa*. Ås Vollebekk 24 July 1954, 2♀♀ 3♂♂, HT leg., in coll. BM. EIS 43: Geilo 26 June 1973, 1♀ on *Taraxacum* sp., LM leg., in coll. BM.
- Thrips pini* (Uzel, 1895).
Reported by Bagnall (1926) (as *Physothrips pini* (Uzel)) from Oslo Bygdøy (EIS 28), where he had collected female specimens from *Abies*. New records: EIS 7: Sandnes Aug. 1979, 2♀♀ 2♂♂ swept from herbage. EIS 92: Byneset 8 April 1979, 1♀ on *Juniperus communis* in coniferous wood. Børsa Hestvollvegen 14 Aug. 1979, 2♀♀ swept from *Calluna* sp., 1♀ swept from grass etc. on bog near spruce wood. Heimdal 17 May 1978, 12♀♀ on *Picea abies*; 20 May 1978, 2♀♀ on *Larix decidua*, 15♀♀ on *P. abies*; June/July 1978, 5♀♀ in wt; 6 April 1979, 2♀♀ on *P. abies*. Målsjøen 2 July 1978, 9♀♀ on *P. abies*; June/July/Aug. 1978, 44♀♀ 12♂♂ in wt in coniferous wood, 18♀♀ in mixed forest. EIS 123: Mo i Rana Ö. Gruben 22 June 1979, 21♀♀ on *P. abies*, 1♀ on *Taraxacum*; 23 June 1979, 1♀ on *Ribes rubrum*.
- **Thrips simplex* (Morrison, 1930).
EIS 28: Oslo 18 Aug. 1971, CS leg., LM det; 20 Aug. 1972, CS leg., LM det; 10 Sep. 1973, 6♀♀ on *Gladialus* sp., CS leg., LM det., in coll. BM.
- Thrips tabaci* Lindeman, 1888.
Previously recorded from *Dianthus chinensis* in Landvik (EIS 6); *Dianthus* sp. in Stavanger (EIS 7); and *Heliothopium* in Oslo (EIS 28) (Herstad 1960). New records: EIS 7: Sandnes 8 Sep. 1976, in glasshouse, CS leg., BP det. EIS 19: Borre 10 May 1977, in glasshouse, CS leg., BP det. Botne Roggeness 15 May 1972, 4♀♀ on cucumber in glasshouse, CS leg., in coll. BM. Stokke 21 June 1977, in glasshouse, CS leg., BP det. Tjøme Mostranda 19 Aug. 1978, 15♀♀ on *Artemisia* sp.; 20 Aug. 1978, 1♀ swept from meadow herbage, 3♀♀ swept from grass in a moist area, 4♀♀ on yellow Scrophulariaceae. Tjøme Vasser 20 Aug. 1978, 52♀♀ on *Berteroa incana*, 1♀ on *Campanula rotundifolia*, 27♀♀ on *Cardamine pratensis*, 7♀♀ on *Sedum maximum*, 14♀♀ on yellow Scrophulariaceae. Tönsberg 20 Aug. 1978, 1♀. EIS 20: Fredrikstad 3 Oct. 1972, in glasshouse, CS leg., BP det. EIS 28: Bærum 22 April 1977, in glasshouse, CS leg., BP det. Oslo Ekeberg 18 Aug. 1978, 5♀♀ on *Spergula arvensis*. Oslo Malmøya 18 Aug. 1978, 85♀♀ swept from herbage on dry meadow, 5♀♀ on *Geranium sanguineum*. Oslo Tøyen (Botanical garden) 17 Aug. 1978, 3♀♀ on *Phlox subulata*. Vestby 14 Oct. 1977, in glasshouse, CS leg., BP det. Ås NLH 18 Aug. 1978, 1♀ on *Matricaria inodora*. EIS 92: Trondheim Lade 2 July 1978, 8♀♀ on *M. inodora*, 7♀♀ on *Trifolium pratense*; 3 July 1978, 10♀♀ on *T. pratense*; 14 Sep. 1978, 5♀♀ on *Campanula rotundifolia*, 15♀♀ on *M. inodora*, 8♀♀ on *T. pratense*.

**Thrips validus* Uzel, 1895.

EIS 28: Oslo 17 Aug. 1978, 2 ♀♀ 1 ♂ on *Hieracium* sp. EIS 43: Geilo 26 June 1973, 5 ♀♀ 1 ♂ on *Taraxacum* sp., LM leg., in coll. BM. EIS 79: Kongsvoll 8 July 1977, 1 ♀ in suction trap on meadow. EIS 91: Aunhaugen nr Fannrem 19 Aug. 1979, 5 ♀♀ swept from herbaceous plants. Eidet nr Fannrem 15 July 1980, 12 ♀♀ 1 ♂ on *Hieracium* sp. EIS 92: Byneset 12 June 1978, 1 ♂ on *Taraxacum* sp. Börsa 8 July 1979, 1 ♀ on *Taraxacum* sp. Heimdal 21 May 1978, 7 ♀♀ 1 ♂ on *Taraxacum* sp.; 3 July 1978, 14 ♀♀ 1 ♂ on *Taraxacum* sp.; 20 Aug. 1978, 1 ♀ 1 ♂ swept from grass etc. Malvik 5 May 1978, 10 ♀♀ 7 ♂♂ on *Tussilago farfara*. Ringvål 7 May 1978, 2 ♀♀ 1 ♂ on *T. farfara*; 12 June 1978 1 ♂ on *T. farfara*; 18 July 1978, 1 ♀ on *Plantago major*. Trondheim Lade 3 July 1978, 1 ♂ on *Trifolium pratense*. Trondheim Voll 4 June 1978, 3 ♀♀ on *Taraxacum* sp. EIS 92: Paradisbukta nr Langstein 7 May 1978, 1 ♂ on *Salix* catkins. 1 ♀ 1 ♂ on *Taraxacum* sp. EIS 98: Röra 1 June 1979, 2 ♀♀ on *Prunus padus*. 10 ♀♀ 2 ♂♂ on *Taraxacum* sp. EIS 123: Mo i Rana 22 June 1979, 1 ♀ on *Ribes rubrum*. 19 ♀♀ 1 ♂ on *Taraxacum* sp. EIS 146: Lavangen Kjeiprød 29 June 1980, 12 ♀♀ 1 ♂ on *Taraxacum* sp.

**Thrips viminalis* Uzel, 1895.

EIS 92: Målsjøen 15 July 1978, 2 ♀♀ 2 ♂♂ in wt in mixed forest.

Thrips vulgatissimus Haliday, 1836.

Zur Strassen (1978) reported the species (as *Taeniothrips vulgatissimus* (Haliday)) from *Centaurea jacea* in Hellesylt in Geiranger (EIS 68), and *Ranunculus* sp. in Åndalsnes (EIS 77) and Kabelvåg (EIS 137). New records: EIS 19: Tjømø Mostranda 19 Aug. 1978, 2 ♀♀ on *Cirsium* sp.; 20 Aug. 1978, 1 ♀ swept from herbage nr a pond. Tjømø Vasser 20 Aug. 1978, 1 ♀ on grass. EIS 28: Oslo Dølvatn 20 Aug. 1978, 2 ♀♀ on *Cirsium vulgare*. Oslo Ekeberg 18 Aug. 1978 9 ♀♀ on *Campanula rotundifolia*, 4 ♀♀ on *Sedum maximum*, 6 ♀♀ on *Solidago virgaurea*. Oslo Malmöya 18 Aug. 1978, 5 ♀♀ swept from herbaceous plants on dry meadow. Oslo Maridalen 17 Aug. 1978, 1 ♀ on *Acer platanoides*. 1 ♀ on *Artemisia vulgaris*, 8 ♀♀ on *Centaurea scabiosa*, 3 ♀♀ on *Hieracium* sp., 2 ♀♀ on *Vicia cracca*. Oslo Tøyen (Botanical garden) 17 Aug. 1978, 3 ♀♀ on *Hesperis matronalis*, 1 ♀ on *Potentilla transcaspicax*, 1 ♀ on *Saponaria officinalis*, 2 ♀♀ on *Spiraea* sp. Ås NLH 18 Aug. 1978, 2 ♀♀ on *Matricaria inodora*, 1 ♀ on *Trifolium pratense*. EIS 33: Hardangervidda Sligstuv 1969–70 1 tube, EK leg. det., in coll ZMB. EIS 42: Ustaoset 26 June 1972, 24 ♀♀ on *Salix* sp., JM leg., in coll. BM. EIS 71: Dovregubbens hall on Dovre 5 July 1978, 3 ♂♂ on *Astragalus frigidus*. EIS 79: Driva 26 May 1978, 3 ♀♀ on *Prunus padus*, 2 ♀♀ on *Ribes rubrum*. Kongsvoll 12 July 1977, 1 ♀ on *Barisia alpina* abt. 1100 m a.s.l., 1 ♀ on *Gymnadenia conopsea* abt. 950 m

a.s.l., 9 ♀♀ on *Pedicularis oederi* abt. 1100 m a.s.l., 12 ♀♀ on *Sorbus aucuparia* abt. 1000 m a.s.l.; 25 May 1978, 1 ♀ on *Betula pubescens* abt. 900 m a.s.l., 4 ♀♀ on *Salix phyllosifolia* abt. 1100 m a.s.l.; 9 June 1978, 6 ♀♀ on *Salix lanata* abt. 1100 m a.s.l., 14 June 1978, 10 ♀♀ in suction trap in *Salix* shrub abt. 900 m a.s.l.; 9 July 1978, 25 ♀♀ on *Taraxacum* sp. 900 m a.s.l.; 23 July 1978, 2 ♀♀ on *B. alpina* abt. 1150 m a.s.l., 3 ♀♀ on *Juniperus communis* abt. 1150 m a.s.l., 3 ♀♀ on *Viscaria alpina* abt. 1150 m a.s.l.; 8 Aug. 1978, 35 ♀♀ on *Calluna vulgaris* abt. 1000 m a.s.l., 102 ♀♀ on *Solidago virgaurea* abt. 1100 m a.s.l.; 29 July 1979, 20 ♀♀ on *Arrhenatherum pubescens* abt. 900 m a.s.l., 6 ♀♀ on *A. frigidus* abt. 1100 m a.s.l., 2 ♀♀ on *Betula nana* abt. 1100 m a.s.l., 10 ♀♀ on *Galium boreale* abt. 900 m a.s.l., 5 ♀♀ on *Juniperus communis* abt. 1100 m a.s.l., 16 ♀♀ on *T. pratense* abt. 900 m a.s.l. Sep 1979, 9 ♀♀ swept from grass etc. on meadow, abt. 900 m a.s.l., 2 ♀♀ on *J. communis* abt. 900 m a.s.l. Kongsvoll Grønbakken abt. 950 m a.s.l. 1 Aug. 1977, 15 ♀♀ on *A. frigidus*, 1 ♀ on *B. alpina*, 11 ♀♀ on *Hieracium* sp.; 21 July 1979, 14 ♀♀ on *A. frigidus*, 1 ♀ on *B. alpina*, 8 ♀♀ on *Carex* sp., 4 ♀♀ on *S. phyllosifolia*. EIS 91: Aunhaugen nr Fannrem 19 Aug. 1979, 2 ♀♀ swept from herbage. Eidet nr Fannrem 15 July 1980, 1 ♀ swept from *Carex* on bog, 2 ♀♀ on *Hieracium* sp. EIS 92: Byneset 12 May 1978, 1 ♀ on *B. pubescens*, 7 ♀♀ on *S. aucuparia*: 18 July 1978, 185 ♀♀ on *Cirsium* sp., 6 ♀♀ on *Lotus corniculatus*, 30 ♀♀ on *Solidago virgaurea*, 159 ♀♀ 1 ♂ on *T. pratense*; 16 Aug. 1979, 2 ♀♀ on *T. pratense*. Börsa 8 July 1979, 7 ♀♀ on *T. pratense*. Börsa Hestvollvegen 14 Aug. 1979, 1 ♀ on *C. vulgaris*; 9 July 1980, 2 ♀♀ swept from herbage on meadow. Gautosen 12 July 1978, 5 ♀♀ on *Valeriana sambucifolia*: 20 Aug. 1979, 1 ♀ swept from herbage on beach meadow. Heimdal 15 May 1978, 2 ♀♀ in male *Salix* catkins; 3 July 1978, 45 ♀♀ on *Anthriscus sylvestris*, 4 ♀♀ on *Ranunculus acris*, 2 ♀♀ on *Taraxacum* sp., 5 ♀♀ on *T. pratense*; 30 July 1978, 2 ♀♀ on *C. vulgaris*; 31 July 1978, 2 ♀♀ in wt in garden. Målsjøen 2 July 1978, 1 ♀ on *A. millefolium*, 1 ♀ on *Geranium silvaticum*, 1 ♀ on *T. pratense*. Ringvålvegen 11 May 1978, 2 ♀♀ on *Anemone nemorosa*; 18 July 1978, 51 ♀♀ on *Campanula latifolia*, 28 ♀♀ on *Cirsium* sp., 27 ♀♀ on *Comarum palustre*, 9 ♀♀ on *Plantago major*, 44 ♀♀ on *Rosa* sp., 159 ♀♀ on *T. pratense*, 8 ♀♀ on *Ulmus* sp., 412 ♀♀ on *V. sambucifolia*, 9 ♀♀ on grass. Trondheim 26 Aug. 1978, 12 ♀♀ on *Jasmine*, PS leg. Trondheim Lade 2 May 1978, 12 ♀♀ on *Salix* catkins; 2 July 1978, 19 ♀♀ on *A. sylvestris*, 30 ♀♀ on *Rosa* sp., 4 ♀♀ on *T. pratense*; 3 July 1978, 4 ♀♀ on *T. pratense*; 14 Sep. 1978, 5 ♀♀ on *C. rotundifolia*, 2 ♀♀ on *M. inodora*. Trondheim Voll June/July 1978, 12 ♀♀ in wt. EIS 92: Paradisbukta nr Langstein 7 May 1978, 3 ♀♀ on *Salix* catkins.

EIS 98: Röra 1 June 1979, 2 ♀ ♀ on *Prunus padus*. Stiklestad 29 July 1978, 1 ♀ on *A. millefolium*, 6 ♀ ♀ on *Chrysanthemum leucanthemum*, 30 ♀ ♀ on *Filipendula ulmaria*, 1 ♀ on *T. pratense*. EIS 101: Snåsa 5 Sep. 1977, 2 ♀ ♀ on *Angelica archangelica*. EIS 118: Bjerka 26 Aug. 1978, 1 ♀ on *Salix* leaves. EIS 123: Mo i Rana Ø. Gruben 23 July 1979, 14 ♀ ♀ on *Ribes rubrum*. EIS 131: Fauske 30 June 1980, 3 ♀ ♀ on *L. corniculatus* on beach meadow. EIS 140: Rombakken 30 June 1980, 5 ♀ ♀ 7 ♂ ♂ on *Potentilla anserina*. EIS 146: Lavangen Kjeiprød 17 Sep. 1978, 70 ♀ ♀ 22 ♂ ♂ on *A. millefolium*; 29 June 1980, 25 ♀ ♀ 1 ♂ on *Carum carvi*, 1 ♀ on *Taraxacum* sp. Lavangen Reite 18 Aug. 1977, 7 ♀ ♀ 25 ♂ ♂ on *C. rotundifolia*, NO leg., 7 ♀ ♀ 1 ♂ on *Chrysanthemum vulgare*, NO leg., 77 ♀ ♀ 8 ♂ ♂ on *Circium*, NO leg., 24 ♀ ♀ 7 ♂ ♂ on *F. ulmaria*, NO leg., 5 ♀ ♀ on *Rosa* sp., NO leg., 4 ♀ ♀ on *Urtica dioica*, NO leg.; 28 June 1980, 9 ♀ ♀ on *Astragalus alpinus*, 1 ♀ on *G. boreale*, 1 ♀ on *Stellaria nemorum*, 23 ♀ ♀ swept from a variety of herbaceous plants on meadow.

TUBULIFERA

Phlaeothripidae

**Bolothrips dentipes* (Reuter, 1880).

EIS 28: Oslo Dælivatn 20 Aug. 1978, 3 ♀ ♀ 5 ♂ ♂ on *Agrostis* sp., 1 ♂ swept from grass etc. on meadow, PS leg. All the specimens in the DKNVSM's collections are micropterous.

Chrysothrips nigripes Reuter, 1880.

Chrysothrips major Bagnall (= *C. nigripes* Reuter sensu Schliephake 1979) was originally described from specimens collected from a lime tree in Oslo Bygdøy (EIS 28) (Bagnall 1911, Williams 1913). Female holotype in coll. BM.

**Megathrips lativentris* (Heeger, 1852).

The specimens in the DKNVSM's collections are all micropterous. EIS 31: Kvinnherad Jemtelandsvann 14 May 1970, 1 tube, EK leg. det., in coll. ZMB. Kvinnherad Rosendal 26 Aug. 1968, 1 tube, EK leg. det., in coll. ZMB. EIS 51: Aurland Vassbygdvann 8 May 1969, specimens, TS leg., LG det., in coll. ZMB. EIS 79 Kongsvoll June 1977, 1 ♀; June 1978, 1 ♀; 12 June 1978, 1 ♀. The specimens from Kongsvoll were found in leaf litter in the subalpine birch belt abt. 1000 m a.s.l. EIS 92: Börsa Hestvollvegen 9 July 1980, 1 ♀ swept from meadow herbage.

Cephalothrips monilicornis (Reuter, 1880).

Reported by Bagnall (1911) from a lime tree in Oslo Bygdøy (EIS 28). A single female in coll. BM. New records: EIS 28: Oslo Dælivatn 20 Aug. 1978, 1 ♀ f. microptera swept from grass etc. on meadow. EIS 92: Byneset 8 April 1979, 51 ♀ ♀ f. microptera, 3 ♀ ♀ f. macroptera on dry grass.

Xylaplothrips fuliginosus (Schille, 1910).

zur Strassen (1980) reported a single female specimen from a dry birch branch in Kvinesdal (EIS

4). New records: EIS 28: Sem Plum 20 May 1974, 1 ♀, GT leg., in coll. BM. EIS 92: Börsa 7 Sep. 1979, 1 ♀, on a tree-stump in deciduous forest.

**Haplothrips alpester* Priesner, 1914.

EIS 28: Oslo Bogstad 18 Aug. 1979, 1 ♀ on *Taraxacum* sp., PS leg. EIS 91: Eidet nr. Fannrem 15 July 1980, 1 ♂ on *Hieracium* sp. EIS 92: Heimdal 3 July 1978, 1 ♀ 1 ♂ on *Taraxacum* sp.; 18 July 1978, 1 ♀ 1 ♂ on *Taraxacum* sp.

Haplothrips leucanthemi (Schrank, 1781).

Previously swept from meadow in Oslo Holmenkollen (EIS 28) (zur Strassen 1978). New records: EIS 7: Sandnes Lura 18 Aug. 1979, 2 ♀ ♀ on *Matricaria inodora*. EIS 92: Börsa Hestvollvegen 20 July 1980, 8 ♀ ♀ 7 ♂ ♂ on *Chrysanthemum leucanthemum*. EIS 98: Stiklestad 29 July 1978, 1 ♀ 2 ♂ ♂ on *C. leucanthemum*.

**Haplothrips minutus* (Uzel, 1895).

EIS 92: Målsjøen 31 July 1978, 1 ♀ f. macroptera in wt in mixed forest.

Haplothrips niger (Osborn, 1883).

Previously recorded from Fyresdal (EIS 16) and Hvalstad (EIS 28) on *Trifolium pratense*: Oslo Maridalen (EIS 28) on *Taraxacum* sp.; and Rollag (EIS 35) on *T. pratense* (Herstád 1960, Fjeldalden 1963). New records: The specimens were collected from *T. pratense* when not otherwise stated: EIS 28: Ås NLH 18 Aug. 1978, 1 ♀. EIS 79: Kongsvoll abt. 900 m a.s.l. 29 July 1979, 2 ♀ ♀. EIS 92: Byneset 18 July 1978, 36 ♀ ♀; 16 Aug. 11 ♀ ♀. Börsa 8 July 1979, 10 ♀ ♀; 1 June 1980, 2 ♀ ♀ (flying specimens). Heimdal 3 July 1978, 143 ♀ ♀. Målsjøen 2 July 1978, 1 ♀. Ringvål 18 July 1978, 20 ♀ ♀. Trondheim Lade 2 July 1978, 5 ♀ ♀; 3 July 1978, 50 ♀ ♀. EIS 98: Stiklestad 29 July 1978, 15 ♀ ♀. EIS 115: Ravasseng nr. Målsjøen 19 June 1978, 1 ♀ on *Taraxacum* sp. EIS 131: Fauske 30 June 1980, 1 ♀ on *Lotus corniculatus* on beach meadow.

Haplothrips propinquus Bagnall, 1933.

Bagnall (1933) reported *Haplothrips angusticornis* Priesner from the Oslo area (EIS 28), where he found the species common in *Achillea*. However, according to zur Strassen (pers. comm.), this record most likely refer to *H. propinquus*. Also Mound et al. (1976) stated *H. propinquus* found in Norway, but no collection data were given. New records: EIS 28: Oslo Bogstad 18 Aug. 1979, 4 ♀ ♀ 1 ♂ swept from herbaceous plants. Oslo Maridalen 17 Aug. 1978, 2 ♀ ♀ swept from *Achillea millefolium* etc. EIS 79: Kongsvoll July 1978, 9 ♀ ♀ on *A. millefolium* abt. 900 m a.s.l.; 8 Aug. 1978, 1 ♀ on *Calluna vulgaris* abt. 1000 m a.s.l. EIS 92: Börsa 9 July 1980, 2 ♀ ♀ 2 ♂ ♂ swept from meadow herbage. Målsjøen 2 July 1978, 6 ♀ ♀ on *A. millefolium*. Ringvålveien 18 July 1978, 1 ♂ on *Campanula latifolia*. Trondheim Lade 2 July 1978, 82 ♀ ♀ 21 ♂ ♂ on *A. millefolium*; 3 July 1978, 83 ♀ ♀ 32 ♂ ♂ on *Matricaria inodora*. EIS 98: Stiklestad 29 July 1978, 42 ♀ ♀ 5 ♂ ♂ on *A. millefolium*.

**Haplothrips setiger* Priesner, 1921.

EIS 19: Tjome Mostranda 19 Aug. 1978, 1 ♀ from herbaceous plants in a boggy area near sea.

**Haplothrips setigeriformis* Fabian, 1938.

EIS 92: Börsa Hestvollvegen, June 1980, 2 ♀ ♀ on *Antennaria dioica*; 16 June 1980, 14 ♀ ♀ 9 ♂ ♂ on *A. dioica*, RS det.

Haplothrips staites (Haliday, 1836).

Herstad (1960) reported this species from *Trifolium pratense* in Asker (EIS 28), but the identification is stated to be doubtful.

Haplothrips subtilissimus (Haliday, 1852).

Bagnall (1924) reported *Haplothrips kurdjumovi* Karny from Norway, but no collection data were given. According to zur Strassen (pers. comm.) Bagnall's record refer to *Haplothrips subtilissimus*. New records: EIS 19: Tjome Mostranda 19 Aug. 1978, 2 ♀ ♀ on *Quercus* leaves.

**Hoplothrips corticis* (de Geer, 1773).

EIS 6: Fevig nr Arendal 1909, 1 ♀ on *Fraxinus*, RB leg., in coll. BM.

**Hoplothrips longisetis* (Bagnall, 1910).

EIS 92: Gaulosen 16 Aug. 1979, 1 ♂ on dead *Hippophäe rhamnoides*.

**Hoplothrips pedicularis* (Haliday, 1836).

EIS 91: Almlia nr Orkanger 13 Aug. 1979, 20 ♀ ♀ 6 ♂ ♂ f. microptera, 2 ♀ ♀ f. macroptera. EIS 92: Börsa 18 Sep. 1979, 5 ♀ ♀ 1 ♂ f. microptera. In both localities the specimens were found under bark of dead *Alnus* in deciduous forest.

**Hoplothrips semicuesus* (Uzel, 1895).

EIS 92: Gaulosen 16 Aug. 1979, 1 ♀ 3 ♂ ♂ f. microptera under bark of dead *Hippophäe rhamnoides*.

**Hoplothrips ulmi* (Fabricius, 1781).

EIS 92: Börsa 18 Sep. 1979, 1 ♀ f. macroptera, 1 ♀ f. hemimacroptera, 3 ♂ ♂ f. microptera under bark of dead *Sorbus aucuparia* in deciduous wood. Heimdal 31 July 1978, 1 ♀ f. macroptera in wt in garden.

**Liothrips setinodis* (Reuter, 1880).

EIS 28: Oslo Kolsås 19 Aug. 1979, 1 ♀ f. macroptera, PS leg.

Liothrips vaneeckei Priesner, 1920.

Herstad (1960) reported this species from *Lilium martagon* on Ås NLH (EIS 28).

Plaeothrips annulipes Reuter, 1880.

Plaeothrips brevicollis Bagnall (= *P. annulipes* Reuter sensu Schliephake 1979) was originally described from a female specimen collected from a lime tree in Oslo Bygdøy (EIS 28) (Bagnall 1911). Holotype in coll. BM. New records: EIS 92: Börsa 7 Sep. 1979, 1 ♂ on dead branches of *Alnus* in deciduous wood.

Plaeothrips bispinosus Priesner, 1919.

zur Strassen (1980) reported males and females of this species from dry *Betula* branches in Kvinesdal (EIS 4).

ACKNOWLEDGEMENTS

We are greatly indebted to Dr. L.A. Mound, Great Britain, who checked the majority of our determinations and corrected some of them. We also wish to thank Dr. Palmer, Great Britain, and Dr. Mound most sincerely for informations about Norwegian thrips material in the BM's collections, and their permission to use this information for publication.

Dr. U. Quick, Sweden, and Dr. R. zur Strassen, Germany, have contributed informations about published thrips records from Norway, and Dr. R. zur Strassen has most kindly checked and corrected some of our determinations and also identified a species. This is highly appreciated. We are also indebted to Dr. L. Greve, Bergen, who put material in the ZMB's collections to our disposal, and to Dr. C. Stenseth and Dr. J. Fjeldalen, Ås, for permission to publish some of their material.

P. Sveum and E. Ofstad, Trondheim, and N. Olsen, Mo i Rana, have contributed thrips material, and to them all we wish to express our gratitude.

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Received 20 Feb. 1981.

Some Trichoptera, Coleoptera and Hymenoptera from Iceland and Greenland¹⁾

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Messersmith, D.H. 1982. Some Trichoptera, Coleoptera and Hymenoptera from Iceland and Greenland. *Fauna norv. Ser. B* 29, 17–18.

Presented are collection records of one family with two species from Iceland and one species from Greenland from the Trichoptera. One species of Hymenoptera was collected in Iceland and two species in Greenland. From Coleoptera six families with a total of 14 species were collected in Iceland and five species from three families were collected in Greenland. One, *Atractodes ambiguus* (Hymenoptera: Ichneumonidae), is apparently new for Greenland.

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During June and July, 1967, I collected insects while on a general tour of Iceland and a four-day excursion to Greenland. It was not possible to collect thoroughly nor systematically, but some apparently new locality records were obtained. A report on the Diptera collected is being published separately.

The records for collections of Trichoptera have been summarized by Frstrup (1942); for Coleoptera by Larsson and Gigja (1959); and for Hymenoptera by Petersen (1956). Lindroth *et al.* (1973) brings all records up to date. It is upon the basis of these works that I have determined some new locality records from my collections.

I am very grateful to the specialists of the U.S. Department of Agriculture and the U.S. National Museum for identifying these specimens. They are Oliver S. Flint (Trichoptera), Robert W. Carlson (Hymenoptera), and Donald M. Anderson, Robert D. Gordon, John M. Kindsolver, Theodore J. Spilman, Donald R. Whitehead, and Richard E. White (Coleoptera). All specimens have been deposited in the collections of the Department of Entomology, U.S. National Museum, Washington, D. C.

Following is a list of specimens collected. The numbers in parentheses refer to the number of specimens collected. The sequence followed is that found in *The Zoology of Iceland*.

ICELAND

TRICHOPTERA:

Limnephilidae:

Limnephilus affinis Rejkjavik.

June (1 ♂); Vik — July (1 ♀). *Apatania* = *Apatelia zonella* Zetterstedt Rejkjavik — 30 June (1 ♀); Hornikvammur — 7 July (1 ♀).

HYMENOPTERA:

Ichneumonidae:

Atractodes ambiguus Ruthe.

Stokkseyri — 3 July (1).

COLEOPTERA:

Carabidae:

Nebria gyllenhali munsteri Larsson and Gigja.

Gullfoss — 2 July (1); Vik — 3 July (2); Olafsvik — 6 July (1); Heimaey — 13 July (1) *Notiophilus biguttatus* Fabricius. Heimaey — 13 July (1).

Bembidion bipunctatum L. Thingvellir — 1 July (1); Alfsey — 12 July (1).

Calathus melanocephalus L. Laugarvatn — 1 July (1); Lake Myvatn — 9 July (1), 10 July (1); Heimaey — 13 July (1).

Pterostichus adstrictus Eschscholtz. Vik — 3 July (1). *Amara quenseli* Schönherr. Vik — 3 July (1); Alfsey — 12 July (6).

Trichosellus cognatus Gyllenhal. Olafsvik — 6 July (1).

Dytiscidae:

Hydroporus nigrata Fabricius. Budir — 6 July (1).

1) Scientific Article No. A2585, Contribution No. 5624 of the Maryland Agricultural Station, Department of Entomology, University of Maryland.

Staphylinidae:

Philonthus cephalotes Gravenhorst. Gullfoss — 2 July (3).

Atheta sp. = 1. Laugarvatn — 1 July (5).

Atheta sp. = 2. Reykjavik — 30 June (1).

Scarabaeidae:

Aphodius lapponum Gyllenhal. Laugarvatn (Kalfstindar) — 1 July (2); Gullfoss — 2 July (2); Stokkseyri — 4 July (3); Akureyri — 8 July (1).

Elateridae:

Cryptohypnus riparius Fabricius. Heimaey — 13 July (1).

Curculionidae:

Brachyrhinus = *Otiorrhynchus arcticus* (Fabricius). Vik — 3 July (1); Heimaey — 13 July (1).

GREENLAND**TRICHOPTERA:****Limnephilidae:**

Limnephilus griseus L. Narssarsuaq — 17 July (1).

HYMENOPTERA:**Ichneumonidae:**

Atractodes ambiguus Ruthe. Kagssiarssuk — 14 July (1); Narssarsuaq — 14 July (1). This is apparently a new record for Greenland.

Barycnemis claviventris (Gravenhorst). Kagssiarssuk — 14 July (1).

COLEOPTERA:**Carabidae:**

Nebria gyllenhalii munsteri Larsson and Gigja. Narssarsuaq — 14 July (3).

Trichocellus cognatus Gyllenhal. Kagssiarssuk — 14 July (4).

Coccinellidae:

Coccinella transversoguttata ephippiata Zetterstedt. Kagssiarssuk — 14 July (1).

Curculionidae:

Brachyrhinus = *Otiorrhynchus arcticus* (Fabricius). Kagssiarssuk — 14 July (9); Igaliko — 16 July (1).

Brachyrhinus = *Otiorrhynchus dubius* (Ström). Kagssiarssuk — 14 July (5); Narssarsuaq — 15 July (4); Igaliko — 16 July (1).

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Received 22 May 1981.

Mallophaga from Svalbard

REIDAR MEHL, CHRISTOFER BANG, BJØRN KJOS-HANSEN AND HALLDIS LIE

Mehl, R., Bang, C., Kjos-Hanssen, B. & Lie, H. 1982. Mallophaga from Svalbard. *Fauna norv. Ser. B* 29, 19–23.

Previously unpublished material from six collections of Mallophaga from Svalbard is presented. 35 species of Mallophaga were recorded from 21 species of birds.

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INTRODUCTION

The first records of Mallophaga from Svalbard were published by Giebel (1874), Mjoeberg (1910) and Waterston (1922). Zunker (1932) reviewed these collections without providing any new information. Thor (1930) made references only to Waterston (1922). A new species for the islands were published by Timmermann (1957). A relative comprehensive material of Mallophaga were collected by Finnish expeditions in 1964, 1965 and 1968, and published by Hackman & Nyholm (1968).

In this paper an unpublished material from six Norwegian collections and a revised list of the Mallophaga recorded from Svalbard are presented.

MATERIAL

The total material of Mallophaga contains 458 specimens (21 species) from 52 birds (18 species). Ectoparasites from live birds were collected by Bang in 1962 and from shot birds by Kjos-Hanssen and Lie in 1980. Three collections are from the Zoological Museum in Oslo (ZMO) and were made in 1923, 1925 and 1926. One collection made in 1954 is from the Zoological Museum in Bergen (ZMB). The collecting data are as follows:

1. 162 Mallophaga from 9 birds, Kap Bruun, Nord-austlandet, July 1923, (leg. E. Hanssen, ZMO).
2. 8 Mallophaga from 4 birds, Dunøyene near Hornsund, Spitsbergen, 12 July 1925, (leg. M/K «Tovik», ZMO., probably also leg. E. Hanssen).
3. 2 Mallophaga from 1 bird, Tempelfjellet, Spitsbergen, 20 May 1926. (ZMO).
4. 1 Mallophaga from 1 bird, Widjefjorden, August 1954, (leg. T. Serck-Hansen, ZMB).

5. 215 Mallophaga from 18 birds, several localities around Hornsund, Spitsbergen, July and August 1962, (leg. Chr. Bang).
6. 70 Mallophaga from 19 birds, Sassen, van Mijenfjorden and Isfjorden, Spitsbergen, May 1980, (leg. Kjos-Hanssen & Lie).

RESULTS AND DISCUSSION

In the study by Hackman & Nyholm (1968) 44 species of Mallophaga were reported. We have reduced this number to 22 species and one subspecies by omitting specimens identified to genus level only and species with an uncertain identity, for reasons given below. We identified 21 species of Mallophaga (from 18 species of birds) in our material. 13 species were new to the islands, which gives a total of 35 species and one subspecies of Mallophaga recorded from Svalbard.

Mallophaga of the following genera from the named birds were identified to the genus level by Hackman & Nyholm (1968):

Austromenopon from *Plautus alle*, *Menacanthus* from *Plectrophenax nivalis*, *Ricinus* from *Plectrophenax nivalis* and *Oenanthe oenanthe*, *Philoaterus* from *Oenanthe oenanthe*, *Emberiza schoeniclus* and *Eremophila alpestris*. *Perineus* from *Sterna paradisaea*, *Quadriceps* from *Calidris canutus*, *Saemundssonina* from *Fulmarus glacialis* and *Crocethia alba*.

The following species are omitted because important systematic revisions have resulted in their identifications being uncertain. (Clay 1962, Zlotorzycska 1967, 1970, Timmermann 1954, 1974, Martens 1974):

Actornithophilus bicolor (Piaget) from *Arenaria interpres*, *Actornithophilus umbrinus* (Burmeister) from *Calidris alpina*, *Menacanthus mu-*

Table 1. Mallophaga collected from birds on Spitsbergen in 1980.

Host species	No. of birds examined	No. of birds with lice	No. of lice
<i>Plautus alle</i>	10	8	24
<i>Uria lomvia</i>	6	5	28
<i>Fulmarus glacialis</i>	10	4	15
<i>Somateria mollissima</i>	9	2	3
<i>Larus hyperboreus</i>	3	0	0
Total	38	19	70

tabilis (Blagoveshtchensky) from *Sturnus vulgaris*, *Anatoecus brevimaclatus* (Giebel) from *Anser brachyrhynchus*, *Anatoecus mollissimae* Keller from *Somateria mollissima*, *Lunaceps actophilus* (Kellogg & Chapman) from *Charadrius hiaticula*, *Philopterus hamatus* Packard from *Plectrophenax nivalis*, *Quadriceps conformis* (Blagoveshtchensky) from *Tringa totanus*.

Five of these species were nymphs and one species was represented by a single female. Three species of *Saemundssonina* mentioned by Hackman & Nyholm (1968) from gulls, *Larus* spp., are regarded as one species. A note on *Lunaceps actophilus* is given under *Lunaceps neireis* in the list of species.

Hackman & Nyholm (1968) mentioned the locality of *Trinoton querquedulae* (L.) as probably Spitsbergen and referred to Zunker (1932) who in turn referred to Mjoeberg (1910) who did not give any locality for this species, but gave the names of the collectors. It is impossible from the work of Mjoeberg to trace the locality back to Spitsbergen from the names of the collectors. They have all been collectors of Mallophaga from many places in the Arctic. The species are therefore removed from the list.

The prevalence of Mallophaga on the birds examined in 1980 is shown in Table 1. This small material indicates high prevalence of Mallophaga on the auks *Plautus alle* and *Uria lomvia*, medium on the fulmar *Fulmarus glacialis*, and low prevalence on the eider *Somateria mollissima*. Featherlice were not recorded on the glaucous gull *Larus hyperboreus*. However, one specimen of the flea *Ceratophyllus vagabundus* (Boheman, 1866) was found on this gull.

Timmermann (1971) discussed the geographic distribution of the *Cummingsiella*-species living on gulls of the sub-family Larinae. He concluded that *C. punctatus* is parasitic on

Larus spp. having a tropical and sub-tropical distribution. *C. ornatus* living on *Larus* spp. and *Rissa* having an arctic distribution, and both species of Mallophaga live together on the same species of gulls in the intermediate zone. We recorded only *C. ornatus* on *Larus hyperboreus*, thus conforming to the pattern of Timmermann (1971).

LIST OF SPECIES

Amblycera

- Ancistrona vagelli* (J.C. Fabricius, 1787)
New records: 2 nymphs, Hornsund 22 August 1962 from *Fulmarus glacialis*.
- Austromenopon brevifimbriatum* (Piaget, 1880)
New records: 1 ♀, Hornsund 22 August 1962 from *Fulmarus glacialis*.
- Austromenopon corporosum* (Kellogg & Kuwana, 1901)
New records: 1 ♂ 1 nymph Dunøyene 13 July 1925 from *Phalaropus fulicarius*.
- Austromenopon fuscofasciatum* (Piaget, 1880)
Recorded from Spitsbergen from *Stercorarius parasiticus* by Mjoeberg (1910, as *Menopon*) and by Hackman & Nyholm (1968) from the same host and from *Stercorarius longicaudus*.
- Austromenopon lutescens* (Burmeister, 1838)
Recorded from Spitsbergen from *Calidris maritima* by Waterston (1922, as *Menopon*).
- Austromenopon merguli* Timmermann, 1954.
New records: 1 ♂, Van Mijenfjorden 8 May 1980 from *Plautus alle*. 1 ♀ of *Austromenopon nigropleurum*-group, Hornsund July 1962 from *Plautus alle* probably belongs to the same species.
- Austromenopon uriae* Timmermann, 1954.
New records: 1 ♂ 1 ♀, Van Mijenfjorden 8 May 1980 from *Uria lomvia*.
- Trinoton anserinum* (Fabricius, 1805)
Recorded from Spitsbergen from *Anser brachyrhynchus*, *Branta leucopsis* and *Phalaropus fulicaria* by Waterston (1922) and from Bjørnøya from *Anser brachyrhynchus* by Hackman & Nyholm (1968).

Ischnocera

- Anaticola anseris* (L., 1758).
Recorded from Spitsbergen from *Branta leucopsis* and from Bjørnøya from *Anser brachyrhynchus* by Hackman & Nyholm (1968).
- Anaticola rubromaculatus* (Rudow, 1869).
New records: 29 ♂ 20 ♀ 19 nymphs, Kap Bruun 21 July 1923, 3 ♀, Dunøyene 13 July 1925 and 3 nymphs of *Anaticola* sp., Isfjorden May 1980, all from *Somateria mollissima*.
- Carduceps meiertzhageni* Timmermann, 1954.
Waterston (1922) recorded *Degeertella zonaria* (Nitzsch/Giebel, 1866) from *Calidris maritima* from Bjørnøya and Spitsbergen. It was also recorded as *Carduceps zonarius* (Nitzsch) from the

- same host and the same islands by Hackman & Nyholm (1968). These specimens almost certainly belong to the species *Carduiceps meinertzhageni* which is the only *Carduiceps* regularly found on *Calidris maritima*. It also parasitises *Calidris alpinum* and *Calidris pitlocnemis* (Timmermann 1954, 1957).
12. *Carduiceps zonarius* (Nitzsch, 1866).
Carduiceps complexivus (Kellog & Chapman) was recorded from *Crocethia alba* from Bjørnøya by Hackman & Nyholm (1968). Timmermann (1954, 1957) regarded the *Carduiceps* population on *Crocethia alba* a part of the species *Carduiceps zonarius*. It is marked out by very small differences which would perhaps permit one to regard it a subspecies of *Carduiceps zonarius*.
13. *Cummingsiella aetherea klatti* (Timmermann, 1954).
Recorded from Spitsbergen from *Plautus alle* by Hackman & Nyholm (1968).
New records: 8 ♂♂ 5 ♀♀ 4 nymphs, Hornsund July—August 1962, and 11 ♂♂ 4 ♀♀, van Mijensfjorden 8 May 1980, all from *Plautus alle*.
14. *Cummingsiella hiaticulae* (Fabricius, 1780).
Recorded from Spitsbergen and Bjørnøya from *Charadrius hiaticula* by Hackman & Nyholm (1968).
15. *Cummingsiella normifer* (Grube, 1851).
Recorded from Spitsbergen from *Stercorarius parasiticus* and *Stercorarius longicaudus* by Hackman & Nyholm (1968).
16. *Cummingsiella obliqua aquilonis* Timmermann, 1974.
New records: 4 ♂♂ 5 ♀♀. Van Mijensfjorden 8 May 1980 from *Uria lomvia*.
17. *Cummingsiella ornatus* (Grube, 1851).
New records: 1 ♀, Hornsund 2 August 1962 from *Larus hyperboreus*.
18. *Cummingsiella phalaropi* (Denny, 1842).
Recorded from Spitsbergen from *Phalaropus fulicarius* by Hackman & Nyholm (1968).
New records: 1 ♀, Dunøyene 13 July 1925 from *Phalaropus fulicarius*.
19. *Cummingsiella strepsilaris* (Denny, 1842).
Recorded from Bjørnøya from *Arenaria interpres* by Hackman & Nyholm (1968).
20. *Goniodes lagopi* (L., 1758).
New records: 1 ♂, Tempelfjellet, Spitsbergen 20 May 1926 from *Lagopus mutus*.
21. *Lagopoecus affinis* (Children, 1836).
Recorded from Spitsbergen from *Lagopus mutus* by Mjøberg (1910) under the name *Nirmus quadrulatus* N. This record were cited by Zunker (1932) under the name *Lagopoecus cameratus* (Nitzsch/Lyonet, 1829) and mentioned by Hackman & Nyholm (1968) as probably *Lagopoecus affinis*.
22. *Lunaceps nereis* Timmermann, 1954.
Deegeriella actophilus (Kellogg & Chapman, 1899) were recorded from Spitsbergen and Bjørnøya by Waterston (1922). Most probably, his specimens belong to *Lunaceps nereis* that regularly parasitises *Calidris maritima*: This record were not reported from *Charadrius hiaticula* by Zunker (1932) as stated in Hackman & Nyholm (1968), but from *Calidris maritima*.
- Hackman & Nyholm (1968) recorded «*Lunaceps actophilus*» from Spitsbergen from *Charadrius hiaticula*. This bird does not have its own population of *Lunaceps* according to Timmermann (1957), but species belonging to other hosts have been found and are regarded as stragglers.
New records: 15 ♂♂ 17 ♀♀ 8 nymphs, Kap Bruun 1923 and 3 ♀, Hornsund 22 August 1962 all from *Calidris maritima*.
23. *Lunaceps phaeopi* (Denny, 1842).
Recorded from Spitsbergen from *Numenius phaeopus* by Hackman & Nyholm (1968).
24. *Ornithobius hexophthalmus* (Nitzsch, 1871).
Recorded from Spitsbergen from *Branta leucopsis* by Hackman & Nyholm (1968).
25. *Perineus nigrolimbatus* (Giebel, 1874).
Recorded from Bjørnøya (Waterston 1922) and Spitsbergen (Hackman & Nyholm 1968) from *Fulmarus glacialis*.
New records: 2 ♀♀ 9 nymphs, Kap Bruun 21 July 1923. 35 ♂♂ 24 ♀♀ 60 nymphs, Hornsund August 1962, from five fulmars. 2 ♂♂ 4 ♀♀ 9 nymphs from Sassen May 1980. All records are from *Fulmarus glacialis*.
26. *Saemundssonina calva* (Kellogg, 1896).
New records: 6 ♂♂ 8 ♀♀ 3 nymphs, Van Mijensfjorden 8 May 1980 from *Uria lomvia*.
27. *Saemundssonina cephalus* (Denny, 1842).
Recorded from Spitsbergen from *Stercorarius parasiticus* by Hackman & Nyholm (1968).
New records: 2 ♂♂ 3 ♀♀, Kap Bruun 22 July 1923 from *Stercorarius parasiticus*.
28. *Saemundssonina grylle* Fabricius, 1780).
Recorded from Spitsbergen from *Cepphus grylle mandtii* by Hackman & Nyholm (1968).
New records: 1 ♂, Dunøyene 12 July 1925 and 1 ♂, Widjefjorden August 1954, both from *Cepphus grylle*.
29. *Saemundssonina inexpectata* Timmermann, 1951.
Recorded from Spitsbergen from *Stercorarius longicauda* by Timmermann (1957 p. 44).
30. *Saemundssonina lari* (O. Fabricius, 1780).
Giebel (1874) recorded this species under the name *Docophorus gonothorax* (Giebel, 1871) from North Spitsbergen collected by von Heuglin from *Rissa tridactyla* and «*Larus mandtii*» (= ? *Cepphus grylle mandtii*). Zunker (1932) mentioned this record under the genus *Philopterus*. Hackman & Nyholm (1968) mentioned three other species of *Saemundssonina* from gulls in their material. The specimens were collected from *Larus fuscus* and *Larus hyperboreus* on Spitsbergen and from *Rissa tridactyla* on Edgeøya. Timmermann (1951, 1957) regarded the populations of *Saemundssonina* from all gulls to belong to a single species.
New records: 1 ♂, Kap Bruun 1923 from

- Larus* sp. 8♂♂ 6♀♀ 1 nymph, Hornsund August 1962 from five *Larus hyperboreus*.
31. *Saemundssonina lockleyi* Clay, 1949.
Saemundssonina sterna (L.) recorded from Spitsbergen from *Sterna paradisae* by Hackman & Nyholm (1968) is most likely *Saemundssonina lockleyi* collected from its typehost.
 New records: 7♂♂ 9♀♀, Kap Bruun 22 July 1923 from *Sterna* sp. 1♂, Dunøyene 12 July 1925 from *Sterna* sp.
32. *Saemundssonina merguli* (Denny, 1842).
 Recorded from Spitsbergen and Bjørnøya from *Plautus alle* by Hackman & Nyholm (1968).
 New records: 4♂♂ 1♀ 2 nymphs, Kap Bruun 1923 (sample no. 29). 6♂♂ 6♀♀ 1 nymph, Hornsund July–August 1962 from five *Plautus alle*. 4♂♂ 5♀♀, Van Mijenfjorden 8 May 1980 from *Plautus alle*.
33. *Saemundssonina occidentalis* (Kellogg, 1896).
 New records: 18♂♂ 3♀♀ 5 nymphs, Hornsund August 1962 from five *Fulmarus glacialis*.
34. *Saemundssonina scolopacisphaeopodis* (Schrank, 1803).
 Recorded from Spitsbergen from *Numenius phaeopus* by Hackman & Nyholm (1968).
- 35a. *Saemundssonina tringae tringae* (Fabricius, 1780).
 Recorded from Bjørnøya and Spitsbergen from *Calidris maritima* by Waterston (1922) under the name *Philopierus fusiformis* (Denny, 1842), and by Hackman & Nyholm (1968) from the same host and the same islands.
 New records: 1♂ 1♀ 1 nymph, Hornsund 22 August 1962 from *Calidris maritima*.
- 35 b. *Saemundssonina tringae variabilis* (Denny, 1842).
 Recorded from Spitsbergen from *Calidris alpina* and *Phalaropus lobatus* by Hackman & Nyholm (1968). The specimens from *Phalaropus lobatus* probably belong to the subspecies *Saemundssonina tringae lobata* Martens, 1974.

HOST LIST OF THE MALLOPHAGA RECORDED FROM SVALBARD

Loevenskiold (1964) listed 81 species of birds from Svalbard. He classified them into three main groups: 21 common breeders, 9 more or less regular breeders in small numbers, and 51 more or less regular visitors. The species of Mallophaga classified in the present study were from 18 species of breeding birds and 3 species of visitors. The visitors are marked with (v) on the host list.

Procellariiformes

- Fulmarus glacialis* (L., 1761)
Ancistrona vagelli, *Austromenopon brevifimbriatum*, *Perineus nigrolimbatus*, *Saemundssonina occidentalis*.

Anseriformes

- Branta leucopsis* (Bechstein, 1803)
Trinoton anserinum, *Anaticola anseris*, *Ornithobius hexophthalmus*.
Anser brachyrhynchus (Baillon, 1833)
Trinoton anserinum, *Anaticola anseris*.
Somateria mollissima (L., 1758)
Anaticola rubromaculatus.

Galliformes

- Lagopus mutus* (Montin, 1776)
Goniodes lagopi, *Lagopoeus affinis*.

Charadriiformes

- Charadrius hiaticula* (L., 1758)
Cummingsiella hiaticulae.
Arenaria interpres (L., 1758)
Cummingsiella strepsilaris.
Calidris maritima (Brünnich, 1764)
Austromenopon lutescens, *Carduiceps meinertzhageni*, *Lunaceps nereis*, *Saemundssonina t. tringae*.
Calidris alpina (L., 1758) (v)
Saemundssonina tringae variabilis.
Crocethia alba (Pallas, 1764)
Carduiceps zonarius.
Numenius phaeopus (L., 1758) (v)
Lunaceps phaeopi, *Saemundssonina scolopacisphaeopodis*.
Phalaropus fulicarius (L., 1758)
Austromenopon corporosum, *Cummingsiella phalaropi*.
Stercorarius parasiticus (L., 1758)
Austromenopon fuscofasciatum, *Cummingsiella normifer*, *Saemundssonina cephalus*.
Stercorarius longicaudus (Vieillot, 1819)
Austromenopon fuscofasciatum, *Cummingsiella normifer*, *Saemundssonina inexpectata*.
Larus hyperboreus (Gunnerus, 1767)
Cummingsiella ornatus, *Saemundssonina lari*.
Larus fuscus (L., 1758) (v)
Saemundssonina lari.
Rissa tridactyla (L., 1758)
Saemundssonina lari.
Sterna paradisaea (Pontoppidan, 1763)
Saemundssonina lockleyi.
Plautus alle (L., 1758)
Austromenopon merguli, *Cummingsiella aetherea klatti*, *Saemundssonina merguli*.
Uria lomvia (L., 1758)
Austromenopon uriae, *Cummingsiella obliqua aquilonis*, *Saemundssonina calva*.
Cephus grylle (L., 1758)
Saemundssonina grylle.

ACKNOWLEDGMENT

We want to express our gratitude to the Zoological Museum in Oslo and the Museum of Zoo-

logy in Bergen for the loan of material. The field work on Svalbard was financed by grants from Norsk Polarinstitut.

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Received 9 June, 1981.

Cluster analysis of dung inhabiting beetle communities from different altitudes in Jostedal, South-West Norway¹⁾

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Key, R.S. Cluster analysis of dung inhabiting beetle communities from different altitudes in Jostedal, South-West Norway. *Fauna norv. Ser. B* 29, 24–33.

Whole communities of adult dung beetles were sampled from sheep, cow and horse dung from a range of altitudes in Jostedal, Norway. Cluster analysis of the results showed a series of overlapping species groupings with only a few species relatively more important at higher altitudes, in particular, *Aphodius lapponum* Gyllenhal. Species diversity and overall abundance was found to be greatest between 180 and 730 m and this is probably related to the temperature and moistness of the dung and the vegetation available to the herbivores. It was found that species previously described as shade loving were more important in exposed conditions at higher altitudes than those previously known to prefer exposed conditions.

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INTRODUCTION

The theme of our expedition was ecological effects of altitude and I therefore decided to look at changes in composition of whole adult dung beetle communities with altitude. There have been few previous investigations into the distribution with altitude of coprophilous Coleoptera. Pearson & White (1965), studied *Aphodius lapponum* Gyllenhal in upland Britain but no worker appears to have investigated changes in the whole fauna. There have, however, been several studies on Scandinavian dung faunas. Duffield (1937), made a qualitative survey of dung communities in Norwegian Lapland and Mysterud (1974), and Mysterud & Wiger (1976), investigated the fauna of bear droppings at 620–660 m. altitude in South-Norway. Landin (1961), carried out autecological studies on members of the genus *Aphodius* in various parts of Sweden and Rainio (1966), Koskela (1972), Koskela & Hanski (1977), and Hanski & Koskela (1977), studied various aspects of the beetle communities inhabiting dung in lowland sites in Finland.

The aim of my study was to measure the relative abundance of each species within the adult dung beetle community at a series of altitudes. For the purposes of this study *community* will be defined as in Duffield (1937);

«the fauna of a collection of droppings of different ages in such proximity that any insect may pass readily from one to the other». The data can then be used to measure similarity between those communities and the results used to construct hierarchical dendrograms showing the relationship between the faunas. These can then be compared with previous studies on the ecological preferences of individual species and an attempt made to interpret the results in relation to environmental variables. This type of hierarchical classification was initially developed for vegetation analysis and has subsequently been used extensively only in marine benthic zoecology. Its use in insect community analysis, however, has been very limited. MacFadyen (1954), Morris (1969), and Hengeveld & Hogweg (1979), applied similar mathematical methods to the study of collembolan, heteropteran and carabid beetle communities respectively and Hanski & Koskela (1977), have used dendrograms to show the relationship between species guilds of dung-inhabiting beetles.

STUDY AREA

Jostedal (61°N, 7°E), (Fig. 1), the valley of the Jostedøla, runs 45 km. north from the Gaupnefjord arm of the Sognefjord. The natural vegetation consists of birch/alder woodland along the larger rivers, mature pine woodland on the

1) Contribution from the Hull University Ecological Expedition to Scandinavia, 1979.

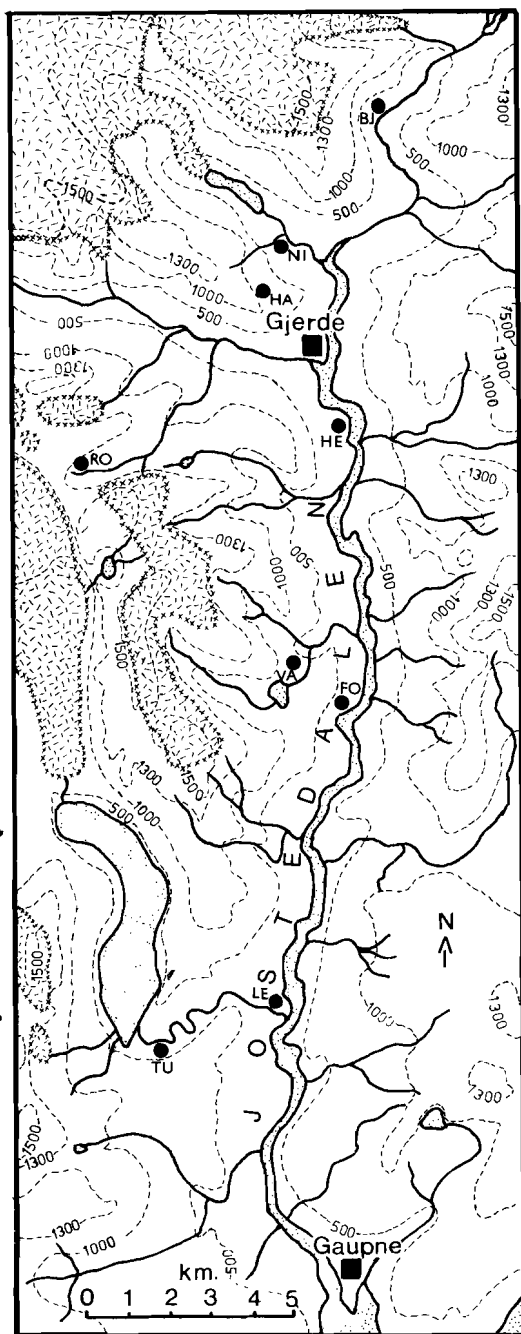


Fig. 1. Map of Jostedal showing sample sites (identified with initial letters). Glacier hatched, heights in metres.

lower slopes giving way to birch/sallow on the steeper slopes and on the moraines and to dwarf and creeping willows and heather at the highest altitudes. The snow line was at approximately 1300 m in July and the climate and drainage of the whole valley is dominated by the massive Jostedalsbreen glacier. The floor of the main and side valleys are used extensively for hay fodder and pasture for cattle, sheep and a few ponies and small high valleys as seter meadow during the summer months.

SAMPLE SITES

The main consideration was to obtain samples from the greatest possible altitude range and sites were located between 55 and 1200 m above sea level. No herbivores were found above 1200 m. Sites are described in Table 1 and the location of those sites shown in Fig. 1. All of the sites were situated in valley bottoms and therefore to some extent sheltered from extremes of wind, but all samples were taken from open areas, not sheltered by trees or bushes. Landin (1961), Rainio (1966), Koskela (1972), and Koskela & Hanski (1977), all record distinct differences between the faunas of droppings in shaded and exposed conditions and it was thought that this would complicate the relationship with altitude. Only the non-shaded dung fauna was therefore sampled at each site.

SAMPLING

Samples were collected using a stainless steel spatula and transferred to labelled polythene bags which were then treble wrapped in polythene for safe transport in a rucksack! Soil from up to a depth of 10–15 cm. beneath the dropping was included to collect dung burying species, and the tunnels of *Geotrupes*, where present, were followed downward, sometimes to a depth of 30 cm, to collect the adults. Active beetles on the surface of the dung were netted and tubed individually before the sample was taken.

It has been shown by Rainio (1966), and Koskela (1972), that dung-beetles exhibit a distinct phenological succession within one dropping with the proportion of carnivores increasing with age to utilize the increasing biomass of coprophagous insect larvae. Droppings have been shown to contain the highest numbers and diversity of beetles 2–6 days after deposition. It was therefore necessary to sample dung with a range of ages at each site. Samples of dung from

*all grid refs. are taken from the 1:50 000
 Norges Geografiske Opmåling Topografisk Karten.
 **not sampled.

Table 1. Description of Sampling Sites

Altitude	Name	Grid Ref.*	Vegetation Type	Animals Present	Description of Area	Sample Dates
55m	Leirmo	MP069161	Riverside wet pasture	Cows	Damp grass meadow with scattered alder trees	30th July
100m	Fossoy	MP069161	Damp hay meadow	Cows, sheep	Large field of recently mown hay stubble, no trees	24th July 30th July
180m	Hesjevoll	MP094256	Permanent pasture	Horses, cows, sheep	Short turf with scattered juniper and alder	11th August
260m	Nigardalen	MP084372	Moorland on recent moraine	Cows, sheep, grouse**	Stony moraine with Empetrum, Calluna and Vaccinium; scattered shrub birch.	25th July 6th August
410m	Tunsbergdal	MP041162	Open birch woodland	Cows, sheep	Large grassy meadow with scattered mature birch	24th July 4th August
450m	Bjornstegane	MP116422	Birch woodland	Horses, cows, sheep, goats**	Large area of short turf, patches of dense birch alder wood	7th August
540m	Vassdalen	MP082267	Seter meadow	Cows, sheep	Short turf with juniper bushes, surrounded by birch woodland	19th July
730m	Haugfjellstølen	MP073767	Seter meadow	Cows, sheep	Large grazing area sheltered by landform surrounded by high moorland	5th August
1120m	Røykjedalen	MP027317	High moorland	Sheep, grouse**	Barren Salix herbacea Empetrum nigrum moor. Large boulders. No bushes, some permanent snow	31st July

all species of herbivore at a site were taken with the exception of grouse droppings at two sites and goat dung at another. Both media were investigated and found to be devoid of insect life.

The largest droppings were chosen wherever possible to maximise the number of individual beetles taken and so collect specimens of the less common species. Olechowicz (1974), has shown an almost exponential relationship between the size of the dropping and the number and diversity of beetles within it. Limitations of time and the capacity of the rucksack restricted the number of samples it was possible to collect from each site. A practical limit of five whole droppings was finally chosen to enable a reasonable spectrum of diversity to be included.

EXTRACTION

The beetles were extracted from the dung by the method of Moore (1954). The whole dropping and soil was placed in a plastic bucket, covered with a circle of 1.5 cm. wire mesh weighted down with a small stone and the bucket two thirds filled with sun-warmed river water. The low temperatures of the glacial river water would otherwise have rapidly reduced the activity of the beetles, preventing those deeply burrowed in the dropping from emerging. Beetles were skimmed from the water surface with squares of nylon netting and immediately preserved in alcohol/formaldehyde solution. Only adult beetles were collected because of limited time available for identification. Also the extraction method cannot be used for quantitative sampling of beetle larvae most of which do not float in water.

MATHEMATICAL ANALYSIS OF THE RESULTS

Data was pooled from all five droppings from each site and the occurrence of each species expressed as a percentage of the total fauna at that site (Table II). For further analysis the data was double standardized in the method of Bray & Curtis (1957). The data is arranged in a matrix with sites as columns and species as rows. The rows are then standardized with the value for each species converted to a percentage of the maximum value in the row for that species. The standardized percentages are then summed in the columns and each value in the column expressed as a percentage of the total for that column. Each site is now represented by a column of relative importance values. This has the ad-

vantage of reducing the overweighting of large numbers of ubiquitous species in the similarity value (below). This double standardized data was used in the construction of the kite diagrams (Fig. 2), to show the relative importance of the major species at each altitude.

It must be stressed that the figures used represent the *relative* importance of a species rather than its numerical abundance. Where the diversity of beetles is higher, a larger number of individuals of a species may be represented by a lower importance value than at another site were it represents a higher proportion of the total fauna. Similarity between sites was computed using the coefficient of Czekanowski (1913), — Cz.

$$Cz = \frac{\sum_1^n W_{i(xy)}}{\sum_1^n (x_i + y_i)} \times 100\%$$

where $W_{i(xy)}$ is the lesser value for species i from sites x and y , x_i and y_i are the importance values of species i at sites x and y and n is the total number of species in the matrix. Species occurring at one site only cannot be included in the method as $W_{i(xy)}$ would then be equal to 0.

This results in a matrix of similarity values upon which an agglomerative hierarchical classification was carried out using the method of Lance & Williams (1967). This uses similarity as a distance measure between elements in the matrix. The hierarchy is then produced by subjecting these measures to a sorting strategy which produces distance measures between *groups* of elements. In this case the furthest-neighbour sorting strategy of McNaughton-Smith (1965), was used where the distance measure between two groups is defined as the similarity between the most dissimilar pair of elements, one from each pre-existing group. This was computed on the Hull University I.C.L. 1900 computer, using the FORTRAN programme CLASSIFY and the results used to plot the dendrograms in figures 4 and 5.

RESULTS

A total of 4,996 beetles of 58 species from 6 families were identified from 45 individual droppings at 9 sites from an altitude range of 55—1200 m above sea level. An average of 19 species per community (range 2—30), was found in contrast to an average of 12 per commu-

Table 2. Occurrence of coprophilous species, to nearest 1 % of total fauna at each site x = present.

	Trophic group*										
		Leirno	Fossoy	Hesjevol	Nigardalen	Tunsbergdal	Bjornstegane	Vassdalen	Haugafellstølen	Røykjedalen	
Total number of individuals		132	169	418	583	279	2293	369	139	17	
Altitude		55m	100m	180m	260m	410m	450m	540m	730m	1120m	
Hydrophilidae											
<i>Sphaeridium scarabaeoides</i> (Linnaes)	c	—	—	—	2	1	1	—	10	—	
<i>Cercyon melanocephalus</i> (Linnaeus)	c	—	16	22	29	10	11	2	15	—	
<i>Cercyon lateralis</i> (Marsham)	c	3	3	1	1	1	—	—	—	—	
<i>Cercyon haemorrhoidalis</i> (Fabricius)	c	—	1	1	1	—	—	1	—	—	
<i>Cercyon atomarius</i> (Fabrius)	c	—	—	1	1	5	5	4	10	—	
<i>Cercyon unipunctatus</i> (Linnaeus)	c	—	—	—	x	—	—	—	—	—	
<i>Cercyon pygmaeus</i> (Illiger)	c	2	1	3	2	—	1	—	—	—	
<i>Megasternum obscurum</i> (Marsham)	c	—	—	—	—	1	—	—	—	—	
<i>Cryptopleurum minutum</i> (Fabricius)	c	27	—	1	—	1	1	—	—	—	
Ptiliidae											
<i>Ptiliola kunzei</i> (Meer)	f	—	—	x	—	—	x	—	—	—	
<i>Ptiliolium sahlbergi</i> (Flach)	f	—	—	1	—	—	1	—	—	—	
<i>Acrotrichis sericans</i> (Meer)	f	—	—	—	—	x	—	—	—	—	
<i>Acrotrichis grandicollis</i> (Mannerheim)	f	17	3	22	13	3	3	7	—	—	
<i>Acrotrichis rugulosa</i> (Mannerheim)	f	—	—	—	—	—	—	x	—	—	
Staphylinidae											
<i>Megarthritis depressus</i> (Paykull)	c	1	1	9	4	1	8	—	3	—	
<i>Deliphrum tectum</i> (Paykull)	p	—	—	1	7	13	19	29	10	—	
<i>Aploderus caelatus</i> (Gravenhorst)	c	—	—	—	x	—	x	—	—	—	
<i>Platystethus arenarius</i> (Fourcroy)	c	3	35	16	2	1	1	1	—	—	
<i>Anotylus nitidulus</i> (Gravenhorst)	c	—	—	x	—	x	—	—	—	—	
<i>Oxytelus laqueatus</i> (Marsham)	c	3	9	16	4	15	5	2	—	—	
<i>Philonthus marginatus</i> (Ström)	p	—	7	—	1	—	1	—	—	—	
<i>Philonthus varians</i> (Paykull)	p	—	1	—	—	1	—	1	—	—	
<i>Philonthus rotundicollis</i> Menetries	p	—	—	—	—	—	—	x	—	—	
<i>Philonthus longicornis</i> Stephens	p	—	—	1	2	8	1	—	—	—	
<i>Philonthus puella</i> (von Nordman)	p	—	—	—	x	x	—	—	—	—	
<i>Tachinus proximus</i> Kraatz	p	—	—	—	3	3	1	5	—	—	
<i>Tachinus pallipes</i> (Gravenhorst)	p	—	—	—	1	—	3	—	—	—	
<i>Tachinus signatus</i> Gravenhorst	p	—	1	—	—	—	—	1	—	—	
<i>Tachinus lignorum</i> (Linnaeus)	p	—	—	—	—	—	—	x	—	—	
<i>Autalia puncticollis</i> Sharp	p	14	3	5	2	13	8	24	—	—	
<i>Tinotus morion</i> (Gravenhorst)	p	—	—	—	—	—	—	x	—	—	
<i>Atheta parvula</i> (Mannerheim)	p	—	—	—	—	—	x	—	—	—	
<i>Atheta atramentaria</i> (Gyllenhal)	p	10	6	4	13	20	18	8	18	—	
<i>Atheta macrocera</i> (Thomson)	p	14	—	—	—	—	—	1	—	—	
<i>Atheta picipennis</i> (Mannerheim)	p	—	—	—	—	1	1	1	—	—	
<i>Atheta longicornis</i> (Gravenhorst)	p	—	—	—	—	x	—	—	—	—	
<i>Atheta dadopora</i> Thomson	p	3	—	—	1	—	—	—	—	—	
<i>Atheta setigera</i> (Sharp)	p	—	1	—	—	3	—	—	—	—	
<i>Atheta graminicola</i> (Gravenhorst)	p	—	—	—	—	—	—	—	—	43	
<i>Atheta cinnamoptera</i> (Thomson)	p	—	—	—	—	—	—	x	—	—	
<i>Oxypoda nigricornis</i> Motschulsky	p	—	—	—	1	—	1	1	—	—	
<i>Aleochara intricata</i> Mannerheim	p	—	—	—	x	—	—	—	—	—	

	Trophic group*									
		Leirmo	Fossoy	Hesjevol	Nigardalen	Tunsbergdal	Bjornstegane	Vassdalen	Haugafjellstøien	Roykjedalen
Total number of individuals		132	169	418	583	279	2293	369	139	17
Altitude		55m	100m	180m	260m	410m	450m	540m	730m	1120m
<i>Aleochara bilineata</i> Gyllenhal	p	—	—	—	1	1	—	—	—	—
<i>Acrostiba borealis</i> Thomson	p	—	—	—	—	—	—	x	—	—
Geotrupidae										
<i>Geotrupes stercorosus</i> (Scriba)	c	—	—	—	—	1	—	1	—	—
<i>Geotrupes stercorarius</i> (Linnaeus)	c	x	—	—	—	—	—	—	x	—
Scarabaeidae										
<i>Colobopterus haemorrhoidalis</i> (Linnaeus)	c	—	—	x	—	—	—	—	—	—
<i>Aphodius ater</i> (Degeer)	c	—	—	—	—	—	x	—	—	—
<i>Aphodius rufipes</i> (Linnaeus)	c	—	—	1	4	3	14	1	—	—
<i>Aphodius depressus</i> (Kugelann)	c	—	—	—	1	1	1	1	—	—
<i>Aphodius lapponum</i> Gyllenhal	c	—	—	1	2	5	5	10	33	57
<i>Aphodius rufus</i> (Moll)	c	—	3	1	2	—	—	—	—	—
<i>Aphodius borealis</i> (Gyllenhal)	c	—	—	—	1	—	1	—	—	—
<i>Aphodius fimetarius</i> (Linnaeus)	c	x	—	—	—	—	—	—	—	—
<i>Aphodius fasciatus</i> (Linnaeus)	c	—	—	—	—	—	1	—	—	—
<i>Aphodius pusillus</i> (Herbst)	c	—	3	1	—	1	—	—	—	—
<i>Aphodius piceus</i> (Gyllenhal)	c	—	—	—	4	1	—	1	—	—
Elateridae										
<i>Hypnoidus riparius</i> (Fabricius)	**	—	—	—	—	—	—	x	—	—

*c = coprophage; p = predator; f = mycetophage

***Hypnoidus riparius* is not usually coprophilic, however Duffield (1937), records it from dung in Norwegian Lapland.

nity recorded by Duffield (1957), who was working in the extreme north of Norway. The results are summarised in Table 2 where each species is expressed a percentage of the total fauna from the pooled results of five droppings at each site. The distribution of the more widespread species is illustrated in Fig. 2, double standardized data being used (explanation above), to show the change in relative importance of each species with altitude.

The number of species encountered at each site is expressed as a function of altitude in figure 3.

Dendrograms of faunal similarity between sites and species associations are shown in Figs. 4 and 5 and recurrent groups of species recorded in Table 3.

The classification of sampling sites (Fig. 4), produced three main groupings which seem to be clearly related to altitude.

- A Range 55—180 m. All fairly damp lowland pasture close to the river Jostedøla. Characterized by a reduced number of individuals and species.
- B Range 260—540 (—730) m. Varied vegetation including open birch woodland, recent glacial moraine and seter meadow. All habitats fairly dry although one, Björnstegane, (450 m), was sampled in damp weather. These sites have the highest number of individuals and diversity of species. Closely allied is the 730 m site (Haugafjellstøien), again a

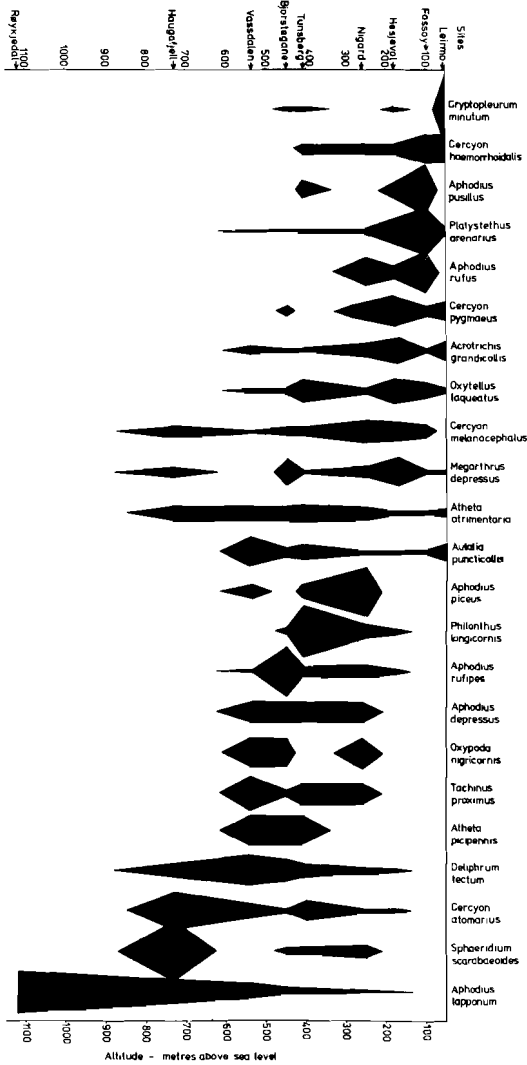


Fig. 2. Kite diagrams showing changes in relative abundance of major species with altitude. Double standardized data used (see text).

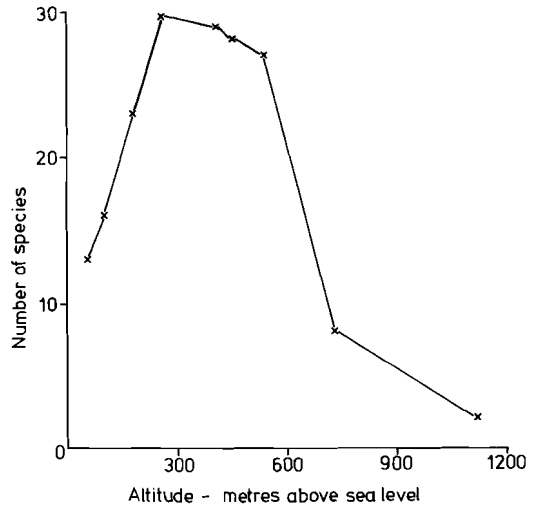


Fig. 3. Graph showing change in mean number of species per community (5 samples, pooled), with altitude.

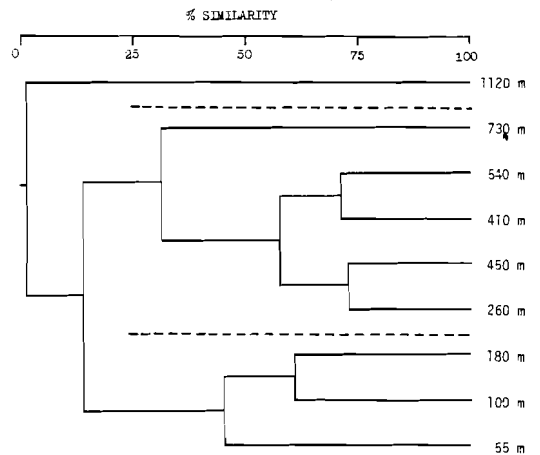


Fig. 4. Dendrogram of similarity between sampling sites.

- dry seter meadow, surrounded by woodland. This site had reduced numbers and diversity.
- C 1120 m. Very dissimilar from all other sites with only two species present. Bleak, high-moorland with little vegetation cover.
- Similar treatment of species (Fig. 5 and Table 3) showed four main groups.
- A Species important only at the lowest sites.
- B Species important at lower altitudes, but not

- at the lowest of all, such as *Aphodius rufus* and *A. pusillus* and also species that occur over a wide range of altitudes but are less important higher up.
- C Species with an intermediate altitude range 260–540 m.
- D Divisible into two groups at 25% similarity.
 - i species occurring at intermediate altitudes, but with a discontinuous distribution.
 - ii species markedly more important at higher altitudes, although also occurring lower down.

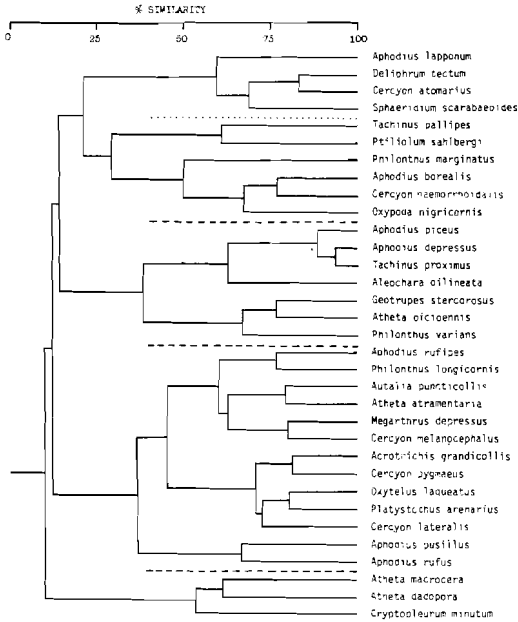


Fig. 5. Dendrogram showing species groupings.

DISCUSSION

The above groupings do not represent a series of discontinuous communities occurring only within a discrete altitude range, rather the community composition changes gradually with altitude. It is extremely unlikely that the beetles are reacting directly to height and probably the most important variables linked with altitude are temperature and humidity, both related to exposure to the wind. A temperature gradient of 1°C per 100 m is commonly quoted but this differential can be much greater in the proximity of a large glacier. White (1960), Landin (1961), and Koskela (1972), all stress the effects of temperature on dung inhabiting beetles. Most sites were visited once and mean temperature over a period could not be measured. Single recordings would have been too dependant on prevailing weather conditions. It can however, be safely assumed that the higher sites were cooler than those lower down.

Temperature can be limiting to a species in a number of ways. Landin (1961), investigated the upper and lower temperature tolerances of adult *Aphodius* sp. and found that those preferring dung in shaded habitats have markedly reduced upper tolerances when compared with those commonly found in the open. He records *Aphodius depressus*, *A. lapponum*, *A. borealis* and *A. fasciatus* as preferring shaded habitats, along

Table 3. Recurrent Groups of Species Resulting from Dendrogram Classification.

A	B	C	D	
Species with high importance values at low altitudes only	Species more important at low altitude + ubiquitous species	Species more important at intermediate altitudes	Intermediate	Higher
<i>Cryptopleurum minutum</i>	<i>Acrotrichis grandicollis</i>	<i>Philonthus varians</i>	<i>Ptiliolum sahlbergi</i>	<i>Sphaeridium scarabaeoides</i>
<i>Atheta dadopora</i>	<i>Cerycyon pygmaeus</i>	<i>Tachinus proximus</i>	<i>Cerycyon</i>	<i>Cerycyon atomarius</i>
<i>Atheta macrocera</i>	<i>Cerycyon lateralis</i>	<i>Atheta picipennis</i>	<i>haemorrhoidalis</i>	<i>Deliphrium tectum</i>
	<i>Cerycyon melanocephalus</i>	<i>Aleochara bilineata</i>	<i>Philonthus marginatus</i>	<i>Aphodius lapponum</i>
	<i>Megarthritis depressus</i>	<i>Geotrupes stercorosus</i>	<i>Tachinus pallipes</i>	
	<i>Platystethus arenarius</i>	<i>Aphodius depressus</i>	<i>Oxyopoda nigricornis</i>	
	<i>Oxytelus laqueatus</i>	<i>Aphodius piceus</i>	<i>Aphodius borealis</i>	
	<i>Philonthus longicornis</i>			
	<i>Autalia puncticollis</i>			
	<i>Atheta atramentaria</i>			
	<i>Aphodius rufipes</i>			
	<i>Aphodius rufus</i>			
	<i>Aphodius pusillus</i>			

with *A. piceus* in the warmer regions of southern Scandinavia, but not in the far north. All these species were found only at higher altitudes in Jostedal, all in exposed situations. Similarly, Koskela (1962), records the following species as oligotopic to shaded situations: — *Deliphium tectum*, *Philonthus puella*, *Tachinus proximus*, *T. pallipes*, *Atheta picipennis*, *A. setigera* and *Oxypoda nigricornis*. Again these species were only found in exposed higher sites in this study.

Conversely, Koskela found several species to prefer exposed situations. These include: — *Apoderus caelatus*, *Anotylus nitidulus*, *Platystethus arenarius* and *Atheta macrocera*. All these species were found to be much more numerous at lowland sites. Additionally, both Koskela and Landin refer to certain species as being eurytopic — less fastidious in their microhabitat requirements. These include: — *Megarthus depressus*, *Oxytelus laqueatus*, *Autalia puncticollis*, *Atheta atramentaria*, *Colobopterus haemorrhoidalis*, *Aphodius rufipes*, *A. pusillus*, *A. fimetarius* and *A. rufus*. All these species were either important at lower and intermediate altitudes or occurred at single sites at low altitude — none were more important higher up. The only exceptions to this were *Philonthus varians* and *Tinotus morion*, both recorded by Koskela as preferring exposed sites and both occurring at quite high altitude in Jostedal. No work has recorded the microhabitat requirements of the Ptiliidae and Sphaeridiinae although Mysterud & Wiger (1976), record *Acrotichis grandicollis*, *A. rugulosa*, *A. sericans*, *Ptiliola kunzei*, *Cercyon atomarius*, *C. melanocephalus* and *Megasternum obscurum* from woodland situations between 620–660 m.

It may be that the shade loving (= high altitude in this study), species cannot tolerate the higher temperatures in the open at the lowland situations or possibly cannot compete in warmer positions with the less cold tolerant species which are unable to exist at cooler altitudes. Of particular importance is the susceptibility of the overwintering stage to low temperature. White (1960), records that most cold tolerant species overwinter as adults. This is true of *Aphodius lapponum*, which, both in this study and in all the literature (Lindroth 1935, White 1960, Landin 1961, Pearson & White 1965), was found to be much more dominant at higher altitudes. The nearby presence of woodland could also have contributed to the high diversity at certain sites. If shade dwelling communities exist in this area it is extremely unlikely that limi-

ted accidental migration to dropping in more exposed situations should not occur.

A complication lies with the distribution of herbivore types. Cattle and sheep were both present at seven of the nine study sites and horses present at only two. Røykjedalen, with only sheep and Leirmo with only cattle have by far the lowest dung-beetle diversity. Rainio (1966), records distinct preferences of the beetles for different types of dung but Landin (1961), states that the texture and dryness of the dung is more important. The plants upon which the animal has been feeding grossly affect this. Cow dung at Leirmo, where the cattle fed entirely on lush grass, was far more fluid than at Haugafjellstølen where the diet contained a high proportion of sclerophyllous sedges and dwarf willows. This was even more marked with sheep dung. Those feeding on lowland grass produced much more moist faeces than those feeding on ericaceous vegetation at Røykjedalen. Here even fresh dung was remarkably dry with an open consistency and much undigested woody material. An intermediate situation was found at the mid-altitude sites in the proximity of woodland, where both cows and sheep were observed browsing from the trees and grazing fresh grass. It would appear that this produces optimal conditions for the beetles — at these sites both the highest abundance and related diversity were found.

A further variable is the period of time during which domestic animals are kept at different altitudes. No sign of large wild herbivores was noticed and therefore it must be assumed that fresh supplies of dung are available at higher altitudes during the summer months only. Adult dung beetles have been shown to have definite seasons of activity (White 1960, Rainio 1965, Breymer 1974). If the adult flight season is temperature regulated it might be expected that spring active species may occur later at higher altitudes. This was not found to be case in this study. Spring flying species, *Aphodius pusillus*, *A. ater* and *A. fimetarius* (the latter a bivoltine species with generations in spring and late summer), were found only as isolated individuals at scattered sites. Beetles with a life cycle requiring fresh dung in the spring will therefore not be able to support successive generations at high altitudes, although there is nothing to stop colonisation for the summer period only.

SUMMARY

Differences have been found in the dung inhabiting beetle communities between the sites stu-

died. These are not discontinuous but exist as a gradual change with species diversity and abundance of individuals greatest between the 180 and 750 m sites. These differences are probably linked to altitude related variables, most likely temperature and moistness of the dung habitat, linked to the vegetation available to the herbivores. It was found that species recorded in the literature from shaded situations are common in the open at higher altitudes and, conversely, those recorded in exposed situations are common only lower down. This suggests a temperature limitation on these species.

ACKNOWLEDGEMENTS

I am indebted to Mr. Colin Johnson, of Manchester Museum, for the identification of certain species and the checking and, in some cases, correction of my own identification.

The expedition was supported by grants from the Royal Society, The Hull University Expedition Trust Fund, The Sir Philip Reckitt Educational Trust Fund and the James Reginald Heslam Memorial Fund, together with material donations from a large number of companies and individuals to whom I extend my sincere thanks.

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Received 12 July 1981.

New records of Norwegian Coleoptera I: Species new to the fauna

TORSTEIN KVAMME

Kvamme, T. 1981. New records of Norwegian Coleoptera I: Species new to the fauna. *Fauna norv. Ser. B* 29, 34–35.

The following species new to the Norwegian fauna are presented: *Gabrius sphagnicola* (Sjöberg), *Metopsia clypeata* (Müller), *Agrilus suvorovi* Obenberger, *Lyctus brunneus* (Stephens), *Apion melloti* Kirby, *Gymnetron melanarium* (Germar), *Coeliodes erythroleucos* (Gmelin) and *Ceutorhynchus roberti* Gyllenhal. *Sitona ononidis* Sharp is provisionally discussed and presented.

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During the last summer seasons seven species of Coleoptera have been recorded which not have been previously reported from Norway according to Lindroth (1960), Strand (1970, 1977) and Silfverberg (1979). In addition some older unpublished records are included. When not otherwise stated, the records are made by the author. The nomenclature follows Silfverberg (1979). The abbreviations of the faunal divisions are used in accordance with Strand (1943), and are placed in front of the locality name. The code referring to the EIS-grids are placed in a parenthesis behind the locality name.

THE RECORDS

Staphylinidae

Gabrius sphagnicola (Sjöberg, 1950)

HEs: Eidskog, Momyra (EIS 38), 1974.

Two specimens were caught in pit-fall traps during an investigation of mirefauna organized by the Norwegian Entomological Society. The traps were situated in a typical *Calluno-fussetum* mire type. Further information on the method of collection and habitat are given by Pedersen et al. (1976). *G. sphagnicola* is associated with mire habitats.

The specimens are identified by Anders Vik.

Metopsia clypeata (Müller, 1821)

AAy: Tromøy, Bjelland (EIS 6), 9 May 1977.

When I visited this very interesting sea-shore area, one specimen was found among roots of grass vegetation under stones. In Sweden the species is known from the same type of sandy habitat (Stig Lundberg pers. comm.). Hansen (1951, 1964) mentions also mushrooms, mouse nests, and under bark as habitats.

Buprestidae

Agrilus suvorovi Obenberger, (*yiridis* ssp. *populneus* Schaefer)

TEy: Tvedestrand, Sannidal (EIS II), 2 July 1961.

AAy: Kragerø, Laget (EIS II), 12 June 1978.

No details are known about the habitat of the first record, when one specimen was found (leg. Bakke). At Laget four specimens were caught flying or sitting on a stack of timber (leg. Bakke & Kvamme).

The stack consisted of fresh logs of *Quercus* sp., *Populus* sp., *Alnus* sp. and *Betulae* sp.

A. suvorovi is not mentioned at all from Scandinavia in the catalogues (Grill 1896, Lindroth 1960, Silfverberg 1979). Freude et al. (1979) mention the species from the European Continent and Sweden. *Populus* spp. are host trees, and perhaps also *Salix* spp. (Freude et al. 1979). In Sweden the species is known only from aspen (*Populus tremula* L.) (Ehnström pers. comm.). The specimens are identified by Svatopluk Bilý.

Lyctidae

Lyctus brunneus (Stephens, 1830)

MRI: Åndalsnes (EIS 77), 20 September 1962.

MRY: Ålesund (EIS 76), 31 October 1976.

This well-known cosmopolitan species has been spread over most of the world by human activity.

In the collection of the Norwegian Forest Research Institute ten specimens are preserved. They have been introduced on *Quercus* sp. from Germany. The sample from Ålesund was found on wooden material in a ship which arrived from South-Africa.

Apionidae

Apion melloti Kirby, 1808

AK: Oslo, Hovedøya (EIS 28), 14 August 1979.

Three specimens were caught by sweep-netting of

Meliloti alba Med. The species is oligophagous on *Meliloti* spp. (Dieckmann 1977). Hansen (1965) mentions that the species is probably increasing its range. In Sweden, several new localities have been found from 1964 until today (Stig Lundberg pers.comm.).

In Finland *A. meliloti* is rare (Silfverberg pers.comm.).

Curculionidae

Sitona ononidis Sharp, 1866

In The Scandinavian Catalogue (Lindroth 1960) *S. ononidis* is included together with *S. suturalis* Stephens, 1831, and not treated as a valid species. The distribution of the two species in Norway has never been cleared up. The species are probably confused, and a revision of the material in museum collections is therefore necessary. Provisionally results show that *S. ononidis* occurs in the following faunal divisions: Ø, AK, HES, Bø, VE and TEY. According to Dieckmann (1980) *S. suturalis* is probably monophagous on *Lathyrus pratensis* L., but members of the genus *Vicia* might be substitute hosts when *L. pratensis* is lacking. *S. ononidis* has species of *Vicia*, *Ononis*, *Trifolium*, *Lathyrus* and others as host plants. It is therefore possible that *S. ononidis* has a much wider range in Norway.

Gymnetron melanarium (German, 1821)

AK: Asker, Brønnøya (EIS 28), 10 August 1980. One single specimen was sweep-netted from *Veronica* sp., *G. melanarium* has a wide range in Sweden (Lindroth 1960), and is therefore one of the species one would expect to find in Norway.

Coelodes erythroleucus (Gmelin, 1790) (*cinctus* Fournet, 1895 nec Drury, 1782)

VAY: Kristiansand, Lyngøya (EIS 2), 18 July 1980.

VE: Tjølling, Svinevika (EIS 19), 29 July 1981.

In both cases one specimen was found by beating branches of *Quercus robur* L.

Ceutorhynchus roberti Gyllenhal, 1837

AK: Bærum, Østøya (EIS 28), 7 June 1980.

One specimen was caught by sweep-netting on sea-shore vegetation. I am not quite sure what plant species the specimen was recorded from. Dieckmann (1972) writes that *C. roberti* is monophagous on *Alliaria officinalis* Andr., and this species was present at the place of capture. The nearest locality is Skåne, South Sweden (Lindroth 1960).

ACKNOWLEDGEMENTS

I wish to express my gratitude to Alf Bakke, Ås, and Anders Vik, Sandefjord, for placing

material at my disposal. Svatopluk Bilý, Czechoslovakia. Bengt Ehnström, Sweden, Stig Lundberg, Sweden and Hans Silfverberg, Finland, have kindly given me valuable information.

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Received 22 Oct. 1981.

A report on a collection of Diptera from Iceland and Greenland¹⁾

DONALD H. MESSERSMITH

Messersmith, D.H., 1982. A report on a collection on Diptera from Iceland and Greenland. *Fauna norv. Ser. B* 29, 36–39.

A total of 57 species from 25 families of Diptera were collected in Iceland and 18 species from 13 families were collected in Greenland. Three species were new records for Iceland and four collections represented range extensions within Iceland. Three species were collected for the first time in Greenland.

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During the summer of 1967 while on a general tour of Iceland and an excursion to Greenland. I had the opportunity to do some intermittent collecting of a variety of insects. As expected, Diptera were most commonly found and the results of that collection are reported herein. Other Arthropods were less frequently collected and are being reported in another article.

Although the collecting could not be done systematically, nor thoroughly, some apparently new records were obtained both for Iceland as a whole, for localities within Iceland, and for Western Greenland.

The records for collections of Diptera from Iceland and Greenland have been summarized by Nielsen *et al.* (1954). Lindroth *et al.* (1973) brings the record up to date.

I am very grateful to the specialists of the U.S. Department of Agriculture, U.S. National Museum and the Canada Department of Agriculture for identifying these specimens. They are Raymond J. Gangne, Lloyd V. Knutson, B. V. Peterson, Harold Robinson, Curtis W. Sabrosky, George C. Steyskal, Alan Stone, J.R. Vockeroth and Willis W. Wirth.

The specimens have been deposited in the collections of the U.S. National Museum, Washington, D.C. and the Entomology Research Institute, Canada Department of Agriculture, Ottawa, Canada.

Following is a list of the specimens collected. The numbers in parentheses refer to the number

of specimens collected. The sequence followed is that of Nielsen, *et al.* (1954) in The Zoology of Iceland Diptera Volume.

ICELAND

Bibionidae

Dilophus femoratus Meigen.

Reykjavik — 30 June (3); Vik — 3 July (1); Stokkseyri — 3, 4 July (18); Hvolsvollur — 4 July (1); Lake Myvatn — 10, 11 July (6).

Bibio pomonae (Fabricius)

Lake Myvatn — 11 July (1 ♂).

Scatopsidae

Scatopse notata (L.)

Akureyri — 8 July (1).

Mycetophilidae

Macrocera vittata Meigen

Gullfoss — 2 July (1 ♂, 1 ♀).

Sciaridae

Bradysia spp.

Laugarvatn — 1 July (4 ♀).

Simuliidae

Simulium vittatum Zetterstedt

Reykjavik — 1 July (7); Gullfoss 2 July (1); Lake Myvatn — 9, 10 July (22).

Ceratopogonidae

Ceratopogon sp.

Reykjavik — 1 July (1).

Tipulidae

Prionocera turcica (Fabricius)

Thingvellir — 1 July (1 ♂, 2 ♀).

1) Scientific article No. A2753, Contribution No. 5803 of the Maryland Agricultural Experimentation Station, Department of Entomology, University of Maryland.

Tipula rufina Meigen.

Thingvellir — 1 July (1); Gaddstadir — 2 July (6); Vik — 3 July (3); Olafsvik — 6 July (1); Heimaey — 13 July (7♂, 5♀).

Ormosia (Rhypholophus) fascipennis (Zetterstedt)

Olafsvik — 6 July (1♂); Grafarnes — 6 July (1♂); Lake Myvatn — 9 July (1♀).

Empididae

Platypalpus ecalceatus Zetterstedt.

Lake Myvatn — 9 July (1).

Empis lucida Zetterstedt.

Gullfoss — 2 July (2).

Rhamphomyia hirtula Zetterstedt.

Lake Myvatn — 9 July (1).

Rhamphomyia simplex Zetterstedt.

Laugarvatn — 1 July (1).

Dolichopodidae

Dolichopus plumipes (Scopoli)

Gullfoss — 2 July (1); Vik — 4 July (2); Stokkseyri — 4 July (1).

Hydrophorus sp. (*viridis?* Meigen)

Gullfoss — 2 July (1). This genus was only collected once previously in Iceland. The specimens now are both females, so can only be doubtfully identified.

Phoridae

Megaselia sp.

Stokkseyri — 3 July (1).

Syrphidae

Melanostoma mellinum (Linn.)

Reykjavik — 30 June (1); Gullfoss — 2 July (1).

Epistrophe = *Phalacrodira tarsata* (Zetterstedt).

Lake Myvatn — 11 July (1).

Syrphus ribesii (L.)

Lake Myvatn — 11 July (1).

Heleophilus pendulus (L.)

Lake Myvatn — 11 July (2).

Neoascia dispar = *floralia* Meigen (Meigen)

Thingvellir — 1 July (1); Laugarvatn — 1 July (1).

Dasyrphus = *Syrphus tricinctus* (Fallén).

Stykkisholmur, (Berserkjaraun) — 5 July (1); Lake Myvatn — 11 July (1). These represent the first known records of this rare species in Northern Iceland.

Piophilidae

Piophila vulgaris (Fallén).

Lake Myvatn — 10 July (3).

Chamaemyiidae

Chamaemyia geniculata (Zetterstedt).

Heimaey — 13 July (1).

Coelopidae

Coelopa (Fucomyia) frigida (Fabricius)

Stokkseyri — 4 July (2); Borgarnes — 5 July (1).

Heleomyzidae

Heleomyza modesta Meigen = *borealis* (Boh.)

Alfsey — 12 July (2); Heimaey — 13 July (11).

Heleomyza serrata (L.)

Grafarnes — 6 July (1); Alfsey — 12 July (1).

Ephydriidae

Hydrellia griseola (Fallén)

Vik — 4 July (4); Heimaey — 13 July (8).

Scatella thermarum Collin.

Gullfoss — 2 July (1).

Lamproscatella = *Scatella sibilans* (Haliday).

Heimaey — 13 July (7).

Borboridae = Sphaeroceridae

Leptocera (Limosina) luteilabris Rondani.

Stokkseyri — 4 July (1); Lake Myvatn — 9 July (7); Heimaey — 13 July (1).

Leptocera sp.

Heimaey — 13 July (1).

Drosophilidae

Scaptomyza graminum (Fallén)

Heimaey — 13 July (4).

Agromyzidae

Phytomyza ranunculi (Schrank)

Laugarvatn — 1 July (1). This is apparently the first specimen taken in southwestern Iceland.

Chloropidae

Oscinella frit (L.) = *hortensis* Coll.

Stokkseyri — 4 July (1); Heimaey — 13 July (7).

Anthomyzidae

Anthomyza gracilis Fallén.

Laugarvatn — 1 July (1). This is apparently the only specimen of this species taken in Iceland to date.

Cordyluridae = Anthomyiidae

Scatophaga stercoraria (L.)

Laugarvatn (Kalfstindar) — 1 July (1♂, 1♀); Gullfoss — 2 July (2); Vik — 3, 4 July (2); Heimaey — 13 July (1).

Scatophaga litorea (Fallén)

Lake Myvatn — 10, 11 July (8); Heimaey — 13 July (2).

Chaetosa punctipes (Meigen)

Laugarvatn — 1 July (4). These are apparently the first specimens taken in southwestern Iceland.

Muscidae

Lasiops longipes Zetterstedt.

Gullfoss — 2 July (2); Vik — 3 July (3).

Lasiops sp.

Lake Myvatn — 10 July (1 ♀).

Hydrotaea cristata Malloch.

Eyvindahólar — 3 July (7); Lake Myvatn — 11 July (1). This species has not previously been recorded in Iceland.

Fannia sp.

Gullfoss — 2 July (4 ♀); Vik — 4 July (1 ♀).

Myospila mediatubunda (Fabricius)

Akureyri — 8 July (1).

Coenosia pumila (Fallén)

Vik — 4 July (1); Lake Myvatn — 10 July (3).

Anthomyiidae

Fucellia fucorum (Fallén)

Hvolsvöllur — 4 July (1), Grafarnes — 6 July (5); Olafsvik — 6 July (4); Akureyri — 8 July (1); Alfsey — 12 July (2). These are apparently the first specimens of this species taken on Alfsey.

Pegomya bicolor (Wiedemann)

Vik — 3, 4 July (3).

Hylamyia (Pegohylemyia) fugax (Meigen)

Reykjavik — 30 June (1); Vik — 3 July (1); Grafarnes — 6 July (3); Stykkisholmur — 6 July (1); Olafsvik — 6 July (3).

Hylamyia (Pegohylemyia) nuoljensis Ringdahl = *rubrigena* Schnabl.

Vik — 3 July (1); Hornikvammur — 7 July (1); Lake Myvatn — 10 July (2).

Pegomya (Nupedia) dissecta (Meigen) = *infirma* (Meigen).

Lake Myvatn — 9, 10 July (3); Heimaey — 13 July (1).

Hylemyia (Delia) fabricii (Holmgren)

Vik — 3 July (1).

Calliphoridae

Protophormia terraenovae (Robineau-Desvoidy)

Hvolsvöllur — 4 July (1); Olafsvik — 6 July (1); Lake Myvatn — 11 July (2); Alfsey — 12 July (1).

Cynomyia mortuorum L.)

Akureyri — 8 July (1); Alfsey — 12 July (1); Heimaey — 13 July (2).

Calliphora vomitoria (L.)

probably same as *vicina* Robineau-Desvoidy and *erythrocephala* Meigen of Iceland lists: Laugarvatn (Kalfstindar) — 1 July (1); Lake Myvatn — 11 July (1); Alfsey — 12 July (1).

Hippoboscidae

Ornithomyia chloropus Bergroth = *fringillina* Curtis.

Lake Myvatn — 11 July (1). This is apparently a new species record for Iceland.

GREENLAND

Tipulidae

Tipula arctica Curtis.

Narssarssuaq — 15 July (1 ♂).

Culicidae

Aedes impiger (Walker)

Kagssiarssuk — 14 July (8 ♀).

Aedes nigripes (Zetterstedt).

Igaliko — 16 July (1 ♀).

Aedes triseriatus (Say)

Narssarssuaq — 15 July (2 ♂). These represent a new species for Greenland and a great extension of the range of this species as reported in Messersmith (1971).

Mycetophilidae

Exechia sp.

Kagssiarssuk — 14 July (1 ♂).

Simuliidae

Simulium vittatum Zetterstedt.

Kagssiarssuk — 14 July (5); Narssarssuaq — 15 July (5).

Simulium verecundum Stone and Jamnback

Narssarssuaq — 15 July (1).

Sciariidae

Bradysia sp. *venosa* Staeger?

Kagssiarssuk — 14 July (14 ♀).

Empididae

Clinocera stagnalis (Haliday)

Igaliko — 16 July (2).

Dolichopodidae

Dolichopus plumipes (Scopoli)

Kagssiarssuk — 14 July (57); Narssarssuaq — 14, 15 July (32); Igaliko — 16 July (3).

Piophilidae

Piophila vulgaris Fallén.

Igaliko — 16 July (4).

Ephydriidae

Scatella stagnalis (Fallén).

Igaliko — 16 July (124).

Anthomyiidae

Hylemyia sp.

Igaliko — 16 July (2 ♀).

Muscidae

Hydrotaea sp.

Kagssiarssuk — 14 July (1).

Calliphoridae

- Protophormia terraenovae* (Robineau — Desvoidy).
Kagssjarssuk — 14 July (40); Narssarssuaq — 14 July (7); Igaliko — 16 July (6).
- Cynomya mortuorum* (L.)
Narssarssuaq — 14 July (2).
- Calliphora vomitoria* (L.)
probably same as *vicina* Robineau-Desvoidy and *erythrocephala* Meigen: Narssarssuaq — 14 July (1). This specimen is apparently a new record for Greenland.

Tachinidae

- Nowickia hispida* (Tothill)
Narssarssuaq — 14, 15 July (4). This species is apparently new for Greenland and represents an extension of range from Nova Scotia.

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Received 22 May 1981.

Some interesting captures of Muscidae (Dipt.) from Norway

KNUT ROGNES

Rognes, K. 1982. Some interesting captures of Muscidae (Dipt.) from Norway. *Fauna norv. Ser. B* 29, 40–44.

Detailed records are given for 31 species of muscid flies, of which 16 seem not to have been previously reported from Norway. Eight males of *Spilogona setulosa* Ringdahl, 1941 have been captured in the mountains of Rogaland. Its terminalia are figured. The Nearctic, strongly synanthropic fly, *Ophyra aenescens* (Wiedemann, 1830) is recorded from localities in Western Norway.

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Among muscid flies which I have recently collected or received as gift are several species which appear not previously, or only rarely reported from Norway. Detailed records for these species are given below. The way of presentation follows previous papers (e.g. Rognes 1980). All specimens are in my private collection except for a few which have been deposited at the British Museum (Natural History) (BMNH below). The sequence of genera follows Pont (1975). For information on distribution of most species outside Norway the reader is referred to Ringdahl (1952, 1954a, 1956, 1958), Hennig (1955–1964), Michelsen (1977), and Hockett (1965). Identifications follow the works of Sabrosky (1949), Ringdahl (1954a, 1956), Hennig (1955–1964), Hockett (1965), Ackland & Pont (1966), Fonseca (1968) and Gregor (1974).

I have included a few records of Norwegian specimens in the possession of BMNH and the Canadian National Collection, Ottawa (CNC below) on the basis of information passed on to me by A.C. Pont (in litt. 21 Jan. 1981).

Achanthiptera rohrelliformis (Robineau-Desvoidy, 1830)

— Rogaland: Ry: Klepp, Øksnevad, EIS 7, 1 ♀, 1 Sept. 1979, T. Kloster.

Previously reported by Siebke (1877: 127, as *Anthomyza inanis* Fall.) from Østfold (Sarpsborg).

Polietes steinii (Ringdahl, 1913)

— Akershus: AK: Oslo, Bygdøy, EIS 28, 1 ♀, 25 June 1979.

This is a rare species known only from Sweden (Ringdahl 1952, 1958), Leningrad area, England (Hennig 1963: 915; Fonseca 1968), Denmark and Japan (Michelsen 1977). New to Norway.

Orthellia viridescens (Robineau-Desvoidy, 1830)

— Akershus: AK: Bærum, Steinhøgda, EIS 28, 1 ♀, 29 July 1977.

It is to be noted that *O. viridescens* (R.-D.) equals *O. cornicina* auctt. nec (Fabricius, 1781) (Michelsen 1977, 1979).

Siebke's (1877: 97) material of *Lucilia cornicina* Fabr. (= *caesarion* Meigen), which I have examined (Rognes 1980), includes a mixture of species (*L. bufonivora* Moniez, *L. silvarum* Meigen and *O. cornicina* Fabricius) but no true *viridescens*. It might, however, be found among material reported from Norway by Zetterstedt (1838: 655) and Bidenkap (1892: 238; 1901: 59). New to Norway.

Morellia simplex (Loew, 1857)

— Buskerud: Bø: Drammen, Drammen EIS 28, 1 ♀, 31 July 1979. — Rogaland: Ry: Sandnes, Selvikvåg, EIS 7, 1 ♀ 8 June 1978; Stavanger, Krossberg, EIS 7, 1 ♀ 15 July 1977. — Møre og Romsdal: MRi: Rauma, Lerheim, EIS 77, 1 ♂ 29 July 1978.

The female from Krossberg has a prominent hair at the front end of beret on right and left hypopleuron, cf. key in Hennig (1964: 964–965).

Strand (1914:323) has reported a female specimen from «Hvalørne» (Østfold: Ø: Hvaler). The locality name is repeated by Hennig (1964: 975, «Kvalørne: DEL»).

Ophyra aenescens (Wiedemann, 1830)

— Rogaland: Ry: Stavanger, Stavanger (center of city), EIS 7, 3 ♂ ♂ 8 Sept. 1980; Tasta (refuse depot), EIS 7, 12 ♂ ♂ 2 ♀ ♀ 1 ♂ 1 ♀ (in cop.) 1 Aug. 1980; 2 ♂ ♂ 2 ♀ ♀ 1 Aug. 1980, BMNH.

— Hordaland: HOy: Bergen (Fana), Rådal — Stend, EIS 30, 1 ♂ 25 July 1980; 8 ♂ ♂ 26 July 1980; 1 ♂ 26 July 1980, BMNH; Stend (refuse depot), EIS 30, 30 ♂ ♂ 30 ♀ ♀ 26 July 1980; 3 ♂ ♂ 3 ♀ ♀ 26 July 1980, BMNH.

This strongly synanthropic species of Nearctic origin was first recorded from Europe in 1964 but

is now remarkably widespread (for the most recent review, see Michelsen 1975). Pont (in litt.) reports it from Italy, Austria, W. Germany, Denmark, Spain, Canary Is., Malta, ?France, Czechoslovakia. The records from Norway are the northernmost known.

Most of the specimens from Norway were caught at the main garbage dumps for the cities of Bergen and Stavanger, respectively, where the species was the most abundant one together with *Protophormia terraenovae* (Robineau-Desvoidy, 1830) (Calliphoridae). The few specimens from the city-center of Stavanger were caught in the street within 50 m from two large restaurants. The specimens from between Rådal and Stend were taken on *Angelica* flowers within a distance of 1 km from the refuse depot at Stend, south of the city of Bergen. New to Norway.

Hydrotaea albipuncta (Zetterstedt, 1845)

— Rogaland: Ry: Stavanger, Krossberg, EIS 7, 1 ♂ 27 May 1978; Nordre Sunde, EIS 7, 1 ♀ 15 July 1977.

The female specimen lacks the blackish shine around the front ocellus (cf. Fonseca 1968: 34). New to Norway.

Hydrotaea borussica Stein, 1899

— Vestfold: VE: Hof, Thorrud, EIS 28, 1 ♂ 28 July 1979. — Telemark: TEi: Sauherad, Nordagutu, EIS 18, 1 ♂ 26 July 1979; Kviteseid, Kviteseid, EIS 17, 1 ♂ 29 June 1980.

This species has previously been reported from Norway only by Hennig (1962: 716, «... , Norwegen (ein wahrscheinlich hierhergehöriges ♀ ohne genaueren Fundort im ZMB) ... »).

Hydrotaea cyrtoneurina (Zetterstedt, 1845)

— Telemark: TEi: Tokke, Dalen, EIS 16, 1 ♂ 30 June 1980. New to Norway.

Hydrotaea militaris (Meigen, 1826)

— Telemark: TEi: Kviteseid, Skredtveit, EIS 17, 1 ♂ 23 June 1980; Lislestøl (Vråvatn), EIS 17, 1 ♂ 24 June 1980; Skredi, EIS 17, 1 ♂ 2 July 1980; Tokke, Dalen, EIS 16, 28 June 1980, K. & T. Rognes.

This species has previously been recorded in Norway from «Trondheimstrakten» (probably Sør-Trøndelag) and Hjerkins (Oppland: Dovre) (Ringdahl 1944a, 1954b).

Hydrotaea pilitibia Stein, 1916

— Sogn og Fjordane: SFi: Gloppen, Sandane (Austrheimstølen), EIS 68, 1 ♀ 1 Aug. 1978.

The specimen was caught at about 550 m a.s.l. a little below the tree-line in mixed woodland with *Betula* sp. and *Pinus sylvestris*.

In the Palearctic region this species is known from a few localities in Sweden and Finland (Hennig 1962: 742), Scotland (Fonseca 1968), USSR (Ivanov region, Murmansk), Austria, Switzerland (Pont in litt.). It is widely distributed in the north of North America (Huckett 1965). New to Norway.

Hydrotaea similis Meade, 1887

— Akershus: AK: Oslo, Sognsvatn, EIS 28, 1 ♀

21 June 1979. — Rogaland: Ry: Bjerkreim, Eik (Ørsdalen), EIS 7, 1 ♀ 31 Aug. 1979. I have also one record from Denmark, East Jutland, Riis Skov, 1 ♂ 6 July 1979, A. & K. Rognes.

The first Norwegian specimen was caught by Pont (1971: 119) near Steinkjer, Nord-Trøndelag.

Phaonia consobrina (Zetterstedt, 1838)

— Akershus: AK: Oslo, Sørkedalen, EIS 36, 1 ♀ 22 June 1979. — Oppland: On: Lom, Galdhøpiggen, EIS 61, 1 ♀ 2—4 July 1969, G.C. & D.M. Wood, CNC. — Sør-Trøndelag: STi: Oppdal, Kongsvoll 1000—1500 m a.s.l., EIS 79, 2 ♀ ♀ 8—27 June 1967, J.E. & R.B. Benson, BMNH.

In Norway, *P. consobrina* has previously been reported from Oslo (Zetterstedt 1855: 4717, as *Aricia consobrina*) and from the northern part of the country (Nordland, Troms and Finnmark) (Strand 1906; Ringdahl 1928, 1944b).

Phaonia erronea (Schnabl, 1886)

— Hordaland: HOy: Bergen, Grønnestølen, EIS 30, 1 ♂ 19 July 1980.

A weak *p* seta is present on the left front tibia slightly below middle. New to Norway.

Phaonia longicornis Stein, 1916

— Vest-Agder: VAY: Kristiansand, Drange, EIS 2, 1 ♀ bred from pupa, emerged 23 April 1980, S. Svendsen; Stangenes, EIS 2, 1 ♀ 18 May 1980, S. Svendsen, BMNH; Flekkefjord, Rasvåg, EIS 4, 1 ♀ 3 June 1979.

This species is occurring only in Scandinavia, as far as is known. Localities are known from Sweden (Skåne, Småland, Jämtland) (Hennig 1963: 839) and Denmark (Bornholm) (Michelsen 1977). New to Norway.

Phaonia mystica (Meigen, 1826)

— Rogaland: Ry: Sandnes, Stølsvik, EIS 7, 1 ♂ 11 June 1980; Stavanger, Godalen, EIS 7, 1 ♂ 1 June 1980.

P. mystica has been reported from Sweden (Skåne) (Ringdahl 1954a), Finland (Regio aboënsis, Karelia australis) (Tiensuu 1935) (I have not been able to check whether his two Karelian localities are within the present boundaries of Finland), England, France, Germany, Switzerland and Italy (Hennig 1963: 847). New to Norway.

Phaonia subfuscineris (Zetterstedt, 1838)

— Finnmark: Fn: Nesseby, Varangerbotn, EIS 176?, 1 ♀ 3 July 1977, I. & T. Nielsen; ?, Seiland, EIS 180?, 1 ♀ June 1934, D. Vesey-Fitzgerald, BMNH.

The species has previously been reported from Sogn og Fjordane (Myrdal, Turtagrø) (Ringdahl 1954b: 50) and Nord-Trøndelag («Suul, Kongsstue & Højsjeldbroe» in Verdal) (Zetterstedt 1845: 1489, as *Aricia subfuscineris*). Otherwise it is known from Sweden, Finland, Scotland, Greenland (Hennig 1963: 876) and several localities in the northern part of North America (Huckett 1965: 320—321).

Phaonia trigonalis (Meigen, 1826)

— Telemark: TEi: Kviteseid, Skredi, EIS 17, 1 ♂ 22 June 1979.

The specimen was caught on the trunk of a pine tree (*Pinus sylvestris*).

Collin (1951) was the first to discover that *laeta* Fallén sensu auctt. contained two species now known by the names *pratensis* Robineau-Desvoidy, 1830 and *trigonalis* Meigen, 1826. Zetterstedt (1845: 1642), Bidenkap (1901: 66) and Ringdahl (1928: 13) reports «*laeta*» from localities in Northern Norway. Siebke (1877: 117) reports it also from Oslo. None of these specimens have been re-examined, however, so it is not known to which species they belong. *Aricia maculipennis* Storm, 1895: 238–239 was synonymized by Ringdahl (1944a: 82, 83) with «*laeta*». The only known specimen of Storm's species is now probably lost (Hennig 1963: 857). New to Norway.

Helina anceps (Zetterstedt, 1838)

— Telemark: TEi: Tokke, Lårdal, EIS 17, 1 ♂ 1 July 1980.

Previously reported by Siebke (1877: 119, as *Anthomyza anceps*) and Bidenkap (1892: 242, as *Spilogaster anceps*) from localities in Southern Norway.

Helina atripes (Meade, 1889)

— Akershus: AK: Bærum, Øverland, EIS 28, 1 ♂ 23 June 1979. — Telemark: TEy: Bamble, Bamble, EIS 11, 1 ♂ 1 ♀ 27 June 1979, Ø. Rognes.

The specimen from Øverland has three pairs of *post dc*, those from Bamble four. New to Norway.

Helina consimilis (Fallén, 1825)

— Vest-Agder: VAY: Flekkefjord, Rasvåg, EIS 4, 5 ♂ ♂ 1 ♀ 24 June 1978. — Rogaland: Ry: Bjerkreim, Eik (Ørsdalen), EIS 7, 1 ♂ 31 Aug. 1979; Stavanger, Sunde, EIS 7, 1 ♂ 1–15 Aug. 1979. The male from Sunde has a weak *p* seta on each fore tibia at middle. The female from Rasvåg has a strong *p* seta in that position.

H. consimilis has previously been reported from Norway by Zetterstedt (1838: 690, as *Anthomyza consimilis*) from between Alta and Kautokeino in Finnmark, but the single female specimen was later (Zetterstedt 1845: 1671, 1675) referred to *protuberans* (cf. also Siebke 1877: 120; Bidenkap 1901: 70). Bidenkap (1892: 245) has reported it (as *Limnophora consimilis* Fall.) from Vestfold and Ringdahl (1954b) from Sogn og Fjordane.

Hebecnema nigricolor (Fallén, 1825)

— Akershus: AK: Oslo, Bygdøy, EIS 28, 1 ♂ 25 June 1979. New to Norway.

Mydaea anicula (Zetterstedt, 1860)

— Rogaland: Ry: Sola, Haga (Hansaberget), EIS 7, 3 ♂ ♂ 7 June 1980. — Troms: TRi: Lyngen, Lyngen, EIS 163, 1 ♀ 24 Aug. 1969, ? leg., BMNH. — Finnmark: Fi: Alta, Alta, EIS 173, 1 ♀ 19 July 1969, G.C. & D.M. Wood, CNC.

Previous Norwegian records of this species are from Troms (Tromsø), Nordland (Narvik) (Ringdahl 1928: 20) and Sogn og Fjordane (Turtagrø) (Ringdahl 1954b).

Mydaea obscurella Malloch, 1921

— Telemark: TEi: Kviteseid, Skredtveit, EIS 17, 2 ♂ ♂ 23 June 1980.

Previously the species has been reported from Nordland (Narvik) by Ringdahl (1928: 44). Otherwise the species is known from Sweden (Torne Lappmark, Jämtland), Great Britain (Ringdahl 1951), Finland (Hennig 1956: 121), Scotland (Fonseca 1968: 42) and several localities in North America (Huckett 1965: 267–268). All the above reports from Europe have been made under the name *M. bengtssoni* Ringdahl, 1924.

Mydaea setifemur Ringdahl, 1924

— Akershus: AK: Oslo, Bygdøy, EIS 28, 1 ♂ 25 June 1979. — Telemark: TEi: Kviteseid, Skredtveit, EIS 17, 1 ♂ 23 June 1980; Vrådal, EIS 17, 1 ♂ 8 July 1980. New to Norway.

Graphomya maculata (Scopoli, 1763)

— Buskerud: Bø: Øvre Eiker, Burud, EIS 27, 1 ♂ 1 Aug. 1979; Kongsberg, Efteløt, EIS 27, 1 ♀ 6 Aug. 1979. — Telemark: TEi: Bø, Bø, EIS 18, 1 ♂ 25 July 1979. — Aust-Agder: AAY: Tvedestrand, Fiare, EIS 6, 1 ♂ 27 June 1979; Fjære, Fjære kirke, EIS 6, 1 ♂ 27 June 1979. — Vest-Agder: VAY: Lindesnes, Jørgenstad, EIS 1, 1 ♂ 22 July 1976, T. Nielsen.

It is not known whether the specimens reported by Ringdahl (1944b: 13) from Vest-Agder and Nordland (1 ♂ 1 ♀) belong to *maculata* or to *picta*, as Ringdahl (1954a: 19) only recognized one *Graphomya* species. Zetterstedt's records from Nord-Trøndelag («inter Kongsstue & Højfeldbro» in Verdal) and Oslo (Zetterstedt 1845: 1356; 1849: 3276) and Siebke's (1877: 100) records from Østfold (Sarpsborg), Akershus (Enebakk) and Buskerud (Røyken) are probably also in need of revision.

Graphomya picta (Zetterstedt, 1855)

— Rogaland: Ry: Nærbø, Søylandsvatn, EIS 7, 3 ♂ ♂ 15 June 1978, T. Nielsen; Sandnes, Grave- ren, EIS 7, 1 ♂ 8 June 1980; Sola, Gimra, EIS 7, 1 ♀ 19 July 1979; Stavanger, Krossberg, EIS 7, 1 ♀ 3 Aug. 1980.

The female specimen from Gimra carries two *ad* setae in the apical half of each middle tibia. New to Norway.

Spilogona setulosa Ringdahl, 1941

— Rogaland: Ri: Forsand, towards Prekestolen, EIS 7, 8 ♂ ♂ 18 May 1980, 500 m a.s.l., UTM reference: 32V LL 372 427, (2 ♂ ♂ at BMNH).

The species is very characteristic on account of the densely setulose lobes of the fifth sternite (Fig. 1A) and the projecting mouth-edge. In Hennig's key (1959: 261) it comes out together with *S. denudata* (Holmgren, 1869). However, the male terminalia of *setulosa* (Fig. 1 B–F) differ considerably from those of *denudata*, judging by the figures published by Hennig (1955–1964: Taf. XI, Fig. 224, Taf. XII, Fig. 229, Taf. XV, Fig. 307) and Huckett (1965: Figs. 77, 181, 246) for the latter species. The cercal plate of *S. setulosa* is oval

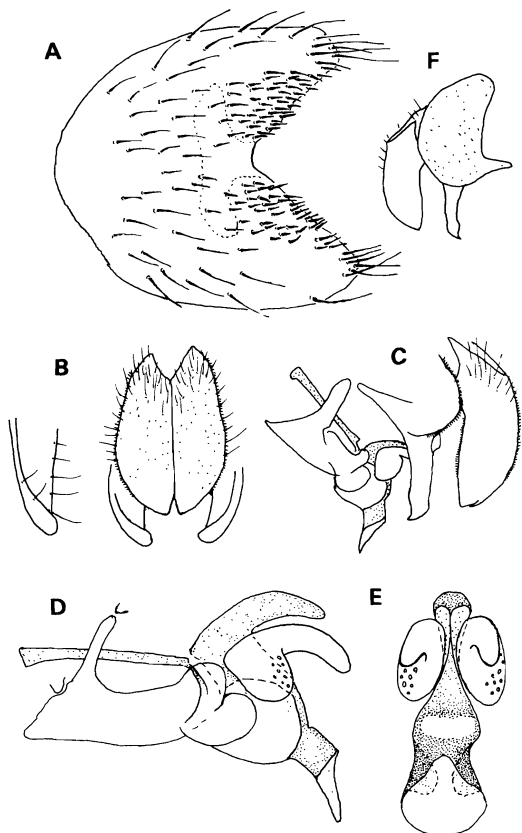


Fig. 1. *Spilogona setulosa* Ringdahl, 1941, male. — A) Fifth sternite, ventral view. — B) Cercal plate and surstyli, posterior view, inset: left surstylus with setulae. — C) Terminalia, left lateral view. Most of the epandrium has been removed. — D) Aedeagal complex, hypandrium and postgonite, left lateral view. Aedeagus, epiphallus and phallosome stippled, very weak stipple indicates unsclerotized parts of aedeagus. — E) Aedeagus, epiphallus and postgonites, posterior view. — F) Cercal plate, surstylus and epandrium (stippled), right lateral view. (G.pr. 17. Glycerol, uncompressed preparation).

and cap-like, with shining and slightly cleft apex. The surstyli are yellow. The pregonite is fused with the hypandrium. Some of the specimens have conspicuous dust on the mentum, in others it is quite glossy. In a few specimens the front tibia, apart from the normal *p* seta at middle, has an additional, slightly weaker *p* seta at about the apical fourth.

The specimens were caught on a very warm day along the tourist path midway between «Prekes-

tolhytta» and «Prekestolen» (Pulpit Rock), a famous site near Lysefjorden. The flies were flying about and alighting in the sun on large boulders covering a small brook in a steep gorge or ravine facing westwards. The locality is in the very uppermost part of the subalpine birch zone at about the tree limit in a mountainous district north of Lysefjorden, which is dominated by naked bedrock criss-crossed by gulleys, steep cliffs and precipices.

This species has been known only from a single male specimen captured the 20 July 1935 (Hugo Andersson, Lund, in litt.) by O. Ringdahl in the alpine region of the Anaris Mountain in southern Jämtland, Sweden (Ringdahl 1941: 220; Hennig 1959: 336—337). Ringdahl (1951) regards the species as arctic, a characterisation which ought to be modified in light of the Norwegian record. New to Norway.

Lispe uliginosa Fallén, 1825

— Finnmark: Fi: Kautokeino, Kautokeino, EIS 157, 1 ♂ 3—4 July 1979, I. & T. Nielsen. New to Norway.

Lispocephala alma (Meigen, 1826)

— Rogaland: Ry: Sandnes, Myklebostad, EIS 7, 1 ♂ 20 May 1979.

«*alma*» has been reported from Northern Norway («Bjoerkvik Nordlandiae») by Zetterstedt (1838: 693, as *Anthomyza spuria*) which record is repeated by Zetterstedt (1846: 1758, as *A. alma* var. b), from Møre og Romsdal («ad Ormem» = Ormheim) by Siebke (1877: 125), from Troms (Tromsø) by Ringdahl (1928: 31), from Rogaland (Klepp, Orre) by Ardö (1957: 153), and from Buskerud (Krødsherad) by Hennig (1961: 483). All these records are in need of revision, however, as several species are contained in «*alma*» in the sense of these authors, among which the following one (Hennig 1964: 1078—1079; Ackland & Pont 1966; Fonseca 1968).

Lispocephala pallipalpis (Zetterstedt, 1845)

— Vest-Agder: VAg: Audnedal, Sveindal, EIS 5, 1 ♂ 7 April 1975, S. Svendsen; Kristiansand, Stangenes, EIS 2, 1 ♂ 13 April 1980, S. Svendsen. This species has previously been reported from Nord-Trøndelag (Sul in Verdal) by Zetterstedt (1845: 1679, as *Anthomyza pallipalpis*). The record is repeated by Siebke (1877: 120).

Coenosia flavicauda Ringdahl, 1932

— Hordaland: HOy: Bergen (Fana), Storetveit, EIS 30, 1 ♂ 20 July 1980; Trollhaugen, EIS 30, 1 ♂ 2 ♀ ♀ 21 July 1980; Fjøsanger, EIS 30, 1 ♂ 1 ♀ 22 July 1980.

Hennig (1961: 552f) has raised some doubts as to the status of this species, and Michelsen (1977: 153) regards it as identical with *C. rufipalpis* Meigen, 1826. My specimens have the palpi entirely dark brown, and otherwise agree exactly with the description of Fonseca (1968: 73).

The species is reported from Norway by Hennig (1961: 553) but without further indication of locality.

ACKNOWLEDGEMENTS

I warmly thank Torbjørn Kloster, Hinna, Tore R. Nielsen, Sandnes and Svein Svendsen, Kristiansand, for the gift of precious material; Hugo Andersson, Lund, for information concerning a specimen in Ringdahl's collection; and Adrian C. Pont, London, for most kindly having verified my identifications, given help with old and new literary records, and provided information on Norwegian specimens in the possession of British Museum (Natural History), London, and Canadian National Collection, Ottawa.

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Received 25 Febr. 1981.

Short communications

RANTUS NOTATICOLLIS AUBÉ (COL., DYTISCIDAE) A SPECIES NEW TO NORWAY DAG DOLMEN AND ODDVAR HANSEN

The water-beetle *Rantus notaticollis* Aubé is reported new to Norway. Five records have been made in Central Norway. This is surprisingly far north and west compared to the nearest Scandinavian finds, in southern Sweden.

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During investigations (DD) of a eutrophic pond, in 1971 in Trondheim, it appeared that one of the water-beetles collected was *Rantus notaticollis* Aubé, a species which previously has not been reported from Norway. Only one specimen was found.

At the Museum of the Royal Norwegian Society of Sciences and Letters, in Trondheim, however, two more specimens, not correctly identified, were later found in Bjarne Lysholm's large collections of Norwegian beetles. One was labelled «Stjørdalen», the other «Grong», both in Central Norway.

In 1973 five new specimens were collected from a eutrophic pond in Verdalen (DD). In 1980 one specimen was found in Sunndalen in Møre og Romsdal province (OH). The records are listed in Table 1.

The species has been known to have a distinct southern/eastern distribution in Fennoscandia.

It is previously known from the extreme southern Sweden (Skåne, Småland, Gotska Sandön) and from South Finland (in the east as far north as Savonia australis and Karelia borealis). In Denmark it is present on the main islands, but it is not found on the British Isles (Lindroth 1960). The records in Central Norway are thus situated far from the previously known distribution area, and surprisingly far north and west.

All finds made in Central Norway by the authors are situated 50–60 m above sea level, in areas with relatively favourable climate conditions. In all three cases the beetles have been caught by net catching in the abundant vegetation in the water close to the shore of the ponds. The areas surrounding the ponds are arable land on clay ground with some stands of deciduous trees (*Alnus incana*) (DD) or fertile *Alnus* woods/scree (OH). The vegetation of the ponds consists mainly of *Carex* spp.; *Potamogeton natans* were present in two or three ponds, and *Menyanthes trifoliata* and *Comarum palustre* in one. Table 1 lists some of the hydrographical data from the localities.

The presently known distribution of the species in Central Norway, and the apparent preference for good edaphic and climatic conditions indicate an early immigration to this region, probably from east (Sweden) during a postglacial period of favourable climate.

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Received 10 Nov. 1981.

Table 1. Records of *Rantus notaticollis* Aubé in Central Norway (Province abbreviations are according to Strand 1943).

Province	Municip.	Locality	UTM-grid	Alt. (m)	Coll.	Date	Lake colour	pH	Spec. conductivity (K ₁₈) μS/cm
NTi	Grong	—	—	—	BL	—	—	—	—
NTi	Stjørdal	—	—	—	BL	—	—	—	—
NTi	Verdal	Fåra	32V PR 308758	50	DD	8 Sep. 1973	green	7.3	350
STi	Trondheim	Madsjø	NR 737341	60	DD	30 July 1971	greygreen	7.2	260
MRi	Sunndal	Vinnu	MQ 835478	50	OH	20 Aug. 1980	brown/yellow	—	—

LATHROBIUM PALLIDUM NORDMANN (COL., STAPHYLINIDAE) NEW TO NORWAY

PREBEN S. OTTESEN

Lathrobium pallidum Nordmann is reported new to Norway. One specimen was caught on 3 May 1981 in the burrows of the ground vole on the island Rambergøya, Oslo county.

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On 3 May 1981 the Oslo-branch of the Norwegian Entomological Society arranged an excursion to the islands Gressholmen and Rambergøya, Oslo county in the inner Oslo fjord. The two islands are connected by a narrow land-bridge which on the Rambergøya side expands into a flat, wet meadow heavily penetrated by the burrow systems of the ground vole (*Agricola terrestris* (L.)). The runways were investigated for insects, and among the species caught was one specimen of the staphylinid beetle *Lathrobium pallidum* Nordmann. The species has previously not been reported found in Norway (Silfverberg 1979). The specimen is deposited in the author's collection.

In Scandinavia *L. pallidum* is a rare beetle which has been caught as sole specimens on scattered localities in southern Sweden and Denmark. Although the majority has been found on the ground surface, it is assumed that the beetle is mainly subterranean and in some way dependent on the burrows of small rodents or the mole (Palm 1963, Hansen 1964, Baranowski 1978, 1979). The present Norwegian record is in accordance with this view.

ACKNOWLEDGEMENT

I wish to thank Stig Lundberg, Luleå for verifying the identification of the species.

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Received 6 Nov. 1981.

ALEOCHARA BIPUSTULATA (L.) (COL., STAPHYLINIDAE) PARASITIZING DELIA FLORALIS FALLÉN (DIPT., ANTHOMYIIDAE)

ARILD ANDERSEN

Aleochara bipustulata (L.) is shown to parasitize *Delia floralis* Fallén in the laboratory. A high mortality of 90% agrees with the fact that the beetle rarely parasitize *D. floralis* in the field. Some data on the duration of the different stages at 21°C are given. The hatched specimens were relatively large, measuring 5.0–5.5 mm.

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In surveys of parasites of *Delia brassicae* Wiedemann and the somewhat larger *D. floralis* Fallén in Norway, Sundby and Taksdal (1969) did not find *Aleochara bipustulata*, but the closely related species *A. bilineata* Gyll. (19,000 puparia were investigated). From other countries *A. bipustulata* is known to parasitize *D. brassicae* to a small extent and rarely to parasitize *D. floralis* (Wishart 1957, Fuldner 1960).

During the summer 1976 about 15 specimens of *A. bipustulata* were caught in southeastern Norway and kept in the laboratory at 21°C. They fed on larvae of *Tenebrio molitor* until 20 Sept. From this date until 7 Febr. 1977 (= 144 days) they were kept at +3°C without food, when they were again given 21°C and fed on eggs of *D. floralis* and larvae of *T. molitor*.

The females quickly started their egg-laying, and after a week the first larvae were observed. This is in good agreement with data in Fuldner (1960). Ninety of the *A. bipustulata*-larvae were each offered one puparium of *D. floralis* (stored for 3 months at +3°C prior to this experiment) in a petri dish (d = 50 mm) with fine sand. The *A. bipustulata*-larvae entered into at least 31 of the puparia, and from these 7–9 beetles and 2 flies developed, from the remaining 22 puparia no insect emerged. This mortality of 90.0% for the *A. bipustulata*-larvae is high compared with 20% for *A. bilineata*-larvae parasitizing *D. brassicae* at 22.5°C (Fuldner 1960). However, these staphylinids, and especially the smaller *A. bipustulata* prefer smaller dipterous species, as remains of the fly in the larger puparia of *D. brassicae*

and *D. floralis* often kills the *Aleochara*-pupae (Fuldner 1960). Seen on this background the high mortality in the present investigation is not unexpected.

One fully grown *A. bipustulata*-larvae was observed in the puparium after 16 days and one pupae after 17 days. Seven beetles emerged from the 34. day onward, and this is in good agreement with data in Fuldner (1960) for *A. bipustulata* parasitizing *D. brassicae*.

All but one of the beetles were anaesthetized with ether and then measured to between 5.0—5.5 mm. The last, unmeasured specimen was somewhat smaller. This fits well with data in Fuldner (1960) for *A. bipustulata* parasitizing *D. brassicae*, while other authors gives values between 1.5—4.5 (de Wilde 1947, Palm 1972). The differences is probably due to measuring dead or alive beetles, as mentioned by Fuldner (1960), or to host-species being of different sizes.

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Received 16 Dec. 1981.

CRYPTACIURA ROTUNDIVENTRIS (FALLÉN, 1820) DIPT., TEPHRITIDAE) NEW TO NORWAY LITA GREVE

Cryptaciura rotundiventris (Fallén, 1820) is reported new to Norway. Two males were netted at Belle, Aurland, Sogn and Fjordane province, EIS: 42 on 22. July 1981, and one female was netted in Simadalen, Eidfjord, Hordaland province on 10. August 1981 EIS: 41. At Belle the locality was a wet meadow, in Simadalen in a forest of *Alnus incana*.

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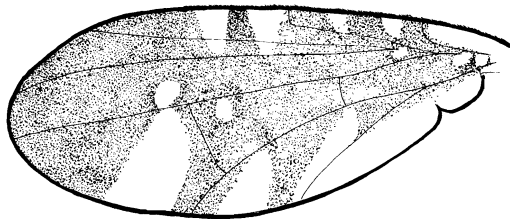


Fig. 1. *Cryptaciura rotundiventris* (Fall.) Wing.

The family *Tephritidae* in Norway has not been a subject of any survey. The list in Siebke, H. (1877) is still a main source of information. Recent work has only been done on some species of economic importance like Ausland, O. (1951) on *Rhagoletis cerasi* L. and Mehl, R. (1980) on *Ceratitis capitata* (Wiedemann).

Two males of *Cryptaciura rotundiventris* (Fallén) were caught with an insect net on 22 July at Belle, Aurland, Sogn and Fjordane province, EIS: 42. The locality was a wet meadow situated near a cluster of alder (*Alnus incana*) bordering to the river. The sun had at the time of capture been shining for hours, still the bottom vegetation of the meadow was quite damp. Two hours at least were spent searching for more specimens, but none were found.

A female was netted on 10 August 1981 along the road leading through the alder (*Alnus incana*) forest at the fjord bottom of Simadalen, Eidfjord, Hordaland province, EIS: 41. The forest is fairly dense and the high populations of snails suggest that the bottom vegetation never dries out completely. The one female specimen was the only found during two or three hours collecting.

The characteristic wing-pattern is sufficient to identify *C. rotundiventris* from other *Tephritidae* in middle and northern Europe, see Fig. 1.

C. rotundiventris is known from Sweden, Denmark and Finland. Wahlgren (1919) reports the species to be rare in Sweden.

In the collection in the Zoological Museum in Copenhagen there are six specimens from a few localities which shows the species to be fairly rare in Denmark. *C. rotundiventris* is also included in the British check-list (1976). Kabos (1959) reports the species to be rare in the Netherlands and says the host-plant for the larvae is unknown.

C. rotundiventris has not been found in the coastal parts of western Norway despite that my collection of *Tephritidae* has been going on for the last years. The localities in inner Sogn and Fjordane and inner Hordaland province could

suggest the species to favour a more continental climate, or perhaps higher summer temperatures than in the outer coastal parts.

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Received 8 Jan. 1982.

TROGULUS TRICARINATUS (L. 1767) (OPILIONES, TROGULIDAE) RECORDED FOR THE FIRST TIME IN NORWAY

TORSTEIN SOLHØY

Trogulus tricarinatus (L.) is reported for the first time from Norway. One specimen was caught in a garden near Arendal, South Norway. The species has till now in Fennoscandia only been found in southern parts of Denmark and in Sweden.

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During the summer and early autumn (June—20 Sept. 1981) ten pitfall traps were run in a garden at Hasselåsen, Arendal, South Norway (EIS: 11). They were half filled with 4% formalin at the start of the catching period, and were not emptied before they were removed in September.

The garden is quite ordinary, but there seems to be quite a lot of different microhabitats due to a mixture of small lawns, flower beds, different types of bushes, a few fruit trees, some pine trees, a spruce hedge and a sycamore tree. The size of the garden is about 900 m² included small outcrops of rock and it is situated about 110 m a.s.l. The garden as well as the neighbouring gardens are about 25 years old.

Prior to cultivation, the area was covered with a mixed oak and pine forest with quite acid soil.

The ten traps were placed at intervals along the margin of the garden and the material caught in the individual traps was treated separately in order to get an idea of the microdistribution of the different taxa.

The most unexpectedly catch of a single specimen of *Trogulus tricarinatus* was done in trap no. 2 in the southeastern corner of the garden under the sycamore tree. The ground here is covered with grasses, some mosses and patches of *Cerastium biebersteinii*.

Description, biology and distribution of *T. tricarinatus* are dealt with by Martens (1978). It is a middle European species which is known only from a limited number of places in south Denmark and Bornholm, southeastern Scania in Sweden and in the south of England (Distribution map by Martens (1978) (p. 166).

The finding place of the species near Arendal in South Norway is quite isolated compared with its known distribution area. It is situated about 270 km north of the most northern Danish locality, about 400 km northeast of the most eastern Swedish locality. It is, however, impossible to judge if the species has been imported with plant material and there after established populations in gardens, parks and other man-made habitats along the south coast of Norway, or if it is an older resident of natural habitats. According to Martens (1978) *T. tricarinatus* is found in different types of woods in middle Europe, both humid and dry ones, but with a pronounced higher population on limerich soil. The preference for soil rich in lime is obviously connected with its feeding behaviour, as the main prey items are different species of land snails, which also show highest densities in such soils. *T. tricarinatus* must also apparently require rather high temperature during its active period, being as far as we know confined to middle Europe and the southern parts of Fennoscandia and England. Thus the best places to search for it in natural habitats in southern Norway seems to be southfacing slopes with deciduous wood, scrubs or grassland.

The catchment of one single specimen of *T. tricarinatus* does not necessarily imply a low population density. The species is rather slowmoving and pitfall trapping is probably not a very good method of obtaining it.

ACKNOWLEDGEMENTS

I am indebted to my father Severin Solhøy for help during the field work, to technical assistant Olga Johnsen for sorting the samples and to professor Hans Kauri for confirming my determination.

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Received 11 Nov. 1981.

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Ad forrige hefte av Serie B (Vol. 28 No. 2):

Uheldigvis ble bare halvparten av Table 1 (s. 54) trykket. I dette hefte er vedlagt en ny side 54 sammen med en side kalt 54 a. Baksiden av den nye side 54 kan klebes oppå den gamle side 54.

Addendum: Bengtson, S.A. 1981. *Fauna norv. Ser. B 28, 52—82.*

Unfortunately only *half* of Table 1 (p. 54) was printed. The complete table is enclosed in the present issue.