

INSECTA NORVEGIAE

Vol. 2

Atlas of the Formicidae of Norway
(Hymenoptera: Aculeata)

by

Torstein Kvamme

Published by Norsk Entomologisk Forening



NORSK INSTITUTT FOR SKOGFORSKNING
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(Hymenoptera, Aculeate). Insecta Norv. 2, 1-56.

The distributions of the 46 ant species known to occur
in Norway are presented on EIS guide maps and discussed.
Additional information on the habitat and the total
range are given.

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Box 61, 1432 Ås-NLH, Norway.

Contents:

I	Introduction	5
II	Basic literature	5
III	Material and methods	7
IV	Accidentally introduced and omitted species	7
V	General comments on the fauna	8
VI	Notes to the species	11
VII	Acknowledgements	30
VIII	References	31
-- IX	The EIS-maps	
X	Appendix: The distribution according to the faunal divisions of 1943.	

I. Introduction

The Norwegian ant fauna has been studied more or less intensively during the last two hundred years. In spite of the long period of collecting, no work giving detailed information on all Norwegian ant species has been published. New records, taxonomic changes and the introduction of the UTM-EIS grid system have made a new publication on the topic necessary. The present maps are a statement of our knowledge, but are more important in emphasizing where future investigations are most needed.

II. Basic literature

Early Scandinavian entomologists (Strøm, Zetterstedt, Dahlbom, Thomson and others) published general catalogues and synopses of the Hymenopterous fauna. These papers contain little useful faunal information on ants according to modern standards. The first catalogue treating the whole Norwegian fauna alone was written by Siebke and entitled "Enumeratio Insectorum Norvegicorum". The Hymenoptera part was edited by Sparre Schneider (1880), and was commented by W. M. Schøyen (1880) the same year.

Comprehensive faunal studies on Norwegian ants were first carried out by Holgersen in the period from 1937 to 1944. Collingwood continued Holgersen's work and included recent taxonomic results (Yarrow 1955, Betrem 1960 and others), and worked out new lists for the Norwegian fauna. However, Collingwood (1971, 1974, 1979) and Baroni Urbani & Collingwood (1977) have presented the distribution as synopsis based on the faunal division and the counties of Norway. The catalogues and general faunal literature treating the ant fauna in Norway, or parts of Norway, are presented in Tab. I, chronologically arranged. Some of the oldest publications by Nylander, Thomson, Zetterstedt and others, are omitted. They are discussed by Strand (1898a), Holgersen (1942b, 1944a) and Collingwood (1979).

Tab. I. Basic general faunal literature on Norwegian ants, chronologically arranged.

Author	Year of editing	Area treated	Remarks
Siebke	1880	Whole Norway	
Strand (Ref. 1898a)	1898	" "	
Schneider	1909	Arctic "	
Holgersen (Ref. 1942b)	1942	North "	
" (Ref. 1943e)	1943	Rogaland County	
" (Ref. 1944a)	1944	Whole Norway	
Forsslund	1957	" "	Based on Holgersen
Dlussky (in Russian)	1967	" "	Only the genus <i>Formica</i>
Collingwood	1971	" "	
"	1974	" "	
Baroni Urbani & Collingwood	1977	" "	
Ronchetti (Comp.)	1978	" "	Only the genus <i>Formica</i> , distribution based on Holgersen
Collingwood	1979	" "	

Several identification keys relevant to the Norwegian fauna have been published the last two decades (Tab. II).

Tab. II. Identification keys relevant to the Norwegian fauna.

Author	Year of editing	Comments
Collingwood	1964	
Bolton & Collingwood	1975	
Donwes	1976	Key for the workers only
Kutter	1977	
Kutter	1978	Illustrations to Kutter 1977
Collingwood	1979	
Jensen & Skøtt	1980	

III Material and methods

The data plotted on the maps have as far as possible been based upon specimens examined by the author or by specialists. Older material in the zoological museums of the universities in Oslo and Bergen have been studied.

During the last four summer seasons a great number of ant samples have been recorded by professor Alf Bakke and the author. Most of these samples have been recorded in the South-Eastern parts of Norway. Most of the collected material are kept in the collection of the Norwegian Forest Research Institute. Private collectors have also reported interesting records.

To complete the maps, records from the literature have been used. Because of the changes in the taxonomy, records have been used only when it is no reason to doubt on the identification. In practice, this means that much data has been omitted, especially data concerning the genus *Formica* from literature published before 1955. Different symbols have therefore been used to separate these records from data based on preserved specimens. The nomenclature follows Collingwood (1979).

IV Accidentally introduced and omitted species

The previously published species *Myrmica rugulosa* Nylander 1849, and *Leptothorax interruptus* (Schenck 1852) have both been deleted from the faunal lists.

M. rugulosa was first reported from HEn: Aset (EIS:55), by Siebke (1880) and later from Ø: Fredrikstad (EIS:20) (Strand 1903). Holgersen (1940, 1944a) stated that the identifications were erroneous. *L. interruptus* was reported by Siebke (1880) from AK: Oslo (EIS:28) and Holgersen (1944a) based on this publication. Collingwood (1971, 1974) and Baroni Urbani & Collingwood (1977) mention the species. However, Collingwood (1979) has deleted the species from the Norwegian list.

New information is needed to establish these species as members of the Norwegian fauna.

Ant species which have been accidentally introduced to Norway, but not established, have been paid little attention. However, I consider it correct also to mention these species.

Acantholepsis frauenfeldi Mayr has been recorded in Ø: Kornsjø (EIS:12) and *Componotus maculatus* F r. *thoracicus* F. in TEy:Langesund (EIS:11), both reported by Strand (1912). These records are commented by Holgersen (1944a).

V General comments on the fauna

The distributions of the forty six ant species known to occur in Norway are presented on EIS grid-maps. The EIS grid system consists of 189 modified 50 km x 50 km squares (Økland 1977). Fig. 1 shows the basic grid system.

Even if the ant fauna in Norway is relatively well known, and the main trends are familiar, there is a substantial lack of information. The numbers of species recorded from the Nordic countries are shown in Tab. III, and indicate that the number of known species in Norway may increase.

Tab III: The number of ant species in the Nordic countries, based on Collingwood (1979).

	Norway	Sweden	Denmark	Finland
Number of species	46	61	49	47

Fig. 2 presents the number of species recorded in each square. An analysis of the data shows that ant collecting has been accidental. The greatest number of species are from squares which are crossed by main roads or in those where the larger cities are situated. Indirectly this indicates where the entomologists have collected.

It is evident that more investigations are needed to give a true picture of the distribution of our ant fauna.

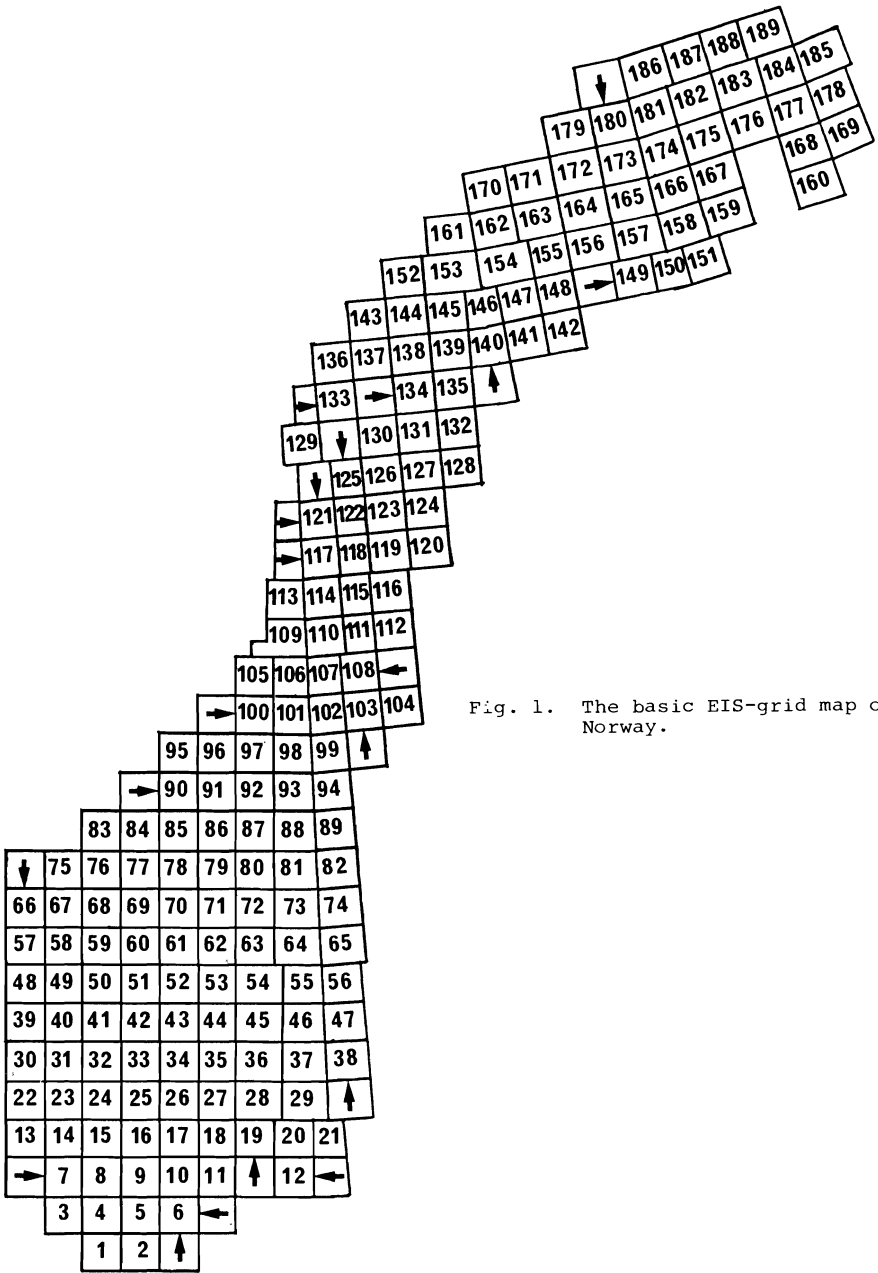


Fig. 1. The basic EIS-grid map of Norway.

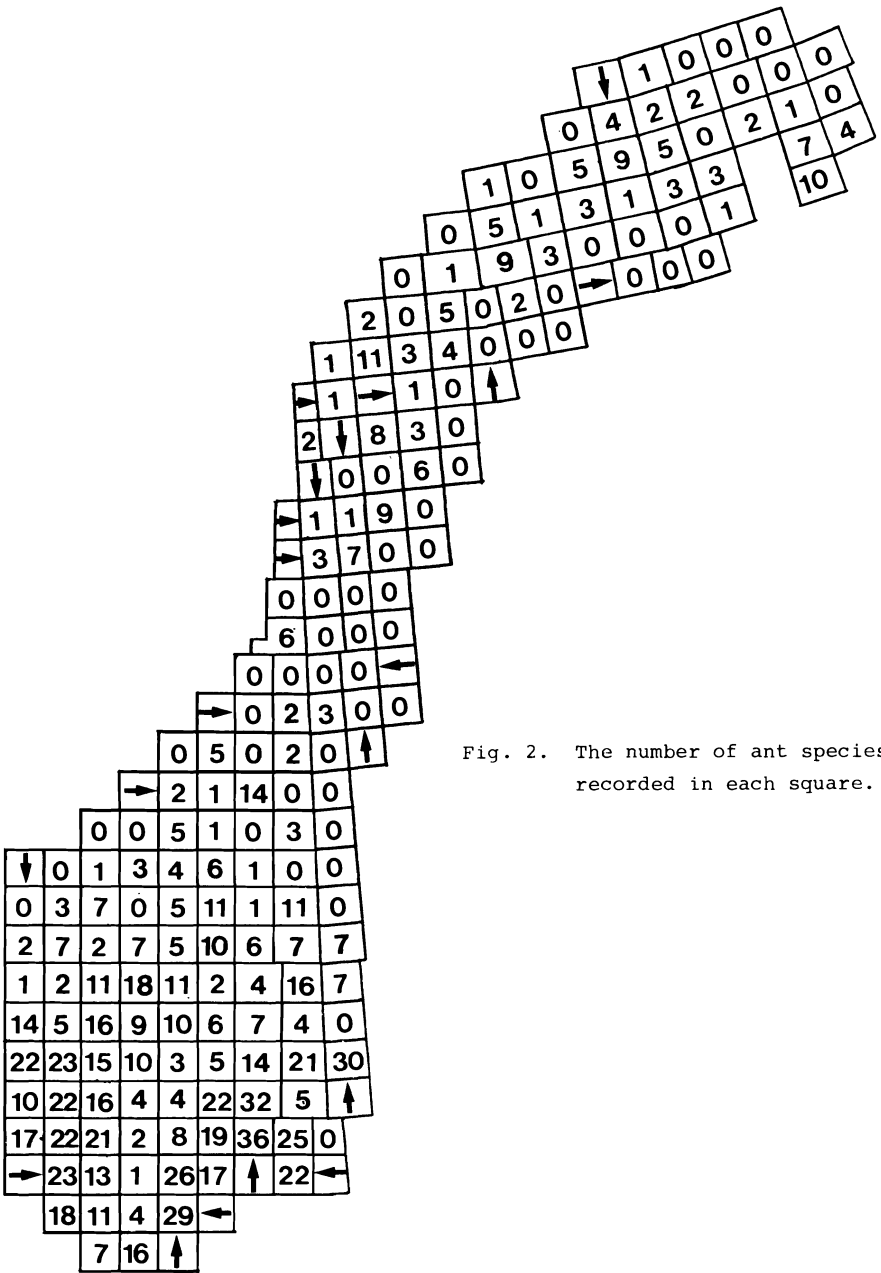


Fig. 2. The number of ant species recorded in each square.

VI Notes to the species

The informations on each species are presented under the following headings:

Habitat: A summarized characterization of the nesting habitat, as far as possible based on observations from Norway.

Distribution: Remarks and discussion on the distribution in Norway, i.e. notes to data from literature. Information on records representing new faunal districts (see A. Strand 1943) and records which remove the border of range are added.

Total range: A brief resumé of the total distribution, mainly based on Bolton & Collingwood (1975), Baroni Urbani & Collingwood (1977), Kutter (1977) and Collingwood (1979).

Hypoponera punctatissima (Roger, 1859)

Habitat: Nests are recorded in houses and bakeries, greenhouses and other warm places. Outdoors, mainly found in saw-dust piles and compost heaps.

Distribution: The first known Norwegian record was made at AK: Lysaker (EIS:28), near to Oslo. Holgersen (1943d) considered the species as a native relict, but it is now generally accepted that the species was introduced to Scandinavia by human activity (Bolton & Collingwood 1975; Collingwood 1971, 1974, 1979; Forsslund 1957a, Skött 1971). The second record was a winged queen caught in a window-trap at VE:Bergandammen, Lardal (EIS:18).

Total range: Stitz (1939) mentioned the Mediterranean areas as the original areas of *H. punctatissima*. The species is a successful cosmopolitan, widely distributed in Europe, sub-tropical and tropical areas.

Myrmica lobicornis Nylander, 1846.

Habitat: The usually single nests occur in different habitats such as fairly open woods, bogs, mosstufts, etc. The nests are often hidden and can be difficult to find.

Distribution: Widely distributed, but sparsely recorded in most parts of Norway. New districts: SFi: Utladalen (EIS: 60); Lærdalsøyri (EIS: 51); HEn: Jordet (EIS: 65).

Total range: Appenines to Arctic Scandinavia, Portugal to Central Russia.

Myrmica rubra (Linné, 1758).

Habitat: Even though many habitats can be occupied by the species, sheltered places are preferred. Colonies are found under stones, in treestumps, in mossclumps, in the ground, etc.

Distribution: Very common in lowland districts in South-Norway, especially in coastal areas. More sporadic higher up and northwards. *M. rubra* is known north to Nnø: Narvik (EIS: 139) and Nnv: Svolvær (EIS: 137) (Collingwood 1974, ORourke 1950). One single queen was recorded by Esmark In Fø: Polmak (EIS: 176). Holgersen (1942b) considered this record as doubtful. The specimen is not preserved (see also *Lasius flavus*). New districts: TEi: Flatdal (EIS: 26), AAy: Omre (EIS: 6), Arendal (EIS: 6), Tromøy (EIS: 6), Isefjær (EIS: 2), Skiftenes (EIS: 6), Åmli (EIS: 10). SFy: Bruland, Utvik (EIS: 68), Sande, Gaular (EIS: 58), Førde, Sunnfjord (EIS: 58). SFi: Balestrand (EIS: 50).

Total range: West-Europe to East-Siberia, from Italy to North-Scandinavia.

Myrmica ruginodis Nylander, 1846.

Habitat: Very common in a wide range of habitats, in the lowlands as well as higher up.

Distribution: One of the most abundant ant species in Norway, distributed over the entire country. The two forms, *microgyna* and *macrogyna* (Brian & Brian 1949, 1955), are both known from Norway (Collingwood 1979), but their distributions are unknown. New districts: TEi: Høydalsmo (EIS: 17), Flatdal (EIS: 26). AAi: Evje (EIS: 5).

Total range: Northern Eurasia to Japan.

Myrmica sabuleti Meinert, 1861.

Habitat: Records of nests have been made in dry and sheltered, often sun-exposed sites. Most frequently found under stones and in mosstufts. The social-parasitic species *Myrmica hirsuta* Elmes 1978, is known only from nests of *M. sabuleti* in South-England (Elmes 1978), but might occur in Norway.

Distribution: Known only from lowland districts of south-west and south-east Norway, where it is locally common. *M. sabuleti* was first reported from Norway by Holgersen (1940). Formerly the species was confused with *M. scabrinodis*. The northernmost record is from SFi: Lærdal (EIS: 51). New districts: TEy: Helle, Bamle (EIS: 11). TEi: Setekleiv, Treungen (EIS: 10). AAy: Tromsøy (EIS: 6); Omre (EIS: 6); Songe (EIS: 6). VAY: Frikstad (EIS: 2); Lyngøya, Kristiansand (EIS: 2).

Total range: South-Europe to the middle parts of Scandinavia, Portugal to Urals.

Myrmica scabrinodis Nylander, 1846.

Habitat: Occurs in many habitats, but not in the dry habitats typical for *M. sabuleti*. Characteristic for mires, where it can be recorded even in the most wet sphagnum. However, the species is also often found under stones, under bark on treestumps on the ground etc., and in soil.

Distribution: Known as far north as Nnv: Svolvær (EIS: 137). Most common in the lowland and in subalpine areas, but

also recorded above the timberline. New districts:
TEy: Helle, Bamble (EIS: 11). TEi: Høydalmo (EIS: 17),
Flatdal (EIS: 26). AAi: Evje (EIS: 5). SFi: Markhus-
vatn, Hyllestad (EIS: 49).

Total range: Whole Europe.

Myrmica schencki Emery, 1895.

Habitat: Warm and well sheltered areas are preferred. Nests
have been observed under stones, in mossclumps and in
sandy ground.

Distribution: Restricted to the lowland areas in South-Norway,
which have the most favourable climate. Mainly found
in coastal areas, but in a few cases recorded in the
inland. The northernmost record is from SFi: Lærdal
(EIS: 51), Sogn and Fjordane. Locally common in the
Oslofjord-areas. New districts: Bø: Steinslette (EIS:
36), Pikerfoss (EIS: 27). TEi: Setekleiv, Treungen
(EIS: 10). AAy: Tromøy (EIS: 6). VAY: Mandal,
Storesanden (EIS: 2).

Total range: South-Europe to South- Scandinavia.

Myrmica sulcinodis Nylander, 1846.

Habitat: A typical inhabitant of heathland (Collingwood 1979)
and dry open forests, but is also known from mires.
Colonies are observed mainly under stones, in cliffs
and in soil; more uncommon in treestumps, etc.

Distribution: Occurs in most parts of Norway, in the lowlands
as well as higher up. New district: SFi: Otternes,
Aurland (EIS: 51).

Total range: Throughout Europe to Siberia, Appenines to
Arctic Scandinavia.

Sifolinia karavajevi (Arnoldi, 1930)

Habitat: This workerless, socialparasitic ant is known from nests of *M. rugulosa*, *M. scabrinodis* and *M. sabuleti* (Collingwood 1976, 1979; Douwes 1977; Kutter 1968, 1973, 1977).

Distribution: Rare in most areas, only known from HES: Eidskog (EIS: 38) (Collingwood 1976), where alate queens were caught in pit-fall traps on a bog.

Total range: South-England to Ukraine and Czechoslovakia to Scandinavia.

Stenammas westwoodii Westwood, 1840.

Habitat: Nesting under deep stones and among roots of trees in protected sites as i.e. interior of oakstands.

Distribution: The first record was made in a green-house in the botanical garden in Bergen. Holgersen (1944) mentioned the species as *Monomorium* sp., and supposed it to be introduced. Collingwood (1974) determined the specimens as *S. westwoodii* and listed it as Norwegian. The species might be introduced to the HOy: Bergen area, but the record of two nests in AAY: Omre (EIS: 6) (Kvamme & Bakke 1977) established the species as a member of the Norwegian fauna.

Total range: Widely distributed in Europe to Caucasus.

Monomorium pharaonis (Linné, 1758).

Habitat: Only known from houses in Norway.

Distribution: Recorded in Haugesund (EIS: 13) and Skien (EIS: 18) (Mehl 1978). The species was mentioned by Holgersen (1944) from HOy: Bergen, but Collingwood (1974) proved it to be *S. westwoodii*.

Total range: Worldwide distributed by human activity.

Leptothorax acervorum (Fabricius, 1793).

Habitat: A very common species in most habitats, ranging from wet mires to sandground and treestumps. Often found associated with other species.

Distribution: Recorded from all parts of Norway. Abundant in lowland districts as well as above the tree-line.
New districts: TEi: Høydalsmo (EIS: 17), AAi: Evje (EIS: 5), Hovden (EIS: 25).

Total range: Mountains in South-Europe to Arctic Scandinavia and Spain to Japan.

Leptothorax muscorum (Nylander, 1846).

Habitat: Nesting in treestumps, etc., but is also occasionally observed under stones and in soil.

Distribution: Found in lowland areas in South-Norway, most frequent in coastal districts. Sveum (1979) reported *L. muscorum* from STi: Trondheim (EIS: 92), which so far is the northernmost record. This surprising observation indicates a wider range than hitherto supposed. New districts: Bø: Saggrenda (EIS: 27), Pikerfoss (EIS: 27). TEy: Helle, Bamble (EIS: 11). TEi: Flatdal (EIS: 26). AAy: Omre (EIS: 6). On: Kvam (EIS: 62).

Total range: Appenines to Central Scandinavia and Pyrenees to Urals.

Leptothorax tuberum (Fabricius, 1775).

Habitat: The small colonies are found under stones on dry sandground and in cliffs. Commonly found on sea-shores.

Distribution: *L. tuberum* has a pronounced south-eastern distribution in Norway. Most abundant in coastal areas, where it is locally very common. The records from On?: Gudbrandsdalen (EIS: 63?) and On: Dovre (EIS: 71?) made by W.M. Schøyen (Siebke 1880), are not to be discredited. However, the exact localities are not known.

The specimens are not preserved and a verification is desirable. New district: Bø: Saggrenda (EIS 27), Pikerfoss (EIS: 27).

Total range: Mountains of Central Europe from Spain to the Caucasus and North-Italy to Central Scandinavia.

Formicoxenus nitidulus (Fabricius, 1775).

Habitat: This is the well-known guest-ant, which has separate nests in the mounds of species belonging to the *Formica rufa*-group. *F. nitidulus* finds the host mound by following the scent trails of the host species (Elgert & Rosengren 1977). New district: HOy: Sandfjellet, Bergen (EIS: 40).

Distribution: Sporadically recorded, but widely distributed in Norway.

Total range: Palearctic, north to 70° N latitude.

Harpagoxenus sublaevis (Nylander, 1849)

Habitat: A social parasitic ant, living in colonies of *Leptothorax acervorum*, *L. muscorum* and *L. tuberum* (Collingwood 1974, 1979, Kutter 1968, 1977). However, in Norway all records of *H. sublaevis* are associated with *L. acervorum* (Munster 1927, Holgersen 1944, Collingwood 1974, 1979). Usually recorded from nests situated in treestumps and branches etc. on the ground, but also from colonies living under stones or in soil. New districts: HEs: Slettmoen, Eidskog (EIS: 38). Os: Stråtjern, Gran (EIS: 36). AAY: Omre (EIS: 6).

Distribution: Not common, but found many places in Norway. Münster (1927) reported the first Norwegian record from Fi: Kåfjord (EIS: 173), which is so far the only record from North-Norway.

Total range: Pyrenees to Caucasus and North-Italy to Arctic Scandinavia.

Tetramorium caespitum (Linné, 1758)

Habitat: Prefers dry, warm and exposed areas. Colonies are found under stones and independently in the ground. Two interesting socialparasitic species, *Anergates atratulus* (Schenck, 1852) and *Strongylognathus testaceus* (Schenck, 1852), are specific to nests of *T. caespitum* (Kutter 1968, 1977, Collingwood 1979). None of them are known in Norway, but might occur here (Collingwood pers. comm.). New district: SFi: Lærdal (EIS: 51), Vassbygda (EIS: 51).

Distribution: Abundant in coastal areas in South-Norway, and found as far north as Møre and Romsdal. In the inlands districts, known north to Bv: Ål (EIS: 43).

Total range: Holarctic, America to Japan, North-Africa to latitude 62°50'.

Camponotus herculeanus (Linné, 1758)

Habitat: Nests are found in treestumps and stems of spruce and pine, but also under stones and in the ground. Harmful to wooden houses.

Distribution: Occurs in most parts of Norway, common, north to TRi: Malangen (EIS: 172) and Fi: Alta (EIS: 173). New districts: TEi: Høydalsmo (EIS: 17). Nnø: Skagstad, Engeløya (EIS: 134), Nnv: Valvåg, Tjeldøya (EIS: 138), TRy: Fornes, Andørja (EIS: 145).

Total range: Mountains on the European Continent, Arctic Norway to Eastern Siberia. Absent in the British Isles.

Camponotus ligniperda (Latreille, 1802).

Habitat: Mainly recorded in warm and exposed habitats in South-Norway, where it is more common than *C. herculeanus*. Harmful to wooden houses.

Distribution: Positively known north to Stordalen (EIS: 78), Møre and Romsdal. Several Norwegian authors have reported *C. ligniperda* from North-Norway, but the reports

are based on misidentification. Holgersen (1942b) used the name *herculeanoligniperda* Forel on intermediate specimens, which probably are specimens of *C. herculeanus*. Collingwood (1974) mentioned *C. ligniperda* from Nord-Trøndelag and Nordland county, but omitted these records in his latest list (Collingwood 1979). The occurrence in North-Norway needs to be verified. New districts: HOy: Anuglo, Tysnes (EIS: 23), Eikemo, Vaksdal (EIS: 40). HOi: Djøнно (EIS: 41), Lofthus (EIS: 32), Fresvik, Ullensvang (EIS: 32).

Total range: Sicily to Central Scandinavia, Central Spain to Western Russia.

Lasius flavus (Fabricius, 1781).

Habitat: A characteristic species for grassland and pastures, but is also common in other habitats such as woodedges and seashores. Colonies are situated under stones, grasstufts and in soil. Frequently found mixed with *Lasius niger*, and also with *Formica pressilabris*.

Distribution: Known north to the Trondheimsfjord area (EIS: 92 and 98). *L. flavus* is mainly a lowland species, and occurs more sporadically at higher elevations and northwards. The record from Fø: Polmak (EIS: 176), made by Esmark, has been characterised as doubtful by Holgersen (1942b, 1944). The winged queen, which is preserved in the Zoological Museum, Bergen, may be incorrectly labelled (see also *M. rubra*).

Total range: North-America to Japan and North-Africa to Scandinavia.

Lasius alienus (Förster, 1850).

Habitat: A xerotherm species, which prefers dry sandy ground i.e. sea-shores. Nests situated under stones or independent in soil.

Distribution: Recorded mainly in coastal areas in South-Norway, where it is locally common. However, it is also caught

in inland districts, and the northernmost records are at HES: Elverum (EIS: 55) and HEn: Trysil (EIS: 56?). No details are known of the records from Trysil, which were made by Forsslund (Collingwood 1974 and pers. comm.). Strand (1903) published *L. alienus* from Ø: Hvaler (EIS: 12-20) under the name *L. niger* var. *alieno-brunnea* Forel. This record was verified as *L. alienus* by Forsslund (1950). The reported record from Ranem in Nord-Trøndelag (Strand 1912) is omitted by Collingwood (1974, 1979) and Baroni Urbani & Collingwood (1977). It is doubtful whether Holgersen (1944), who listed this record, had seen the specimens. New districts: Bø: Pikerfoss (EIS: 27). AAV: Tromøy (EIS: 6).

Total range: Portugal to Japan, Himalaya and North-Africa, Scandinavia. Also known from North-America.

Lasius brunneus (Latreille, 1978).

Habitat: Associated with old oak trees (Collingwood 1974, 1979; Forsslund 1949), but is also observed associated with ash trees and old birches. *L. brunneus* can also be found in houses (Collingwood 1979, Ehnström pers. comm.). In addition to regular nesting places such as in bark and in the interior of oaks, colonies are found under stones in woodedges.

Distribution: Found sporadically along the coast from Akershus to Aust-Agder. Locally abundant.

Total range: Spain to Crimea, West Himalaya and Italy to Scandinavia.

Lasius niger (Linné, 1758).

Habitat: Common in habitats ranging from dry sandground to bogs and in houses. Nesting under stones, in treestumps, etc.

Distribution: Almost the same distribution as *L. flavus*. Very abundant in lowland districts in South-Norway. The

northernmost known locality is NTi: Finsås, Snåsa (EIS: 102) in Nord-Trøndelag. New districts: TEi: Flatdal (EIS: 26). AAi: Evje (EIS: 5).

Total range: Holarctic, Western U.S. to Japan, North-Africa to Scandinavia.

Lasius fuliginosus (Latreille, 1798).

Habitat: Most frequently found with deciduous trees and also recorded associated with coniferous trees. Collingwood (1979) mentions walls of wood-houses and ground as nesting habitats.

Distribution: Restricted to South-Eastern Norway.

Total range: Portugal to Japan and North-India, South-Italy to Central Scandinavia.

Lasius umbratus (Nylander, 1846).

Habitat: Nesting under treestumps, under stones and at the base of old trees.

Distribution: This very incompletely known species is only recorded in South-Eastern Norway. *L. umbratus* was first reported from Norway by Strand (1903). The northernmost locality is On: Vågå (EIS: 71) (Holgensen 1944). *L. umbratus* is difficult to find, and might be overlooked. Holgensen (1944) writes: "- No doubt *L. umbratus* may be found over most of Eastern Norway and along the south coast as well". New districts: TEy: Helle, Bamble (EIS: 11). AAy: Åmli (EIS: 10).

Total range: Holarctic, throughout Europe.

Lasius meridionalis (Bondroit, 1919).

Habitat: According to Collingwood (1979), this is a characteristic species to lowland sandy heath in North Europe. Nests are built in the ground, not adjacent to stones etc.

Distribution: Rare, only known from VE: Stolpestad (EIS: 19), Vestfold county.

Total range: Spain to Japan, Italy to Scandinavia.

Lasius mixtus (Nylander, 1846).

Habitat: Nesting deep in ground, under deep stones or among roots of trees and bushes. Nests are also found under stones of somewhat rich and moist meadows. Holgersen (1940) mentioned that a colony was found in the interior of a linden tree.

Distribution: A poorly known species in Norway, represented by only a few sporadic records in South-Eastern parts of the country. Known up to about latitude 60°N.
New district: Ø: Alby, Jeløya (EIS: 19).

Total range: Throughout Eurasia and subalpin regions of Central Europe.

Formica fusca Linné, 1758.

Habitat: *F. fusca* covers a wide range of habitats. Warm and sun-exposed sites are preferred. Nesting in treestumps, in ground not necessarily under stones and build sometimes earth mounds.

Distribution: Very common in the lowland of South-Norway. The northernmost record is from STY: Rissa (EIS: 96), Sør-Trøndelag. *F. fusca* has been reported from North-Norway by several authors. However, all Norwegian authors including Holgersen confused *F. fusca* and *F. lemni*. The systematics was cleared up by Yarrow (1954). Collingwood (1974) stated that the reports from North-Norway were based on misidentification.
New districts: Bø: Steinsletta (EIS: 35), Krekling (EIS: 27), Kongsberg (EIS: 27). AAy: Åmli (EIS: 10), Kvastad (EIS: 6), Tromøy (EIS: 6), Omre (EIS: 6). AAi: Evje (EIS: 5), Rysstadmo (EIS: 16). VAY: Vigeland (EIS: 2), Lene, Lyngdal (EIS: 1), Tronstadvannet (EIS: 2). MRI: Jordalsgrend (EIS: 85).

Total range: The whole Palearctic region from Portugal to Japan, Italy to Central Scandinavia.

Formica gagatoides Ruzsky, 1904.

Habitat: Nests are constructed in treestumps, in soil not necessarily adjacent to stones etc. and also in old mounds of i.e. *F. exsecta*. The nesting habitats range from bogs to heather land.

Distribution: Widely distributed in North-Norway and alpine and subalpine areas in South-Norway. Holgersen (1943a) redescribed the species and commented about the distribution. New districts: HEn: Slettås, Trysil (EIS: 64), Femundsenden (EIS: 73), Sjølen (EIS: 73), AAi: Hovden (EIS: 25).

Total range: Only in Scandinavia and Northeast Siberia.

Formica lemani Bondroit, 1917.

Habitat: Abundant in most habitats, except the most dry and sun-exposed habitats in the lowland districts of South-Norway, where *F. fusca* is dominating.

Distribution: Common in all parts of Norway. Bondroit (1917) separated *F. lemani* from *F. fusca*, but they were confused until the revision of the *F. fusca*-group (Yarrow 1954). (See *F. fusca*). New district: AAi: Hovden (EIS: 25) (see also *F. fusca*).

Total range: Mountains of Spain to Japan; Himalaya and Appenines to Arctic Scandinavia.

Formica transcaucasica Nasonov, 1889.

Habitat: Peus (1932) characterised *F. transcaucasica* as thyrphobiont species. However, the species is also recorded in drier habitats (Peus 1932, Kutter 1977, Collingwood 1979). All the records in Norway have been made in mires, where it nests in sphagnum tufts. Like the other species in this subgenus, *F. transcaucasica* is found in nests of *F. sanguinea*.

Distribution: A total of four localities are known, all in Southeast Norway. In Sweden *F. transcaucasica* is recorded as far north as Torne Lappmark (Baroni Urbani & Collingwood 1977, Collingwood 1979), which may indicate a wider distribution in Norway. New districts: AK: Tjenn, Vestby (EIS: 28). VE: Svines, Sandar (EIS: 19).

Total range: Pyrenees to Japan and Appenines to Arctic Sweden.

Formica cinerea Mayr, 1853.

Habitat: The small mounds are built in dry habitats as heathland and open sandground. Colonies are also found under stones.

Distribution: Only known from the HES: Elverum area (EIS: 55), which is the northernmost record together with the record in Mora, Sweden (Collingwood 1963, 1974).

Total range: Pyrenees to Urals, North Italy to Central Fennoscandia.

Formica rufibarbis fabricius, 1793.

Habitat: Restricted to the warm and sun-exposed sites as sparsely scattered sandy ground and sea-shores. Nests are constructed in ground or under stones.

Distribution: Mainly recorded in coastal areas in the southernmost parts of Norway. A few records from the inland are known (Strand 1919). Locally abundant around the Oslofjord and along the south coast.

Total range: Portugal to Western Siberia, mountains of Middle East to South Scandinavia.

Formica exsecta Nylander, 1846.

Habitat: Common in woodland, but also recorded in meadows, sea-shores and above the timberline. Mounds are commonly built around treestumps etc. Colonies mixed with *L. acervorum* or *F. lemni* are not uncommon.

Distribution: Very abundant and widely distributed in most parts of Norway. New districts: TEy: Helle, Bamble (EIS: 11). TEi: Setekleiv, Treungen (EIS:10). SFy: Sande, Gaular (EIS.58) (Leg. J. Breen). SFi: Luster (EIS:60) (Leg. J. Breen), Balestrand (EIS:50) (Coll. B. Mus.). TRi: Bardufoss (EIS:154).

Total range: Appenines to Arctic Scandinavis, Central Spain to Urals.

Formica forsslundi Lohmander, 1949.

Habitat: This is an exclusive mire inhabitant, which builds small mounds of heather, pieces of grass and sphagnum. *F. exsecta* and *F. transcaucasica*, and sometimes *F. uralensis*, occur often in the same locality as *F. forsslundi*.

Distribution: All the three Norwegian localities are situated in Southeastern Norway. *F. forsslundi* might be overlooked, and is probably more widely distributed. New district: HEn: Julussdalen, Rena (EIS:55).

Formica pressilabris Nylander, 1846.

Habitat: The mounds are built in grassland, where sheltered and warm places are preferred. This is the typical habitat in Norway. One specimen was taken in a pit-fall trap, situated in a bog (Collingwood 1974). Even though Peus (1932) writes: "Nur zeigen einigen Arten in bestimmten Teildistrikten ihres Areas eine Tendens zur Tyrphophilie; das ist z.b. bei *Formica pressilabris* Nyl.", this record is an exception in Norway.

Distribution: Rare, only known from the southernmost parts with the most favourable climate.

Total range: Spanish Pyrenees to Siberia, Italy to Central Fennoscandia.

Formica suecica Adlerz, 1902.

Habitat: Usually found on mires and the surroundings of mires. However, *F. suecica* is not uncommon in other habitats, i.e. subalpin pine. and birch-woods (see Holgersen 1943e, 1944a). The often rather flat mounds, are usually built around treestumps etc.

Distribution: Widely distributed in South-Norway. STy: Rissa (EIS: 96) is the northernmost known locality, but the distribution in Sweden indicates that occurrence in North-Norway is possible. Found in lowland as well as sub-alpine areas. New districts: Bv: Fætjan Seter, Flå (EIS:44). TEi: Høydalsmo (EIS:17). On: Tyin (EIS:52). STy: Rissa, Fosen (EIS:96).

Total range: Endemic to Fennoscandia, not found east of longitude 30° or south of latitude 56°.

Formica uralensis Ruzsky, 1895.

Habitat: Restricted to mire habitats in Europe (Collingwood 1979). However, *F. uralensis* is known from dry habitats in southern parts of Urals and in Asia (Peus 1932, Forsslund 1949, Collingwood 1979).

Distribution: Rare in Norway, only known from three localities. First published by Fjellberg (1975), from Fø: Pasvik (EIS:160), Sør-Varanger. Later the species was found in HES: Eidskog (EIS:38) and HEn: Julussdalen (EIS:55). *F. forsslundi* was also found together with *F. uralensis* in the two latter localities. New district: HEn: Julussdalen, Rena (EIS:55).

Rotal range: Widely distributed in Mongolia and Central Siberia, Northeast Europe including Germany, Baltic States and West U.S.S.R. and one record from the Swiss Alps.

Formica sanguinea Latreille, 1798.

Habitat: Frequently recorded from woodedges, open woods, clearcuts and bogs. The mounds are often built around

treestumps etc., but nests under stones, in sphagnum (Peus 1932) and in ground, are common too. *F. sanguinea* is well-known as "the slave-keeper ant", and takes slaves from the species in the subgenus *Serviformica*.

Distribution: Widely distributed, and common north to Dovre. North of Dovre, only known from STi: Trondheim (EIS:92), STy: Rissa (EIS:96) and Fø: Øvre Pasvik (EIS:150). New districts: TEy: Helle, Bamble (EIS:11). TEi: Setekleiv, Treungen (EIS:10), Heståsen, Heddal (EIS:27).

Total range: Throughout Eurasia from Portugal to Japan and Iran to Arctic Norway.

Formica truncorum Fabricius, 1804.

Habitat: Woodedgedes, clearcuts, open woods and sandy banks are common nesting sites. The mounds are often built up around stones and treestumps, but smaller colonies are also found under stones.

Distribution: Sampled both in South- and North-Norway, but still unknown from large parts of the country. New districts: HEs: Slettmoen, Eidskog (EIS:38). TEy: Rugtveit (EIS:11).

Total range: Jura Alps to North Japan, Italy to North Fennoscandia.

Formica rufa Linné, 1761.

Habitat: Nests are constructed in warm and sheltered woodland, as woodedgedes, open woods and surroundings of mires. *F. rufa* is sampled from nests of *F. fusca*, which can be used when new colonies are founded.

Distribution: *F. rufa* is positively known from South-Norway, where it is locally abundant. The northernmost localities are SFy: Gaular (EIS:58) and On: Kvam (EIS:62). Reports on *F. rufa* from North-Norway, are based on misidentifications. Records mentioned in the literature before Yarrow's revision (1955), are omitted, because of the confusion of the species. New district: TEy: Rugtveit (EIS:11).

Total range: Central Scandinavia to Pyrenees, including England. Eastwards throughout the middle of U.S.S.R. to lake Baikal and South Caucasus.

Formica polyctena Förster, 1850.

Habitat: Occupies lowland habitats, which are well sheltered, as older clearcuts and exposed woodedges. The habitat choice is very similar to that of *F. rufa*.

Distribution: Has a more restricted range than *F. rufa*. Conclusively known localities are few, and only from areas with high summer temperature. Further investigations may add new areas to the range. New districts: HES; Slettmoen, Eidskog (EIS:38). Os: Sør-Aurdal (EIS:45). AAY: Birkenes (EIS:6). VAY: Tronstadvannet (EIS:2). Ry: Åsland, Jæren (EIS:7) (Coll. B. Mus.) Ri: Lerang, Forsand (EIS:7) (Coll. B. Mus.). HOI: Tvildemoen, Voss (EIS:41) (Coll. B. Bus.)

Total range: Spain to Siberia, The Italian Alps to Southern Scandinavia. Known north to latitude 60°N in Sweden (Collingwood 1979).

Formica aquilonia Yarrow, 1955).

Habitat: Occupies all types of woods.

Distribution: Our most common wood species, distributed all over the country. New districts: TEI: Høydalsmo (EIS:17). AAI: Evje (EIS:5).

Total range: Eastern Alps to Siberia, North Italy to North Norway.

Formica lugubris Zetterstedt, 1840.

Habitat: Occurs in woodland, but usually occupies less protected habitats than *F. aquilonia*.

Distribution: Distributed all over the country.

Total range: Northern Eurosiberia and the European mountains
from the Pyrenees to Kamchatka, Italy to Arctic
Scandinavia.

Formica pratensis Retzius, 1783.

Habitat: Observations of the relatively small mounds have been
made in woodedges and dry meadows. Sandy and exposed
ground is most attractive to the species.

Distribution: Locally common, but generally rare. The records
are few and sporadic, and only in the southern parts
with the most sunny summer climate. The opinions are
splitted as to whether *F. pratensis* and *F. nigricans* are
one species (Kutter 1977), Douwes 1979) or two species
(Collingwood 1974, 1979, Baroni Urbani & Collingwood
1977). I follow Collingwood (1979), even though the
problem has not yet been satisfactorily solved.
New districts: AAY: Tromøy (EIS:6), Amlı (EIS:10).
SFi: Otternes, Aurland (EIS:51), Balestrand (EIS:50).

Total range: Portugal to Siberia, North Italy to Central
Scandinavia.

Formica nigricans Emery, 1909.

Habitat: Prefers dry habitats, which often are more sheltered
than the habitats *F. pratensis* prefers, i.e.
sandy banks and open pine wood or other open woods.

Distribution: Rare, only known positively from four localities,
all from districts in South-Norway, with the best
climate (see *F. pratensis*). New district: VE: Tjøme
(EIS:19).

Total range: Central Italy to Central Sweden, Portugal to
Central Asia.

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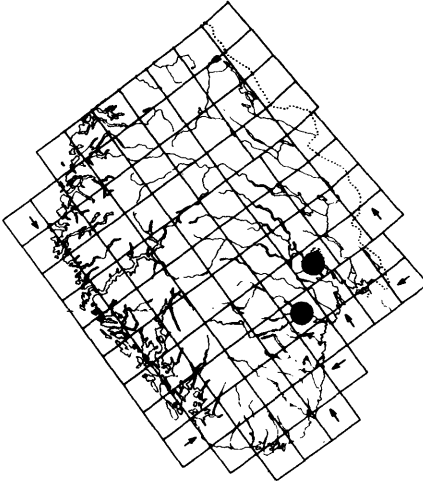
Tab. IV. Key to the symbols used on the maps and in the appendix.

Black symbols (Row A) are used for secure data.

Open symbols (Row B) are used for records connected with some uncertainty.

A B

1. Data for which the basic material is available and verified. If there is any doubt about the position of the locality, an open circle is used. 
2. Data based on literature, but the material is not verified or preserved. 
3. Species only living synatropically and/or accidentally imported, and not regarded to be a true member of the outdoor fauna. 
4. Records which represent a county, but without information on locality or faunal division. Used only in the appendix table. 

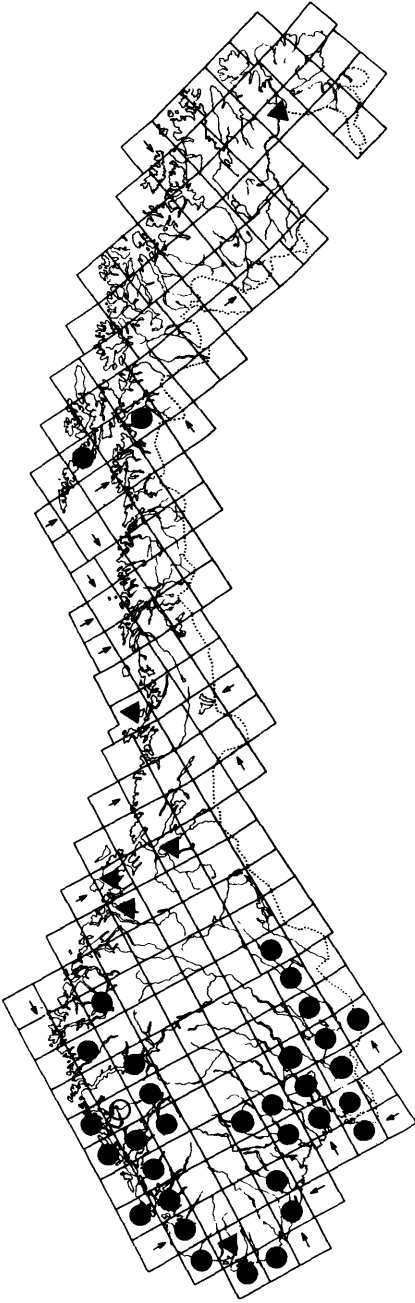


*Hypoponera
punctatissima*

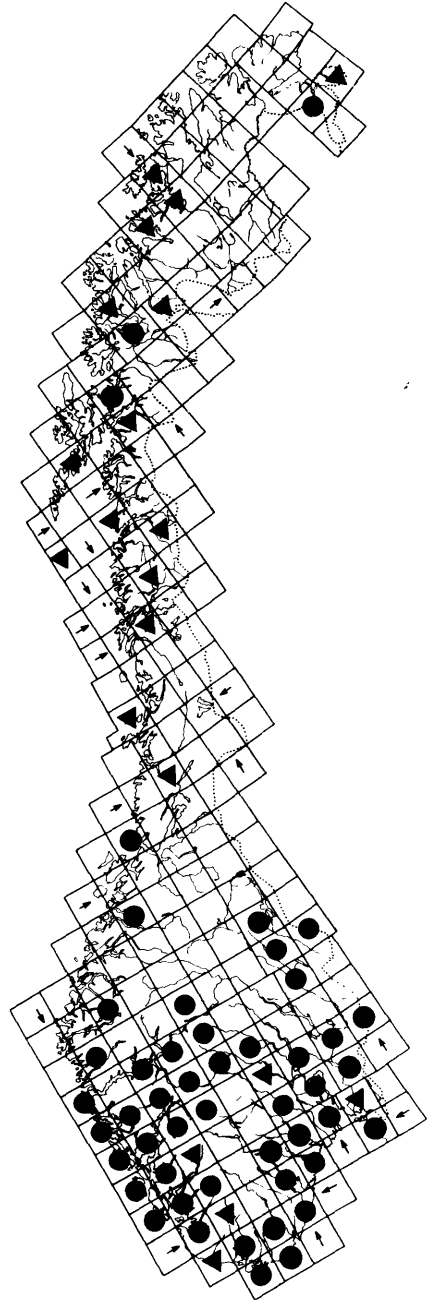


Myrmica sabuleti

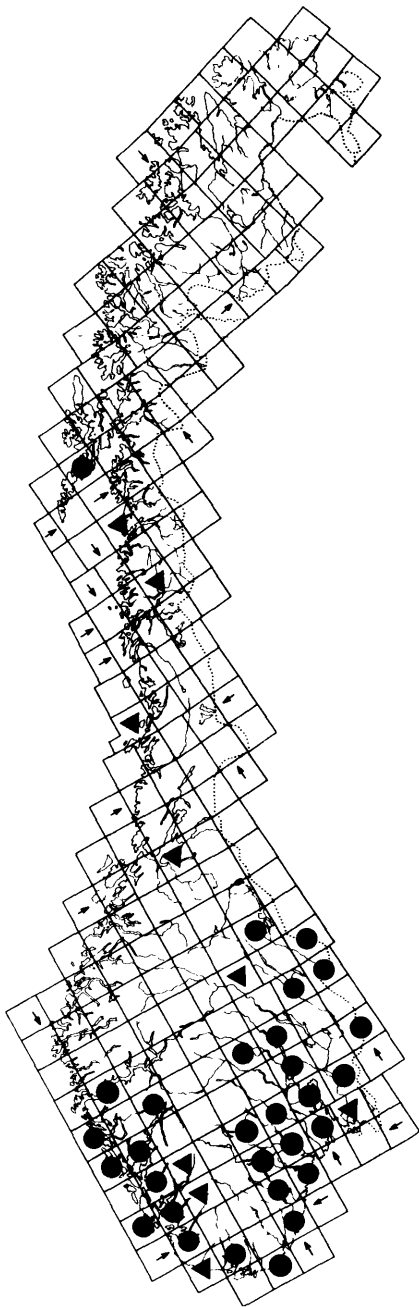
M. lobicornis



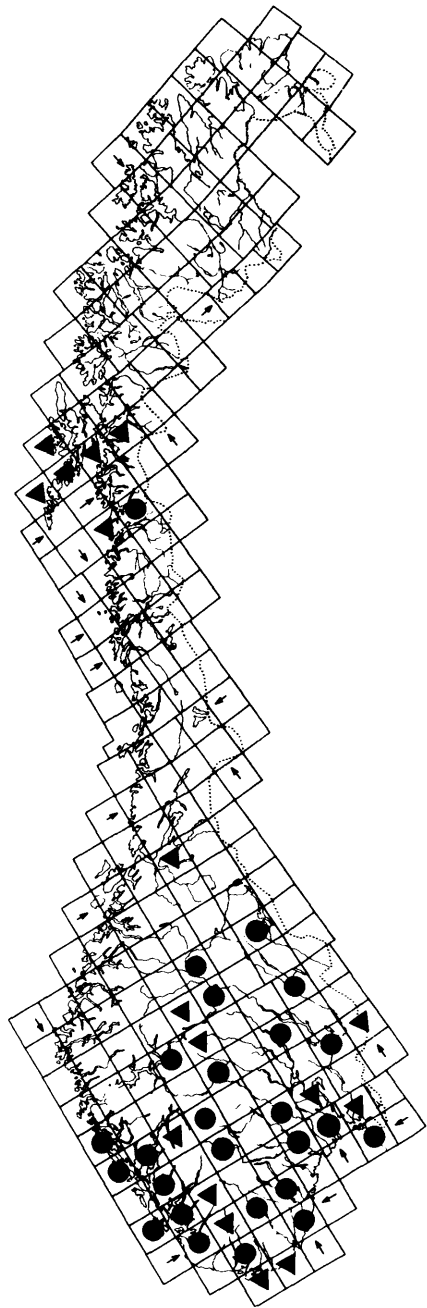
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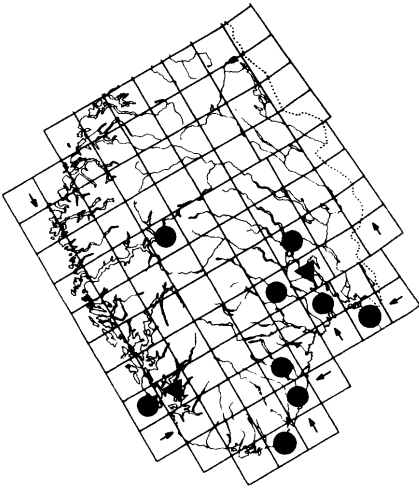
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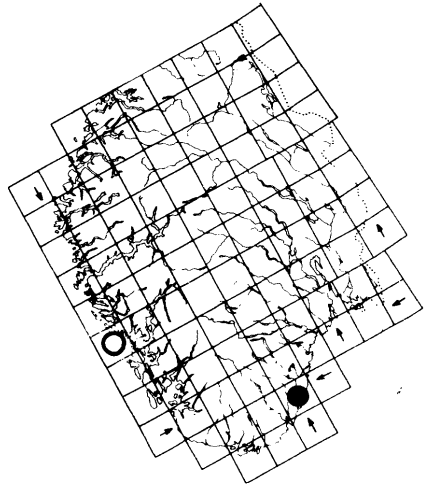
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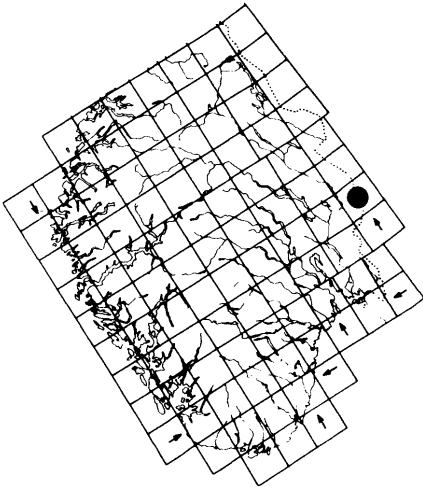
M. sulcinodis



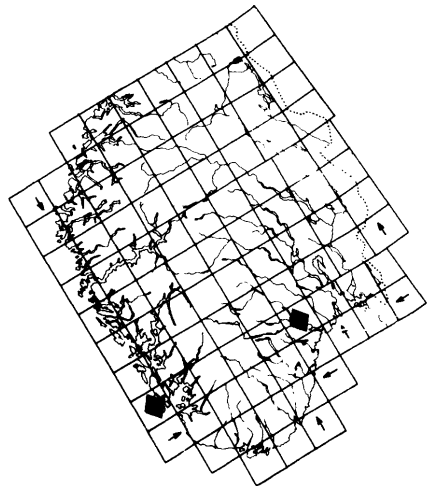
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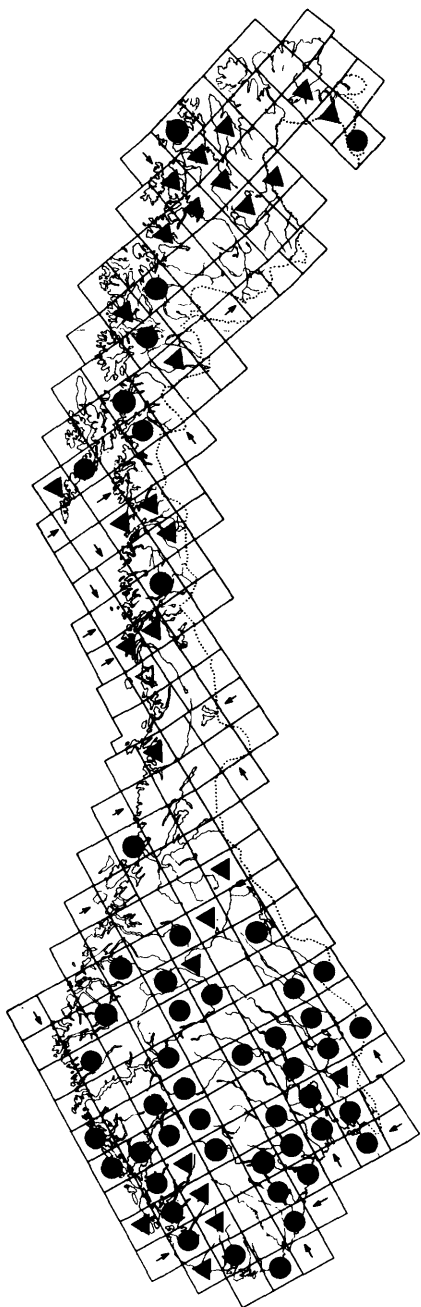
*Stenamamma
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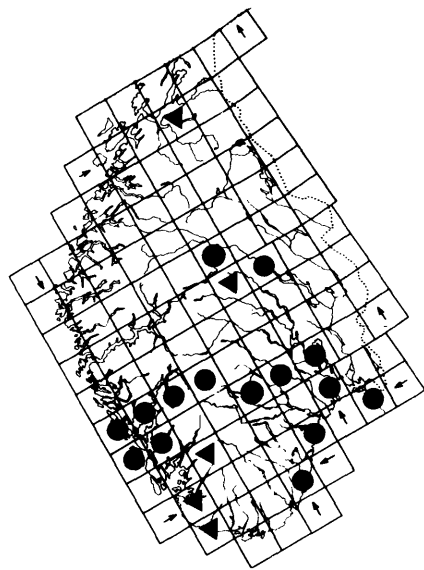
*Sifolinia
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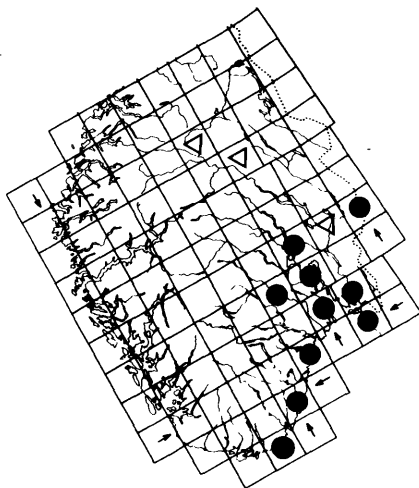
*Monomorium
pharaonis*



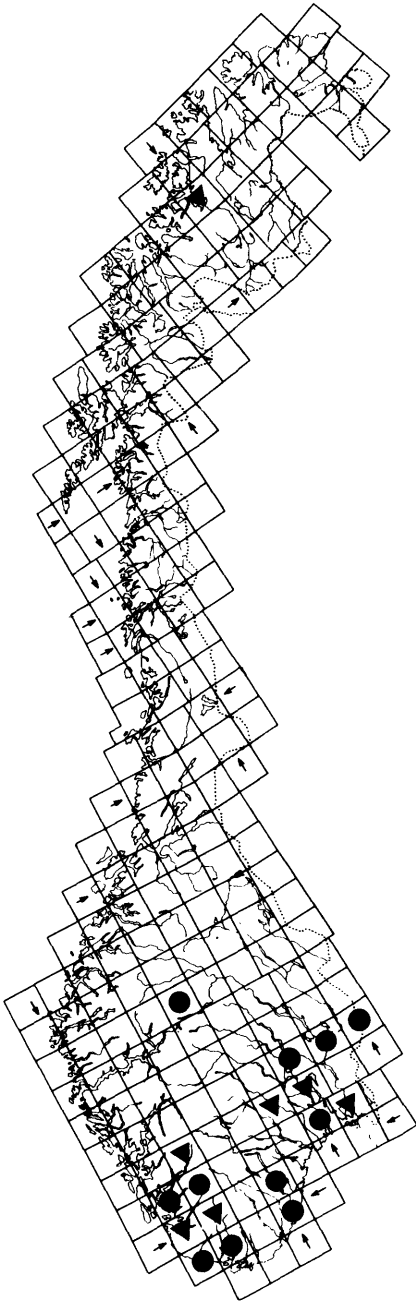
*Leptothorax
acervorum*



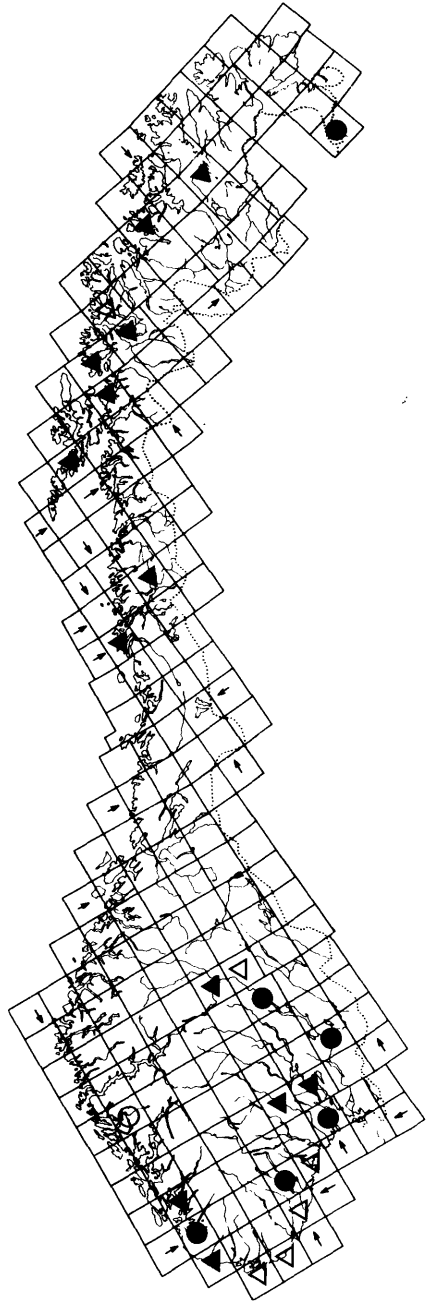
L. muscorum



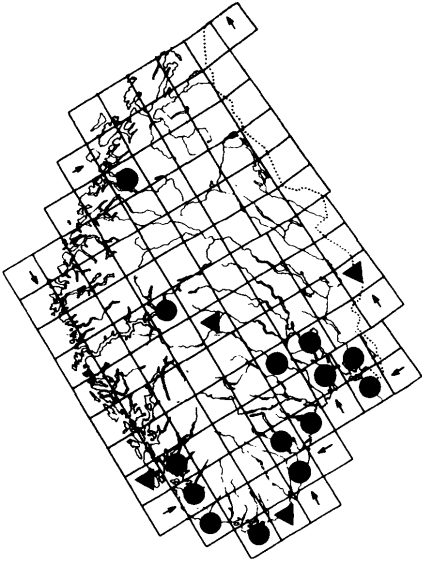
L. tuborum



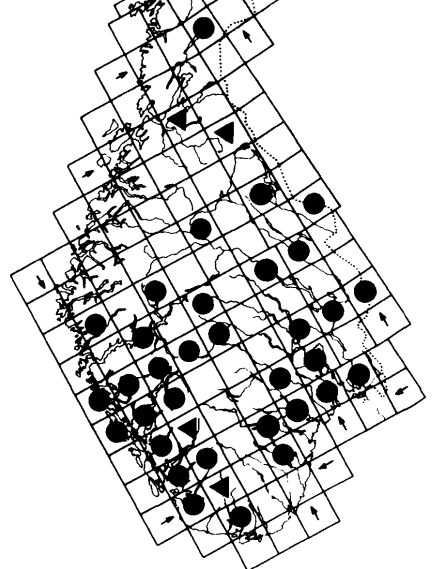
*Harpagoxenus
sublaevis*



*Formicoxenus
nitidulus*

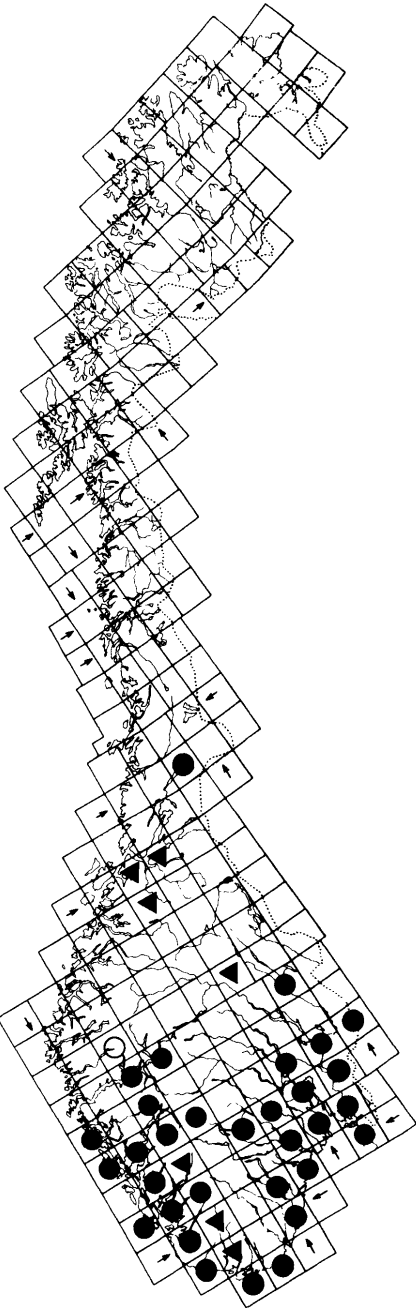


*Tetramorium
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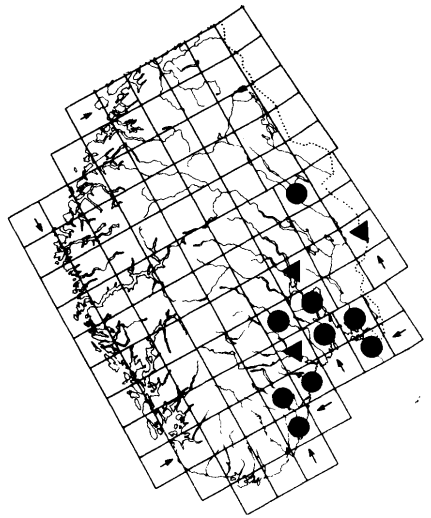


*Camponotus
ligniperda*

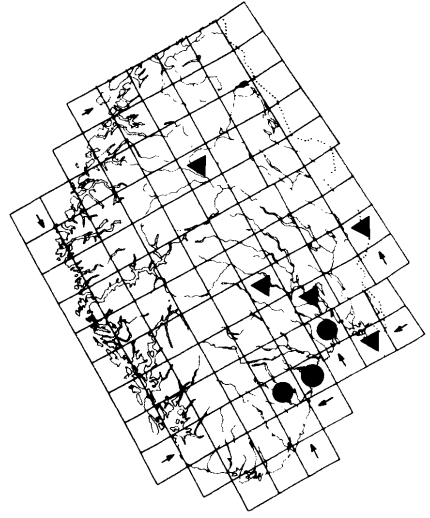
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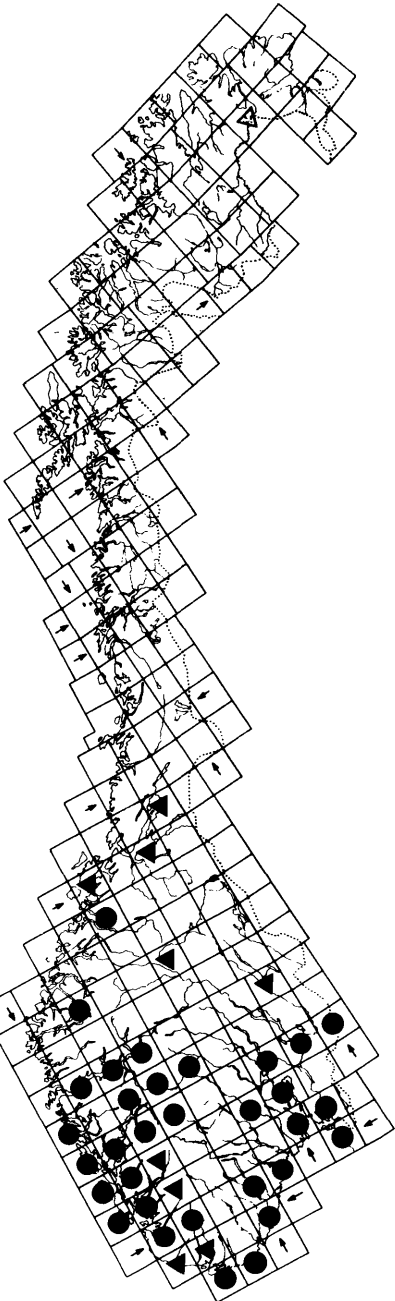
L. niger



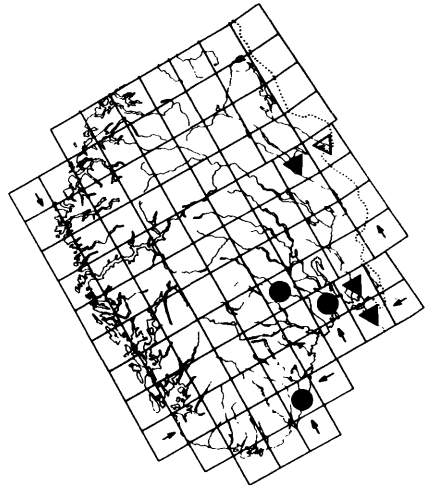
L. fuliginosus



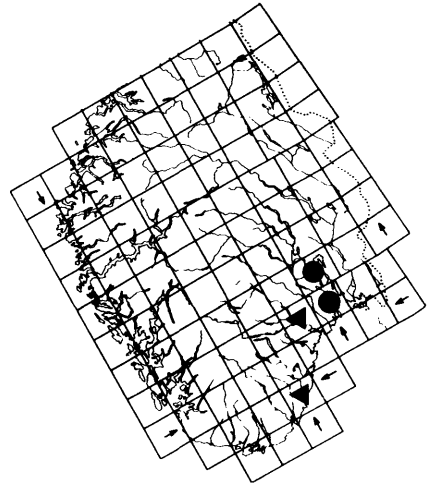
L. umbratus



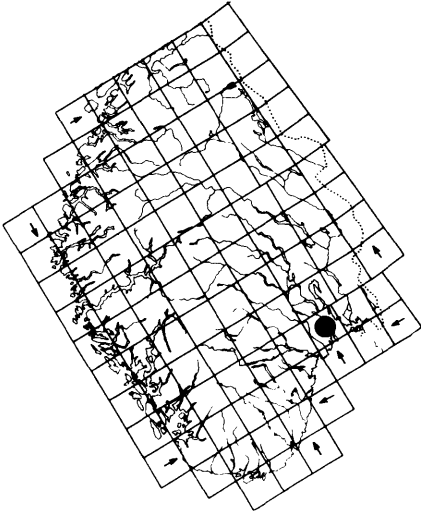
Lasius flavus



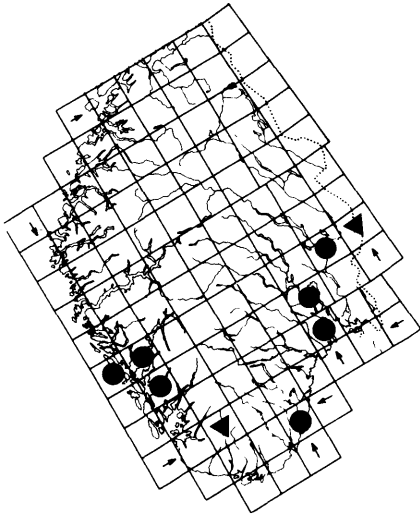
L. alienus



L. brunneus

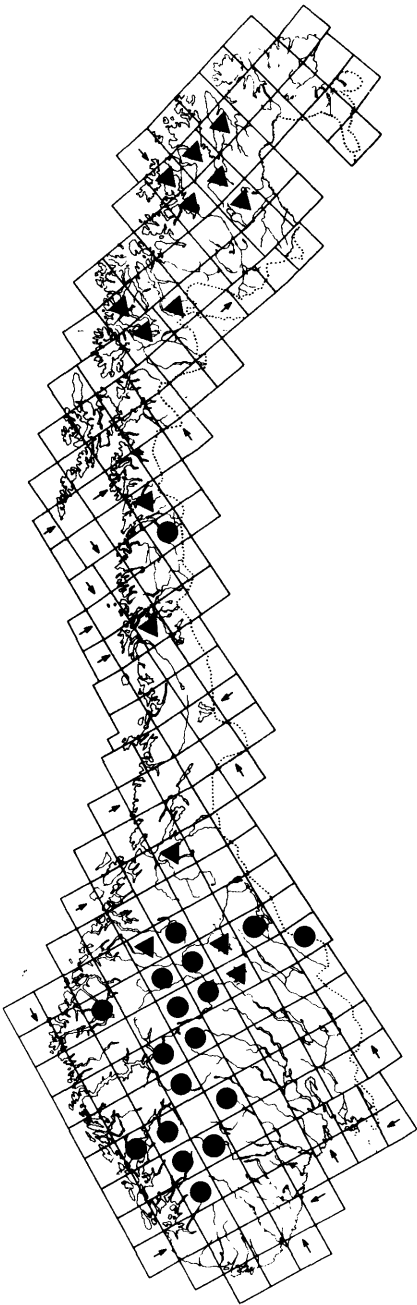


L. meridionalis

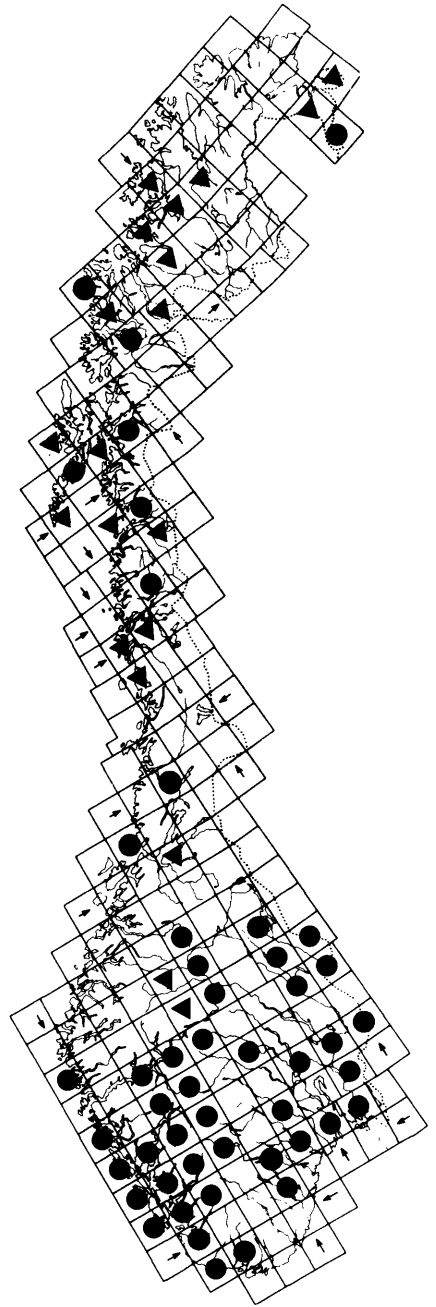


L. mixtus

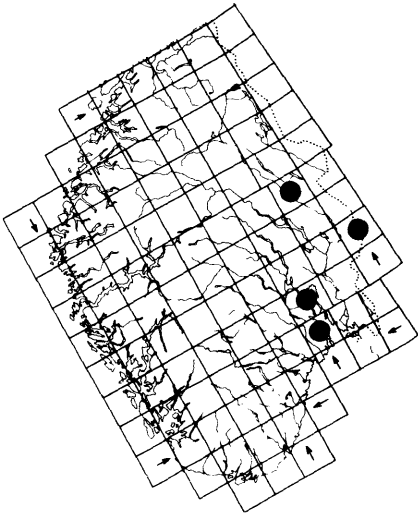
Formica fusca



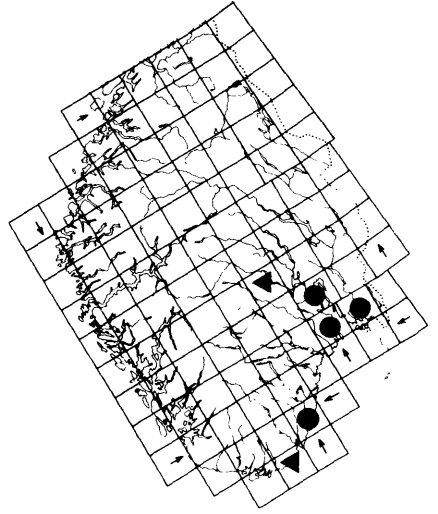
F. gagatoides



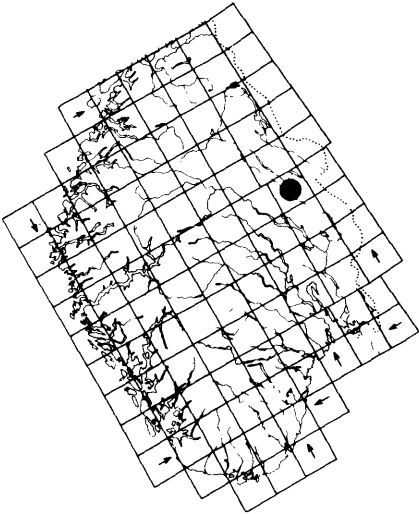
F. lemani



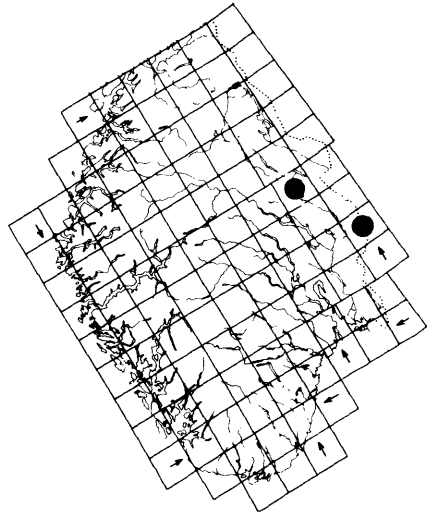
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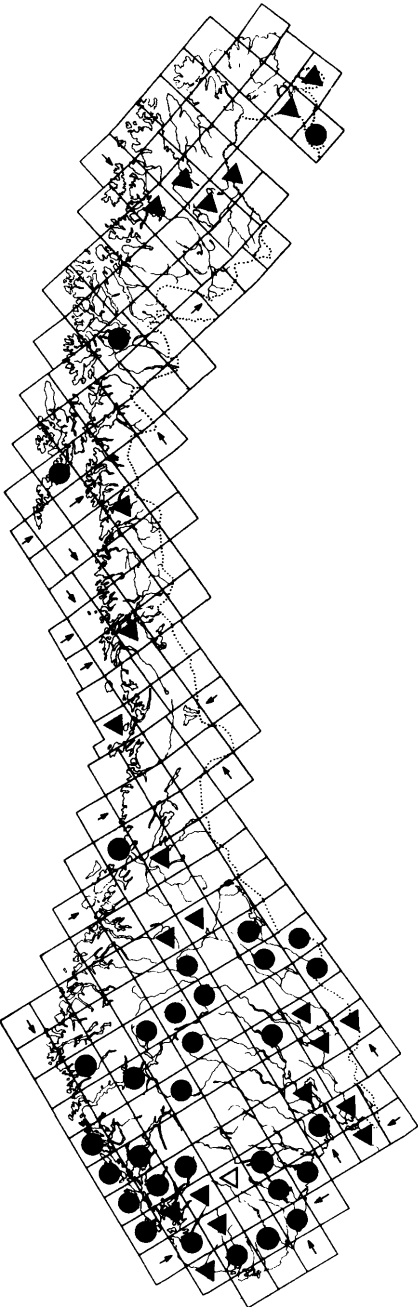
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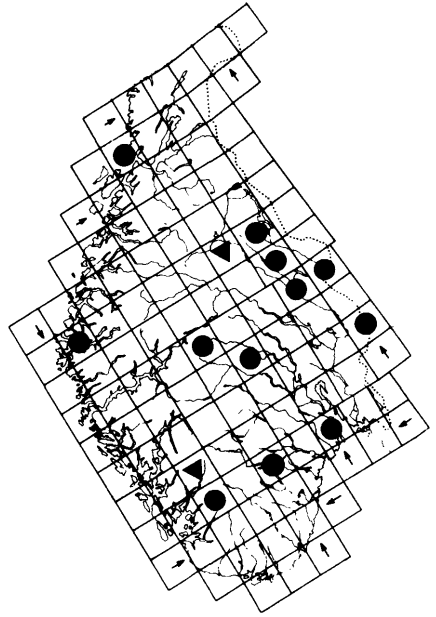
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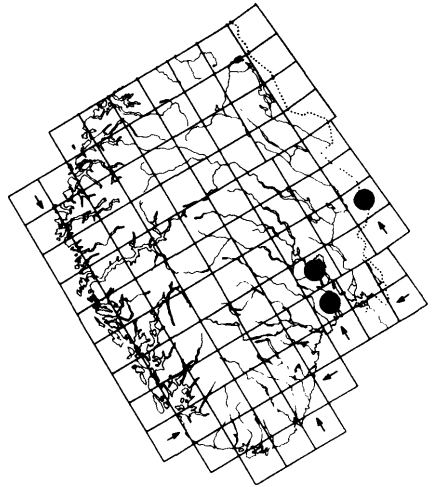
F. forsslundi



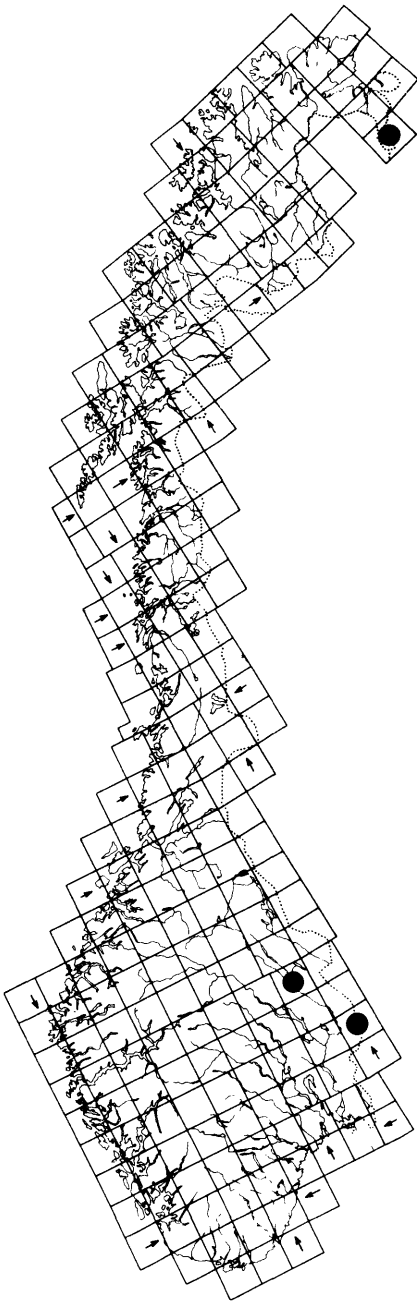
F. exsecta



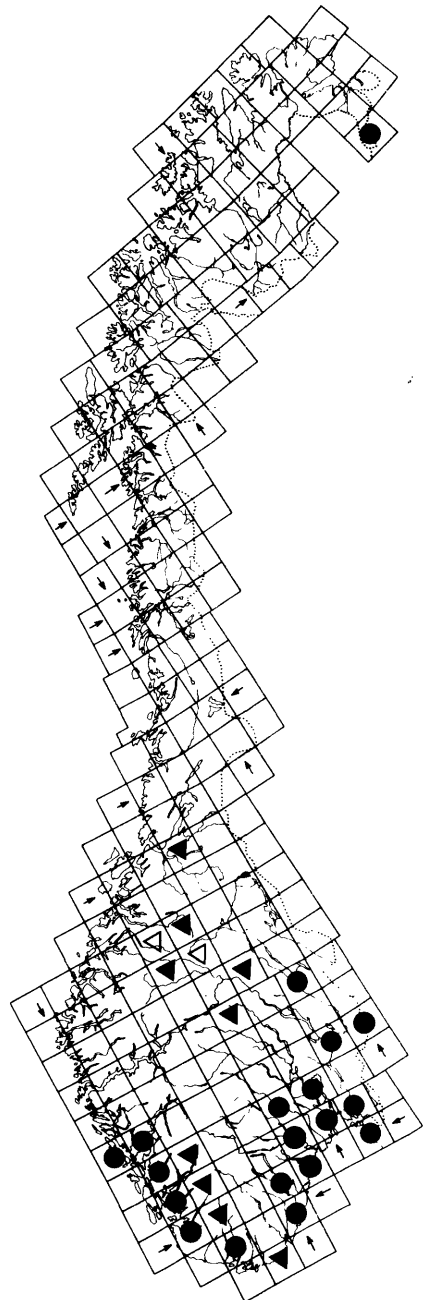
F. suecica



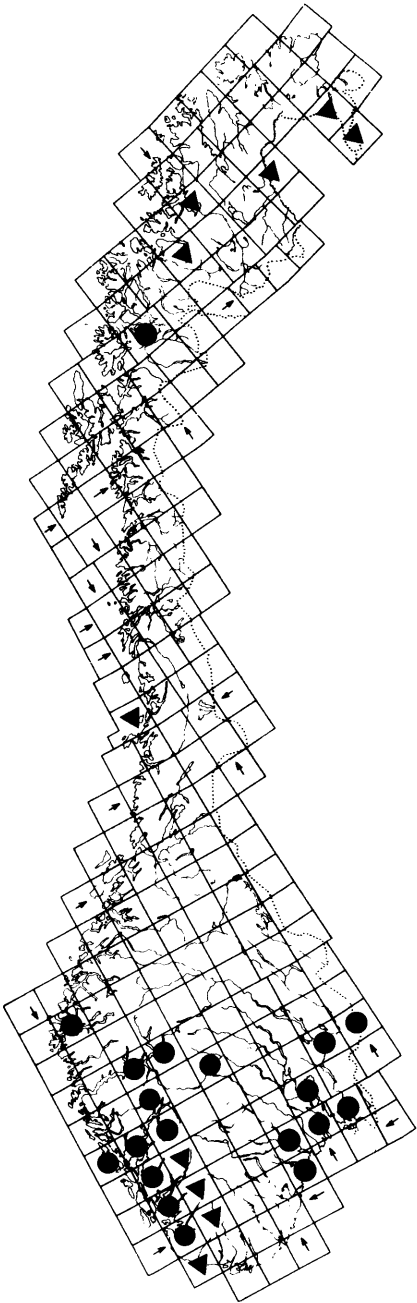
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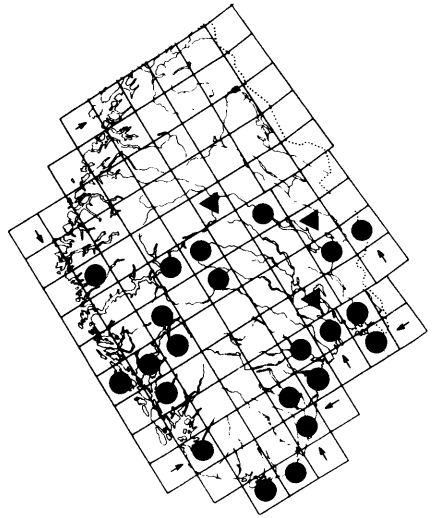
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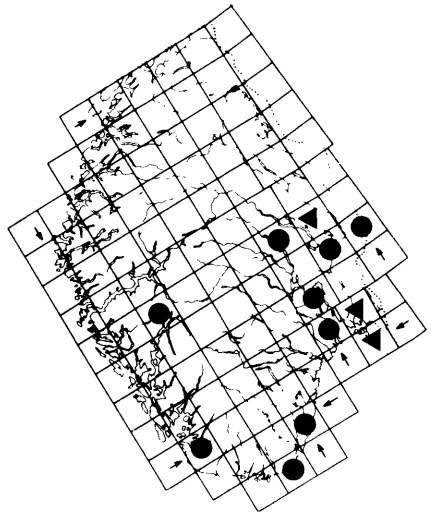
F. sanguinea



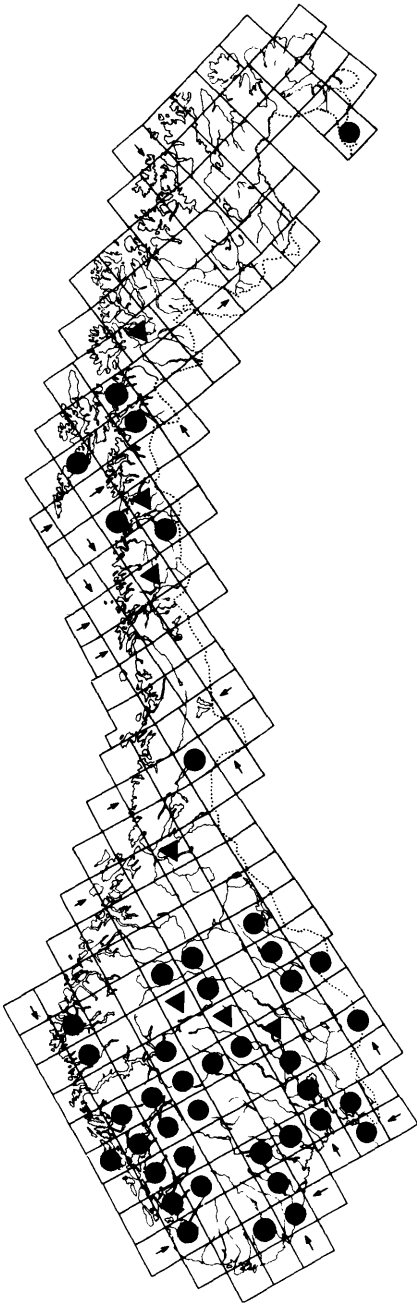
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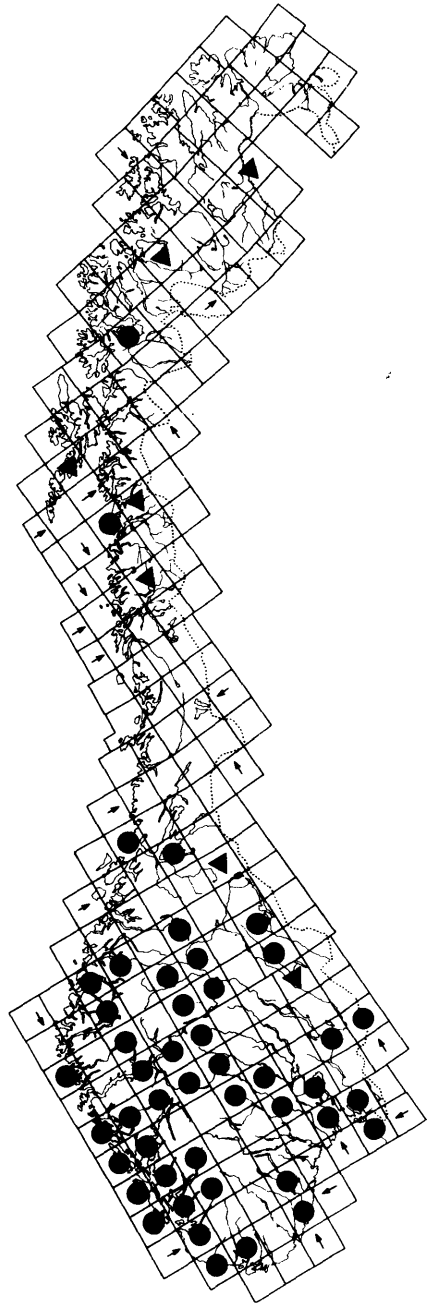
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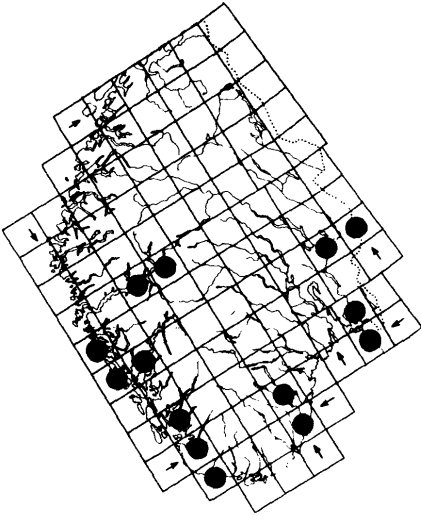
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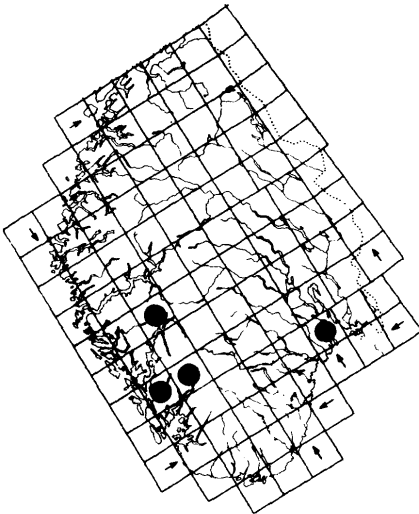
F. aquilonia



F. luqubris



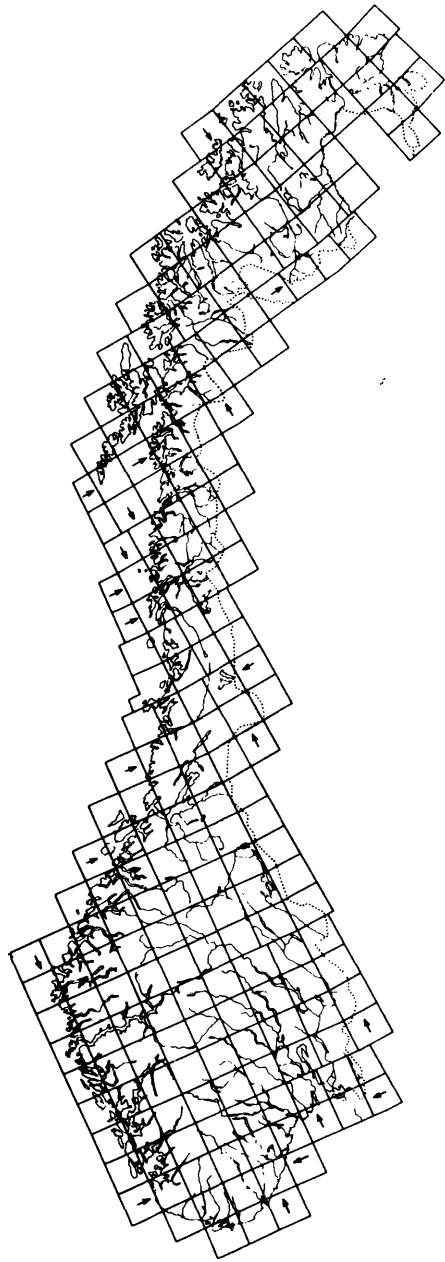
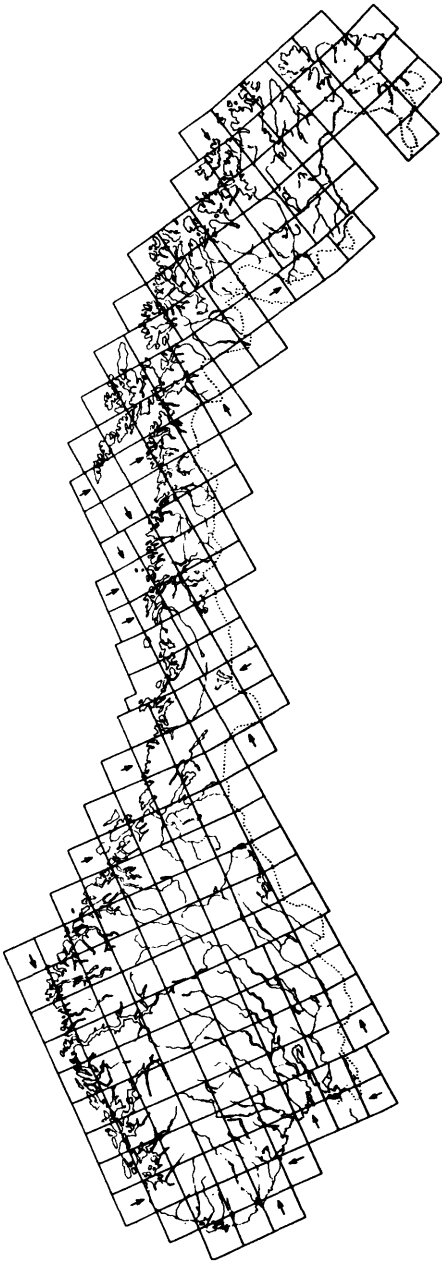
F. pratensis



F. nigricans

Faunal divisions :		Ø	AK	HES	HEN	OS	ON	Ba	Bv	VE	TEY	AAV	AAI	VAI	RY	RI	HOY	SFV	SFI	MRY	MRI	STI	NTY	NTI	NSY	NSI	Nv	TRY	TRI	FV	FI	Fv	Fn	Fo			
Species:		●	●																																		
<i>F. rufibarbis</i> Fabricius		●	●																																		
<i>F. exacta</i> Nylander		●	●																																		
<i>F. forsslundi</i> Lohmander		●	●																																		
<i>F. pressilabris</i> Nylander		●	●																																		
<i>F. suecica</i> Adlerz		●	●																																		
<i>F. uraliensis</i> Ruzsky		●	●																																		
<i>F. sanguinea</i> Latreille		●	●	▼																																	
<i>F. truncorum</i> Fabricius		●	●	◀																																	
<i>F. rufa</i> Linné		●	●																																		
<i>F. polycтена</i> Förster		▼																																			
<i>F. aquilonia</i> Yarrow		●	●																																		
<i>F. luabris</i> Zetterstedt		●	●																																		
<i>F. pratensis</i> Retzius		●	●																																		
<i>F. nigricans</i> Emery		●	●																																		
sp. pr. division *		31	35	34	18	18	18	27	15	36	22	16	33	10	23	6	25	24	25	25	13	21	5	9	8	16	6	7	10	5	10	6	9	4	9	5	12
sp. pr. county		31	35	37	25	31	36	27	34	23	23	23	23	23	23	23	28	28	28	23	16	18	12	13	7	10	5	10	6	9	4	9	5	12		17	

* Records marked with double arrows are not included in the totals.



Hittil utkommet:

Earlier published:

- Vol. 1: Refseth, D. 1980. Atlas of the Coleoptera of Norway.
1. Silphidae, Catopidae, Colonidae, Leptinidae.
44 pp.
- Vol. 2: Kvamme, T. 1982. Atlas of the Formicidae of Norway
(Hymenoptera: Aculeata). 56 pp.

