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Studies on Norwegian Aphids (Hom., Aphidoidea) I
The subfamily Dactynotinae Börner

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Abstract: TAMBS-LYCHE, HELENE. 1968. Studies on Norwegian Aphids (Hom., Aphidoidea) I. The subfamily Dactynotinae Börner. *Norsk ent. Tidsskr.* **15**, 1-17.
The present paper is the first of a series which will give a survey of the Norwegian aphid fauna, based upon the author's own collections and information already published. It comprises the subfamily Dactynotinae Börner, totalling 63 species, 20 of which are recorded for the first time from Norway in the present paper. The species new to Norway are the following: *Aulacorthum cylactis* Börner, *Aulacorthum palustre* Hille Ris Lambers, *Aulacorthum rufum* Hille Ris Lambers, *Acyrthosiphon loti* (Theobald), *Subacyrthosiphon cryptobium* Hille Ris Lambers, *Metopolophium frisicum* Hille Ris Lambers, *Metopolophium tenerum* Hille Ris Lambers, *Cryptaphis poae* (Hardy), *Corylobium avellanae* (Schrank), *Macrosiphum weberi* Börner. *Macrosiphoniella tapuskae* (Hottes and Frison), *Macrosiphoniella usquertensis* Hille Ris Lambers, *Dactynotus cichorii* (Koch), *Dactynotus muralis* (Buckton), *Dactynotus obscurus* (*Koch*), *Dactynotus pilosellae* Börner, *Dactynotus sonchi* (Linné), *Dactynotus tanaceti* (Linné), *Megourella purpurea* Hille Ris Lambers, *Megourella tribulis* (Walker). *Aulacorthum palustre* and *Cryptaphis poae* are recorded for the first time from Scandinavia.

INTRODUCTION

The earliest records of aphids from Norway concern a few species mentioned by Strøm (1762) and Fabricius (1779). The identity of these species is, however, doubtful. The first and only somewhat comprehensive list of aphid species for the country was published by Siebke (1874). It lists 53 species, each of them referring to Kaltenbach's monography (1843). The identifications have not so far been revised, and in the following study they are referred to, when not specially mentioned, as identical with Kaltenbach's species.

In his review of Zetterstedt's aphid species from Lapland Wahlgren (1939) discusses a few records from Norway, and other records are found in Theobald's (1926-29) work on British aphids. W. M. Schøyen (1893-1913) and T. H. Schøyen (1914-1941) give records of aphids occurring as pests on cultivated plants. The present author (see references), Ossiannilsson (1962) Fjelddalen (1964) and Heikinheimo (1966) have all contributed to the knowledge of the Norwegian aphid fauna.

The author started investigations on Norwegian aphids more than twenty years ago, and in the first instance studied aphids on potato plants (Tambs-Lyche 1950, 1957). During extensive travels in connexion with these collections several other species were also sampled.

Collections of Norwegian aphids have been continued by travels in different parts of the country. Most of the collections, however, come from western Norway, particularly from the surroundings of Bergen and from Hardanger. During the years 1954-56 yellow traps (Moericke-traps) were used near Bergen, near Stavanger and at the Agricultural College at Ås near Oslo, and very extensive collections were made. They have been worked up and practically all species identified. A preliminary report has been published (Tambs-Lyche 1956). The material could not, however, be

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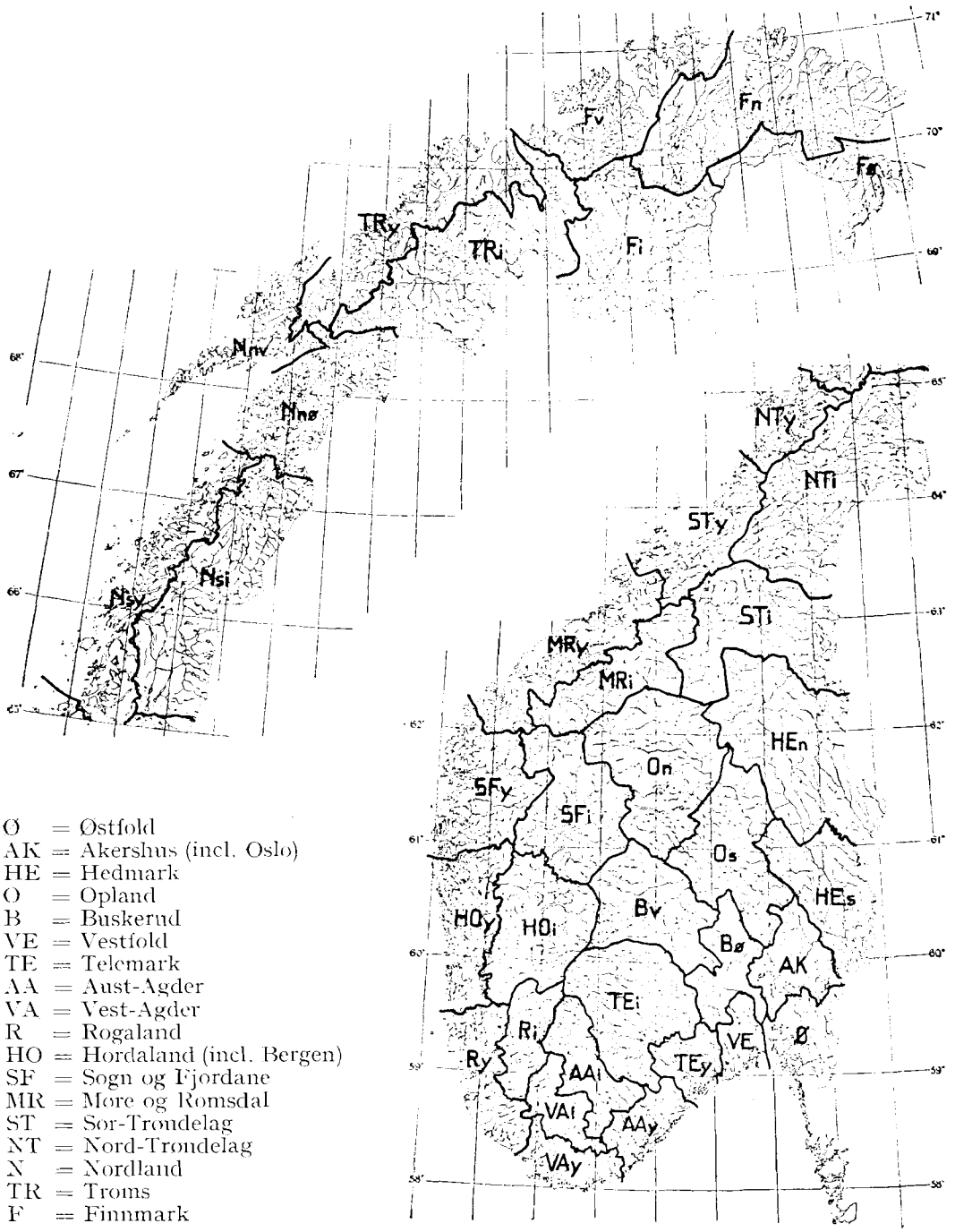

O = Østfold
AK = Akershus (incl. Oslo)
HE = Hedmark
O = Opland
B = Buskerud
VE = Vestfold
TE = Telemark
AA = Aust-Agder
VA = Vest-Agder
R = Rogaland
HO = Hordaland (incl. Bergen)
SF = Sogn og Fjordane
MR = More og Romsdal
ST = Sør-Trøndelag
NT = Nord-Trøndelag
N = Nordland
TR = Troms
F = Finnmark

Fig. 1. Districts of Norway with explanation of the abbreviations used in the present paper. The districts are subdivided in zones: i (inner), y (outer), n (northern), s (southern), v (western) and ø (eastern). From Strand (1943).

fully utilized unless the main features of the Norwegian aphid fauna were better known as a background. It was therefore decided to work up the author's main collection with the purpose of giving an overall survey of the fauna, before the ecological and biological results of the trap collections were discussed.

The present paper is the first of a series which will give a survey of the Norwegian aphid fauna, based upon the author's own collections and such information as has already been published. It comprises the subfamily Dactynotinae Börner, 63 species in all, 20 of which are recorded for the first time from Norway in the present paper.

The geographical distribution of the different species is mostly cited from Hille Ris Lambers (1938, 1939, 1947, 1949, 1953) and Börner (1952). In addition it has been mentioned if the species occurs in the nearest countries, e.g. Sweden (Ossiannilsson 1959), Denmark (Heie 1960, 1961, 1962, 1964a, 1967, Reitzel 1965), Finland (Heie & Heikinheimo 1966, Heikinheimo 1944, 1963, Thuneberg 1960, 1962, 1963, 1966), Iceland (Heie 1964b, Hille Ris Lambers 1955, Prior & Stroyan 1960) and Great Britain (Kloet & Hincks 1964), where such information may be of interest. In the locality lists the abbreviations for the different parts of the country refer to the map in Fig. 1.

All finds recorded are by the author, when no other collector is mentioned. The author's collection will be deposited at the Zoological Museum, University of Bergen.

LIST OF SPECIES

Microlophium evansi (Theobald)
Aulacorthum circumflexus (Buckton)
* *A. cylactis* Börner
** *A. palustre* Hille Ris Lambers
* *A. rufum* Hille Ris Lambers
A. solani (Kaltenbach)
Acyrthosiphon aurlandicus Heikinheimo
A. caraganae (Cholodkovsky)
A. auphorbia subsp. *neerlandicus* Hille Ris Lambers
A. ignotus Mordvilko
* *A. loti* (Theobald)
A. malvae (Mosley)
A. pisum (Harris)
* *Subacyrthosiphon cryptobium* Hille Ris Lambers
Matopolophium albidum Hille Ris Lambers
M. dirhodum (Walker)
M. fesucae (Theobald)
* *M. frisicum* Hille Ris Lambers
* *M. tenerum* Hille Ris Lambers
** *Cryptaphis poae* (Hardy)
* *Corylobium avellanae* (Scharnk)
Macrosiphum cholodkovskyi Mordvilko
M. daphnidis Börner
M. euphorbiae (Thomas)
M. gei (Koch)
M. melampyri Mordvilko
M. rosae (Linné)
* *M. weberi* Börner
(Sitobion) avenae (Fabricius)
(Sitobion) fragariae (Walker)
Macrosiphoniella absinthii (Linné)
M. artemisiae (Boyer de Fonscolombe)
M. chamomillae Hille Ris Lambers
M. millefolii (de Geer)
M. oblonga (Mordvilko)
M. saborni (Gillette)
M. sejuncta (Walker)
M. tanacetaria (Kaltenbach)
* *M. tapuskae* (Hottes and Frison)
* *M. usquertensis* Hille Ris Lambers
Dactynotusà achilleae (Koch)
* *D. cichorii* (Koch)
* *Dactynotus muralis* (Buckton)
* *D. obscurus* (Koch)
* *D. pilosellae* Börner
* *D. sonchi* (Linné)
* *D. tanaceti* (Linné)
D. tussilaginis (Walker)
(Uromelan) aeneus Hille Ris Lambers
(Uromelan) campanulae (Kaltenbach)
(Uromelan) jacea (Linné)
(Uromelan) similis Hille Ris Lambers

(Uromelan) solidaginis (Fabricius)
(Uromelan) taraxaci (Kaltenbach)
Metopeurum fuscoviride Stroyan
Amphorophora ampullata Buckton
A. rubi (Kaltenbach)
Delphinobium junackianum (Karsch)
Megoura viciae Buckton
* *Megourella purpurea* Hille Ris Lambers
* *M. tribulis* (Walker)
Wahlgreniella ossiannilssoni Hille Ris Lambers
W. vaccinii (Theobald)

* New to Norway
** New to Scandinavia

SUBFAMILY DACTYNOTINAE BÖRNER

MICROLOPHIUM Mordvilko 1914

Microlophium evansi (Theobald 1923)

I. H. Siebke 1874: *Aphis urticae* Schrank.

First published from Norway by Siebke (1874) from AK. Oslo. Heikinheimo (1966) recorded the species from SFi: Aurland.

VE: Larvik on *Urtica* sp. 28. VII 1944. Bv: Hol: Bardøla, Geilo by thrashing mixed vegetation 23. VIII 1963. HOi: Kvinnherad: Sundevågen on *Urtica* sp. 9. VIII 1949.

Trappings in yellow trays: AK. Ås: Vollebekk, Ry: Hetland: Forus, HOy: Fana: Stend and Biological Station.

Geographical distribution: Europe. It is known from Sweden, Denmark, Finland and Great Britain.

AULACORTHUM Mordvilko 1914

Aulacorthum circumflexus (Buckton 1876)

Tambs-Lyche (1950, 1961): *Neomyzus circumflexus* (Buckton)

First published from Norway by Tambs-Lyche (1950) with a list of records from greenhouses. More records from greenhouses were published by Tambs-Lyche (1961) and by Fjelddalen (1964).

HOy: Fana: Biological Station on *Senecio vulgaris* 13. VIII 1954 and on *Streptocarpus* (pot plant indoor) 28. XI 1955. Bergen: Botanical garden on tulips in greenhouse. 1. III 1954. Nnv: Hadsel on *Anemone* sp. in greenhouse 15. VII 1950.

The species is usually found in greenhouses, and all earlier records from Norway are from greenhouses or other indoor places. The record from Biological Station on *Senecio* consisted of a colony of alate and apterous viviparae. The host plant was growing just outside the laboratory building.

Geographical distribution: Cosmopolitan.

Aulacorthum cylactis Börner 1942.

Published here for the first time from Norway.

Os: Ringebu: Venabu on *Rubus chamaemorus* 1. IX 1961 (oviparae).

The species was found on the underside of the leaves of *Rubus chamaemorus* in small colonies consisting of apterous viviparous females and oviparous females, also a few immature oviparae.

The species has been recorded from *Rubus saxatilis* by several authors. The find of oviparae on *Rubus chamaemorus* indicates that this plant may also serve as host.

Geographical distribution: Germany, Netherlands, Sweden, Denmark, Finland.

Aulacorthum palustre Hille Ris Lambers 1947.

Published here for the first time from Norway, and also for the first time from Scandinavia.

HOy: Fana: Bjelkarøy 19. VI 1953 on *Hypochoeris radicata,* Mariholmen 16. IX 1953 on *Leontodon autumnalis* (oviparae).

The find from Bjelkarøy consisted of a single aptera. On Mariholmen both apterous viviparous and oviparous females were found.

Geographical distribution: Netherlands, Germany, Great Britain.

Aulacorthum rufum Hille Ris Lambers 1947.

Published here for the first time from Norway.

On: Ringebu: Venabu by thrashing *Vaccinium* spp. and *Empetrum* 1. IX 1961 (oviparae). HOy: Fana: Nordre Eggholmen on *Vac-*

cinium myrtillus 24. VI 1953, Titlestad on *Vaccinium myrtillus* 5. X 1963 (oviparae, alate ♂).

The species was found as a single aptera on *Vaccinium myrtillus* on Nordre Eggholmen, Fana. At Venabu, Ringebu, one single oviparous female was found by thrashing a mixed vegetation consisting of *Empetrum* sp., *Vaccinium myrtillus* and *V. vitis-idaea*. At Titlestad, Fana, one oviparous female, one immature ovipara and one alate male were found. The oviparous female was light dirty reddish, a little greenish just around the siphunculi, and the alate male was greenish of colour.

Geographical distribution: Netherlands, Germany, Great Britain, Sweden.

Aulacorthum solani (Kaltenbach 1843)

Tambs-Lyche (1950): *Aulacorthum pseudosolani* (Theobald).

Records from potato and greenhouses were published by Tambs-Lyche (1950, 1957, 1961). Fjelddalen (1964) published records from greenhouses and from potato. Ossiannilsson (1962) recorded the species from Bø: Drammen on *Matricaria inodora*.

Ø: Hvaler: Reff on indoor pot plant 4. VII 1953, Fredrikstad on *Hibiscus* (indoor) 3. IV 1954. AK: Ås on *Stachys paluster* 2. VIII 1965 (leg. Heikinheimo, in litt.) HOy: Fana: Stend on potato 24. VIII 1955 and on *Calceolaria* 20. VIII 1955, Spikaren on *Potentilla anserina* 16. VIII 1961. Lindås: Lygra on potato 14. VII 1948. HOi: Kvinnherad: Sundevågen on *Digitalis purpurea* 9. VIII 1949. Fn: Nordkapp: Honningsvåg on *Achillea millefolium* 24. VII 1955 (leg. L. Cederholm).

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus, HOy: Fana: Stend.

Geographical distribution: The species has a very wide distribution and may be regarded as cosmopolitan.

ACYRTHOSIPHON Mordvilko 1914

Acyrthosiphon aurlandicus Heikinheimo 1966.

The species was described and published by Heikinheimo (1966) from SFi: Aurland. It is not known from other localities.

Acyrthosiphon caraganae (Cholodkovsky 1907).

First published from Norway by Ossiannilsson (1962) from Bø: Drammen. Fjelddalen (1964) published records from AK: Ås.

Os: Nord-Aurdal: Valdres agric. school 1. VIII 1945. Bø: Modum: Buskerud agric. school 9. VIII 1945. Hoy: Bergen: Botanical garden 15. VI 1961. NTi: Skogn: Staup horticult. school 19. VII 1950. All finds on *Caragana* sp. At Staup horticultural school the species was also taken on *Prunus cerasifolia* (most likely an accidental host).

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus.

Geographical distribution: Russia, Poland, Germany, Netherlands, England, Sweden, Denmark, Finland.

Acyrthosiphon euphorbiae Börner 1940, subspecies *neerlandicus* Hille Ris Lambers 1947.

Published from Norway and for the first time from Scandinavia by Ossiannilsson (1962) from AK: Oslo.

Geographical distribution: The species is known from the Netherlands.

Acyrthosiphon ignotus Mordvilko 1914.

First published from Norway by Ossiannilsson (1962) from Bø: Drammen. Fjelddalen (1964) published records from AAv: Herefoss and SFi: Balestrand.

Geographical distribution: Northern Russia, Germany, Sweden, Denmark.

Acyrthosiphon loti (Theobald 1912)

Published here for the first time from Norway.

HOy: Vikebygd: Førde 12. VIII 1958, Fana: Biological Station 29. VII 1952, Nordre Eggholmen 15. VI 1953, Sund: Tussøy 24. VII 1952. HOi: Kvinnherad: Gjermundshamn 14. VIII 1958. All finds on *Lotus corniculatus*.

Trappings in yellow trays: HOy: Fana: Biological Station and Stend.

Geographical distribution: Great Britain, Netherlands, Germany, Sweden and Denmark.

Acyrthosiphon malvae (Mosley 1841) sensu latiore.

H. Siebke 1874: *Aphis pelargonii* Kaltenbach.

First published from Norway by Siebke (1874) from AK: Oslo. Records published by Tambs-Lyche (1961) from Ø: Fredrikstad (*Acyrthosiphon malvae* s.s.), by Ossiannilsson (1962) from Bø: Drammen, by Fjelddalen (1964) from Ø: Fredrikstad and by Heikinheimo (1966) from SFi: Aurland. The subspecies *geranii* Kaltenbach was published by Tambs-Lyche (1961) from On: Vågå on *Geranium* sp.

Trappings in yellow trays: HOy: Fana: Biological Station.

Geographical distribution: Europe, USA.

Acyrthosiphon pisum (Harris 1776)

Siebke (1874) records *Aphis pisi* Kaltenbach (mentioned by Fjelddalen 1964). *Aphis pisi* Kaltenbach is, however, only partly a synonym of *Acyrthosiphon pisum* (Harris), and Siebke's record must refer to *Macrosiphum cholodkovskyi* (see page 7). This species is probably referred to as *Macrosiphum pisi* in the State Entomologists' Annual Report in 1926. (T. H. Schøyen 1922-1941.) The species is recorded by Tambs-Lyche (1961), by Ossiannilsson (1962), by Fjelddalen (1964) and by Heikinheimo (1966).

Os: Eina on *Vicia* sp. 1. IX 1961 (ovipara). On: Vågå: Vågåmo on *Vicia cracca* 11. VII 1953. Bø: Modum: Buskerud agric. school on *Pisum sativum* 9. VIII 1945. Øvre Eiker: Sem on *Vicia cracca* 8. VIII 1945. Ry: Klepp: Øksnevad on *Matricaria inodora* 30. VIII 1955, Hetland: Forus on *Trifolium hybridum* 30. VIII 1955. HOy: Bømlo: Espevær by thrashing mixed vegetation 12. VIII 1958, Stord: Degernessund on *Lotus corniculatus* 17. VII 1953, Austevoll: Hækjingen on *Lotus corniculatus* 21. VIII 1953, Fana: Stend on *Trifolium pratense* and on *Vicia cracca* 26. VIII 1955, Biological Station on *Lotus corniculatus* 6. VI 1957, Sund: Tussøy on *Lotus corniculatus* 21. VIII 1953. HOi: Ulvik: Hjeltnes on *Vicia* sp. 15. VIII 1958. SFi: Stryn: Loen by sweeping grasses 2. VIII 1942 (leg. Nils Knaben).

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus, HOy: Fana: Stend and Biological Station.

Geographical distribution: The species is distributed all over the world.

SUBACYRTHOSIPHON Hille Ris Lambers 1947

Subacyrthosiphon cryptobium Hille Ris Lambers 1947.

Published here for the first time from Norway.

AK: Ås: Vollebekk, trapped in yellow trays.

According to Hille Ris Lambers the species lives on the older parts of the lying stems of *Trifolium repens.* I have not as yet found the species on its host plant in Norway.

Geographical distribution: Netherlands, Great Britain, Sweden.

METOPOLOPHIUM Mordvilko 1914

Metopolophium albidum Hille Ris Lambers 1947.

First published by Tambs-Lyche (1957) from Nsy: Mosjøen and Try: Kvæfjord.

HOy: Fana: Stend on unidentified grasses 11. VI 1954, Store Milde on unidentified grasses 28. V 1959. HOi: Eidfjord on *Agrostis* sp. 15. VIII 1958. TRy: Tromsøysund: Holt on *Achillea millefolium* (probably accidentally).

Trappings in yellow trays: AK: Ås: Vollebekk, HOy: Fana: Biological Station.

Geographical distribution: The species is known from Netherlands, Germany, Great Britain and Sweden.

Metopolophium dirhodum (Walker 1848).

First published from Norway by Tambs-Lyche (1957) from Nsy: Tjøtta and in 1961 from Nnv: Vesterålen, by Ossiannilsson (1962) from Bø: Drammen and VE. Strømm, by

Fjelddalen (1964) from VE: Sem and Borre and Nnv: Hadsel.

AK: Ås on *Avena sativa* 11. VIII 1965 (leg. Heikinheimo, in litt.). HOy: Vikebygd: Førdespollen on *Agrostis tenuis* 12. VIII 1958, Tysnes: Ånuglo on *Rosa* sp. 17. IX 1953. Fana: Biological Station on *Rosa* sp. 2. VI 1951 and 23. IX 1961 and on *Sorbus intermedia* 23. IX 1961. Nsy: Bodin: Vågønes on *Avena sativa* 2. VIII 1950.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus, HOy: Fana: Biological Station.

Geographical distribution: Europe, North America. It is known from Sweden, Denmark, Finland, Iceland and Great Britain.

Metopolophium festucae (Theobald 1917)

First published from Norway by Heikinheimo (1966) from SFi: Aurland.

Ry: Klepp: Øksnevad on *Poa* sp. 29. VIII 1955. HOy: Fana: Biological Station on *Juncus effusus* 6. VIII 1952 and on unidentified grasses 5. VI 1961, Stend on *Achillea millefolium* (accidentally) 26. VIII 1955 and on unidentified grasses 29. VI 1954, Rådal on *Luzula silvatica* 15. VI 1954.

Trappings in yellow trays: Ry: Hetland: Forus, HOy: Fana: Stend and Biological Station.

Geographical distribution: Great Britain, Netherlands, Germany, Sweden, Denmark, Finland, Iceland.

Metopolophium frisicum Hille Ris Lambers 1947.

Published here for the first time from Norway.

HOy: Fana: Biological Station on unidentified grasses 5. VI 1961, Rådal on *Frageria vesca* 8. VI 1954.

Trappings in yellow trays: HOy: Fana: Stend and Biological Station.

Geographical distribution: Netherlands, Great Britain, Germany, Sweden.

Metopolophium tenerum Hille Ris Lambers 1947.

Published here for the first time from Norway.

Ry: Hetland: Forus by thrashing of grasses 22. VIII 1956. HOy: Fana: Biological Station by thrashing of grasses 5. VI 1961, Festevik by thrashing of grasses 21. VI 1959, Rådal on *Deschampsia flexuosa* 8. VI 1958.

Geographical distribution: Netherlands, Great Britain, Germany, Sweden.

CRYPTAPHIS Hille Ris Lambers 1947

Cryptaphis poae (Hardy 1850)

(= *C. setiger* Hille Ris Lambers 1947)

Published here for the first time from Scandinavia.

HOy: Fana: Stend trapped in yellow trays.

I have not as yet found the species on its host plants, which according to Hille Ris Lambers are *Festuca ovina* and *Holcus mollis*.

Geographical distribution: Netherlands, Great Britain.

CORYLOBIUM Mordvilko 1914

Corylobium avellanae (Schrank 1801)

Published here for the first time from Norway.

HOy: Fana: Lønningehamn on *Corylus avellana* 12. VIII 1961.

The species was found as two apterae on the petioles of young shoots. One specimen was of a reddish brown colour, the other was green.

Geographical distribution: Europe. It is known from Sweden, Denmark, Finland and Great Britain.

MACROSIPHUM Passerini 1860

Macrosiphum cholodkovskyi Mordvilko 1909.

H. Siebke 1874: *Aphis pisi* Kaltenbach

First recorded from Norway by Siebke (1874). According to Hille Ris Lambers (1939) Kaltenbach's *Aphis pisi* is partly synonymous with *Macrosiphum cholodkovskyi* Mordvilko. As Siebke's record is from *Spiraea ulmaria (= Filipendula ulmaria)* it seems reasonable to record his find under this species.

VE: Tjøme: Kolabekk (host not noted) 1. VIII 1944. Ry: Klepp: Øksnevad on *Sanguisorba officinalis* 27. VIII 1956. HOy: Fana: Fjøsanger 18. VI 1944, Eggholmen 15. VI 1953, Kuholmen. 7. VI 1954 and Festevik 21. VI 1959, all finds on *Filipendula ulmaria*. HOi: Kvinnherad: Bjellandshamn on *Filipendula ulmaria* 13. VII 1949. Nsi: Saltdal: Drageid on *Filipendula ulmaria*.

Geographical distribution: Europe, Western Asia.

Macrosiphum daphnidis Börner 1940

Published from Norway by Ossiannilsson (1962) from AK: Oslo.

Geographical distribution: Germany, Great Britain, Sweden, Denmark, Finland.

Macrosiphum euphorbiae (Thomas 1878)

First published from Norway by Tambs-Lyche (1950). Finds on potato and in greenhouses were published by Tambs-Lyche (1950, 1957). Fjelddalen (1964) published finds from potato and greenhouses.

AK: Oslo on *Senecio vulgaris* VIII 1949 (sample sent to the author from the Norwegian Plant Protection Institute). Bø: Øvre Eiker: Haug on *Rosa* sp. 8. VIII 1945. Ry: Klepp: Øksnevad on potato 28. VIII 1955. Hetland: Forus on potato 26. VIII 1955. HOy: Tysnes: Ånuglo (host not noted) 17. IX 1953. Fana: Nordre Eggholmen on *Valeriana officinalis* 8. VIII 1952 and by thrashing mixed vegetation 11. VIII 1954, Biological Station on *Epilobium montanum* and on *Rubus idaeus* 29. VII 1952, Ospøya on *Valeriana officinalis* 28. VII 1952, Spikaren on *Galium* sp. 16. VIII 1961, Bergen: Bergen on *Freesia* (cut flowers) 21. II 1951 and on *Streptocarpus* (pot plant indoor) 12. XI 1955. Nnv: Hadsel: Stokmarknes on *Anemone* sp. and *Rosa* sp. in greenhouse 15. VII 1950.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Klepp: Øksnevad, Hetland: Forus, HOy: Fana: Biological Station.

Geographical distribution: Widely distributed, probably holarctic.

Macrosiphum gei (Koch 1855)

First published by Ossiannilsson (1962) from AK: Oslo.

HOy: Fana: Ådlandsvannet by thrashing mixed vegetation 5. IX 1955, Ospøya by thrashing *Vaccinium myrtillus* 28. VII 1953.

Trappings in yellow trays: AK: Ås: Vollebekk, HOy: Fana: Biological Station.

Geographical distribution: Europe. It occurs in Sweden, Denmark, Finland, Iceland and Great Britain.

Macrosiphum melampyri Mordvilko 1919.

Published from Norway by Ossiannilsson (1962) from Bø. The author has not so far found the species.

Geographical distribution: Russia, Germany, Sweden.

Macrosiphum rosae (Linne 1758)

H. Siebke 1874: *Aphis rosae* Linne.

First published from Norway by Siebke (1874) from AK: Oslo. Records published by Tambs-Lyche (1961), by Ossiannilsson (1962), Fjelddalen (1964) and Heikinheimo (1966).

Ø: Hvaler: Bølingshamn on *Rosa* sp. 24. VII 1947. AK: Ullensaker: Jessheim on *Knautia arvensis* 18. VII 1945. Os: Nord-Aurdal: Valdres agric. school on *Potentilla* sp. 1. VIII 1945. On: Vågå: Vågåmo on *Leontodon autumnalis* 11. VII 1953. Bø: Drammen: Bragernesåsen on *Rosa* sp. 9. VIII 1944, Modum: Buskerud agric. school on *Rosa* sp. 9. VIII 1945, Øvre Eiker: Haug on *Rosa* sp. 8. VIII 1945, Rustaden on *Rosa* sp. 12. VIII 1945, Øvre Sandsvær: Hedenstad on *Knautia arvensis* 15. VIII 1945. VE: Brunlanes: Klever on *Rosa* sp. 28. VII 1944. Tjøme: Hulebak on *Rosa* sp. 30. VII 1944. Ry: Klepp: Øksnevad on *Sanguisorba officinalis* 23. VIII 1956, Hetland: Forus on *Rosa* sp. 30. VIII 1955. HOy: Tysnes: Ånuglo on *Rosa* sp. 17. IX 1953 (alate ♂), Fana: Flesland by thrashing mixed vegetation 15. IX 1952, Stend on *Rosa* sp. 4. VI 1947, on *Rumex acetosa, Rubus idaeus* and on grasses (probably all accidentally) 11. VI 1954, Paradis on *Rosa* sp. 18. VI 1944, Espeland on *Rosa*

sp. 15. X 1961 (oviparae), Kviturdsvikpollen on *Valeriana* sp. 9. VII 1954, Biological Station on *Galeopsis bifida* (accidentally) 29. VII 1952, Bergen: Botanical garden on *Cephalaria tatarica* 15. VI 1961. SFi: Luster: Skjolden on *Knautia arvensis* 13. VII 1953. NTi: Skogn: Staup horticult. school on *Potentilla fruticosa* 10. VII 1950. Nsy: Tjøtta on *Rosa* sp. 3. VIII 1950. Nsi: Saltdal: Drageid on *Rosa* sp. 12. VII 1950. TRy: Kvæfjord: Torheim on potato 17. VII 1950.

Trappings in yellow trays: AK: Ås: Vollebekk, HOy: Fana: Stend and Biological Station.

Geographical distribution: All over the world.

Macrosiphum weberi Börner 1933.

Published here for the first time from Norway.

HOy: Fana: Flesland on *Succisa pratensis* 11. VII 1954.

The aphids were found on the underside of the leaves of the host plant. The plant grew in a very wet place, on the marshy border of a little lake. The small colony of viviparous apterous females and larvae were almost down in the water. The apterae were very dark purplish-brown, the larvae were greyish-violet in colour. Dr. H. L. G. Stroyan has kindly confirmed the identification.

Geographical distribution: Germany, Great Britain, Sweden, Finland.

Subgenus *SITOBION* Mordvilko 1914

Macrosiphum (Sitobion) avenae (Fabricius 1775)

H. Siebke 1874: *Aphis cerealis* Kaltenbach, Tambs-Lyche (1957, 1961): *Sitobion avenae* (Fabricius).

First published from Norway by Siebke (1874) from AK: Oslo. Since 1894 frequently mentioned in the State Entomologists' Annual Reports (W. M. Schøyen 1893-1913, T. H. Schøyen (1914-1941). The species was recorded by Tambs-Lyche (1957, 1961), by Ossiannilsson (1962) and by Fjelddalen (1964).

Ø. Hvaler: Reff on *Juncus bufonius* 4. VII 1953. AK: Ås: Vollebekk on *Capsella bursa pastoris* 3. IX 1956. Bø: Modum: Buskerud agric. school on *Triticum vulgare* and *Avena sativa* 9. VIII 1945. Ry: Klepp: Øksnevad on *Avena sativa* 29. VIII 1955, Hetland: Forus on *Agropyron repens* 30. VIII 1955. HOy: Fana: Paradis-Natland on unidentified grasses 25. VIII 1947, Biological Station on *Vaccinium uliginosum* 8. IX 1952, on *Cerastium arvense* 11. VIII 1956, on *Vicia sepium* 1. VIII 1961, Nordre Eggholmen on *Holcus lanatus* 7. VIII 1952 and on *Juncus articulatus* 7. IX 1952, Rådal on *Salix* sp. 15. VI 1954, Milde (host unknown) 13. VIII 1956, Stend on unidentified grasses 12. VIII 1961. HOi: Kvinnherad: Våge, Sunde on *Festuca* sp. 12. VII 1949, Ullensvang: Aga on *Achillea millefolium* 15. VIII 1958, Ulvik: Hjeltnes on *Potentilla erecta* 15. VIII 1958. TRi: Sørreisa on unidentified grass 24. VII 1950.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus, HOy: Fana: Stend and Biological Station.

Geographical distribution: The species is distributed all over the world.

Macrosiphum (Sitobion) fragariae (Walker 1848)

First published from Norway by Heikinheimo (1966) from SFi: Aurland.

HOy: Fana: Biological Station on *Dactylis glomerata* 5. VIII 1952 and 7. VI 1954, on *Juncus effusus* 6. VIII 1952, on *Campanula rotundifolia* 15. VIII 1961, on *Geranium robertianum* 1. VIII 1961 and on *Rosa* sp. 23. IX 1961, Festevik on unidentified grass 21. VI 1959, Lønningehamn on *Rosa* sp. 7. X 1961, Spikaren on *Potentilla anserina* 16. VIII 1961. HOi: Kvinnherad: Bjellandshamn on *Festuca* sp. and on *Phragmites communis* 13. VII 1949, Rosendal by sweeping a *Hordeum*-field 10. VIII 1943, Ullensvang: Aga on unidentified grass 14. VIII 1958.

Trappings in yellow trays: AK: Ås: Vollebekk, HOy: Fana: Biological Station.

Geographical distribution: Great Britain, Netherlands, Germany, Sweden, Denmark, Finland.

MACROSIPHONIELLA del Guercio 1911

Macrosiphoniella absinthii (Linné 1758)

First published from Norway by Ossiannilsson (1962) from VE: Strømm.

Ø: Hvaler: Botne on *Artemisia* sp. 12. VII 1947.

Geographical distribution: Europe, Siberia. The species is known from Sweden and Finland.

Macrosiphoniella artemisiae (Boyer de Fonscolombe 1841)

First published from Norway by Ossiannilsson (1962) from Bø: Drammen and VE: Strømm. Heikinheimo (1966) recorded the species from SFi: Aurland.

VAy: Mandal on *Artemisia vulgaris* 25. VII 1963.

Trappings in yellow trays: AK: Ås: Vollebekk.

Geographical distribution: Europe, Siberia. The species is known from Sweden, Denmark, Finland and Great Britain.

Macrosiphoniella chamomillae Hille Ris Lambers 1947.

First published from Norway by Ossiannilsson (1962) from Bø: Drammen.

AK: Ås: Vollebekk on *Matricaria inodora* 12. IX 1955 (ovipara).

Geographical distribution: Netherlands, France, Great Britain, Sweden.

Macrosiphoniella millefolii (de Geer 1773)

H. Siebke 1874: *Aphis millefolii* Fabricius.

First published from Norway by Siebke (1874) from AK: Oslo. Heikinheimo (1966) records the species from SFi: Aurland.

Ø: Hvaler: Bølingshamn 24. VII 1947 and near Hvaler church 6. VIII 1947 both localities on *Achillea millefolium*. Os: Fluberg: Karlsborg on *Achillea millefolium* 2. VIII 1945. On: Vågå: Vågåmo on *Plantago lanceolata* 11. VII 1953. VE: Brunlanes: Klever on *Achillea millefolium* 29. VIII 1944. Ry: Klepp: Øksnevad on *Achillea millefolium* 29. VIII 1955 (alate ♂). HOy: Fana: Biological Station on *Achillea millefolium* 29. VII 1952 and on *Achillea ptarmica* 5. VIII 1952, Stend on *Achillea millefolium* 26. VIII 1955 (alate ♂). Lindås: Lygra on *Achillea millefolium* 14. VII 1948. Nsy: Tjøtta 3. VIII 1950 and Bodin: Nordland agric. school 2. VIII 1950 both localities on *Achillea millefolium*. Nsi: Mosjøen on *Tanacetum vulgare* 4. VIII 1950. TRy: Tromsøysund: Holt on *Achillea millefolium* 28. VII 1950.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Klepp: Øksnevad, HOy: Fana: Stend and Biological Station.

Geographical distribution: Europe.

Macrosiphoniella oblonga (Mordvilko 1901)

First published from Norway by Ossiannilsson (1962) from Bø: Drammen and VE: Strømm. Heikinheimo (1966) recorded the species from SFi: Aurland. I have not as yet found the species on its host plants in Norway.

AK: Ås: Vollebekk trapped in yellow trays.

Geographical distribution: Europe. It is recorded from Sweden, Denmark, Finland and Great Britain.

Macrosiphoniella sanborni (Gillette 1908)

First published from Norway by Tambs-Lyche (1950), from greenhouses in AK: Asker and HOy: Fana. Fjelddalen (1964) gives records from Os: Gjøvik and Lillehammer, Ry: Stavanger and Fi: Alta.

Geographical distribution: The species is cosmopolitan.

Macrosiphoniella sejuncta (Walker 1948)

First published from Norway by Ossiannilsson (1962) from Bø: Drammen.

Bv: Hol: Geilo 23. VIII 1963. Ry: Klepp: Øksnevad 16. VII 1958. HOy: Fana: Stend 26. VIII 1955. All finds on *Achillea millefolium*.

Trappings in yellow trays: AK: Ås: Vollebekk and Ry: Hetland: Forus.

Geographical distribution: Great Britain, Netherlands, Germany, France, Sweden, Denmark and Finland.

Macrosiphoniella tanacetaria (Kaltenbach 1843)

H. Siebke 1874: *Aphis tanacetaria* Kaltenbach.

First published from Norway by Siebke (1874) from AK: Oslo on *Tanacetum vulgare*. Ossiannilsson (1962) published records from Bø: Drammen.

AK: Ås: *Vollebekk* on *Matricaria inodora* 12. IX 1955 (oviparae) and 3. IX 1956 (alate ♂♂). Os: Brandbu: Tingelstad on *Matricaria inodora* 3. VIII 1945. On: Vågå: Vågåmo on *Tanacetum vulgare* 11. VIII 1953. VE: Larvik on *Tanacetum vulgare* 28. VII 1944. HOi: Eidfjord on *Tanacetum vulgare* 15. VIII 1958.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus.

The finds from Vollebekk, Ås, of sexual forms on *Matricaria inodora* in two successive years seem to indicate that this plant can serve as winter-host in Norway. Dr Hille Ris Lambers has kindly confirmed the identifications.

Geographical distribution: Europe, America. The species is known from Sweden, Denmark, Finland and Great Britain.

Macrosiphoniella tapuskae (Hottes and Frison 1931)

Published here for the first time from Norway.

Ry: Klepp: Øksnevad on *Achillea millefolium* 29. VIII 1955 and 22. VIII 1956.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Klepp: Øksnevad.

Geographical distribution: USA, Netherlands, Germany, Sweden, Finland.

Macrosiphoniella usquertensis Hille Ris Lambers 1935.

Published here for the first time from Norway.

HOy: Bømlo: Espevær on *Achillea millefolium* 12. VIII 1958.

Trappings in yellow trays: AK: Ås: Vollebekk.

Geographical distribution: Netherlands, Great Britain, Germany, France, Sweden, Denmark, Finland (Heikinheimo in litt.).

DACTYNOTUS Rafinesque 1818[1]

Dactynotus achilleae (Koch 1855)

First published from Norway by Ossiannilsson (1962) from VE: Strømm.

Ry: Klepp: Øksnevad 29. VIII 1955, Hetland: Forus 30. VIII 1955. Both localities on *Achillea millefolium*. HOy: Fana: Biological Station by thrashing mixed vegetation 11. VIII 1956.

Trapping in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus.

Geographical distribution: Germany, Netherlands, Great Britain, Belgium, France, Sweden, Denmark, Finland.

Dactynotus cichorii (Koch 1855)

Published here for the first time from Norway.

On: Vågå: Vågåmo on *Leontodon autumnalis* 11. VIII 1953. HOy: Bømlo: Espevær on *Leontodon autumnalis* 12. VIII 1958, Fana: Stend on *Hypochoeris radicata* 6. VII 1954 (leg. Byrkjeland), Biological Station on *Leontodon autumnalis* 9. VIII 1955 and on *Hypochoeris radicata* 13. VIII 1956 (alate ♂), Herdla: Turøy on *Hypochoeris radicata* 9. VII 1954.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus.

Geographical distribution: Germany, Netherlands, Great Britain, Italy, Denmark, Sweden, Finland.

Note: Fabricius (1779) in his 'Reise nach Norwegen' gave a description of a species which he called *Aphis hypochoeridis* found on *Hypochoeris radicata* in AK: Skedsmo. His description reads as follows: — Corpus mag-

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[1]) The International Commission on Zoological Nomenclature has recently suppressed Rafinesque's names (1818), and the genus in question will be called *Uroleucon* Mordvilko 1914.

num, nigrum, obscure nitidum, aeneo colore tinctum. Antennae nigrae corpore longiores. Cornicula elongata, nigra. Stylus brevior viridis. Pedes pallidi femoribus apice nigris. Alae hyalinae. Iuniores omnino virescentes.

Fabricius' description makes it certain that he had before him one of the two *Dactynotus* spp. living on *Hypochoeridis,* namely *Dactynotus cichorii* (Koch) or *Dactynotus hypochoeridis* Hille Ris Lambers 1939. The description may fit both species. *Dactynotus hypochoeridis* Hille Ris Lambers has not yet been found in Norway, but its distribution in Denmark and Sweden indicates that it may occur there.

According to the code of nomenclature, Fabricius' name ought to be preserved on one of the two species. It would be unfortunate, however, if the well known and widely distributed *D. cichorii* (Koch) should change name to *D. hypochoeridis* which since 1939 has been used for a distinct species. It may also be wrong to apply Fabricius' name to Hille Ris Lambers' species, thereby fixing the type locality outside the known area of distribution of the species.

A decision should therefore be postponed until the distribution of the species is better known, and in the meantime Fabricius' name should be regarded as a *nomina incertis.*

Dactynotus muralis (Buckton 1876)

Published here for the first time from Norway.

HOy: Fana: Ytre Midttun on *Lactuca muralis* 9. VII 1954. The aphids formed dense colonies on the flower stems.

Geographical distribution: Great Britain, Netherlands, Germany, France, Sweden, Denmark.

Dactynotus obscurus (Koch 1855)

Published for the first time from Norway by Heikinheimo (1966) from SFi: Aurland.

Ø: Hvaler: Skibholmen on *Hieracium umbellatum* 12. VIII 1947. On: Vågå: Vågåmo on *Hieracium* sp. *(umbellatum*-type) 11. VII 1953. Bø: Øvre Sandsvær: Hedenstad on *Hieracium* sp. 15. VIII 1945. Bv: Uvdal on *Hieracium* sp. 29. VIII 1955.

TEi: Vinje: Haukeligrend on *Hieracium* sp. 31. VII 1959 (ovipara). AAi: Bygland: Moi on *Hieracium* sp. 13. VII 1967. Ry: Klepp: Øksnevad on *Hieracium* sp. 16. VII 1958 (alata ♂♂). HOy: Lindås: Kvalvågnes on *Hieracium* sp. 18. VII 1948.

Geographical distribution: Europe.

Dactynotus pilosellae Börner 1933.

Published here for the first time from Norway.

VE: Brunlanes: Klever on *Hieracium* sp. 28. VII 1944. VAy: Spangereid: Våge, Lindesnes on *Hieracium* sp. 25. VII 1963. HOy: Bømlo: Espevær on *Hieracium* sp. 12. VIII 1958. HOi: Ulvik: Hjeltnes on *Potentilla norvegica* (accidentally) 15. VIII 1958.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus, HOy: Fana: Stend.

Geographical distribution: Germany, Italy, France, Belgium, Great Britain, Sweden.

Dactynotus sonchi (Linné 1767)

Published here for the first time from Norway.

Os: Brandbu: Grinaker on *Sonchus arvensis* 3. VIII 1945.

Geographical distribution: Europe, Central Asia, America. It is known from Sweden, Denmark, Finland and Great Britain.

Dactynotus tanaceti (Linné 1758)

(= *Dactynotus tanaceticola* (Kaltenbach))

Published here for the first time from Norway. The specimens were identified by Dr. V. F. Eastop.

AK: Ås: Vollebekk trapped in yellow trays 1954.

Geographical distribution: Middle and Northern Europe. The species is known from Sweden, Great Britain and Finland (Heikinheimo in litt.).

Dactynotus tussilaginis (Walker 1850)

Published for the first time from Norway by Ossiannilsson (1962) from Bø: Drammen.

Os: Vestre Toten: Bøverbru on *Tussilago farfara* 29. VII 1945.

Trappings in yellow trays: AK: Ås: Vollebekk, HOy: Fana: Stend.

Geographical distribution: Europe, Central Asia. The species is known from Sweden, Denmark, Finland and Great Britain.

Subgenus *UROMELAN* Mordvilko 1914

Dactynotus (Uromelan) aeneus Hille Ris Lambers 1939.

Published from Norway by Heikinheimo (1966) from SFi: Aurland.

Geographical distribution: Europe. The species is known from Sweden, Denmark, Finland and Great Britain.

Dactynotus (Uromelan) campanulae (Kaltenbach 1843)

First published from Norway by Heikinheimo (1966) from SFi: Aurland.

Ø: Hvaler: Reff 4. VII 1953. On: Vågå: Storhaug 12. VII 1953. Ry: Hetland: Forus 30. VIII 1955 (oviparae and alate ♂♂). HOy: Fana: Biological Station 13. VIII 1956, Lindås: Kvalvågnes 18. VII 1848. HOi: Kvinnherad: Bjelland 22. VII 1949, Eidfjord 15. VIII 1958. In all localities the species was found on *Campanula rotundifolia.*

Trappings in yellow trays: HOy: Fana: Biological Station.

Geographical distribution: Europe. The species is known from Sweden, Denmark, Finland and Great Britain.

Dactynotus (Uromelan) jacea (Linné 1758), sensu latiore.

First published from Norway by Tambs-Lyche (1950) from Os: Vestre Toten.

Ø: Hvaler: Brenne on *Centaurea jacea* 18. VII 1947, Reff on *Centaurea scabiosa* 20. VII 1947, Bølingshamn on *Centaurea scabiosa* 20. VII 1947, Botne on *Centaurea jacea* 29. VII 1947. HEs: Stange: Sollia on *Centaurea jacea* 22. VII 1945. On: Vågå: Vågåmo on *Centaurea scabiosa* 11. VII 1953. Bø: Drammen on *Centaurea* sp. 1. VII 1944. HOy: Fana: Kviturdsvikpollen on *Centaurea nigra* 13. VII 1954, Os: Osøyri on *Centaurea phrygia* 17. VIII 1965 (leg. Heikinheimo, in litt.). HOi: Kvinnherad: Bjelland on *Centaurea nigra* 13. VII 1949.

Trappings in yellow trays: HOy: Fana: Biological Station.

Geographical distribution: Europe, Central Asia. The species is known from Sweden, Denmark, Finland and Great Britain.

Dactynotus (Uromelan) jacea subspecies *henrichii* Börner 1950.

Published from Norway by Heikinheimo (1966) from SFi: Aurland.

Dactynotus (Uromelan) similis Hille Ris Lambers 1935.

Published from Norway by Heikinheimo (1966) from SFi: Aurland.

Geographical distribution: Netherlands, Germany, Switzerland, France, Great Britain, Sweden and Finland.

Dactynotus (Uromelan) solidaginis (Fabricius 1781)

H. Siebke 1874: *Aphis solidaginis* Fabricius.

First published from Norway by Siebke (1874) from AK: Oslo and Asker. Further records by Tambs-Lyche (1961), Ossiannilsson (1962) and Fjelddalen (1964).

Ø: Hvaler: Botne 31. VII 1947. AK: Eidsvoll 19. VII 1945. VAy: Mandal 24. VII 1963. HOy: Fana: Biological Station 20. VIII 1956, Lindås: Kvalvågnes 18. VII 1948. Nnv: Hadsel: Ånstad 15. VII 1950. TRi: Målselv: Olsborg 22. VII 1950. All finds on *Solidago virgaurea.*

Geographical distribution: Europe. The species is known from Sweden, Denmark, Finland and Great Britain.

Dactynotus (Uromelan) taraxaci (Kaltenbach 1843)

First published from Norway by Tambs-Lyche (1957) from Nsy: Tjøtta and Nnv: Had-

sel. Ossiannilsson (1962) records the species from VE: Strømm.

HOi: Ullensvang: Opedal on *Taraxacum* sp. (leg. Lundetræ) 3. VI 1953.

Trappings in yellow trays: AK: Ås: Vollebekk, Ry: Hetland: Forus, HOy: Fana: Stend and Biological Station.

This species was very commonly found in the traps. I have, however, never found it myself on the host plant in Norway. The above-cited record was a sample sent to me for identification. The *Taraxacum*-plants were said to be strongly attacked with dense colonies on the stems.

Geographical distribution: Europe, North America. The species is known from Sweden, Denmark, Finland and Great Britain.

METOPEURUM Mordvilko 1914

Metopeurum fuscoviride Stroyan 1950.

(= *Pharalis tanaceti* (Linné) sensu Hille Ris Lambers 1939.) H. Siebke 1874: *Aphis tanaceti* Linné.

As Siebke's aphids are not revised there is no certainty that the aphids he listed under *Aphis tanaceti* really belong to this species, but on the assumption that he had before him the species Kaltenbach called *Aphis tanaceti,* it should be placed here. He recorded the species from AK: Oslo. I have not as yet found the species on its host *Tanacetum vulgare*.

AK: Ås: Vollebekk, trapped in yellow trays.

Geographical distribution: Europe. The species is known from Sweden, Denmark, Finland and Great Britain.

AMPHOROPHORA Buckton 1876

Amphorophora ampullata Buckton 1876.

First published from Norway by Ossiannilsson (1962) from Bø: Drammen.

HOy: Fana: Espeland by sweeping mixed vegetation 14. IX 1952 (ovipara) (leg. N. Opheim). HOi: Kvam: Fyksesund on *Dryopteris phegopteris* 14. VIII 1958.

Trappings in yellow trays: AK: Ås: Vollebekk.

Geographical distribution: Europe, USA. The species is known from Sweden, Finland, Great Britain and Denmark (Heie, in litt.).

Amphorophora rubi (Kaltenbach 1843)

Probably first recorded as *Siphonophora rubi* in 1927 in the State Entomologists' Annual Reports (T. H. Schøyen 1922-1941). Other records by Ossiannilsson (1962), Fjelddalen (1964) and Heikinheimo (1966).

HOy: Fana: Stend on *Rubus idaeus* 9. VII 1954, Biological Station on *Rubus idaeus* 12. VII 1957 and 26. IX 1958 (ovipara), Festevik on *Rubus idaeus* 21. VI 1959. HOi: Kvinnherad: Våge, Sunde 12. VII 1949 and Sundevågen 9. VIII 1949 both localities on *Rubus fruticosus,* Eidfjord: Løkjafeti, Hardangervidda by thrashing *Rubus chamaemorus* 25. VIII 1961, Voss: Mjølfjell on *Rubus chamaemorus* 21. VII 1953. TRi: Målselv: Målselv bridge on *Rubus idaeus* 23. VII 1950. Fi: Karasjok on *Rubus chamaemorus* 7. VII 1955.

Geographical distribution: Europe, Western Asia and USA.

DELPHINIOBIUM Mordvilko 1914

Delphiniobium junackianum (Karsch 1878)

Published from Norway by Tambs-Lyche (1961) (leg. Fjelddalen) and Fjelddalen (1964) from Ry: Stavanger.

Geographical distribution: Germany, Great Britain, Netherlands, Russia, Sweden and Denmark.

MEGOURA Buckton 1876

Megoura viciae Buckton 1876.

H. Siebke 1874: *Aphis viciae* Kaltenbach.

First published from Norway by Siebke (1874) from AK: Oslo. Tambs-Lyche published records (1957) from STi: Strinda and Ossiannilsson (1962) from Bø.

VAy: Spangereid: Ramsland on *Vicia* sp. 25. VII 1963. Halse og Harkmark: Lande on

Convallaria majalis (accidentally) 24. VII 1953 (alate ♂).

Trappings in yellow trays: AK: Ås: Vollebekk, HOy: Fana: Biological Station.

Geographical distribution: Palaearctic.

MEGOURELLA Hille Ris Lambers 1949

Megourella purpurea Hille Ris Lambers 1949.

Published here for the first time from Norway. I have not found the species on its host *Lathyrus pratensis*.

AK: Ås: Vollebekk trapped in yellow trays.

Geographical distribution: Netherlands, Great Britain, Sweden, Finland (Heikinheimo in litt.).

Megourella tribulis (Walker 1849)

Published here for the first time from Norway.

HOy: Fana: Stend and Biological Station trapped in yellow trays.

The species was found several times in the traps, but I have not as yet found it on its host *Vicia sepium*.

Geographical distribution: Great Britain, Netherlands, and from one locality in Sweden (Uppsala).

WAHLGRENIELLA Hille Ris Lambers 1949

Wahlgreniella ossiannilssoni Hille Ris Lambers

First published from Norway by Tambs-Lyche (1955) without giving any localities, which are therefore recorded here.

On: Vågå: Skjervå 12. VII 1953. HOy: Stord: Degernessund 17. VI 1953, Austevoll: Horgo 21. VIII 1953, Fana: Nordre Eggholmen 7. VIII 1952, 7. IX 1952 (oviparae), 7. VI 1953. 21. IX 1957 (oviparae and alate ♂♂), 18. VIII 1961. Fn: Kistrand: Smørstad, Lakselv 6. VII 1955. In all localities on *Arctostaphylos uva ursi*.

Geographical distribution: The species is known from Sweden, Finland, Great Britain, France (Pyrenees).

Wahlgreniella vaccinii (Theobald 1924)

First published by Tambs-Lyche (1955) without giving localities, which are therefore recorded here.

On: Vågå: Storhaug on *Arctostaphylos alpina* 12. VII 1953. HOy: Fana: Nordre Eggholmen on *Vaccinium vitis idaea* 7. IX 1952.

Trapped in yellow trays: AK: Ås: Vollebekk, HOy: Fana: Stend.

Geographical distribution: Great Britain and Sweden.

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Stilbia anomala Hw. ny for Skandinavia (Lep., Noctuidae)

ARNE NIELSEN
Sandnes

Abstract: NIELSEN, A. 1968. *Stilbia anomala* Hw. ny for Skandinavia (Lep., Noctuidae). *Norsk ent. Tidsskr.* **15**, 18.
Stilbia anomala Hw. is reported for the first time in Norway from Sandnes, Rogaland. One single male was collected on 7 August 1967. The species is new to Scandinavia.

Et enkelt eksemplar av denne art, (en ♂), ble tatt på kvikksølvlampe 7/8, -67 like ved Gandsfjorden på Dale i Sandnes. Dale sjukehus (nå Rogaland psykiatriske sjukehus) lå tidligere i Hetland. Sykehuset har et ubebodd område på ca. 7 km² størrelse, dels liggende til fjorden, dels under og omkring den ca. 300 m høye Dalsnuten. Langs fjorden er det rikelig med knauser hvor hovedvegetasjonen er bjørk, eik, selje, einer, pors og lyng. Dette nevnes fordi *S. anomala* av South (1948) omtales som 'a local species, but sometimes not uncommon on heaths or in rocky places by the sea'.

Arten er avbildet i nevnte verk og de hannlige genitialier er avbildet hos Pierce (1909). Det fundne eksemplar (se fig. 1 og 2) stemmer godt overens med disse kildene. Dessuten har konservator Knaben i brev meddelt meg at imago også stemmer nøye med fig. *e*, Tafel 42 hos Seitz (1914).

Arten som synes å ha en ganske stor utbredelse i det sydlige England m. Wales, er også påtruffet i Irland, på øen Man, i Skottland og på Orknøyene. South (1948) anfører at den utenom England bare synes være påtruffet i Frankrike, Central- og Vest-Tyskland, samt i det sydlige Spania (som var. *andalusiaca* Staud.) og i Syria som var. *syriaca* Staud. Larven, som lever på grasarter fra høsten til i mars, forekommer i grønne og mørkt brune varianter kjennetegnet med bred hvitaktig stripe langs sidene.

Fig. 1. *Stilbia anomala* Hw. —. Vingespenn 34 mm.

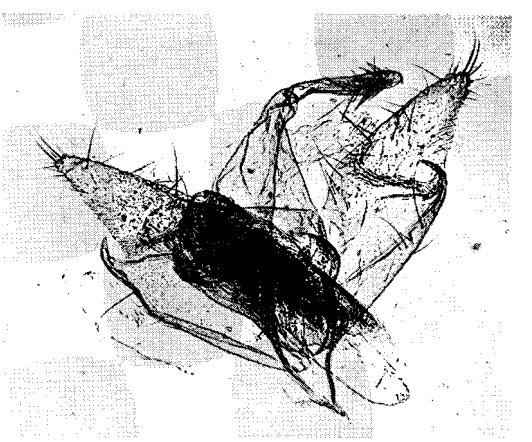

Fig. 2. Hannlige genitalier til *Stilbia anomala* Hw.

LITTERATUR

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Mottat 25 November 1967

Studies on the Diptera Brachycera Fauna of the Sea Shores in North Norway

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Abstract: DAHL, R. 1968. Studies on the Diptera Brachycera Fauna of the Sea Shores in North Norway. *Norsk ent. Tidsskr.* **15**, 19-27.
This paper is based upon the results of an entomological journey in North Norway in 1956, during which 315 species of Diptera Brachycera were collected. As the material comes mainly from sea shore localities, it is recorded with due regard to the ecological distribution of the most frequent species in the various distinct types of shore biotopes. A comparison of the ecological groups of Diptera Brachycera from North Norway and North America shows that of the 28 typical sea shore flies in North Norway, 17 are known from the coasts of North America.

INTRODUCTION

During a journey in northern Norway in June-July 1956 I made intensive studies of Diptera Brachycera at different shore localities in North Norway, almost all of them on the Arctic Ocean shore. Almost all of the localities, in other words, are North of the Arctic Circle. The geographical divisions follow Strand (1943).

DESCRIPTION OF THE BIOTOPES AND THEIR DIPTEROUS FAUNA

With regard to degree of exposition to the sea, inclination, soil properties etc., the shore biotopes may be divided into different types, all being suitable for an ecological study. Where the rock ground is solid or splintered in big blocks at the shore, there is seldom sufficient organic material to establish the basis for a stable coenose of Diptera. Only the *rock pool* biotope has been studied on these shores.

A much richer fauna is found on the shallow shores where the tide characterizes the coast and different types of organic material are deposited. Depending on its composition and the possible vegetation, three different biotopes have been studied: A. The most exposed where sand is the predominant component, the *sand marsh*, B. The more protected, consisting of mainly organic and more fine-grained material, the *mud marsh*, C. The most protected, often situated at a higher level with a vegetation, forming a more or less close vegetation, the *grass marsh*. B and C are often well established at the estuaries of larger rivers, where the supply of organic substrate is good.

The exposed sand shore often has a mosaic from the dune heath vegetation at its higher levels. Therefore, attempts have been made to separate a *dune heath* biotope, which may be of interest with regard to the investigations made at the coasts of Finland (Krogerus 1932) and Sweden (Ardø 1957).

On several coast localities the zone directly above the tidal zone is a ground with closed vegetation of grass and herbs. I have defined two biotopes in this upper zone: The *grass meadow* and the *herb meadow*, both being more or less exposed to grazing. The last-named biotope is distinguished from the other meadow type by a predominance of insect-pollinated plants.

Though the investigations were restricted to coastal localities, some inland biotopes have also been studied for comparison. Thus collecting of Diptera was made on several sandy

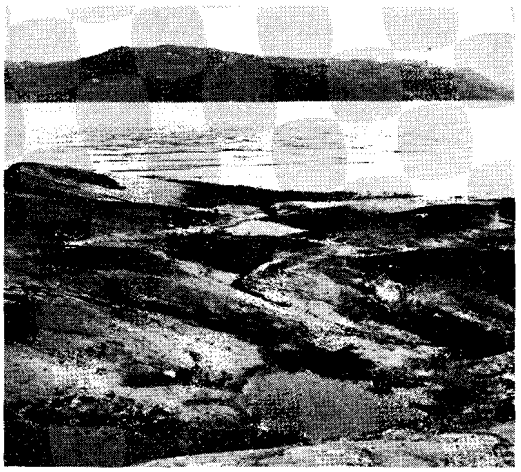

Fig. 1. In many localities rock pools show a various degree of exposition to inundation by tides and storm waters, thus creating pools of different values of salinity. Rigidly bound to the biotope is *Hilara maura*, *Leptocera fontinalis*, *Hydrellia griseola*, *Scatella stagnalis* and *Ephydra* species (Fi: Talvik).

lake shores, almost all of them in the regio alpina. But little ecological information can be given from the few specimens collected. On the other hand, rich material has been collected in localities of the *bog meadow* biotope, which with its hygrophilous fauna may be used for comparison with the fauna of the saline sea shore.

The rock pool

The rock pool biotope (Fig. 1) belongs to the group of rather intensely studied biotopes in North Europe. There are various attempts to distinguish different types of rock pools (e.g. Lindberg 1944) but the few localities here studied imply only rocky basins with salt water, provided by sea at high-water level.

Localities. Nnø. Sørkil; TRi. Gratangen; Balsfjordbotn; Kvenangsbotn; Fi. Talvik; Fn. Ifjord (two localities); Vardø (two localities). 9 localities, 19 species, 42 specimens.

Most frequent species:

4 localities: *Hilara maura, Leptocera fontinalis, Hydrellia griseola, Scatella stagnalis.*

3 localities: *Ephydra alandica.*

2 localities: *Ephydra riparia.*

Thus the *Ephydra*-species show a low degree of constancy within this biotope in northern Norway as a contrast to corresponding localities in the south of Sweden (Dahl 1959).

A comparison with the results of Johnsen (1946), obtained from the study of rock pools on Bornholm, Denmark, shows that only two species are in common, *Ephydra riparia* and *Scatella stagnalis*, a fact mostly due to the poor investigation of Diptera Brachycera, only five species being recorded from this island.

The sand marsh

The exposed coastal low land with a sandy bottom material (Fig. 2) is of course difficult to distinguish both from other types of marshy shores and from sand shores not exposed to the tide. The organic material increases with the distance from the water, and also as the vegetation becomes more closed, beginning with single plants of *Carex goodenowii, Scirpus*

Fig. 2. In connexion with drier parts of the sand marsh biotope (with *Xiphandrium monotrichum, Hydrophorus norvegicus, Themira putris* and *Scatella quadrisetosa* as most prominent species) the dune heath forms a range of a mosaic character, consisting of association-fragments of *Honckenya peploides, Elymus arenarius* etc. with a diptera coenose dominated by *Hilara griseola, Scatella stagnalis* and *Nupedia dissecta* (TRi: Balsfjordbotn).

rufus and *pauciflorus* and *Festuca rubra*. Often *Elymus* and *Honckenya* form associations on dried parts of this shore type.

Localities. Nsi. Mo i Rana; Saltdal; TRi. Gratangen; Fv. Langfjord; Fn. Lakselv; Varangerbotn; Smalfjord. 7 localities, 40 species, 350 specimens.

Most frequent species:

6 localities: *Scatella stagnalis, S. quadrisetosa.*
4 localities: *Xiphandrium monotrichum, Hydrophorus norvegicus, Themira putris.*
3 localities: *Porphyros riparius, Hydrellia griseola, Scatophaga litorea, Collinellula lutosa.*

The dune heath

On many shores dry sand forms an intermediate zone between the moist biotopes near sea level and the meadows which often constitute the highest parts of a shore profile. Often the vegetation of this zone is of a type suggesting comparison with its counterpart on the shores of southern Fennoscandia. From this point of view every locality with a closed vegetation of *Elymus* and *Honckenya* has been studied and is here referred to the *dune heath* biotope (Fig. 2), a term not quite corresponding to the more limited concept used by Ardø (1957). This is a consequence of the indistinct zonation of the localities in northern Norway compared with those in southern Sweden. On the localities here studied, the zone is broken up into several plant associations, separated by open sand, all forming a mosaic, such as associations of *Festuca rubra* and *ovina, Poa pratensis, Astralagus alpinus, Lathyrus maritimus* etc., alternating with the vegetation of *Elymus* and *Honckenya*.

Localities. Nsi. Mo i Rana; TRi. Balsfjordbotn; Fn. Tana bru; Tanafjord; Tornvik; Vardø. 6 localities, 36 species, 146 specimens.

Most frequent species:

2 localities: *Hydrellia griseola, Scatella stagnalis, Nupedia dissecta, Acroptena nuda, Scatophaga litorea, S. stercoraria.*

Among the collected material the following species are mentioned by Ardø (1957) in his list of stenotope marine shore dune diptera in southern Sweden: *Helina protuberans, Delia quadripila, Thoracochaeta zosterae, Scatophaga litorea, Fucellia fucorum, Spilogona contractifrons* (common at all moist places) and *Paregle cinerella.*

The mud marsh

The big content of organic material characterizing the mud marsh constitutes a biotope with a rich flora and fauna, among others *Scirpus uniglumis, Carex heleonastes* and *canescens*, and grasses such as *Festuca rubra* and *Agrostis stolonifera*. In some localities *Primula sibirica* is not rare.

Localities. TRi. Gratangen; Sørkil; Balsfjordbotn; Fi. Altafjordbotn (two localities); Fn. Storfjord, Lakselv. 7 localities, 33 species, 367 specimens.

Most frequent species:

All localities: *Scatella quadrisetosa.*
6 localities: *Porphyros riparia.*
5 localities: *Hydrophorus norvegicus.*
4 localities: *Hydrophorus praecox, Hilara griseola, Hydrellia griseola.*

In this biotope, species with a high degree of constancy had a high abundance too, especially *Scatella quadrisetosa.*

The grass marsh

The grass-dominated lowlands (Fig. 3) appearing on sheltered coasts seem to be morphologically closely related to the south-western Swedish coast meadows. The salt water support, however, is more regular, the spring tide playing a particularly important role in this respect. Climatic conditions prevent any direct comparisons between these two types of coastal meadows.

Localities. Mnø. Djupvik; Fn. Lakselv (two localities); Varangerbotn; Smalfjord; Bjørnnes. 6 localities, 48 species, 299 specimens.

Most frequent species:

4 localities: *Scellus spinimanus, Porphyros riparia.*
3 localities: *Hygroceleuthus latipennis, Schoenomyza litorella, Scatophaga litorea, S. stercoraria, Parallelomma fuscipes.*

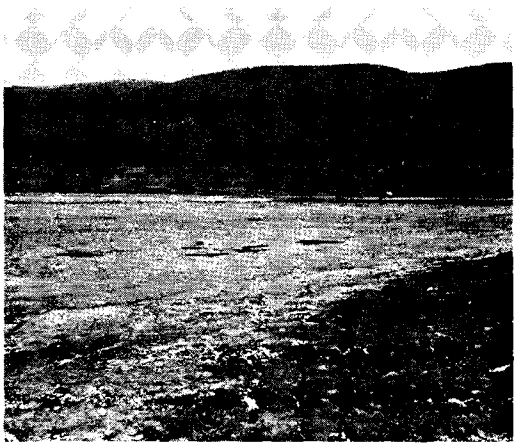

Fig. 3. On sheltered low land coasts the grass marsh - with *Scellus spinimanus* and *Porphyrus riparia* as the most interesting species - is the natural continuation at higher parts of the mud marsh, which has *Scatella quadrisetosa* as a very characteristic species in the diptera coenose. (Fn: Tanafjord)

Ringdahl (1959) gives a list of flies from coastal meadows. An attempt at a comparison with his records gives the following results:

A. Flies common in coastal meadows in both districts: *Hygroceleuthus latipennis, Porphyros riparia, Scatophaga litorea, Scatella stagnalis.*

B. Flies common in my northern localities, not listed by Ringdahl: *Scellus spinimanus, Scatella quadrisetosa, Parallelomma fuscipes.*

C. Flies common in the southern localities, not collected in this investigation: This applies to many flies e.g. the *Nemotelus*-specis, characteristic of many coastal meadows in the south and like other *Stratiomyiids* southern in distribution.

The grass meadow

The upper boundary of the true shore is often formed by grazing ground with a vegetation of *Poa pratensis, Festuca rubra, Aira caespitosa* and *Anthoxantemum odoratum.* In addition, single herbs appear, such as *Ranunculus*-species, *Trollius europaeus* and *Achillea millefolium.* Thanks to the droppings of the grazing cattle, coprophilous Diptera have good life conditions. Of the investigated localities, two are situated outside any shore zonation.

Localities. Nsi. Dunderland; Nnø. Djupvik; TRi. Gratangen (three localities); Sørkjos; Kvenangsbotn; Fn. Lakselv (two localities); Tanafjord; Adamsfjord. 11 localities, 118 species, 281 specimens.

Most frequent species:

6 localities: *Melanostoma mellinum.*

5 localities: *Melanostoma scalare, Lasiops nigritellus, Hilara interstincta, H.maura, Bicellaria subpilosa.*

4 localities: *Fannia serena, Scatophaga suilla, Lasiops aculeipes, Cheilosia vernalis, Platychirus manicatus.*

3 localities: *Hilara griseola, Rhamphomyia albissima, Lycia laeta, Lauxania cylindricornis, Scatella stagnalis, Lasiops ater, L.innocuus, Okeniella caudata, Microprosopa pallicauda, Scatophaga stercoraria, Sepsis flavimana, Nemopoda* sp. (the three last-named being pronouncedly coprophilous).

The herb meadow

A distinction between the two meadow biotopes, the grass and the herb meadow, is naturally debatable, especially since abiotic factors do not show any important differences. The main reason for this distinction is the vegetation, which in the herb meadow, in contrast to the grass meadow, is dominated by 'insect-flowers', such as *Solidago virgaurea, Ranunculus*-species, *Trollius europaeus, Saussurea alpina, Veronica longifolia* and so on.

Localities. Nsi. Mo i Rana (several localities); Nnø. Røsvik; TRi. Gratangen (several localities); Målselv; TRy. Tromsø; Sandbukt; Fn. Tana bru (several localities). 13 localities, 116 species, 365 specimens.

Most frequenting species:

6 localities: *Scatophaga suilla, Fannia serena.*

5 localities: *Melanostoma mellinum.*

4 localities: *Melanostoma scalare, Scatophaga stercoraria, Coelomyia spathulata.*

3 localities: *Platychirus peltatus, Hilara maura,*

Sepsis flavimana, Scatophaga lutaria, Lasiops ater.

Among species found on two localities the following may be mentioned: *Symphoromyia crassicornis, Porphyros riparia, Empis lucida, Nupedia dissecta,* and *Hydrophoria conica.*

A comparison between the two meadow biotopes shows a good agreement, the following species being common to both types:

Platychirus peltatus
P.manicatus
Melanostoma mellinum
M.scalare
Scatophaga suilla
S.stercoraria
S.lutaria
Lasiops ater
L.nigritelius
L.aculeipes
Lycia laeta
Hilara maura
Bicellaria subpilosa
Fannia serena

On the other hand the ecological distribution of other species calls for a distinction. The following species of more or less high constancy have been found in one of the two biotopes only:

The grass meadow..
Hilara intersticta
Xiphandrium monotrichum
Schoenomyza litorella
Okeniella caudata
Microprosopa pallicauda
Lauxania cylindricornis

The herb meadow
Coelomyia spathulata
C.subpellucens
Hydrophoria conica
Nupedia dissecta

The bog meadow

The bog meadow is different from other meadow types both with respect to vegetation and to abiotic factors. It is often developed at a higher attitude, and also in the regio alpina. The annual temperature amplitude is larger, the humidity is higher, the substrate is poorer. Connexion with a shore zonation is uncommon. The vegetation is characterized by *Eriophorum*-species such as *angustifolium, vaginatum* and *scheuchzeri, Scirpus caespitosus, Betula nana, Andromeda polifolia, Rubus chamaemorus* and *Empetrum*-species etc.

Localities. Nsi. Fauske; Nnø. Kråkmo; Sørkil; TRi. Bardu; Sørkjos; Fi. Kåfjord; Alta; Fn. Tanafjord; Vardø; Vicksa; Ifjord; Børselv. 12 localities, 67 species, 191 specimens.

Most frequent species:

7 localities: *Empis lucida.*

6 localities: *Rhamphomyia obscura.*

5 localities: *Hilara interstincta.*

4 localities: *Empis borealis, Renocera striata, Melanostoma mellinum.*

3 localities: *Neoascia dispar, Dolichopus maculipennis, D.stenhammari, Lispocephala erythrocera, Spilogona macropyga, Nupedia dissecta, Scatophaga furcata, Okeniella caudata, Parallelomma fuscipes.*

Discussion

The constancy values give an estimation of the regularity of the appearance of a species within a coenose of a biotope. As a summary, Table I records all the biotopes and their most representative species mentioned above. This table may also form a basis for an estimation of the homogeneity of the biotopes selected as far as the Diptera coenoses are concerned. A high constancy value for a number of species is a sign of a homogenous coenose. Examples of these are found in the sand, mud and grass marsh biotopes. Of the remaining biotopes treated, the grass, herb and bog meadows and the rock pool have a fairly constant Diptera coenose, the dune heath less so.

I have stated that biotopes of a zonated shore type have a good Ephydrid coenose in contrast to biotopes of a mosaic or non-shore-bound type (Dahl 1959 p. 45). This statement

Table I. *Ecological grouping of the dipterous sea shore fauna based upon the values of constancy (%)**

	rock pool	sand marsh	dune heath	mud marsh	grass marsh	grass meadow	herb meadow	bog meadow
Dolichopodidae								
Dolichopus maculipennis								25
D. stenhammari								25
Hygroceleuthus latipennis					50			
Hydrophorus norvegicus		57		63				
H. praecox				50				
Scellus spinimanus					66			
Porphyros riparia		43		75	66			
Xiphandrium monotrichum		57						
Empididae								
Empis borealis								33
E. lucida								58
Hilara griseola				50		38		
H. interstincta				50				42
H. maura	57					63	38	
Rhamphomyia albissima						38		
R. obscura								50
Syrphidae								
Cheilosia vernalis						50		
Platychirus manicatus						50		
P. peltatus							38	
Melanostoma mellinum						75	63	33
M. scalare						63	50	
Neoacia dispar								25
Sepsidae								
Nemopoda pectinulata						38		
Themira putris		57						
Spesis flavimana						38	38	
Sciomyzidae								
Renocera striata								33

*The number of samples in which a species has been found, divided by the total number of samples, multiplied by 100 and expressed as a percentage.

Table I. *Continued*

	rock pool	sand marsh	dune heath	mud marsh	grass marsh	grass meadow	herb meadow	bog meadow
Ephydridae								
Ephydra alandica	43							
Scatella quadrisetosa		86		100				
S. stagnalis	57	86	33			38		
Hydrellia griseola	57	43	33	50				
Sphaeroceridae								
Collinelluta lutosa		43						
Leptocera fontinalis	57							
Muscidae								
Lasiops ater						38	38	25
L. aculeipes						50		
L. innocuus						38		
Fannia serena						50	75	
Coelomyia spathulata							50	
Lispocephala erythrocera								25
Schoenomyza litorella					50			
Anthomyiidae								
Acroptena nuda			33					
Nupedia dissecta			33					25
Scatophagidae								
Parallelomma fuscipes					50			
Okeniella caudata						38		25
Microprosopa pallicauda						38		
Scatophaga furcata								25
S. litorea		43	33		50			
S. lutaria							38	
S. stercoraria			33		50	38	50	
S. suilla						50	75	

can be expanded to be applicable to the whole Diptera Brachycera coenoses as proved by the present investigations in North Norway.

The distribution of the large Diptera Brachycera families on the different biotopes is very marked. In Table I the species of a high constancy listed above form a basis for an evaluation of ecological distribution. The *Dolichopodids* and *Ephydrids* dominate in the shore biotopes, especially in the marsh types; the *Empidids* appear regularly in the grass meadow but are especially predominant in the bog meadow. The *Syrphids* are mainly confined to the grass and herb meadows, an ecological distribution that is also typical for the *Muscids*. The most eurytopic character, besides the *Ephydrids Hydrellia griseola* and *Scatella stagnalis*, is shown by the *Scatophagids*.

There is a remarkable distinction between the herb and grass meadow biotopes on one hand and all the rest on the other, the former being inhabited by a very large number of species, 116-118, the latter by only 19-67 species.

The most characteristic types of coastal biotopes, with their most prominent Diptera species, have been described. In comparison with South Scandinavia most species are in common. With regard to the composition of the coastal shore coenoses it is interesting to note how in these certain typical alpine species —often appearing in the bog meadow biotope —may be rather common, e.g. *Dolichopus maculipennis, D.stenhammari, Hydrophorus pilipes, Diaphorus nigricans,* and *Spilogona arenosa*.

This is a distribution tendency that is known in many other animal and plant groups (Lindroth 1931 p. 439), and can be explained by the similarities of some environmental factors within these separate biotopes, above all the dry substrate, a result either of sun exposition or of a high degree of salinity, or both. Of course, this tendency is most easy to study in localities situated at higher latitudes, where the shore biotopes are established in close connexion with alpine biotopes and not isolated by the ecological barrier formed by a forest zone. From Iceland Lindroth (1931) gives many examples, both among plants and among Coleoptera, and from the same island, Tuxen et al. (1954, p. 152) mention *Fucomyia frigida* and *Scatophaga villipes,* both sea-shore species, as found on the central highland.

SOME REMARKS ON THE GEOGRAPHICAL DISTRIBUTION OF THE SHORE SPECIES

In my North Norwegian material of 315 species, 112 species are so far recorded as American. Of the typical shore flies collected in North Norway, the following ones are also known from North America:

Hydrodromia stagnalis
Hilara bistriata
Porphyros crassipes
Scellus spinimanus
Themira putris
Limosina crassimana
Scatella paludum
S. quadrisetosa
Ephydra riparia
Pelina aenescens
Trichopalpus punctipes
Ceratinostoma ostiorum
Scatophaga litorea
Spilogona aerea
S.arenosa
Lispe tentaculata
Fucellia fucorum

Thus of 28 species recorded as typical sea shore flies in North Norway, 17 are also known from the coasts of North America. Of these, two species are only recorded from the most northern shores of the continents, *Scatella quadrisetosa* and *Ceratinostoma ostiorum*. The European species not known from North America have a more southern tendency in their distribution and most of them are boreal species with only few arctic localities.

The majority of the typical sea shore species

have their distribution centre in the north of the Atlantic and neighbouring seas. As a matter of course this implies that the fauna of coast shore biotopes can be characterized as having one of the widest geographical distributions in the Arctic districts in comparison to the fauna of other biotopes. This fact can be a result of the distribution ecological factors favouring the dispersion of the shore species.

But more probably this large distribution area is caused by the better possibilities of survival during the Ice Ages that marked the shore species. At any rate the climatic conditions were somewhat better in the ice-free coastal belts with their higher humidity and moderate temperature. The retreating sea uncovered new land on the continental shelves and new shore biotopes were formed with the variation of the ice masses.

The composition of the diptera coenoses of the North Norwegian shore biotopes may be characterized as having two origins, one formed by species invading the localities from distribution centres in more south-easterly parts of the Eur-Asiatic land mass, the other represented by species regarded as Wurm-hibernating and colonizing these localities from any of the many refugial areas in the Arctic or Atlantic Oceans. Before a more valid decision can be made on which of these two groups a shore species belongs to, it will be necessary to get a better knowledge of the diptera fauna of other coast localities in the Arctic Ocean.

ACKNOWLEDGEMENTS

With some families I have had the help of specialists in the identification of the species. I am very grateful to the following scientists for their kind help: Fil. mag. S. Gaunitz, Växjö (Syrphidae: *Cheilosia, Chrysogaster, Melanostoma),* Fil. lic. L. Hedström, Uppsala (some Dolichopodidae specimens), Fil. dr. W. Hellén, Helsingfors (Syrphidae: *Cheilosia),* Docent W. Hackman, Helsingfors (Sphaeroceridae: *Limosina),* Prof. M. Hennig, Stuttgart (Sepsidae: *1 specimen),* Prof. H. Kauri, Bergen (Tabanidae), Prof. R. Tuomikoski, Helsingfors (Empididae: *Bicellaria, Hilara),* Dr. R. Vockeroth, Ottawa (Scatophagidae).

Most thanks are due to my old friend and teacher, the late fil. dr. O. Ringdahl, who has helped me with the determination of some Dolichopodidae, Syrphidae, Muscidae and Anthomyiidae.

Thanks to the kindness of Dr. R. Vockeroth, Ottawa, some Canadian dipterologists—besides Dr. Vockeroth himself, Dr. J. G. Chillcott and Dr. G. E. Shewell—have gone through my species list, identifying all species known from North America.

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Infestation Density of *Trypodendron lineatum* (Olivier) (Coleoptera: Scolytidae) in Relation to Felling Date of Logs

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Abstract: CHRISTIANSEN, E. & SÆTHER, T. 1968. Infestation Density of *Trypodendron lineatum* (Olivier) (Coleoptera: Scolytidae) in Relation to Felling Date of Logs. *Norsk ent. Tidsskr.* **15**, 28-30.
Picea abies logs cut from October through March were attacked by the ambrosia beetle, *Trypodendron lineatum*, the infestation being heaviest in timber felled during the first part of the period. Logs cut in April, May, and June remained undamaged.

INTRODUCTION

Logs of a great number of conifers are attacked by the ambrosia beetle, *Trypodendron lineatum* (Olivier) when stored unbarked in the forest during spring and summer. Publications from several countries, in dealing with this damage, point out that the timber felling date influences the extent of attack (Trägårdh 1921, Hadorn 1933, Morley 1939, Johnson 1958, Bletchly 1961, Bevan 1962, Bletchly & White 1962, Dyer & Chapman 1965). Generally, the greatest damage occurs in logs cut during autumn and winter, whereas attacks on those felled in spring are less extensive.

In 1963-64 an investigation was carried out by Austarå and Sæther (1965) to study the infestation of *Trypodendron lineatum* in unbarked Norway spruce *(Picea abies)* logs felled at different times of the year. The intention was to examine the relevance of foreign research results to Norwegian conditions. The investigation demonstrated that logs felled during the months September-November were heavily attacked, whereas timber felled in the period 2 December—31 March only showed a slight infestation. One strange feature appeared, however, in that timber cut in late April was as heavily attacked as the autumn-felled logs, and also that the brood developed successfully even in the April-felled timber. To examine this result, the present investigation was carried out.

METHOD

An experimental plot was established at Maura, about 50 km NNE of Oslo, at an altitude of 250 m. In an old stand of Norway spruce nine logs of sawtimber dimension were cut every month from October 1966 to June 1967, except for February. Six of these logs were placed close to adjoining clear-cut areas, three near the western and three near the northern edge of the stand. The remaining three of the nine logs were placed in the middle of a small stand.

In each of the storing places, the three logs with the same felling date were put together in close contact. The distance between timber originating from different felling dates was 10 m. The experimental design permitted an analysis of variance of the results.

In the first week of August 1967, a registration of the infestation density was carried out. On each log three sections of 0.25 m^2 were debarked: two at a distance of 1 m from the ends of the log, and the third in the middle.

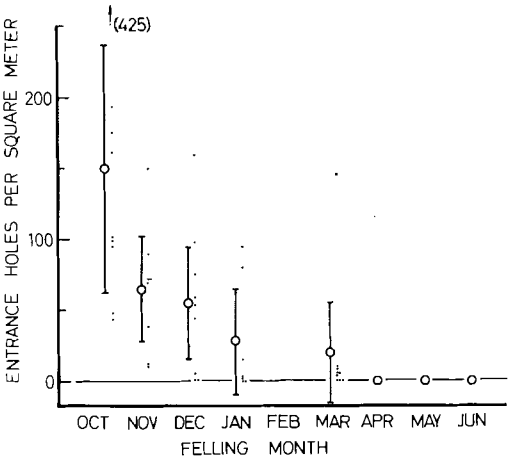

Fig. 1. Infestation density of *Trypodendron lineatum* (Olivier) in relation to felling month.
Points: single logs. Circles: Arithmetical mean values. Vertical lines: 95% confidence intervals.

The number of entrance holes in each debarked section was recorded.

Infestation on the upperside and the underside of the debarked areas was registered separately.

RESULTS

There was no significant difference in infestation density between the debarked section in the middle of the log and those 1 m from each end. The recordings from the three debarked sections of each log were therefore summarized before further analysis of the results was performed.

The degree of infestation in logs felled at different times during the season October-June is given graphically in Fig. 1. Timber cut from October through March was attacked, the infestation being heaviest in logs cut during the first part of the period. The difference in attack density between the various felling months is significant on the 10 per cent level only. Logs cut during the period April-June were not attacked.

There was no significant difference in infestation density between logs stored in the three different places, or between the upperside and the underside of the logs.

DISCUSSION

As mentioned in the introduction, publications from several countries point out that timber felled during autumn and winter may be attacked by *Trypodendron lineatum* when left unbarked in the forest during the swarming period of the beetle. Logs felled later than January or February are seldom attacked to any noteworthy extent. The present investigation shows that, under the climatic conditions existing in this part of Norway, logs felled as late as the middle of March may be infested.

When weather conditions are favourable, the mass flight may take place in the middle of April in the southern part of the country (Bakke 1960). In 1967, however, the cold weather and the large amounts of snow delayed the flight until late May in the experimental area. The infestation demonstrated in logs felled as late as March might be conferred with the late swarming.

The investigation does not confirm the previously mentioned result of Austaå & Sæther (1965) that logs felled in late April were heavily infested.

ACKNOWLEDGEMENTS

The investigation was carried out in the forests of Mathiesen-Eidsvold Værk with valuable assistance from the firm. The Forestry and Forest Industrial Research Association (SSFF) supported the project financially. We are indebted to both institutions.

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Bombus jonellus (Kirby) (Hym., Apidae) has Two Generations in a Season

OVE MEIDELL †

Abstract: MEIDELL, O. 1968. *Bombus jonellus* (Kirby) (Hym., Apidae) has two generations in a season. *Norsk ent. Tidsskr.* **14**, 31-32.
It is stated that *B. jonellus* (Kirby) produces two generations in a season. The frequency of workers reaches one maximum during June and another in the last half of August. A young queen from a colony (1st generation) kept under observation mated on 15 July. She established a colony (2nd generation) from which the first worker emerged on 15 August.

It is generally known that bumble bees produce one generation in the sense of queen broods in a season. The hibernating queens establish their individual nests, produce a varying number of worker broods succeeded by sexual brood. Soon after the males and the young queens have emerged the cycle is completed and the colony breaks up. The mated queens hibernate and establish colonies of their own in the following spring.

The claim that a bumble bee produces two generations in a season, moreover in Norway, is striking and may justify the delayed publication of the following. It is taken from the notes of the late O. Meidell, which are kept at the Zoological Museum, University of Bergen.

Astrid Löken
Zoological Museum, University of Bergen

In a survey of the bees around Bremen, Germany, Alfken (1914) briefly suggests that *Bombus jonellus* (Kirby) may produce two generations in a season based on a possible maximum flight intensity of workers observed early in June and another in September.

This theory has stimulated a study of *B. jonellus* in Rogaland county, situated in the southwestern part of Norway. The frequency distribution of the exsisting material of ♀♀, ♀♀ and ♂♂ throughout the season may be summarized as follows: An almost equal number of queens occurs in the field during the first three weeks of May and is then reduced to a minimum during June. The workers appear about 20 May, increase rapidly in number and reach a maximum during June. A rapid decline occurs in the first week of July and then the number of workers is slowly reduced to a minimum at the end of this month. The first males are recorded at the beginning of June, reach their greatest number at the end of the month and are numerous in the first week of July as well, at a time when some young queens appear. The number of those queens in the fields is constantly low because they prefer to stay in the nest or swarm at the top of trees. Near the end of July only a few workers are observed. Males and young queens have disappeared except for rare single records.

Nests kept under observation agree in the main with the life cycle outlined above: The colonies are established towards the end of April. The first brood, hatching in the last half of May, contains six to ten workers. One or two males may emerge about the same time as the second worker brood in the first half of June. The colony reaches its maximum number of workers about midsummer, and at that time most of the males and the first batch of young queens are emerging. The remaining

queens hatch at the beginning of July. The queens often stay more than a week in the nest before they finally leave it. The colonies are in general finished about the middle of July.

However, at the end of July some young queens and a few older workers are observed collecting pollen and nectar continuously, indicating that colonies are being raised. The number of these queens, however, is smaller than in the spring. The number of workers increases during the first half of August but by then only a few queens are observed. The frequency of workers reaches a maximum in the latter half of August when they are particularly numerous on *Calluna vulgaris* L. By then males are again observed. Newly emerged queens are observed in September.

B. jonellus establish their nests about three to four weeks later in the subalpine areas of the county (Suldal: Mostøl, altitude about 600 m), but the cycle is usually completed only about two weeks later than in the lowland. Further observations in these areas in 1936 indicate that the species produces two generations in this region as well. Firstly, the frequency distribution of workers clearly reveals two maxima during the season. Secondly, a newly established colony was recorded as late as the middle of August. Besides the founder, a rather new queen with unworn wings, it contained cocoons of the first batch of worker brood.

Some more nests were controlled in Suldal in 1937, one of which was recorded on 2 June and contained by then cocoons of the first worker brood. This nest reached its climax about 1 July, and males and young queens emerged the second week of July. A simple experiment was now carried out. On one of the young queens in this nest, hatching about 8 July, the wings were cut off so that she would stay in the nest. Three males emerged about four days later one of which mated the wingless queen on 15 July. By then the colony was almost finished. The founder of the nest died on approximately 7 July and only five relatively young workers remained in the nest together with the mated queen which by now was barely moving. The workers provisioned the honeypots with some nectar but did not collect pollen.

When the nest was inspected on 4 August, the queen was establishing a new colony. The first waxen cell was built at the edge of the old derelict comb. Two days later the swelling of the cell indicated that larvae were developing. The first worker emerged on 15 August and by then more broods were produced. Unfortunately the observations had to be interrupted.

The quantitative evaluations, the study of the colonies kept under observation as well as the experiment above, reveal clearly that *B. jonellus* raises two generations in a season in Rogaland county, in the lowlands as well as in subalpine areas.

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Notes on the Genus *Boreus* in Norway

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Abstract: FJELLBERG, A. & GREVE, LITA. 1968. Notes on the Genus *Boreus* in Norway. *Norsk ent. Tidsskr.* **15,** 33-34. New localities for *B. hyemalis* and *B. westwoodi* are reported. Some observations on the sex ratio, the air temperature and mass occurrence are presented.

There is little information in the literature on the genus *Boreus* in Norway. Since Tjeder's (1945) 'Catalogus Neuropterorum et Mecopterorum Norvegiae' the genus has been mentioned briefly by Greve (1965, 1966). Since the Boreidae are among the few insects modified for active life during the winter months, several workers have concentrated on their ecology, among them Strübing (1950, 1958), Svensson (1966) and Sauer (1966). Strübing reports temperatures around 10°C as optimal for *B. hyemalis*. Svensson reports active animals at temperatures down to zero, in one extreme case an active *B. westwoodi* ♂ was observed at -5.5°C.

A list of localities where *B. hyemalis* and *B. westwoodi* were found is given below. *B. hyemalis* is new to Vestfold (VE), western Buskerud (Bv) and southern Opland (Os), and *B. westwoodi* to (VE) and (Os). The collection at Vuozeljokka was made by K. Hove, at Finse by a student excursion from the Zoological Museum, University of Bergen, at Dagali by H. B. Jensen, and the remaining ones by A. Fjellberg. The geographical division follows Strand (1943).

Boreus hyemalis (L.). VE: Tjöme 29.11.1964 3 ♂♂ 1 ♀, 26.2.1966 1 ♀, 24.12.1966 2 ♂♂. OS: Sör-Aurdal 18.10.1965 1 ♀, 5.11.1965 3 ♂♂ 1 ♀. Bv: Hol, Dagali 13.4.1965 Coll. H. B. Jensen. HOi: Finse, Kongsnut 8.9.1967 1 ♂.

Boreus westwoodi (Hag.). VE: Tjöme, Kjære 29.11.1964 1 ♂, Tjöme, Eidene 6.3.1965 1 ♂, Tjöme 26.2.1966 30 ♂♂ 22 ♀♀, 27.2.1966 51 ♂♂ 34 ♀♀, 24.12.1966 16 ♂♂ 11 ♀♀, 29.12.-1966 2 ♂♂. Os: Sör-Aurdal 1.3.1966 1 ♀, 4.3.1966 3 ♀♀, 5.3.1966 1 ♂, 7.3.1966 1 ♀, 8.3.1966 1 ♀. Fi: Vuozeljokka 29.4.1967 1 ♂ (Z.M.O.).

The locality at Finse (Fig. 1) is close to the glacier Hardangerjökulen, as pointed out by Greve (1965), and is very exposed to wind and snow during the winter time. September is also early in the season for Boreidae. An extreme occurrence for the spring season is an observation of *B. westwoodi* by Prof. Kauri (personal communication) in Blekinge Sweden as late as 4 June 1962.

At one locality, Sör-Aurdal, on 2 November 1965, 545 specimens of both species were caught. The locality is a cleared area in a spruce (*Picea*

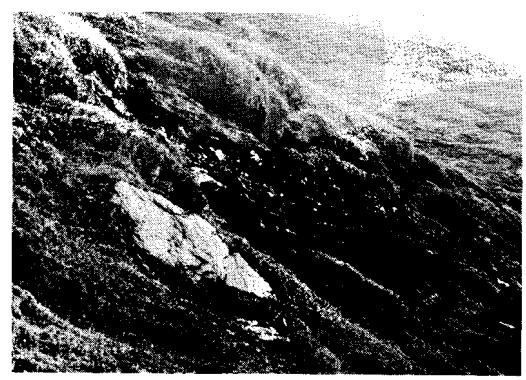

Fig. 1. The locality at Finse at an altitude of 1,400 m. Behind the ridge in the background of the picture is one arm of the glacier. Behind the viewpoint is the Blåisen. The vegetation is sparse and typical of the middle Alpine region.

abies) forest descending in a westernly direction towards a swamp. The forest was felled in 1949. Of the total number of specimens, 14 per cent were in copulation. Mass occurrence is otherwise mentioned in the literature by OHM (1961).

Some comments should be made concerning the sex ratio: *B. westwoodi*; Tjöme 26.2.1966. 30 ♂♂ 22 ♀♀, ♂♂/♀♀ 3:2, 57.6% males; Tjöme 27.2.1966, 51 ♂♂ 34 ♀♀, 3:2, 60% males; Tjöme 24.12.1966, 16 ♂♂ 11 ♀♀, 3:2, 59.1% males. Both *B. hyemalis* and *B. westwoodi* together: Sör-Aurdal 2.11.1965 324 ♂♂ 221 ♀♀ ♂♂/♀♀ 3:2 59.4% males. Similarly in the four localities where several specimens were caught, the ratio ♂♂/♀♀ was very near 3:2.

Some of our observations on activity at low temperatures are: *B. hyemalis* Tjöme 26.2.1966 1°C Sör-Aurdal 2.11.1965 just above zero; *B. westwoodi* Tjöme 26.2. and 27.2.1966 some C° above zero. All figures are air temperature.

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Gyrophaena keeni Casey and *G. orientalis* A. Str. (Col., Staphylinidae)

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Abstract: STRAND, A. 1968. *Gyrophaena keeni* Casey and *G. orientalis* A. Str. (Col., Staphylinidae). *Norsk ent. Tidsskr.* **15,** 35-36.
Gyrophaena keeni Casey and *orientalis* A. Str. are so closely related that the question has arisen whether they are distinct species. On the basis of an examination of material of both forms the author expresses the opinion that they must really be considered two separate species.

Folwaczny (1967) has recently stated that in the European part of the Ural mountains he has found *Gyrophaena keeni* Casey, which was earlier known only from N. America. He suggests that the species, which he indicates as new to the palaearctic area, might be distributed all over Siberia. The determination has been made by Likovsky.

Folwaczny has kindly sent me a ♂, which is exactly the same as my *orientalis* (Strand 1938) from Finland and the Sajan mountains in Siberia.

Likovsky has made his determination on the basis of a publication of Seevers (1951), which also contains a figure of the penis of *keeni* in lateral position.

In this publication, which Rupert L. Wenzel of Field Museum in Chicago kindly has sent me together with some of the late Dr. Seevers' specimens, he mentions that he has seen the specimens in Casey's collection, but as the type material could not be dissected he had to content himself with external characters.

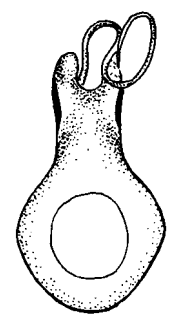
Casey (1911) mentions that *keeni* is 'shining though with distinct and rather large micro-reticulation', and Seevers (1951) says: 'Reticulation of head and pronotum rather strong, finely meshed'.

The specimens of *keeni* that I have seen, are quite correctly described as having a rather strong micro-reticulation on head and pronotum, while in *orientalis* the central part of the forehead and the pronotum are very shining and without, or with very indistinct, reticulation. The antennae are stouter in *keeni* than in *orientalis*.

The penes of the two species are very much alike, but there are some differences, most distinct in dorsal view, as shown in Figs. 1 and 2.

Although the two are undoubtedly closely related, there seems to be sufficient reason to consider them as distinct species.

I am most grateful to Br. Folwaczny, Bad Hersfeld, Dr. Zbynek Likovsky, Prague, Prof.



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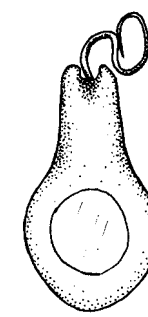

2

Fig. 1. Penis of *Gyrophaena keeni* Casey, dorsal view. (Anders Vik del.)

Fig. 2. Penis of *Gyrophaena orientalis* A. Str., dorsal view. (Anders Vik del.)

Carl H. Lindroth, Lund, Dr. Sten Stockmann, Helsinki, and Rupert L. Wenzel, Chicago for help with material and information, and to my friend Anders Vik, Sandefjord, for the figures.

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Received 28 February 1968

Micaria decorata Tullgren 1942 (Clubionidae, Araneae) New to Norway

ODD H. JOHANNESSEN
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Abstract: JOHANNESEN, O. H. 1968. *Micaria decorata* Tullgren 1942 (Clubionidae, Aranae) New to Norway. *Norsk ent. Tidsskr.* **15**, 37-39.
Micaria decorata Tullgren is reported new to Norway. One single female was found 25 May 1965, five kilometres south of Bergen. Measurements of legs and cephalothorax in the present specimen are compared to previously published data.

On the 25th of May 1965 I found an adult female spider, which was later identified as *Micaria decorata* Tullgren. The identification was confirmed by Prof. H. Kauri, Bergen Museum. The animal was found near Gamlehaugen, about 5 km south of Bergen, in an area of hillocks covered with loose stones and patches of heather and moss. Palmgren (1943) stated that it occurred on stones and rock with sparse vegetation near the coast of southern Finland. Miller (1967) described similar biotopes in Czechoslovakia ('... im spärlichen Heidekraut unter lose liegende Steinen oder in Cladonia- und Cetraria-Polstern ...').

The species has previously been found in Sweden, Finland and Czechoslovakia. The centre of distribution seems to be in Scandinavia, with several records from the southern parts of Sweden and Finland.

The specimen which I found had the following measurements: Total length 4.83 mm; length of cephalothorax 1.76 mm; maximum width of cephalothorax 1.23 mm; width of cephalothorax at the eyes 0.62 mm. Measurements of the legs are given in Table I. Comparison of these measurements with those from other specimens shows this to be the largest ♀ yet recorded.

Among the arachnids the ♀ is usually larger than the ♂. In the case of *Micaria decorata*, measurements of the length of cephalothorax, as shown in Table II, have been published. In the case of the specimens obtained by Palmgren and Miller, the ♂♂ were thus generally larger than the ♀♀, though overlapping did occur.

Previously published records of the length of legs in ♀♀, and measurements of the present specimen, are given in Table III. The relative lengths of the legs in the ♂♂ are constant in all the animals which have been measured, the order of decreasing length being 4.1.2.3. This order does not seem to be constant in the ♂♂. According to Tullgren (1942), the relative

Table I. *Measurements of the legs (in mm) of the present specimen of M. decorata*

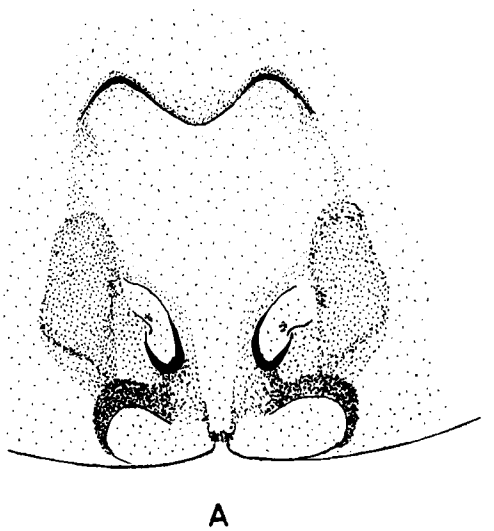
	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	1.14	0.49	0.85	0.74	0.68	3.90
2	1.09	0.48	0.74	0.74	0.66	3.71
3	0.91	0.51	0.66	0.75	0.55	3.38
4	1.52	0.66	1.12	1.17	0.80	5.27

Table II. *Measurements of the length of cephalothorax (in mm) in M. decorata*

Reference	min ♂♂	max	min ♀♀	max
Tullgren (1942)	1.3	1.75	1.3	1.75
Palmgren (1943)	1.8	2.0	1.3	1.6
Miller (1967)	1.32	2.17	1.40	1.62

Table III. *Measurements of the legs (in mm) in ♀♀ of M. decorata*

Reference	1	2	3	4
Tullgren (1942)	3.81	3.63	3.32	4.99
Palmgren (1943)	3.30	3.00	2.60	4.80
Present record	3.90	3.71	3.38	5.27



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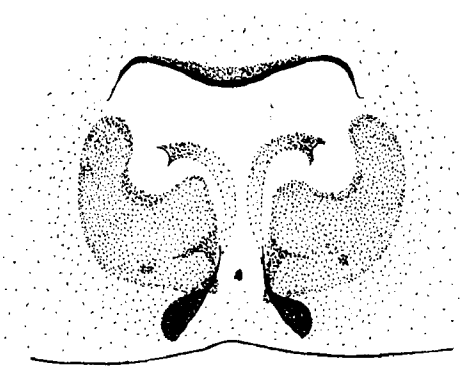

B

lengths are the same in both sexes, 4.1.2.3. Palmgren (1943), however, gave the order as 1.4.2.3. in the ♂♂, and Miller (1967) stated that the ♂♂ varied in this respect, those with a short cephalothorax (1.32-1.45 mm) having legs with the same relative lengths as in the ♀♀, and those with a longer cephalothorax (1.70-2.17 mm) having the first pair the longest, i.e. 1.4.2.3.

Micaria decorata Tullgren can be confused with the commoner species, *Micaria pulicaria* (Sundevall). Some of the specimens of *M. decorata* referred to by Palmgren (1943) had previously been identified as *M. pulicaria*. This mistake may have been made elsewhere.

The two light bands across the abdomen of *M. decorata* are wavy and of uneven breadth, whereas those of *M. pulicaria* are straight and of even breadth. *M. decorata* has four white patches between the hindmost of these bands and the spinners, though often only three can be seen. *M. pulicaria* has but three white patches in the same area. The best way to distinguish between the two species is to examine the epigyn, which possesses clear specific characters, as shown in Fig. 1.

Fig. 1. Epigyne: A, *Micaria decorata*; B, *Micaria pulicaria*.

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Blomsterdalen, Norway

Corticarina irkutensis n. sp. (Col., Lathridiidae)

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Vor vielen Jahren erhielt ich von Reitter 40 Exemplare einer *Corticarina*-Art mit den Fundortzetteln «Quell d Irkut Reitter» und «Quellgebiet des Irkut Leder», die einer unbeschriebenen Art zu gehören scheinen.

Diese neue Art kommt in ektoskelettalen Merkmalen *fuscula* Gyll. am nächsten, unterscheidet sich jedoch von ihr durch durchschnittlich kleineren Körper, ein wenig kürzere Fühler, kleineren und stärker punktierten Halsschild deren grösste Breite weiter nach vorne liegt und vor allem durch ganz anders gebauten Penis.

Im bau des Penis kommet die Art *lambiana* Sharp überaus nahe wie aus den Figuren hervorgeht, *lambiana* ist jedoch viel kleiner und etwas breiter gebaut, die Fühler sind viel kürzer und die Seiten der Deckflügel sind mehr gerundet.

Holotypus: Ein ♂ bezettelt «Quell d Irkut Reitter» in meiner Sammlung.

Eingegangen 28 Februar 1968

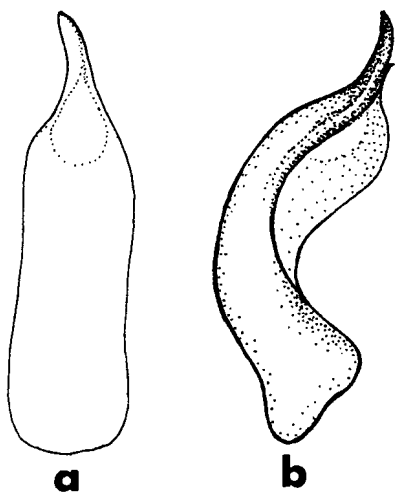

Fig. 1. Penis von *Corticarina irkutensis* A. Str. a. Dorsalansicht. b. Lateralansicht (Anders Vik del.)

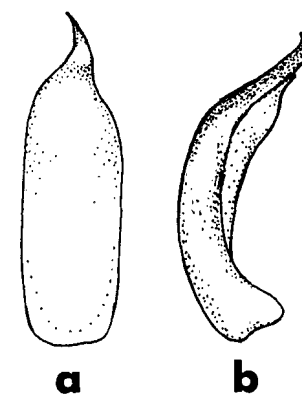

Fig. 2. Penis von *Corticarina lambiana* Sharp a. Dorsalansicht. b. Lateralansicht (Anders Vik del.)

Microchordeuma gallicum (Latzel 1884), (Diplopoda) New to Scandinavia

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Abstract: MEIDELL, B. A. 1968. *Microchordeuma gallicum* (Latzel 1884), (Diplopoda), new to Scandinavia. *Norsk ent. Tidsskr.* **15**, 41-46.
The diplopod *Microchordeuma gallicum* (Latzel 1884) is reported new to Scandinavia. Thirty-five specimens were collected in 1967 and 1968 in the vicinity of Bergen in western Norway. Morphological characters of taxonomic importance are illustrated, and some of the variation within the material is discussed.

Twenty-eight ♀♀ and 7 ♂♂ of *Microchordeuma gallicum* (Latzel), a diplopod new to Norway, have been found in the surroundings of Bergen. This species is the first of the family Chordeumidae to be found in Norway. The family Chordeumidae belongs to the suborder Ascospermophora, order Chilognatha.

Localities: Fana, Tvetevannet 1967: 23/4 1♀, 21/5 1♀, 29/5 1 juv.♀, 7/9 2♀♀, 19/10 6♀♀+5 juv. ♀♀+1♂; 1968: 2/2 8♀♀+4♂♂. Fana, Fjøsanger 1967: 7/4 1♀ (leg. G. Litland). Fana, Fantoft 1967: 23/5 2♀♀+1♂. Alversund, Seim 1967: 28/10 1♀+1♂ (leg. O Johannesen). Fana lies just to the south of Bergen, whilst Seim is about 30 km north of Bergen. Unless otherwise stated, the specimens were collected by the author.

The biotope at Tvetevannet is inclined to the west and is the best investigated as regards diplopods. It has a high humidity, sloping as it does down to a bog. The vegetation is dominated by *Corylus avellana* Bechst, *Quercus* sp., rowan tree *(Sorbus aucuparia)* and some *Rosa* sp. Half the area is covered by a relatively thick layer of foerna, mainly oak and hazel leaves. The other half is free of litter, and not covered by grass. This part is covered by quite a few big flat stones and rotten pices of timber and tree stumps. Most of the animals were found here, in the upper and middle parts away from the bog.

Microchordeuma gallicum is a fairly active diplopod. Only on 2 February 1968 were some taken in a curled-up state. They were found under the stones covering this area. The litter-covered part of the biotope was at this time covered by a 10 cm-thick layer of snow.

The animal from Fjøsanger was found in a garden. Those from Fantoft were found in a hazel wood, interspersed with a few oak-trees. The animals from Seim were found in the litter-layer of a beech wood.

It is difficult to measure the lengths of the animals as they often curl up in alcohol. The figures below give maximum and minimum measurements in millimetres for adults.

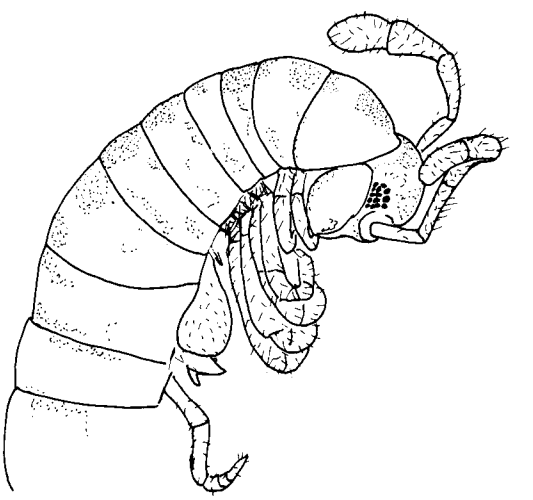

Fig. 1. *Microchordeuma gallicum* (Latzel), ♂ from Tvetevannet. Head and anterior segments. The three pairs of bristles on the metasonites are omitted.

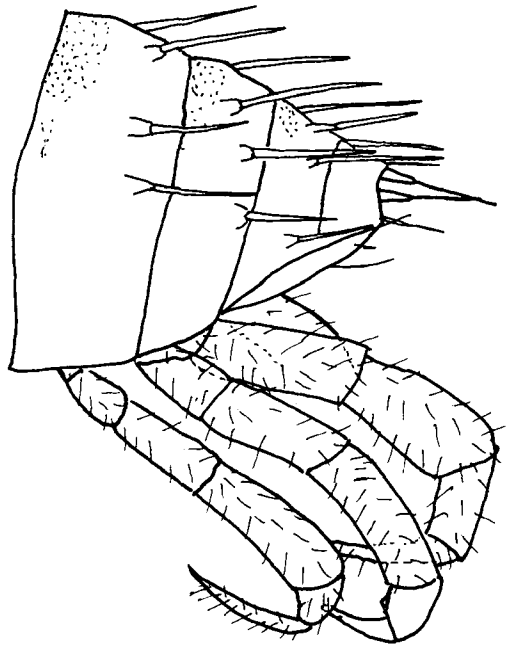

Fig. 2. Posterior segments of the same animal as in Fig. 1.

♀♀ length 12.4-8.0; width 0.9-0.66
♂♂ length approx. 9.8; width approx. 0.78

General appearance (Figs. 1 and 2): brownish-yellow in colour, head and rear part of body mottled. Relatively dense covering of bristles on antennae, head and feet. All metasonites with 3 pairs of bristles. On the preanal segment are 2 papillae containing openings of silk glands. Juveniles are much lighter in colouring and not mottled.

In the adult the ocelli form a triangular shape, and vary in number from 14-17 (6,5,3-6,5,4,2 and a ♀ with 7,5,4). The cuticula is brittle and they are easily crushed with a pair of tweezers. The body has 30 segments.

In Ascospermophora both pairs of legs on the 7th segment are modified as gonopods. Fam. Chordeumidae is characterized by the last pair of legs on the 6th and 8th segments being modified as paragonopods. The appearance of the paragonopods is especially important for determination of genus. The anterior pair of legs on the 8th segment is reduced.

Figs. 3 and 4 show anterior paragonopods on *Microchordeuma gallicum*. Anterior paragonopods characterize the genus *Microchordeuma* from the other genera within the family. Anterior gonopods (Fig. 5), and anterior paragonopods are quite similar for *Michrochordeuma gallicum* and *M. voigti* Verhoeff. The anterior gonopods consist of a sternal projection and a coxal projection (Fig. 6) on each side.

The posterior gonopods (Fig. 7) have a swollen telopodite, 3 coxal projections and a pseudoflagellum. The coxal projections (Fig. 8) are similar in *M.gallicum* and *M.voigti*, one spade-shaped and two which are joined at the

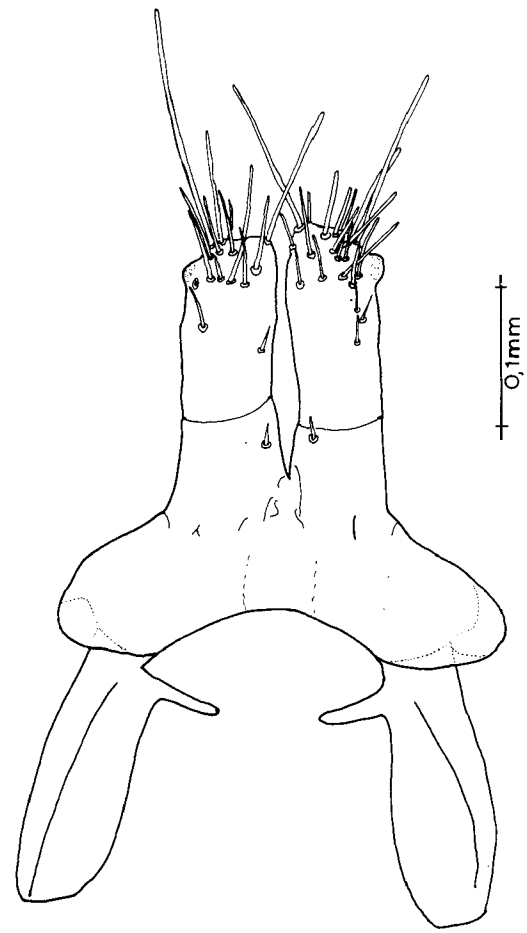

Fig. 3. Anterior paragonopods of *M. gallicum* ♂ from Tvetevannet.

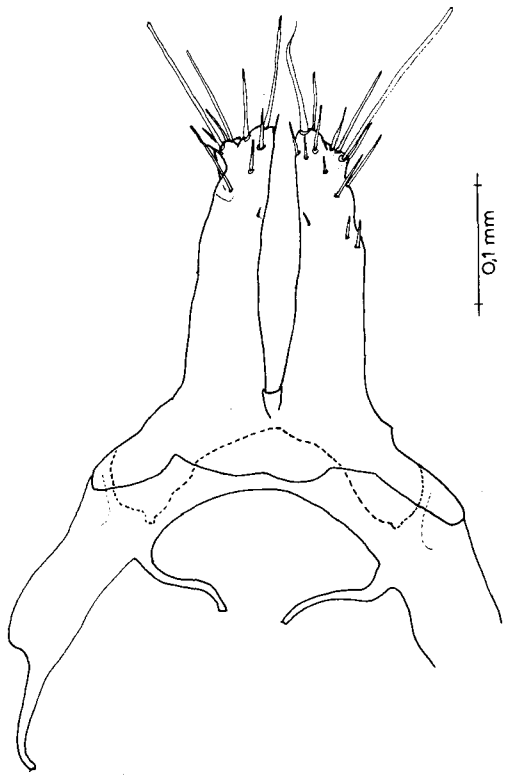

Fig. 4. Anterior paragonopods of *M. gallicum* ♂ from Seim.

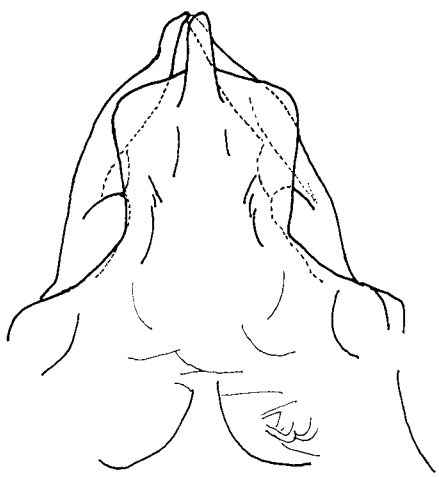

Fig. 5. Anterior gonopods of *M. gallicum* ♂ from Seim. Anterior view.

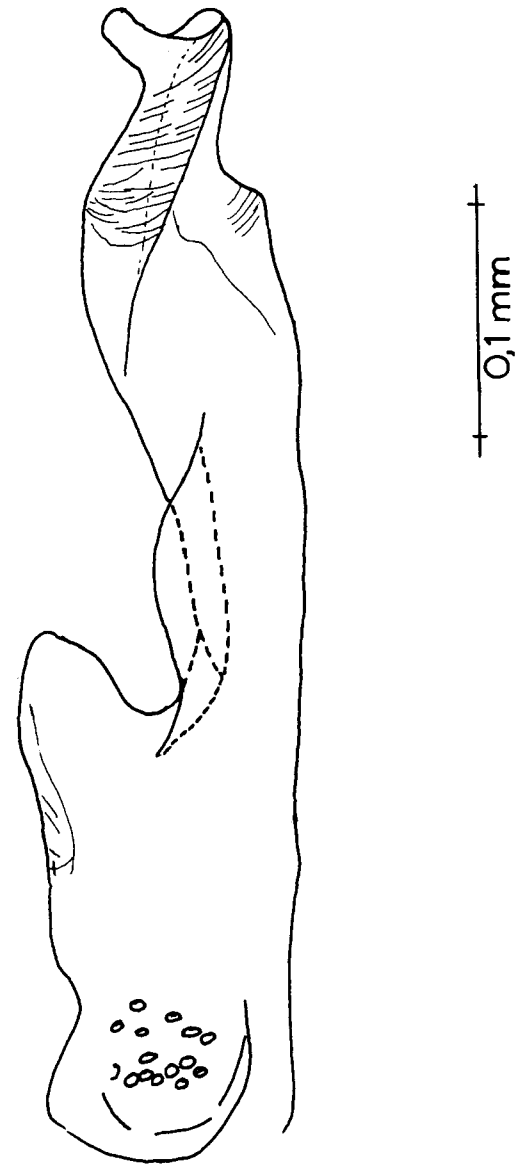

Fig. 6. One coxal projection of anterior gonopods, internal profile. Animal from Tvetevannet.

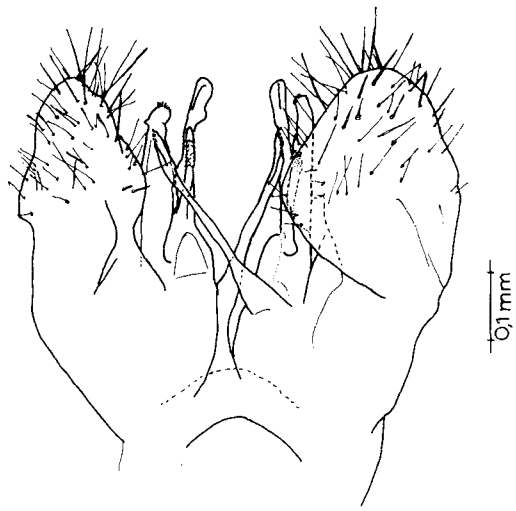

Fig. 7. Posterior gonopods of *M. gallicum* ♂ from Seim. Posterior view.

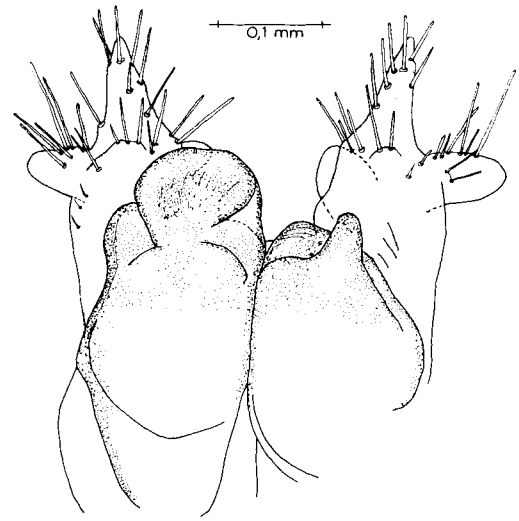

Fig. 9. Posterior paragonopods, partly covered by coxal sacs, of *M. gallicum* ♂ from Seim. Anterior view.

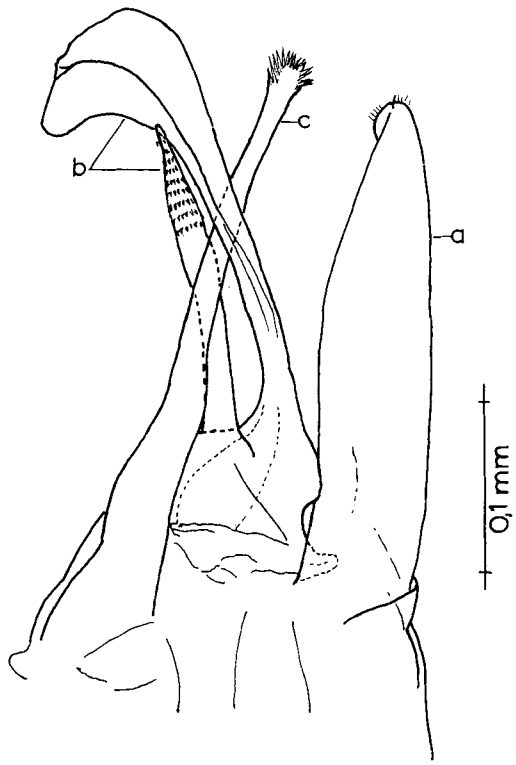

Fig. 8. One set of coxal projections with pseudoflagellum of posterior gonopods. Animal from Tvetevannet. a. The spade-shaped projection. b. The two projections joined at the base. c. The pseudoflagellum.

base, but the appearance of these last two is very different. The pseudoflagellum in *M.gallicum* is longer than in *M.voigti*.

The posterior paragonopods (Fig. 9) with 3 branches on the coxal projection differ from *M.voigti* which has only a plain projection. The family Chordeumidae has in the ♀ a sternite just behind the vulvae, the platosternite. Fig. 10 shows the platosternite in *M.gallicum*. Fig. 11 show the platosternite in a *M.voigti* from Bavaria (leg. et det. Verhoeff, in the collection of the Zoological Museum, Bergen).

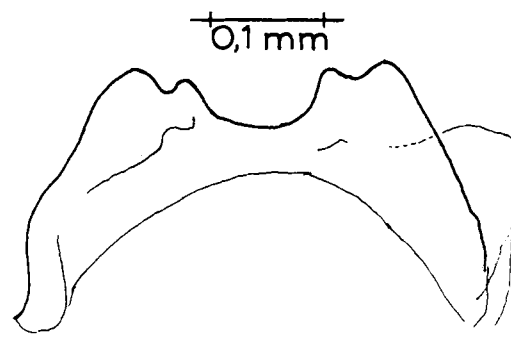

Fig. 10 Platosternite of *M. gallicum* ♀ from Tvetevannet.

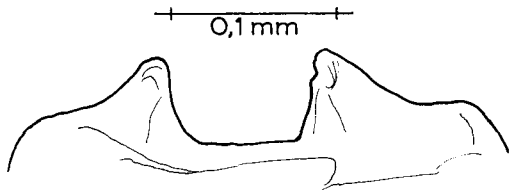

Fig. 11. Platosternite of *M. voigti* Verhoeff ♀ from Bavaria.

Figures of *M.voigti* ♂ for comparison f.inst. in Lohmander (1925, p. 22, Figs. 9-13).

Brolemann (1935) described for *M.gallicum* a race *helviorum* from southern France, which Ribaut (after Schubart 1963) declared a proper species. From Brolemann's Figures it is the posterior paragonopods in particular which are different in *helviorum* and the nominate race. In my material there is an especially large variation in the size of the lateral branch on the coxal projection. None of the posterior paragonopods of *M.gallicum* in my collection were of quite so dramatic appearance as in *M.g.helviorum* (Brolemann 1935, Figs. 694 and 695). According to Brolemann there is also a difference between *helviorum* and the nominate race in the anterior paragonopods. Figs. 3 and 4 show the great variation within the Norwegian material. Fig. 3 is nearly the same as the nominate race (Brolemann 1935, Fig. 692), whereas Fig. 4 is very similar to *M.g.helviorum* (Brolemann 1935, Fig. 693). For the anterior gonopods (Fig. 5) the ratio of the lengths of the coxal and sternal projections is the same as for *helviorum* (Brolemann 1935, Fig. 592), but the ratio for the length and width of the sternal projection is the same as for genuinum (Brolemann 1935, Fig. 688). Brolemann gives no differences for posterior gonopods.

Lohmander (1925) is of the opinion that the variations of the gonopods of *M.voigti,* on the basis of which Verhoeff (1938) established a great number of races and varieties, are analogous to the macrodactyle and brachydactyle forms of the *Craspedosoma* species. The variation which occurs within the Norwegian material of *M.gallicum* should indicate a classification into macro- and brachydactyle forms for this species as well, but the quantity of ♂♂ is at the moment too small to say anything definite about this. Brolemann has no Figures of the platosternite in *helviorum*.

Common to the Ascospermophora are the papillae on the anal segment, the 3 pairs of bristles dorsally on each segment and the lack of poison glands. Ascospermophora are very dependent on a high humidity. They can tolerate low temperatures to a far greater extent than other diplopods but are very sensitive to higher temperatures. As a result of their low-temperature tolerance most ascospermophores are active during autumn and spring (cf. list of finds). Copulation has been observed in April and October (Schubart 1934).

Microchordeuma gallicum is described from the north-west of France (Latzel 1884). Schubart (1934) mentions it from Germany, west of the Rhine, Belgium, the Netherlands (in *Talpa* nests) and Switzerland (up to 2,000 m above sea level underneath stones). Eason (1957) describes it from Great Britain (Wales, Caernarvonshire, 1 ♀ + 1 ♂ in garden leaf-litter). Schubart (1963) makes a further report from Luxembourg.

The find at Seim is therefore the northernmost locality reported for *Microchordeuma gallicum*. It has not been found in Denmark or Sweden.

Whether the animals from Norway have a synantropic distribution is not clear as yet. If their immigration to Norway has been synantropic they have had enough time to occupy their natural biotopes.

M.voigti Verhoeff has a synantrope distribution in the south of Sweden (Lohmander 1925) and in Jutland, Denmark (Lohmander 1957). It orginates in the German Jura (Verhoeff 1918) and has spread within Germany on shipments of earth and plants (Verhoeff 1932). Schubart (1934) reports it from northern Switzerland, and also one find in Czechoslovakia.

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Tetrops starki Chevr., en art ny for Norden (Col., Cerambycidae)

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Abstract: STRAND, A. 1968. *Tetropos starki* Chevr., en art ny for Norden. (Col., Cerambycidae) *Norsk ent. Tidsskr.* **15**, 47-48.
Der Verfasser hat, als neu für die nordischen Länder, ein Exemplar von*Tetrops starki* Chevr. in der Nähe von Oslo Gefunden.

Schmidt (1958) har inngående behandlet de mellomeuropeiske *Tetrops*-arter og har, i likhet med Müller (1926/1927) og Horion (1935), framholdt at *starki*, som Reitter (1912) regnet som aberrasjon av *praeusta* L., i virkeligheten er en god art.

Schmidt (1958) har i sin bestemmelsestabell skilt de to artene slik:

Forbenene helt gule, på mellom- og bakbenene er lårene i stor utstrekning mørke, og av og til er også skinnebenene delvis noe mørkfarget, dekkvingespissen med kraftige, noe ulike store, punkter, mellomrommene for det meste større enn punktenes diameter ..... *praeusta* L.

Forbenene gule, sjelden er lårenes rot smalt mørkfarget, på mellom- og bakbenene er bare en meget smal del av roten mørkfarget, ofte på innersiden, skinnebenene er alltid gule, dekkvingespissen ensartet og meget grovt og tett punktert, mellomrommene for det meste mindre enn punktenes diameter ... *starki* Chevr.

Videre nevner han at *starki* er gjennomsnittlig større enn *praeusta*, dekkvingene er noe mer parallelle og flatere, punkteringen på sidene uten antydning til rekkedannelse, særlig er spissen meget grovt punktert og sterkt skinnende, dekkvingenes behåring, særlig i forreste del, er lang og oppstående, bakover betydelig kortere og mer nedliggende, en forholdsvis stor del av spissen samt skulderpartiet og sidene er mørke, likevel slik at et kort stykke av sidene like foran spissflekken er lyst.

Arten er funnet på en rekke steder i Mellom- og Sydøst-Europa og skal også være funnet i Kaukasus. Fra de nordiske land har den ikke vært oppgitt.

Schmidt (1958) nevner at *starki*, i motsetning til *praeusta*, er et skogsdyr, som fortrinnsvis er funnet på eik og ask, i den siste er også utviklingen iakttatt, men den er også, som *praeusta*, funnet på frukttrær, hassel og pil.

Den 4/6 1934 håvet jeg på AK: Brønnøya, Asker, et eksemplar (♂) som jeg mener er *starki*. Til sammenlikning har jeg hatt mellomeuropeiske eksemplarer som Stig Lundberg har latt meg se, og et eksemplar (♂) fra Böhmen, som jeg har fått av Egon Lekeš.

Jeg kjenner ikke til at det er gjort noen undersøkelser av penis hos disse arter, men jeg har preparert fram organet hos en del eksemplarer av *praeusta* og to *starki*. Penis ser ut til å variere en del, men på det undersøkte ma-

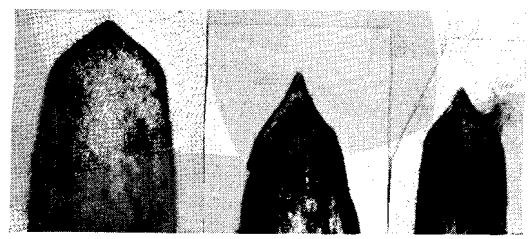

Fig. 1. Penis hos A: *Tetrops starki* Chevr. fra Brönnöya, Norge, B: *T. praeusta* L. fra Målselv, Norge, og C: *T. praeusta* L. fra Wien.

teriale er den hos *starki* større og betydelig bredere og mer stumpvinklet enn hos *praeusta*.

Figurene viser den apikale del av penis hos det nevnte eksemplar av *starki* fra AK: Brønnøya (fig. 1 A), hos et eksemplar av *praeusta* fra TRi: Rundhaug, Målselv (fig. 1 B), og hos et eksemplar av *praeusta* fra Wien (fig. 1 C). Hos eksemplaret av *starki* fra Böhmen er penis noe spissere enn hos det norske. Hos begge eksemplarer av *starki*, som utvilsomt er fullt utviklet, er penis lysere enn hos *praeusta*-eksemplarene.

Mottatt 28. februar 1968

LITTERATUR

HORION, A. (1935) *Nachtrag zu Fauna Germanica. Die Käfer des Deutschen Reiches von Edmund Reitter.* Krefeld (358 p.).

MÜLLER, J. (1926/27) Ueber einige europaische Bockkäfer. *Coleopt. Zbl.* **1**, 310-315.

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SCHMIDT, G. (1958) Untersuchungen über die mitteleuropäischen Vertreter des Genus *Tetrops* Stephens. *Mitt. dt. ent. Ges.*, **17**, 53-60.

The Life Cycle of Ephemeroptera in the Lower Part of Aurland River in Sogn and Fjordane, Western Norway

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Abstract: LARSEN, R. 1968 The Life Cycle of Ephemeroptera in the Lower Part of Aurland River in Sogn and Fjordane, Western Norway. *Norsk ent. Tidsskr.* **15,** 49-59. Collections of larvae of *Ephemerella aurivillii*, *Baetis rhodani*, and *Ameletus inopinatus* (Ephemeroptera) were made each month during 1966 in the Aurland River, Western Norway, and were used to get information about the life cycle of the species. *E. aurivillii* emerges mainly in June, July, August and September. The new generation begins to appear in August and growth proceeds throughout the winter with a drop in the growth rate through January and February. The animals complete a generation in one year. *B. rhodani* emerges from April to the beginning of November, and completes two generations in one year. These consist of a long overwintering and a short summer generation, the former emerging from April to July, the latter from July to the beginning of November. *A. inopinatus* emerges throughout May-August. No hatching is found from December to August the next year. There is only one generation in one year.

During 1966 the life cycle of the benthic species of Ephemeroptera was studied at two localities in the Aurland River. The positions of the localities are shown on Fig. 1, marked Loc. 1 and Loc. 2, and more detailed maps of the stations, called TR and A_4, at which this work was carried out, are shown on Fig. 2 and Fig. 3. The River is characterized by the criteria given by Brinck (1949) for Northern rivers. Variations in water-flow during the investigation period are shown on Fig. 4.

METHODS

On each sampling station 15 samples were taken every month, 5 on sand bottom (A), 5 on stony bottom without moss vegetation (B), and 5 on stony bottom with a compact layer of moss (C). Because of the great number of individuals only a part of the samples were examined, as shown in Table I. The substrata mentioned above are seen on Figs. 5, 6 and 7. Samples were taken partly with a Surber-Sampler and partly with a Neill's cylinder (Macan 1958), both covering an area of approximately 0.1 m^2.

The collecting apparatus was made of plankton net size 250 μ. Sand, stones and moss were placed in a bucket. Larger stones and finer materials were washed and thrown away. The remains were preserved in 80 per cent alcohol, and total macroscopic fauna was sorted out under a binocular. The larvae of Ephemeroptera were measured in mm on a microscope slide. Measurements were taken from the anterior edge of clypeus to the base of caudal cerci. All larvae more than 1 mm in length were measured. Some larvae below 1 mm passed through the collecting net and were therefore excluded from the quantitative analysis. Water current and depth were measured every month. Samples were taken from 0 to 80 cm depth, and in the current range of 50 cm/sec. to 130 cm/sec. Care was taken to sample each of the three categories of substrata each month under the same current and depth conditons.

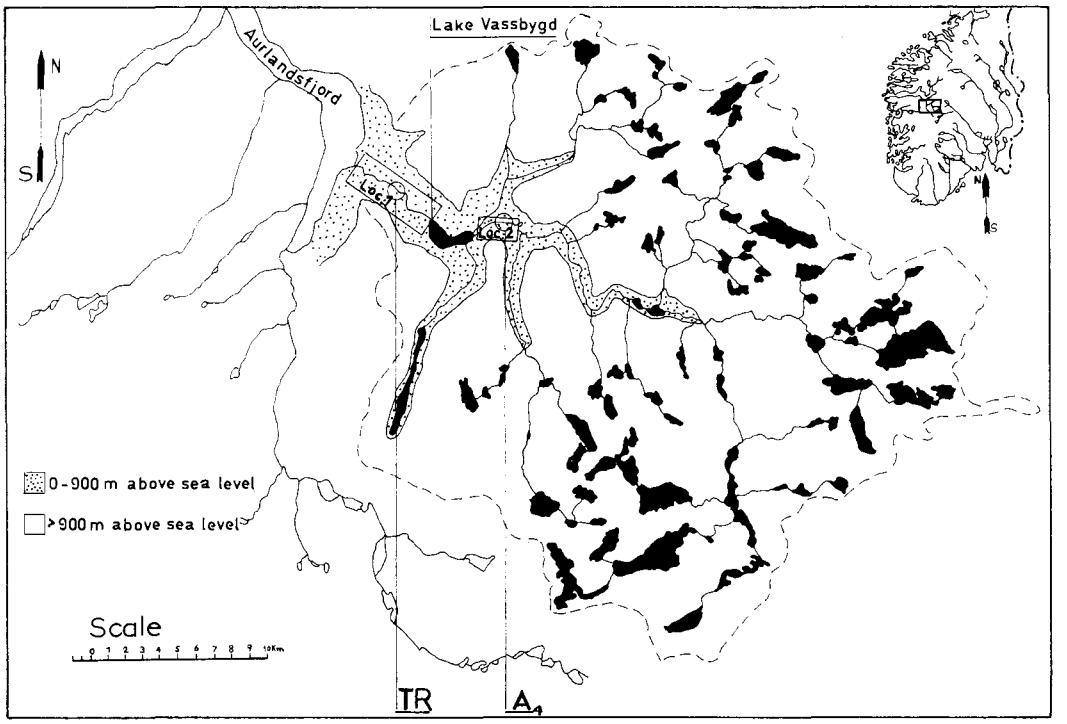

Fig. 1. The Aurland River system (within stippled line). The localities Loc. 1 and Loc. 2, and the stations TR and A_4

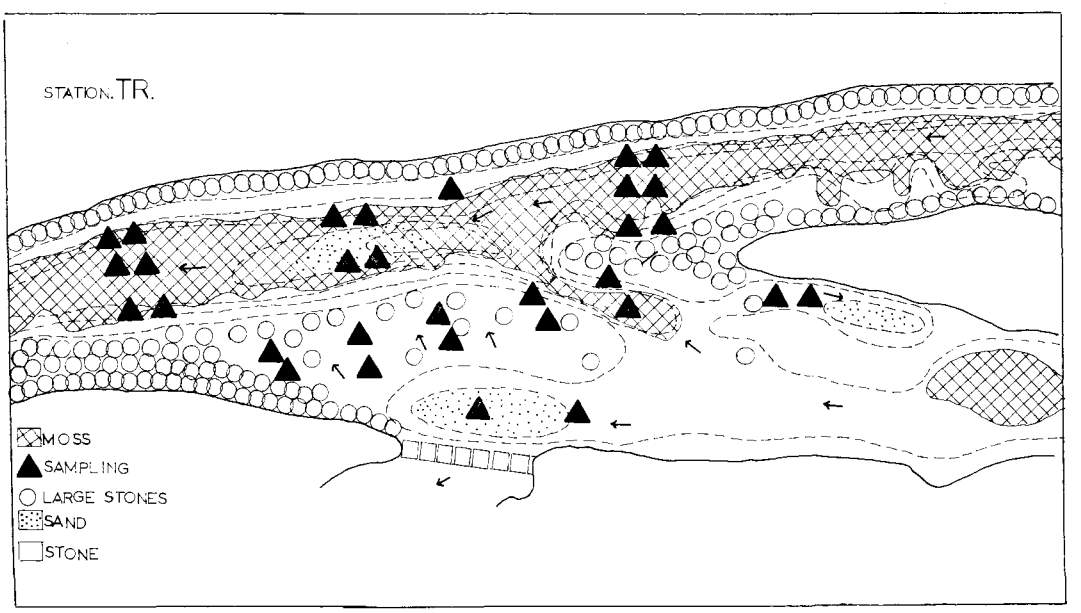

Fig. 2. Station TR, situated 30 m above sea level. Black arrows indicate direction of current flow. (Scale 1:2000)

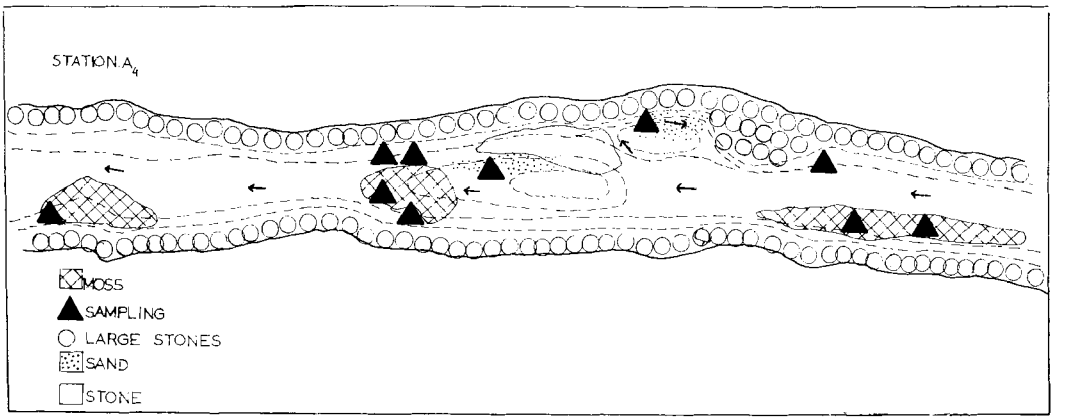

Fig. 3. Station A_4 situated 110 m above sea level. (Scale 1:2000)

The homogeneity of the sampling units will not be considered here.

THE SPECIES

Five species were found, *Leptophlebia marginata* (L.), *Leptophlebia vespertina* (L.), *Ephemerella aurivillii* Bengtsson, *Ameletus inopinatus* Eaton, and *Baetis rhodani* (Pictet). The first two species are not considered here, because they did not belong to the benthic species of the river.

The distribution of Ephemeroptera so far known for Norway is found in Brekke (1938, 1943, 1965), Grimeland (1963, 1965), Økland (1964) and Illies (1967). Regarding the species found by the author, only *A. inopinatus* have not previously been reported from Western Norway.

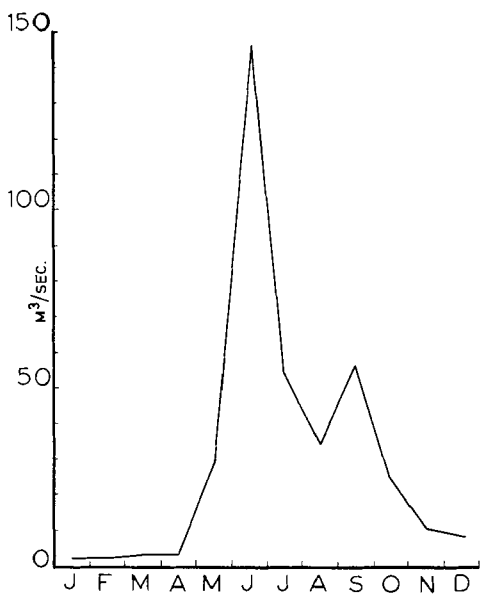

Fig. 4. The average water-flow every month during 1966 in m^3/sec. measured at the outlet of lake Vassbygd.

THE LIFE HISTORY OF EPHEMEROPTERA

The life history of Ephemeroptera has been studied by Moon (1939), who estimated the growth-rate of two species of *Leptophlebia* and *Caenis horaria* (L.), and showed that there is a single brood each year in all three species. Rawlinson (1939) found two broods of *Ecdyonurus venosus* (Fabricius) a year, and found a marked seasonal variation in the growth-rate too. Harker (1952, 1953) studied the life cycle and growth-rates of four species, *Ecdyonurus torrentis* Kimmins, *Heptagenia lateralis* (Curtis), *Rithrogena semicolorata* (Curtis), and *Baetis rhodani* (Pictet), in a stream near Bolten. Because of the long period of emergence for *B. rhodani* and appearance of small larvae throughout the year he failed to determine the life cycle of this species. Macan (1957) examined *B. rhodani, Baetis pumiulus* (Burm.), *Ephe-*

Table I. *Number of samples examined and dates of sampling every month during* 1966 *at TR and* A_4

Station			TR			A_4				
Date		Substratum:	A	B	C	A	B	C	Number of samples examined	Tested area in m²
Jan.	4.		5	2	2				9	0.9
	5.					5	5	5	15	1.5
Feb.	5.		5	5	5	5	5	5	30	3.0
Mar.	5.					5	5	5	15	1.5
	7.		5	5	5				15	1.5
Apr.	1.		5	5	5				15	1.5
	3.					5	5	5	15	1.5
May	4.		5	5	5				15	1.5
	5.					5	5	5	15	1.5
June	4.		5	5	5				15	1.5
	6.					5	5	5	15	1.5
July	4.		5	5	5				15	1.5
	5.					5	5	5	15	1.5
Aug.	4.		5	5	5				15	1.5
	5.					5	5	5	15	1.5
Sept.	3.		5	2	2				9	0.9
	5.					5	5	5	15	1.5
Oct.	1.		5	2	2				9	0.9
	3.					5	5	5	15	1.5
Nov.	4.		6	2	2				9	0.9
	6.					5	5	5	15	1.5
Dec.	20.		5	5	2				12	1.2
	21.					5			5	0.5
	22.						5	5	10	1.0

merella ignita (Poda), and *Paraleptophlebia submarginata* (Stephens). The life history of *A. inopinatus* has been studied by Gledhill (1959) in a little stream in the Lake District in England. As far as I know, nobody has studied the life cycle of *Ephemerella aurivillii*, but some knowledge about this species can be obtained from Bengtsson (1930), Tiensuu (1939), Södergren (1963), Ulfstrand (1967) and Illies (1967).

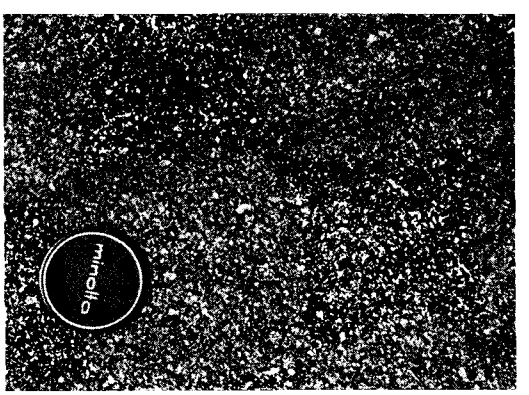

Fig. 5. Sand-substratum. The disc is 5.5 cm in diameter.

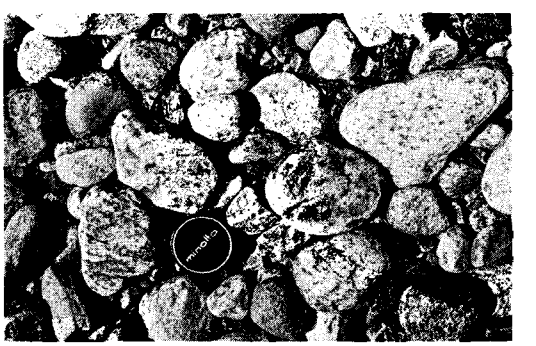

Fig. 6. Stone-substratum without moss-cover. The disc is 5.5 cm in diameter.

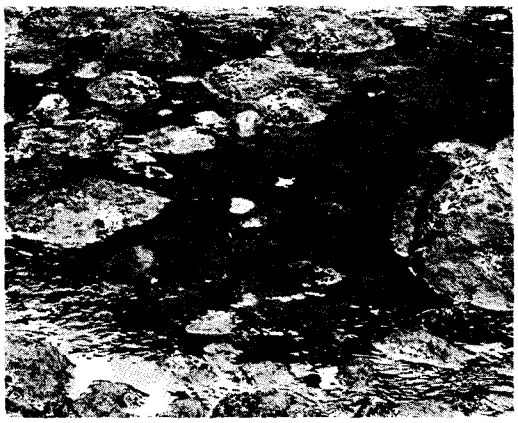

Fig. 7. Stone-substratum with moss-cover.

EPHEMERELLA AURIVILLII BENGTSSON 1908

A number of larvae and a few imagines and subimagines were collected on Station TR. It was not found in Loc. 2.

Both larvae and imagines agree with the descriptions of Bengtsson (1930). The number of specimens in each size group throughout the year is shown in Table II, and Fig. 8 shows the groups: small, half-grown and full-grown. The flight period is indicated by the black horizontal line, deduced from findings of larvae ready for emergence, subimagines and imagines. The results can be summarized as follows.

1) The flight period of *E. aurivillii* starts in the beginning of June and lasts to the middle of September with no clear peaks of emergence.

2) The first newly-hatched larvae are found from the beginning of August and the larvae are growing rapidly throughout the autumn.

3) Apparently there is a cessation of growth or a drop in the growth rate in December, January, February and March. Then the larvae grow rapidly again and reach the time of emergence towards the beginning of June. However, this can only partly be deduced from the data given, because they belong to two following generations, and it must be mentioned that nothing is known about the yearly fluctuation of the population density.

4) The natural death rate of the young larvae is high, reducing the population to half or less during one or two months.

5) The animals complete a generation in one year.

6) The subimagines are found early in the morning and the imaginal stage is reached 2 or 3 hours later. In the afternoon an upstream flying activity begins. The females are flying low over the water and eggs are dropped on the surface mostly in the middle of the river. Copulation has never been observed.

Discussion

The flight period of *E.aurivillii* is long, lasting for almost 4 months, compared with the two and a half months of *E.ignita,* and the 20 days of *E.notata.*

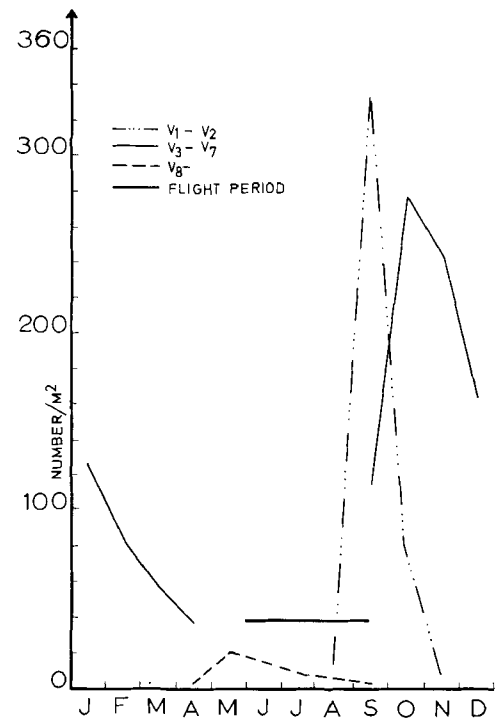

Fig. 8. Variation in number of *E. aurivillii* per m² at TR in the groups: small (V_1–V_2), half-grown (V_3–V_7), and full-grown (V_8–), based on monthly samples.

Table II. *Average number of* E. aurivillii *at station TR on substrata A, B, and C per m², and average number in each size group per m² based on the mean of the numbers on B and C. Size V of specimens in mm*

st. TR.		Average number per. m²						
Month	Subst.	A	B	C	$\frac{B+C}{2}$	$1 \leq V_1 < 2$	$2 \leq V_2 < 3$	$3 \leq V_3 < 4$
Jan.		2	0	250	125			
Feb.		2	0	164	82			
Mar.		4	0	112	56			
Apr.		4	2	74	38			
May		2	4	36	20			
June		0	18	12	15			
July		0	12	6	9			
Aug.		0	12	28	20	10	3	
Sept.		0	15	905	460	265	73	45
Oct.		2	0	710	355		78	85
Nov.		2	0	505	253		8	23
Dec.		4	0	326	163			
							$1 \leq$ small < 3	

Sawyer (1953) has shown that the flight period varies from place to place for the same species. This may be due to temperature differences. Brinck (1949) has shown that the emergence of many species of Plecoptera takes place progressively later and often the flight period becomes shorter in colder zones in Sweden.

This may be the case for Ephemeroptera too. But there is no reason to believe that temperature is the only factor regulating the flight period. Weather, water-flow and biotic factors as well as endogenous factors have to be considered regarding this question, see Remmert (1962) and Aschoff (1965).

The incubation period is variable, varying from 10 days in *Ephemera vulgata* (Schoenemund 1930) to 10 months in *E. ignita* (Macan 1961 and Pleskot 1958). The time spent in the egg stage cannot be determined exactly for *E. aurivillii*. But it may be about one month, as only one month elapses from the time the first larva is ready for emergence until newly-hatched larvae appear, unless the newly-hatched larvae are from diapause eggs laid in the autumn the year before. This is shown by Gledhill (1959) to be the case for *A. nopinatus*. But the diapause eggs of *A. nopinatus* hatched early in the spring, those of *E.aurivillii* in August. Why should the diapause last till August for the eggs of *E. aurivillii?* So it is possible that my suggestion of no diapause eggs for *E. aurivillii* is correct in this case. The exact death and growth rates cannot be estimated from the average of monthly catches and measurements as done by Harker (1952) and Illies (1952), because a) drifting of the specimens is not considered, b) the specimens below 1 mm are excluded from the material, and c) a delayed hatching or growth in the small stage invalidates the calculations. Therefore I think that the calculations of Illies and Harker are doubtful, because they have not taken into account these factors. Considering the death and growth rates of *E. aurivillii* it is therefore not possible to do more than gain an idea of these two.

Regarding copulation in other *Ephemerella* species, it takes place on land up to two hundred metres from the water edge (Kimmins and Frost 1943). This can be the case for *E. aurivillii* too. I was prevented from making observations that far from the water because

Table II *(Contd.)*

Average number in each size group per. m^2							
$4 \leq V_4 < 5$	$5 \leq V_5 < 6$	$6 \leq_6 < 7$	$7 \leq_7 < 8$	$8 \leq_8 < 9$	$9 \leq V_9 < 10$	$10 \leq V_{10} < 11$	$V_{11} \geq 11$
43	70	13					
36	27	19					
11	28	17					
	5	28	3	2			
				2	3	15	
					5	7	3
						3	6
						4	3
60	13					3	3
105	48	40					
78	40	105					
57	34	72					
$3 \leq$ half grown < 8					full grown ≥ 8		

of the cultivated land in the area. The same mode of egg depositing is also found in American and other European *Ephemerella* species (Smith, 1935, Jensen 1961).

BAETIS RHODANI (PICTET) 1844

This is the most abundant species in the Aurland River both in Loc. 1 and Loc. 2. The larvae agreed completely with the discriptions by Müller-Liebenau (1965), and the imagines with that of Kimmins (1954). The number of specimens in each size group throughout the year is shown in Table III, and Fig. 9 shows the groups: small, half-grown and full-grown. The flight period is indicated as for *E. aurivillii*. This result is based on collections from TR, but for comparison some data for *B. rhodani* on A_4 are shown in Table III. The results can be summarized as follows.

1) The flight period of *B. rhodani* starts at the beginning of April and lasts to the begin-

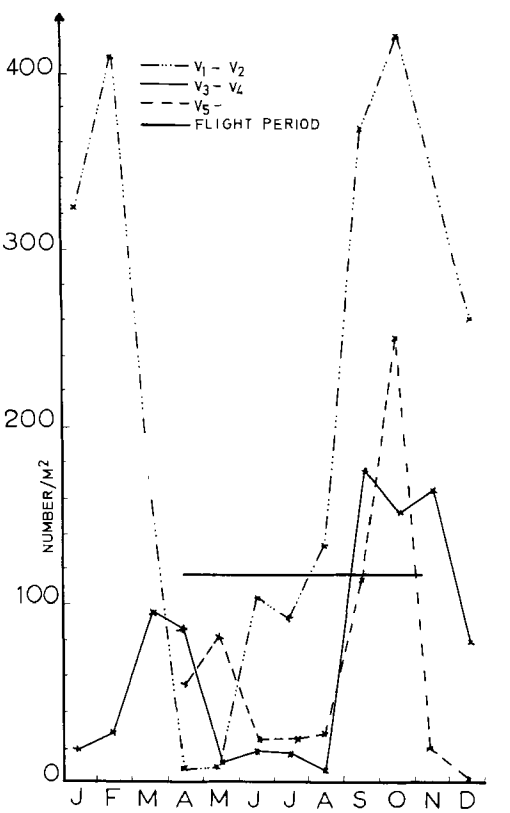

Fig. 9. Variation in number of *B. rhodani* per m^2 at TR in the groups: small (V_1–V_2), half-grown (V_3–V_4), and full-grown (V_5–), based on monthly samples.

Table III. *Average number of* B. rhodani *at station TR and A_4 on substrata A, B, and C per m², and average number in each size group per m² at TR based on the mean of the numbers on B and C. Size V of specimens in mm*

st. TR.	Average number per m²				Average number in each size group per m²						st. A_4	Average number per m²		
	Substr.			B+C										
Month	A	B	C	2	$1 \leq V_1 < 2$	$2 \leq V_2 < 3$	$3 \leq_3 < 4$	$4 \leq V_4 < 5$	$5 \leq V_5 < 6$	$V_6 \geq 6$	Subst.	A	B	C
Jan.	40	495	185	340	218	105	15	3			Jan.	20	242	104
Feb.	32	660	210	435	301	108	23	3			Feb.	16	374	118
Mar.	44	380	140	260	109	53	46	52			Mar.	16	146	50
Apr.	30	260	30	145		6	77	8	3	51	Apr.	10	136	16
May	64	180	20	100	1	8	5	2	20	64	May	14	136	22
June	4	200	86	143	101	3	14	2	6	17	June	4	88	42
July	2	155	105	130	73	20	10	5	8	15	July	0	94	68
Aug.	4	130	200	165	130	5	3	0	20	8	Aug.	0	80	74
Sept.	6	1200	110	655	300	68	85	90	78	35	Sept.	10	636	56
Oct.	48	1470	175	823	348	73	23	130	148	103	Oct.	26	946	108
Nov.	105	845	205	525	240	105	80	83	18		Nov.	82	530	164
Dec.	80	430	250	340	215	45	63	15	3		Dec.	64	260	144
					$1 \leq$ small < 3		$3 \leq$ half grown < 5		full grown ≥ 5					

Table IV. *Average number of* A. inopinatus *at station A_4 on substrata A, B, and C per m², and average number in each size group per m² based on the mean of the numbers on B and C. Size V of specimens in mm*

st. A_4		Average number per m².						
Month	Substr.	A	B	C	B+C / 2	$1 \leq V_1 < 2$	$2 \leq V_2 < 3$	$3 \leq V_3 < 4$
Jan.		0	8	10	9		2	
Feb.		2	6	10	8		1	
Mar.		2	6	8	7			
Apr.		0	4	6	5			
May		0	8	4	6			
June		0	16	2	9			
July		0	26	8	17			
Aug.		0	32	4	18			
Sept.		0	4	2	3	3		
Oct.		0	10	12	11	6	2	3
Nov.		0	4	20	12	7	3	1
Dec.		0	8	2	5		3	
						$1 \leq$ small < 3		

ning of November. Two peaks appear, one in May and another in October.

2) Newly hatched larvae are found throughout the year, except in April and the beginning of May, and the larvae are growing rapidly during spring, summer and autumn.

3) As for *E. aurivillii* there is a drop in the growth rate in the winter.

4) As for *E. aurivillii* the death rate is high.

5) The animals complete two generations in one year.

6) The subimagines are found in the morning, and the imaginal stage is reached the same afternoon. Copulation takes place near the water edge or some distance from the water.

Discussion

The analyses made by Macan (1957), Pleskot (1958) and Harker (1953) on *B. rhodani* show almost the same pattern. But there are some differences. This species has a longer flight period in Great Britain than in Aurland. In England newly hatched larvae also are found in April, but this size group is extremely low in April, as only 3 specimens in the smallest group were found by Macan. In the preceding month he found 68 specimens and in the following 425. These differences can be explained by the longer flight period in Great Britain, which causes an overlapping of the two generations. Macan (1957) also says that there are two generations in one year for *B. rhodani*, but Illies (1959) has shown that eggs of *B. rhodani* remain unhatched for a long time. If some eggs laid in the autumn do not hatch before May of the next year, there could be reason to believe that there is only one generation in one year. But why should eggs not hatch in April, when they are hatching in January, February and March? I think that all the eggs laid in the autumn are hatched during October-March. Therefore no newly hatched larvae are to be found in April and the beginning of May. The peak of imagines in May give rise to a new generation that go through the larval stage during the summer and gives rise to a peak of imagines in October. Furthermore, these imagines produce a new generation of larvae that cannot complete the larval stage the same year, because of the decreasing temperature and food shortage. These larvae produce the imagines appearing in May.

Table IV *(Contd.)*

Average number in each size group per m^2							
$4 \leq V_4 < 5$	$5 \leq V_5 < 6$	$6 \leq V_6 < 7$	$7 \leq V_7 < 8$	$8 \leq V_8 < 9$	$9 \leq V_9 < 10$	$10 \leq V_{10} < 11$	$V_{11} \geq 11$
5			2				
1		6					
	3		4				
	2	2	1				
			1	3		1	1
				2		2	5
							17
							18
		1					
	1		1				
3 ≤ half grown < 8					full grown ≥ 8		

AMELETUS INOPINATUS EATON 1887

Many larvae and a few imagines were taken on station A_4, the species was not found at Loc. 1. The larvae agreed closely with the description by Macan (1961), and the imagines with the description by Kimmins (1954). The number of specimens in each size group throughout the year is shown in Table IV, and Fig. 10 shows the groups, small, half-grown and full-grown. The material is small, due to the fact that *A. inopinatus* had a much denser population higher up along the River, and that the place where the samples were taken lay on the limit of the population range. This has caused some peculiarities in the results obtained. But some information may be drawn from the data.

1) The flight period of *A. inopinatus* starts at the beginning of May and lasts until the end of August.

2) No newly-hatched larvae are found from December to August the next year.

3) The growing periods are almost identical with those of *B. rhodani* and *E. aurivillii*.

4) Nothing can be said about the death rate, because the drifting of animals from places with higher population density gives an increasing number of animals per m^2 during the summer, and it is probable that the drift has a larger influence on the samples taken at the limit of the population range then on samples taken in places with a dense population.

5) The animals complete a generation in one year.

6) Copulation and oviposition were not observed.

Discussion

Gledhill (1959) found that *A. inopinatus* has an emergence period from May to late August, and grows throughout the winter. This agrees with my observation. He found two peaks of larvae in each size group, and said that they appear to be due to two bursts of hatching, one in the autumn and the other at the beginning of the year. This cannot be deduced from the data obtained by the author.

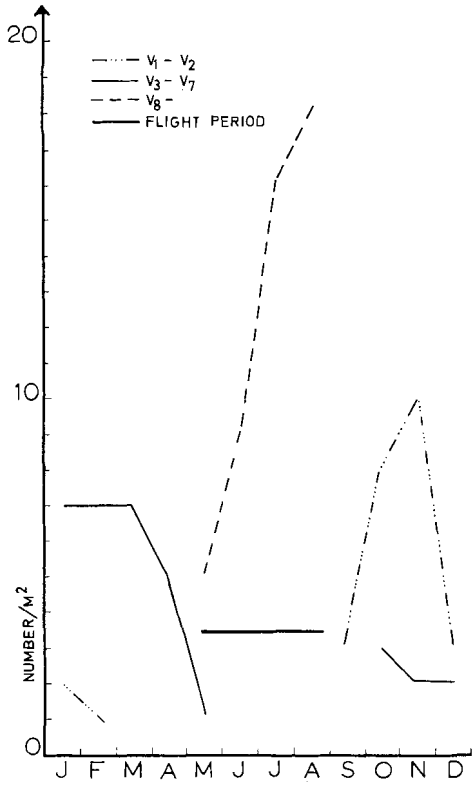

Fig. 10. Variation in number of *A. inopinatus* per m^2 at A_4 in the groups: small (V_1–V_2), half-grown (V_3–V_7), and full-grown (V_8–), based on monthly samples.

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Nye funn av Lepidoptera i Norge

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Lom
(Mottatt 30. mai 1968)

'Catalogue of the Lepidoptera of Norway' (Opheim 1962) kan suppleres ved nedennevnte funn av arter som er nye for den krets hvor de er fanget.

Bø: *Amphipyra perflua* F., Åros 15.8.1967. *Pterostoma palpinum* L., Åros 25.5.1968.

VE: *Drepana falcataria* L., Narverød 10.8. 1967, *Diarsia festiva* Schiff., Narverød 26.8. 1967, *Cerastis rubiricosa* Schiff., Narverød 29.4. 1968, *Antitype chi* L., Narverød 12.8.1967, *Agrochola litura* L., Narverød 26.8.1967, *Apamea ypsilon* Schiff., Narverød 26.8.1967, *Caradrina cinerascens* Tngstr., Narverød 12.8.1967, *Zenobia subtusa* L., Narverød 11.8.1967, *Arenostola phragmitidis* Hb., Narverød 11.8.1967.

TEi: *Anthocaris cardamines* L., Hjardal 24.5. 1968.

VAy: *Orthosia populi* Strøm, Søgne 6.5.1967, *Apamea rubrirena* Tr., Søgne 9.8.1967, *Amphiphyra perflua* F., Søgne 4.8.1967, *Scoliopteryx libatrix* .L, Søgne 25.8.1967.

TRy: *Diarsia rubi* View., Finnsnes 31.8.1965, *Apamea secalis* L., Finnsnes 25.8.1965, *Hydraecia crinanensis* Burr., Finnsnes 30.8.1965, *Lygris testata* L. Finnsnes 23.8.1965.

SUMMARY

The article gives a list of new localities for 16 species of Lepidoptera from Norway.

LITTERATUR

OPHEIM, M. Catalogue of the Lepidoptera of Norway. Part I. Rhopalodera, Grypocera, Sphinges and Bombyces (1958, 26p) and Part II. Noctuoidea. (1962,-32 p). Norsk Entomologisk Forening, Oslo.

Om noen norske arter av slekten *Atheta* Ths. (Col., Staphylinidae)

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Abstract: STRAND, A. 1968. Über einige norwegische Arten der Gattung *Atheta* (Col., Staphylinidae). *Norsk ent. Tidsskr.* **15**, 61-62.
Der Verfasser teilt einige norwegische Funde von Atheten mit und macht u. a. darauf aufmerksam, dass die von Munster beschriebene *Atheta taxiceroides* mit der früher beschriebenen *subquadrata* Sharp identisch zu sein scheint.

Atheta (Microdota) nesslingi Bernh. Arten er hos oss tidligere bare kjent fra Bø: Teksle i Numedal, men den 13/7 1964 fant jeg to eksemplarer i saft fra en bjørkestubb på On: Vålåsjø.

Atheta (Atheta s. str.) *divisa* Märk. Jeg har tidligere (Strand 1959) redegjort for en del funn av denne arten med misdannet brystskjold. I løpet av de siste årene har jeg på AK: Brønnøya, Asker funnet ytterligere 9 eksemplarer med svakt til meget sterkt uttrukne bakhjørner på brystskjoldet, to av dem symmetriske, de øvrige til dels meget sterkt asymmetriske, mest i hønselort, men også i hønse- og paddekadaver og et eksemplar flygende. Funnene fordeler seg på samtlige måneder fra mai til september.

Merkelig nok ser det ut til at flere abnorme *divisa* også er funnet i England så langt tilbake som omkring århundreskiftet. Således nevner Fowler og Donisthorpe (1913) følgende: '*H. (Atheta) divisa,* Märk., var. *blatchi,* Ellis, Ent. Rec. 1901, p. 251. *H. angulata,* Fowler and Sharp Cat., 1893. A very distinct form differing from the type in that the base of the thorax is much wider than the elytra owing to the strongly developed posterior angles.

Taken by the late Mr. W. F. Blatch in dead moles and hedgehogs at Knowle, Warwickshire. Mr. Willoughby Ellis, who described this form in honour of Mr. Blatch, has also taken it in similar situations.'

Det er her ikke nevnt noe om hvorvidt brystskjoldet var symmetrisk eller ikke. Nærmest ligger det vel å tro at det gjelder symmetriske eksemplarer, da det er lite trolig at de ellers ville bli gitt særskilt navn.

Atheta (Atheta s. str.) *subquadrata* Sharp. Arten er beskrevet etter en ♀ fra Brockenhurst i New Forest, England. Beare (1930) har den med i sin katalog, og Brundin (1953) har undersøkt typen, som han mener er *angusticollis* Ths. Joy (1932) har den derimot ikke med.

For en tid siden fikk jeg fra Allen til undersøkelse en art som han mente er *subquadrata.* Den stemmer helt med to eksemplarer (♂, ♀) fra New Forest, som jeg for mange år siden fikk av Harwood, og som har følgende seddel: «*?nitidicollis* Fairm. det. Deville». Ved å undersøke den nærmere viste den seg å være *taxiceroides* Munst.

Allen har forsøkt å finne typen av *subquadrata,* men uten resultat. Derimot har han i British Museums materiale funnet en rekke eksemplarer, som han regner som *subquadrata.* De er alle fra New Forest.

Det kan etter dette ikke avgjøres helt sikkert hva typen er, men da det er rimeligst å tro at det er den samme som *taxiceroides,* og da arten i England vil komme til å gå under navnet *subquadrata,* bør Munsters navn trekkes inn som synonym. Ifølge Brundin (1953) er *nitidicollis* Fairm. den samme som *fungicola* Ths.

Arten har en eiendommelig utbredelse, nemlig England (New Forest), N.-Norge (TRy: Oksfjorddal, TRi: Målselv og Nordreisa) samt Beskidene.

Atheta (Badura) puncticollis G. Benick. Denne arten er i Norge kjent fra følgende steder: AK: Røa (A. Strand), Bø: Lyngdal (Munster) og VE: Sandøy (A. Strand). På On: Vålåsjø i ca. 1000 m høyde tok Anders Vik den 10/8 1964 en ♀, som har en spermatheca som i form stemmer med de andre eksemplarer jeg har, men den er betydelig større. Benick har sett eksemplaret og bekreftet at det er *puncticollis*.

Atheta (Amischa) amplicollis Muls. & Rey. Kevan (1966) har publisert et funn av denne arten etter et eksemplar tatt i Cornwall. Det har vært undersøkt av Benick, som mener at det er *amplicollis*, uten å være helt sikker, mens Jarrige, som også har sett eksemplaret, mener at det er en annen art. Det har ikke vært mulig å finne typemateriale.

I materialet fra flom i Lysakerelva ved AK: Røa, Oslo, fant jeg den 13/5 1966 og den 15/5 1967 over et halvt hundre eksemplarer som stemmer godt med Kevans beskrivelse. Både Benick og Kevan har sett norske eksemplarer og bekrefter at det er samme art.

Arten har tidligere vært regnet som synonym til *fungi* Gr., som den likner sterkt, men den er gjennomsnittlig større med bredere og mer rundet brystskjold, mørkere følehorn, tettere og mer bredmasket mikroskulptur på bakkroppens ryggledd, og spermathecaen er betydelig større.

Kevan (1967) oppgir at en ♂ som han har undersøkt, har en tydelig, stor punktgrube på hver side av brystskjoldet et stykke fra midtlinjen og omkring ⅓ fra roten, en karakter som han sier ville være meget nyttig, dersom det skulle vise seg at den er konstant. I mitt materiale har jeg en ♀ med to slike gruber, en ♀ med en tydelig grube på den ene siden og en svak på den andre samt en ♀ med grube bare på den ene siden. Noe liknende ser det også ut til å være hos *Thiasophila wockei* G. W. Schneider. Horion (1967) nevner således at det i Østerrike er funnet eksemplarer av denne art som har en slik punktgrube på hver side av brystskjoldet (var. *bifossulata* Scheerp. i. l.). I mitt materiale av denne arten er det en rekke slike eksemplarer, men dybden av grubene varierer, og også her er det et eksemplar som har sterkere grube på den ene siden enn på den andre.

De kjente norske funn av *amplicollis* er: AK: Lommedal og Røa, Bø: Svene, Nsi: Mo i Rana, Nnv: Lødingen og TRi: Målsnes. På de to sistnevnte steder ble den tatt ved sikting av tang i sjøkanten.

Mottatt 28. februar 1968

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Über die norwegischen Tabaniden (Diptera)

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Abstract: KAURI, H. 1968. Über die norwegischen Tabaniden (Diptera) *Norsk ent. Tidsskr.*, **15**, 63-64. Records of some horseflies in Norway are presented. To the species known from Norway may be added, *Hybomitra distinguenda* Verral, *Tabanus glaucopis* Meigen and *Hexatoma pellucens* Fabr.

Die Tabanidenfauna Norwegens hat in der entomologischen Literatur wenig Aufmerksamkeit gefunden. Die artliche Zusammensetzung der Fauna sowie Verbreitung der Arten ist nicht näher bekannt. Ausserdem ist in den letzten Jahren die Synonymik vieler europäischen Arten geklärt und einige nomenklaturische Änderungen sind vorgeschlagen worden. Eine Veröffentlichung der bekanntgewordenen neuen Angaben findet dadurch ihre Berechtigung.

Eine Reihe kleinerer Sammlungen von Dr. A. Semb-Johansson, cand. mag. Tore Nielsen, dem Arzt Arne Nielsen und stud. real. Arne Fjellberg, die vom Verfasser bearbeitet worden sind, bilden die Unterlage dieses Verzeichnisses. Die Namen der Sammler werden im folgenden verkürzt gebraucht: SJ — A. Semb-Johansson, AN — Arne Nielsen, TN — Tore Nielsen und AF — Arne Fjellberg.

Hybomitra bimaculata Macq. (*tropica* auctt., *confinis* Zett., *collini* Lyneborg, nec *tropica* L.): Vestfold (VE), Tjøme 20.6—14.7. AF; Østfold (Ø), S. Sandøy 14.6—8.7. SJ. Diese Art hat sicher eine ausgedehnte Verbreitung im Lande, wegen der verwickelten Synonymik aber müssen die älteren Angaben revidiert werden.

Hybomitra conformis Frey (*confinis* Olsoufjev, nec *confinis* Zett.): Vestfold, Tjøme 6.6—20.6. AF. Die Art ist früher für Finnmark, Altafjordbotn, angegeben worden (Kauri 1964). In Schweden ist *conformis* weit verbreitet von Schonen bis Karesuando, Torne Lappmark (Kauri 1964).

Hybomitra distinguenda Verral: Rogaland (R), Brattebø und Myrland TN; Østfold, S. Sandøy SJ. Die Zeitangaben verteilen sich vom 30.6—8.7. Diese Art ist früher in Norwegen nicht gefunden worden. Sämtliche Fundstellen liegen im Süden des Landes. In Schweden erreicht *distinguenda* längs der Küste der Ostsee Nederluleå 65° 35′ n.Br. (Kauri 1954).

Hybomitra lapponica Wahlberg: Hedmark (HE), Borkhus, Tolldal 22.7. TN.

Hybomitra lundbecki Lyneborg (*fulvicornis* auctt.): Sør-Trøndelag (ST), Kongsvoll, Grønbakken 9.7. TN; Buskerud (BD), Gol 13.7. AN; Østfold, S. Sandøy 17.6. SJ; Oslo, Sognsvann 10.7. SJ. Diese Art ist in der älteren Literatur irrtümlich als *fulvicornis* Meigen bezeichnet (Lyneborg 1959), oft auch mit *montana* Meigen verwechselt worden.

Hybomitra m. montana Meigen: Vestland, TN; Vestfold, Tjøme 19.7. AF; Østfold, S. Sandøy 23.—29.7. SJ. Eine Revision der älteren Sammlungen ist notwendig, weil die Art of mit *lundbecki, montana flaviceps* und *tropica* verwechselt wird.

Hybomitra nigricornis Zett.: Sør-Trøndelag, Gåvåli 28.7. TN; Hedmark, Borkhus, Tolldal 22.7. TN.

Hybomitra sexfasciata Hine (*Tabanus borealis anderi* Kauri): Diese nordamerikanische Art wurde vor einigen Jahren für Europa festgestellt, indem die Identität mit *borealis anderi* erkannt wurde (Kauri 1958). Die Verschiedenheit gegenüber *borealis* Loew hatte schon Zetterstedt observiert und die Form als Varietät «e» (abdominis lateribus non ferrugines) bezeichnet (Zetterstedt 1840). Die norwegischen Fundorte sind Finnmark, Bossekop (Zetterstedt loc. cit.) und Varanger, sowie Tromsø, Sørstrannen (Kauri 1951).

Hybomitra tropica L. (*tuxeni* Lyneborg): Vestfold, Tjøme 18.7.—11.8. AF; Rogaland, Klepp, Alvevatn 18.7. AN & TN. Auch diese Art ist von früheren Verfassern manchmal unrichtig bestimmt worden. In den Sammlungen des Zoologischen Museums der Univ. Bergen ist z.B. von den von Bidenkap signierten Stücken ein ♀ richtig als *Tabanus tropicus* L. bestimmt, ein ♂ aber als *fulvicornis*.

Tabanus glaucopis Meigen: Vestfold, Tjøme 20.7. AF; Oslo, Åklungen 27.6. SJ; Østfold, S. Sandøy 25.7.—16.8. SJ. An dem letztgenannten Fundort hat Dr. Semb-Johansson insgesamt 5 ♀ erbeutet. Eine beträchtliche Menge, weil die Art in Skandinavien sonst nur vereinzelt gefunden wird. Diese südliche Art ist früher nicht als norwegisch angegeben worden. Aus Schweden sind nur wenige Fundorte bekannt, am nördlichsten in Dalarna bei Falun (Kauri 1951). Aus Dänemark liegen überhaupt keine Fundangaben vor. Die Verbreitung der Art umfasst sonst West-, Mittel- und Südeuropa, Osteuropa bis zum Ural.

Tabanus maculicornis Zett.: Hordaland (HO), Voss 15.7. TN; Østfold, S. Sandøy 18.—20.6. SJ. *T. maculicornis* wurde von Zetterstedt (1842) auf Grund des norwegischen Materials beschrieben. In Schweden von Schonen bis Norrbotten verbreitet.

Eingegangen 14 Mars 1968

Tabanus sudeticus Zeller: Vestfold, Tjøme 19.—22.7. AF; Østfold, S. Sandøy 1.—15.7. SJ. In den Sammlungen des Zoologischen Museums d. Univ. Bergen befindet sich Material von Akershus, Aust-Agder, Rogaland und Hordaland.

Atylotus plebejus Fallén: Rogaland, Brattebø 3.7. TN.

Atylotus sublunaticornis Zett. (partim *plebejus* Kröber und *plebejus* Olsoufjev, nec *plebejus* Fallén): Sør-Trøndelag, Kongsvoll, Grønbakken 9.7. TN. Das Typusmaterial für diese Art hatte Zetterstedt in Kälahög, Norwegen, gesammelt. Die späteren Autoren haben *sublunaticornis* meist mit *plebejus* Fallén zusammengeworfen, weshalb die beiden Arten in den Sammlungen unter dem Namen *plebejus* zu finden sind. Der andere norwegische Fundort, den Zetterstedt angibt, ist Nord-Trøndelag, Sul. In Schweden ist die Art weit verbreitet, am nördlichsten bei Abisko. Die meisten Fundorte in Schweden liegen im Westen des Landes.

Hexatoma pellucens Fabr.: Vestfold, Tjøme 8.—20.7. AF. Aus Schweden ist diese seltene Art nur an wenigen Fundorten gefunden worden.

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Typhochraestus sylviae sp.n. and *Panamomops mengei* Simon (Araneae) in Norway

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Abstract: HAUGE, E. 1968. *Typhochraestus sylviae* sp.n. and *Panamomops mengei* Simon (Araneae) in Norway. *Norsk ent. Tidsskr.* **15**, 65-69.
During summer 1967 two species of the family Erigonidae (Araneae) were found in Ankenes, Nordland, in Northern Norway. *Typhochraestus sylviae* sp.n. is described as new to science, and *Panamomops mengei* Simon is reported for the first time from Norway. Both species were found in the ground cover of a north-facing birch forest about 200 m above sea level.

During arachnological investigations made during the summer of 1967 in Nordland, Skjomenfjord in the Ankenes district, about 30 km south of Narvik, two species of the family Erigonidae, which deserve some attention, have been found. I have come to the conclusion that one of the species, *Panamomops mengei,* is new to Norway, and that the other, *Typhochraestus,* seems to be new to science.

TYPHOCHRAESTUS SYLVIAE SP.N.

Description: 1 female. Total length: 1.88 mm, length and width of cephalothorax 0.76 and 0.52 mm respectively. Width of head behind eyes 0.33 mm. Abdomen 1.26 mm. Measurements taken on legs I-IV (ta.-metat.-tib.-pat.-fem.-tr.-cx.): Leg I (0.38 - 0.42 - 049 - 0.22 - 0.58 - 0.07 - 0.14) = 2.40 mm, leg II (0.34 - 0.36 - 0.43 - 0.20 - 0.54 - 0.06 - 0.14) = 2.07 mm, leg III (0.32 - 0.34 - 0.36 - 0.18 - 0.50 - 0.07 - 0.10) = 1.87 mm, leg IV (0.38 - 0.47 - 0.61 - 0.21 - 0.74 - 0.06 - 0.10) = 2.62 mm. Length of legs in order: 4, 1, 2, 3.

Cephalothorax oval, appears narrow, width of head about ⅔ of that of thorax. Viewed from above the clypeus is somewhat protruding. The profile of the cephalothorax shows a distinct convexity behind the posterior eyes, and immediately afterwards decreases, to slope gently to a point situated at the beginning of the last ⅓ of the cephalothorax, after which it falls in a steeper line (Fig. 1).

Posterior row of eyes slightly procurve. Distance between posterior medians equal to their diameter. Distance to the laterals is equal to the diameter of the laterals, which is slightly less than that of the medians (ca. ⅘). The diameter of the anterior lateral eyes is the same as the diameter of the posterior medians. Anterior medians about half the diameter of the laterals.

Length of chelicerae 0.30 mm. Posterior margin has 5 small teeth, close to each other. Anterior margin with 6 larger teeth. The outermost one is a little smaller than the others, which are of approximately the same size and at equal distance from each other,

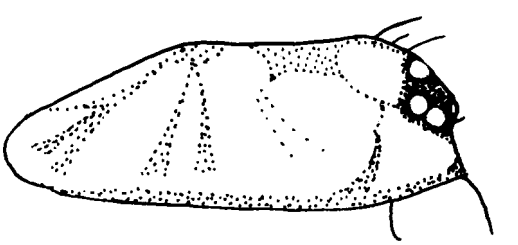

Fig. 1. *Typhochraestus sylviae,* profile of cephalothorax

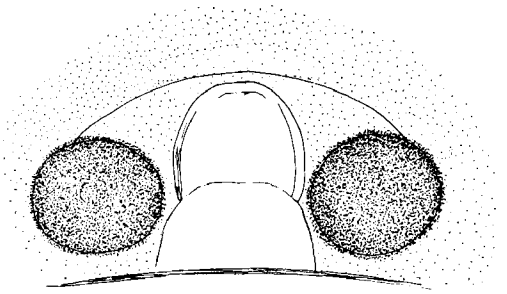

Fig. 2. *Typhochraestus sylviae*, epigyne.

except for the innermost one, which is situated at some greater distance from its neighbour.

Sternum as broad as long, with a broad protrusion between coxae IV.

Femurs I-III have ventrally, near the middle of the distal half, a long spine. Patellae I-IV have a dorsal, apical spine. Tibias I-III have 2 dorsal spines in positions: Tib. I 0.18 and 0.73, tib. II 0.16 and 0.72, tib. III 0.19 and 0.72. Tibia IV has one spine in position 0.28. On tibia I, length of spines is about 1.5 times the diameter of the tibia; on tibia IV the corresponding ratio is 2.25.

Metatarsus IV without a trichobothrium. Positions of trichobothriums on the other metatarses are: TmI = 0.57, TmII = 0.53, TmIII = 0.47.

The ratio between length of metatarsus I and its diameter is 7.64. The corresponding ratio on leg IV is 9.40.

Cephalothorax is yellow-brown, strongly suffused with black, black 6-sided spot behind the eyes, black radial stripes and dark margin. Ocular area dark. Abdomen grey. The area around the spinnerets is much lighter than the rest of the abdomen. The abdomen has on its ventral side two lateral rows of light spots. Sternum dark, smooth and arched. Legs lighter than cephalothorax, though suffused with black.

Epigyne (Fig. 2) is similar to that of *T. digitatus* (Wiehle (1960) and Locket & Millidge (1953)). The structure of the vulva (Fig. 3) together with the other characters leads me to suppose that this species is most correctly placed, until the male is discovered, in the genus *Typhochraestus* Simon 1884.

Locality of holotypus: Nordland, Skjomenfjord in Ankenes district, about 200 m above sea level. The spider was found between wet leaves on the ground in north-facing birch forest. Undergrowth dominated by *Dryopteris* and a thin discontinuous layer of moss (particularly *Hylocomium*). A female was collected on 14-VIII-1967 together with: *Hilaira herniosa* (Thor.), *Centromerus arcanus* (Cambr.), *Lepthyphantes tenebricola* (Wider), *Latithorax latus* (Holm), *Eboria fausta* (Cambr.), *Tapinocyba pallens* (Cambr.), *Maro sublestus* Falconer.

A comparison of my species with other species of the genus Typhochraestus Simon 1884 reveals: Spine formula on tib. I-IV (2221) corresponds to that of *T. digitatus* (Wiehle 1960) and *T. tenuis* (Holm 1943). On *T. brucei*, Tullgren (1955) reports one spine on the basal half of tib. IV, near the middle of the tibia, and 2 dorsal spines on tib. I.

There are some differences between my specimen and the others as regards the positions of the trichobothriums on metat. I-III, especially I and II. According to Wiehle (1960) *digitatus* has TmI-III = 0.40 (III)-0.45. Tullgren (1955) reports from *brucei* trichobothriums of metat. I-III at the basal half near the middle of the metat. The same is true of *tenuis* (I + II) (Holm 1943), but with TmII > 0.5. My

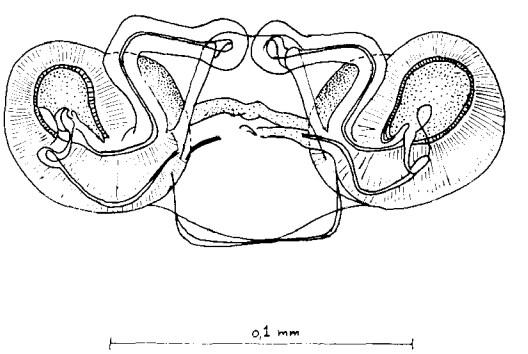

Fig. 3. *Typhochraestus sylviae*, vulva.

Table I. *Measurements of Panamomops mengei (in mm). Length of abdomen to the tips of the spinnerets*

	Specimens			
	1	2	3	Mean
Total length	1.45	1.55	1.47	1.49
Length of cephalothorax	0.69	0.69	0.69	0.69
Width of ceph.-th.	0.49	0.49	0.51	0.50
Width of head behind eyes	0.32	0.33	0.32	0.32
Width of ocular area	0.26	0.25	0.27	0.26
Length of med. eye trapezium	0.12	0.12	0.14	0.13
Clypeus	0.08	0.08	0.08	0.08
Length of abdomen	0.98	1.02	1.06	1.02
Length of chelicerae	0.22	0.26	0.23	0.24
Width of sternum	0.35	0.36	0.37	0.36
Length of sternum	0.39	0.39	0.43	0.40

species is therefore the only one that has TmI + II > 0.5.

As to the size of the eyes and the distances between them, there are similarities, except that in *brucei* the anterior laterals are the largest ones, and in *tenuis* the distance between posterior medians and laterals is less than their diameter. The posterior row of eyes is slightly recurve on *digitatus,* on *tenuis* almost straight, on my specimen slightly procurve and on *brucei* it is clearly procurve.

Number of teeth on anterior margin of chelicerae is 6 and corresponds to *digitatus; brucei* and *tenuis* are both reported to have 5 teeth.

The ratio length of ta./metat. on my specimen is: 0.91(I), o.94(II), 0.94(III), 0.80(IV). These are somewhat higher values than those for *digitatus*. According to Holm (1943) the anterior tarses are almost as long as the metatarses on *tenuis*. The same is reported of *brucei*.

The epigyne, Fig. 2, is similar to that of *digitatus* (Wiehle 1960, Fig. 602 and Locket & Millidge (1953)), but lacks the tongue-shaped anterior part found on *tenuis* (Holm 1943, T. II, Fig. 19), and is very different from the epigyne of *brucei* (Tullgren 1955, T. XIV, Fig. 41 a).

The vulva (Fig. 3) differs from that of *digitatus* (Wiehle 1960) in the shape of the ducts leading from the receptaculae seminis to

Table II. *Measurements of legs of Panamomops mengei made dorsally. Length of tarses to the basis of the claws. Total length of legs = the sum of the lengths of the articulates*

	Length in mm			Total length			
	1	2	3	1	2	3	Mean
Tarse I	0.30	0.29	0.31				
Metat. I	0.33	0.32	0.35				
Tibia I	0.39	0.39	0.39				
Patella I	0.18	0.18	0.20	1.93	1.93	2.04	1.97
Femur I	0.49	0.49	0.51				
Troch. I	0.08	0.08	0.10				
Coxa I	0.16	0.18	0.18				
Tarse II	0.28	0.28	0.27				
Metat. II	0.31	0.31	0.31				
Tibia II	0.35	0.35	0.35				
Pat. II	0.19	0.18	0.18	1.79	1.79	1.80	1.79
Femur II	0.45	0.45	0.45				
Troch. II	0.08	0.06	0.08				
Coxa II	0.13	0.16	0.16				
Tarse III	0.25	0.24	0.26				
Metat. III	0.29	0.29	0.29				
Tibia III	0.28	0.29	0.28				
Pat. III	0.18	0.18	0.20	1.50	1.61	1.65	1.62
Femur III	0.39	0.39	0.39				
Troch. III	0.08	0.06	0.08				
Coxa III	0.13	0.16	0.15				
Tarse IV	0.28	0.29	0.26				
Metat. IV	0.37	0.37	0.38				
Tibia IV	0.46	0.47	0.47				
Pat. IV	0.18	0.18	0.18	2.09	2.10	2.07	2.09
Femur IV	0.52	0.52	0.52				
Troch. IV	0.10	0.08	0.10				
Coxa IV	0.18	0.19	0.16				

Table III. *Positions of spines on tibia I-IV in Panamomops mengei. A and B refers to proximal and distal spines of the tibia*

Specimens Tibia		1	2	3	Mean
I	A	0.10	0.10	0.10	0.10
	B	0.70	0.75	0.75	0.73
II	A	0.14	0.11	0.14	0.13
	B	0.67	0.72	0.72	0.71
III		0.17	0.20	0.17	0.18
IV		0.28	0.27	0.25	0.27

Table IV. *Positions of trichobothriums on the metatarsus I-III in Panamomops mengei*

Specimens Metat.	1	2	3	Mean
I	0.33	0.33	0.31	0.32
II	0.33	0.34	0.31	0.33
III	0.37	0.37	0.37	0.37

the vagina. There are also differences from *tenuis* (Holm 1943, Fig. 14 a) and *brucei* (Tullgren 1955, Fig. 41 b) in the site of the openings of the copulatory ducts.

As to the length of the species, my specimen is, at 1.88 mm, much longer than *digitatus* (1.4-1.5 mm) (Wiehle 1960), and somewhat longer than *tenuis* (1.7 mm) (female) (Holm 1943) and *brucei* (1.6 mm) (Tullgren 1955).

Holotypus: 1 female, Zoological Museum, University of Bergen.

PANAMOMOPS MENGEI SIMON *(TISO NEMORALIS* HOLM 1939, *PANAMOMOPS SULCIFRONS* HACKMAN 1951)

Found 19-VI-1967, about 200 m above sea level, among wet detritus in north-facing birch forest, with undergrowth dominated by Dryopteris and a thin, discontinuous moss cover (mainly Hylocomium), 3 females.

Some measurements from my 3 specimens are shown in Table I.

Spine formula on tibias I-IV is 2211, as recorded by Holm (1939). According to Wiehle (1960). *P. mengei* has spine formula 2221.

The positions of tibia spines of my 3 specimens are given in Table III. The mean value of the ratio between the length of tibia spine IV and the diameter of the tibia is 1.4. The corresponding ratio on tib. I-III is about 1.25.

The ratios, length of metat. I/tarsus I, are 1.10; 1.10 and 1.13, mean 1.11. The corresponding ratios on leg IV are 1.33; 1.28 and 1.46, mean = 1.36.

The ratios, length of metat. I/diam. metat. I, are 4.9; 4.9 and 4.3, mean = 4.7.

Posterior eyes of equal size, distance between medians equal to their diameter, dis-

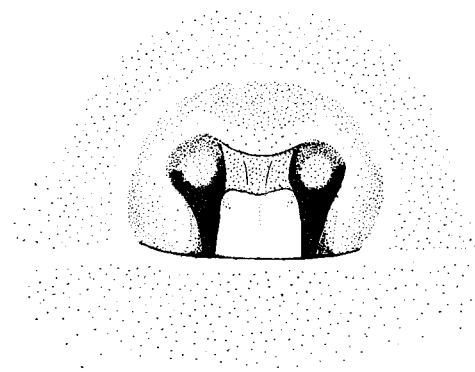

Fig. 4. *Panamomops mengei*, epigyne, ca.220×.

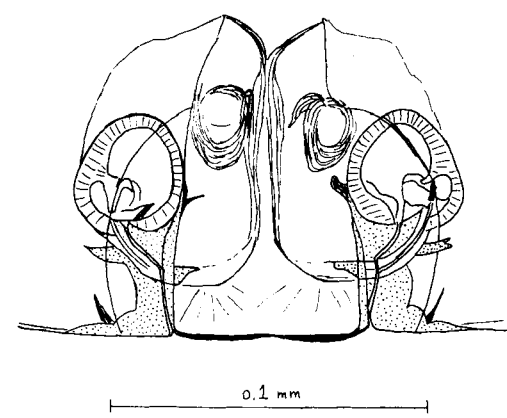

Fig. 5. *Panamomops mengei*, vulva.

tance to the laterals about 1.25 times their diameter. Posterior row of eyes slightly procurve.

Each patella has a strong dorsal, apical spine. The same is found on the palpal tibias.

Cephalothorax is broad, and likewise the head. Profile of cephalothorax as recorded by Holm (1939, Fig. 17a).

Cephalothorax is brownish-grey suffused with black, dark 6-sided spot behind eyes, dark radial lines and dark margins. Ocular area is black. The middle of the clypeus is suffused with black. Sternum is dark, smooth and arched. Dark edges on coxae. Chelicerae yellow-brown suffused with black.

Posterior margin of chelicerae has 5 small teeth of equal size, close to each other. Anterior margin has 6 larger teeth, the 4 outermost of equal size, close together, then one still larger, and the innermost much smaller. At the front of chelicerae, somewhat above the large tooth, are two small hook-like teeth.

Epigyne (Fig. 4), and vulva (Fig. 5), accord to a large extent with drawings made by Wiehle (1960) and Holm (1939).

Species found in the same sample as *P. mengei: Tapinocyba pallens* (Cambr.), *Trichopterna mengei* (Simon), *Robertus scoticus* Jackson, *Ceratinella brevipes* (Westr.).

For synonyms of *Panamomops mengei* see Miller (1959).

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ACKNOWLEDGEMENT

Dr. H. Kauri, director of the Zoological Museum, has helped me carry out this work.

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New Records of Fleas from Norway

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Abstract: MEHL, R. 1968. New Records of Fleas from Norway. *Norsk ent. Tidsskr.* **15,** 70.
The following species of fleas are reported from Norway: *Archaeopsylla e. erinacei* (Bouché, 1835), *Chaetopsylla globiceps* (Taschenberg, 1880), *Ischnopsyllus octactenus* (Kolenati, 1856), *Ceratophyllus vagabundus* (Boheman, 1866) and *Ceratophyllus fringillae* (Walker, 1856).

In three previous papers (Mehl 1967a, b, c) I have published records of 16 species of fleas not earlier reported from Norway. This paper adds four species and gives a record of a fifth, little known species from this country. According to their formerly known distribution, the five species were expected to be found at the new localities. Forty-eight species of fleas are now known from Norway.

My specimens are kept at the Zoological Museum in Oslo.

Archaeopsylla erinacei erinacei (Bouché, 1835). 1 ♂ 1 ♀ ex *Erinaceus europaeus* L. Botanical Garden, Tøyen, Oslo 27 May and 26 June 1967, leg. R. Mehl. 2 ♂ 5 ♀ ex *E. europaeus* Simensbråten, Oslo 7 December 1967, leg. J. Teig.

Chaetopsylla globiceps (Taschenberg, 1880) 1 ♀ *Vulpes vulpes* L. from Heggedal, Asker, Akershus February 1967, leg. Fossum jr.

This species is mentioned as occurring in Norway by Smit (1966) in his catalogue of the fleas of Switzerland, but as far as I know no further information has been published.

Ischnopsyllus octactenus (Kolenati, 1856) 2 ♀ ex *Pipistrellus pipistrellus* Schreber, Sundet, Eidsvoll, Akershus in the spring 1956, leg. R. Mehl.

Ceratophyllus vagabundus (Boheman, 1866) 1 ♀ from nest materials of *Phalacrocorax aristotelis* L. gathered by G. Lid on Rundøy, Herøy, Sunnmøre, 16 June 1967. Unfortunately, the subspecies could not be determined.

Ceratophyllus fringillae (Walker, 1856) 1 ♂ from a nest of *Sturnus vulgaris* L. collected by J. A. Pedersen at Sørås, Ås, Akershus 6 June 1967.

ACKNOWLEDGEMENTS

Thanks are due to the following persons for help in collecting hosts, nest materials and fleas: Curator J. A. Pedersen, preparators L. Blomberg and J. Teig, and cand. mag. G. Lid, all at the Zoological Museum in Oslo; and Mr. Fossum jr., Oslo.

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Received 28 March 1968

The Larva of *Miscodera arctica* Payk. (Col., Carabidae)

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Abstract: ANDERSEN, J. 1968. The larva of *Miscodera arctica* Payk. (Col. Carabidae). *Norsk ent. Tidsskr.* **15,** 71-74. The larva of *Miscodera arctica* Payk. is described. Its relationship to *Broscus* sp. is evident but it is easily separated from this genus by, among other things, such characters as shape of nasale, absence of cervical groove and keel, laterally marginated tergites and shape of cerci.

The larva of the monotypic genera *Miscodera* with the species *M. arctica* has hitherto been unknown (Lindroth 1961) and a description is therefore given in the following.

The material comprises three larvae, obviously in the third stage according to the ratio between adult length and head width of the larvae (Emden 1942). They were collected on 5 September 1967 about 1 km N of Frihetsli in Dividalen in TRi., and were found under stones on rather dry, sparsely vegetated moraine (sand-silt mixture).

Two *Miscodera arctica* adults were collected in the same habitat, and *Bembidion grapei* Gyll. and *Amara quenseli* Schl. occurred rather abundantly. Two of the larvae were killed and preserved in alcohol, while I tried to rear the third one into an imago. However, the larva died on 27 October. It was kept in a glass with earth at room-temperature and small, dead insects were available as food. Although the identification has not been verified by rearing to the imago stage, the following facts place the larva without doubt in *Miscodera arctica:* the larvae are distinctly different from all other known carabid larvae, but some fundamental characters make it certain that they belong to the tribe Broscini. *Miscodera arctica* is the only member of the tribe recorded from Northern Norway (Lindroth 1960).

NOTES ON LIFE HISTORY

Larsson (1939) regards *Miscodera arctica* as an autumn breeder, whereas Lindroth (1945, 1961) is of the opinion that it hibernates as imago. In a footnote Lindroth (1945), however, mentions that the life cycle may take two years in the northernmost part of Fennoscandia. As the larvae were taken as late as the beginning of September and as one of them had still not pupated at the end of October, it is probable that larvae, as well as imagines, hibernate.

More material is, however, needed to work out the life history of the species in detail.

DESCRIPTION OF THE LARVA

Total length: about 10-11 mm, length of head from tip of nasale to end of epicranial suture: 0.8-0.9 mm; width between ocelli: 0.9-1.0 mm.

Least pigmented parts of head and pronotum, as well as legs, orange or brownish orange. Parts of head and pronotum and most of mesonotum, metanotum and tergites brown or dark brown. Ventral side of head brownish orange, ventrites pale greyish brown, easily separated from rest of ventral side of abdominal segments by their pigmentation. Ocellar area black. Entire surface shiny, without visible microsculpture.

Head (Fig. 1) from tip of nasale to end of epicranial suture a little shorter than width between ocelli. Total length of head (length measured from tip of nasale to mid point of an imaginary line drawn between hindmost parts of head) longer than width. Neck not present, without cervical groove and keel. Distribution of setae on head roughly as in Fig. 1. Ocelli six, well developed, ocellar area without distinct sulcus posteriorly and dorsally. Epicranial suture developed, but rather short, about

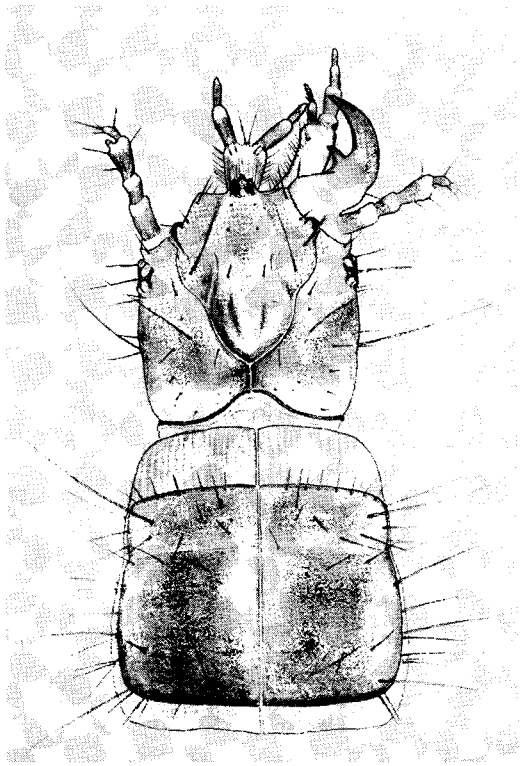

Fig. 1. *Miscodera arctica* Payk. Head and pronotum. Forelegs, left mandible and maxillae not drawn.

one-seventh of length of frontale. Frontale lengthened with nasale protruding on median line, nasale reaching far in front of corners of adnasalia. Front margin of nasale narrow, two of the specimens with one strong median tooth and one on each side of it, whereas front margin was scarcely denticulated in the third larva. Terminal joint of labial palpi much shorter than basal joint. Ligula small, with two setae. Inner lobe of maxillae absent. Terminal joint of outer lobe about 0.8 of basal joint. First joint of maxillary palpi longer than the others, 1.6-1.8 times longer than terminal joint, terminal joint about 0.8-1.0 of second joint, slightly shorter than palpiger. Second joint 0.7-0.8 of first joint. Antennae short, joints lumpy. First joint a little longer than third joint, and about twice as long as terminal joint. Second joint about two-thirds of first joint. Index length-width of first joint: 1.7-2.0; of second joint: 1.2-1.4. Mandibles strong with well developed retinaculum, penicillus present.

Pronotum (Fig. 1) much longer than and about 1.3 times broader than head. Pre- and postscutum (terminology according to Bøving 1910) with longitudinal, fine grooves. Scutum in anterior part in its entire width with a strong transversal furrow or constriction. Scutum with about 40-50 setae on each half.

Meso- and metanotum broader, but much shorter than pronotum. Scutum with about 30-35 setae on each half of median line. Prescutum well defined, notum is marginated anteriorly, but hardly laterally and not posteriorly. Postscutum of mesonotum and metanotum differs from scutum by longitudinal, fine grooves.

Legs (Fig. 2a) short, but very strong. Trochanter and femur about same length and longer than tibia and tarsus. Tibia a little shorter than tarsus. The outwardly directed, concave part of coxa with three and four setae, respectively, on the borders of the excavation. One developed claw with two short, but very distinct spines on ventral side.

Abdominal segments successively narrower, but slightly longer from first to ninth segment.

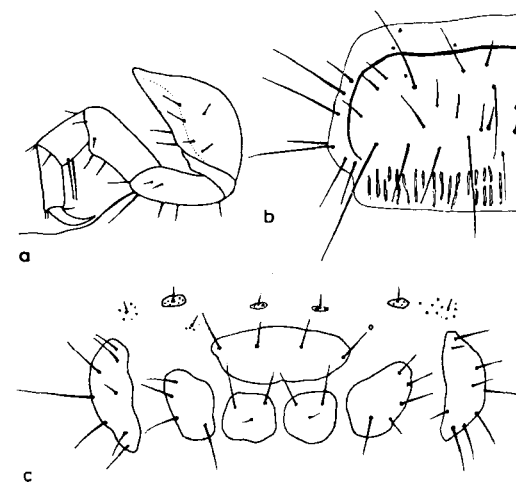

Fig. 2. a-c. *Miscodera arctica* Payk. - a. Leg. - b. First abdominal tergite, left half. - c. Latero-ventral sclerites of first abdominal segment.

First tergite (Fig. 2b) about twice as broad as long. Tergites with about 27-34 setae on each half of median line. Postscutum suggested by longitudinal grooves and absence of setae. Prescutum without grooves, well defined by the margination anteriorly. Tergites very distinctly marginated laterally, too. Sclerites on latero-ventral side (Fig. 2c) consisting of ventrite, two pairs of postventrites, a pair of hypopleurites and some praeventrites of which one pair is distinct, whereas the others are more or less indistinctly defined.

Cerci (Fig. 3 a and b) firmly fixed to ninth abdominal segment, rather strong, but short, not much longer than tenth abdominal segment. Cerci with strong, setiferous nodes with about 14 setae each.

DISCUSSION

The larva of *Miscodera* is distinguished from the larva of *Broscus cephalotes* L. by the characters given in Table I. Most of them seem to hold good for separation of *Miscodera arctica* from the entire genera *Broscus,* according to the key given by Emden (1942), perhaps with the exception of characters 1, 4 and 8. *Miscodera* is smaller than even the first stage larva of *Broscus cephalotes;* the length of head from tip of nasale to end of epicranial suture is less than 1.0 mm in *Miscodera,* more than 1.0 mm in *Broscus. Miscodera* is separated from *Axonya,* according to Emden (1942), by the absence of the inner lobe of the maxillae, by the presence of penicillus on mandibles and two distinct spines on the claw.

By means of imaginal characters, Ball (1956), in his systematic study of Broscini, divides the tribe into three sub-tribes. The genera *Axonya, Broscus* and *Miscodera* all belong to one of them: Broscina. The author further arranges the genera within the subtribe in three groups, of which one is made up of the single genus *Axonya,* whereas *Miscodera* and *Broscus* are put in another, consisting of Oriental-Palaearctic-Nearctic genera (excl. *Axonya).* This separation even seems very natural according to larval characters. Although the larva of *Miscodera* has some characters in common with *Axonya* (laterally marginated tergites, short cerci) the relationship with *Broscus* evidently is more fundamental: inner lobe of maxillae absent, penicillus present, and, above all, by the presence of the spines on the claw. Since *Broscus,* according to imaginal characters, is put in one group within the holarctic Broscina,

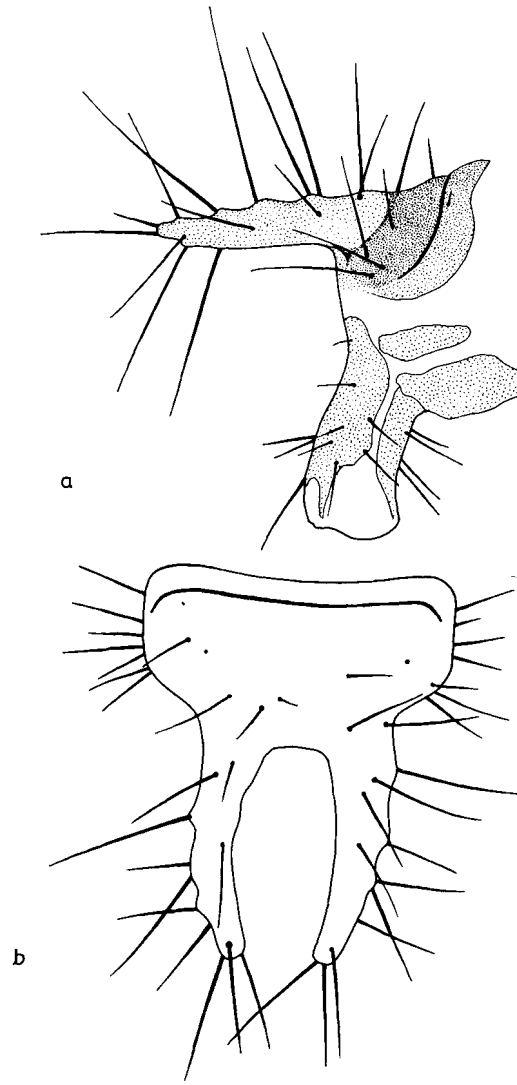

Fig. 3. a-b. *Miscodera arctica* Payk. a. Side view of 9th and 10th abdominal segment. Only the right cerci drawn. b. 9th abdominal segment. Dorsal view.

Table I. *Characters separating Broscus chephalotes L. and Miscodera arctica Payk from each other*

Character(s) No.		*Broscus cephalotes*	*Miscodera arctica*
1	Head	a little broader than long	longer than broad
2	Cervical groove and keel	present	absent
3	Sulcus posteriorly and dorsally of ocelli	present	not distinct
4	Nasale	Not protruding on median line, truncate, front margin broad	protruding on median line, front margin narrow
5	Outer lobe	second joint less than three-fourths of first joint	second joint more than three-fourths of first joint
6	Maxillary palpi	terminal joint strongly tapering to apex, hardly half as long as second joint	terminal joint slightly tapering to apex, more than two-thirds of second joint
7	Antennae	joints rather slender, first joint nearly 2.5 times longer than broad	joints lumpy, first joint less than two times longer than broad
8	Setae along borders of excavation on coxa	at least four and six respectively in second and third stage larvae	three and four respectively
9	Tergites	not marginated laterally	marginated laterally
10	Cerci	long and slender, much longer than tenth abdominal segment	short and lumpy, not much longer than tenth abdominal segment

and *Miscodera* in another by further arraying of the sub-tribe (Ball 1956), it is reasonable to believe that the larval characters mentioned for *Broscus* and *Miscodera* are common to all the seven holarctic genera of Broscina.

The data we now have about the larva of *Miscodera* make it difficult to separate Broscini from Bembidini according to the key of Emden (1942). *Miscodera* is, however, easily distinguished from this tribe by the lateral margination of the tergites and the spines on the claw. It is also separated from *Pogonini* by at least the last character.

ACKNOWLEDGEMENTS

I wish to express my gratitude to Doc. S. G. Larsson, Copenhagen, for giving Tromsø Museum material of *Broscus cephalotes* for comparison, and to R. Binns, B.Sc., for checking the English.

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Acrotrichis insularis (Mäklin, 1852) (Col., Ptiliidae) Designation of Lectotype and Redescription

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Abstract: SUNDT, E. 1968. *Acrotrichis insularis* (Mäklin, 1852) (Col., Ptiliidae), designation of lectotype and redescription. *Norsk ent. Tidsskr.* **15,** 75-77. The present article gives a redescription and lectotype-designation of a new palearctic species, *Acrotrichis insularis* (Mäklin, 1852). The author establishes *Acrotrichis sitcaensis* (Motschulsky, 1842) as a nomen dubium.

INTRODUCTION

At Prestbakke in Idd, Østfold (Ø 13), during the summer of 1965, Dr. Alf Bakke collected three specimens of an *Acrotrichis* species not previously found in the palearctic region. The specimens were taken in an insect trap in flight. Dr. Andreas Strand, to whom Bakke gave the specimens, sent them to me for examination. They proved to be of the same species as Mäklin described in 1852 under the name *Trichopteryx insularis* from specimens collected by Holmberg on the island of Sitka on the west coast of Alaska. Later, Bakke collected the species in flight at (AK 6), Ås in Akershus, and Strand has found it underneath an old moose cadaver in Sørkedalen near Oslo. Subsequently, *insularis* was reported from England as found beneath old hay in Yorkshire (Johnson 1966).

Acrotrichis insularis has had a modest and secluded existence in literature. Apart from the description in 1852, it is only mentioned as a valid species by Motschulsky (1868) together with *sitcaensis* Motschulsky, 1845, while Matthews (1872) synonymizes the two species and gives priority to *sitcaensis,* which was described seven years earlier. Later authors, including Csiki (1911), have followed Matthews' indication with the consequence that *insularis,* for nearly one hundred years, has led a Sleeping Beauty existence as a synonym to which little attention has been paid.

In order to clear up the identity of the species, I approached the museums in Helsinki and Moscow, where Mäklin's and Motschulsky's collections respectively are kept, with a request to be sent for examination any material available of the species concerned. Dr. Zhelochovtsev of Zoological Museum, Moscow, informed me, however, that there is no specimen of *sitcaensis* in Motschulsky's collection, nor is there any label. *Acrotrichis sitcaensis* (Motschulsky 1845) is consequently a nomen dubium because of incomplete description and the lack of type specimen (Sundt 1958a).

DESIGNATION OF LECTOTYPE

Fourteen specimens of *insularis* are in the Zoological Museum, Helsinki, and all of them have been sent me for examination. Ten of the specimens are labelled 'Sitca', 'Holmberg', whereas the other four, mounted, moreover, on the same cardboard, are labelled *'Trichopteryx insularis* Mäklin. Amer. Bor.'. The handwriting on this label is not that of Mäklin. I see no reason to throw doubt upon the syntypical value of the ten first-mentioned specimens, whereas I do not consider the last four to belong to the original type-material.

I have designated the following lectotype:

A ♀ with the spermatheca mounted on its own cardboard and with labels as follows: 'Sitca'; 'Holmberg'; Helsinki Museum's No. 2391: *Acrotrichis insularis* (Mäklin), det. Sundt; a red lectotype label with *'Trichopteryx insularis* Mäklin, 1852' on the underside; Lectotype designated X-57. E. Sundt; Foto Sundt 5/57: 33.

The remaining 9 syntypes have been given a red paralectotype label upon the underside of which I have written *'Trichopteryx insularis* Mäklin, 1852'.

REDESCRIPTION

Medium large (0.9 mm), elongated, in front a somewhat tapering species with long elytra and highly-domed pronotum. Head fine and scattered punctulated, with open, weak microreticulation. Antennae medium long, 3rd-8th joint of the same length as *fascicularis* Hb. Pronotum with fine, diffuse punctulation and with the same characteristic microreticulation as *fascicularis*, but considerably weaker. The rear part of the side edge of pronotum is evenly and comparatively strongly arched. Elytra long in proportion to pronotum.

♀: Spermatheca (Fig. 1) is characteristic and reminiscent of the organ of *silvatica* Rossk. and *dispar* Matth.

♂: Unknown.

Variability: The sculpture of pronotum and the basal arch of the side edge can vary somewhat but, otherwise, the species seems to be relatively constant.

Distribution: I have seen specimens from England, Norway (palearctic region), California, Oregon, Washington, British Columbia (nearctic region).

Habitats: In flight, underneath old hay, in

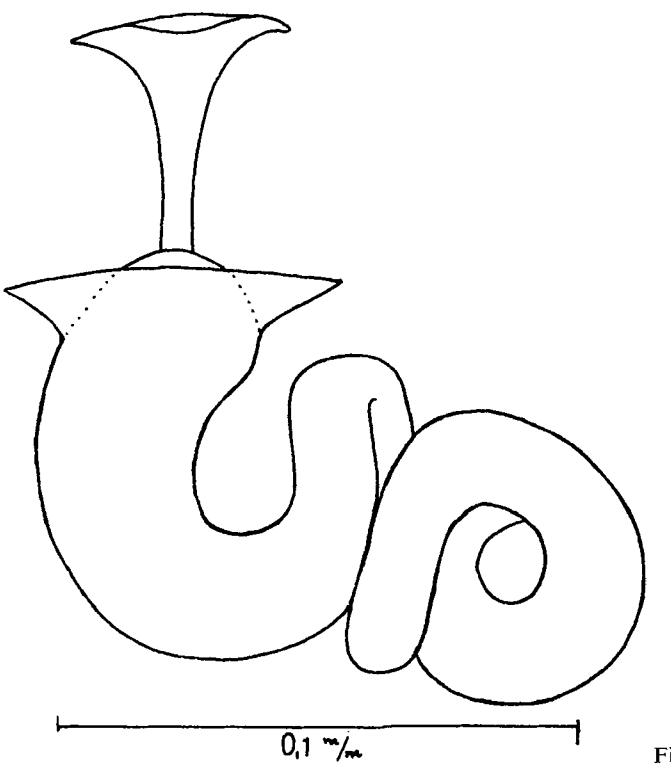

Fig. 1. Spermatheca of *Acrotrichis insularis*.

forest refuse underneath cadaver of moose and racoon, in compost as well as in rotten fungi.

Because of the long elytra and the narrow pronotum, *insularis* can easily be confused with *arnoldi* Rossk. and *silvatica* Rossk. Besides with the help of the spermatheca, it can be distinguished from both of these species by a somewhat considerably larger size; from *silvatica*, moreover, by the basal arch being evenly rounded, never angle-shaped.

I have seen a large number of specimens both from the palearctic and the nearctic region without finding a ♂, and I consider it not impossible that *insularis*, like some other nearctic *Acrotrichis* species, can be parthenogenetic.

In all probability, *insularis* will prove to have a considerable distribution.

ACKNOWLEDGEMENTS

I acknowledge my indebtedness to the following institutions and individuals for loan of specimens, information and other assistance: Zoological Museum, Helsinki (Dr. M. Meinander, Dr. P. Kontkanen), Zoological Museum, Moscow (Dr. A. Zhelochovtsev), Dr. H. S. Dybas, Chicago, Mr. Colin Johnson, Manchester, Dr. Andreas Strand, Oslo, and Mr. A. Vik, Sandefjord.

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Bokanmeldelser

Lindroth, Carl H. 1967. Våra skalbaggar och hur man känner igen dem. 3 deler. Albert Bonniers förlag AB, Stockholm. (78 + 71 + 74 p.). Pris sv. kr. 15.50.

Da denne populære boka lenge har vært utsolgt, har forlaget nå gitt ut en ny, omarbeidd utgave.

Den svenske billefaunaen omfatter ca. 4100 arter mot den norske ca. 3100. Av disse har Lindroth valt ut de vanligste og mest iøynefallende, i alt 1095 arter, og på grunnlag av de mest karakteristiske kjennetegn satt opp korte og greie bestemmelsestabeller, som over familie og slekt fører fram til artene. 427 av dem er avbildet ved fotografier, derav 128 i farger.

Da praktisk talt alle disse artene finnes i Norge, vil også norske amatører som vil gi seg i kast med billene, her få en utmerket og særdeles kyndig veiledning ved bestemmelsen av sine dyr.

Andreas Strand

Horion, A. 1967. Faunistik der mitteleuropäischen Käfer. Band XI. Staphylinidae. 3. Teil: Habrocerinae bis Aleocharinae (ohne subtribus Athetae). Überlingen-Bodensee (415 s.).

Med dette tredje staphylinidebindet er behandlingen av staphylinidene avsluttet, bortsett fra den store slekten *Atheta* og noen mindre, nærstående slekter, som Horion ikke har villet påta seg, men som dr. G. Benick og dr. G. A. Lohse vil behandle senere.

Som Horion gjør oppmerksom på, inneholder også dette bind en lang rekke endringer sammenliknet med Reitters Fauna Germanica av 1909 med Horions tillegg av 1935 og Horions Käfer-Verzeichnis av 1951. Ikke minst gjelder det de mange nye arter. Om berettigelsen av mange av disse er det meningsforskjell, som Horion gjør oppmerksom på, og som forhåpentlig vil spore til videre arbeid med dem.

Det er et beundringsverdig arbeid som ligger bak de meget utførlige utbredelsesoppgaver, og for oss nordeuropeere er det særlig gledelig at han har fått med både korrekte og helt ajourførte oppgaver for det som er publisert om de artene som også forekommer i de nordiske land.

Det som ikke minst gjør dette verk så verdifullt, er de meget omfattende oppgaver om funnforhold, som også nordiske samlere vil ha stor nytte av.

Andreas Strand

Landin, Bengt-Olof 1967. Insekter 1. Fältfauna. Natur och Kultur, Stockholm. (394 p. 914 figurer). Pris kr. 66.50.

Natur og Kultur i Stockholm har startet publikasjonsserien Fältfauna. Serien som har Bengt-Olof Landin som redaktør vil behandle en lang rekke evertebrater, og tar sikte på å avhjelpe behovet for bestemmelseslitteratur for de hvirvelløse dyr. Landin står også som forfatter av insektbøkene som vil omfatte 3 bind.

Del 1 av insektene gir først en kort oversikt over insektenes ytre bygning hvor de karakterer som er nødvendige for bestemmelsene blir gjennomgått. Kapitlet om utviklingen gir en grei oversikt, og tar også med de forskjellige formeringsmåter. Her nevnes partenogenese som ukjønnet formering. Det er en betegnelse jeg håper vi skal få utryddet etter hvert. Så lenge det er en eggcelle som gir opphav til det nye individ, er formeringen kjønnet, om eggcellen er befruktet eller ikke er av underordnet betydning.

Deretter gis en kort oversikt over insektenes

levevis og klassifisering. Avsnittet om innsamling, preparering og oppbevaring er meget verdifullt i en bok som denne. Anvisningen om hvor det nødvendige utstyr kan skaffes, må også hilses med glede. Oversikten over danske og norske insektnavn er ikke helt tilfredsstillende for de norske navns vedkommende, men så har vi heller ikke hatt noen fortegnelse over norske navn som kan være til hjelp for utenlandske forfattere.

Størsteparten av boken, over 300 av 380 sider er systematikk, og bind 1 omfatter de første insektordener til og med Hemiptera. Den systematiske del starter med en bestemmelsestabell over insektordnene i Norden. Også larvene kommer med i tabellen, noe sikkert mange vil finne svært nyttig. Tabellene forøvrig går til familier og slekter, i tillegg kommer under mange av slektene, verdifulle opplysninger om artene. Etter hver orden følger en oversikt over den viktigste litteraturen.

Boken er rikt illustrert med gode strektegninger, over 900 i tallet. Figurforklaringene er tatt inn i teksten. For den systematiske del er dette helt tilfredsstillende. Når det gjelder oversiktstegningene over insektenes bygning, hadde det vært en fordel med en figurtekst, eller at forklaringen i teksten kom på motsatt side av tegningen. Slik ordningen er, må en stadig bla fram og tilbake.

Men innvendingene er små i forhold til alle de positive sider ved boken. Vi har i Fältfaunaen fått en håndbok som vil være til god hjelp såvel for nybegynnere som viderekomne. Tabellene er utmerkete, og boken vil sikkert virke stimulerende på utforskingen av insektfaunaen.

Ragnhild Sundby

Lindroth, Carl H. 1967. Entomologi. Almqvist & Wiksell, Stockholm (236 p.). Pris sv. kr. 65,—.

En nordisk akademisk lærebok i entomologi er en velkommen begivenhet. Carl H. Lindroth, professor i entomologi ved Lunds Universitet, har skrevet boken først og fremst til bruk for undervisning ved universitetet og faghøyskoler. Innholdet er så omfattende at den ikke bare dekker de lavere grunnkursene men også et høyere akademisk kurs (tilsvarende «tre betyg» ved Universitetet i Lund).

Verket er rikt illustrert. Alle tekstfigurene er tegnet, resp. omtegnet av fru Astrid Ulfstrand og er av meget god standard. Tegningene er instruktive, med mange klare detaljer. Takket være en slik behandling har man fått frem en enhetlig, dekorativ stil — noe man ellers sjelden ser i læreboklitteraturen. Denne effekt fremheves ytterligere ved at figurene er trykt på mot tekstsiden kontrasterende bakgrunnen. Plansjene og de originale fargeplansjene, om enn få, er av god kvalitet, og liksom tekstbildene tilfredsstiller de høye krav.

I den systematiske avgrensningen av insektgruppen følger forfatteren den eldre oppfatningen, som innebærer at samtlige av de såkalte urinsektene (Apterygota), springhaler, tohaler og proturer, er inkludert. Det er imidlertid verdifullt at også den moderne systematiske oppfatningen blir behandlet, ettersom de ovennevnte ordener sikkert ikke tilhører de ekte insektene.

I den allmenne delen berettes om insektenes plassering i systemet og om organenes bygning og funksjon, omfattende således både den anatomiske og den fysiologiske problemstillingen. Det blir gitt en introduksjon om insektenes oppførsel, samtidig som forplantning, utvikling og metamorfose blir behandlet. Et særskilt kapitel er viet tilpasninger til miljøet. Kapitlet omfatter en stor del økologisk stoff med mange velvalgte eksempler.

Den spesielle delen, insektordnene, innledes med en taksonomisk oversikt, paleontologi og bestemmelsestabell over ordener. Insektordener får en meget fyldig behandling og teksten er rikt illustrert. Ordenene karakteriseres ikke bare morfologisk men også levemåten og de egenartede biologiske trekk skildres ved hjelp av eksempler. En stor del av de viktigste familiene er med.

Boken avsluttes med et kapitel over tillempet entomologi, i hvilket fremforalt skadeinsektene og deres bekjempelse får en nyansert behandling.

Særlig prisverdig er det at alle avsnitt er utstyrt med en fortegnelse over den viktigste litteraturen.

Boken mangler endel tradisjonelle kapitler, zoogeografi, økologi, m. m. som imidlertid ikke behøver oppfattes som feil. Ved de fleste nordiske universiteter og faghøyskoler, med biologi som undervisningsemne, meddeles undervisning i disse fag. Dessuten har forfatteren tatt inn en betydelig del økologiske fakta i bokens øvrige avsnitt. På denne måte har de enkelte problemstillinger fått en mere mangesidig og avrundet behandling. Teksten er meget lettlest og klar. Forfatterens store pedagogiske erfaring har kommet vel med.

Skulle man allikevel komme med noen ønske-

mål, så gjelder det først og fremst en del detaljer. De sosiale insektene behandles hovedsaklig i kapitlet etologi. En sådan behandling gir visserlig en tilstrekkelig oppfatning av kontaktsystem individene imellom, orienteringsmulighetene i miljøet m.m., men meget mangler. Med tanke på den store betydning, både den teoretiske og praktiske, som disse insekter har, ville en fyldigere behandling av temaet vært ønskelig, enten i form av et eget kapitel eller inntatt i en annen avdeling.

Avsnittet «tillempet entomologi» har fått en gjengs utforming med oversikt over skadeinsekter og bekjempningsmetoder. Avsnittet har sin store verdi i den mangesidige behandlingen av bekjempningsmetodene og i de kritiske synspunktene mot kjemisk bekjempning som fremlegges. Hva man ytterligere skulle ha ønsket seg er at bekjempningsproblematikken ville ha vært lagt opp på populasjonsøkologisk basis. Dette fremforalt med tanke på kjemisk bekjempning, som jo tross alt er og forblir brukt i det minste en viss tid fremover. De anvendte giftene virker jo til en viss grad selektivt, avhengig av artenes ulike motstandskraft, spredning, giftstoffets fordeling m.m. Effekten på dyresamfundet (enten på balansert naturlig, eller en endret sådan i agrarlandskapet gjør den samme), kan ikke uten videre forutsies. Følgen har ofte blitt at man har oppnådd en motsatt effekt i forhold til den ønskede.

En innføring i denne problematikk hadde vært verdifull. Et par sider ekstra tekst hadde vært nok.

Med denne bok har vi fått et verk av meget høy kvalitet som kan likestilles med de beste som fins på området. Den er uunnværlig ved den akademiske undervisningen og passer godt til å brukes som håndbok av gymnasielærere, praktiske zoologer, m. fl. interesserte.

Hans Kauri

Nils Knaben 70 år

Det vil nok forbause mange at førstekonservator, cand. real. Nils Knaben fyller 70 år 24. juli 1968. Få har alderen røynet mindre på og først nå — når han faller for aldersgrensen — blir vi minnet om at også han må ha blitt eldre med årene.

Nils Knaben er født i Vanse på Lista. Han tok artium på Voss Off. Landsgymnas 1921, gjennemgikk Pedagogisk seminar 1927 og fullførte matematisk-naturvitenskapelig embetseksamen 1930. Han deltok i Norges Svalbard- og Ishavsundersøkelser somrene 1929—30 og var vitenskapelig assistent ved Universitetet i Oslo, Zoologisk Laboratorium fra 1930 inntil han i 1933 ble ansatt som konservator ved Bergens Museum, evertebratsamlingen ved Zoologisk avdeling. I 1938 gikk han over i amanuensisstillingen ved C. Sundts lærestol i zoologi samme sted og siden 1946 har han vært konservator, fra 1955 førstekonservator ved Universitetet i Oslo, den marine vertebratavdelingen på Zoologisk Museum.

Fra 1955 til dags dato har han vært sensor i zoologi ved Norges Landbrukshøyskole og 1956—66 har han årvisst vært på Biologisk stasjon i Drøbak og holdt kurs i bunnfaunaen for zoologistudenter. Han er korresponderende medlem av Tromsø Museum.

Gymnasietiden på Voss hvor entomologen, lektor Nils Grønlien virket, må ha vært inspirerende år for såvel lærer som elev, og særlig ble begges interesse for lepidopterne til gjensidig nytte og glede helt inntil Grønlien døde i 1939. På den tid var Knaben amanuensis i Bergen; men da hans sjef, professor dr. A. Brinkmann, oppfordret ham til å overta denne stillingen for å dra nytte av hans pedagogiske evner i undervisningen, hadde Knaben forbeholdt seg å bruke all disponibel tid til de entomologiske samlingene. Takket være hans initiativ kom derfor bl. a. Grønliens samlinger til Universitetet i Bergen (daværende Bergens Museum). Ved å inkorporere dem, samt sin egen og sin brors sirlig preparerte samlinger, i museets lepidoptersamling, ble denne ikke bare mangedoblet men representativ for særlig den sørnorske makro-lepidopterfauna. Grønliens og Knabens materiale av bladminerende insekter er vel den mest representative norske samling av denne gruppen. Innen han forlot Bergen rakk han enn videre å bestemme mindre samlinger av bl. a. *Heteroptera, Orthoptera, aculeate Hymenoptera* hvilket vitner om hvilken all round systematiker han er. Hans entomologiske virksomhet i Bergen forberedte utvilsomt opprettelsen av museets entomologiske avdeling i 1949.

Det var sorg blant entomologene da Knaben gikk over til marin zoologi, men det viser hvilken allsidig zoolog han er. Også her har han først og fremst satt sine krefter inn i arbeidet med de vitenskapelige samlingene og for øvrig vendte han tilbake til studiet av sekkdyrene, *Tunicata* som han hadde syslet litt med i tredveårene.

Knabens produksjon gjenspeiler også hans allsidighet. De fleste arbeider er systematisk-faunistiske og behandler diverse lepidoptere foruten en oversikt over Norges Orthoptera. Hans publikasjoner over biologiske og cytologiske undersøkelser av bladmineren *Tischeria angusticolella* (Duponchel), embryologien hos visse sekkdyr og deres utvikling ved varierende saltholdighet og temperaturer, viser hvor godt han behersker de ulike disipliner av zoologien og er like fortrolig med felt- og laboratorieundersøkelser som det museale arbeide. Hans populariserende evner kommer særlig til syne i bidragene til Norges Dyreliv.

Knaben har aldri sviktet sin klokkerkjærlighet til entomologien. Selv om han går stille i dørene har han helt fra han i 1922 kom med i Norsk Entomologisk Forening vært medlemmenes gode støtte og rådgiver. Hans viktigste tillitsverv er vel som redaktør av Norsk Entomologisk Tidsskrift 1957—1965. Sikkert et byr-

defullt verv for denne vennesæle mann som med sin sakkunnskap, språksans, tegneferdighet og fotografiske kyndighet ofte strakte seg lenger enn langt for å forbedre et manuskript.

Vi er glad for å få hylle så vel vitenskapsmannen som det uselviske, harmoniske menneske Nils Knaben. Vi unner ham å nyte sitt otium ved endelig å få fordype seg i sin egen forskning. Vi er glad fordi vi ikke bare håper, men vet, han fortsatt vil beholde kontakten med fagfeller og naturinteresserte venner. Men vi er bekymret over at en fremragende museumsmann nå går fra borde — og det i en tid da trenede taxonomer, museale vitenskapsmenn er mangelvare og bl. a. kan bli flaskehalsen i den gryende, moderne økologiske forskning i vårt land.

Astrid Løken

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