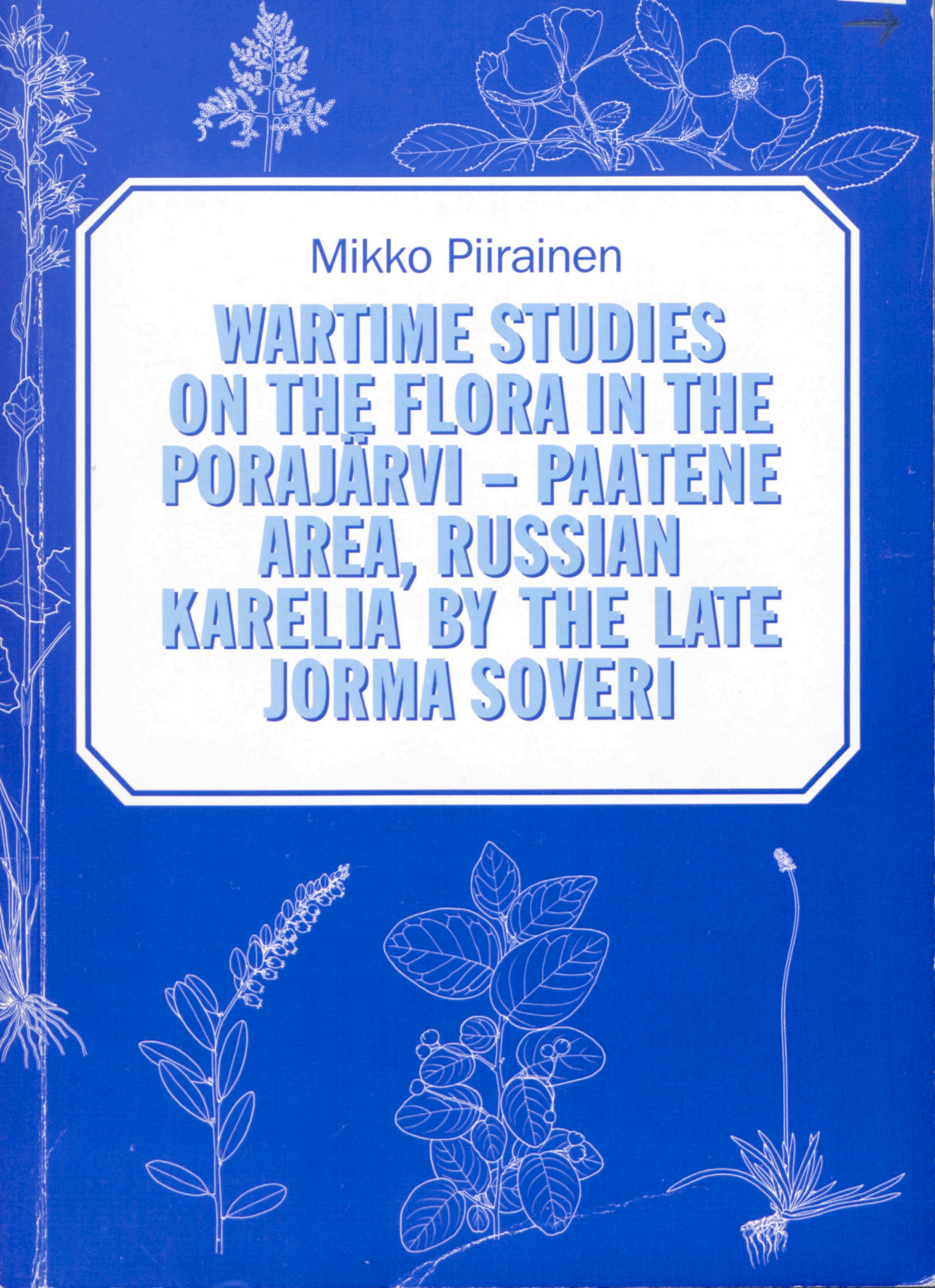


Mikko Piirainen

**WARTIME STUDIES  
ON THE FLORA IN THE  
PORAJÄRVI – PAATENE  
AREA, RUSSIAN  
KARELIA BY THE LATE  
JORMA SOVERI**



# NORRLINIA 5

**NORRLINIA** on Helsingin yliopiston luonnontieteellisen keskusmuseon kasvimuseon julkaisusarja, jossa ilmestyy laajahkoja kasvitieteellisiä katsauksia ja tutkimuksia. Sarja on nimetty Johan Petter NORRLINin (1842–1917) kunniaksi. Hän toimi Helsingin yliopiston kasvitieteen laitoksessa vuodesta 1867 vuoteen 1903, aluksi assistenttina ja 1879 alkaen kasvitieteen professorina. Norrlin oli kasvimaantieteen uranuurtaja Suomessa ja on tunnettu myös jäkäliä ja keltanoiden taksonomiaa käsittelevistä tutkimuksistaan (ks. Acta Forestalia Fennica 23, 1923).

**NORRLINIA** is a botanical periodical published, at irregular intervals, by the Botanical Museum of the Finnish Museum of Natural History, University of Helsinki. The periodical is named in honour of Johan Petter NORRLIN (1842–1917), who belonged to the staff of the Department of Botany, University of Helsinki, from 1867 to 1903, first as an assistant and from 1879 onwards as Professor of Botany. Norrlin was a pioneer in plant geography in Finland, and is also well known for his work on lichens and on the taxonomy of the apomictic taxa of *Hieracium* and *Pilosella* (see Acta Forestalia Fennica 23, 1923).

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HELSINGIN YLIOPISTO

16. 02. 1998

LUONNONTIETEIDEN KIRJASTO

# Wartime studies on the flora in the Porajärvi – Paatene area, Russian Karelia by the late Jorma Soveri

Mikko Piirainen

Piirainen, M. 1994: Wartime studies on the flora in the Porajärvi – Paatene area, Russian Karelia by the late Jorma Soveri. — *Norrinia* 5:1–90.

One of the botanical excursions to occupied Russian Karelia made by Finnish botanists during the war period 1941–44 was that of Jorma Soveri and Reino Kalliola in July – August 1942 to the Porajärvi (Porosozero) – Paatene (Padany) area. The area belongs mainly to the biogeographical province of Karelia onegensis, minor parts belonging to Karelia pomorica occidentalis. The most up-to-date survey of the flora in the area has thus far been from the 1870'ies.

In the west the area is oligotrophic and mostly covered by coniferous forests. In the east, where the bedrock is more basic and richer in nutrients, the general eutrophic nature of Karelia onegensis is much more evident: demanding and calciphilous plant species, herb-rich forests, rich fens and meadows are relatively common.

Soveri and Kalliola studied mostly the areas near the roads, but also made a ten-day trip to large forests around Vuottovaara hill. They made extensive floristic field notes, but the floristic results of the excursion remained unpublished. Soveri began to prepare a manuscript on the relations between vascular plants and human impact in the area, but could not finish this work before his death. His manuscript consisted of 446 distribution maps (10 common species were not mapped), and species lists with special reference to influence of culture and oligotrophy – eutrophy of the habitats. The maps and an annotated summarizing species list are published in this paper.

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## Preface

During World War II, while Finnish troops were occupying major parts of the Karelian SSR, Finnish botanists studied the area with enthusiasm. In part, the studies were organized through the Finnish State Scientific Committee. Floristical studies on vascular plants from Russian Karelia from the war period 1941–44 have been published mainly in *Acta Soc. Fauna Flora Fennica*, *Annales Bot. Vanamo*, *Archivum Soc. Vanamo* and *Memoranda Soc. Fauna Flora Fennica*. The scientific results of many excursions, however, still remain unpublished. Most of the plant specimens collected are deposited in the Botanical Museum of the Finnish Museum of Natural History, University of Helsinki (H).

In summer 1942 Jorma Soveri<sup>1</sup> and Reino Kalliola<sup>2</sup> studied the Porajärvi (Porosozero) – Paatene (Padany) area situated in the biogeographical provinces of Karelia onegensis and Karelia pomorica occidentalis immediately beyond what was the Finnish border at the time (Figs. 1 and 2).

Before the Russian revolution the Porajärvi – Paatene area was beyond the reach of most botanical excursions in Russian Karelia, an area then mainly studied by Finnish botanists. Russian botanists have been active in the Porajärvi – Paatene area neither before nor after the revolution (A. Kravchenko, pers. comm.). Of the Finnish botanists at least J. Sahlberg in 1869 (see Erkamo 1942), J. P. Norrlin in 1870 (Norrlin 1871), and I. O. Bergroth in 1894 and 1896 (see Erkamo 1949) visited the area; Bergroth and Sahlberg in the northeast (Paatene), Norrlin in the south and southeast (Porajärvi, Soutojärvi, Jänkäjärvi and Selki).

Norrlin's (1871) classical work has so far been the most up-to-date survey of the flora of the area. He showed that there are distinct eastern and northern features in the flora of Karelia onegensis. He emphasized the prevalence of rich fens in the area, especially around Selki and Soutojärvi. The eutrophic character of the area was mainly seen in the abundance of demanding and calciphilous species, particularly in rich fens, meadows, herb-rich

forests and lakes. His conclusion was that the main causal factors were the prevailing continental climate, the influence of Lake Onega on the local climate and the soil rich in calcium.

Soveri and Kalliola made their excursion 16.VI.–24.VII.1942 with the starting and ending point at Joensuu, Finnish North Karelia; the time period 18.VI.–20.VII. was spent in the actual study area. The studies concentrated near the roads and villages, but they also made a ten-day trip in the uninhabited forest area around Vuottovaara (Fig. 3). The time they could spend in the study area was limited — it seems that the two-month trip they had planned had to be halved because of the operations of an enemy patrol.

Soveri was responsible for the floristic studies and Kalliola for the studies on forest vegetation. They made extensive floristic field notes, the major portion of which has regrettably been lost since Soveri's death. Their collections from the area, c. 110 specimens, are deposited in H. In his popular description of the area, Kalliola (1942) emphasized the contrast between the oligotrophic western forest wilderness and the eutrophic eastern, more densely inhabited part. His studies on forest vegetation were published soon after the excursion (Kalliola 1943).

The floristic results were to be published by Soveri, who began preparation of a manuscript entitled "Porajärven – Paatenen seudun putkilokasvien suhteesta kulttuuriin" [On the relations between vascular plants and human impact in the Porajärvi – Paatene area]. This manuscript was never finished, and thus the floristic findings from the excursion remained unpublished. The manuscript includes 446 distribution maps (10 common species were not mapped: *Picea abies*, *Pinus sylvestris*, *Juniperus communis*, *Calluna vulgaris*, *Vaccinium myrtillus*, *V. vitis-idaea*, *Linnaea borealis*, *Solidago virgaurea*, *Deschampsia flexuosa* and *Eriophorum vaginatum*), tables summarizing the relations between vascular plant species and human impact, the eutrophy – oligotrophy of the habitats and the distribution pattern of the species.

<sup>1</sup>J. Soveri (1909–67), Ph.D., zoologist (academic dissertation on the avifauna of Lammi parish, South Finland); took an interest also in floristics. Did his career largely in the school world; published several botanical schoolbooks.

<sup>2</sup>R. Kalliola (1909–82), Ph.D., geobotanist, expertized in arctic botany; Finnish State Supervisor of Nature Protection 1939–72; see Söyrinki (1984).



*Fig. 1. Study area of Soveri and Kalliola.  
The Finnish border before 1944 is indicated by a dotted line.*

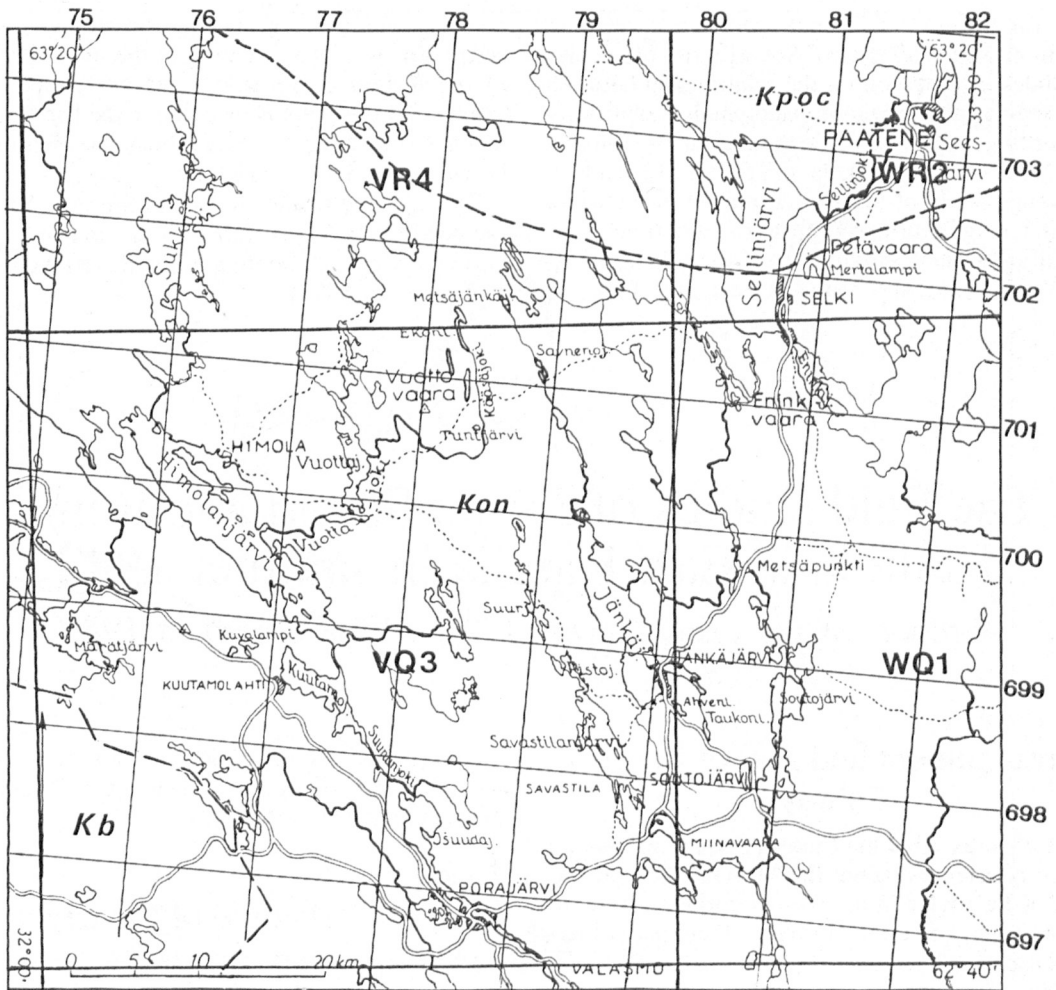


Fig. 2. Continuation of the uniform grid system (Grid 27°E; thin lines), UTM grid system (*Atlas Floraeae Europaeae*; thick lines). The border between biogeographical provinces *Karella borealis* (Kb), *Karella onegensis* (Kon) and *Karella pomorica occidentalis* (Kpoc) is indicated by a dashed line; the border between Kb and Kon was also the national border between Finland and U.S.S.R. up until 1944.

Soveri's papers also include tables and lists of vegetation analyses of forests (published by Kalliola 1943), and of meadows and rich fens with special reference to human impact on the sites. The main geological features (Fig. 4), forest-fire areas (Fig. 5), villages, forest huts, slash-and-burn forests and scythed eutrophic fens (Fig. 6) and the number of anthropochores in the villages (Fig. 7) were also shown on maps. Soveri's papers were deposited in the Botanical Institute, University of Helsinki. The maps have been used by Prof. J. Jalas and J. Suominen, Ph.D., in preparing the *Atlas Floraeae Europaeae* (Jalas & Suominen 1972–1991).

Soveri's maps (pp. 22–85) appear in this paper in their original form (some maps have been combined). Precise information on Soveri's material and methods needed to prepare the maps is unfortunately lacking. The maps seem to include, beside Soveri's and Kalliola's own floristic data, a few dots based on other collectors' herbarium material in H. It is at least certain that the collections by Lauri Lehtonen and Arvi Toivainen from the war year 1943 were included. Probably the records in Norrlin (1871) were also included, with a few exceptions (see p. 19).

The nomenclature and sequence of taxa have been updated according to Kurto & Lahti (1987)

and for the few additional species according to Tutin & al. (1964–1980). Soveri's list of species includes information on the relationship between the species and human impact which is obviously according to the classification used by Linkola (1916:239–283). Linkola (1916, 1921) made a thorough study of the human impact on the flora of the neighbouring Finnish (at the time, now mainly Russian) province of Karelia *ladogensis*. This study has apparently served as a focus of

comparison for Soveri in preparing his own manuscript. Soveri's classification of the main habitats of the species in the study area on the axis eutrophy – oligotrophy is included in the list, though it is not known to what extent this classification is based on real field studies.

Twenty-nine of the species in Soveri's list are included in the list of rare and threatened higher vascular plants of Karelian Republic (Kravchenko & Kuznetsov 1993).

## The field studies of Jorma Soveri and Reino Kalliola in East Karelia in summer 1942

A report of the excursion made by Jorma Soveri in 1942<sup>3</sup>

### Arrangement and aim of the field study

In late winter 1941 the Finnish Society for Nature Conservation contacted the Military Administration of East Karelia in order to initiate a study of what is known as the Himola – Pieninkä wilderness area to consider its value for nature conservation. This area is situated between the roads from Porajärvi to Repola and from Porajärvi to Paatene and Rukajärvi. Major N. A. Osara<sup>4</sup> from the Military Administration made all the arrangements. It was decided that two botanists would be sent to the area: Reino Kalliola and Jorma Soveri. Soveri was also one of those who had taken part in the botanical inventory of the East Karelian military administrative territory authorized by the State Scientific Committee.

Kalliola and Soveri decided their task to be to (1) make an inventory of the area, considering its value for nature conservation, (2) study the forest and swamp site types in the area and (3) make a

floristic inventory of the area — all these to be accomplished during the period of 1–2 months available for their field study.

### The schedule of the trip

18.VI. Arrival at the study area: from Suojärvi, Finland, to Porajärvi village by car. From Porajärvi to Kuutamolahti village by bicycle.

19.VI. Field trips in the surroundings of Kuutamolahti.

20.VI. From Kuutamolahti to the shore of Himolanjärvi lake. To Himola village by boat.

21.–24.VI. Field trips in the surroundings of Himola.

25.–26.VI. From Himola to Vuottojärvi lake. By boat to the mouth of the Kääsäjoki river. From Kääsäjoki to the top of Vuottovaara hill.

27.–30.VI. Field trips in the Vuottovaara area.

1.–4.VII. A field trip to the forests behind Vuottovaara up to Metsäjänkjärvi lake.

<sup>3</sup>Soveri wrote his report mainly regarding the value of the Himola – Pieninkä wilderness area for nature protection and thus dealt mostly with the oligotrophic western parts of the area (cf. Fig. 4). The report is translated here in slightly edited form.

<sup>4</sup>N. A. Osara (1903–90), Professor of forest economics in the Forest Research Institute at the time, was the chief of the Forestry Office of the Military Administration of East Karelia in 1942. The Porajärvi Area Staff of the Military Administration was situated in Kuutamolahti.



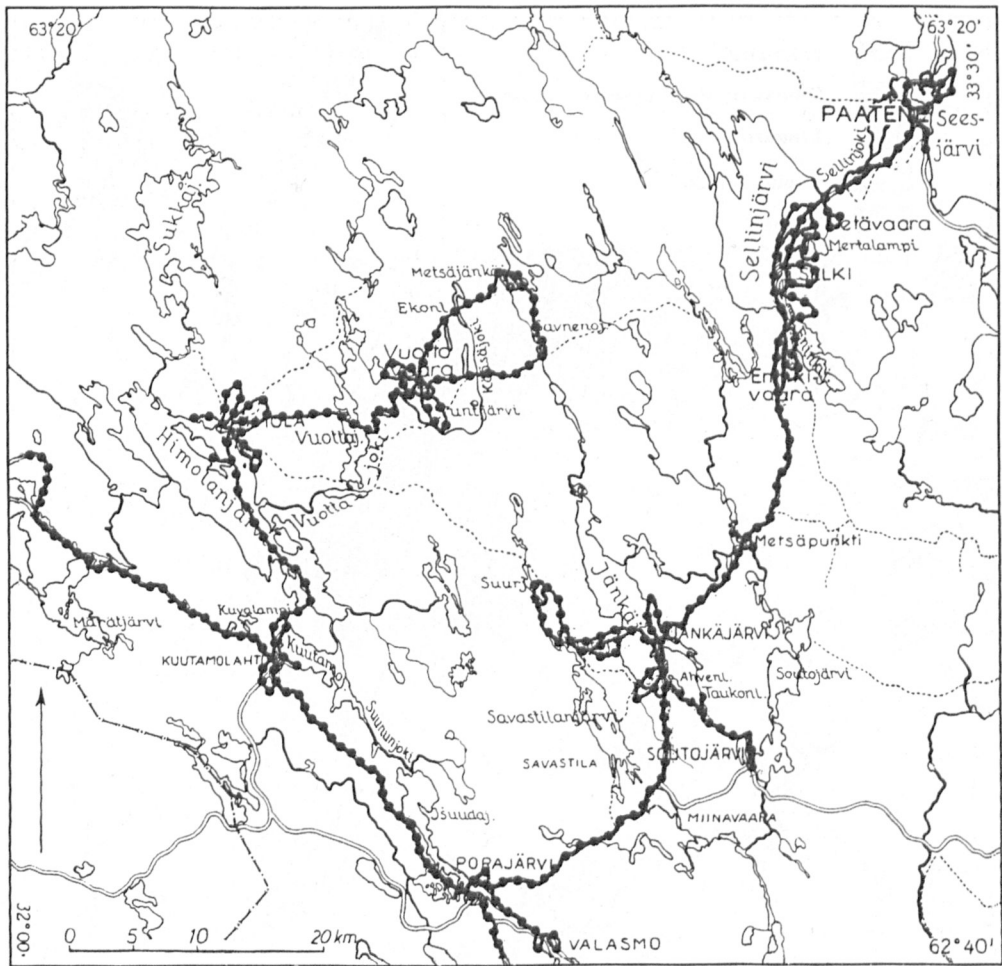


Fig. 3. Soveri and Kalliola's route in the area.

4.–6.VII. Back to Himola and Kuutamolahti.

7.VII. A bicycle trip from Kuutamolahti along the Lupasalmi road up to the isthmus of Mäntälampi lake.

8.VII. From Kuutamolahti to Porajärvi by car. Field trips in the surroundings of Porajärvi and in Valasmo village.

9.VII. From Porajärvi to Jänkälampi village by bicycle.

10.–12.VII. Field trips in the surroundings of Jänkälampi.

13.VII. A field trip to the forests behind Jänkälampi lake by the water course entering Savastilanjärvi lake from the north.

14.VII. From Jänkälampi to Selki village by bicycle.

15.–18.VII. Field trips in the surroundings of Selki.

19.VII. (Field trips from Selki forbidden because of an enemy patrol in the area.) From Selki to Paatene village by car.

20.VII. From Paatene to Malu railway station by car. Out of the study area.

## General features of the study area

On a large scale the Himola area is rather monotonous, but in its details it is a varied, wild, and beautiful virgin wilderness. The area between Kuutamolahti village and Metsäjänkälampi lake (from which most of the vegetation descriptions were made) turned out to be mostly very poor, especially in the parts west of Vuottovaara. This is seen, for instance, in the fact that *Oxalis acetosella* is almost totally absent. Because of the rather

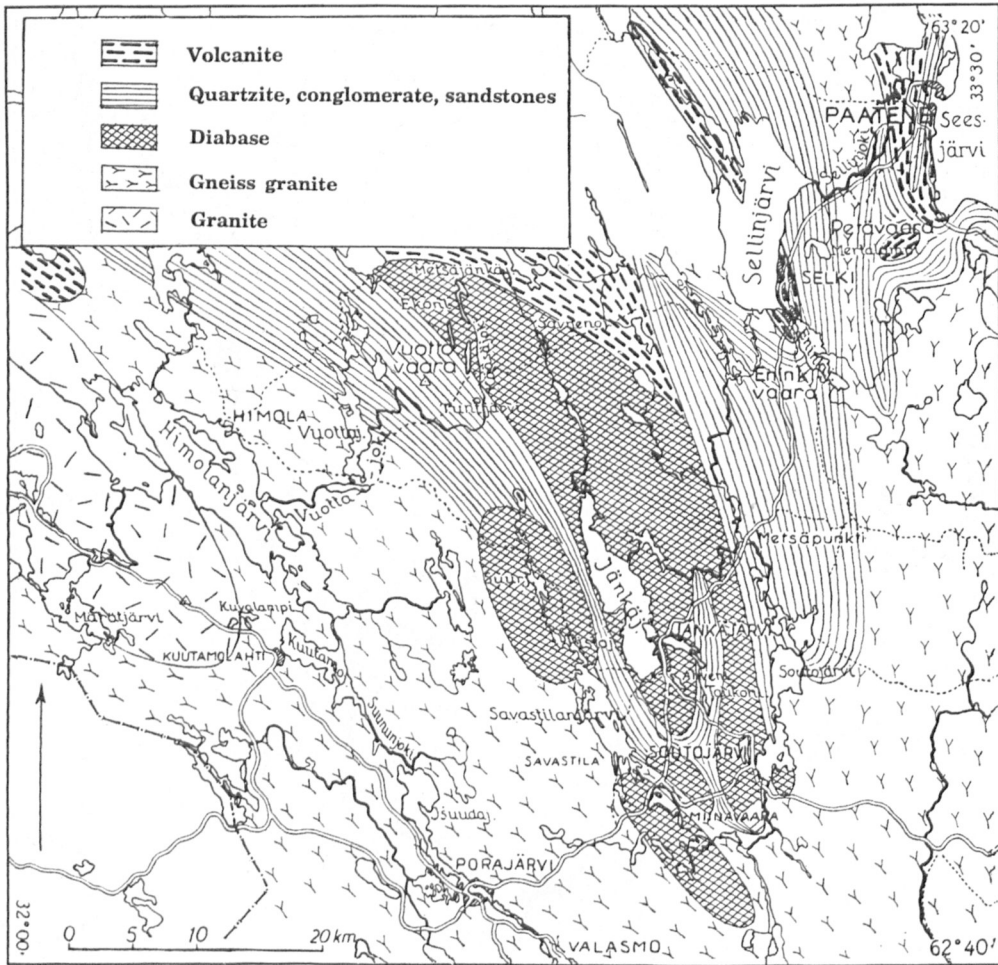


Fig. 4. The main geological features of the study area, probably adapted from Eskola (1941); see also Korsakova et al. (1987).

northern environment there are distinctively northern features in the area's forest site types. The most common site types are an intermediate between *Vaccinium vitis-idaea* and *Empetrum nigrum* – *Vaccinium vitis-idaea* types, a *Vaccinium myrtillus* site type (with distinct northern features) and a *Calluna vulgaris* – *Vaccinium myrtillus* – *Cladina* site type. The western parts of the area in particular (between Kuutamolahti and Vuottojärvi) include wide, barren, sandy areas with their open *Calluna vulgaris* – lichen heath forests. This is the situation also in the east between the water courses of Jänkajärvi and Savastilanjärvi lakes. In this area only the brook-sides are somewhat richer. The forests are dominated by *Pinus sylvestris*.

In the western parts of the area *Picea abies* grows over wider areas only in spruce-hardwood

swamps and along bog margins. East of Vuottovaara spruce is common also in forested areas. Spruce appears as the lower canopy layer in forests of *Vaccinium myrtillus* and *Vaccinium vitis-idaea* / *Empetrum nigrum* – *Vaccinium vitis-idaea* site types, but is prevented from playing a major role by the frequent forest fires. Thus pine is regularly the dominant tree species on better soils as well.

Forest fires have a strong effect on the forests everywhere. Both old and recent fire areas are seen throughout. In the upland forests storm injuries are also common. Usually the forests are over-aged, uneven and patchy (separate age groups mixed together, large variations in density). Forests in bad condition are common; beautiful, even and continuous forests are rather uncommon.

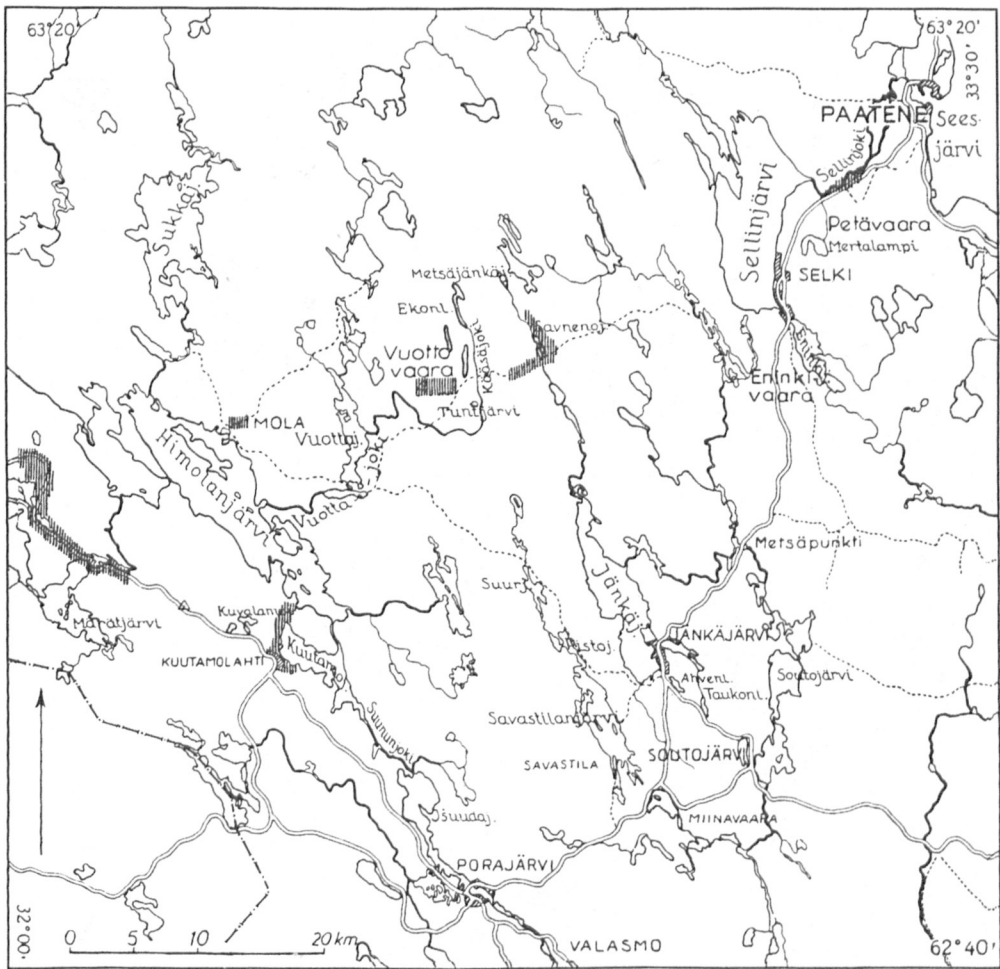


Fig. 5. Forest fire areas seen by Soveri and Kalliola (hatched).

The spruce-hardwood swamps are mostly poor *Vaccinium myrtillus* and *Rubus chamaemorus* swamps, bogs are heath bogs and *Chamaedaphne calyculata* bogs, fens mostly of *Sphagnum* and *Eriophorum vaginatum*, or *Carex lasiocarpa* fens. Vegetation in water and on rocks is also poor. Pine forests and bogs usually surround the lakes, which lack any hardwood margin.

An exception to this poor pattern is seen on the lower slopes and below the larger forested hills. Thus below the high and steep western and south-western slope of Vuottovaara there are quite beautiful, well-grown birch forests (in old forest fire areas) and old, rich mixed forests of *Oxalis acetosella* – *Vaccinium myrtillus* and *Oxalis acetosella* – *Maianthemum bifolium* site types (with *Picea abies*, *Populus tremula*, *Betula pendula*, *B. pubes-*

*ens* and in the upper canopy layer *Pinus sylvestris*) and spruce-hardwood swamps of Filices and of the grass-herb site types: all of these in virgin condition seen nowhere in southern Finland. Along the Kääsäjoki river below the hill are spruce-hardwood swamps dominated by grasses or herbs.

The quartzitic Vuottovaara hill is the highest point of Karelia onengensis, 413 m a.s.l. The stony and rocky forest on the summit is characterized by spruce damaged by the heavy snow burden, old low-growing pines and bushy birches; these give the place the appearance of northern mountain forests. The birches form a "subalpine zone" on the hill's highest point, where several forest fires have destroyed the conifers. In the valleys leading to the summit are forests with features of the

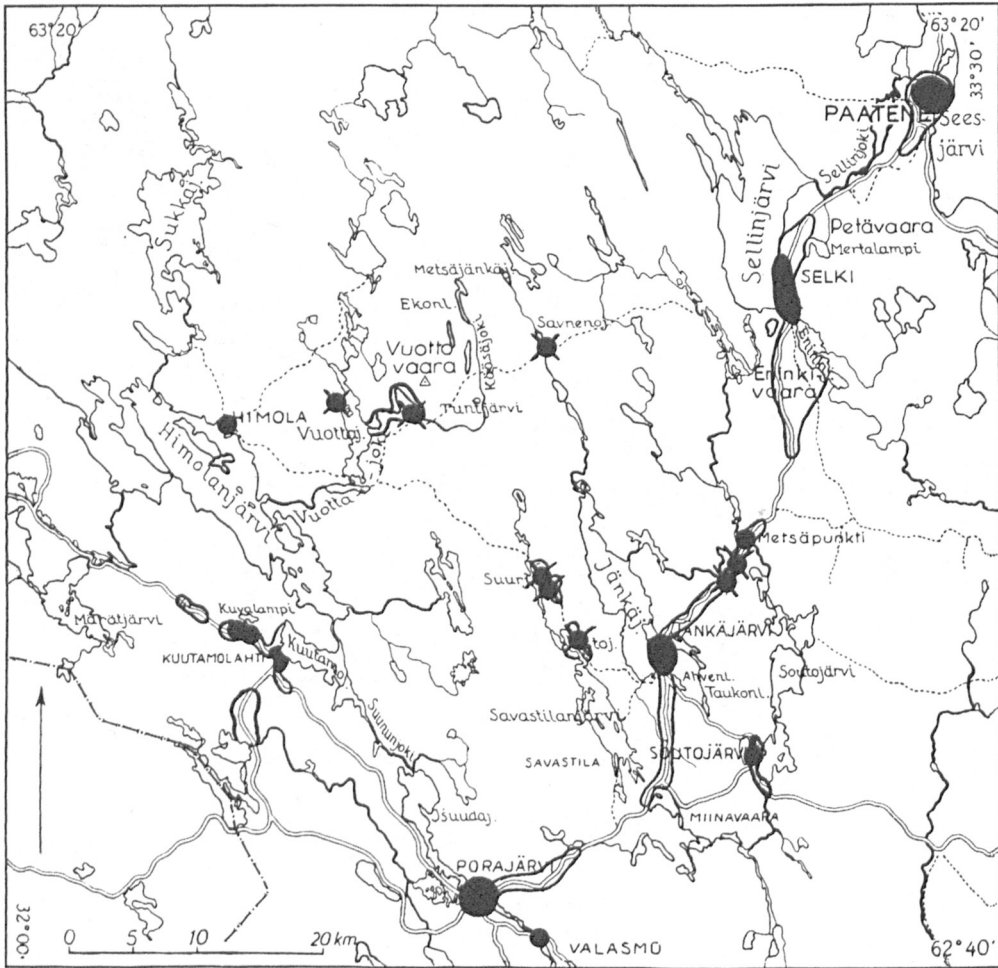


Fig. 6. Villages (black dots) and forest huts (black dots marked with a cross), slash-and-burn forests and mowed eutrophic fens (surrounded with a solid line) in the area studied by Soveri and Kalliola.

*Pleurozium schreberi* – *Vaccinium myrtillus* site type, dominated by spruce. The *Oxalis acetosella* – *Vaccinium myrtillus* site type forests on the lower slopes have features of the *Geranium sylvaticum* – *Gymnocarpium dryopteris* – *Vaccinium myrtillus* site type. In addition, the flora in the surroundings has certain "montane" features.

Everywhere the forests are virgin, untouched by man, characterized by old upper canopy trees, dried-up standing pines and fallen trees, with the poorer forests resembling very much those of Lapland. Probably most of the area is untouched by axe. However, along the rivers large enough for floating logs are visible signs of old fellings dating from before the revolution (mostly by selection of only the biggest trees). Along the lower run of the

Kääsajoki river and on the shores of Vuottojärvi lake, loggers' camps existed after the revolution, as well. The nearest camp ("Metsäpukki" on the maps), with its vast fellings, is located on the eastern margin of the wilderness, between Jänkajärvi and Selki. In addition to this, human impact is mostly visible in a few paths, the wilderness huts beside them and fishermen's cabins on the shores of distant lakes and in small meadow patches cleared in the forests (with hardly any in the poorest forests). All in all, signs of human impact are minimal considering the vastness of the wilderness.

In the east the Himola wilderness ends in the line Miinavaara – Jänkajärvi – Selki, where the bedrock becomes richer and in consequence the

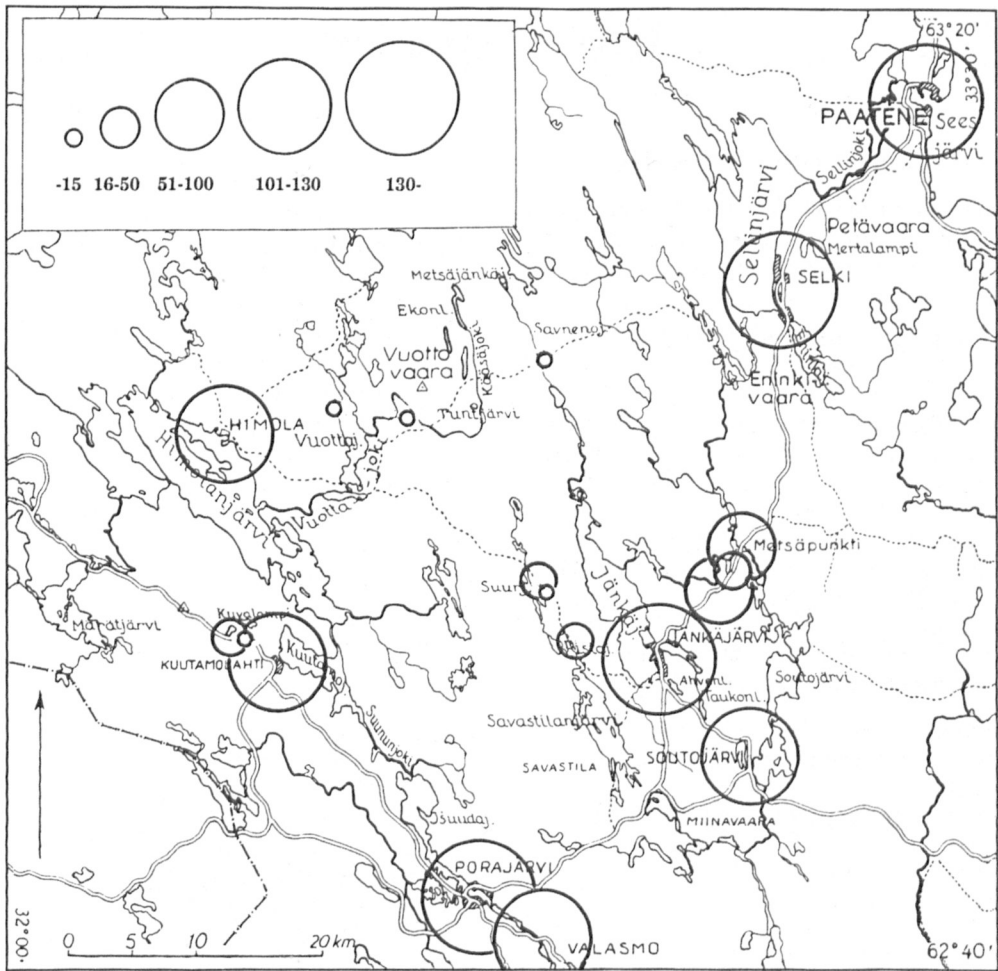


Fig. 7. Number of anthropochores in the villages and around forest huts.

soils much better. Forests here are of grass-herb site types in large areas, and the bogs and fens are eutrophic and suitable for cultivation and often have been turned into rich fen meadows. Slash-and-burn cultivation patches appear here and there on slopes, and in the surroundings of villages are merely birch forests and grazed forests or, because of the long-duration slash-and-burn cultivation and grazing, thickets dominated by *Alnus incana*.

Of all the roads travelled during the study, only the stretch between Porajärvi – Kuutamolahti – Märätjärvi belongs, in its total length, to the poor area. The area west of Porajärvi seems to be a little richer, in part luxuriant (*Oxalis acetosella* – *Vaccinium myrtillus* forests). The stretch between Porajärvi and Miinavaara is intermediate (forests

of *Vaccinium myrtillus* site type). The surroundings of Miinavaara, Soutojärvi, Jänkajärvi and Selki belong to the luxuriant area. Here and there between Jänkajärvi and Selki and, on a smaller scale between Jänkajärvi and Soutojärvi are grand virgin spruce forests unlike anywhere in the poor western parts of the area.

30.XII.1942 Jorma Soveri

# List of species

## Explanations of the list

The names used by Soveri appear within parentheses. Species with further comments at the end of the list are marked with an asterisk.

## Hemerophily of the species in the study area

### ANTROPOCHORES

- ANTRO 1 only in sites with a strong human impact
- ANTRO 2 in sites with a strong or moderate human impact and, on a smaller scale in natural habitats clearly effected by man
- ANTRO 3 like ANTRO 2 but thriving well in natural habitats with some human impact
- ANTRO 4 neophyte or casual alien
- ANTRO 5 uncertain antropochores

### APOPHYTES

- APOPH 1 uncertain apophytes, close to ANTRO 5
- APOPH 2 strongly benefiting from human impact
- APOPH 3 moderately – ” –
- APOPH 4 weakly – ” –

### HEMERADIAPHORES — HMRAD

### HEMEROPHOBES

- HMPHO 1 weakly hemerophobic
- HMPHO 2 strongly – ” –

## Eutrophy – oligotrophy of the habitats in the study area

### EUTROPHIC

- EUTR 1 strongly eutrophic habitats
- EUTR 2 weakly – ” –

### MESO-EUTROPHIC — ME-EU

### MESOTROPHIC — MESO

### MESOTOPHIC-NEUTRAL — ME-NE

### NEUTRAL — NEUT

### NEUTRAL-OLIGOTOPHIC — NT-OL

### OLIGOTROPHIC — OLIG

### EDAFIDS — EDAF

## Species

### Lycopodiaceae

- Huperzia selago* (*Lycopodium s.*) HMRAD, MESO
- Lycopodiella inundata* (*Lycopodium i.*) HMRAD, OLIG
- Lycopodium annotinum* HMPHO 1, MESO
- L. clavatum* HMPHO 1, MESO
- Diphasiastrum complanatum* (*Lycopodium c.*) HMRAD, EDAF

### Selaginellaceae

- Selaginella selaginoides* APOPH 1, EUTR 1

### Isoëtaceae

- Isoëtes lacustris* HMRAD, OLIG
- I. echinospora* HMRAD, MESO

### Equisetaceae

- Equisetum hyemale* APOPH 2, NEUT
- E. variegatum* APOPH 1, EUTR 1
- E. scirpoides* APOPH 3, EUTR 2
- E. fluviatile* (*E. limosum*) HMRAD, NEUT
- E. palustre* APOPH 2, MESO
- E. sylvaticum* HMRAD, NEUT
- E. pratense* APOPH 2, EUTR 2
- E. arvense* ANTRO 1

### Ophioglossaceae

- Botrychium lunaria* ANTRO 1, NEUT
- B. lanceolatum* ANTRO 1
- B. multifidum* ANTRO 1

### Dennstaedtiaceae

- Pteridium aquilinum* (*Eupteris aquilina*) ANTRO 4, MESO

### Thelypteridaceae

- Thelypteris palustris* (*Dryopteris thelypteris*) HMRAD, EUTR
- T. phegopteris* (*Dryopteris phegopteris*) HMRAD, MESO

### Dryopteridaceae

- Dryopteris carthusiana* (*D. spinulosa*) APOPH 1, MESO
- D. expansa* (*D. austriaca*)\* HMPHO, EUTR 1–2
- Diplazium sibiricum* (*Athyrium crenatum*) HMRAD, EUTR 1
- Athyrium filix-femina* APOPH 4, MESO

*Cystopteris fragilis* APOPH 4, EUTR 1  
*Gymnocarpium dryopteris* (*Dryopteris  
 linnaeana*) APOPH 3, MESO  
*Matteuccia struthiopteris* HMRAD, EUTR 2

### Polypodiaceae

*Polypodium vulgare* HMRAD, NEUT

### Pinaceae

*Picea abies* (no map)  
*Pinus sylvestris* (no map)

### Cupressaceae

*Juniperus communis* (no map)

### Nymphaeaceae

*Nymphaea alba* HMRAD, EUTR 3  
*N. candida* HMRAD, MESO  
*N. tetragona* HMRAD, NEUT  
*Nuphar lutea* HMRAD, NEUT  
*Nuphar pumila* HMRAD, EUTR ?

### Ranunculaceae

*Trollius europaeus* ANTRO 2, MESO  
*Actaea spicata* HMRAD, EUTR 2  
*A. erythrocarpa* HMPHO, EUTR 1  
*Caltha palustris*\* APOPH 3, NEUT  
*Ranunculus polyanthemus* APOPH 1, MESO  
*R. repens* APOPH 2, MESO  
*R. acris* subsp. *acris* (*R. acris*)\* ANTRO 2, NEUT  
*R. acris* subsp. *borealis* (*R. borealis*)\* HMPHO,  
 EUTR 2  
*R. auricomus* ANTRO 2, MESO  
*R. flammula* ANTRO 4  
*R. reptans* HMRAD, NEUT  
*R. lingua* HMRAD, EUTR ?  
*R. peltatus* HMRAD, MESO  
*Myosurus minimus* ANTRO 4, NEUT  
*Thalictrum flavum* APOPH 4, EUTR 2

### Fumariaceae

*Fumaria officinalis* ANTRO 1, NEUT

### Urticaceae

*Urtica dioica* ANTRO 1, MESO  
*U. urens* ANTRO 4, NEUT

### Betulaceae

*Betula pendula* (*B. verrucosa*) APOPH 3  
*B. pubescens* APOPH 2  
*B. nana* HMRAD, NEUT  
*B. nana* × *pubescens* HMRAD  
*Alnus glutinosa* HMRAD, NEUT  
*A. incana* APOPH 2, MESO

### Portulacaceae

*Montia fontana* (*M. rivularis*) ANTRO 1, MESO

### Caryophyllaceae

*Arenaria serpyllifolia* ANTRO 4, NEUT ?  
*Stellaria media* ANTRO 2, MESO  
*S. palustris* ANTRO 2, MESO  
*S. fennica* (*S. palustris* "v. *fennica*") ANTRO 5,  
 MESO  
*S. graminea* ANTRO 3, MESO  
*S. longifolia* HMRAD, EUTR 2  
*Cerastium fontanum* subsp. *scandicum* (*C. fon-  
 tanum* Baumg.)\* ANTRO 4  
*C. fontanum* subsp. *vulgare* (*C. caespitosum*)\*  
 ANTRO 2, NEUT  
*Sagina procumbens* ANTRO 1, NEUT  
*Scleranthus annuus* ANTRO? 1, MESO ?  
*Spergula arvensis* ANTRO 1, NEUT  
*Spergularia rubra* ANTRO 4  
*Lychnis flos-cuculi* ANTRO 2, MESO  
*Lychnis viscaria* (*Viscaria vulgaris*) ANTRO 4  
*Silene vulgaris* (*S. inflata*) ANTRO 1, NEUT  
*S. latifolia* subsp. *alba* (*Melandrium album*)  
 ANTRO 1, NEUT  
*Dianthus deltoides* ANTRO 2, MESO

### Chenopodiaceae

*Chenopodium album* coll. (*C. album*)\* ANTRO 1,  
 NEUT

### Polygonaceae

*Polygonum aviculare* ANTRO 1, MESO  
*P. minus* ANTRO 1, MESO  
*P. hydropiper* ANTRO 1, MESO  
*P. lapathifolium* (*P. tomentosum*) ANTRO 1, NEUT  
*P. amphibium* HMRAD, MESO  
*P. viviparum* ANTRO 3, MESO  
*Fallopia convolvulus* (*Polygonum c.*) ANTRO 1,  
 NEUT  
*Rumex aquaticus* ANTRO 1, EUTR ?  
*R. longifolius* (*R. domesticus*) ANTRO 1, MESO  
*R. pseudonatronatus* (*R. fennicus*) ANTRO 1,  
 MESO  
*R. acetosa* APOPH 1, MESO  
*R. fontano-paludosus*\* APOPH 4, EUTR 1  
*R. thyrsoflorus* (*R. auriculatus*) ANTRO 1, EUTR 2  
*R. acetosella* ANTRO 2, NEUT

### Hypericaceae

*Hypericum maculatum* ANTRO 2, NEUT

### Violaceae

*Viola mirabilis* HMPHO, EUTR 1  
*V. rupestris* ANTRO 1  
*V. riviniana* HMRAD, EUTR 2

- V. canina* subsp. *montana* (*V. montana*)  
APOPH 2, NEUT  
*V. palustris* APOPH 3, NEUT  
*V. selkirkii* HMPHO, EUTR 1  
*V. epipsila* APOPH 4, MESO  
*V. tricolor* ANTRO 1, EDAF  
*V. arvensis* ANTRO 1, NEUT

### Brassicaceae

- Sisymbrium loeselii* ANTRO 4  
*Descurainia sophia* ANTRO? 1, NEUT  
*Arabidopsis thaliana* ANTRO 1, NEUT  
*Bunias orientalis* ANTRO 1, NEUT  
*Erysimum cheiranthoides* ANTRO 1, NEUT  
*Chorispora tenella* ANTRO 4  
*Barbarea vulgaris* ANTRO 1, NEUT  
*B. stricta* ANTRO 4, NEUT  
*Rorippa palustris* ANTRO 1, MESO  
*Cardamine pratensis* subsp. *dentata* (*C. pratensis dentata*)\* APOPH 3, EUTR  
*C. pratensis* subsp. *polemonioides* (*C. pratensis*)\* HMRAD, MESO  
*Arabis glabra* (*Turritis g.*) ANTRO 1, EDAF  
*Berteroa incana* ANTRO 4  
*Camelina sativa* ANTRO 4  
*Capsella bursa-pastoris* ANTRO 1, NEUT  
*Thlaspi arvense* ANTRO 1, NEUT  
*Brassica rapa* subsp. *campestris* (*B. campestris*) ANTRO 1, NEUT  
*Raphanus raphanistrum* ANTRO 1, NEUT  
*Sinapis arvensis* ANTRO 1, EUTR 2

### Salicaceae

- Salix pentandra* HMRAD, EUTR 2  
*S. phylicifolia* APOPH 2, NEUT  
*S. myrsinifolia* (*S. nigricans*) HMRAD, MESO  
*S. cinerea* HMRAD, NEUT  
*S. aurita* HMRAD, NEUT  
*S. caprea* APOPH 2, MESO ?  
*S. myrtilloides* HMRAD, EUTR 1  
*S. starkeana* (*S. livida*) ANTRO 2, EUTR 2  
*S. repens* ANTRO 4, MESO ?  
*S. rosmarinifolia* APOPH 2, EUTR 1  
*S. lapponum* HMRAD, NEUT  
*Populus tremula* APOPH 2, MESO

### Ericaceae

- Calluna vulgaris* (no map)  
*Ledum palustre* HMRAD, OLIG  
*Arctostaphylos uva-ursi* APOPH 2, EDAF  
*Andromeda polifolia* HMRAD, NEUT  
*Chamaedaphne calyculata* HMRAD, NEUT  
*Vaccinium oxycoccos* (*Oxycoccus quadri-petalus*) HMRAD, NEUT  
*V. microcarpum* (*Oxycoccus microcarpus*) HMRAD, NEUT

- V. vitis-idaea* (no map) HMRAD, NEUT  
*V. uliginosum* HMRAD, NEUT  
*V. myrtilus* (no map) HMRAD, MESO

### Pyrolaceae

- Pyrola minor* HMRAD, NEUT  
*P. media* HMPHO ?, MESO  
*P. chlorantha* HMRAD?, EDAF  
*P. rotundifolia* HMRAD, EUTR 2  
*Orthilia secunda* (*Pyrola s.*) HMRAD, MESO  
*Moneses uniflora* (*Pyrola u.*) APOPH 4, MESO

### Empetraceae

- Empetrum nigrum*\* HMRAD, OLIG

### Primulaceae

- Lysimachia vulgaris* APOPH 2, MESO  
*L. thyrsoflora* HMRAD, NEUT  
*Trientalis europaea*

### Malvaceae

- Malva pusilla* ANTRO 1, NEUT

### Thymelaeaceae

- Daphne mezereum* HMRAD, EUTR 1

### Saxifragaceae

- Saxifraga hirculus* HMPHO ?, EUTR 1

### Grossulariaceae

- Ribes spicatum* (*R. rubrum*)\* HMPHO ?, EUTR 2  
*R. nigrum* HMPHO, EUTR 2

### Parnassiaceae

- Parnassia palustris* APOPH 1, EUTR 2

### Droseraceae

- Drosera rotundifolia* HMRAD, NEUT  
*D. anglica* HMRAD, NEUT

### Rosaceae

- Filipendula ulmaria* APOPH 3, ME-EU  
*Rubus chamaemorus* HMRAD, NEUT  
*R. arcticus* APOPH 3, NEUT  
*R. saxatilis* APOPH 2, NEUT  
*R. idaeus* APOPH 2, ME-EU  
*Rosa acicularis* APOPH 4, NEUT  
*R. majalis* (*R. cinnamomea*) APOPH 2, MESO  
*Geum rivale* APOPH 2, EUTR 2  
*Potentilla palustris* (*Comarum palustre*) HMRAD, NEUT  
*P. anserina* ANTRO 1, NEUT  
*P. argentea* ANTRO 1, EDAF



- P. norvegica* ANTRO? 2, NEUT  
*P. intermedia* ANTRO 4  
*P. thuringiaca* ANTRO? 4, EDAF  
*P. erecta* ANTRO 2, MESO  
*Fragaria vesca* APOPH 2, ME-EU  
*Alchemilla acutiloba* (*A. acutangula*) ANTRO 4  
*Alchemilla* sp. (*A. monticola* + *A. subcrenata*)\*  
 ANTRO 2, MESO  
*Sorbus aucuparia* HMRAD, MESO  
*Cotoneaster melanocarpa* HMRAD, EUTR  
*Prunus padus* HMRAD, ME-EU

### Fabaceae

- Astragalus alpinus* ANTRO 4, EDAF  
*Vicia cracca* ANTRO 3, NEUT  
*V. hirsuta* ANTRO 1, NEUT  
*V. sepium* ANTRO 4  
*Vicia sativa* subsp. *nigra* (*V. angustifolia*)  
 ANTRO 1  
*Lathyrus vernus* ANTRO 4  
*L. pratensis* ANTRO 1, NEUT  
*L. palustris* HMRAD, EUTR 1  
*Pisum sativum* ANTRO 4  
*Melilotus officinalis* ANTRO 4, NEUT  
*Medicago lupulina* ANTRO 4, NEUT  
*Trifolium repens* ANTRO 1, NEUT  
*T. hybridum* ANTRO 4  
*T. spadiceum* ANTRO 1, MESO  
*T. pratense* ANTRO 2, NEUT

### Lythraceae

- Lythrum salicaria* HMRAD, NEUT

### Onagraceae

- Epilobium angustifolium* (*Chamaenerium a.*)  
 APOPH 2, MESO  
*E. montanum* ANTRO 2, EUTR  
*E. collinum* ANTRO 2, EUTR  
*E. palustre* ANTRO? 5, NEUT

### Haloragaceae

- Myriophyllum alterniflorum* HMRAD, NEUT

### Linaceae

- Linum usitatissimum* ANTRO 4

### Oxalidaceae

- Oxalis acetosella* APOPH 3, EUTR 2

### Geraniaceae

- Geranium pratense* ANTRO 1  
*G. sylvaticum* ANTRO 2, MESO  
*Erodium cicutarium* ANTRO 1, NEUT

### Polygalaceae

- Polygala amarella* ANTRO 3, EUTR 1

### Cornaceae

- Cornus suecica* HMRAD, NEUT

### Apiaceae

- Chaerophyllum prescottii* ANTRO 1, NEUT  
*Anthriscus sylvestris* (*Chaerophyllum sylvestre*)  
 APOPH 1, EUTR 2  
*Pimpinella saxifraga* ANTRO 2, NEUT  
*Conium maculatum* ANTRO 4  
*Cicuta virosa* ANTRO 2, NEUT  
*Carum carvi* ANTRO 2, NEUT  
*Angelica sylvestris* ANTRO 3, MESO  
*Peucedanum palustre* APOPH 4, NEUT  
*Pastinaca sativa* ANTRO 4  
*Heracleum sphondylium* ANTRO 1, NEUT

### Rhamnaceae

- Rhamnus frangula* HMRAD, MESO

### Rubiaceae

- Galium boreale* ANTRO? 2, NEUT  
*G. triflorum* HMPHO ?, EUTR  
*G. uliginosum* APOPH 2, NEUT  
*G. palustre* APOPH 2, NEUT  
*G. trifidum* ANTRO 5  
*G. verum* ANTRO 1, EDAF  
*G. album* (*G. mollugo*)\* ANTRO 2, NEUT  
*G. spurium* (*G. vaillantii*) ANTRO 1, NEUT

### Gentianaceae

- Gentianella amarella* subsp. *amarella* (*G. axillaris*)  
 ANTRO 1, EUTR 1  
*G. amarella* subsp. *lingulata* ANTRO 1, EUTR 1

### Menyanthaceae

- Menyanthes trifoliata* APOPH 3, MESO

### Caprifoliaceae

- Viburnum opulus* HMRAD, EUTR 1  
*Linnaea borealis* (no map)  
*Lonicera caerulea* HMRAD, EUTR 1

### Succisaceae

- Knautia arvensis* ANTRO 1, EDAF

### Polemoniaceae

- Polemonium caeruleum* ANTRO 4

### Boraginaceae

- Lithospermum arvense* ANTRO 1

*Nonea lutea* ANTRO 4  
*Anchusa arvensis* (*Lycopsis a.*) ANTRO 4  
*Myosotis arvensis* ANTRO 1, NEUT  
*M. laxa* subsp. *cespitosa* (*M. caespitosa*)  
 ANTRO 2, MESO  
*M. scorpioides* (*M. palustris*) ANTRO 2, EUTR 2  
*Lappula deflexa* ANTRO 4

### Lamiaceae

*Scutellaria galericulata* APOPH 4, NEUT  
*Galeopsis speciosa* ANTRO 1, NEUT  
*G. tetrahit* ANTRO 4, NEUT  
*G. bifida* ANTRO 2, NEUT  
*Lamium purpureum* ANTRO 4  
*Stachys sylvatica* ANTRO? 1, EUTR  
*S. palustris* ANTRO 5, ME-NE  
*Glechoma hederacea* ANTRO 1  
*Prunella vulgaris* ANTRO 2, NEUT  
*Mentha arvensis* ANTRO 2, NEUT

### Callitrichaceae

*Callitriche* sp. APOPH 3, MESO

### Solanaceae

*Hyoscyamus niger* ANTRO 4

### Scrophulariaceae

*Linaria vulgaris* ANTRO 4, NEUT  
*Veronica serpyllifolia* ANTRO 2, NEUT  
*V. officinalis* ANTRO 3, NEUT  
*V. chamaedrys* ANTRO 3, MESO  
*V. scutellata* ANTRO 2, NEUT  
*V. beccabunga* ANTRO 5, EUTR  
*V. arvensis* ANTRO 4  
*V. verna* ANTRO 2, NEUT  
*V. longifolia* APOPH 1  
*Melampyrum sylvaticum* APOPH 4, MESO  
*M. pratense* HMRAD, NEUT  
*Euphrasia stricta* var. *stricta* (*E. brevipila*)\*  
 ANTRO 2, NEUT  
*Pedicularis sceptrum-carolinum* HMRAD, NEUT  
*P. palustris* subsp. *palustris* (*P. palustris*)  
 ANTRO 3, NEUT  
*P. palustris* subsp. *opsiantha* (*P. palustris* late  
 race)\* ?, EUTR ?  
*Rhinanthus minor* ANTRO 1, NEUT  
*R. serotinus* (*R. major*) ANTRO 1, NEUT

### Plantaginaceae

*Plantago major* ANTRO 1, NEUT  
*P. media* ANTRO 1, NEUT  
*P. lanceolata* ANTRO 1, NEUT

### Lentibulariaceae

*Pinguicula vulgaris* HMRAD, NT-OL

*Utricularia minor* APOPH 4, NEUT  
*U. intermedia* APOPH 4, NEUT  
*U. vulgaris* APOPH 4, NEUT

### Hippuridaceae

*Hippuris vulgaris* HMRAD, NEUT

### Campanulaceae

*Campanula patula* ANTRO 1, NEUT  
*C. glomerata* ANTRO 2, NEUT  
*C. rotundifolia* ANTRO 2, NEUT ?  
*Lobelia dortmanna* HMRAD, OLIG ?

### Asteraceae

*Solidago virgaurea* (no map)  
*Erigeron acer* ANTRO 2, EDAF  
*Gnaphalium sylvaticum* ANTRO 1, NEUT  
*G. uliginosum* ANTRO 1, NEUT  
*Antennaria dioica* APOPH 4, EDAF  
*Achillea millefolium* ANTRO 2, NEUT  
*A. nobilis* ANTRO 4  
*Tripleurospermum inodorum* (*Matricaria in-*  
*odora*) ANTRO 1, NEUT  
*Tanacetum vulgare* (*Chrysanthemum vulgare*)  
 ANTRO 1, EDAF  
*Matricaria matricarioides* (*M. discoidea*)  
 ANTRO 1, NEUT  
*Leucanthemum vulgare* (*C. leucanthemum*)  
 ANTRO 2, NEUT  
*Artemisia vulgaris* ANTRO 1  
*A. absinthium* ANTRO 1  
*Senecio vulgaris* ANTRO 1, NEUT  
*Tussilago farfara* ANTRO 1, MESO  
*Ligularia sibirica* HMRAD ?, EUTR 1  
*Arctium minus* ANTRO 4  
*Saussurea alpina* APOPH 4, EUTR 1  
*Carduus crispus* ANTRO 1, NEUT  
*Cirsium vulgare* (*C. lanceolatum*) ANTRO 4  
*C. helenioides* (*C. heterophyllum*) APOPH 4,  
 EUTR 2  
*C. palustre* APOPH 1, EUTR 1  
*C. arvense* ANTRO 1, NEUT  
*Centaurea phrygia* ANTRO 2, MESO  
*C. cyanus* ANTRO 1, NEUT

### Cichoriaceae

*Leontodon autumnalis* ANTRO 2, NEUT  
*L. hispidus* ANTRO 2, MESO  
*Sonchus arvensis* ANTRO 1, NEUT  
*Taraxacum* spp. ANTRO 2, NEUT  
*Lapsana communis* ANTRO? 4, NEUT  
*Crepis paludosa* HMRAD, EUTR 2  
*C. biennis* ANTRO 1  
*C. tectorum* ANTRO 1, NEUT  
*Hieracium umbellatum* (uncomplete map)  
 ANTRO 2, EDAF

*Pilosella officinarum* coll. (*Hieracium pilosella*)  
ANTRO 2, EDAF

### Trilliaceae

*Paris quadrifolia*

### Convallariaceae

*Convallaria majalis* APOPH 4, MESO

*Maianthemum bifolium* APOPH 4, MESO

### Melanthiaceae

*Tofieldia pusilla* HMPHO, EUTR 1

### Cypripediaceae

*Cypripedium calceolus* HMRAD, EUTR 1

### Orchidaceae

*Epipactis helleborine* (*Helleborine latifolia*)  
HMRAD, EUTR

*Epipogium aphyllum* ?, EUTR

*Listera ovata* HMRAD, EUTR 1

*L. cordata* HMPHO, MESO

*Goodyera repens* HMPHO, MESO

*Platanthera bifolia* APOPH 4, MESO

*Gymnadenia conopsea* APOPH 3, EUTR 2

• *Dactylorhiza traunsteineri* (*Orchis t.*) ?, EUTR

*D. incarnata* (*Orchis incarnatus*) HMRAD, EUTR

*D. maculata* (*Orchis maculatus*) APOPH 2, MESO

*Corallorhiza trifida* HMPHO, MESO

### Araceae

*Calla palustris* APOPH 4

### Lemnaceae

*Lemna minor* ANTRO 4

### Alismataceae

*Sagittaria sagittifolia* ANTRO 5

*S. natans* APOPH 4, MESO

*Alisma plantago-aquatica* APOPH 4, MESO

### Scheuchzeriaceae

*Scheuchzeria palustris* HMRAD, NEUT

### Juncaginaceae

*Triglochin palustris* ANTRO 2, MESO

### Potamogetonaceae

*Potamogeton natans* HMRAD, NEUT

*P. gramineus* HMRAD, MESO

*P. alpinus* HMRAD, NEUT

*P. perfoliatus* HMRAD, EUTR 2

*P. berchtoldii* (*P. pusillus*)\* HMRAD, NEUT

### Sparganiaceae

*Sparganium gramineum* (*S. natans*)\* HMRAD,  
NEUT

*S. emersum* (*S. simplex*) ANTRO? 2, MESO

*S. minimum* HMRAD, NEUT

### Juncaceae

*Juncus filiformis* ANTRO 3, NEUT

*J. compressus* ANTRO 1, EUTR 2

*J. bufonius* ANTRO 1, MESO

*J. bulbosus* (*J. supinus*) HMRAD, OLIG

*J. alpinoarticulatus* subsp. *nodulosus* (*J. nodulosus*) ANTRO 5, NEUT

*J. articulatus* (*J. lampocarpus*) ANTRO 4, MESO

*J. stygius* HMRAD, EUTR 1

*Luzula multiflora* ANTRO 2, NEUT

*L. pallescens* ANTRO 2, NEUT

*L. sudetica* ANTRO 2, NEUT

*L. pilosa* APOPH 4, MESO

### Cyperaceae

*Scirpus sylvaticus* ANTRO 2, MESO

*Schoenoplectus lacustris* (*Scirpus lacuster*)  
HMRAD, NEUT

*Trichophorum cespitosum* (*Scirpus caespitosus*)  
HMRAD, OLIG 2

*T. alpinum* (*Eriophorum a.*) APOPH, 2 EUTR 2

*Eriophorum angustifolium* (*E. polystachyum*)  
APOPH 2, NEUT

*E. latifolium* APOPH 3, EUTR 1

*E. gracile* APOPH 4, MESO

*E. vaginatum* (no map)

*Eleocharis quinqueflora* (*Scirpus pauciflorus*)  
HMRAD, MESO

*E. acicularis* (*Scirpus acicularis*) HMRAD, NEUT

*E. palustris* (*Scirpus paluster*) ANTRO 3, MESO

*Rhynchospora alba* HMRAD

*Schoenus ferrugineus* HMRAD, EUTR 1

*Carex appropinquata* (*C. paradoxa*) HMRAD,  
EUTR 1

*C. diandra* APOPH 3, EUTR 2

*C. chordorrhiza* APOPH 3, NEUT

*C. ovalis* (*C. leporina*) ANTRO 1, NEUT

*C. echinata* (*C. stellulata*) ANTRO 5, MESO

*C. dioica* APOPH 3, EUTR 2

*C. elongata* ANTRO 5, EUTR 2

*C. heleonastes* APOPH 1, EUTR 1

*C. canescens* APOPH 1, MESO

*C. loliacea* HMPHO, EUTR 2

*C. brunnescens* APOPH 2, MESO

*C. disperma* (*C. tenella*) HMPHO, EUTR 2

*C. tenuiflora* HMRAD ?, EUTR

*C. lasiocarpa* HMRAD, NEUT

*C. rostrata* APOPH 3, NEUT

*C. vesicaria* APOPH 2, MESO

*C. capillaris* APOPH 1, EUTR 1

*C. panicea* APOPH 1, MESO  
*C. vaginata* APOPH 2, MESO  
*C. livida* HMPHO, EUTR 1  
*C. flava* APOPH 2, EUTR 2  
*C. serotina* (*C. oederi*)\* APOPH? 1, NEUT  
*C. pallescens* ANTRO 2, MESO  
*C. digitata*\* APOPH 4, EUTR 2  
*C. ericetorum* ANTRO 4  
*C. globularis* (uncomplete draft map) HMRAD, NEUT  
*C. limosa* HMRAD, NEUT  
*C. magellanica* subsp. *irrigua* (*C. magellanica*) APOPH 2, MESO  
*C. elata* HMRAD, NEUT  
*C. buxbaumii* (*C. polygama*) HMRAD, MESO  
*C. aquatilis* APOPH 1, NEUT  
*C. cespitosa* APOPH 4, EUTR 2  
*C. nigra* subsp. *nigra* (*C. goodenowii*) ANTRO 3, NEUT  
*C. nigra* subsp. *juncella* (*C. juncea*) HMPHO, NEUT  
*C. acuta* (*C. gracilis*) HMRAD, NEUT  
*C. pauciflora* APOPH 4, OLIG 2  
*C. capitata* HMRAD, EUTR 1

## Poaceae

*Festuca pratensis* ANTRO 1, MESO  
*F. rubra* ANTRO 2, NEUT  
*F. ovina* ANTRO 2, NEUT  
*Poa annua* ANTRO 1, MESO  
*P. trivialis* ANTRO 2, MESO  
*P. pratensis* ANTRO 2, MESO  
*P. angustifolia* ANTRO 1, MESO  
*P. remota* HMPHO ?, EUTR  
*P. palustris* ANTRO 2, MESO  
*P. nemoralis* ANTRO 2, EUTR 2  
*P. alpina* ANTRO 1, MESO  
*Dactylis glomerata* ANTRO 1, MESO  
*Apera spica-venti* ANTRO 1, NEUT  
*Melica nutans* APOPH 4, EUTR 2  
*Glyceria fluitans* ANTRO 1, NEUT  
*Bromus arvensis* ANTRO 4  
*Leymus arenarius* (*Elymus a.*) HMRAD  
*Elymus caninus* (*Agropyrum caninum*) HMPHO, EUTR 1  
*E. repens* (*Agropyrum repens*) ANTRO 1, NEUT  
*Deschampsia cespitosa* APOPH 1, MESO  
*D. flexuosa* (no map)  
*Hierochloë hirta* (*H. odorata*)\* ANTRO 2, MESO  
*Anthoxanthum odoratum* ANTRO 2, NEUT  
*Agrostis canina* ANTRO 1, NEUT  
*Agrostis capillaris* (*A. tenuis*) ANTRO 1, NEUT  
*Agrostis stolonifera* ANTRO 1, MESO  
*Calamagrostis epigejos* APOPH 2, NEUT  
*C. canescens* (*C. lanceolata*) ANTRO 2, MESO  
*C. purpurea* subsp. *phragmitoides* (*C. purpurea*) HMRAD, NEUT

*C. stricta* (*C. neglecta*) APOPH 4, NEUT  
*C. arundinacea* APOPH 2, MESO  
*Phleum pratense* ANTRO 2, NEUT  
*Alopecurus pratensis* ANTRO 4  
*A. geniculatus* ANTRO 1, MESO  
*A. aequalis* ANTRO 1, MESO  
*Phalaris arundinacea* APOPH 4, MESO  
*Milium effusum* HMRAD, EUTR 2  
*Phragmites australis* (*P. communis*) HMRAD, NEUT  
*Molinia caerulea* APOPH 4, NEUT  
*Nardus stricta* ANTRO 2, NEUT

### Of the species

Antropochores	222	48.7 %
Indigenous species		
Apophytes	95	20.8 %
Not benefiting from human impact	139	30.5 %
	456	100 %

## Notes to the list of species

Some of the plant names used by Soveri need further explanation, as given below. Specimens (H) of the species commented upon, which were collected from the area by Soveri and Kalliola, are indicated with an exclamation mark.

*Dryopteris expansa* — Given as *D. austriaca*, which includes both *D. dilatata* and *D. expansa*; *D. dilatata* is not known from the area.

*Caltha palustris* — *C. palustris* subsp. *minor* (= subsp. / var. *radicans*) is known from Finnish North Karelia and Russian Karelia olonetsensis; Soveri and Kalliola most probably meant only subsp. *palustris*.

*Ranunculus acris* — Given as *R. borealis* (!; here as *R. acris* subsp. *borealis*) and *R. acris*. The latter is here considered as subsp. *acris* (beside these two, no other subspecies known from the area), but it may also be understood collectively.

*Cerastium fontanum* — Given as *C. caespitosum* (here considered *C. fontanum* subsp. *vulgare*) and *C. fontanum* Baumg. (here as *C. fontanum* subsp. *scandicum*); both subspecies are known from the area.

- Chenopodium album* coll. — Given as *C. album*, but may also include *C. suecicum*, which is known from the area.
- Rumex fontano-paludosus* — Usually included in *R. acetosa* subsp. *acetosa*. In Kurtto & Lahti (1987) as *R. acetosa* var. *fontanopaludosus*.
- Cardamine pratensis* — Given as *C. pratensis* (here as *C. pratensis* subsp. *polemonioides*) and *C. pratensis dentata* (here as subsp. *dentata*); beside subsp. *dentata*, only subsp. *polemonioides* is known from the area.
- Empetrum nigrum* — Both subsp. *nigrum* and subsp. *hermaphroditum* are known from the area.
- Ribes spicatum* — Given as *R. rubrum*; most probably subsp. *spicatum*, but subsp. *hispidulum* may also reach the area.
- Alchemilla* sp. — Given in Soveri's maps as *Alchemilla* sp., but in his hand-written lists as *A. monticola* + *A. subcrenata* !.
- Galium album* — Given as *G. mollugo*; *G. mollugo* s. str. is not known from the area.
- Euphrasia stricta* — Given as *E. brevipila*; in H there appear specimens only of var. *stricta* from the area.
- Pedicularis palustris* — Given as *P. palustris* (here as subsp. *palustris*) and *P. palustris* 'late race' (here as subsp. *opsiantha*).
- Potamogeton berchtoldii* — Given as *P. pusillus*, which Finnish botanists at the time understood as conspecific with *P. berchtoldii*.
- Sparganium gramineum* — Given as *S. natans*, which according to different authors could also mean *S. angustifolium*, *S. hyperboreum* or *S. minimum*.
- Carex serotina* — *C. serotina* subsp. *fennica* and subsp. *pulchella* ! are known from the area.
- Carex digitata* — *C. pallens* (= *C. digitata* var. *pallens*) is not known from the area.
- Hierocloë hirta* — Given as *H. odorata*; *H. odorata* s. str. is not known from the area, of *H. hirta* both subsp. *arctica* and subsp. *hirta* are known from Karelia onegensis.

"*Salix myrsinites* × ? between Jänkajärvi and Selki, ca. 2 km S of Polovino, rich fen, 14.VII. 1942 Soveri & Kalliola" (H), was in 1993 determined by R. Elven as *S. myrsinifolia* coll. × *myrsinites*. A specimen of *Elymus* sp. (*Agropyron*) collected from "Paatene, the calcareous cliff of islet Severinsaari" by L. Lehtonen in 1943 (not seen) was cited in Soveri's list of species. Besides *E. repens*, shown on a map, *E. alaskanus*, *E. caninus*, *E. fibrosus* and *E. trachycaulus* are known from Karelia onegensis.

The following records by Norrlin (1871) are included neither in the list of species nor on the maps.

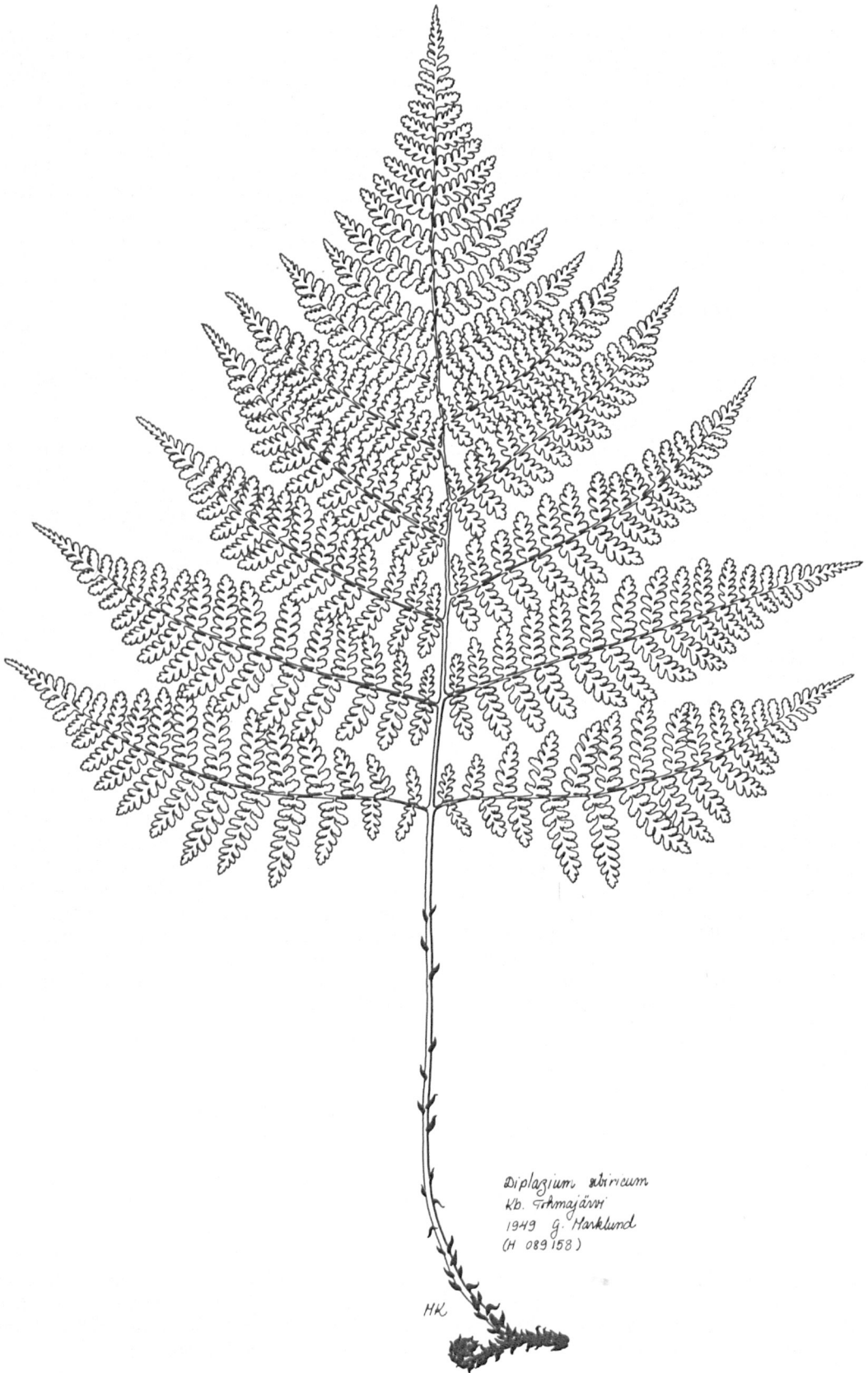
- Betula nana* forma *foliis basi subcordatis*: Pora-järvi.
- Carex panicea* var. *sublivida*: Selki.
- Hieracium floribundum*: Jänkajärvi, Selki.
- H. prenanthoides*: Selki.
- Leontodon hispidus* var. *hastilis*: Selki.
- Nymphaea alba* var. *biradiata*: Soutojärvi.
- Dactylorhiza incarnata* subsp. *cruenta* (as *Orchis incarnata* var. *cruenta*): Selki, Jänkajärvi
- Salix myrsinites*: Soutojärvi.
- Trifolium medium*: Soutojärvi – Jänkajärvi.
- Linum catharticum*: Selki.
- Cardamine amara*: Jänkajärvi.

Norrin (1871) gives the status of *Lychnis flos-cuculi* in Karelia onegensis as "fq.-fqq., e Selki et Jänkajärvi non adnotata". Soveri has reported the species in both places. In Norrlin (1871) the status of *Picris hieracioides* is "fq.", with the comment "locis nonnullis, ut ad Jänkajärvi, Soutajärvi, Kämpselkä – Dianova-gora deest" — neither has Soveri reported the species in the area. Norrlin reports *Carex capitata* from "Selki in prato devexo, sub-turfoso, humectato". This site is not shown on Soveri's map.

## Acknowledgements

I am grateful to Prof. Jaakko Jalas for his valuable criticism of this manuscript. I also wish to thank Working group for nature conservation of Finnish-Russian joint commission for environment and

North Karelia Water and Environment District for their financial support, Mr. Jarmo Koski for the retouching of the maps and Carolyn Norris, Ph.D., for revising the English language.



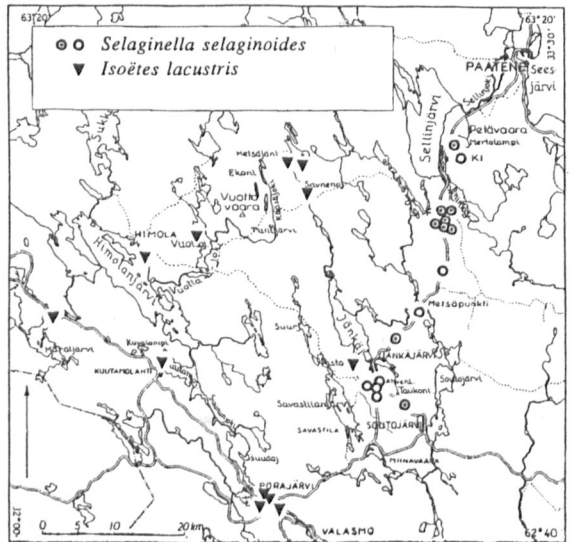
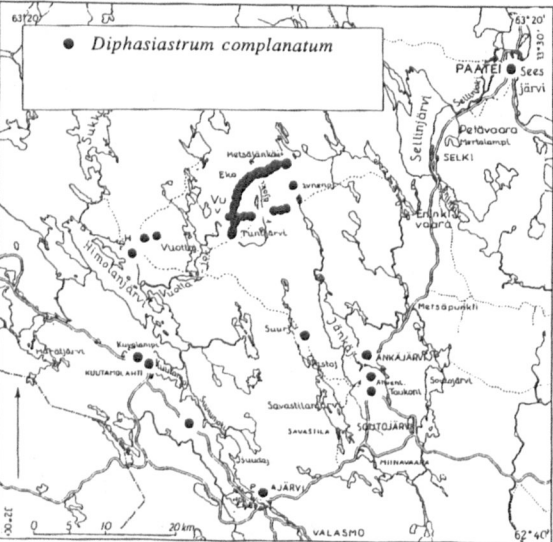
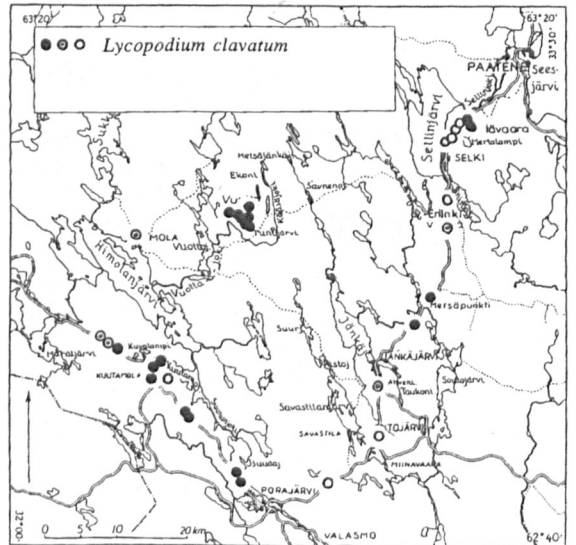
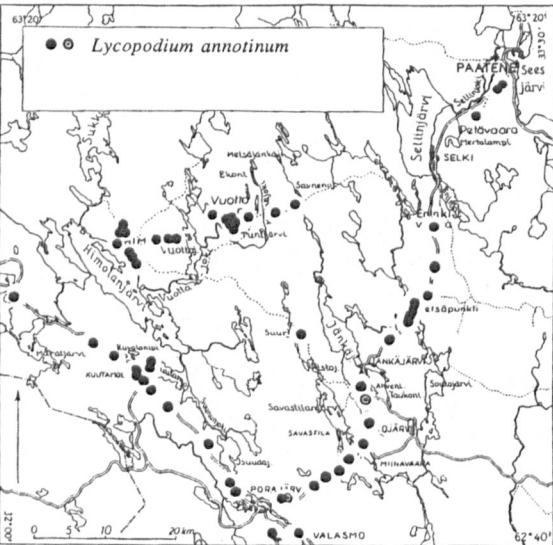
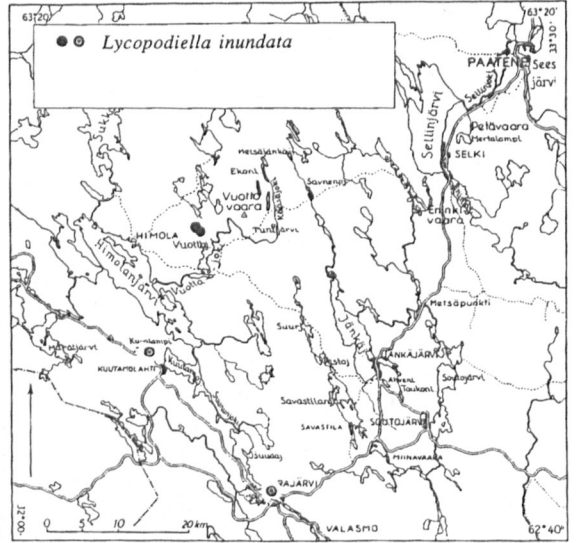
*Diplazium striatum*  
Kb. Suomajärvi  
1949 G. Marklund  
(H 089153)

HK

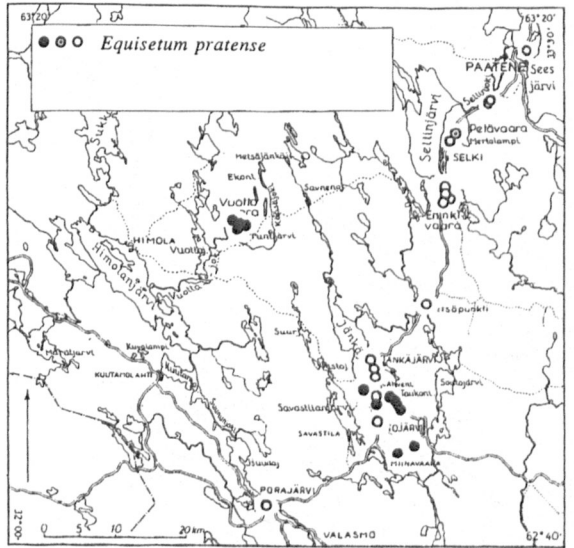
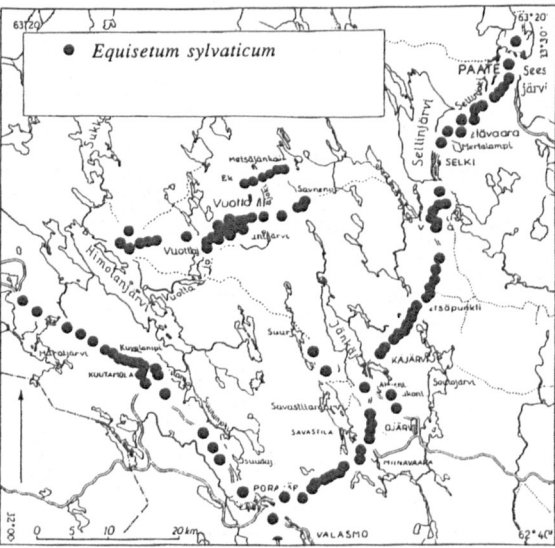
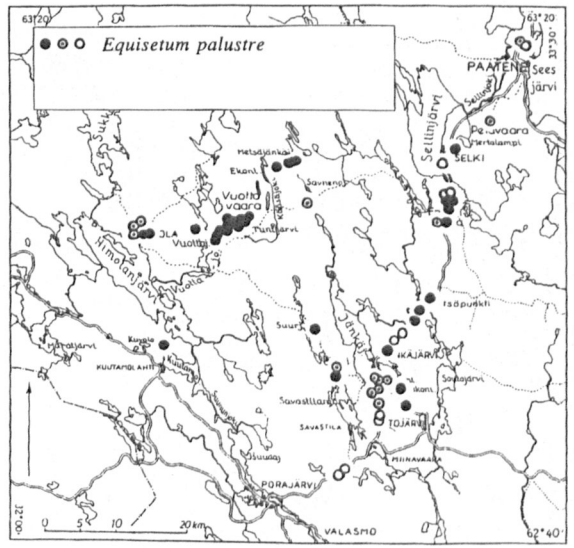
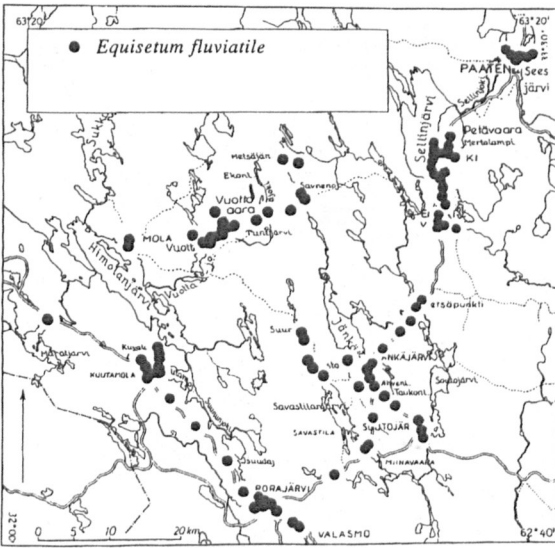
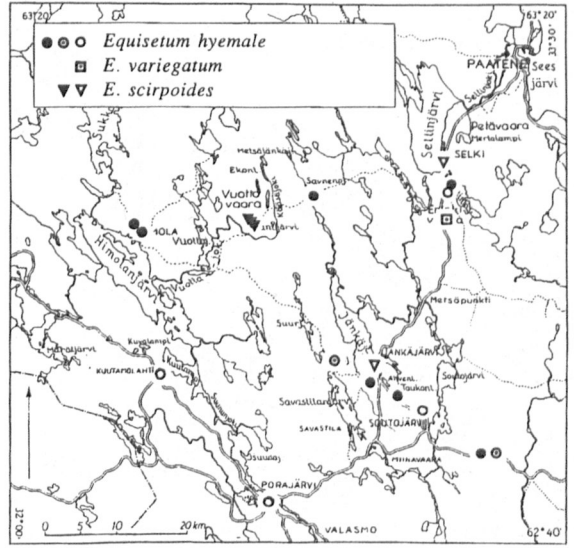
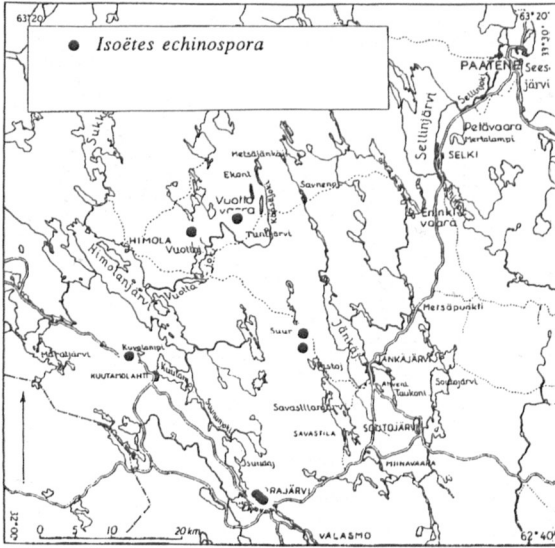
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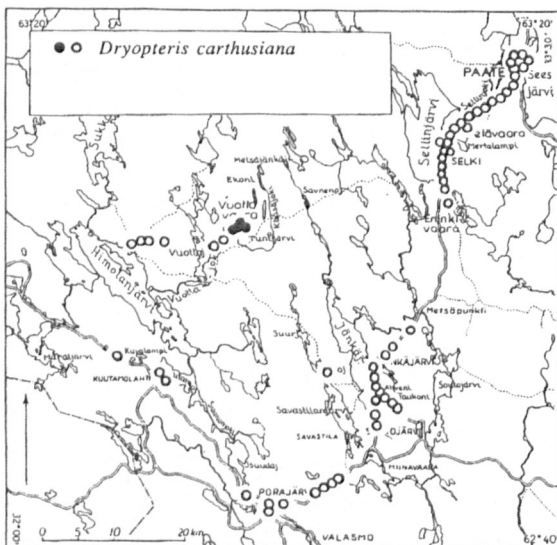
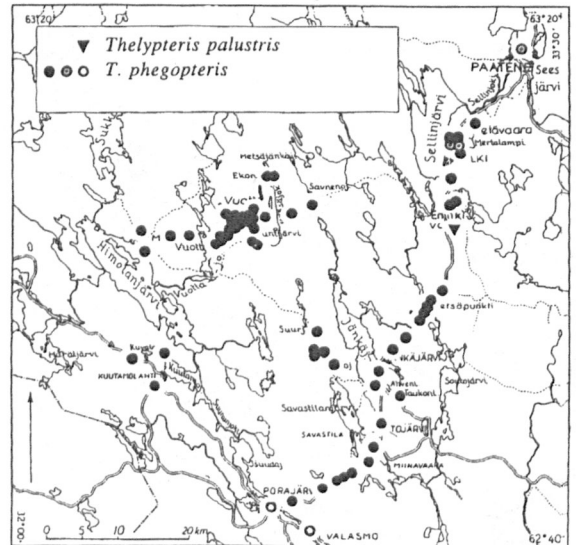
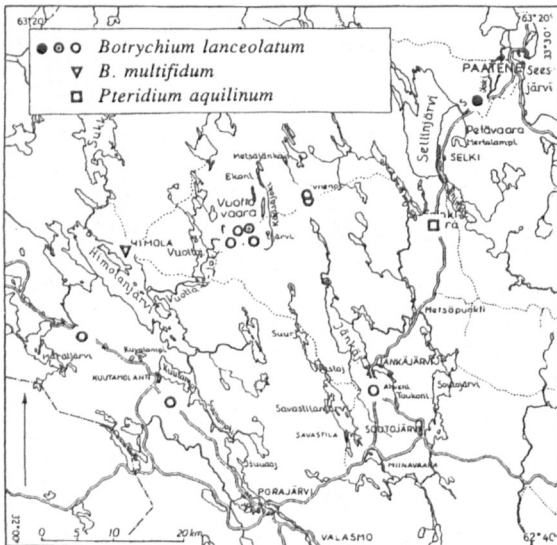
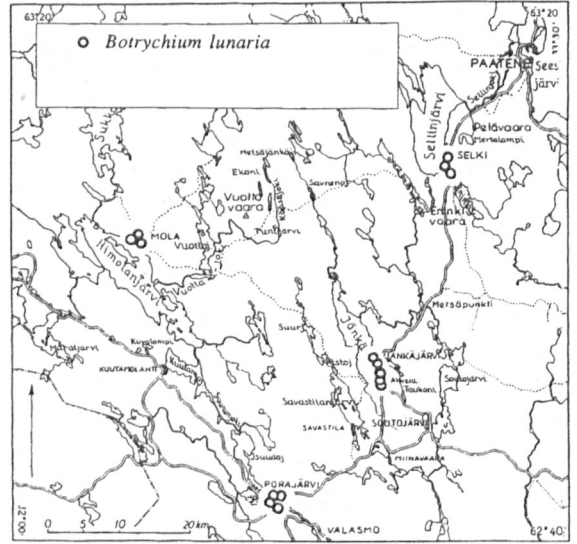
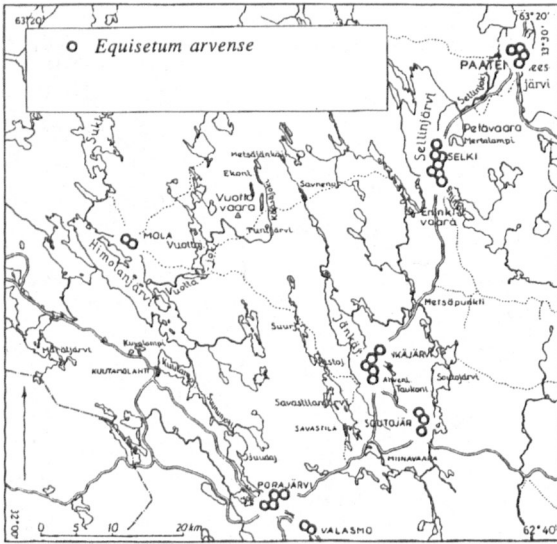
### Map symbols

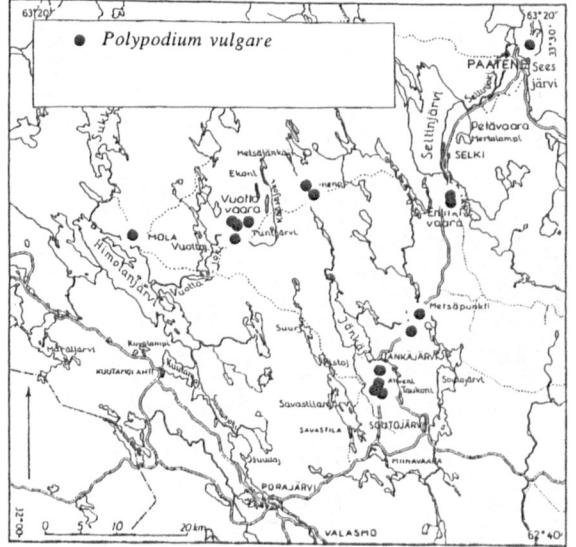
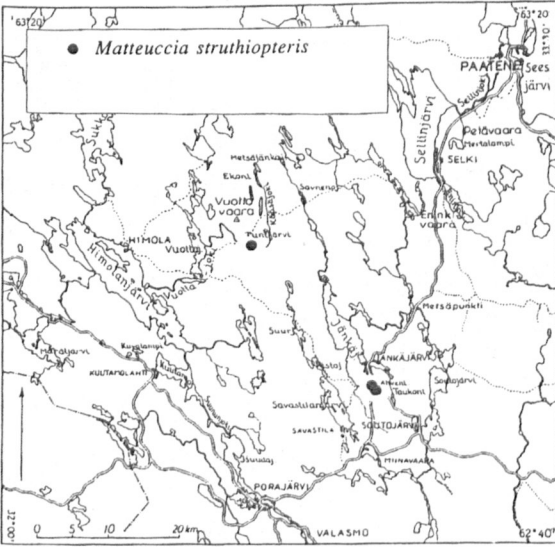
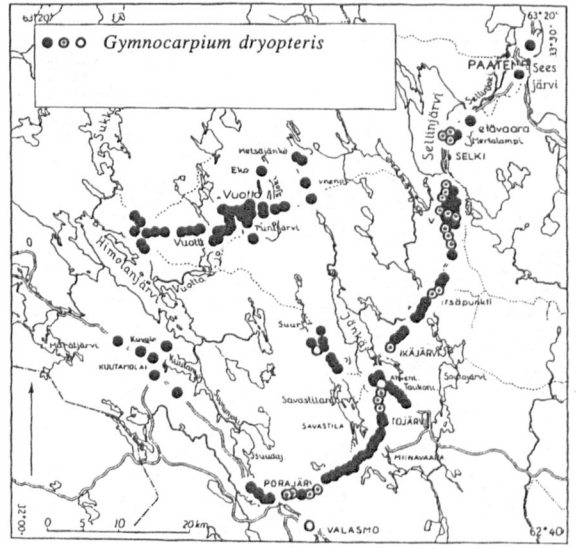
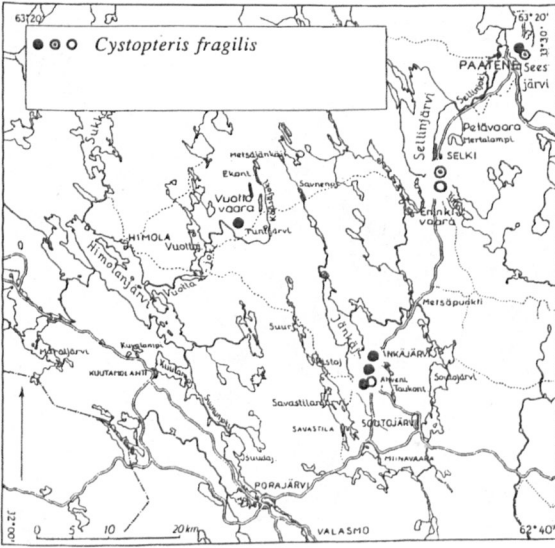
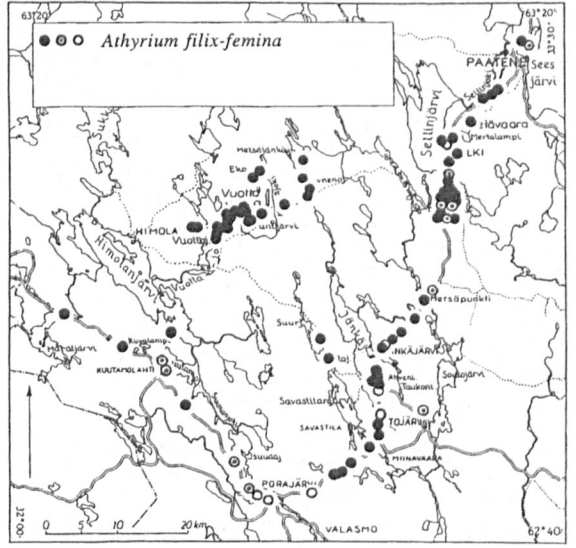
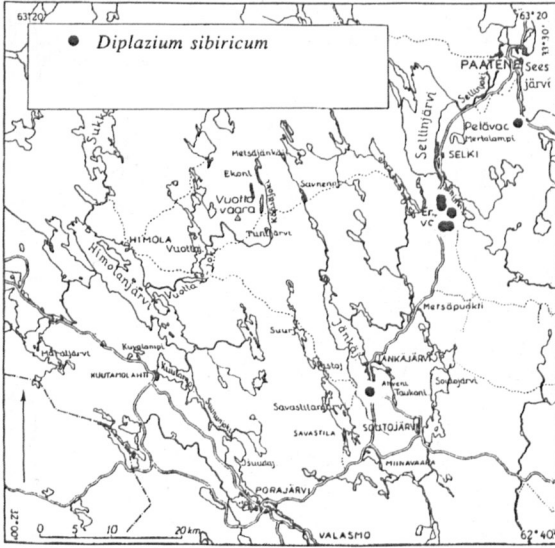
- ■ ▼ Habitats untouched by man; the species may still be seen in habitats with human impact.
- ⊙ ◻ Habitats with some human impact, with no object of comparison in natural habitats; not clearly or only scarcely concentrated near habitats with human impact.  
— Also: status uncertain.
- ◻ ▼ Only habitats with human impact, not in the near-by (up to 500 m) natural habitats; or constantly only in habitats with human impact and in bordering equal natural habitats.

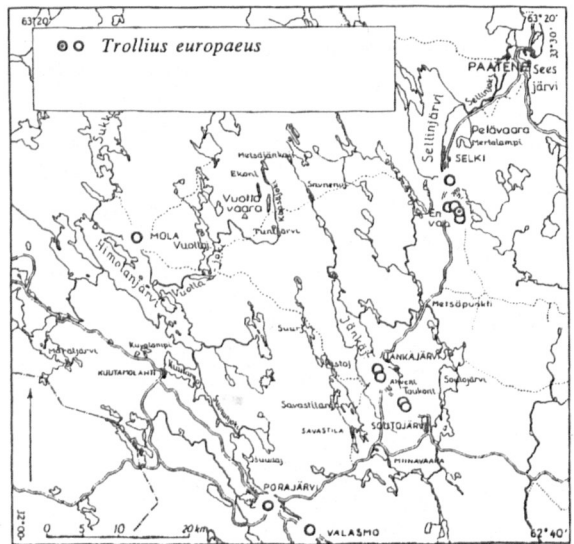
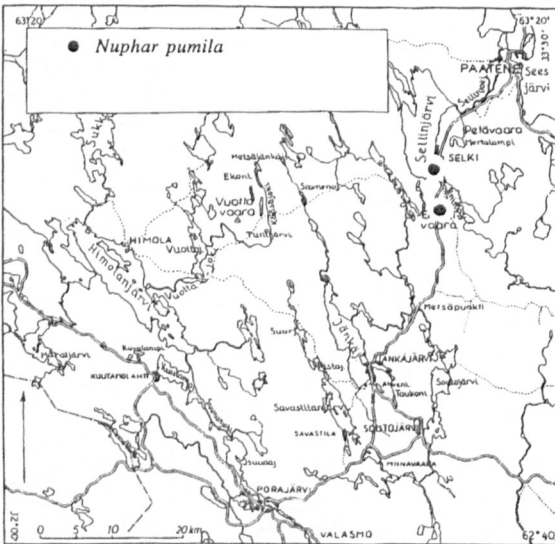
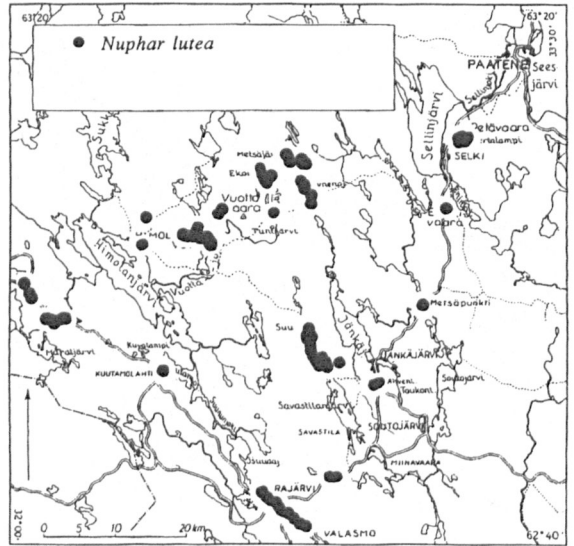
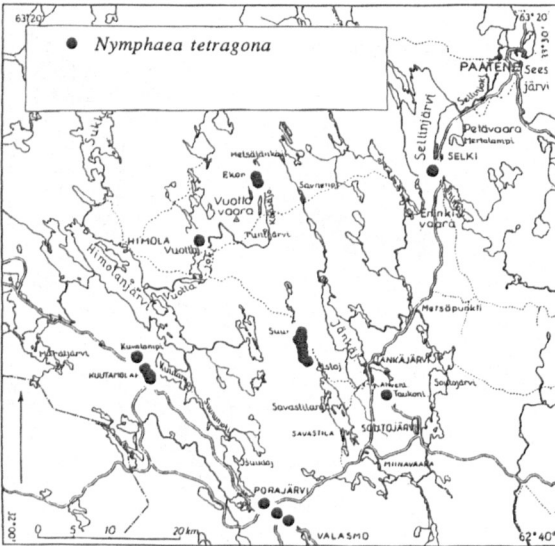
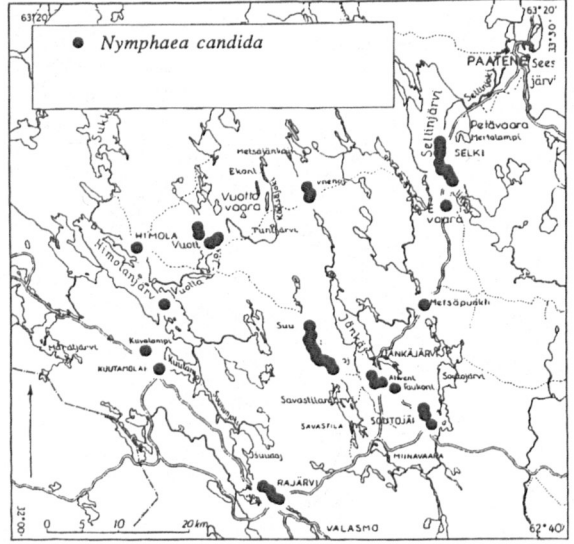
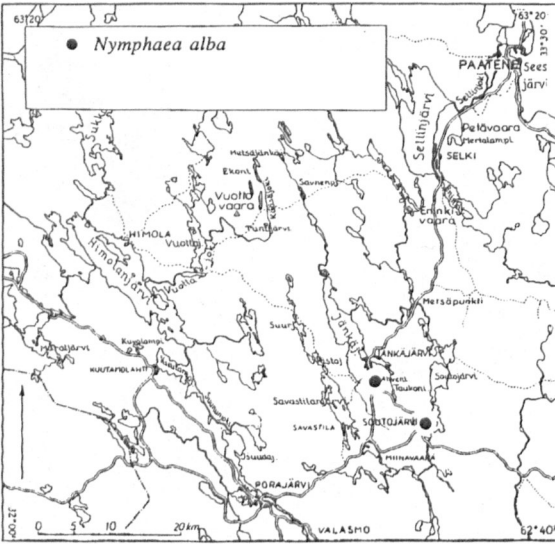


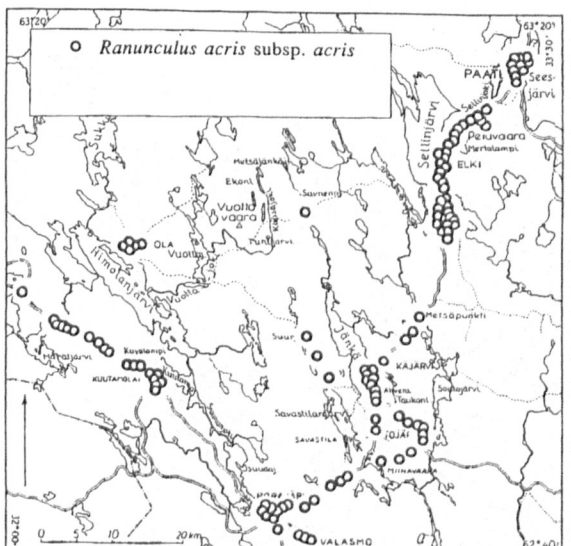
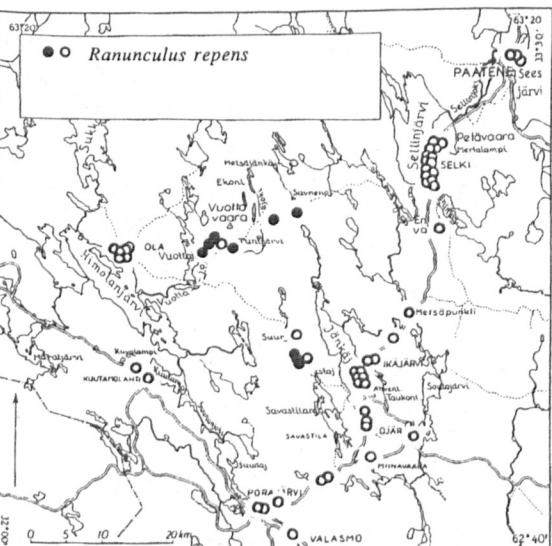
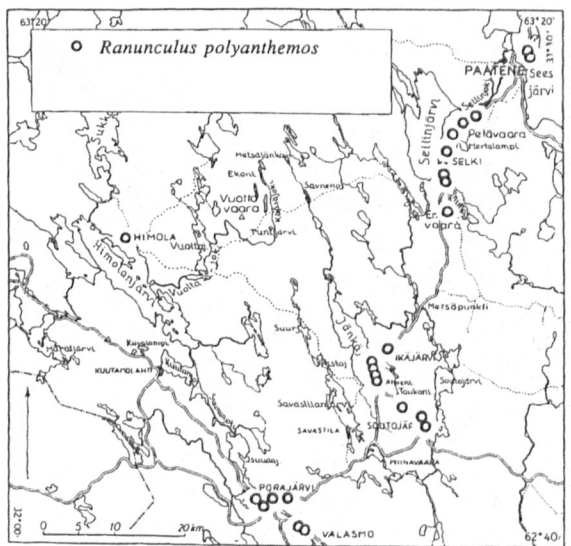
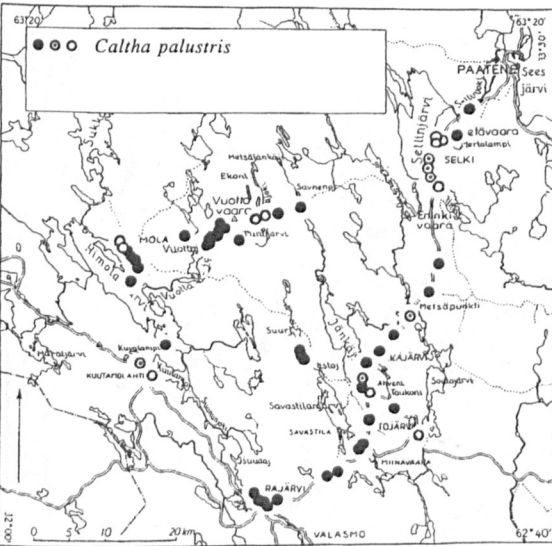
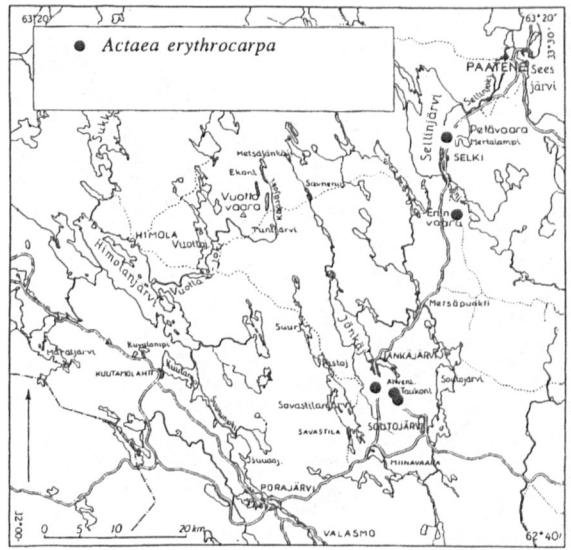
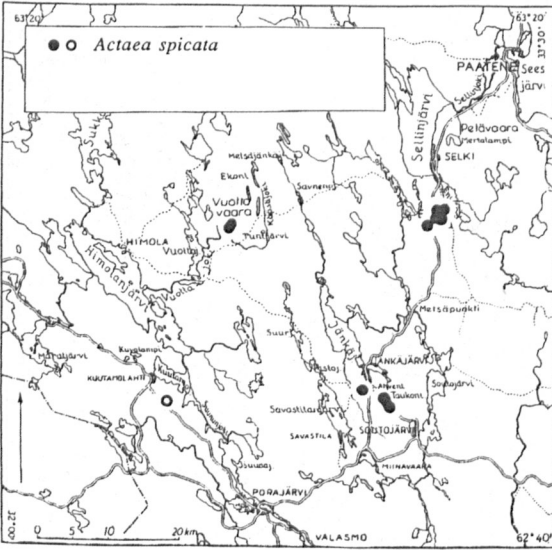


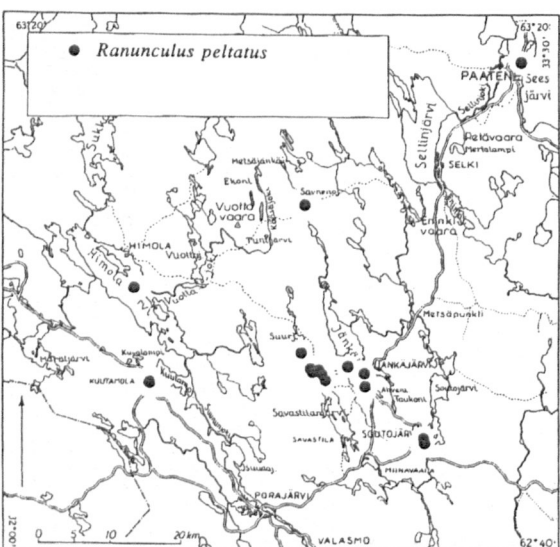
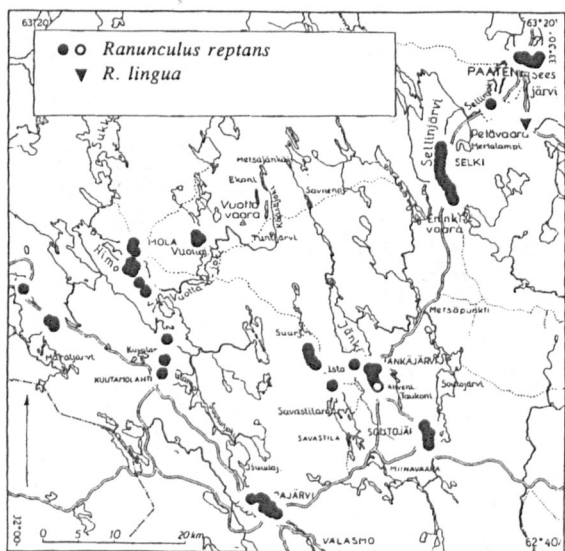
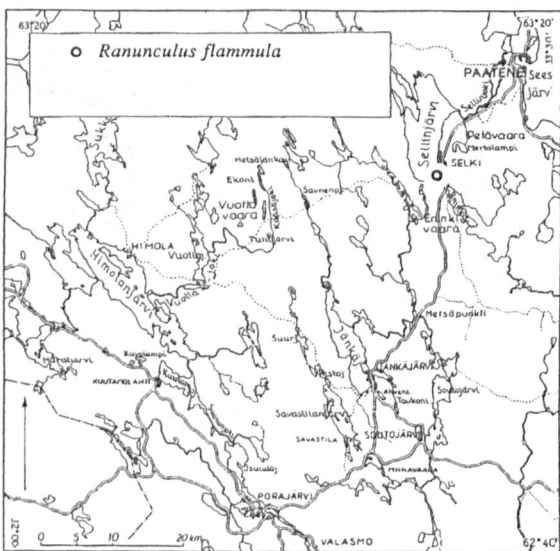
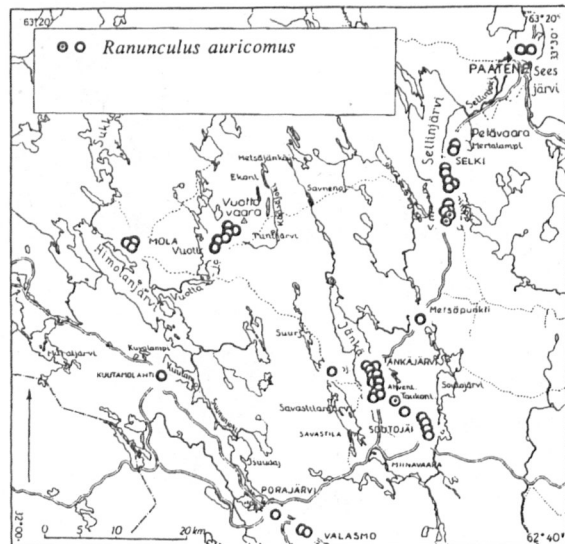
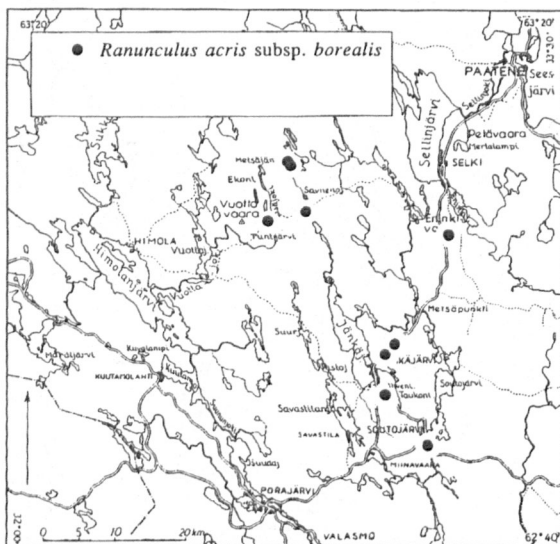


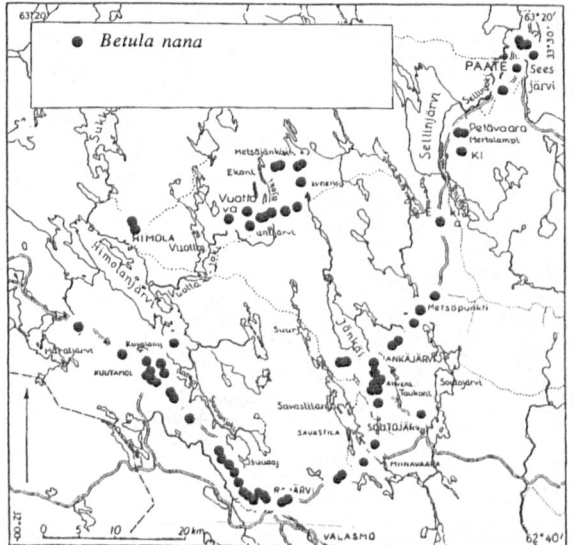
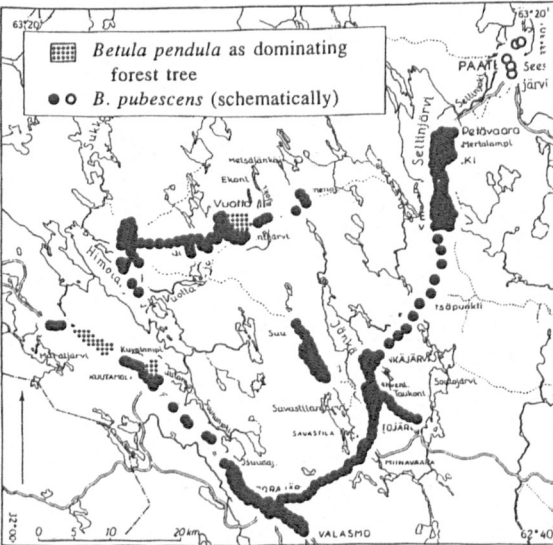
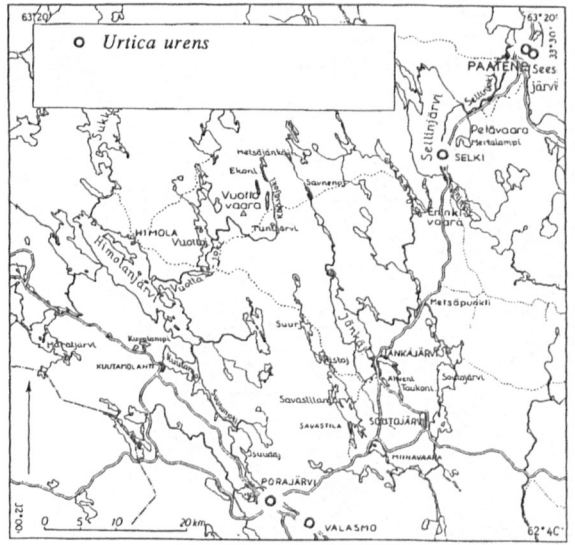
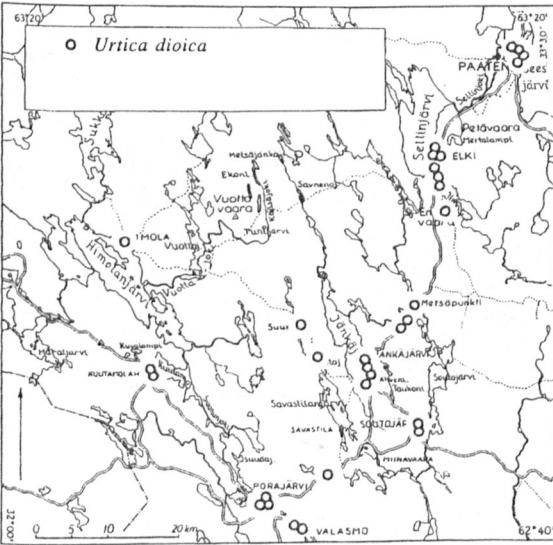
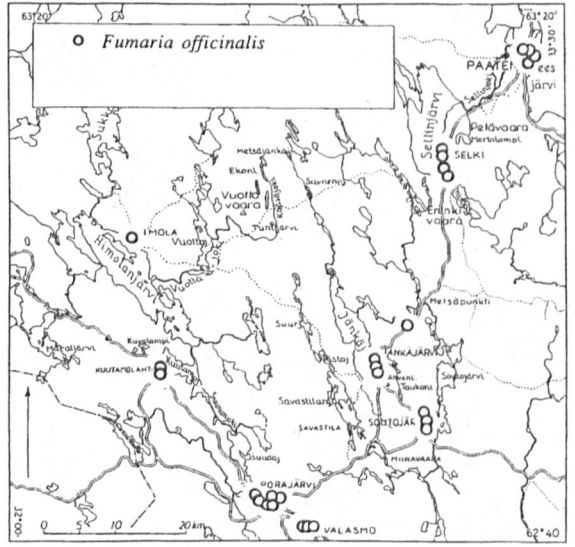
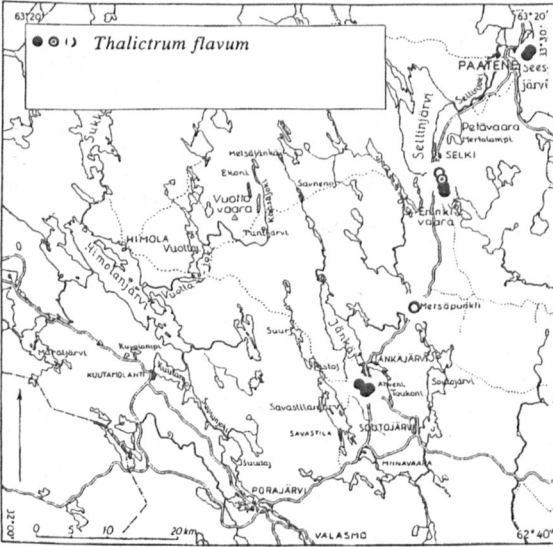


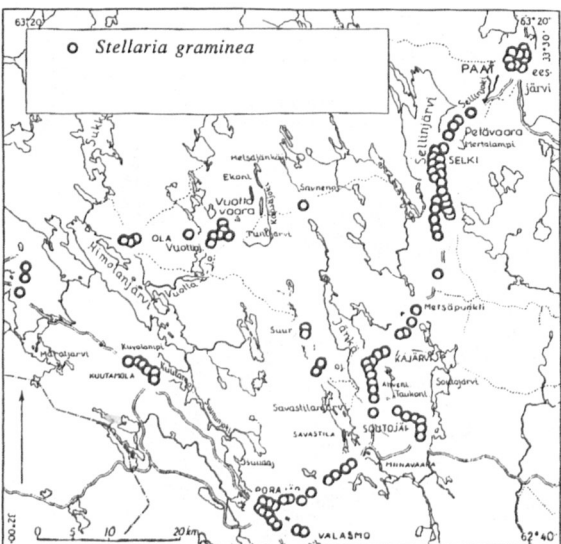
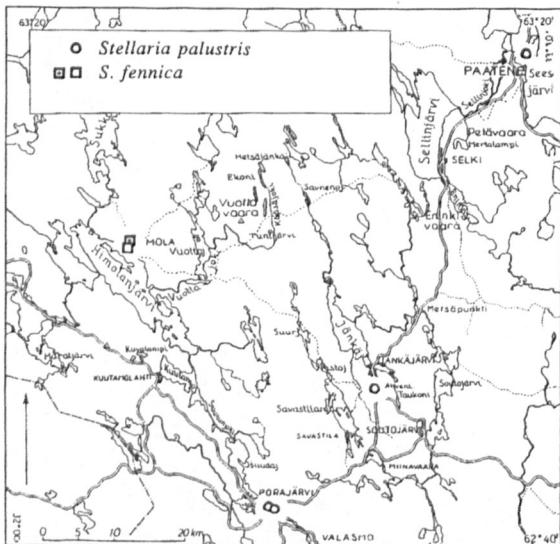
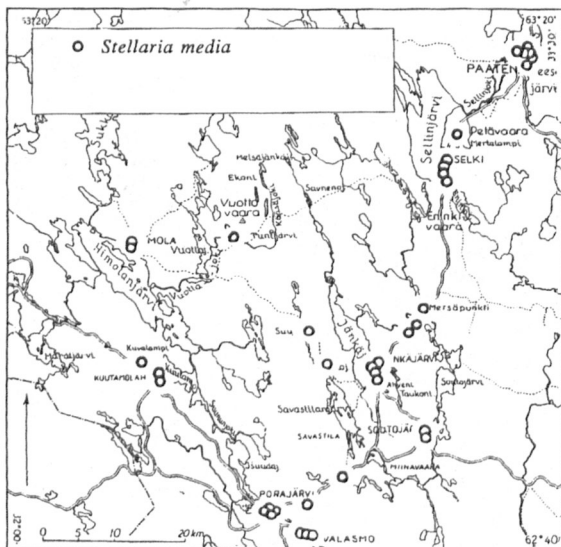
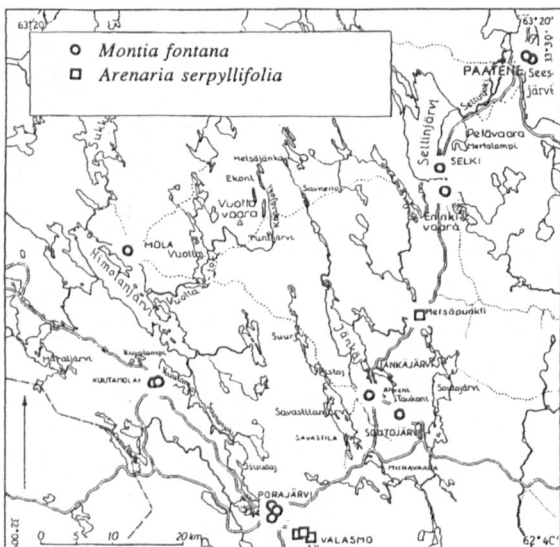
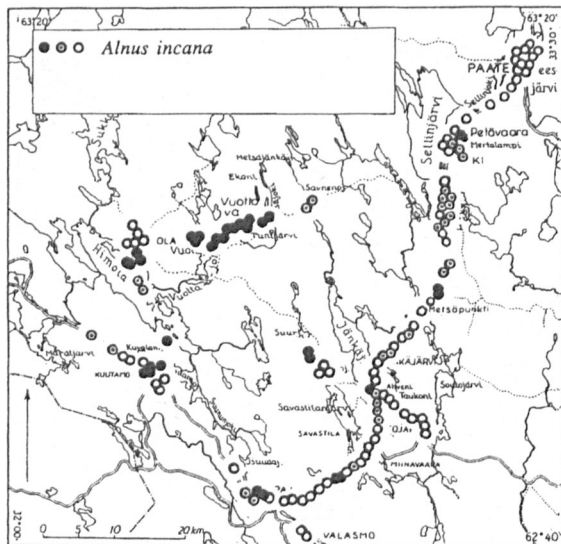




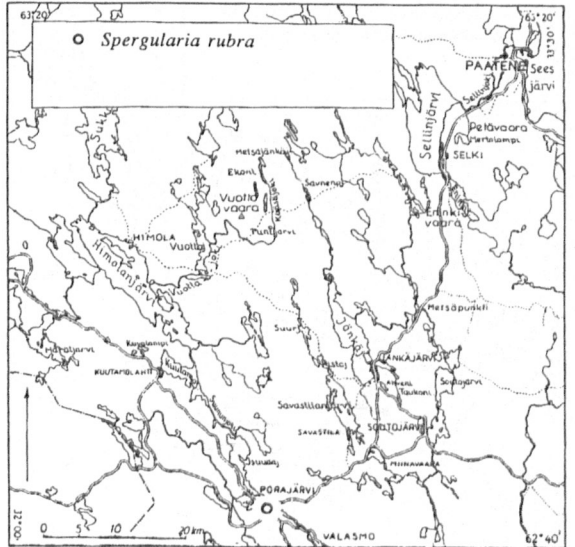
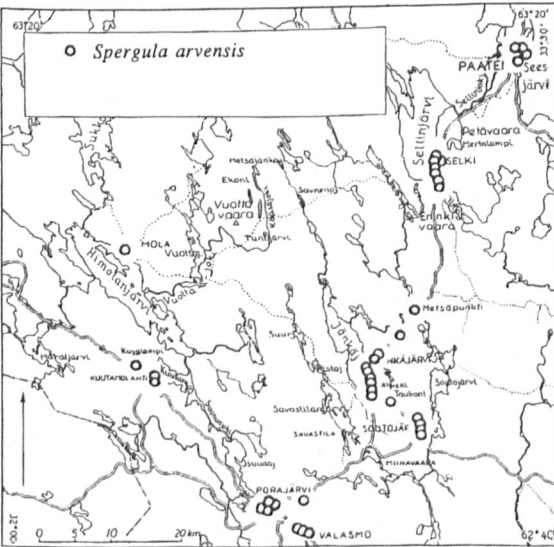
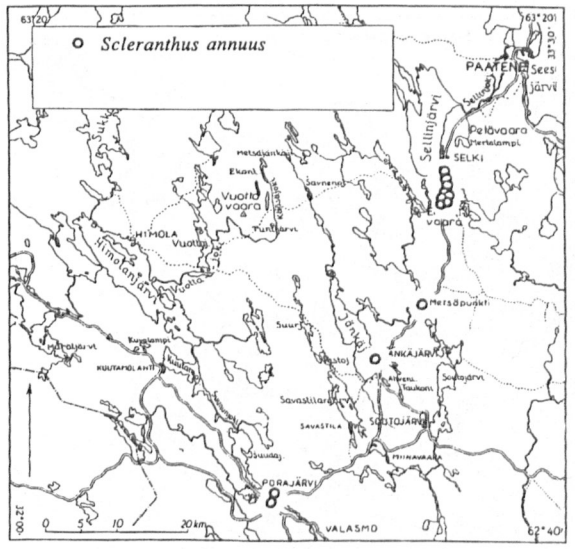
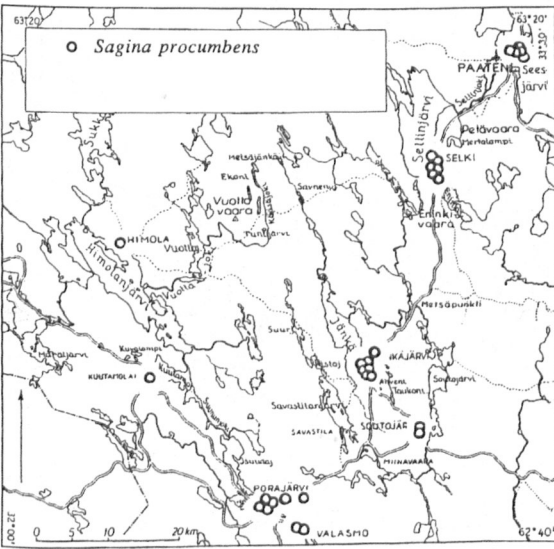
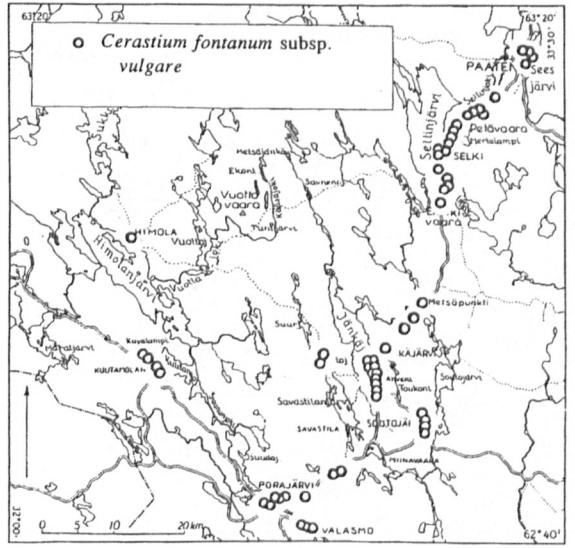
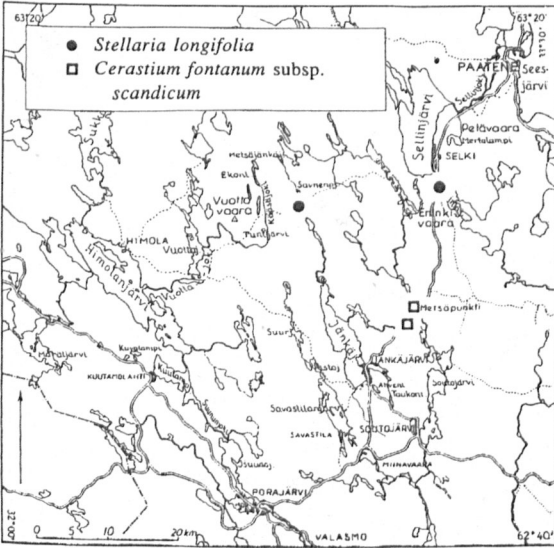


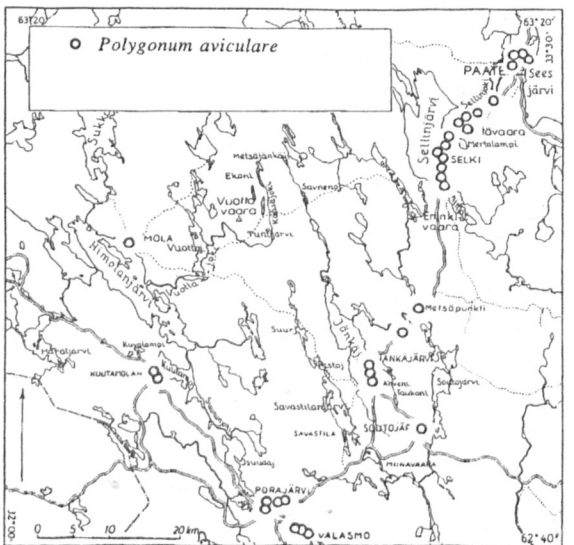
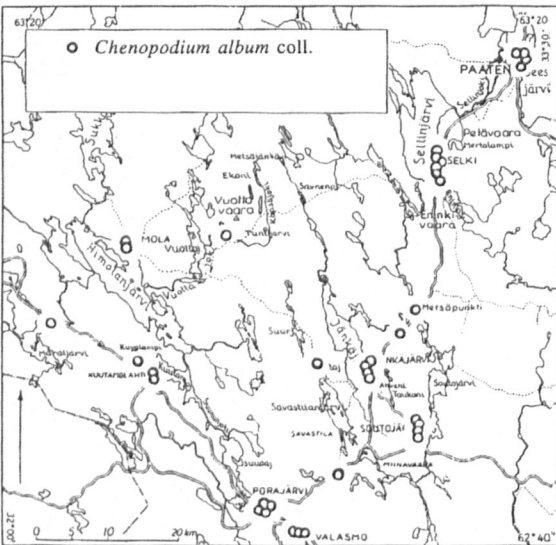
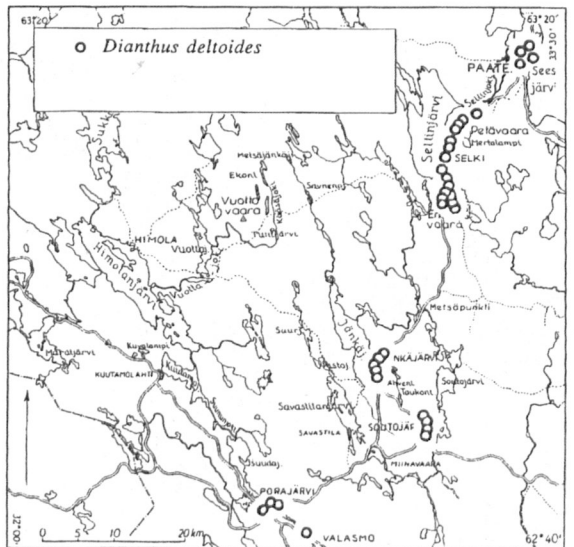
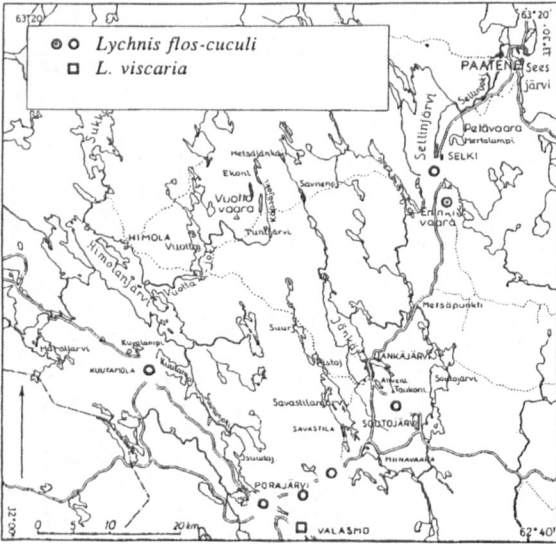


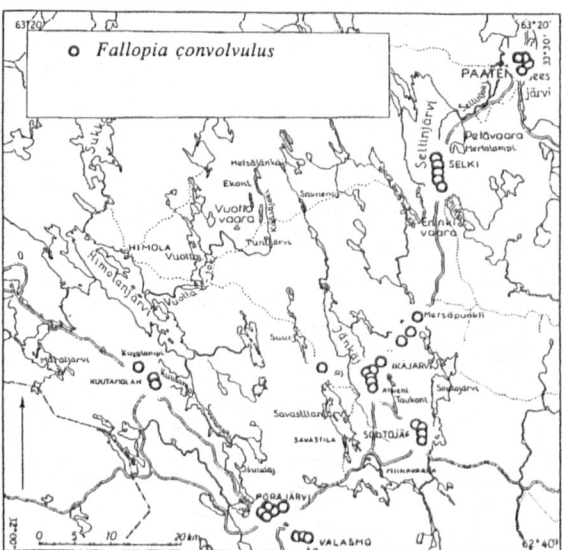
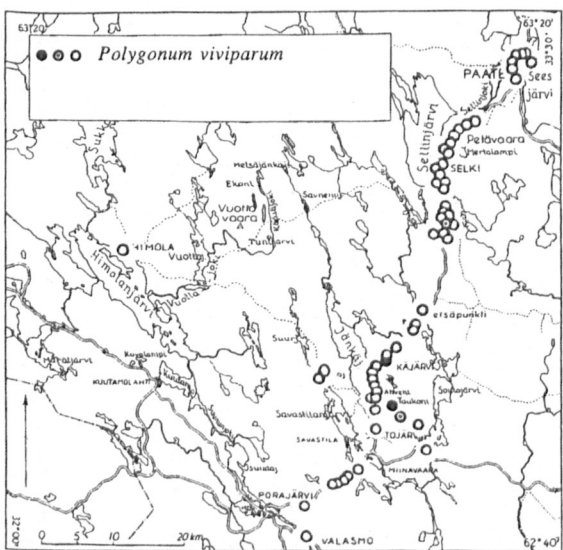
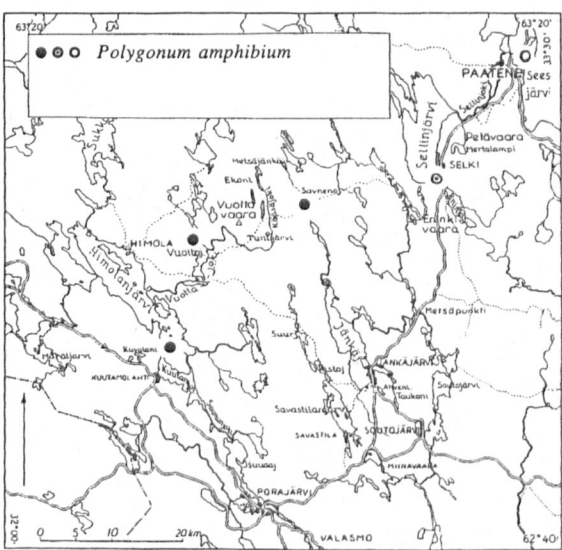
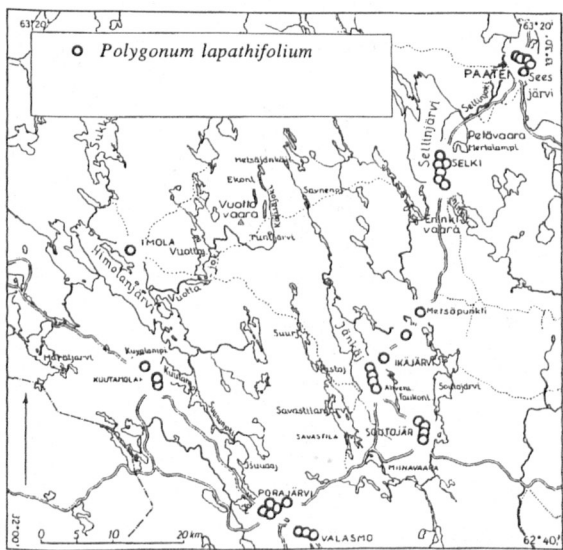
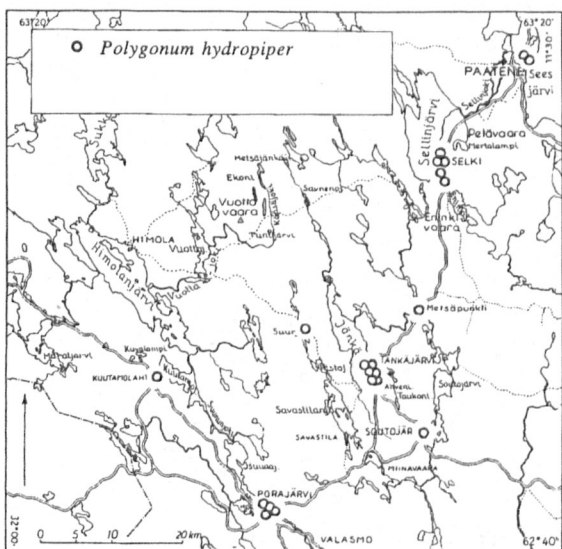
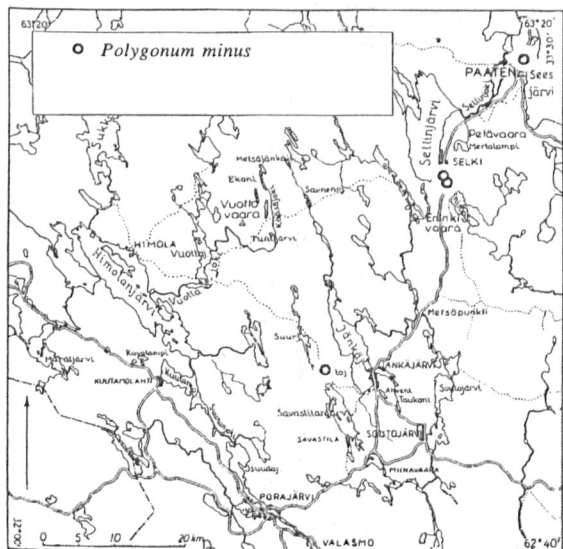


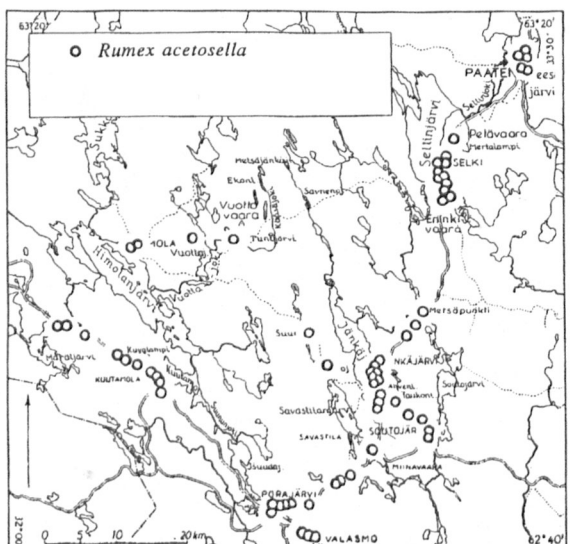
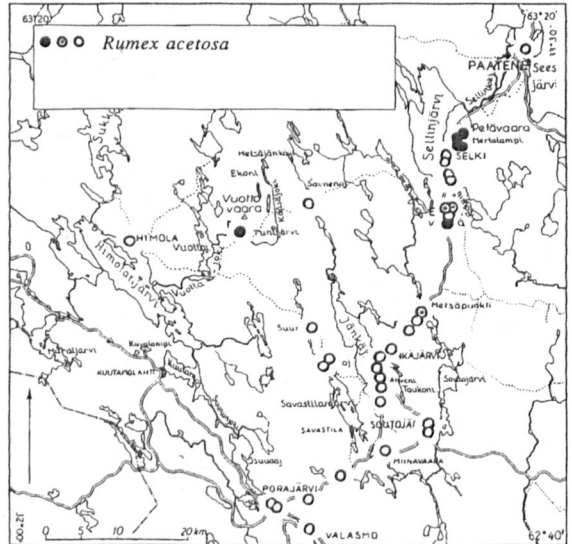
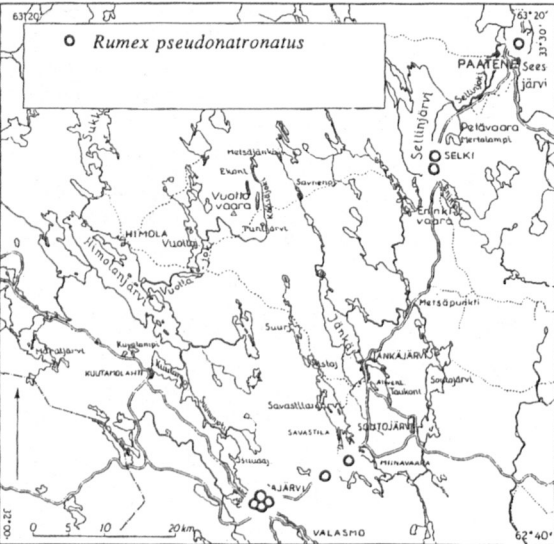
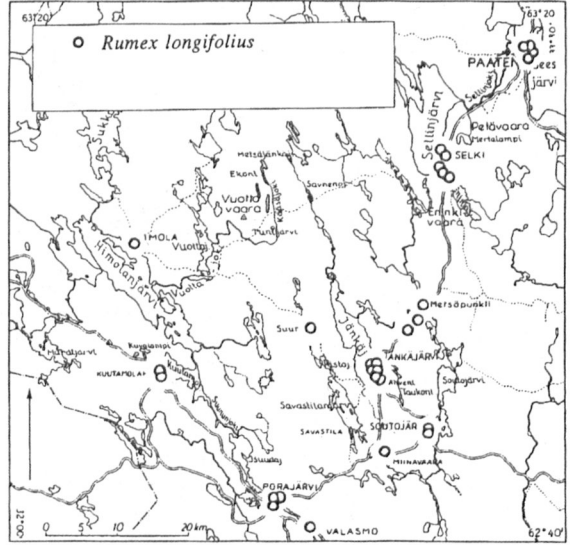
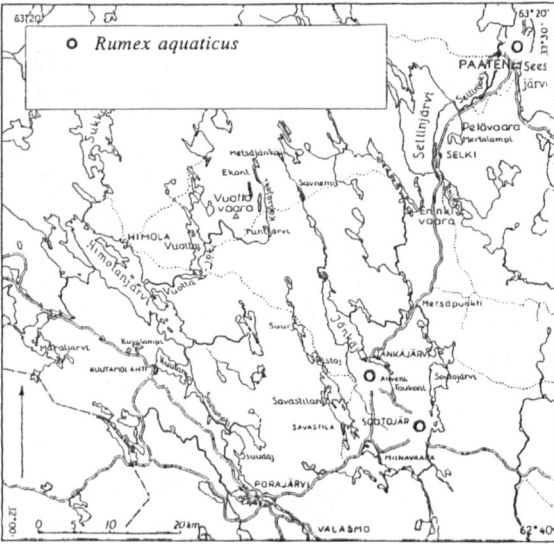


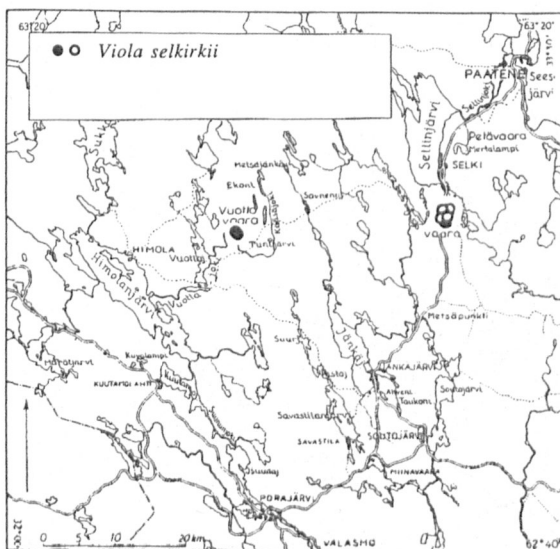
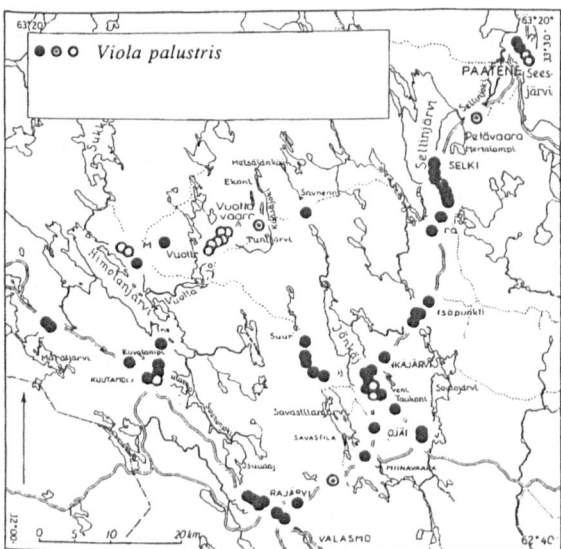
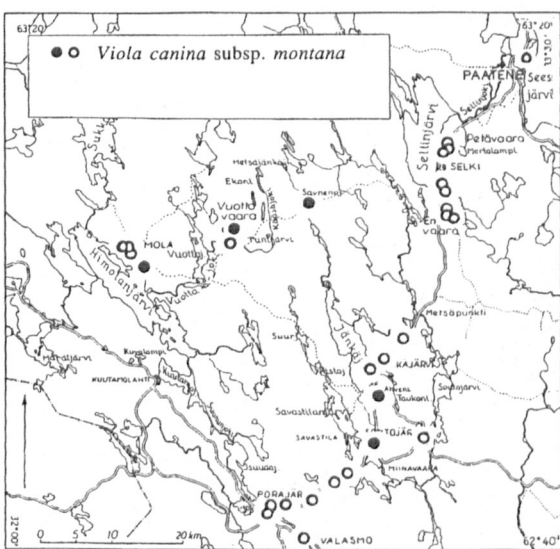
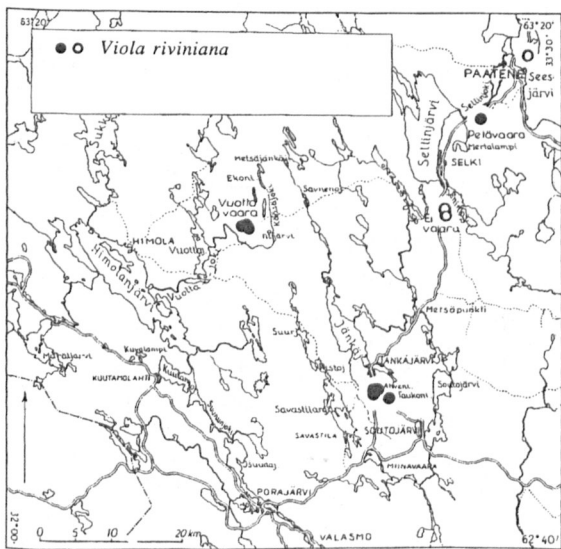
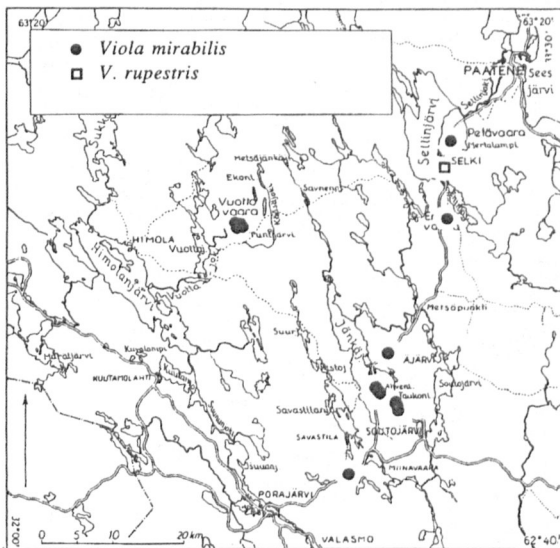


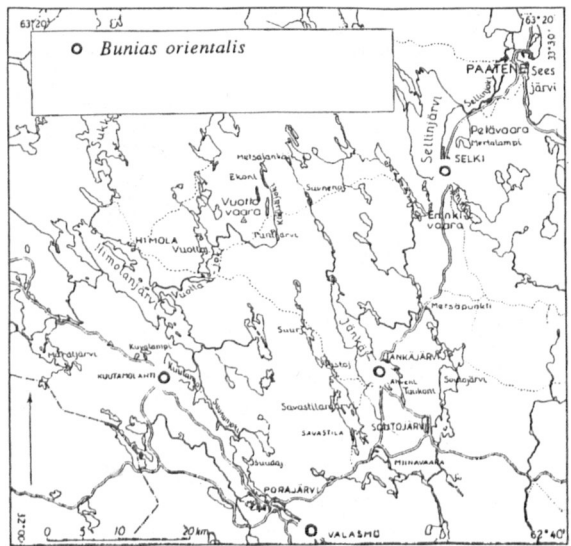
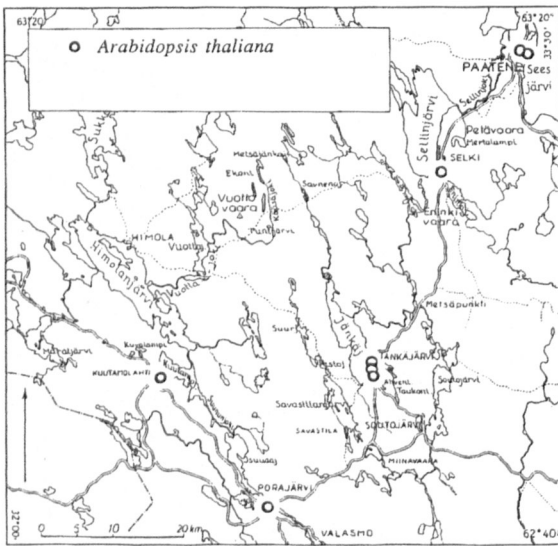
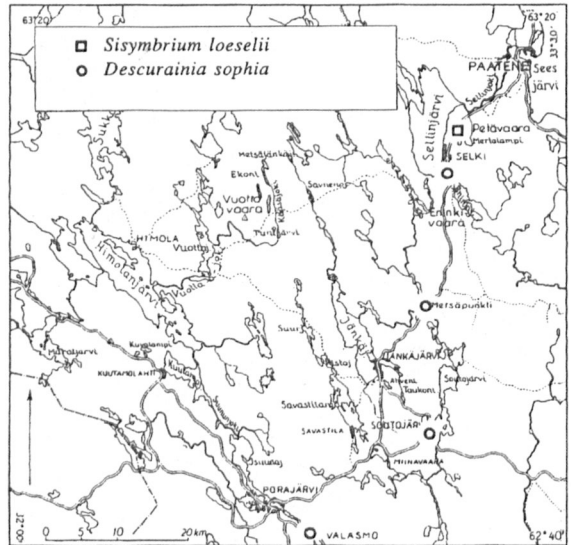
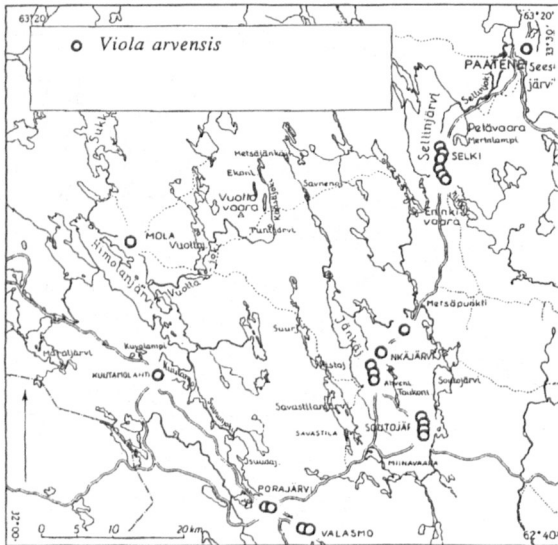
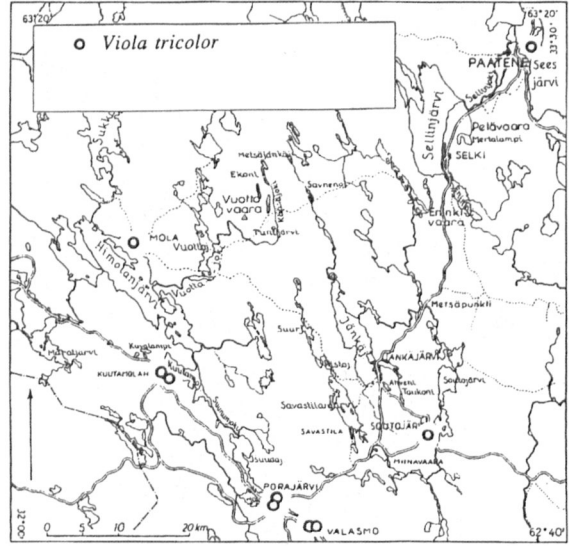
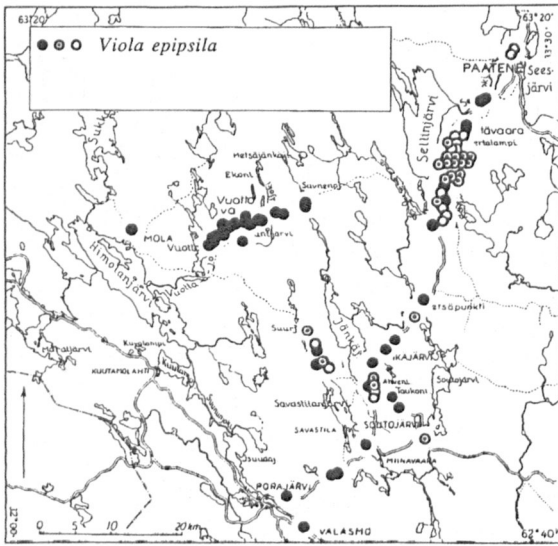


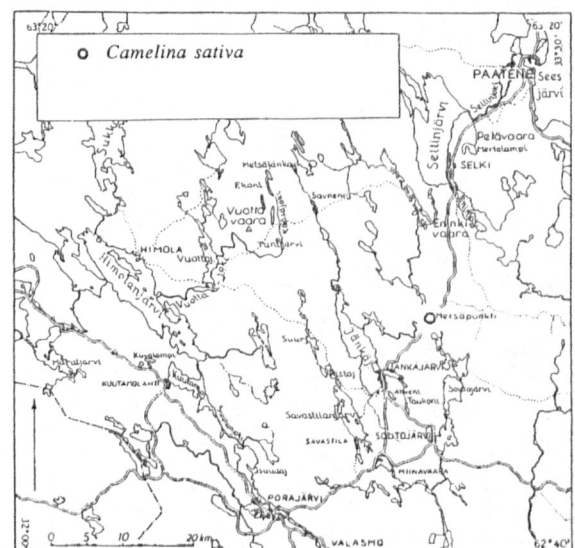
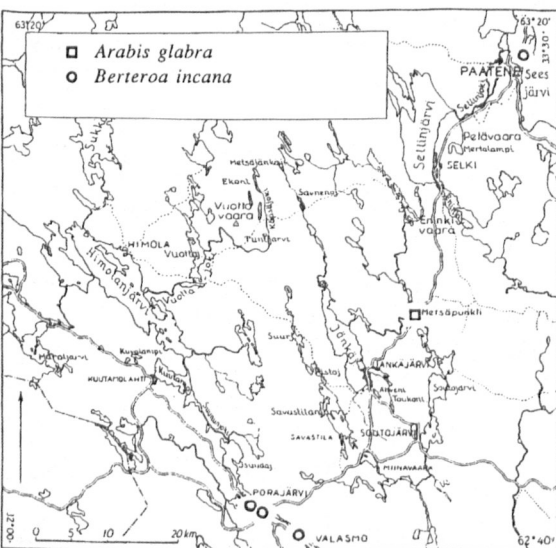
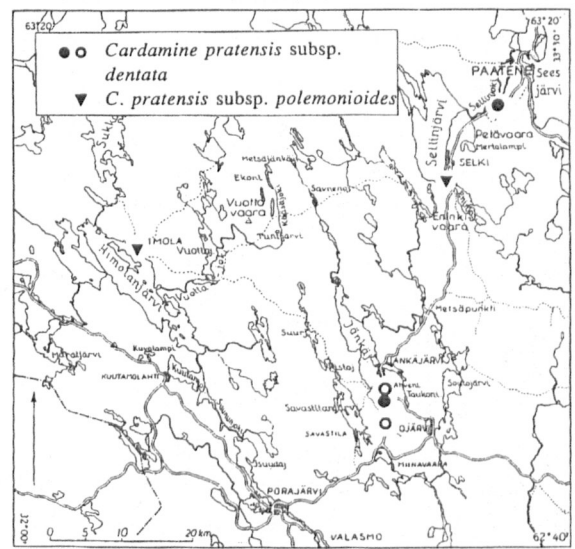
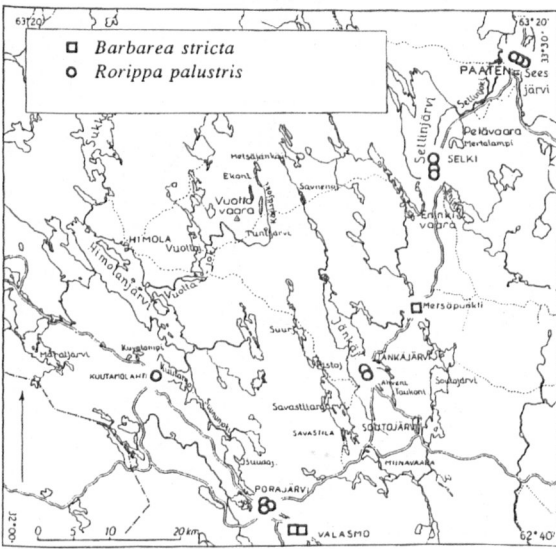
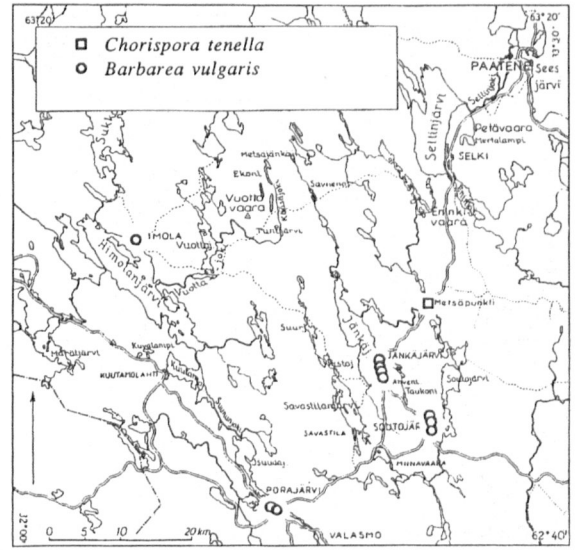
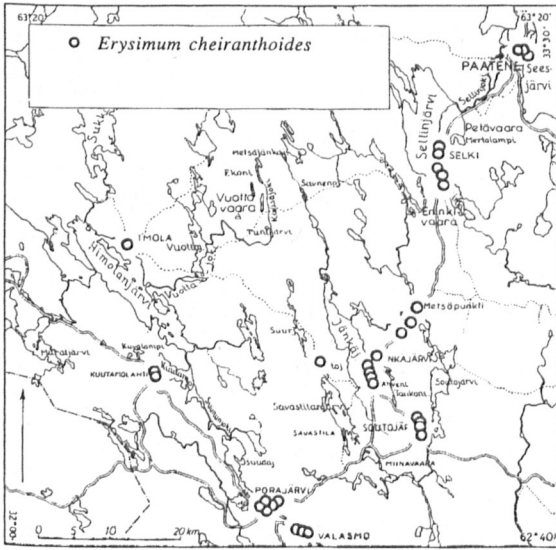


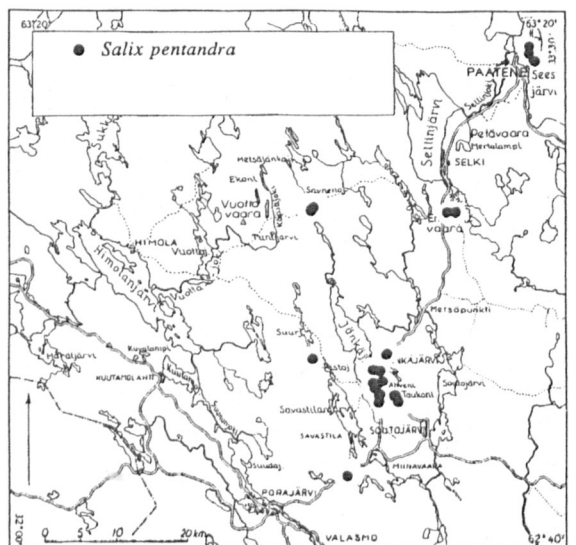
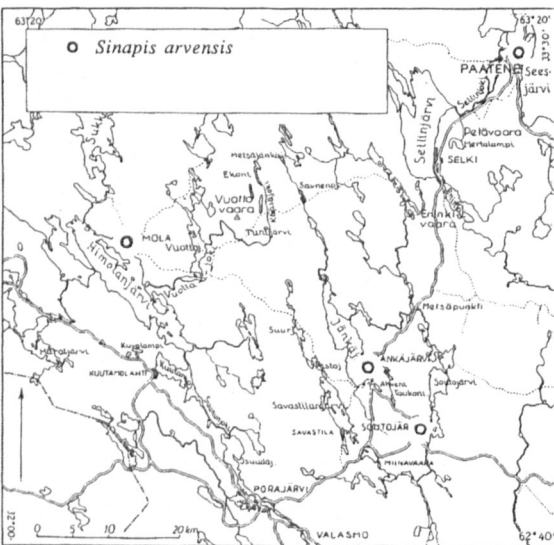
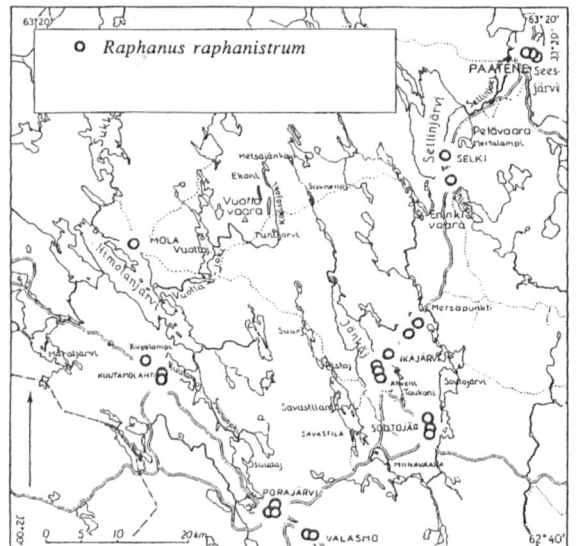
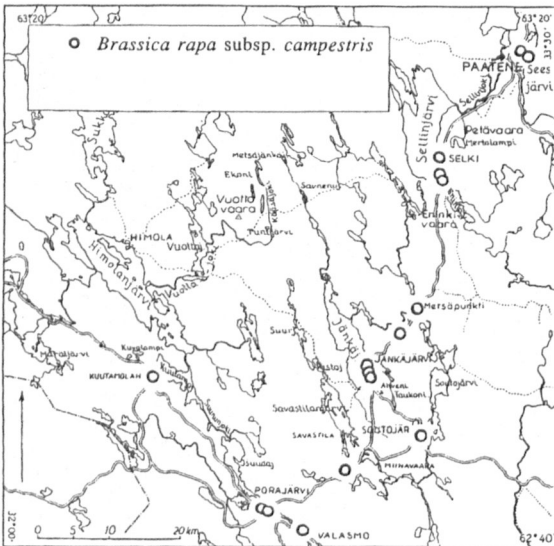
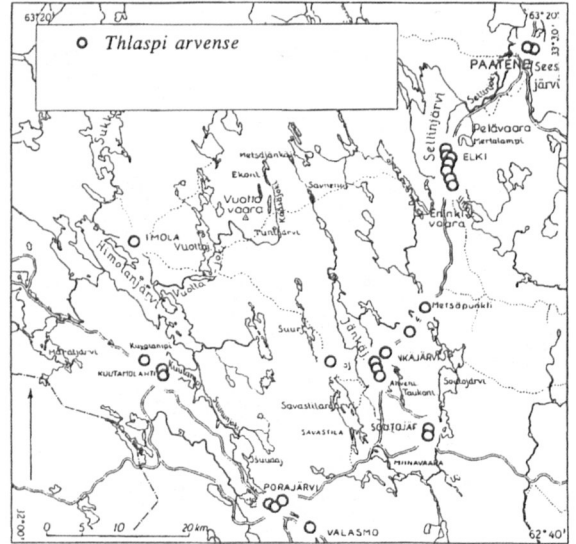
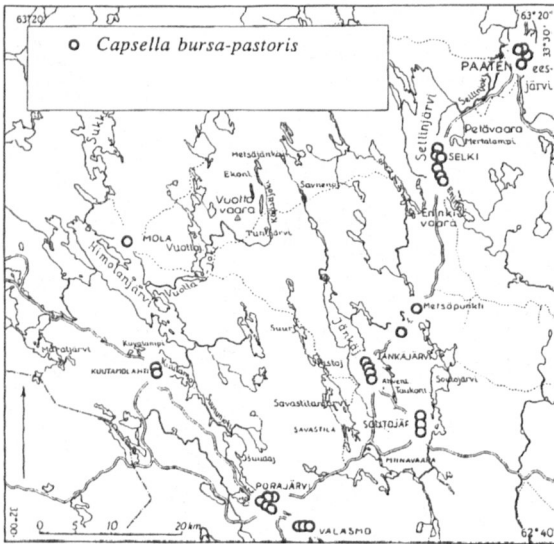




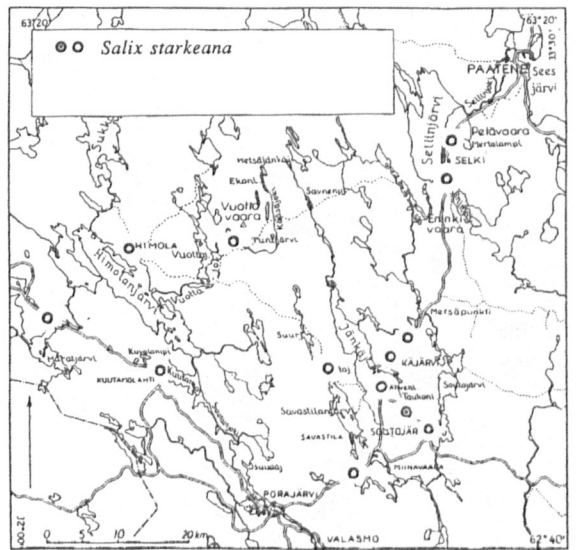
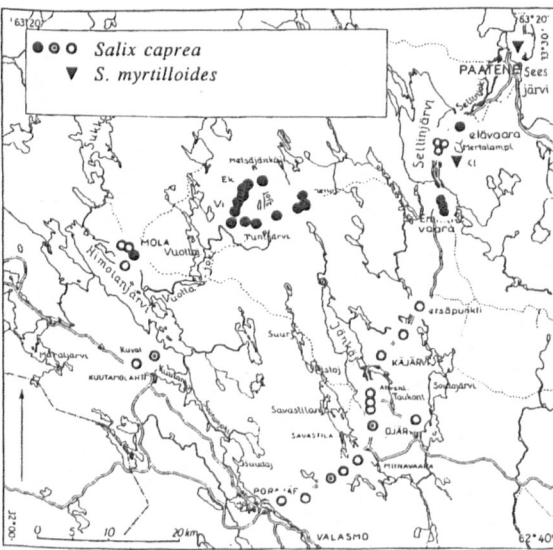
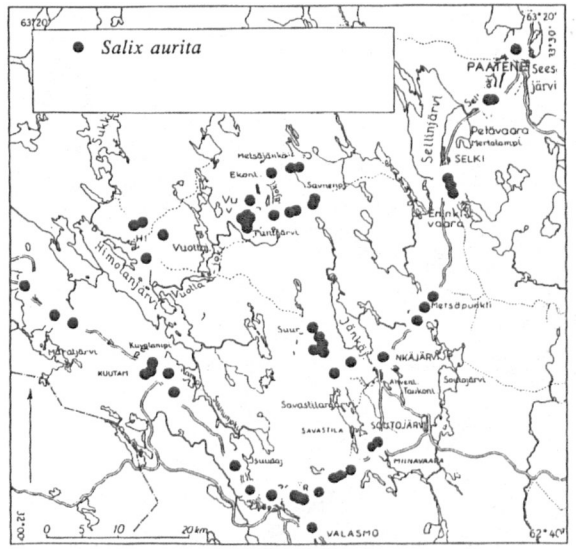
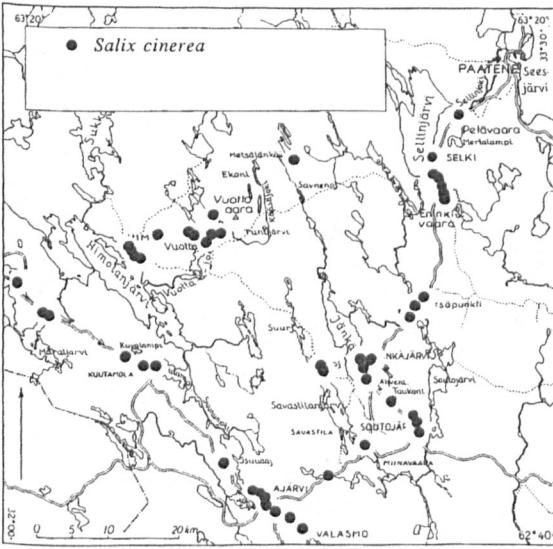
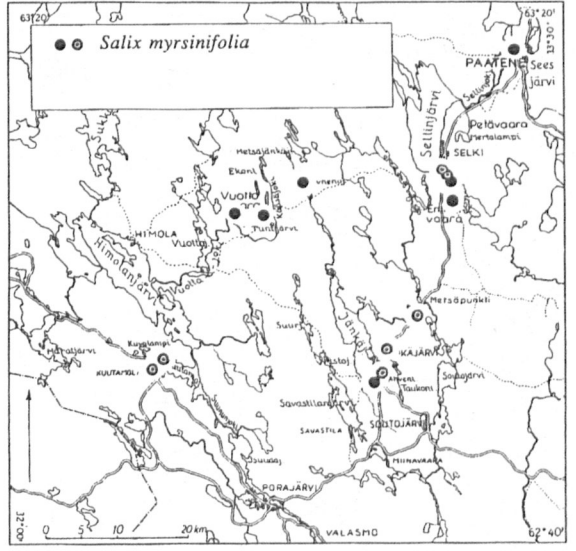
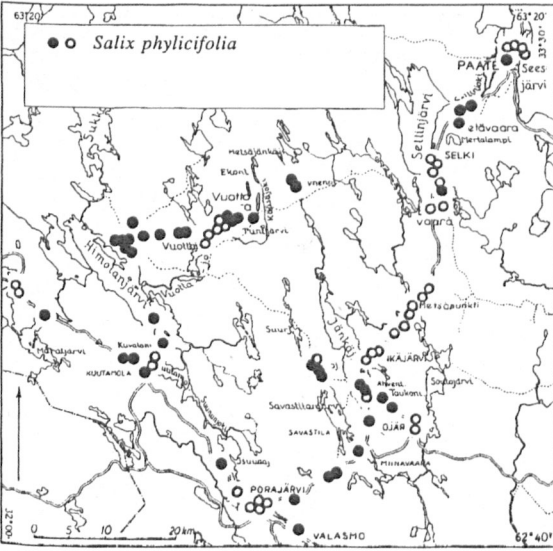


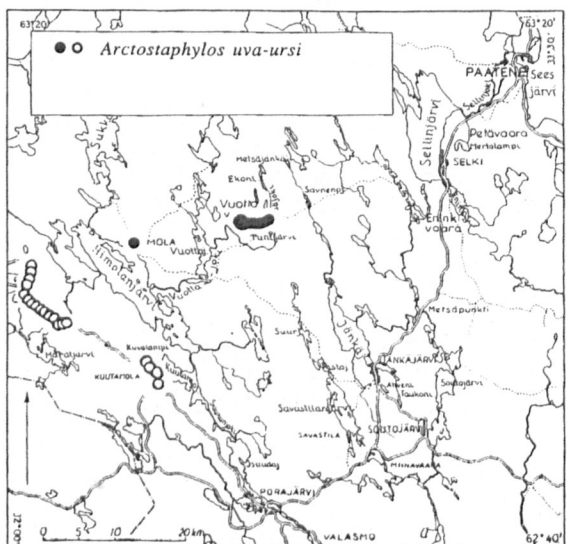
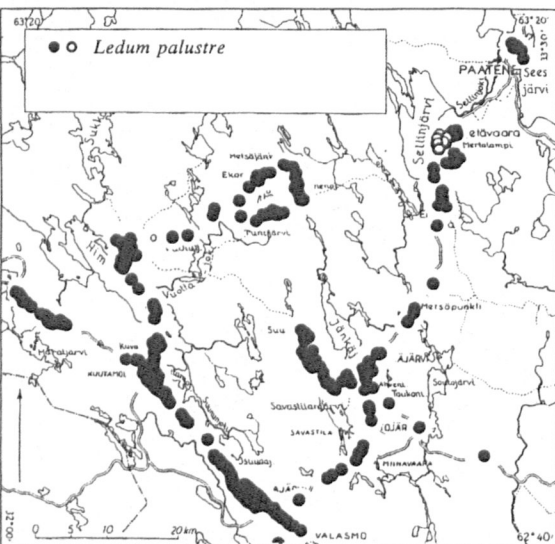
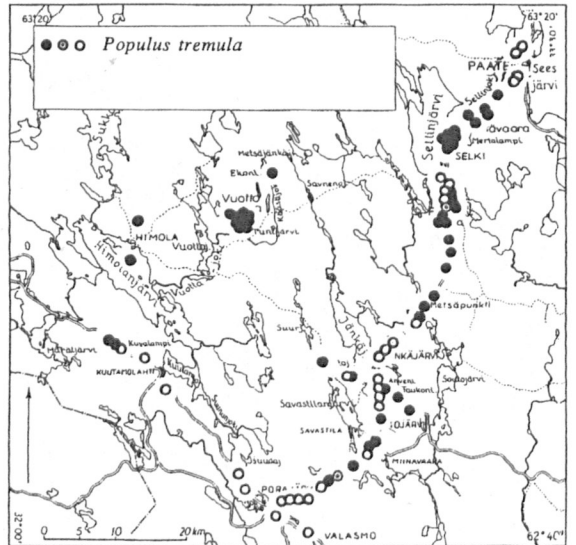
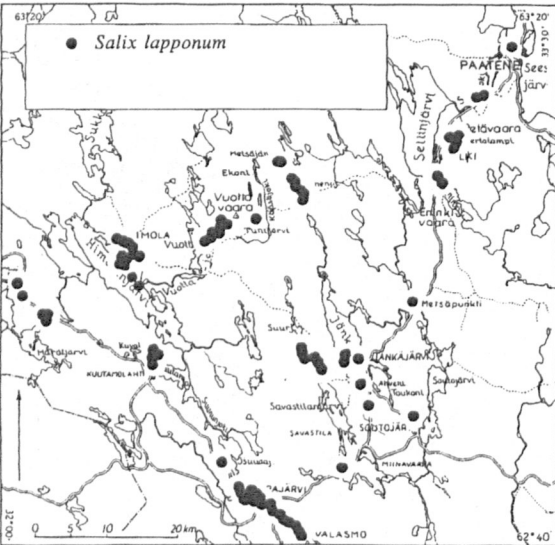
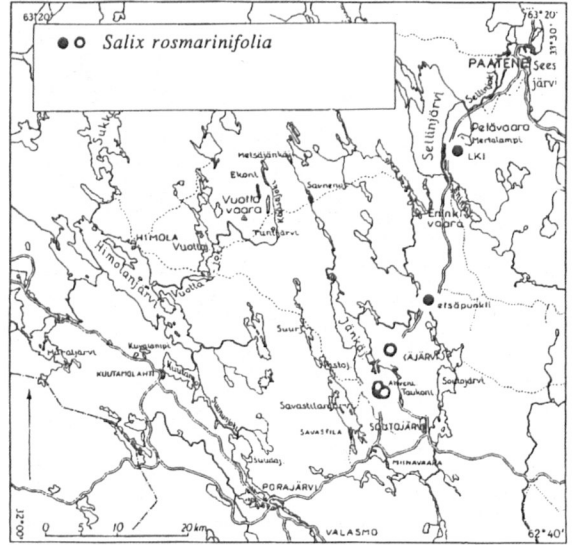
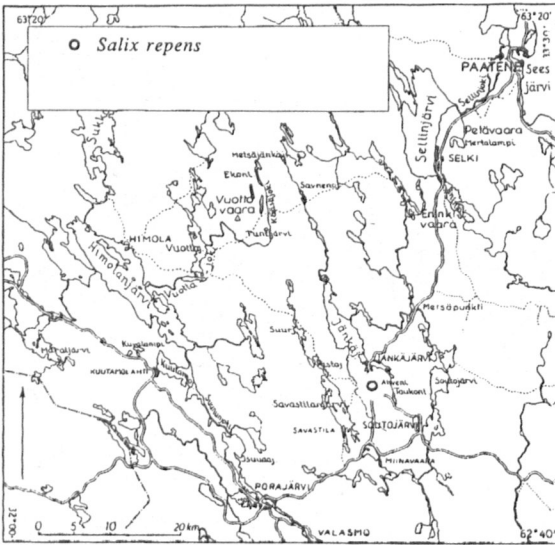


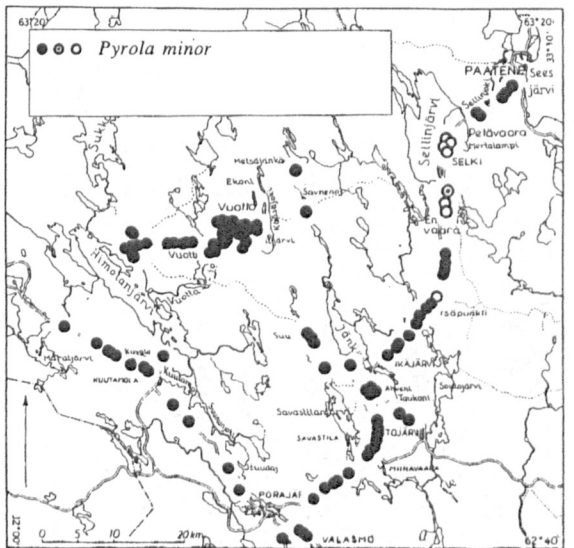
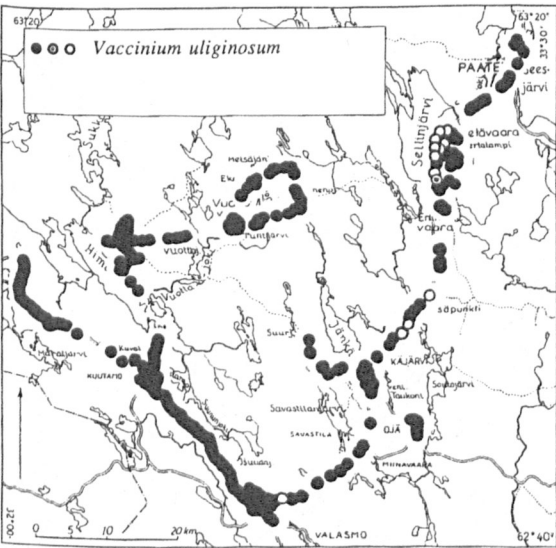
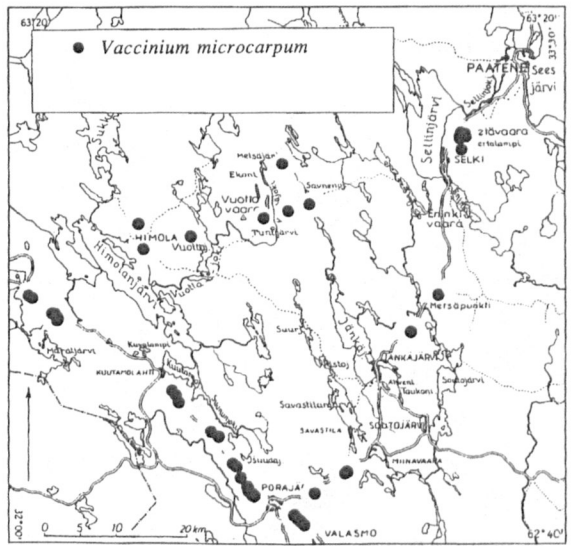
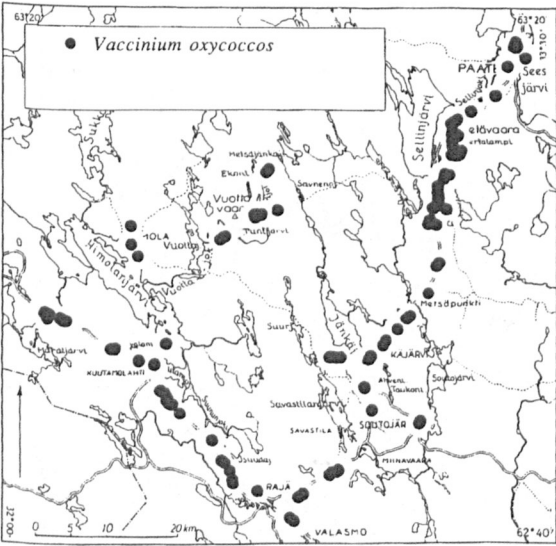
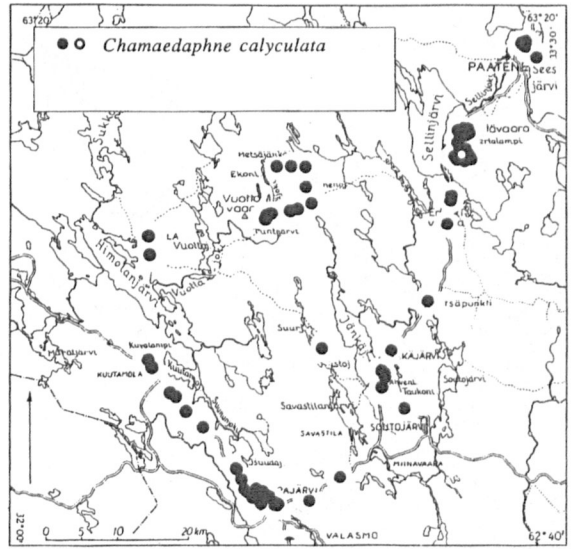
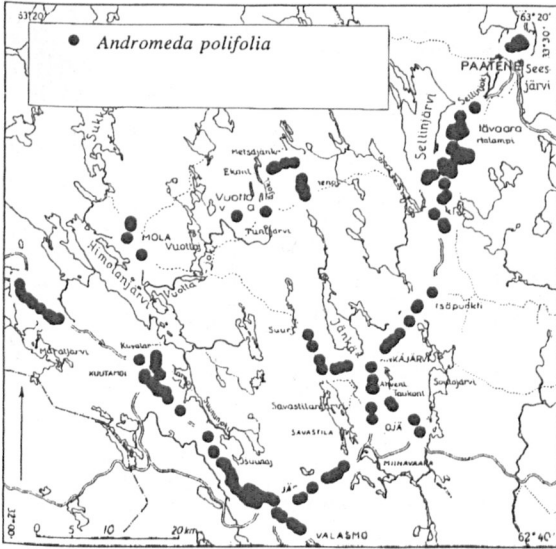


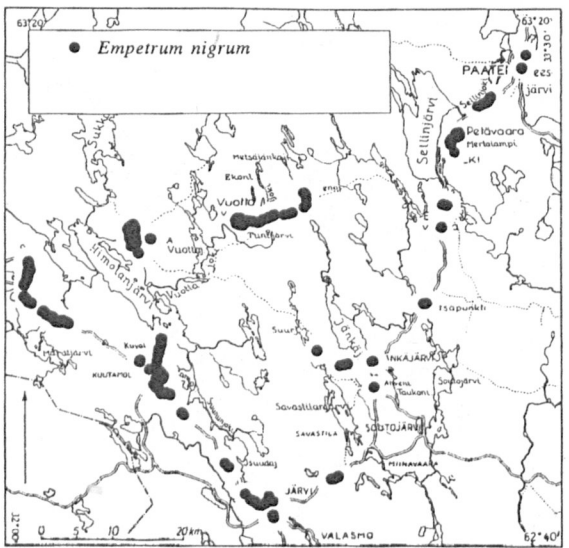
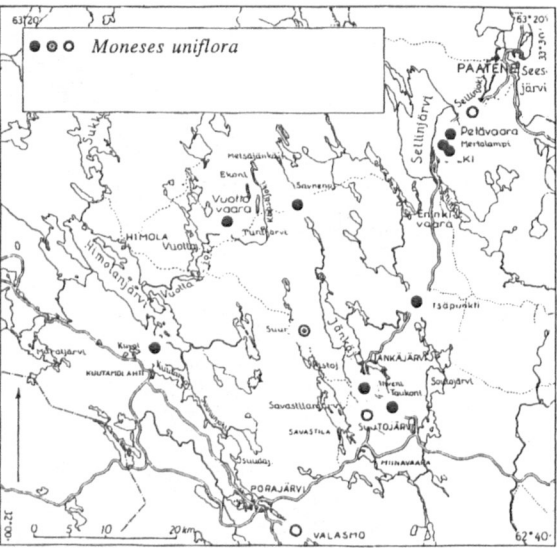
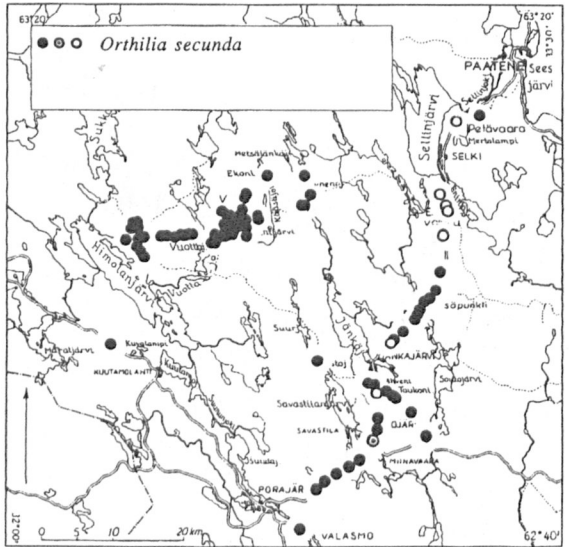
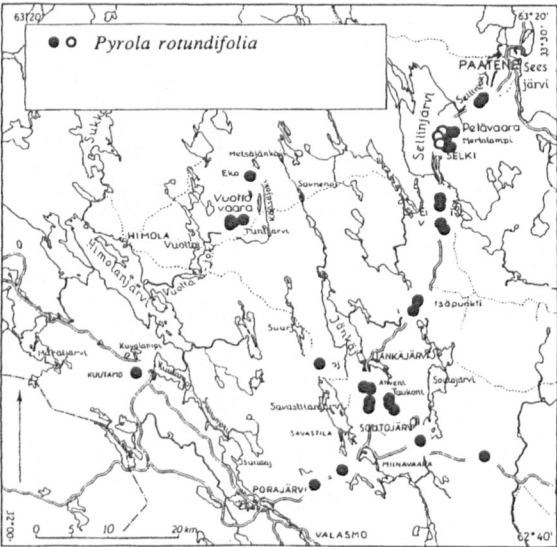
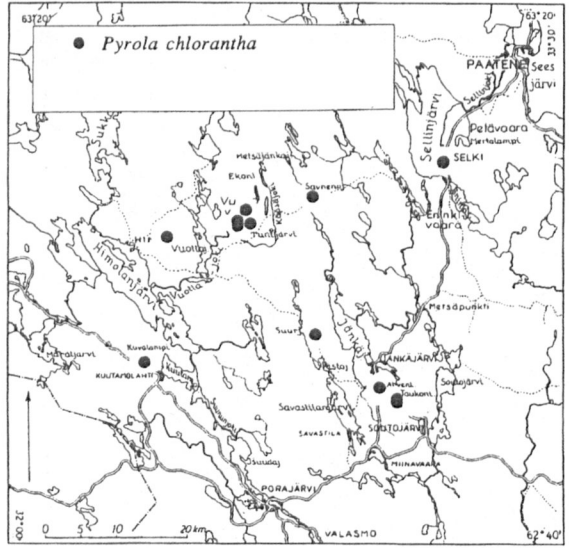
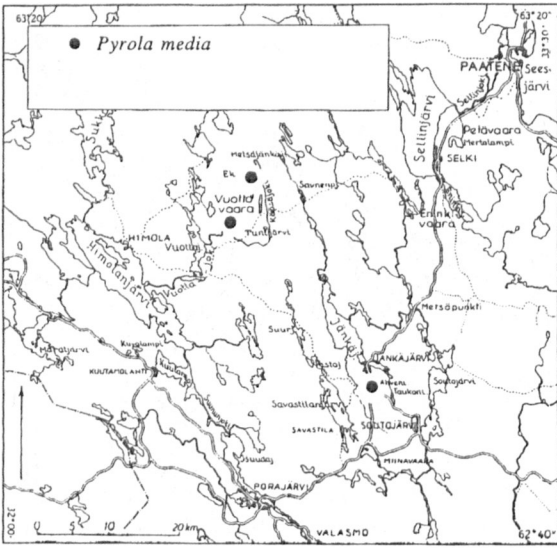


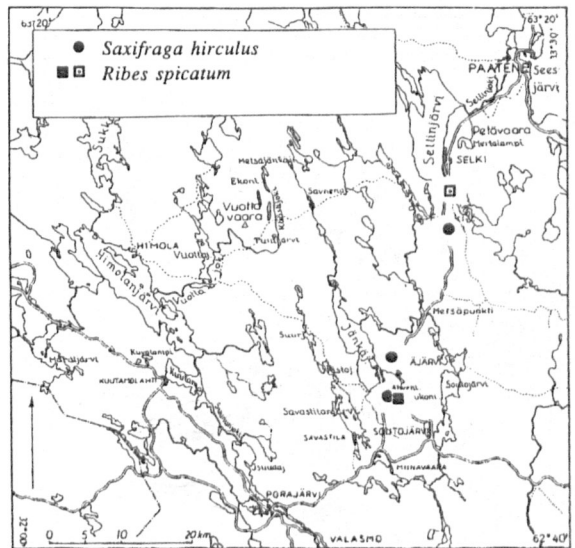
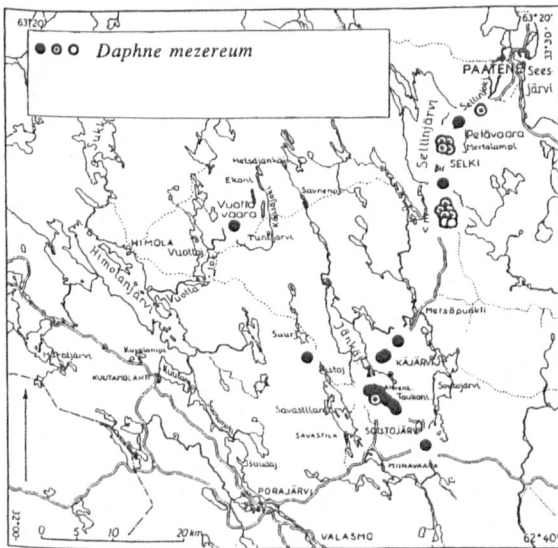
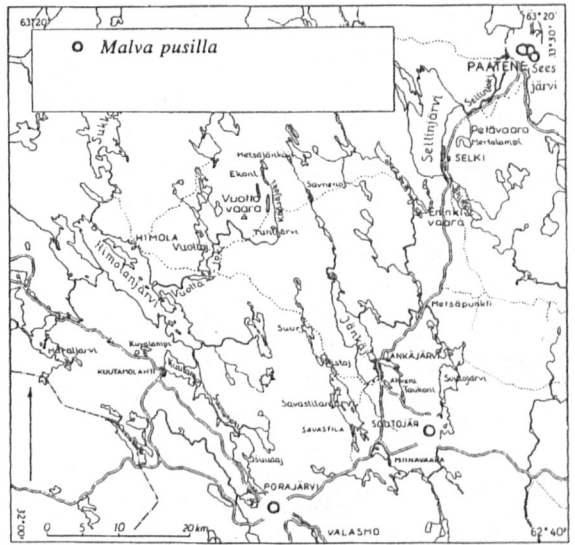
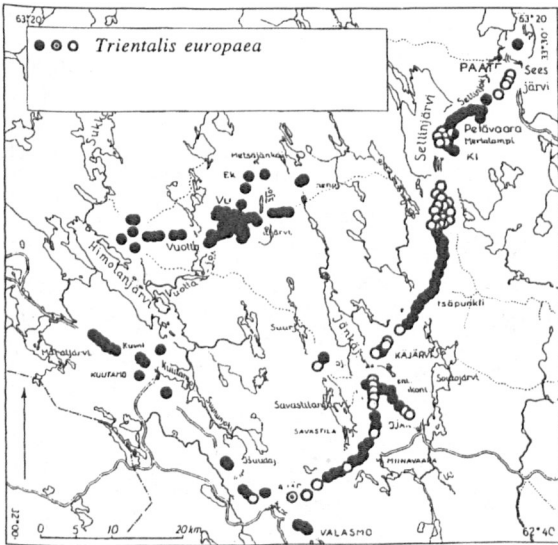
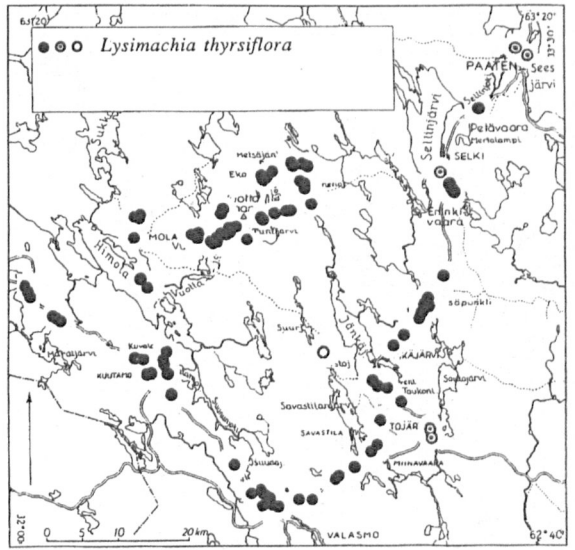
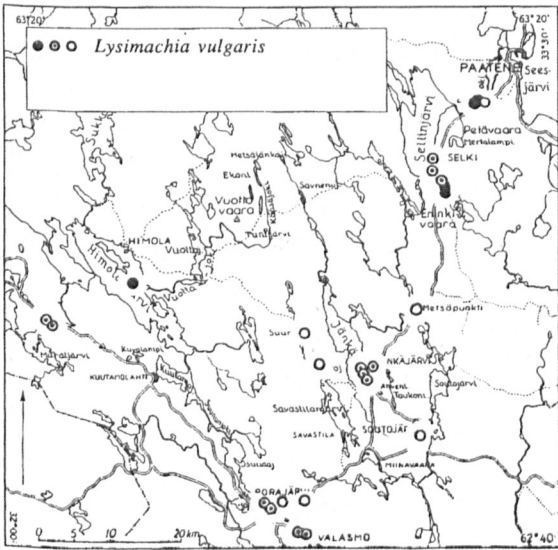


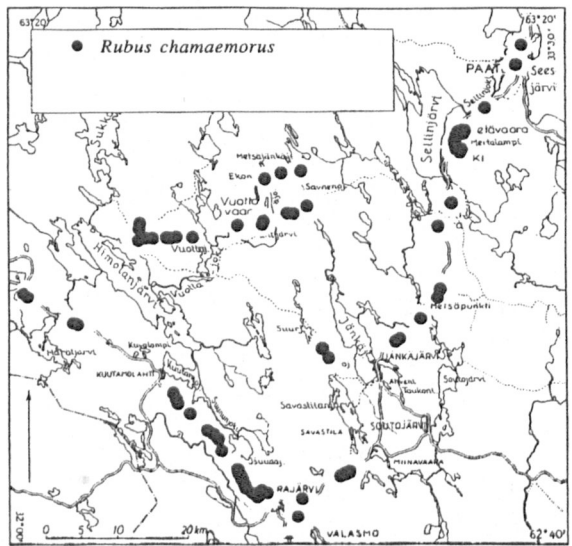
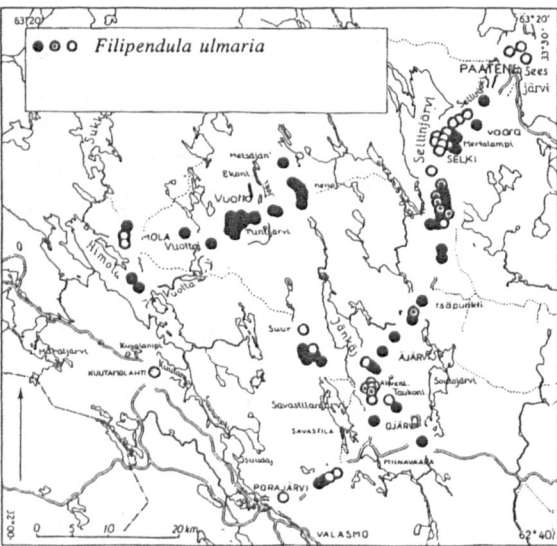
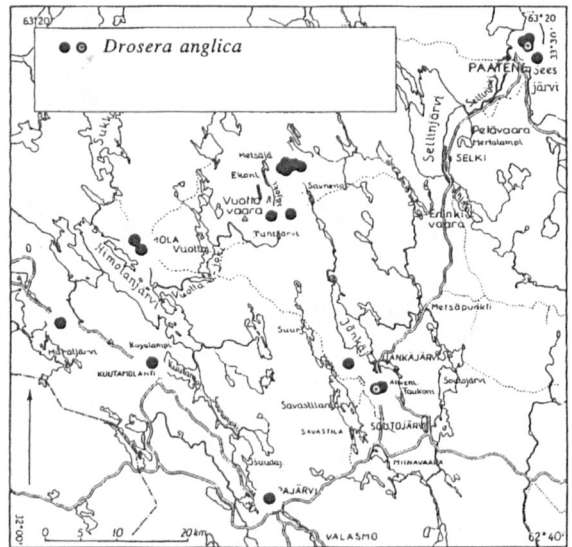
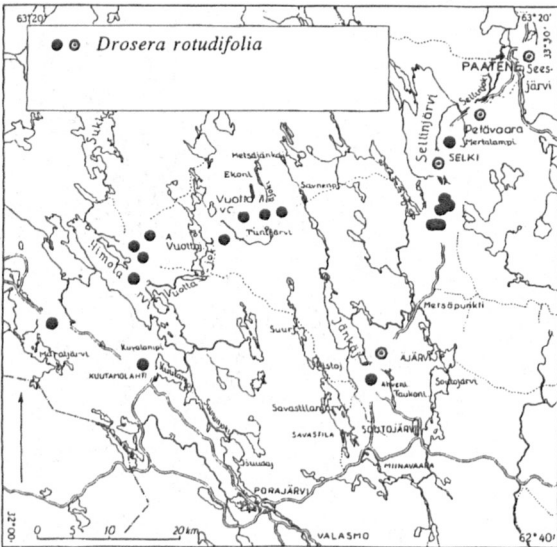
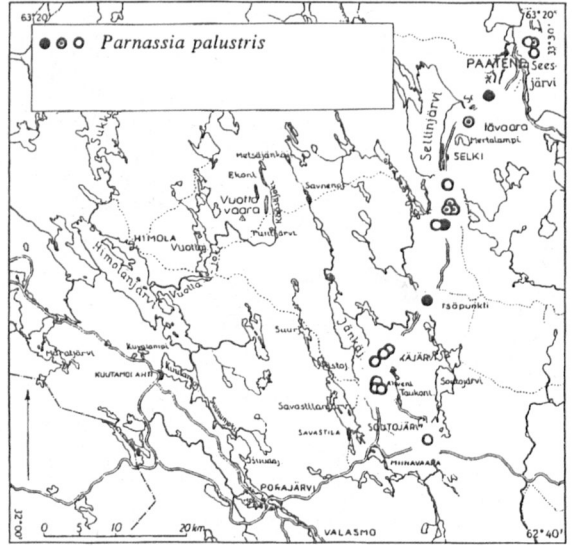
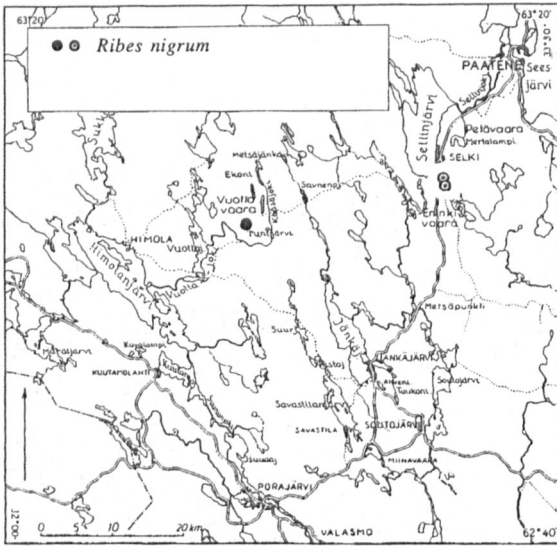


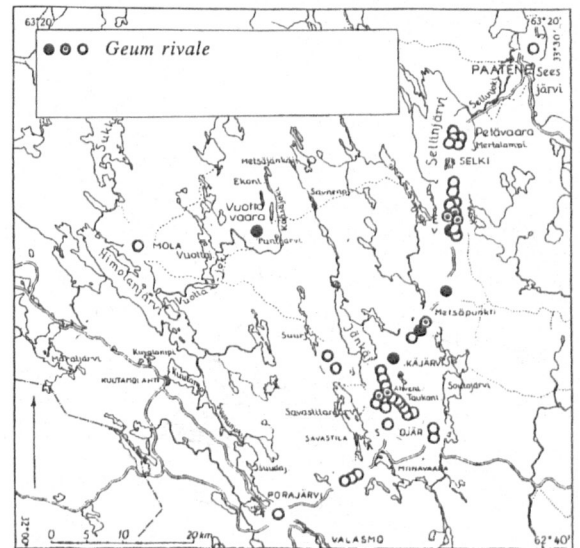
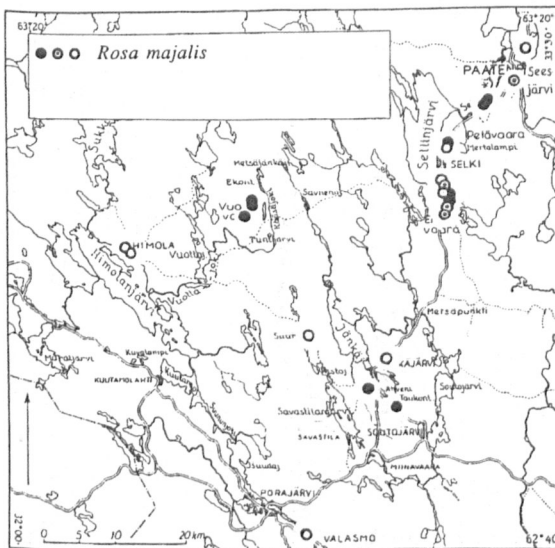
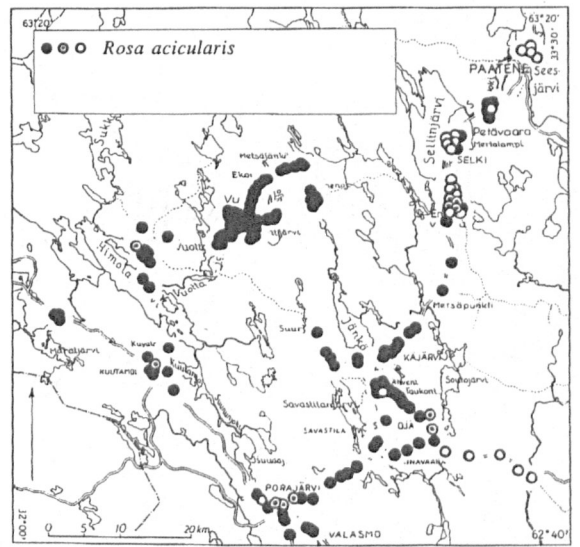
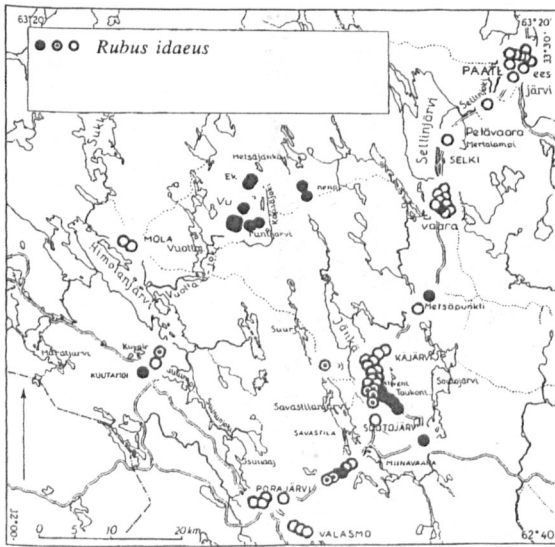
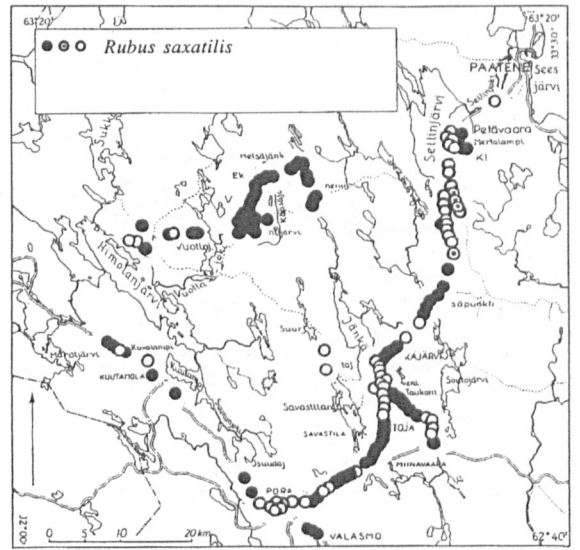
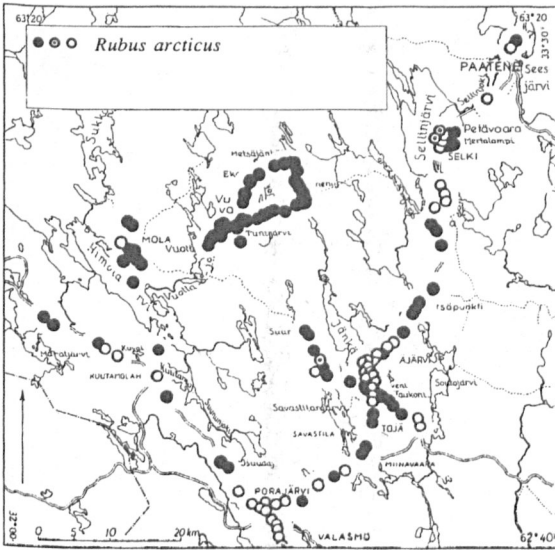


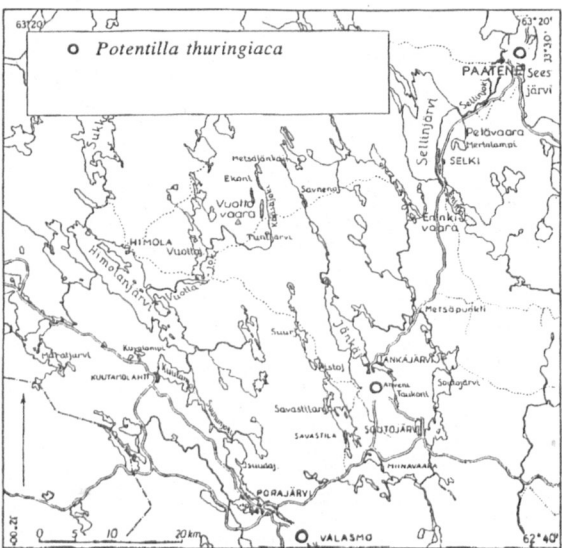
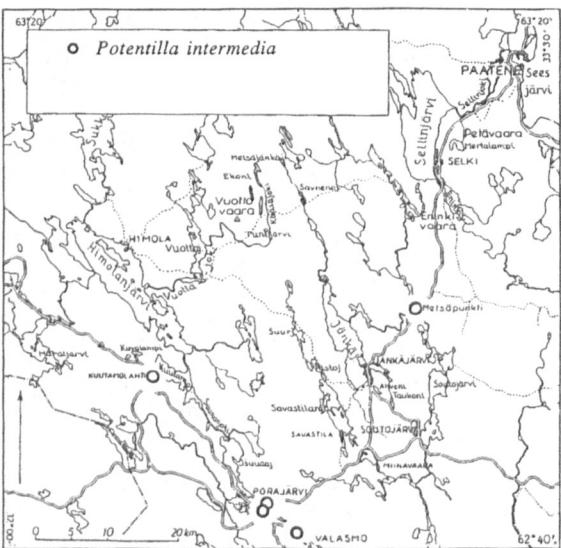
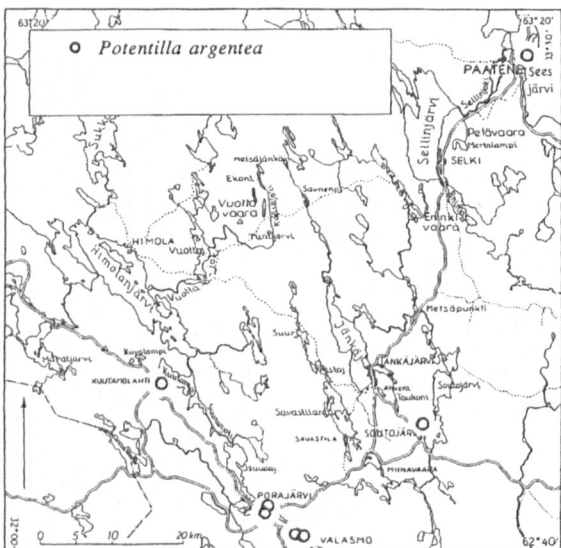
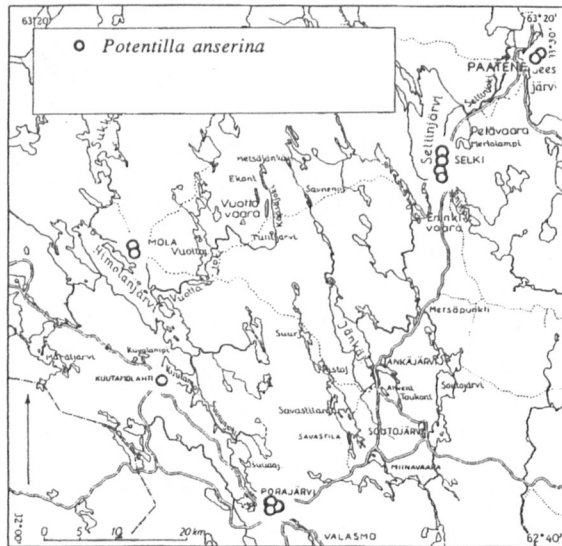
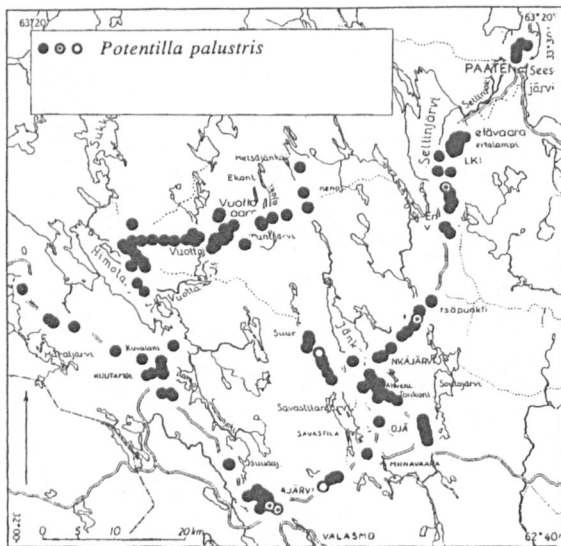




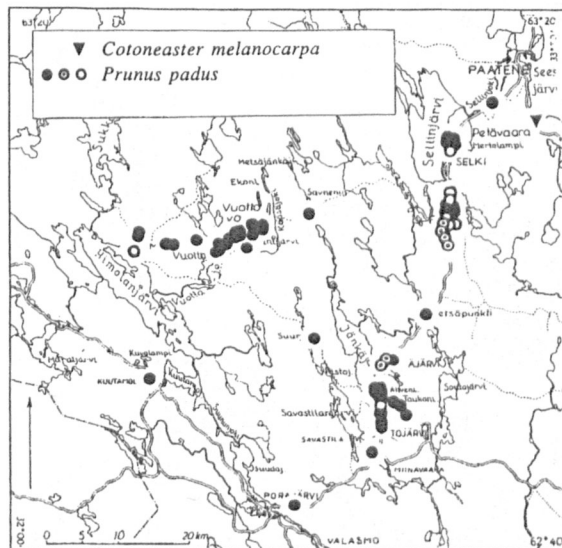
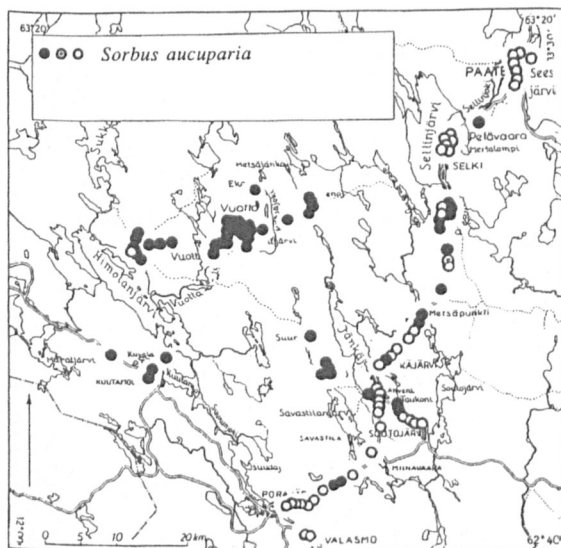
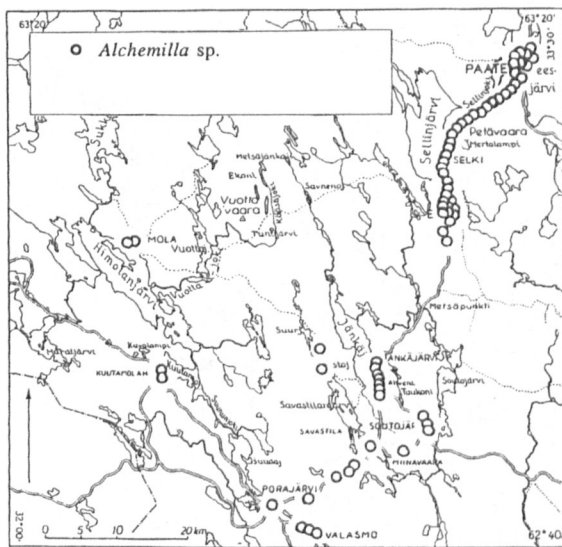
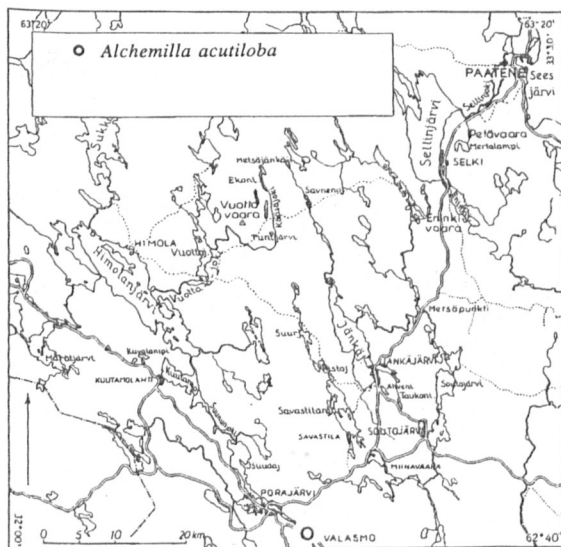
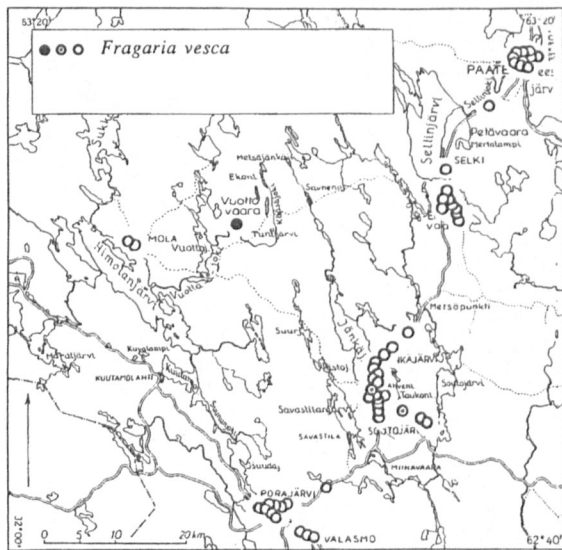
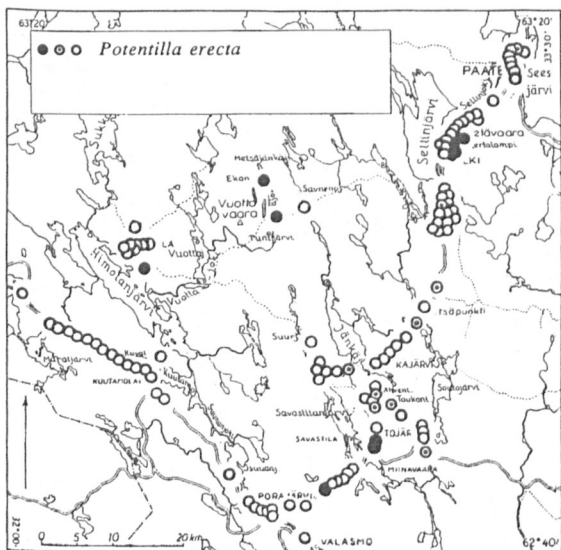


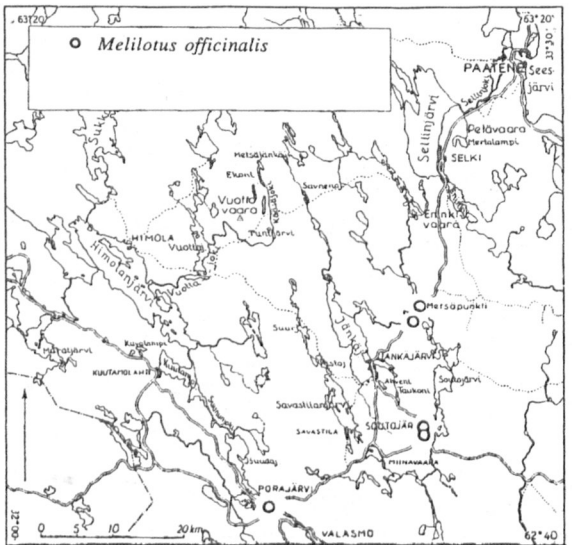
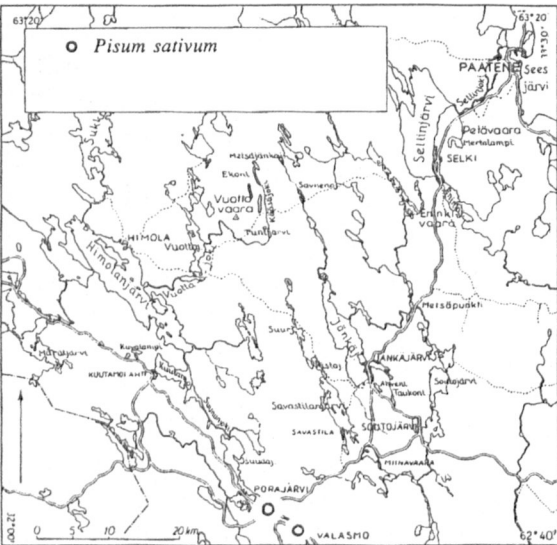
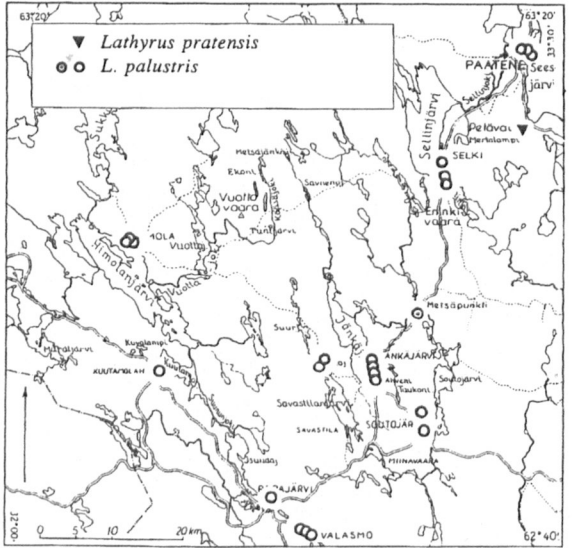
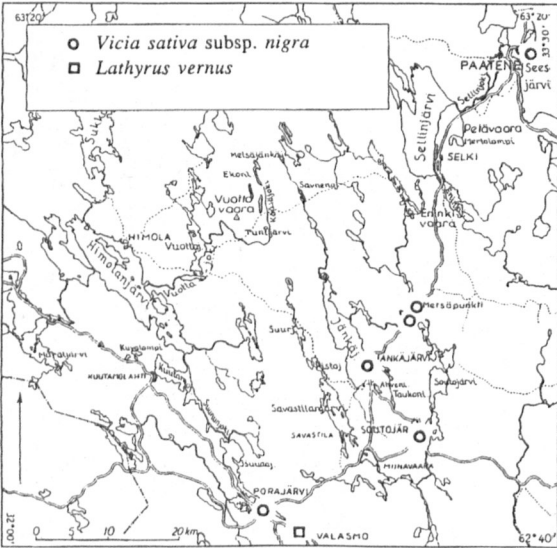
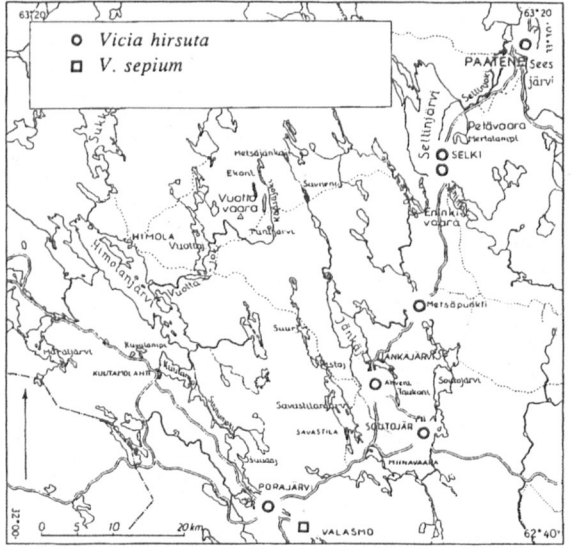
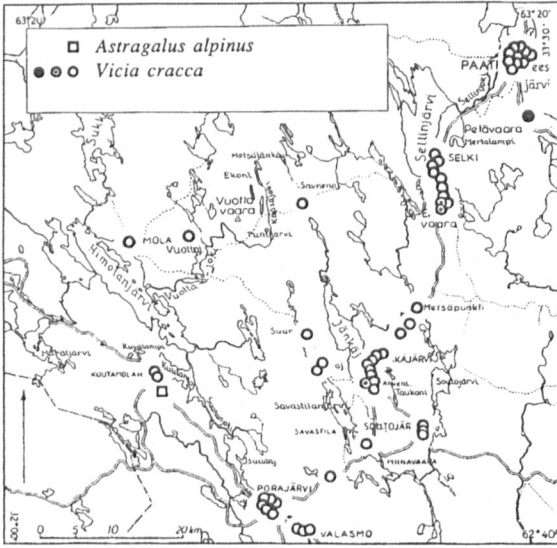


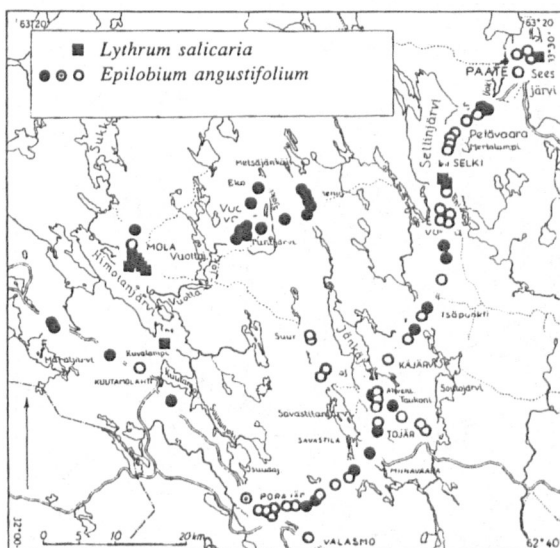
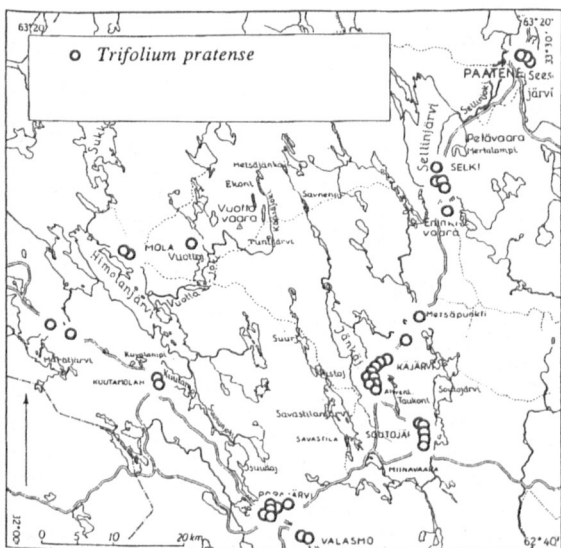
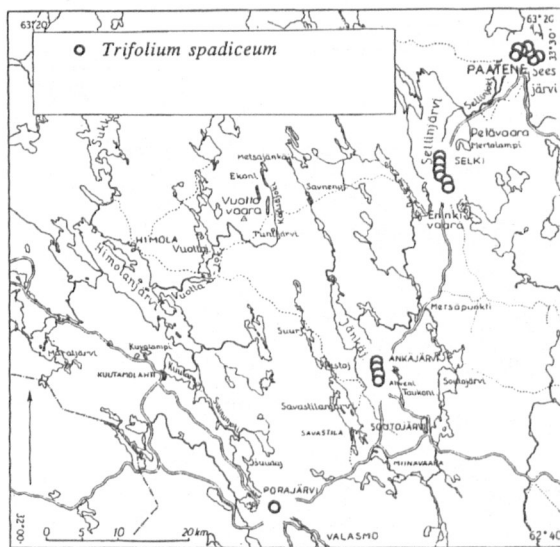
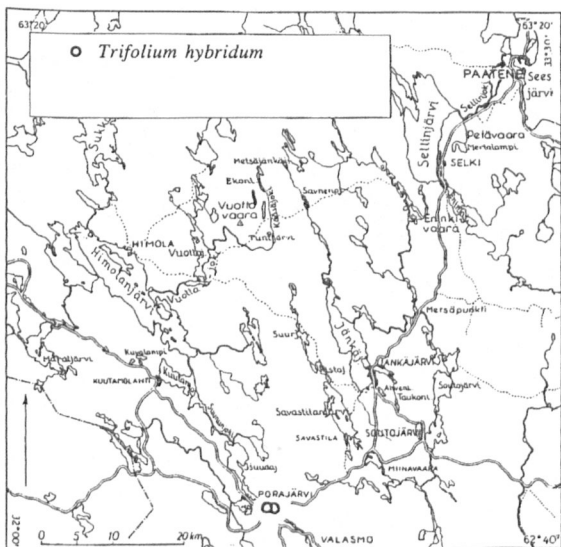
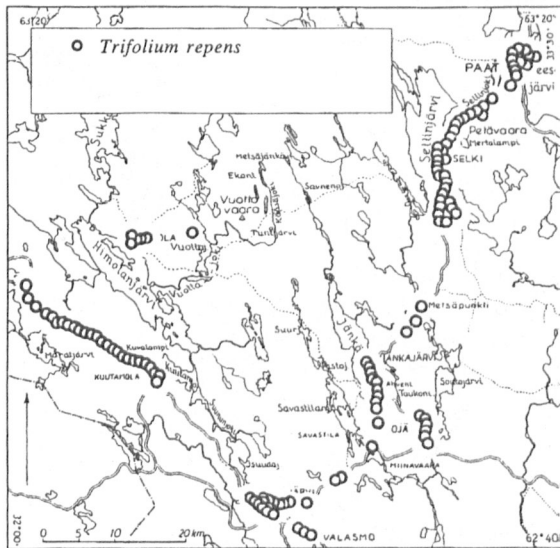
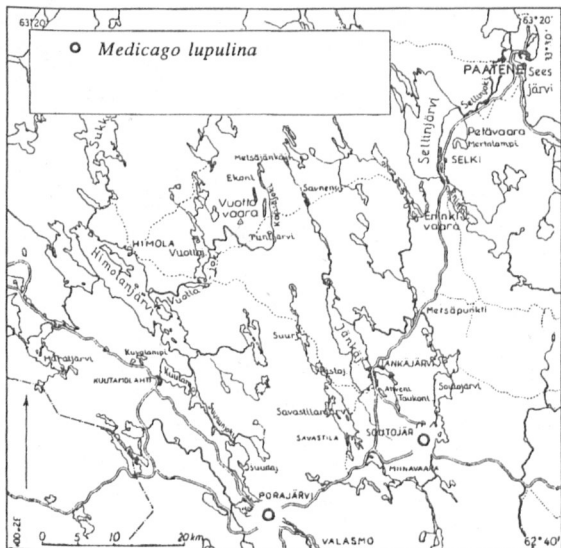


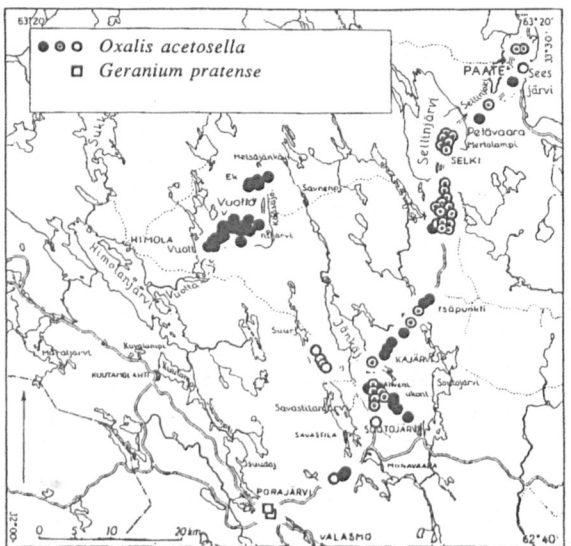
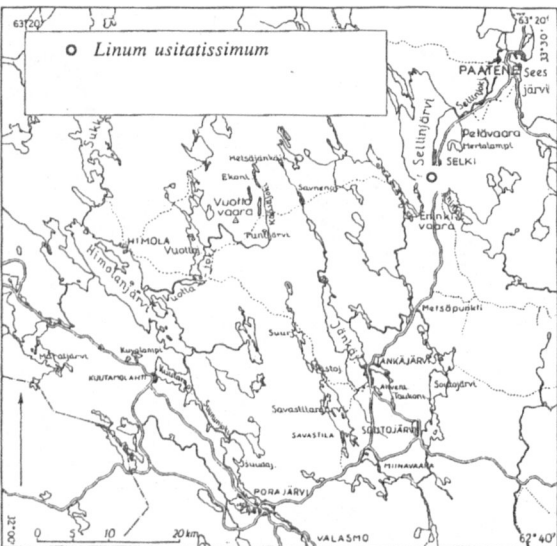
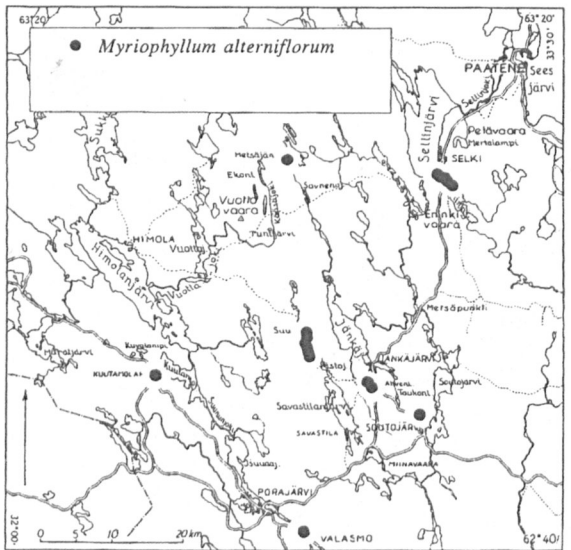
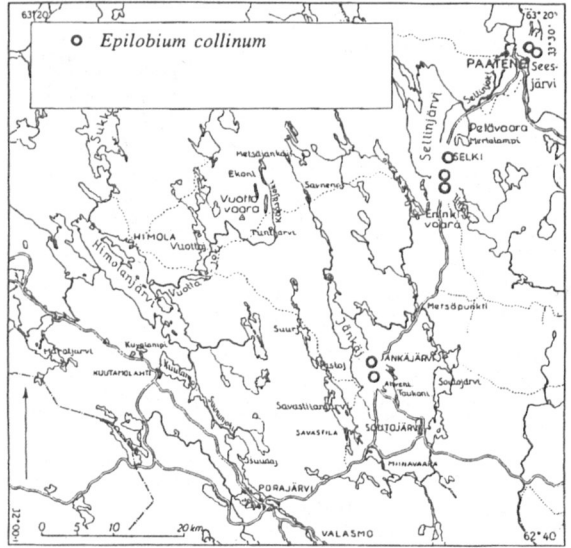
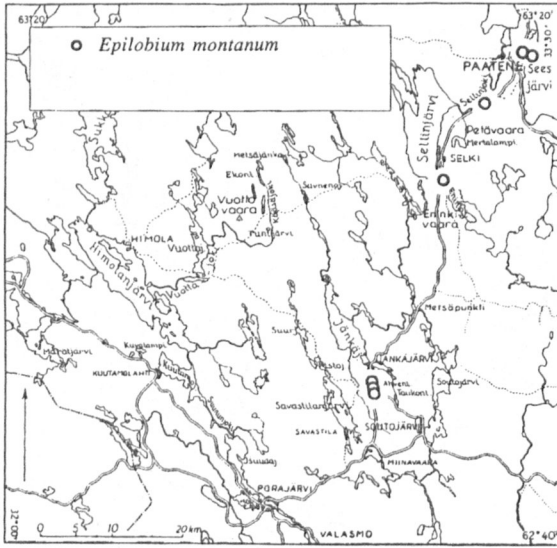


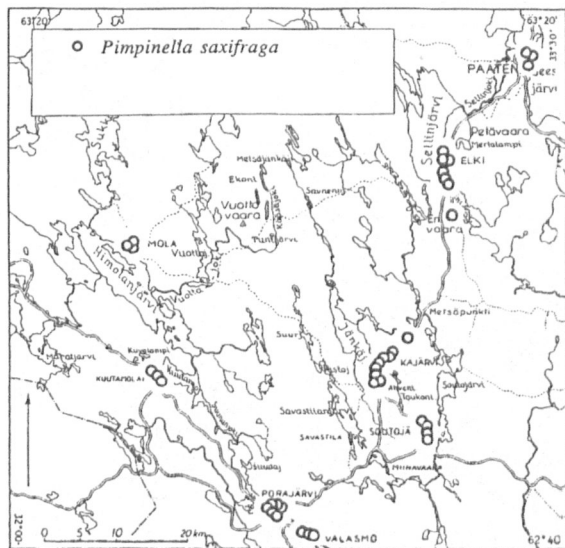
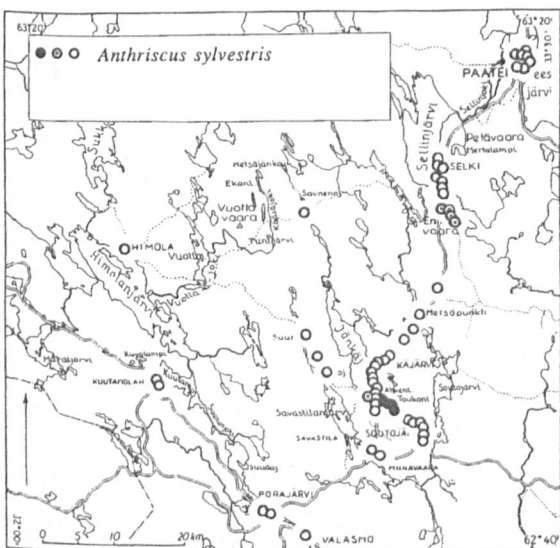
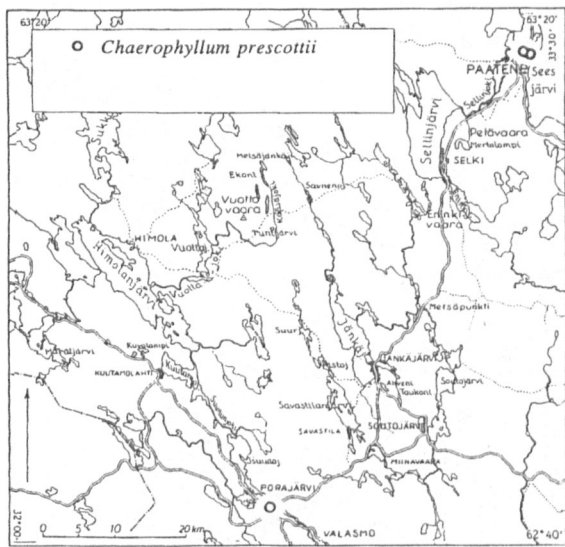
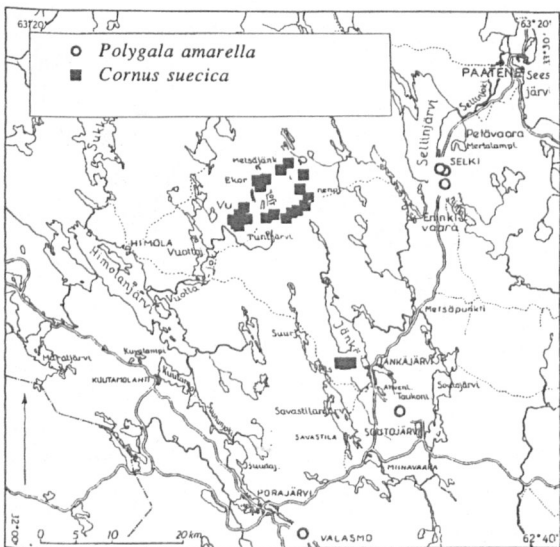
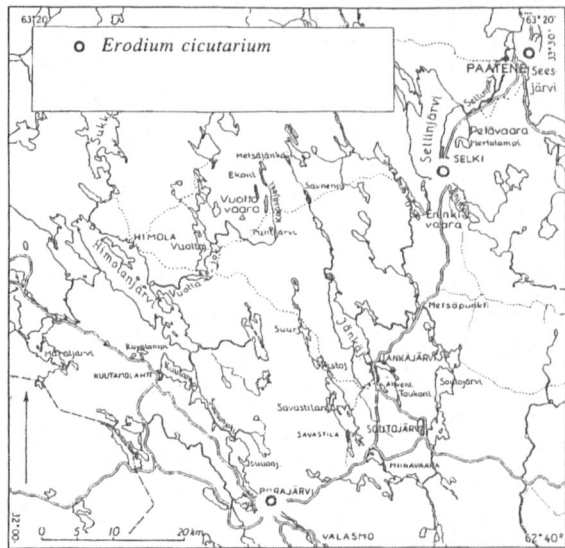
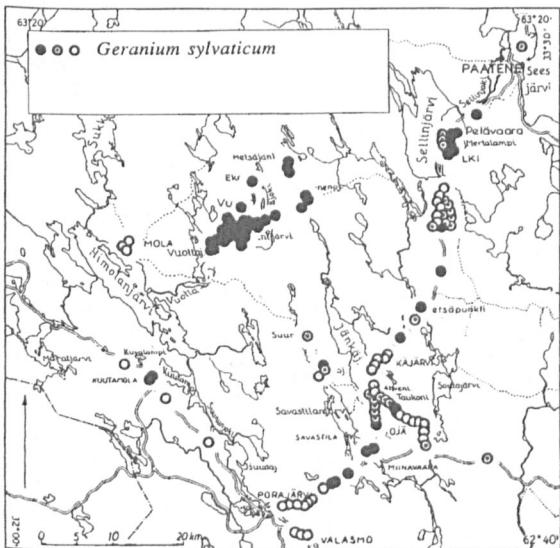


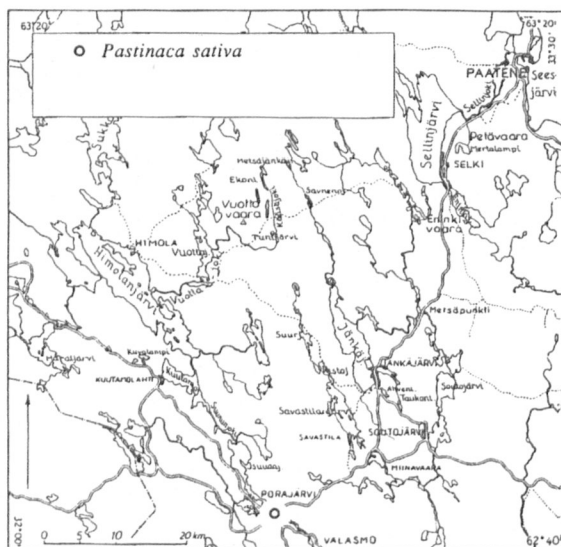
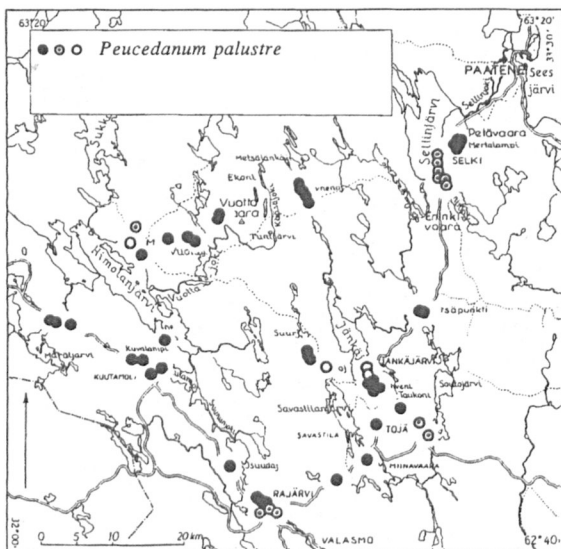
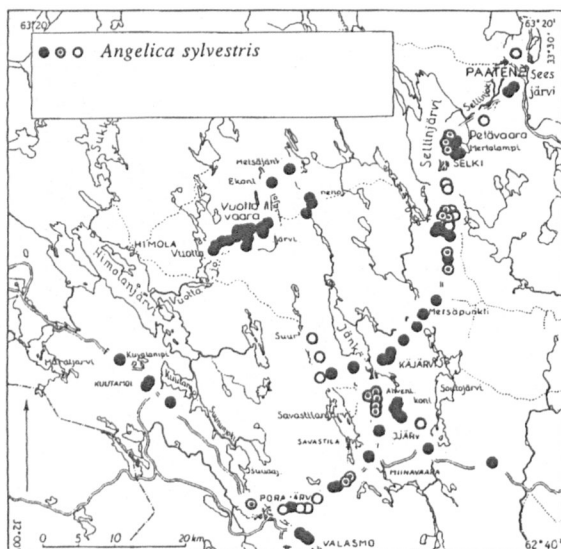
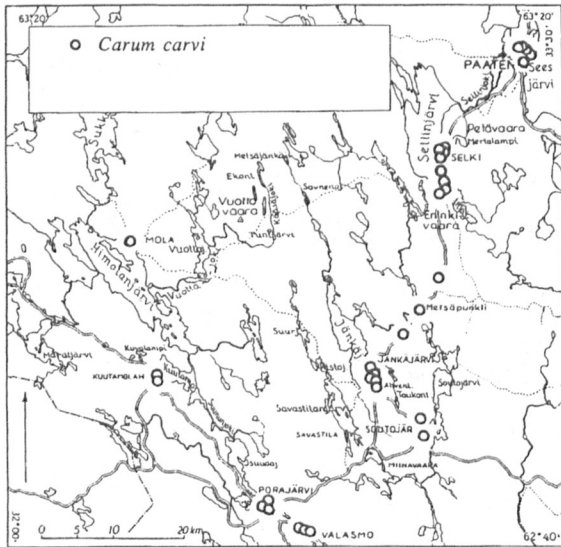
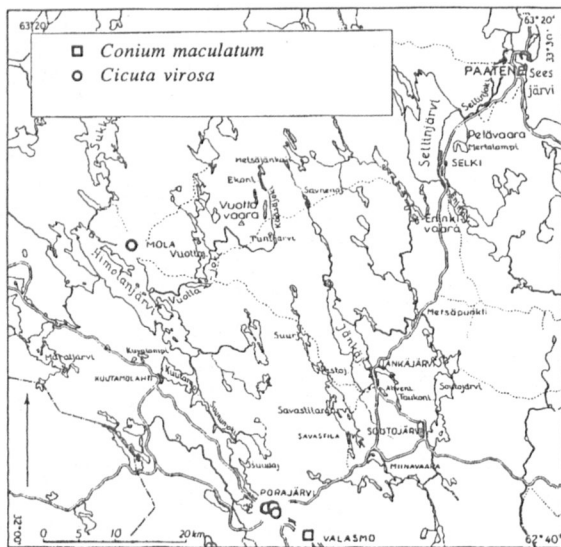


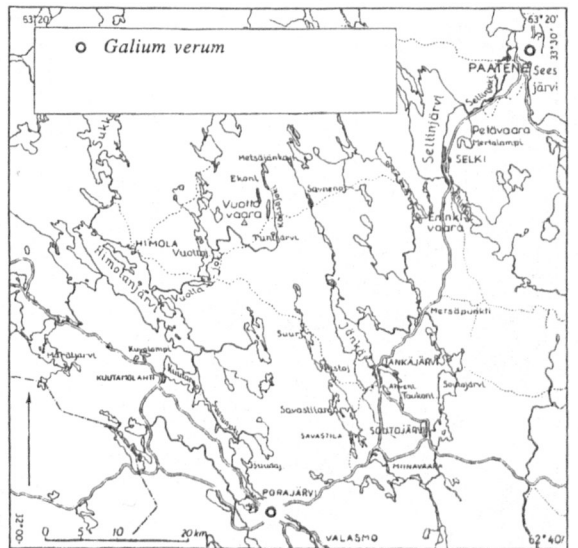
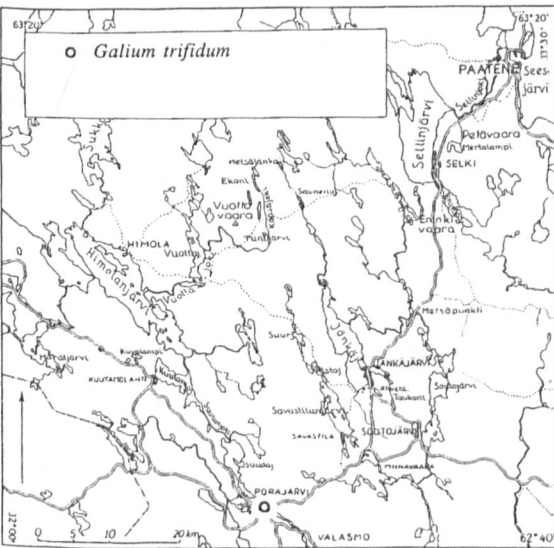
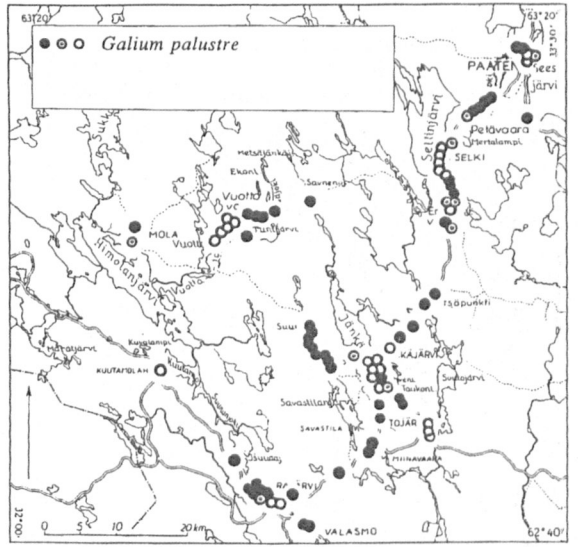
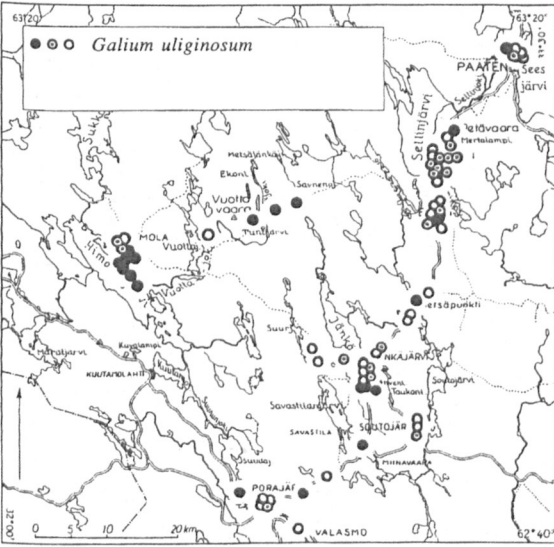
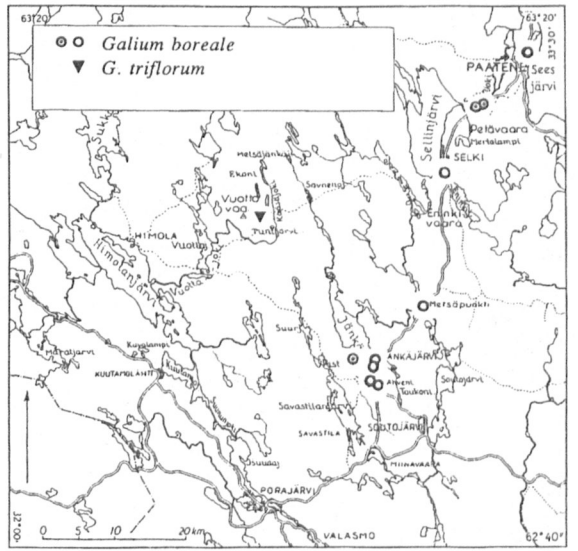
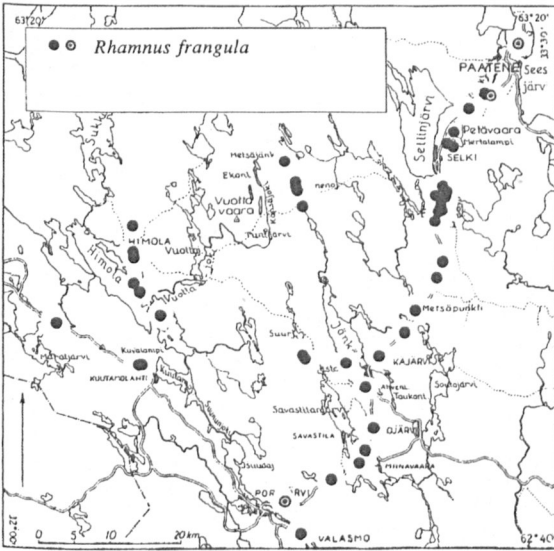


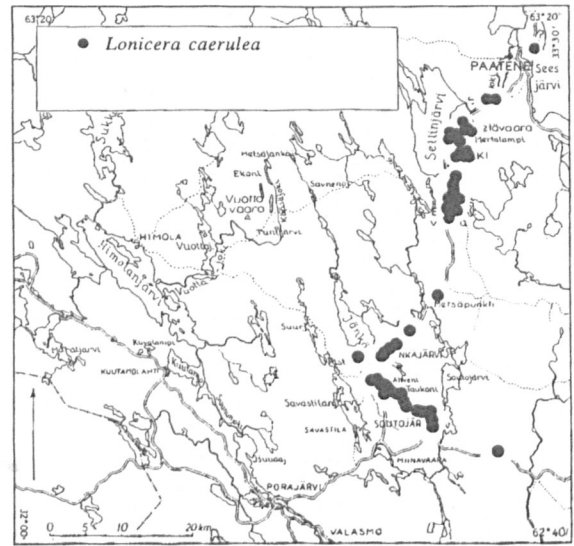
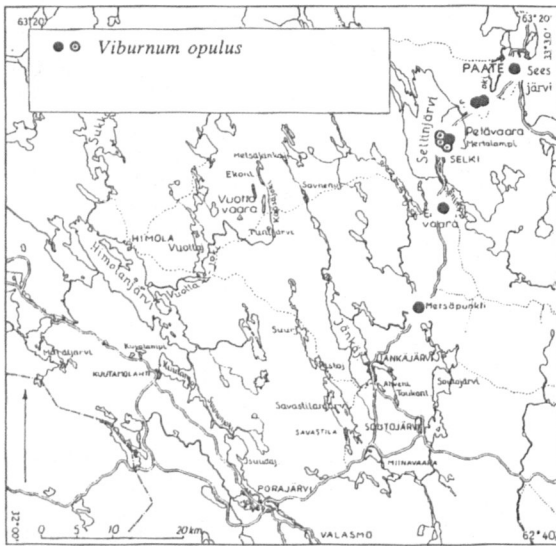
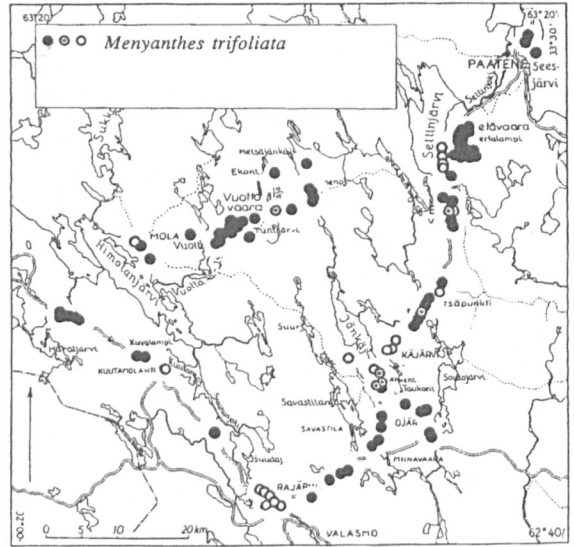
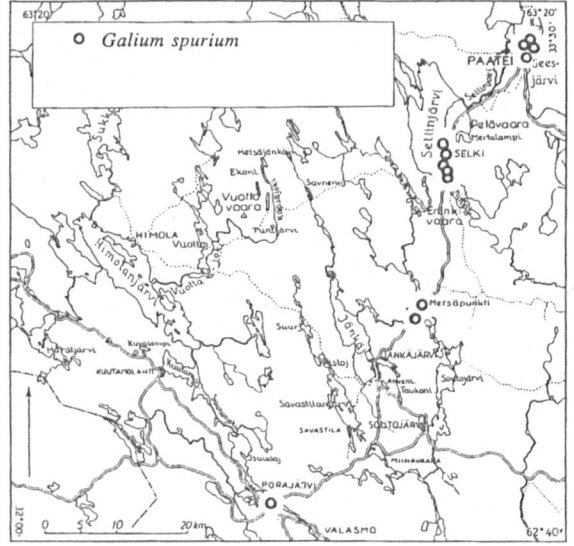
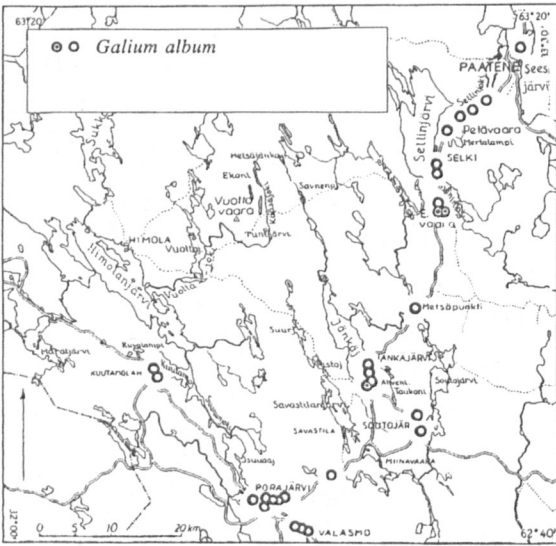




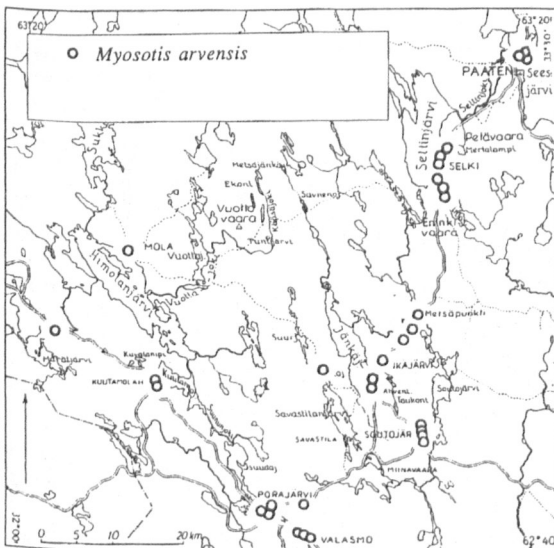
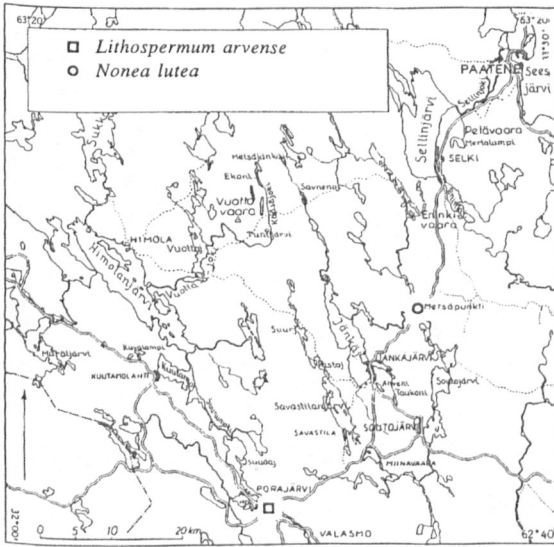
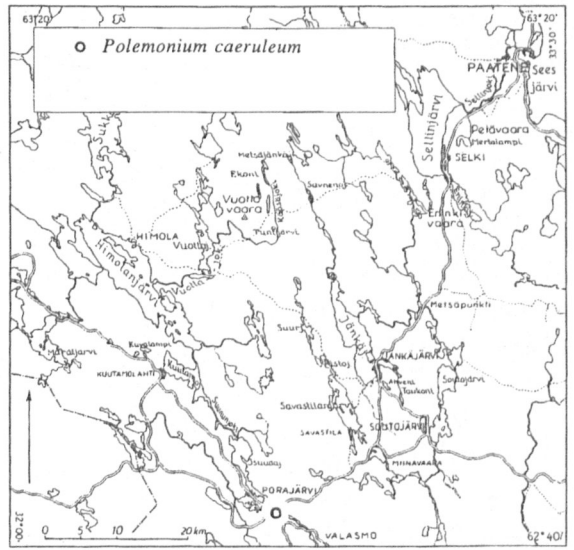
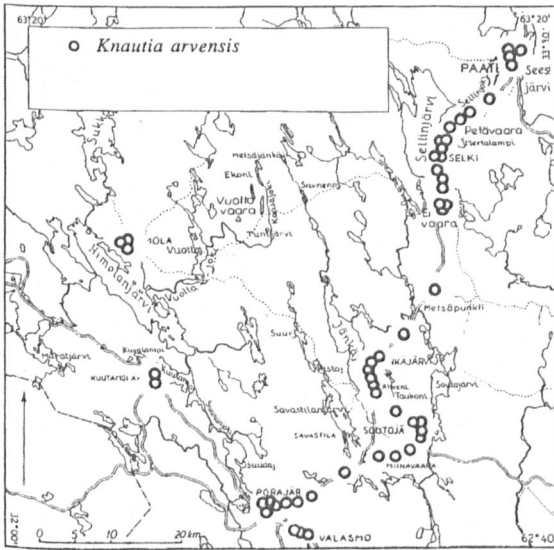


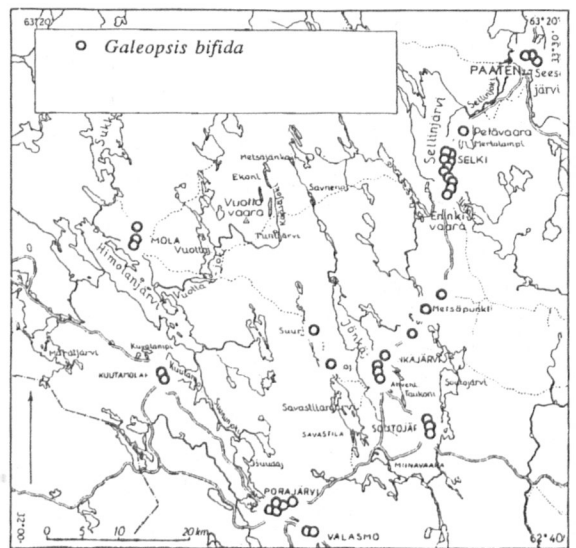
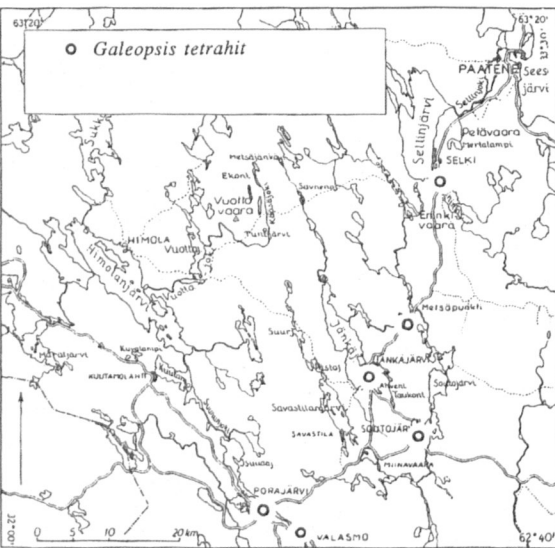
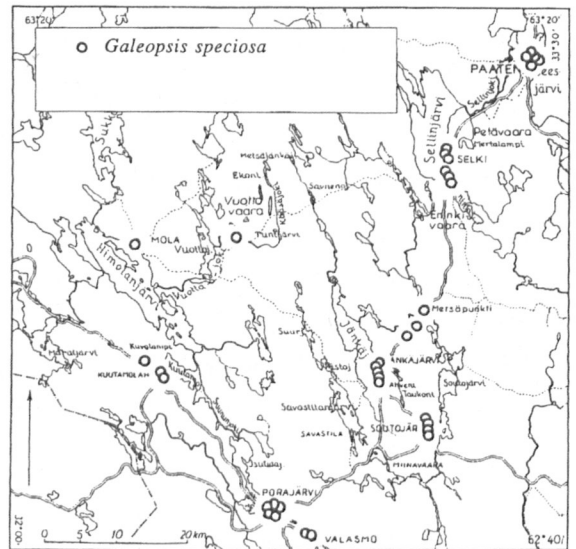
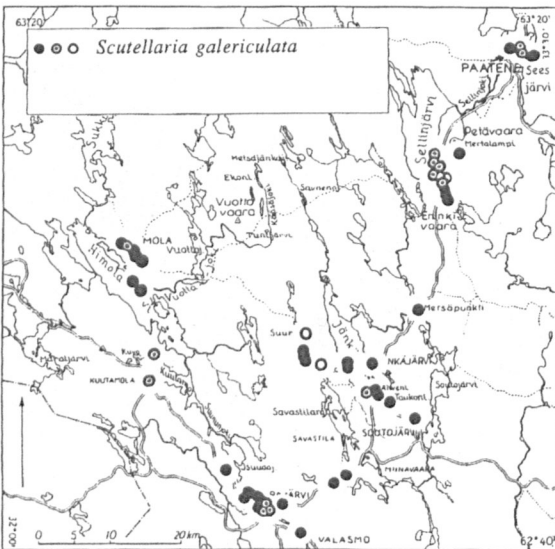
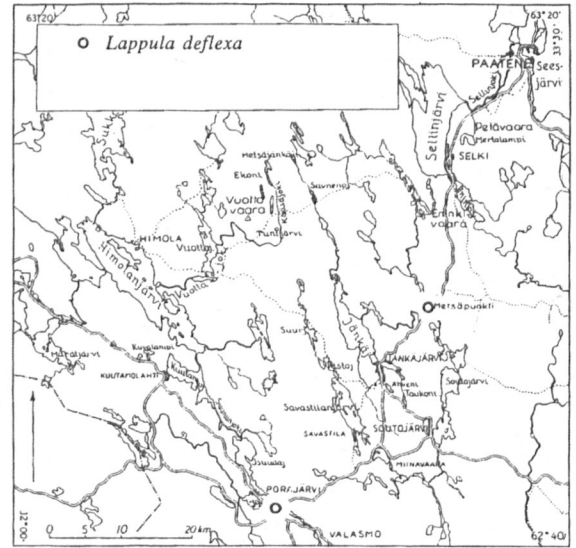
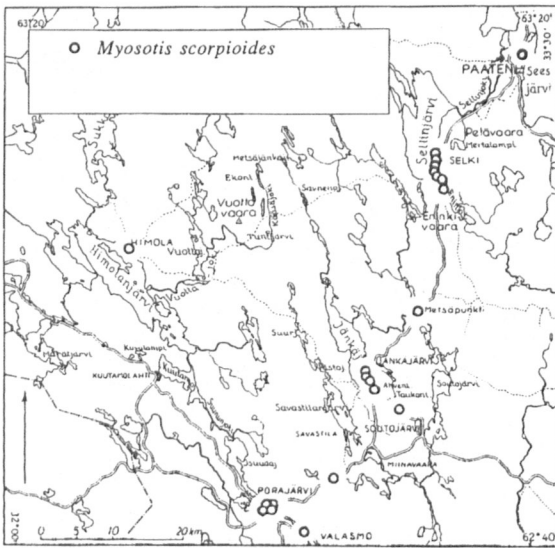


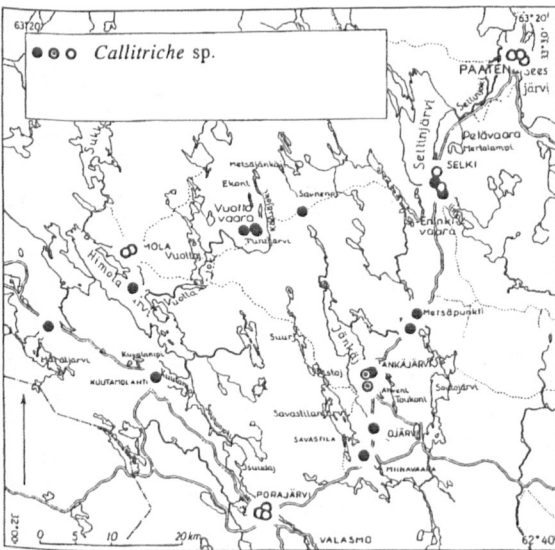
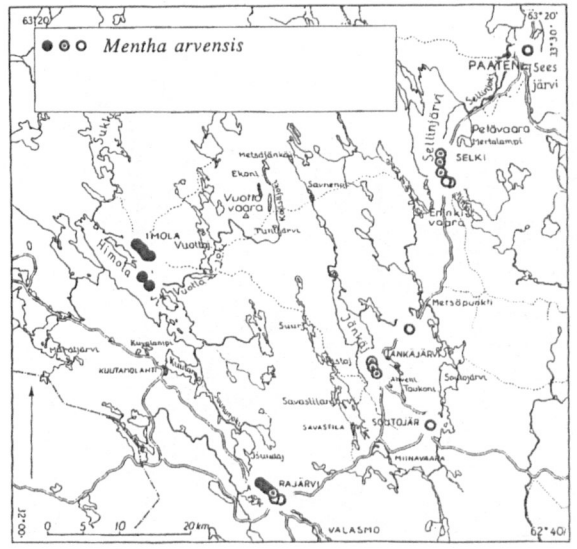
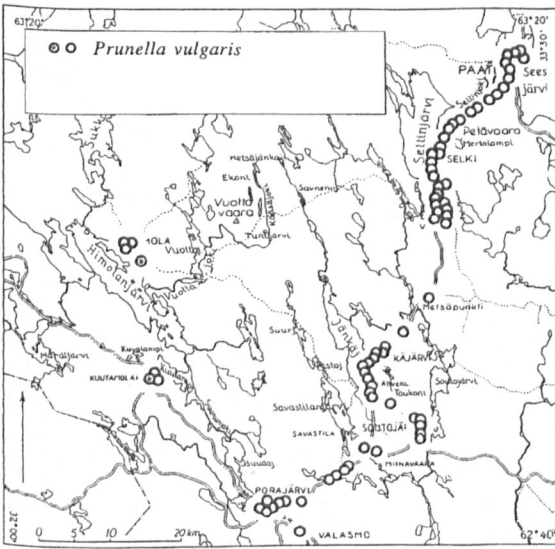
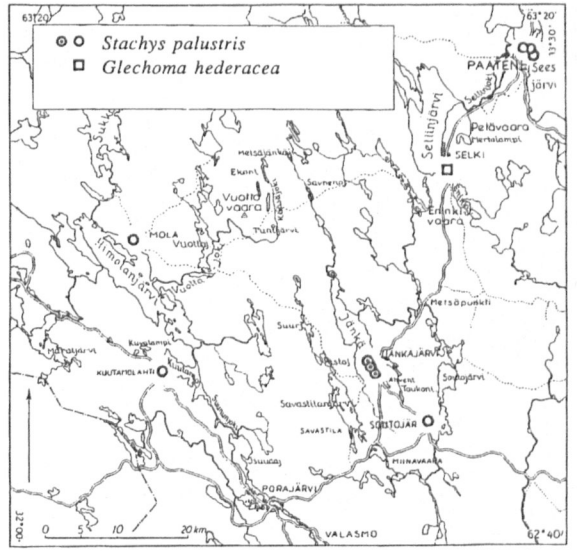
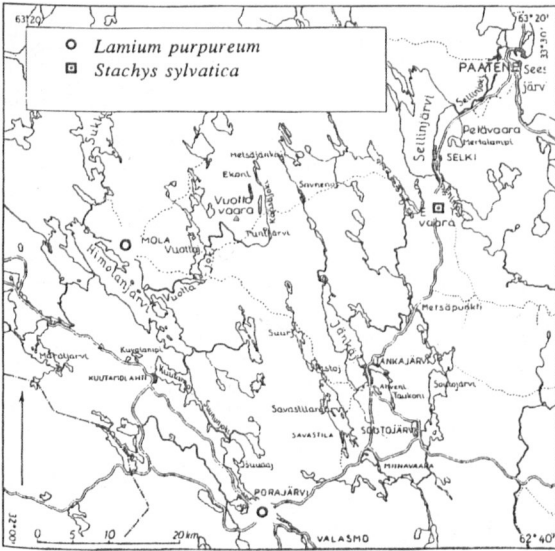


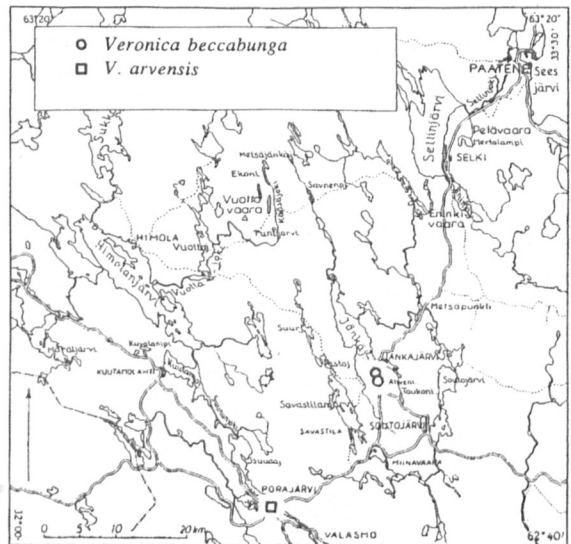
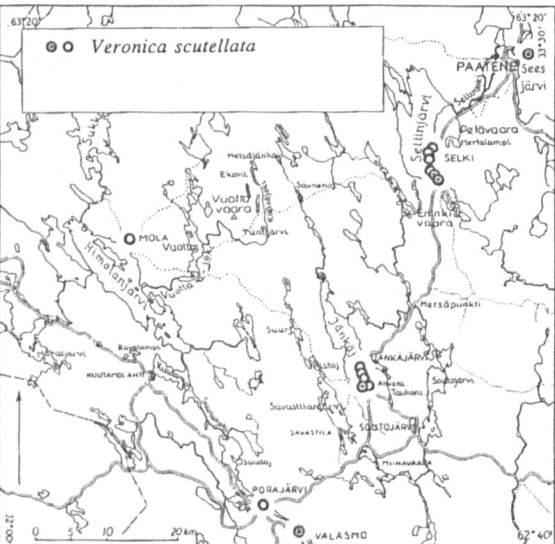
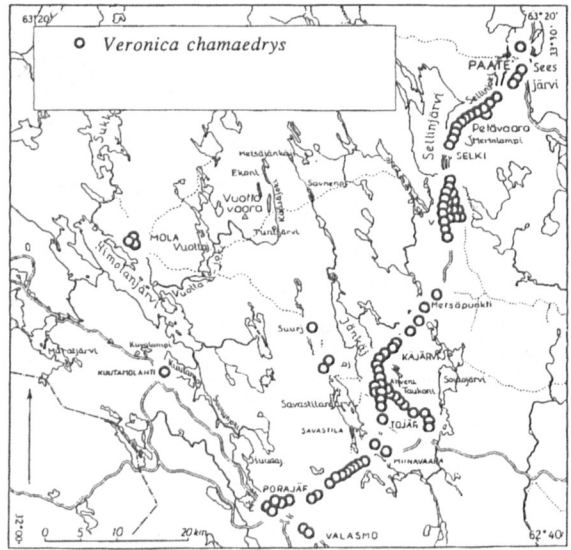
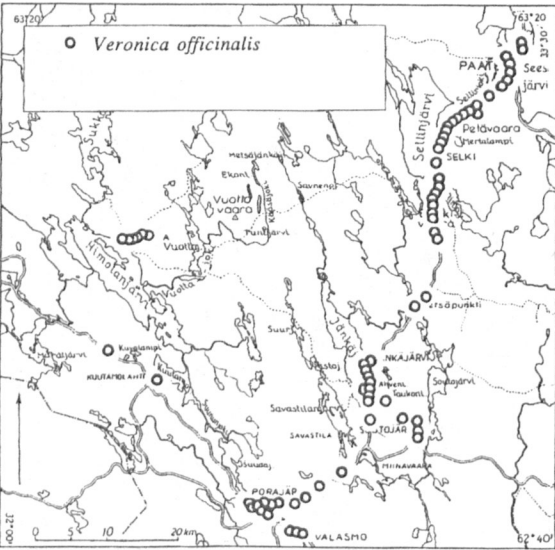
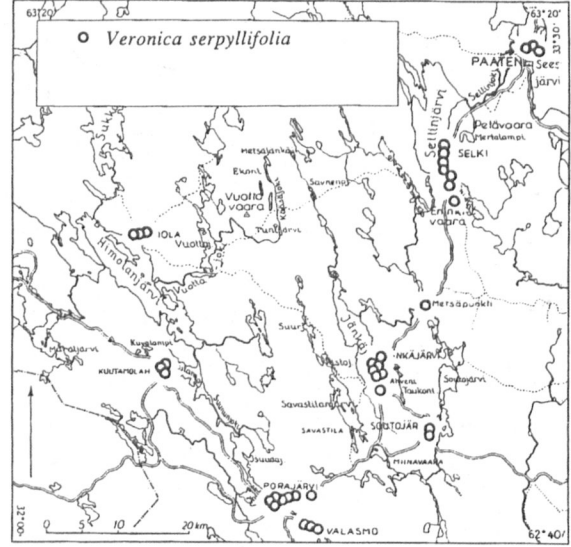
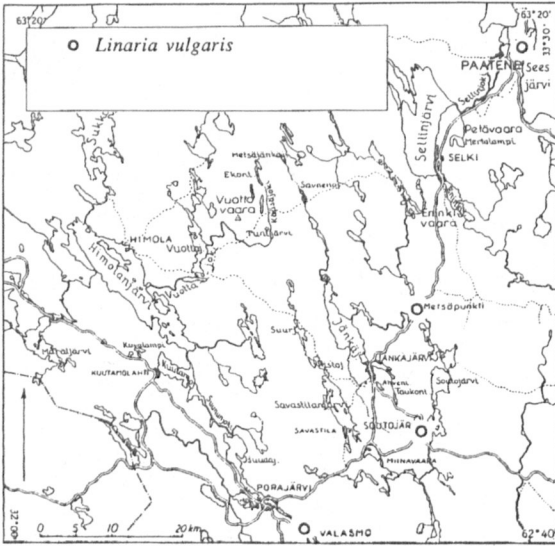


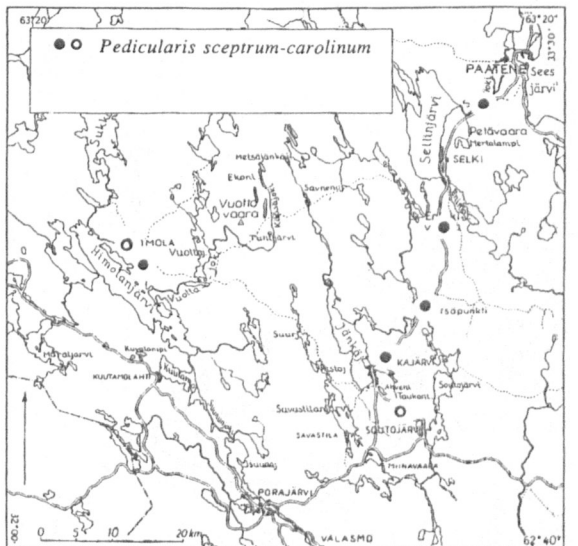
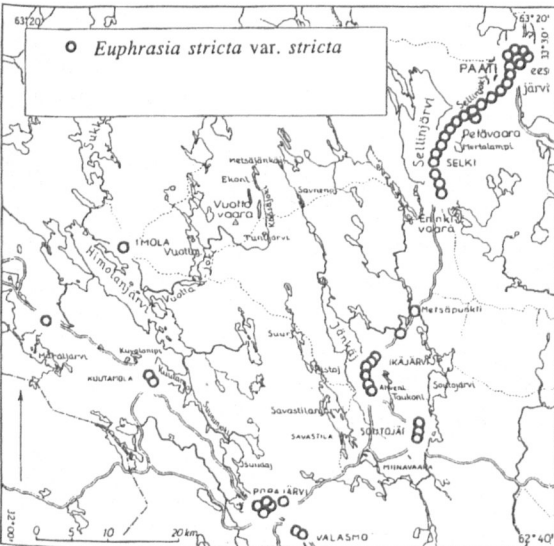
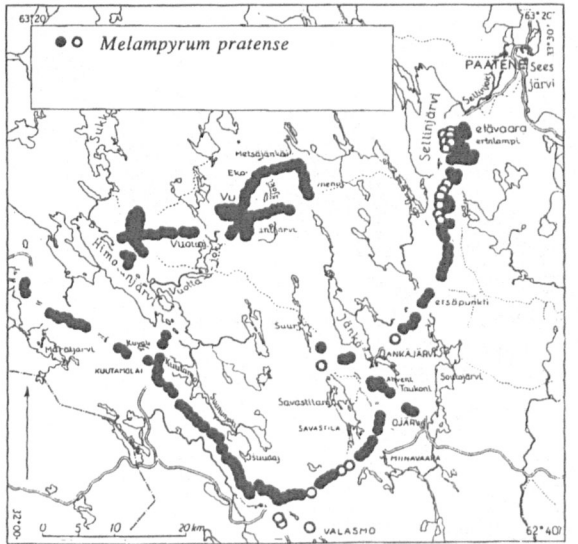
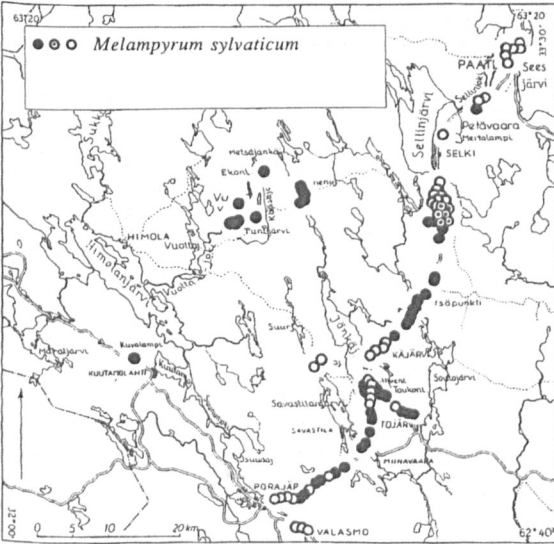
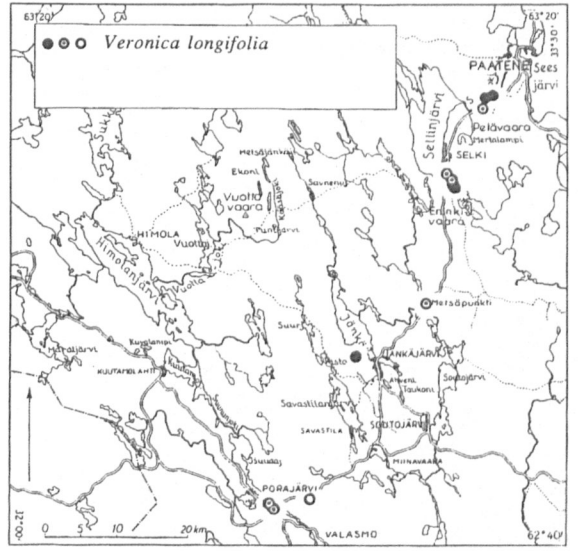
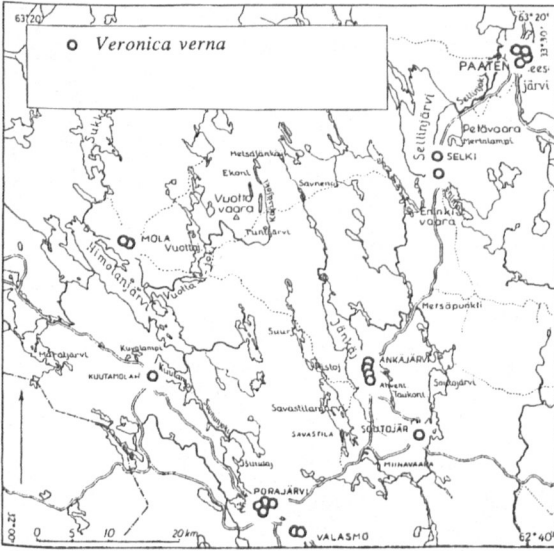


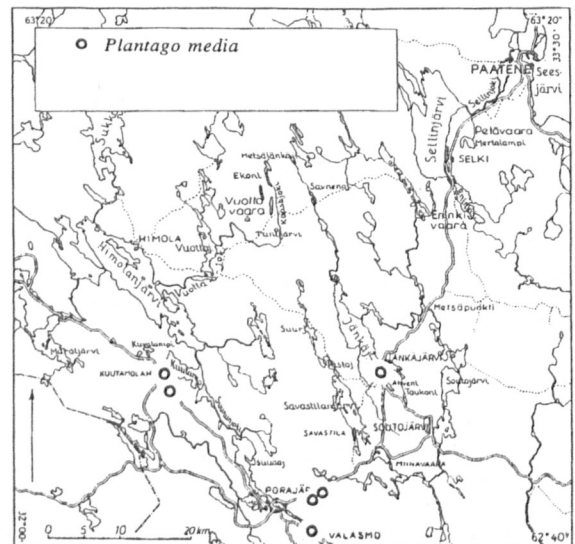
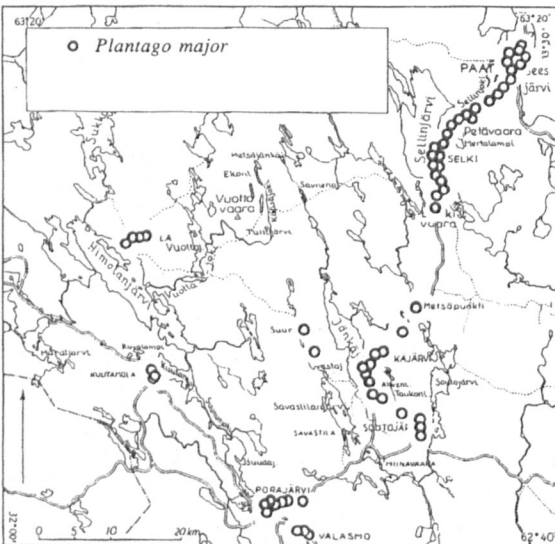
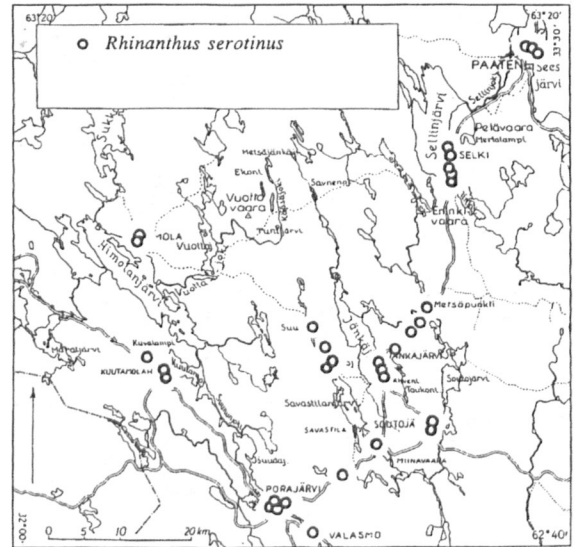
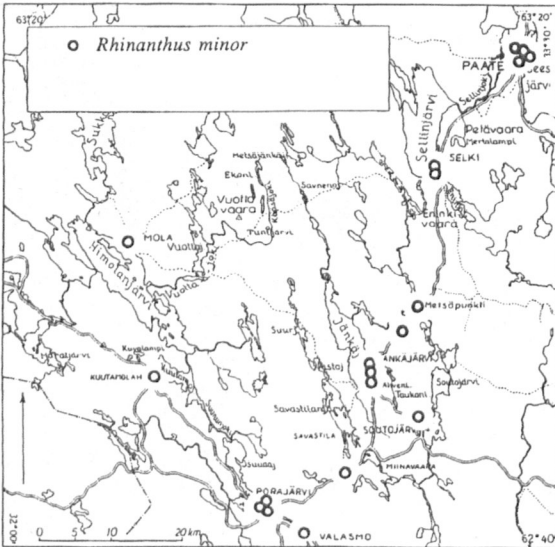
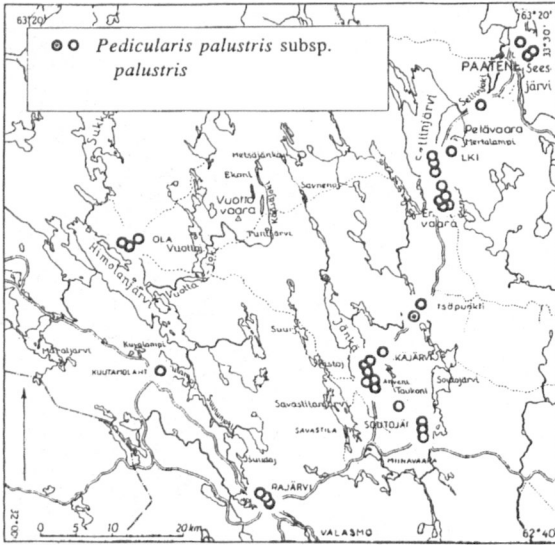


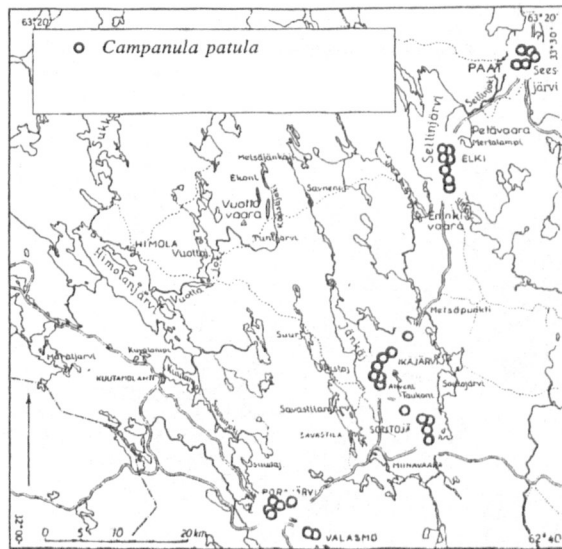
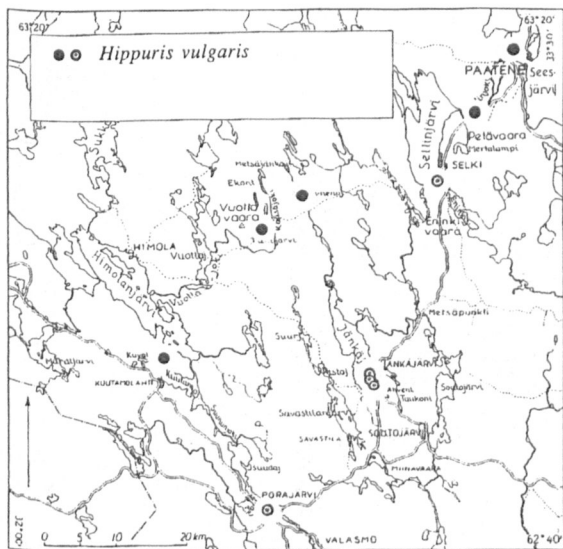
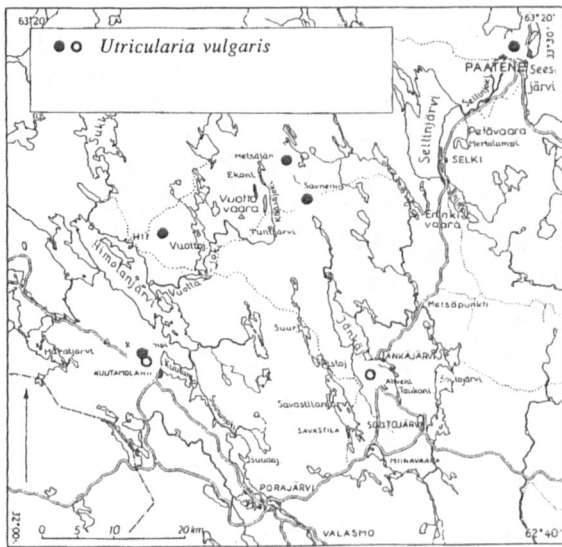
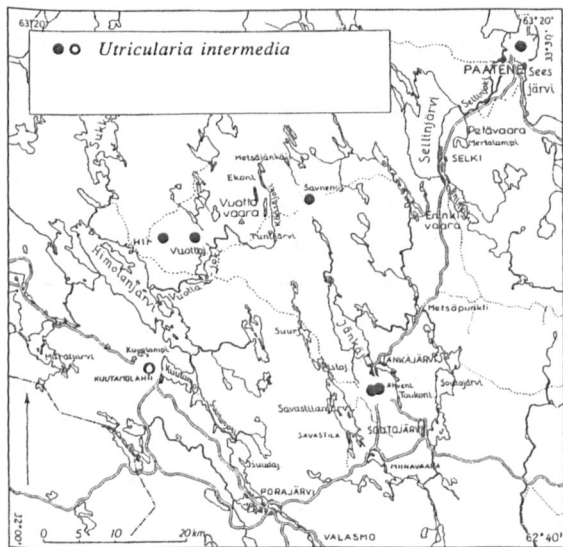
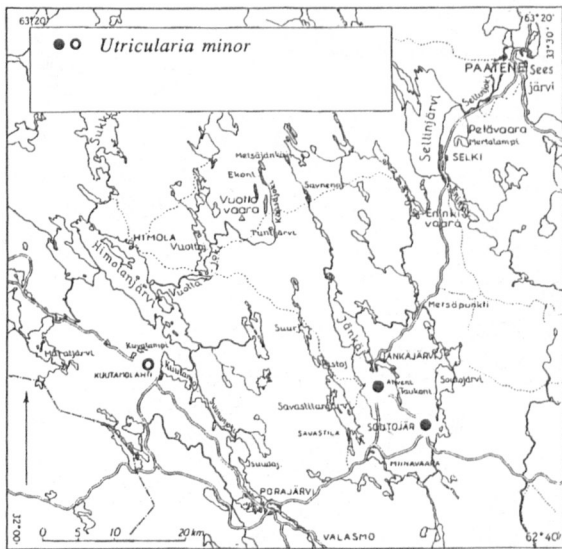
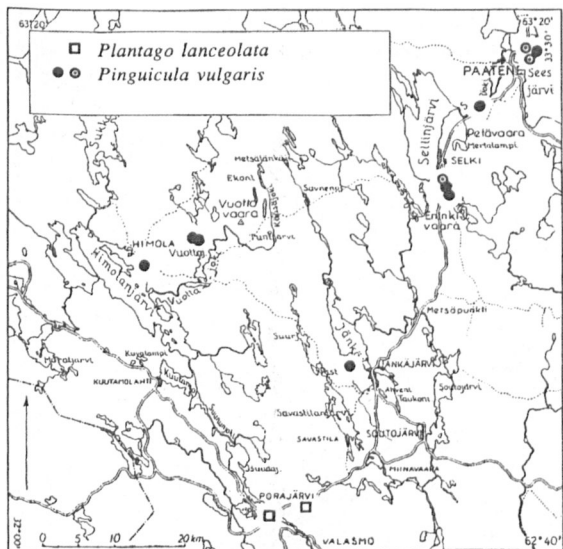


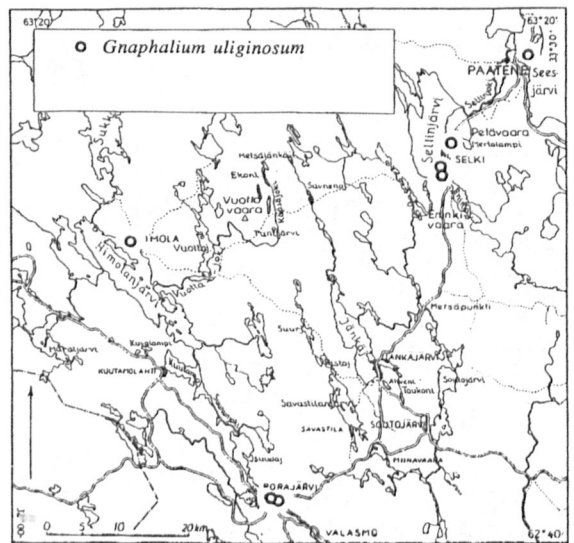
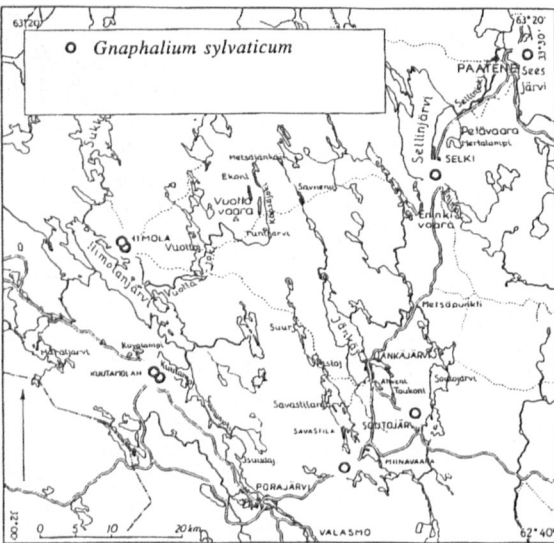
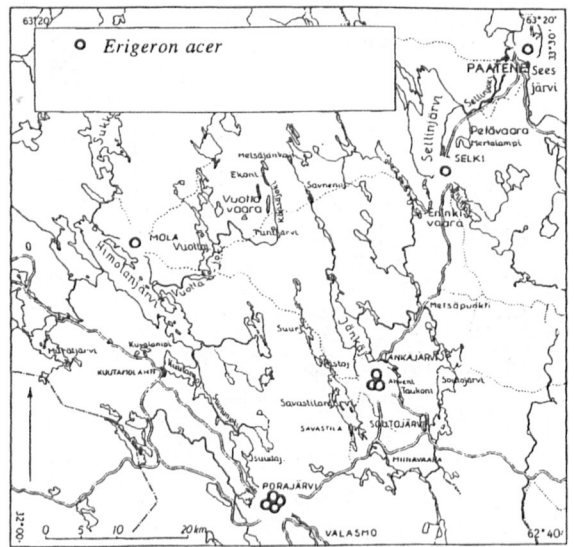
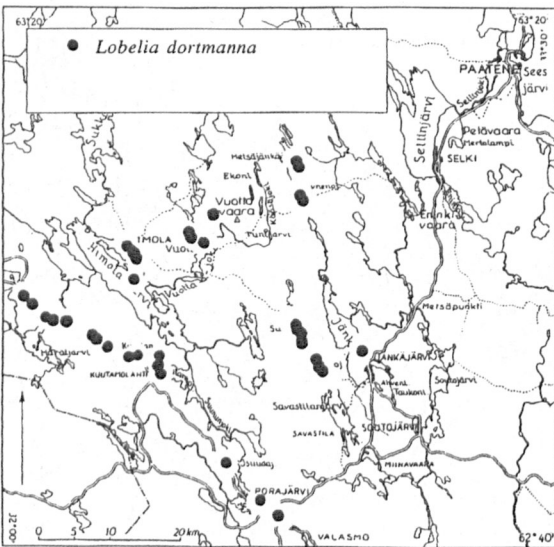
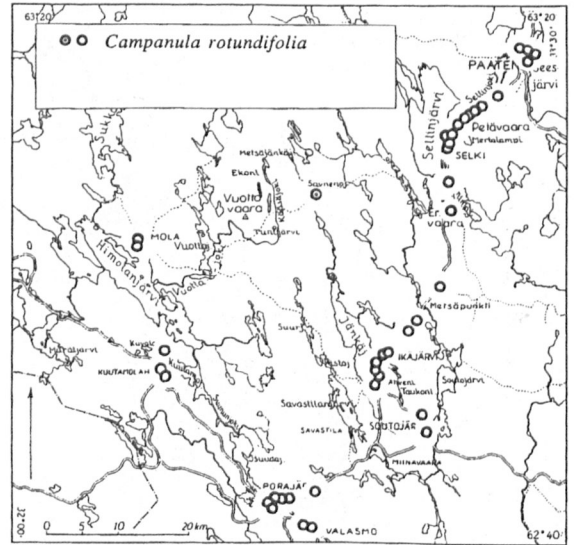
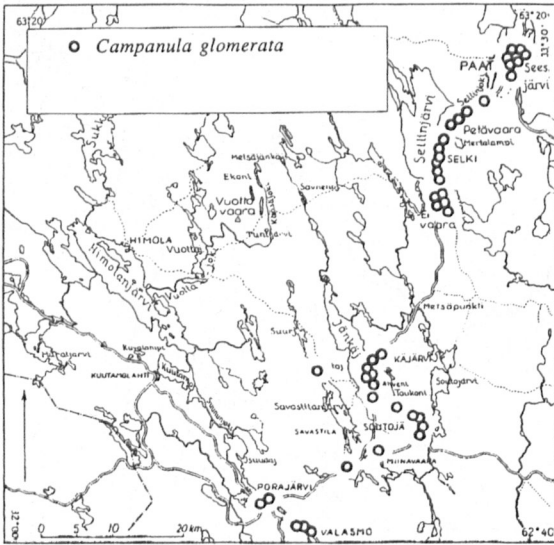




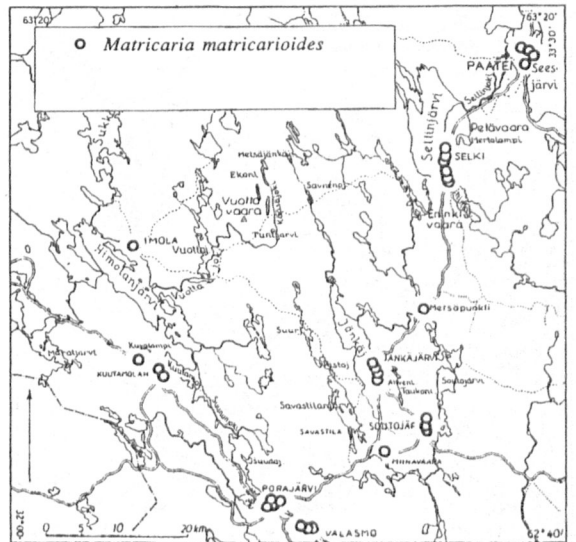
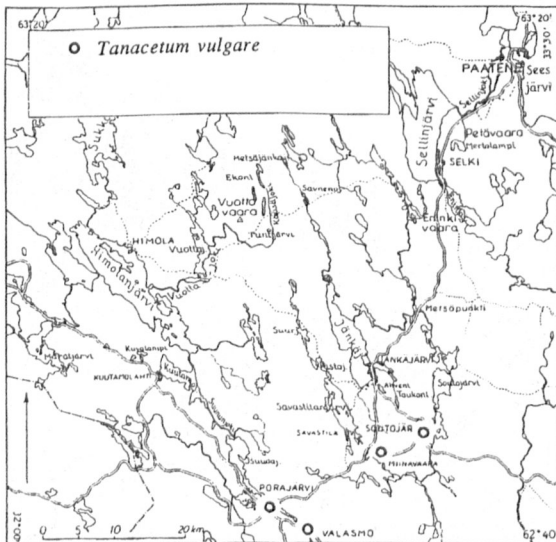
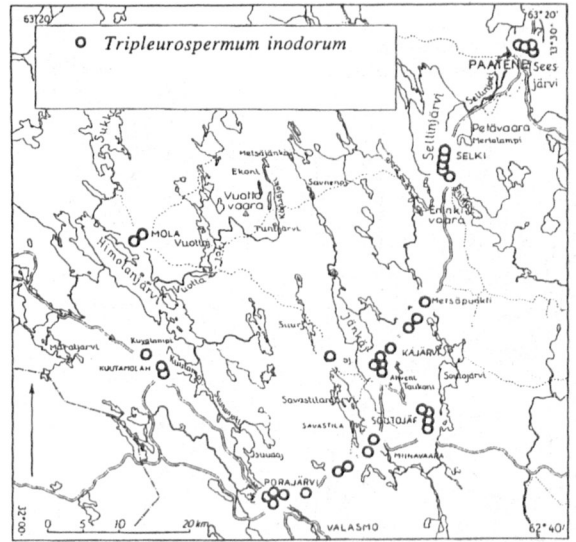
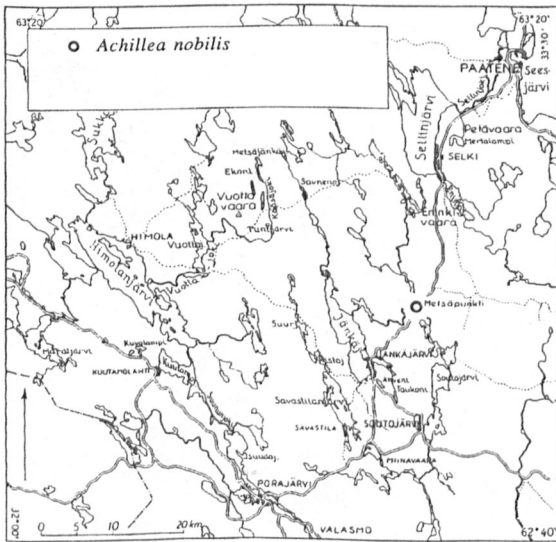
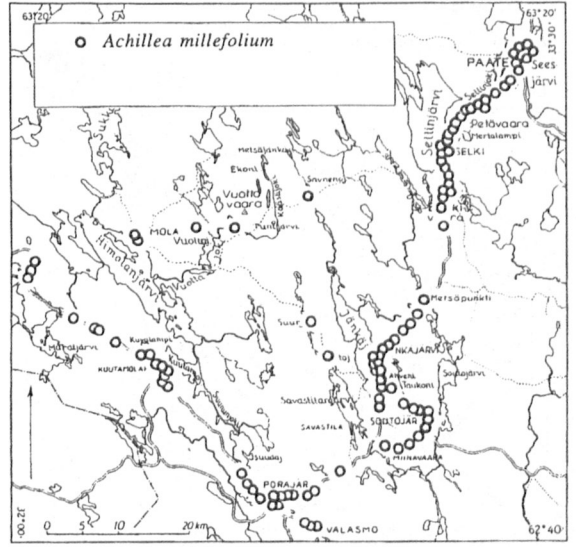
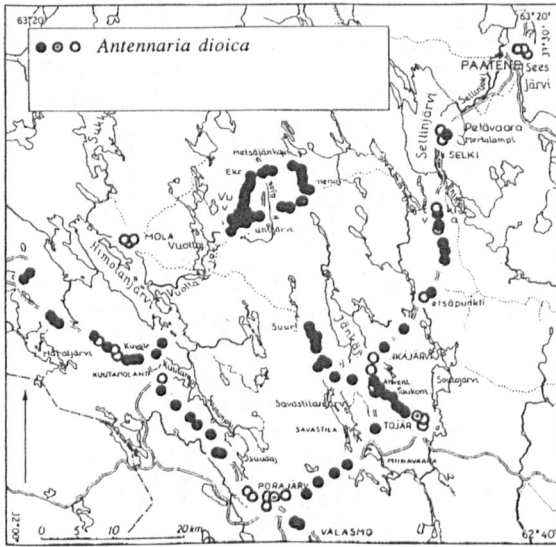


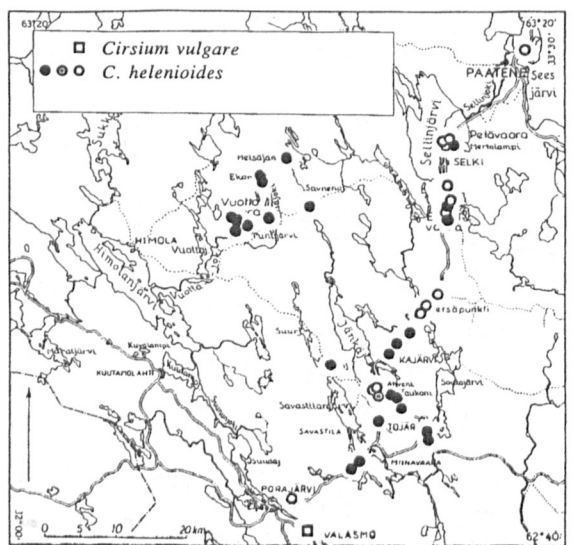
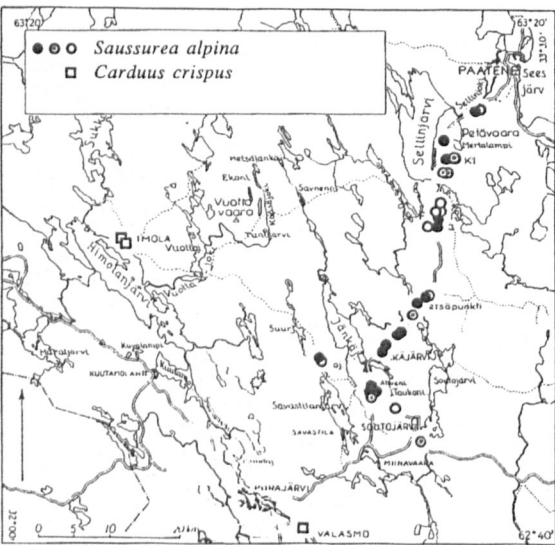
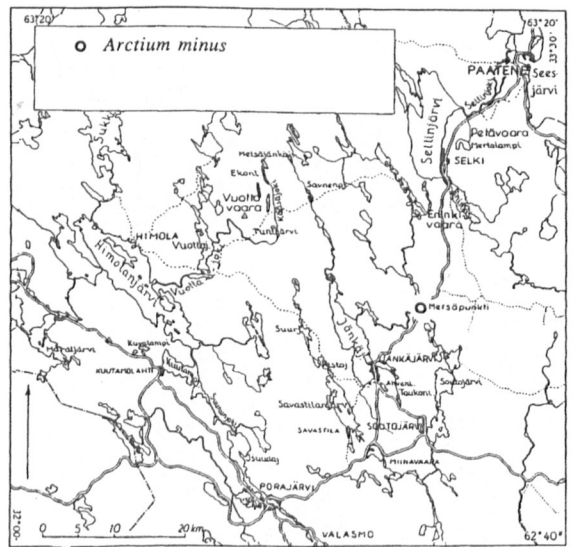
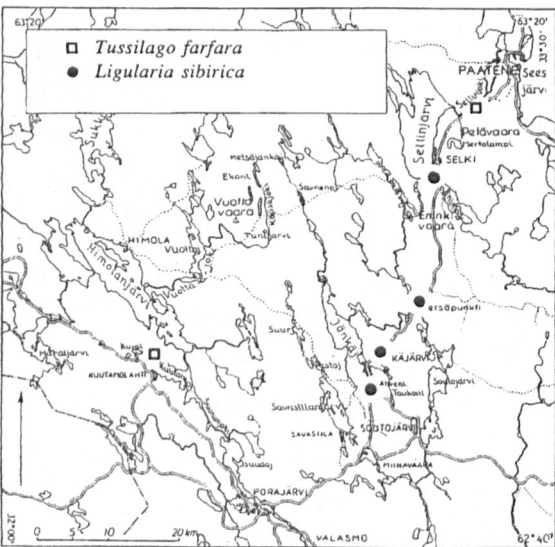
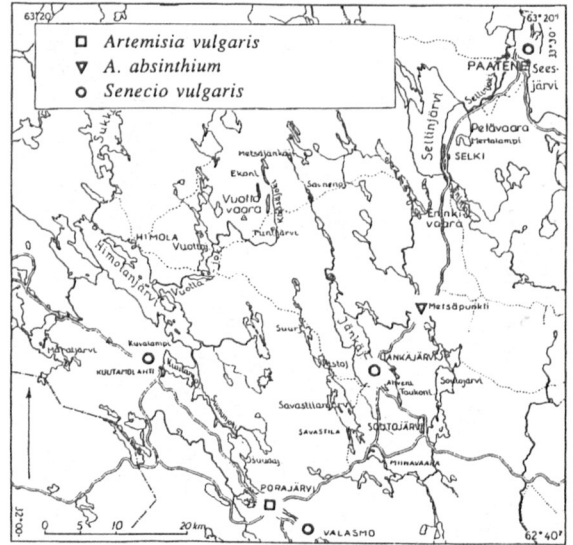
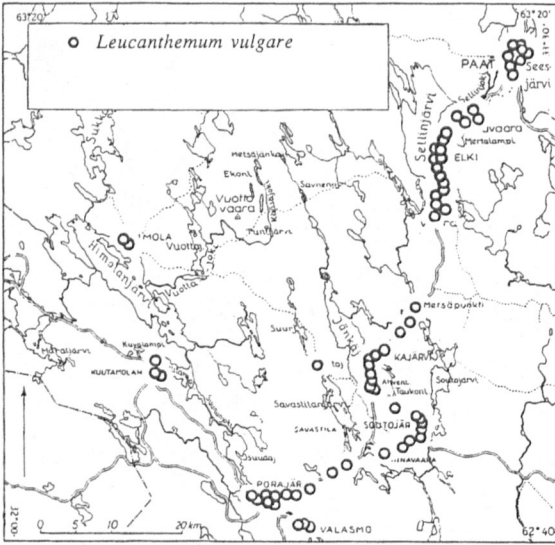


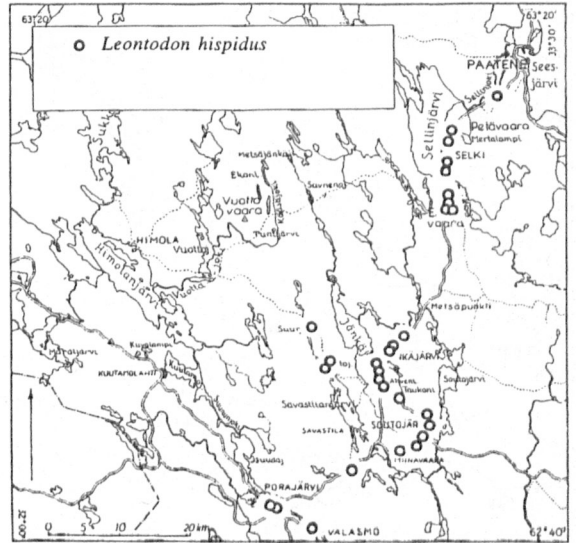
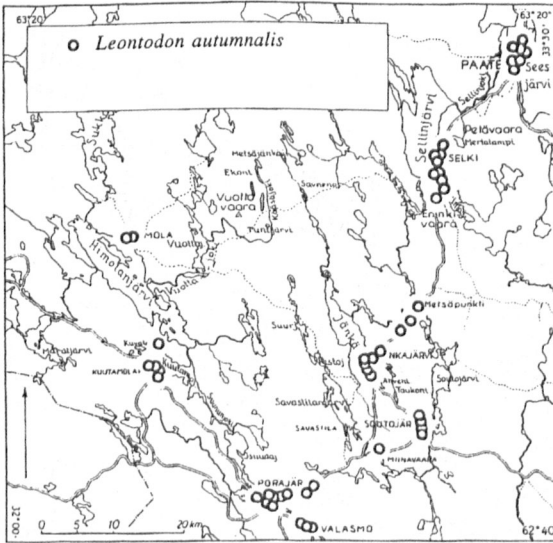
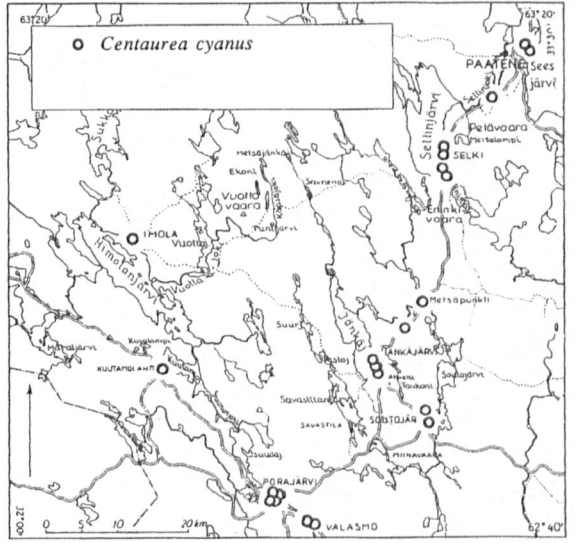
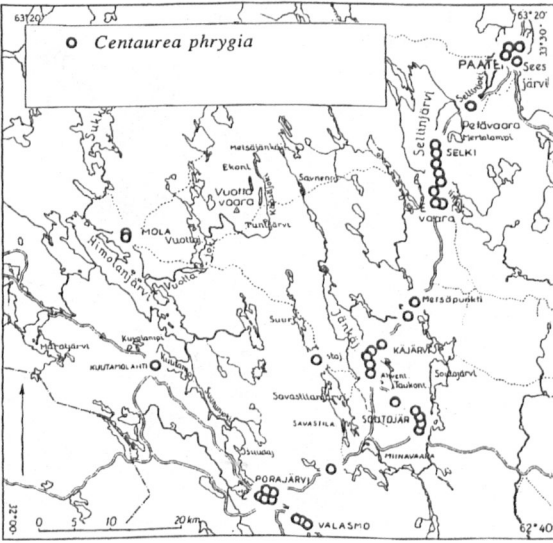
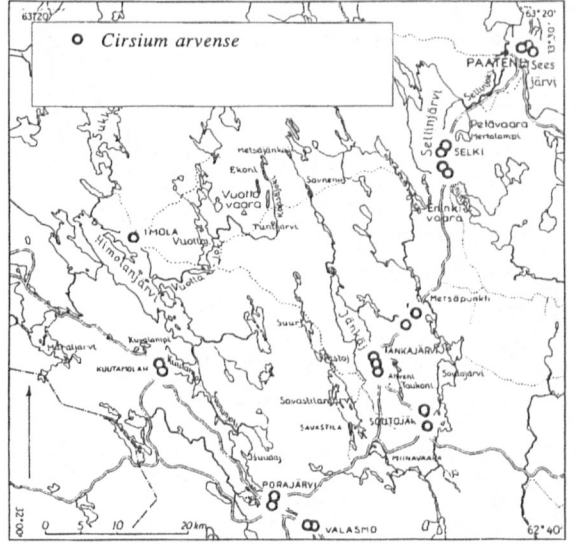
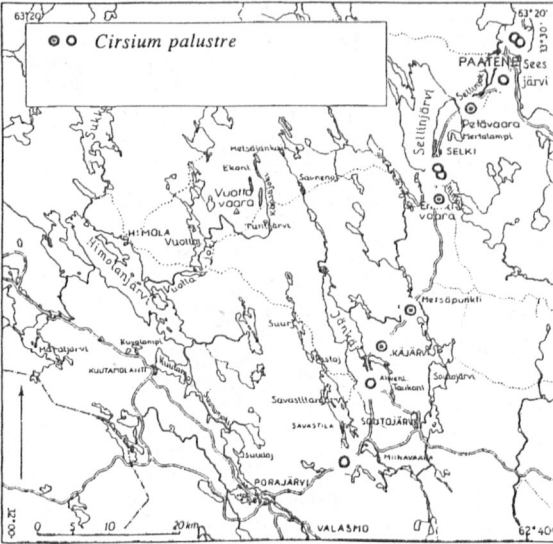


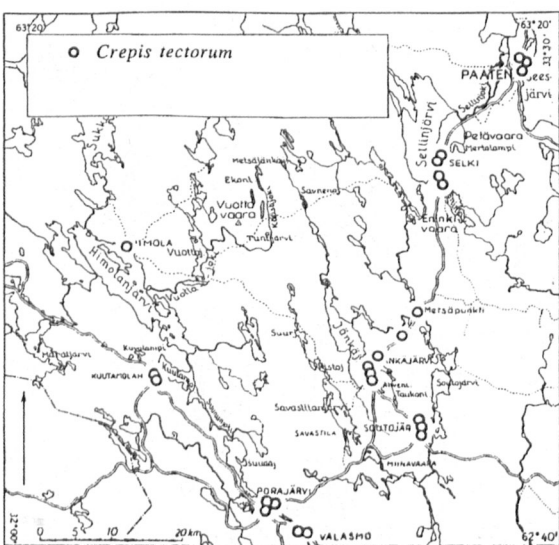
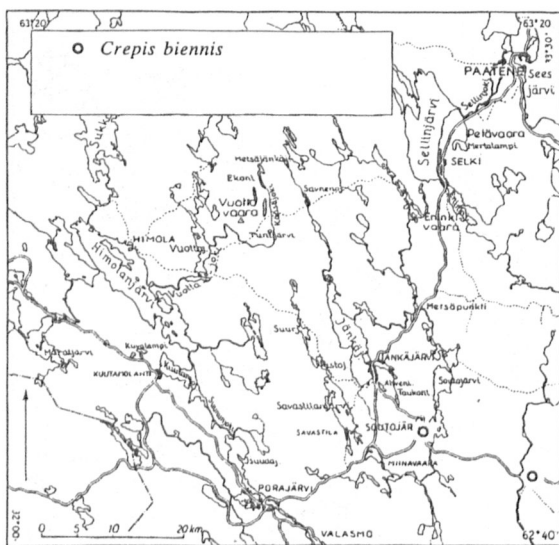
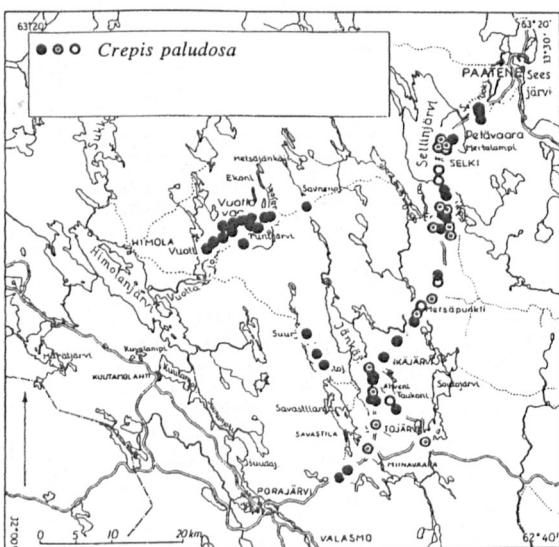
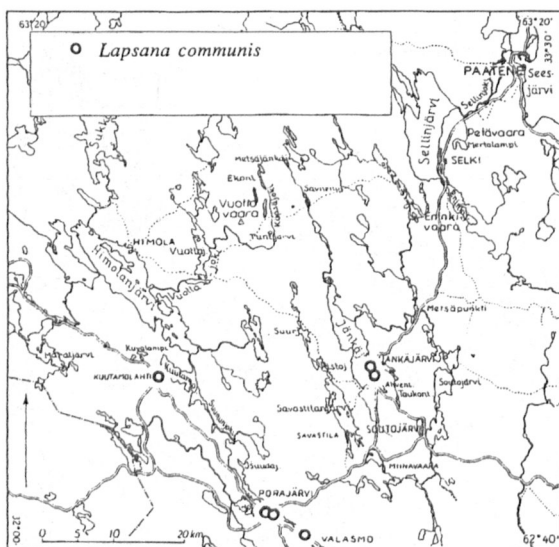
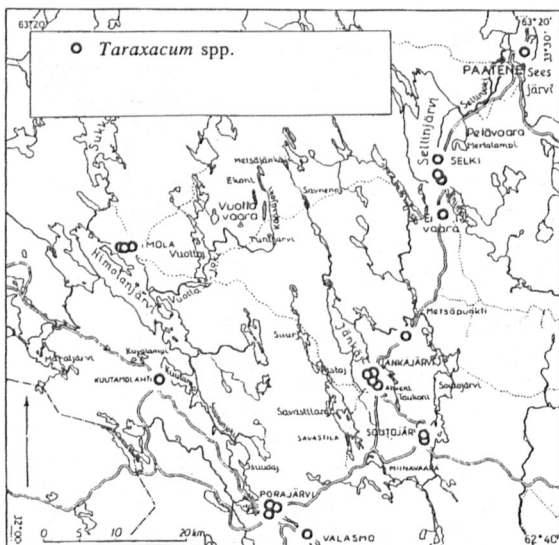


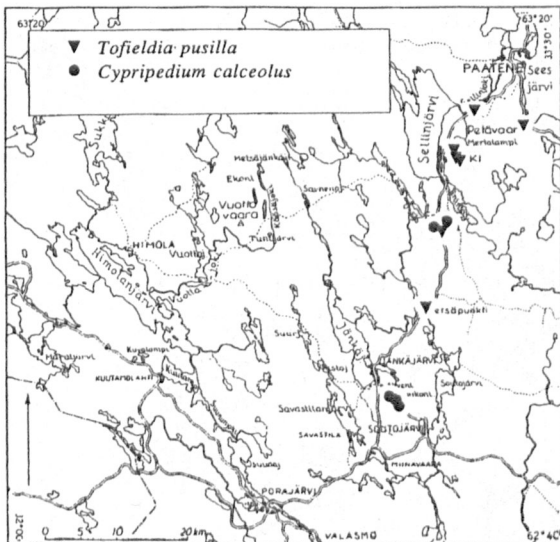
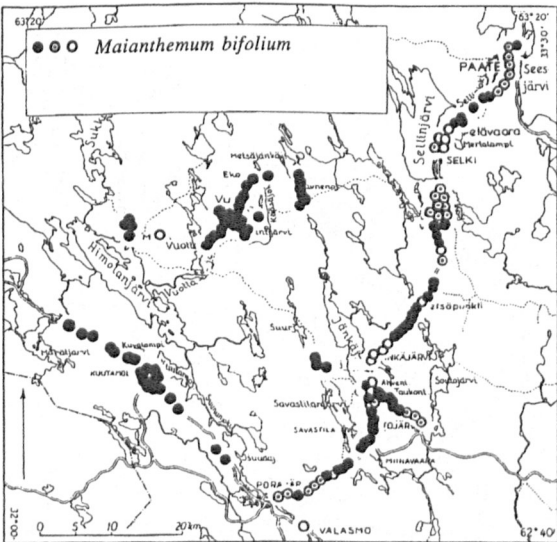
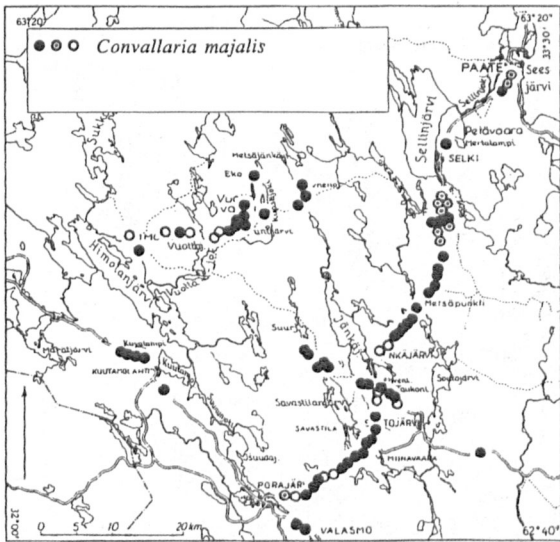
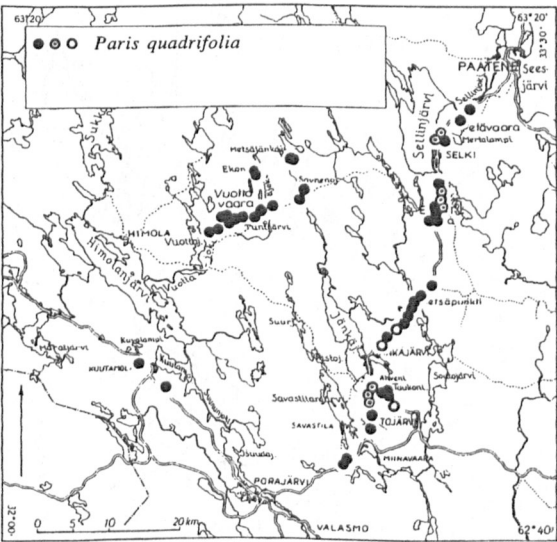
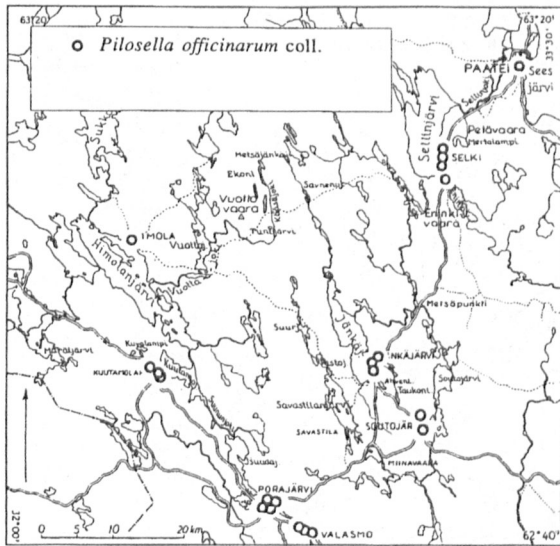
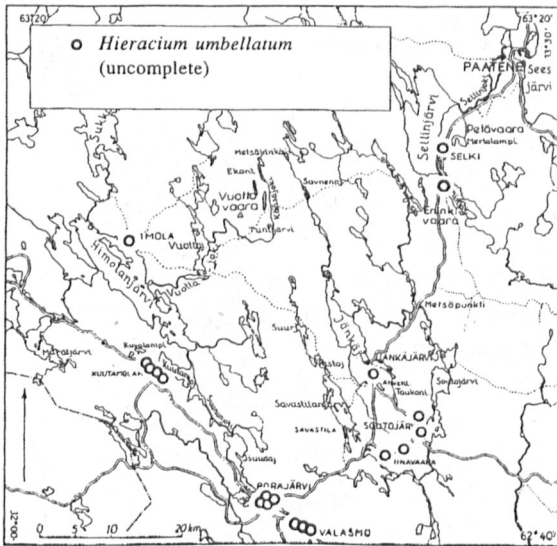


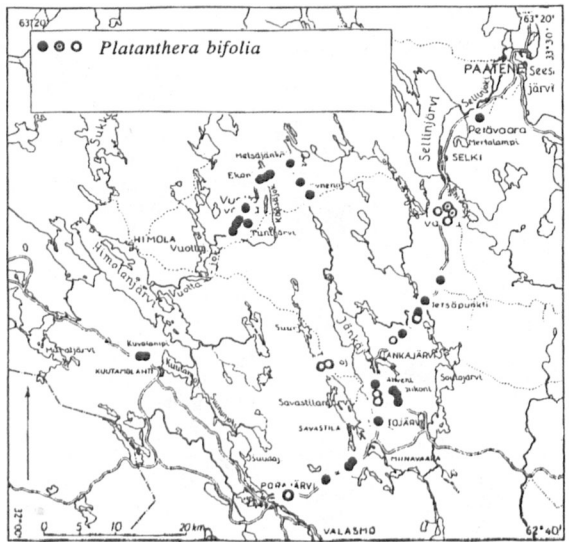
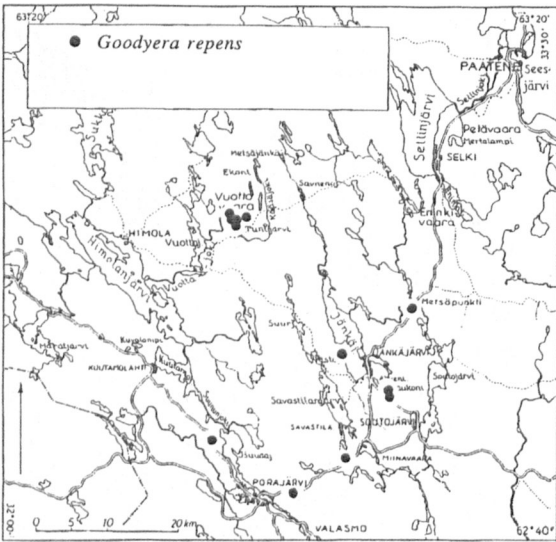
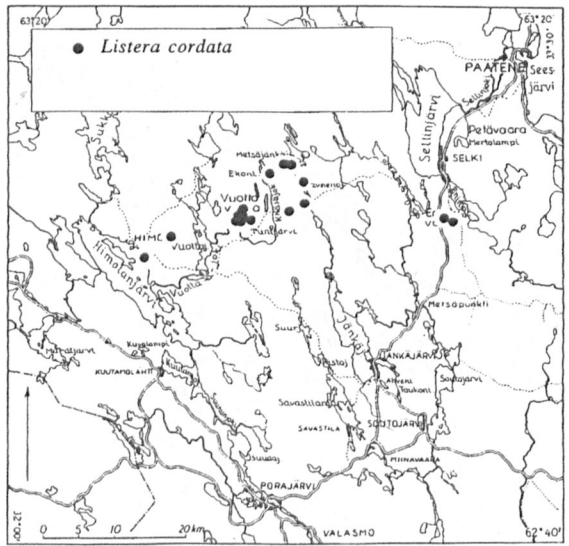
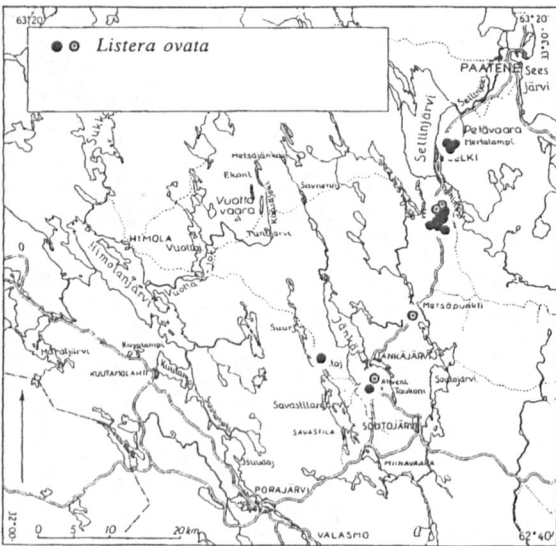


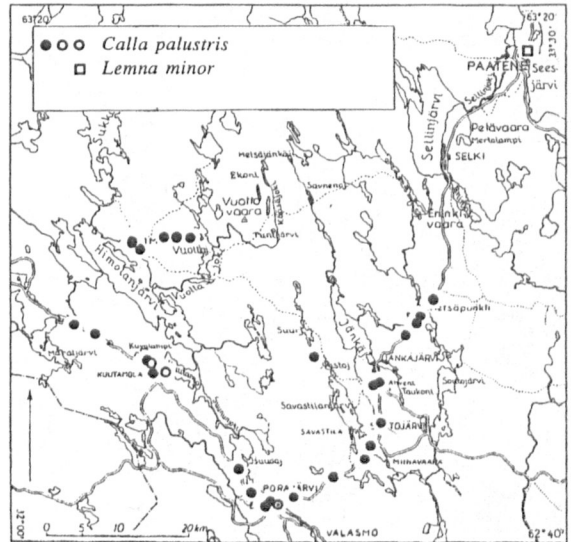
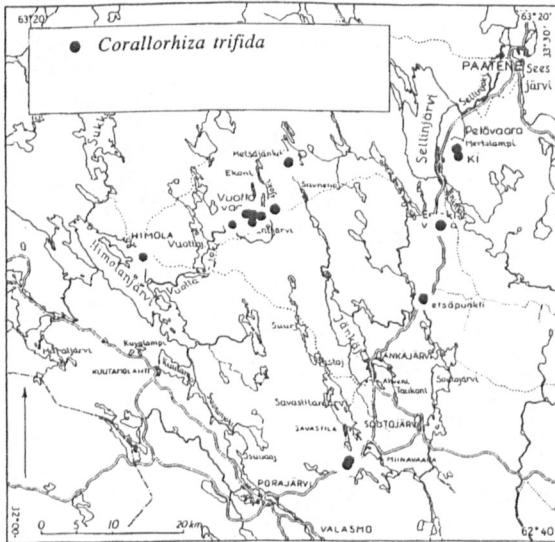
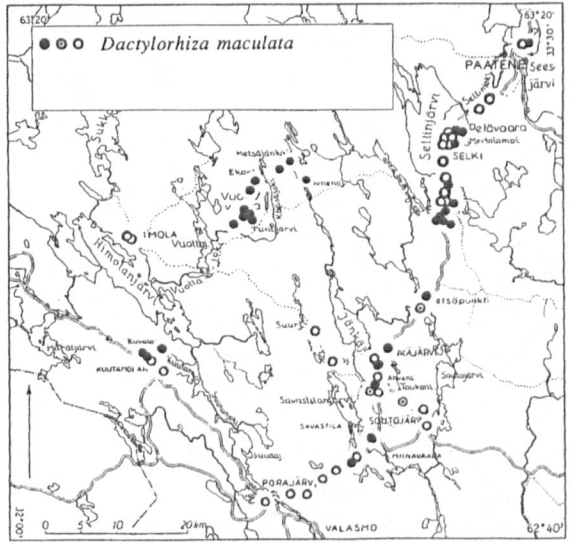
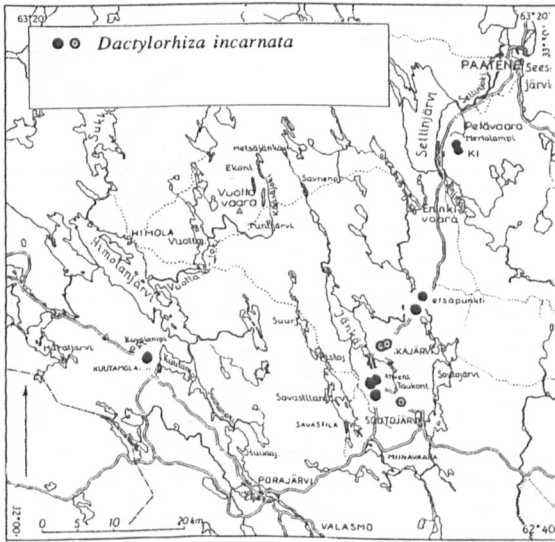
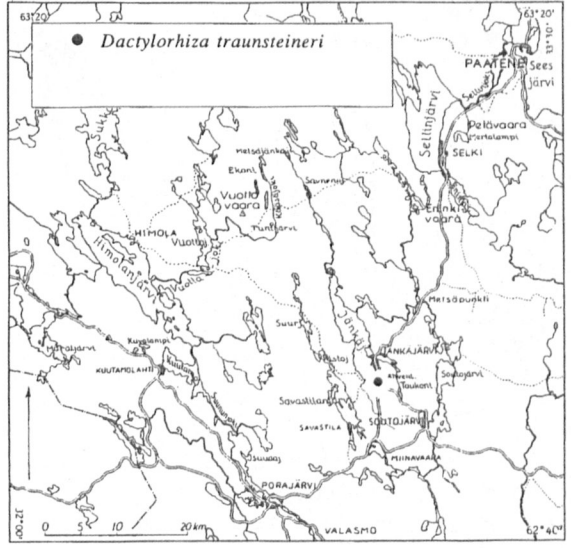
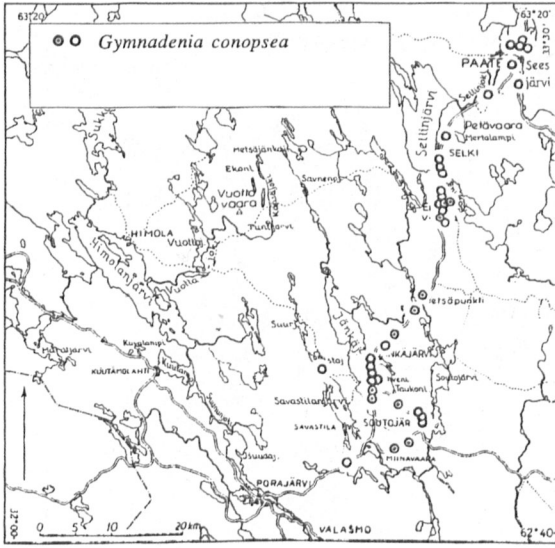


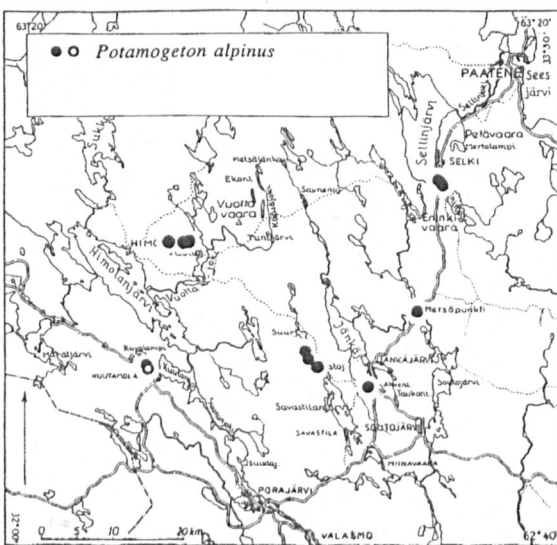
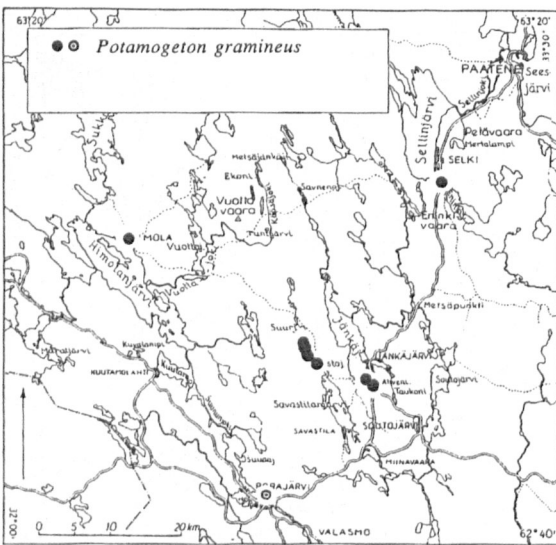
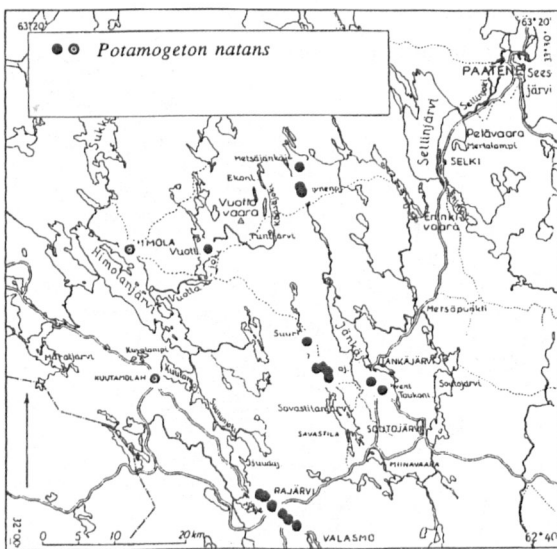
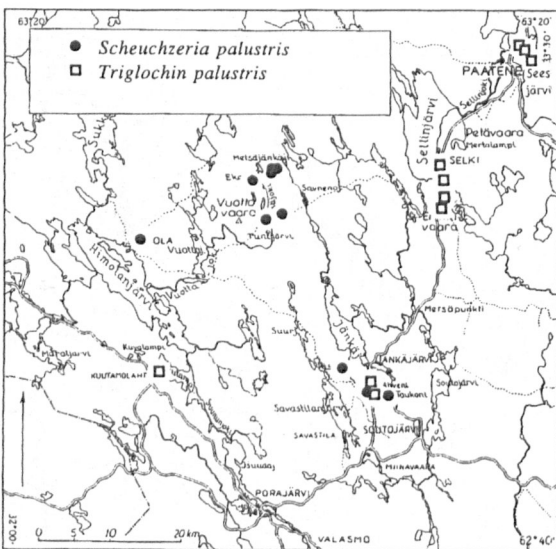
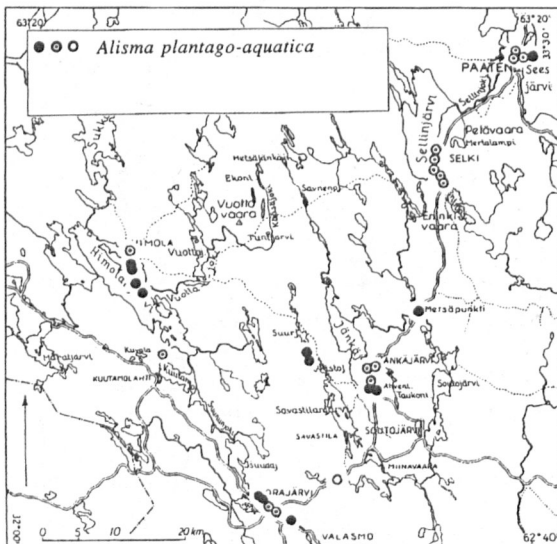




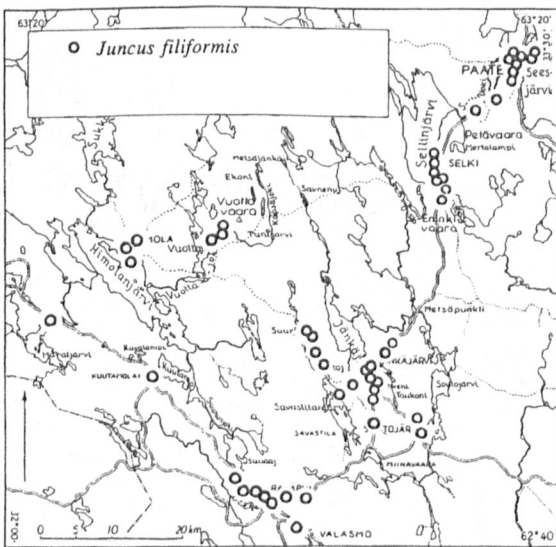
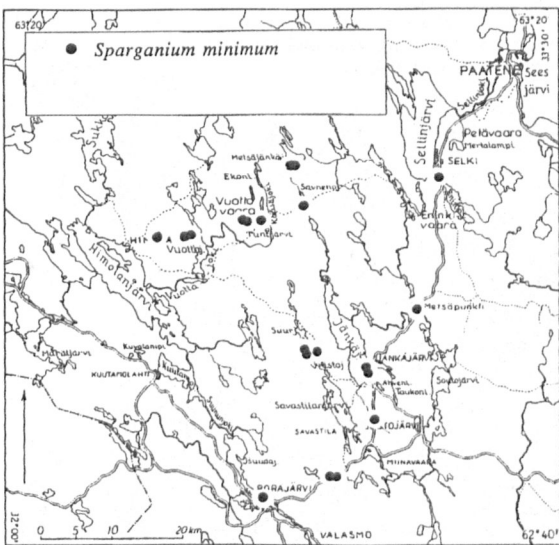
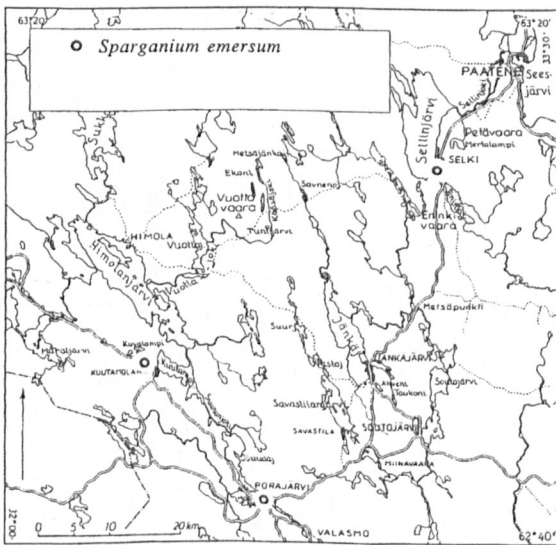
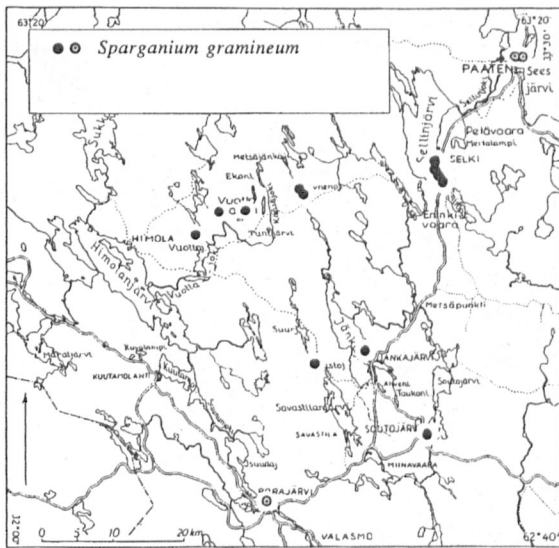
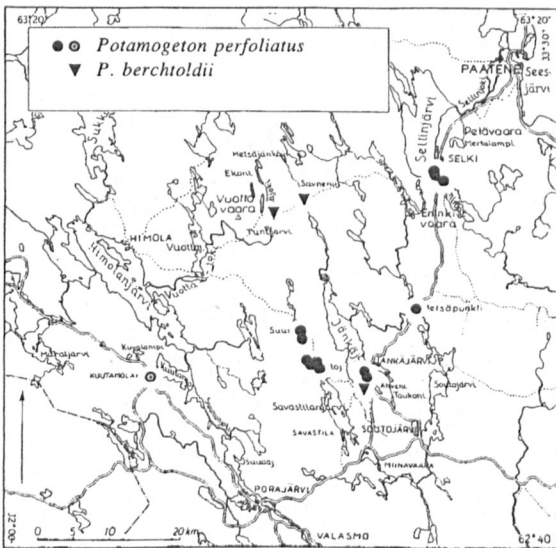


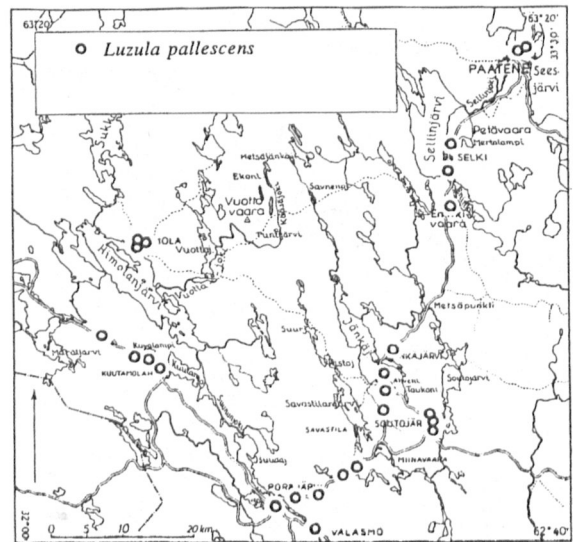
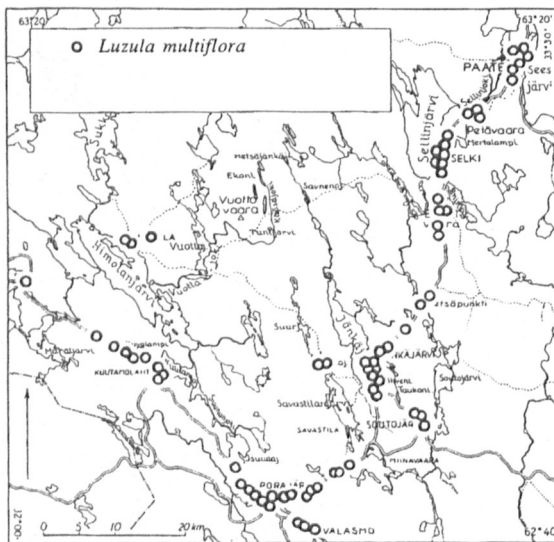
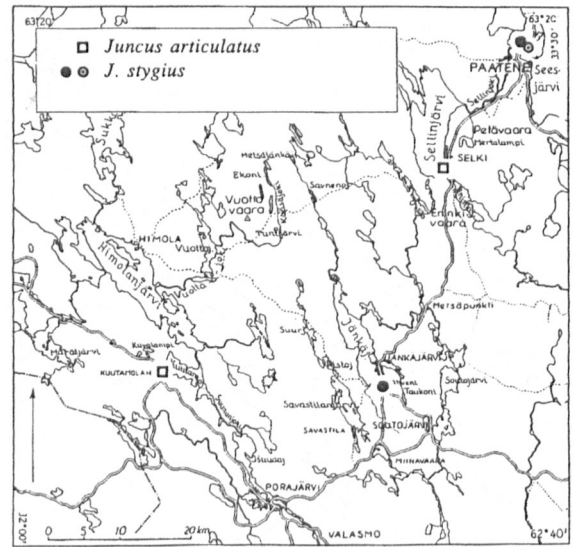
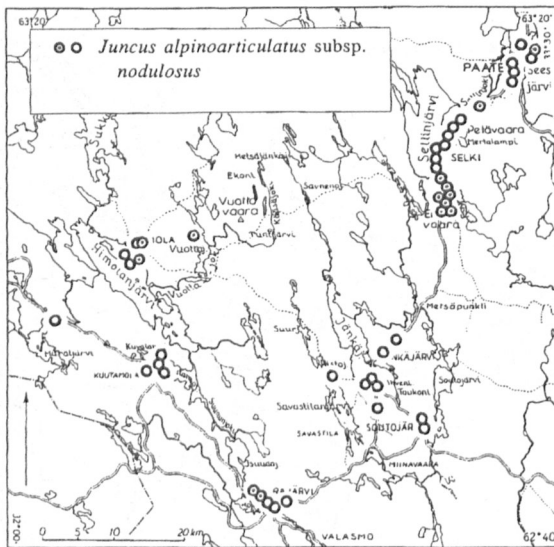
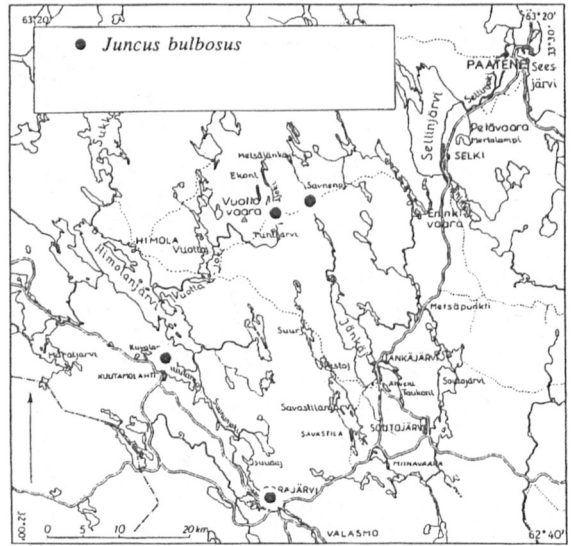
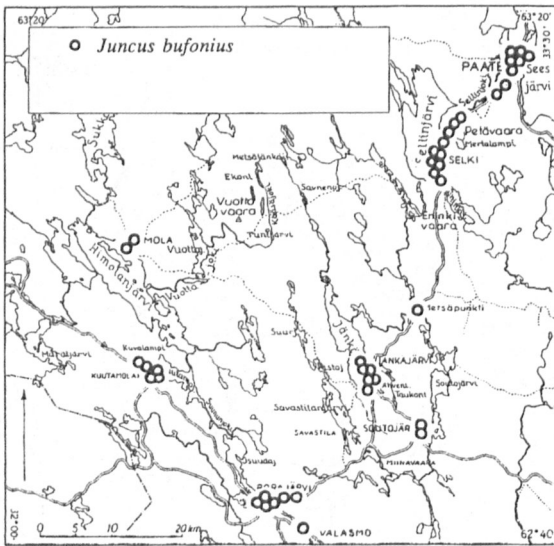


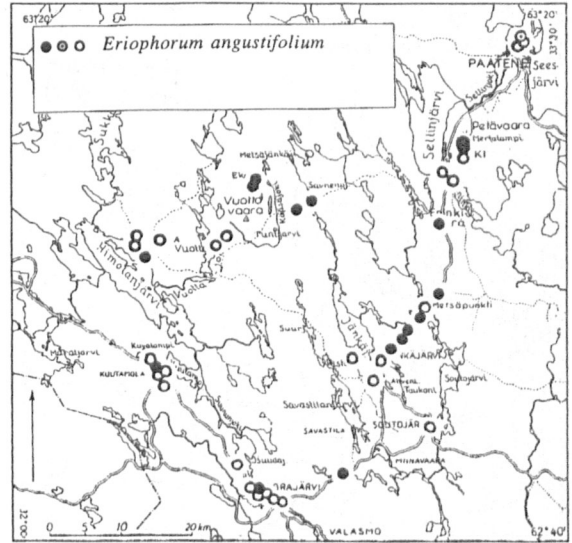
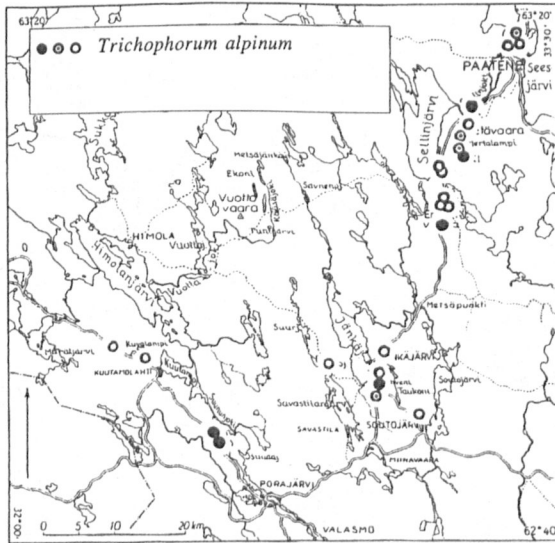
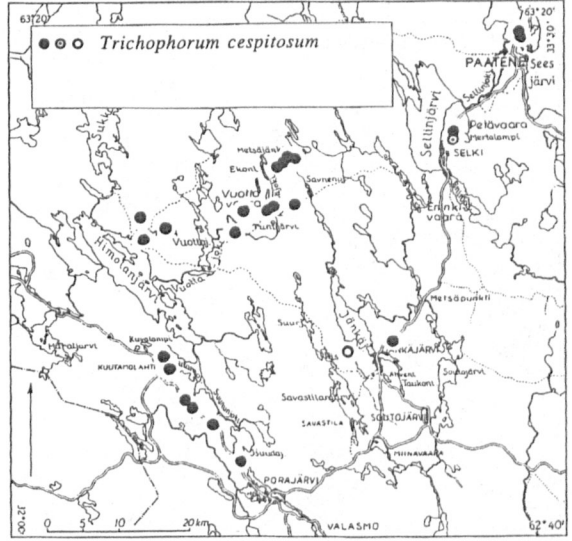
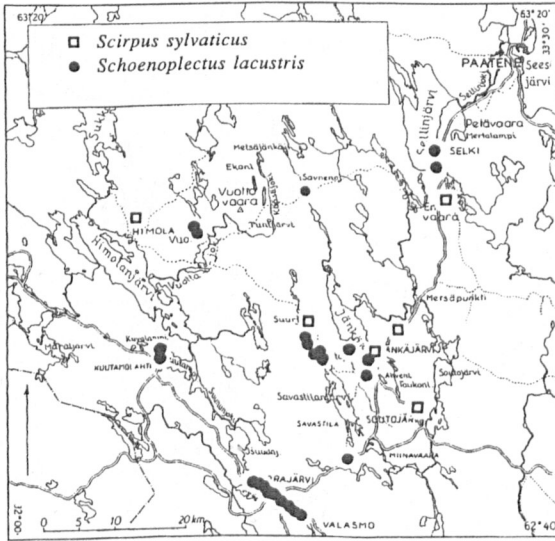
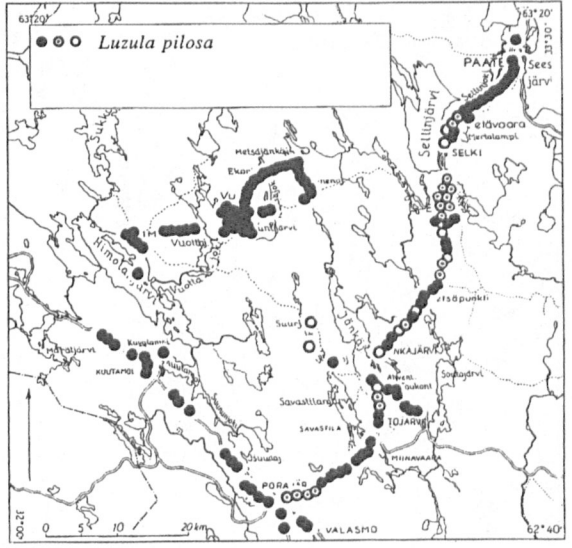
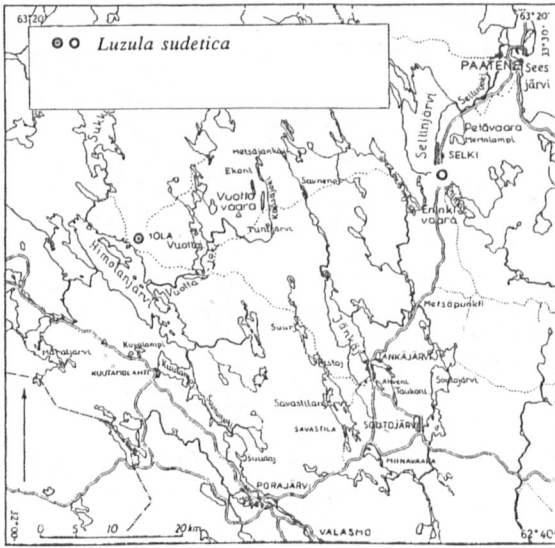


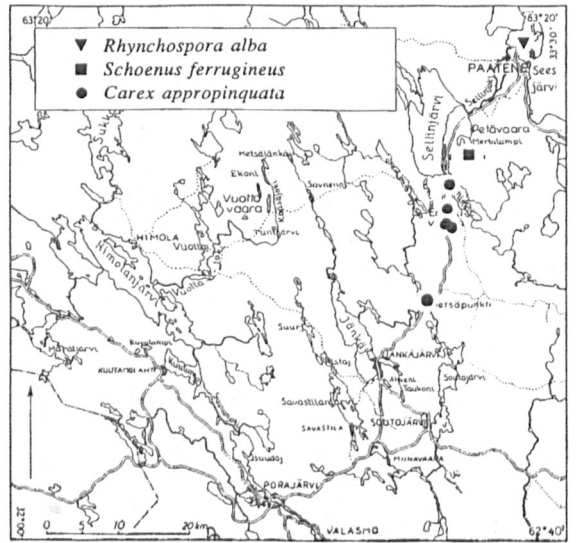
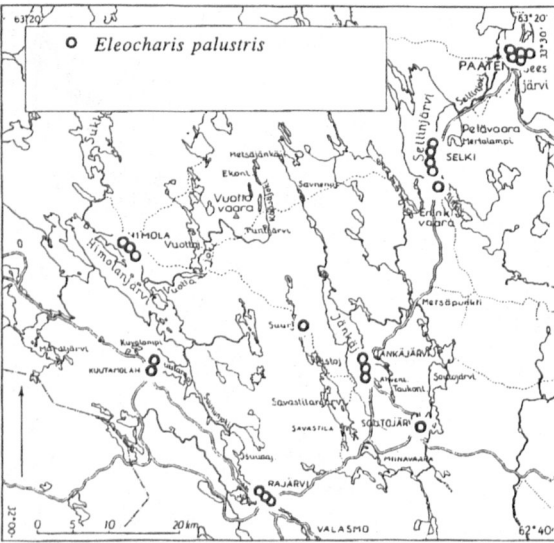
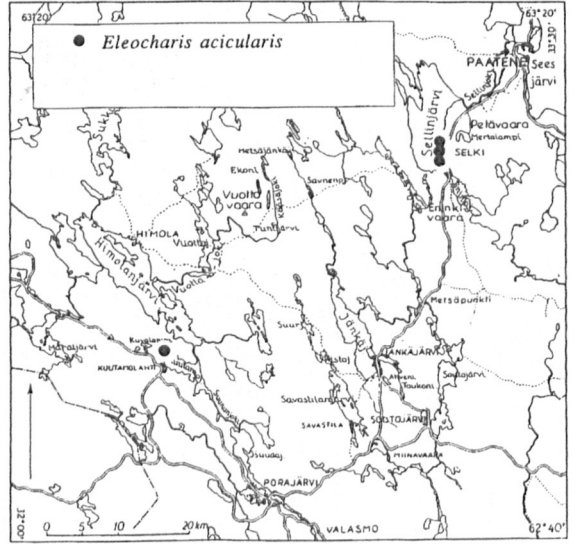
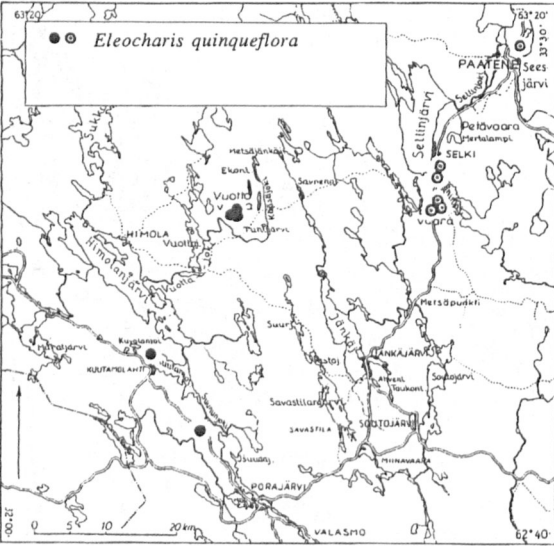
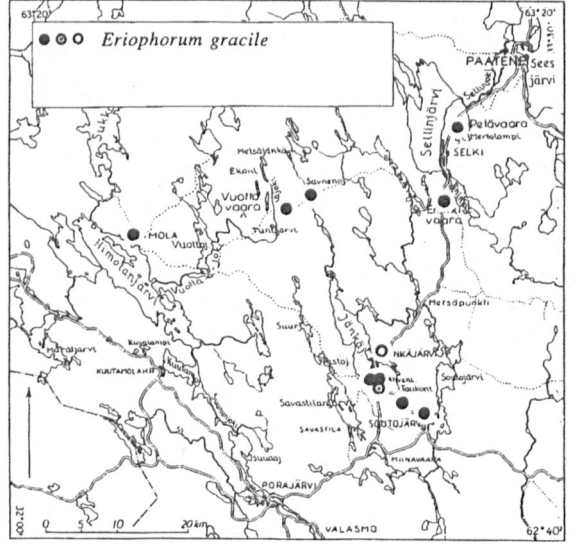
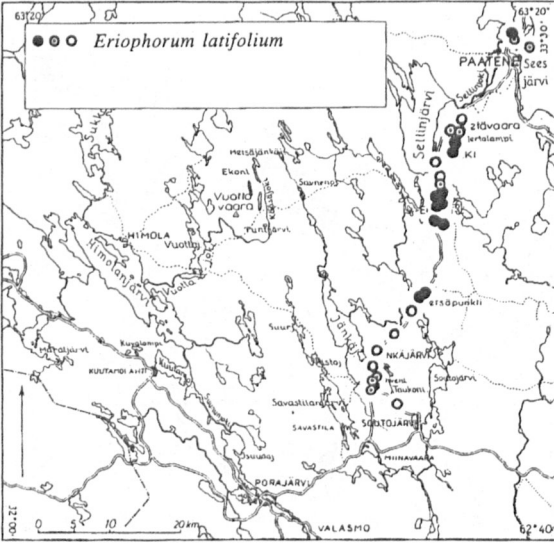


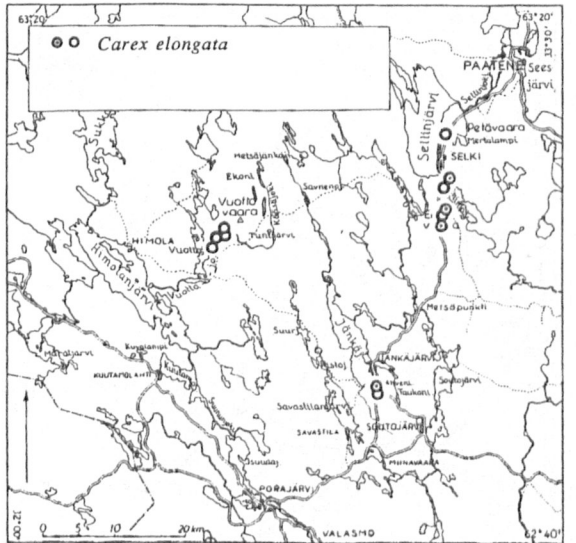
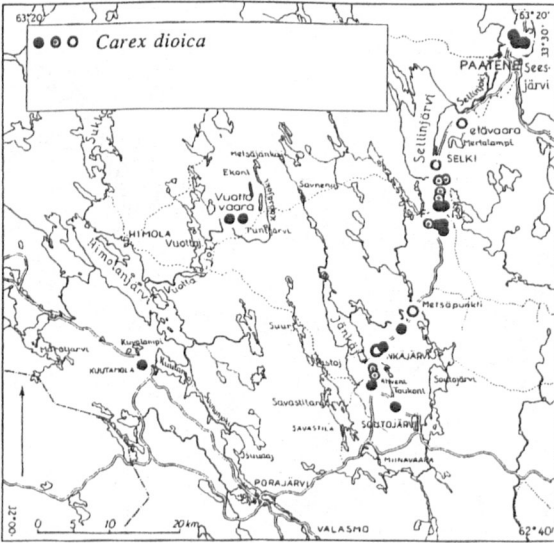
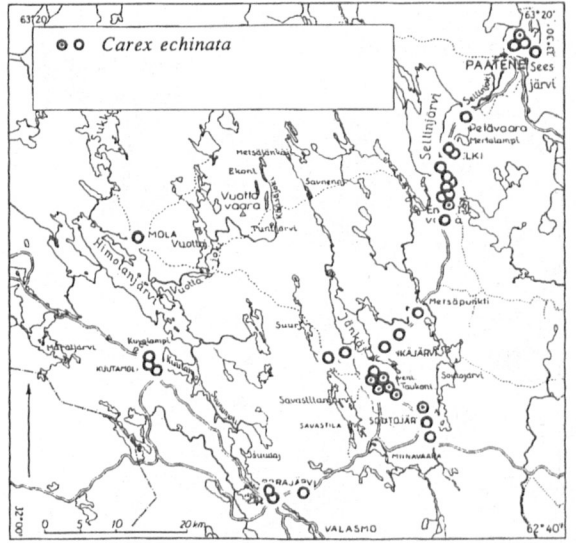
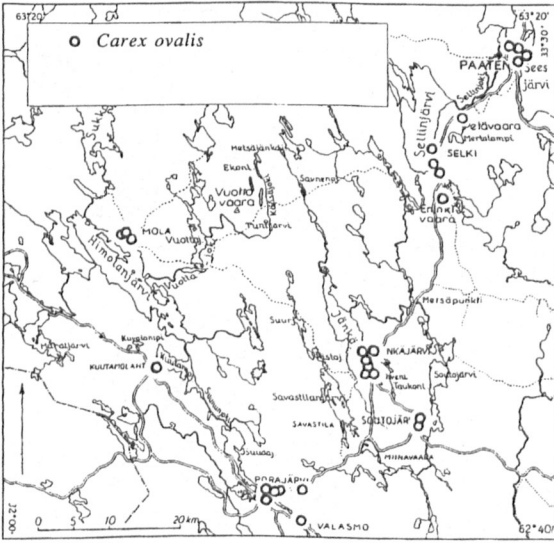
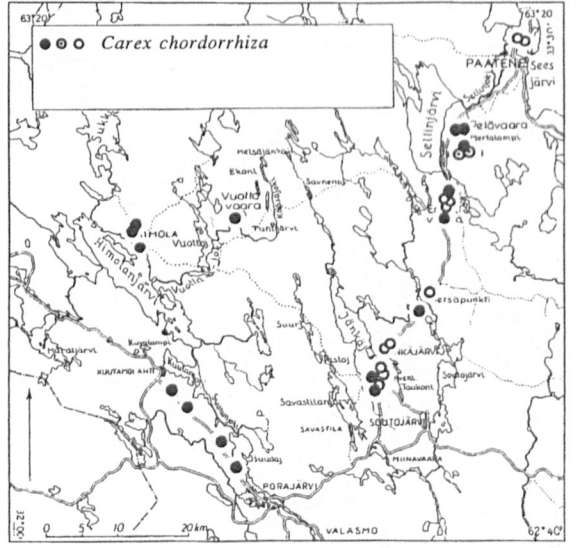


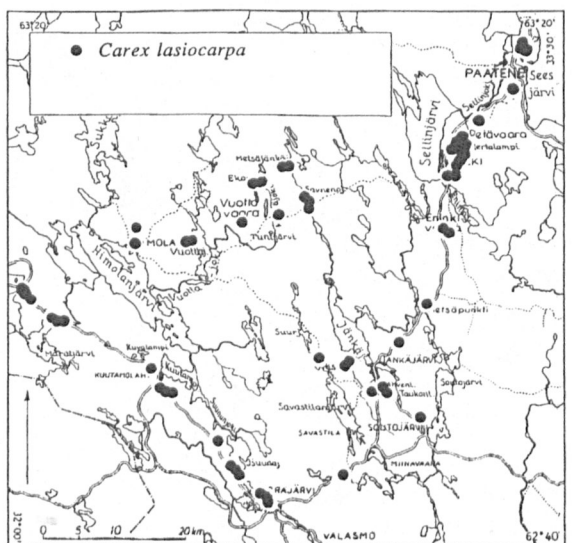
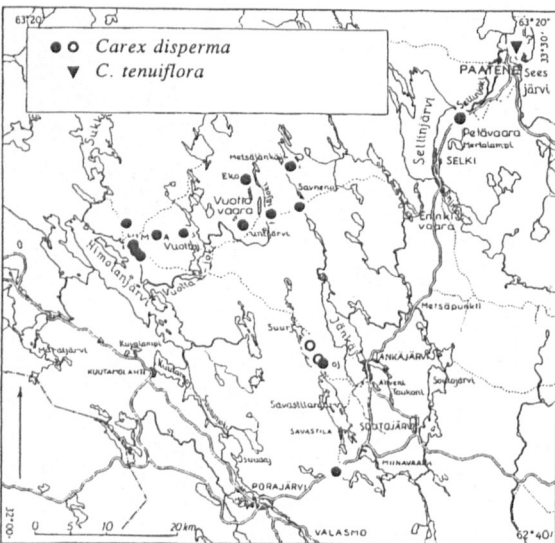
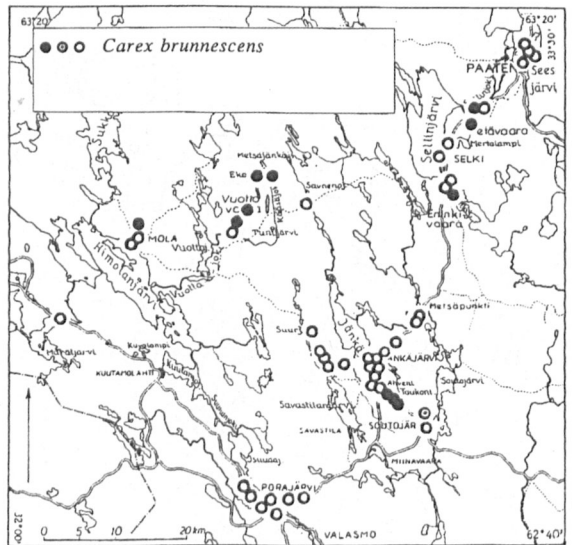
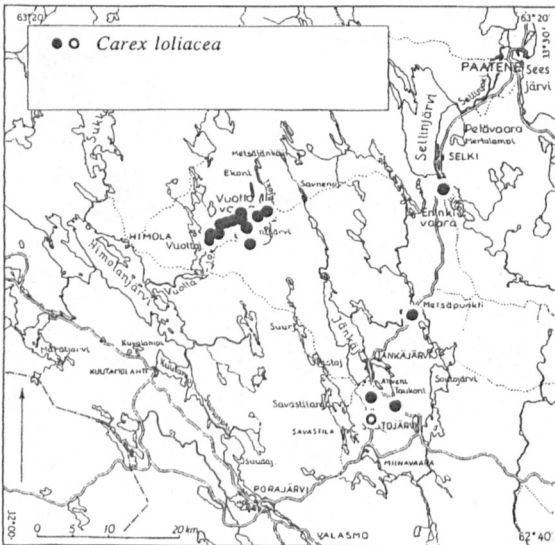
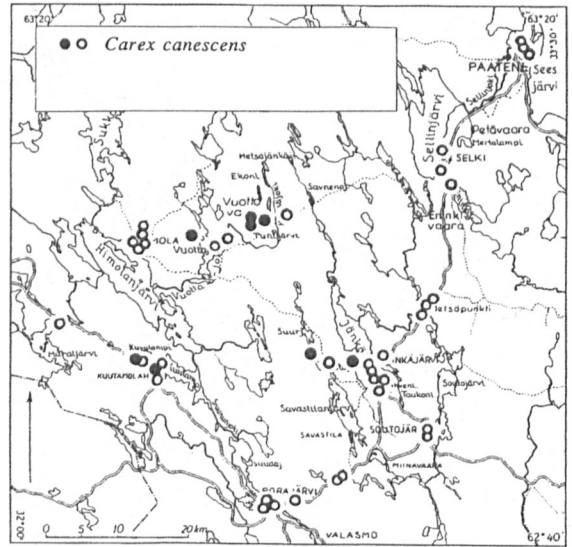
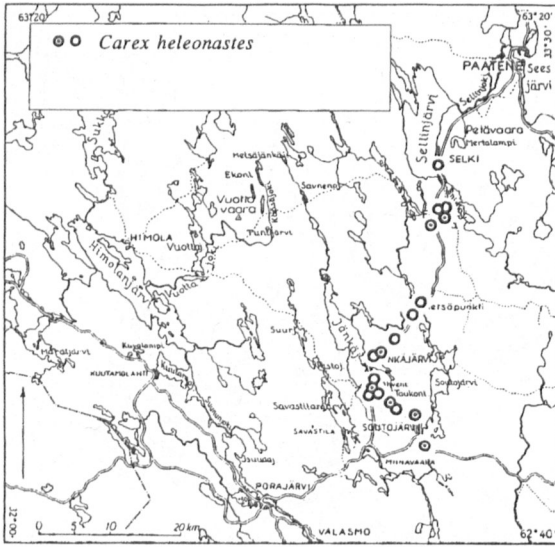


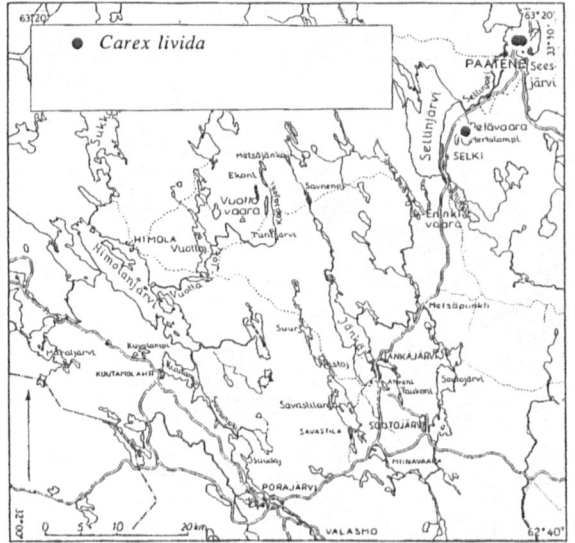
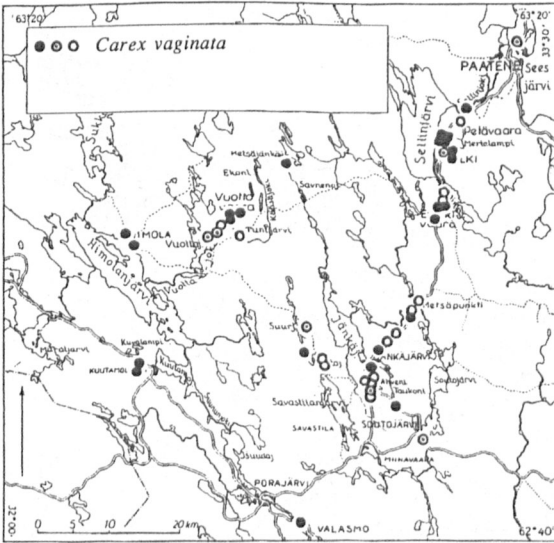
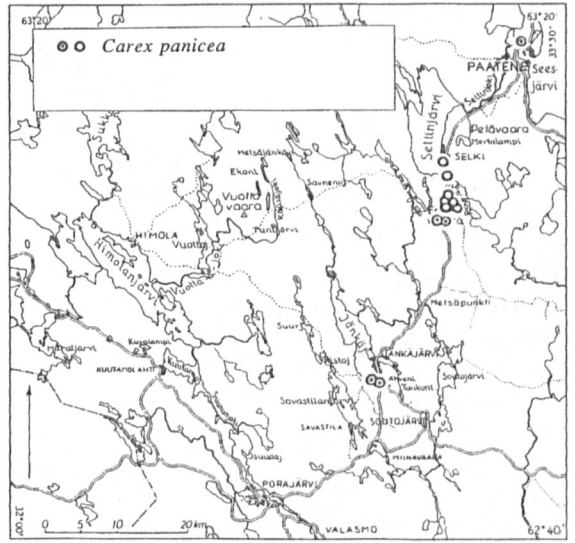
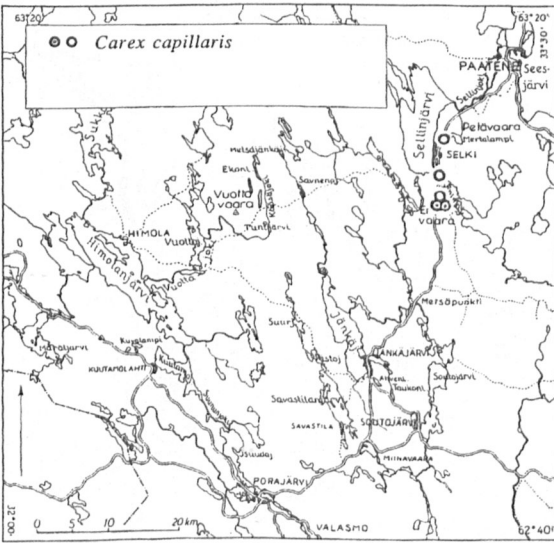
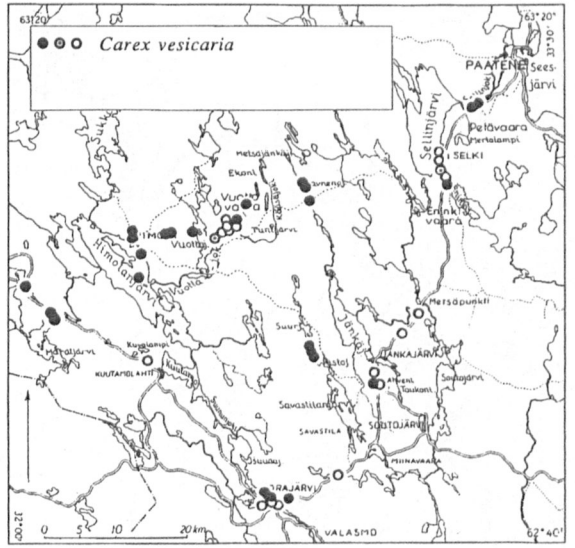
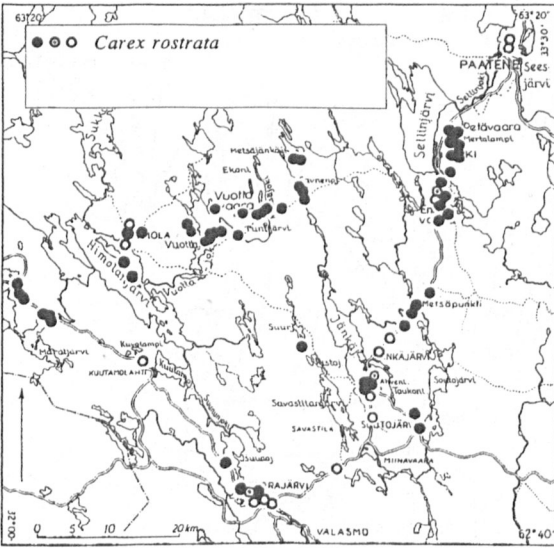


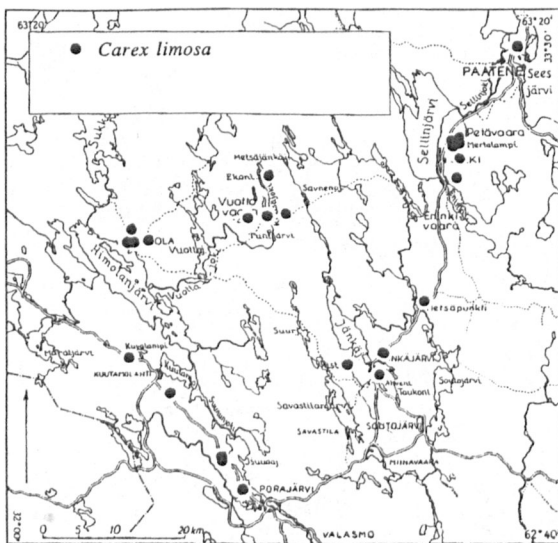
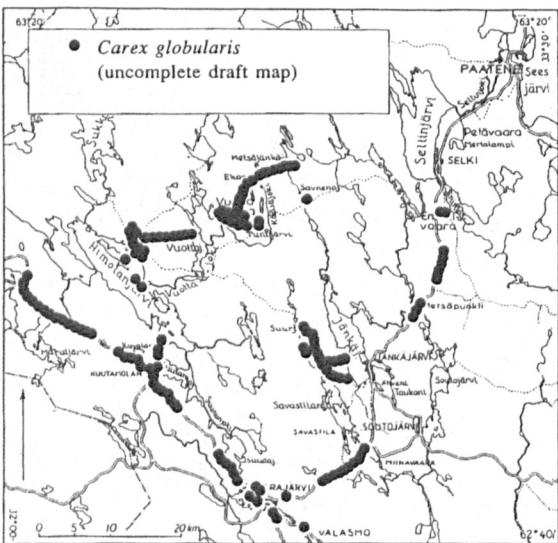
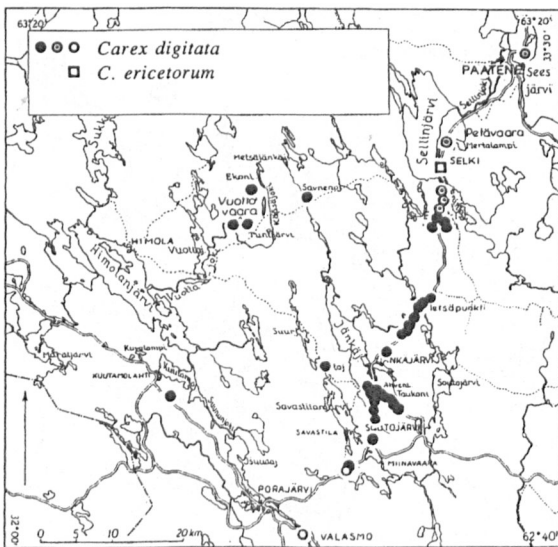
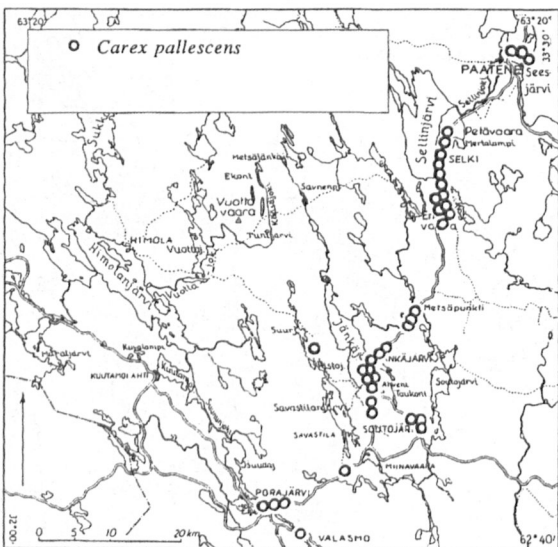
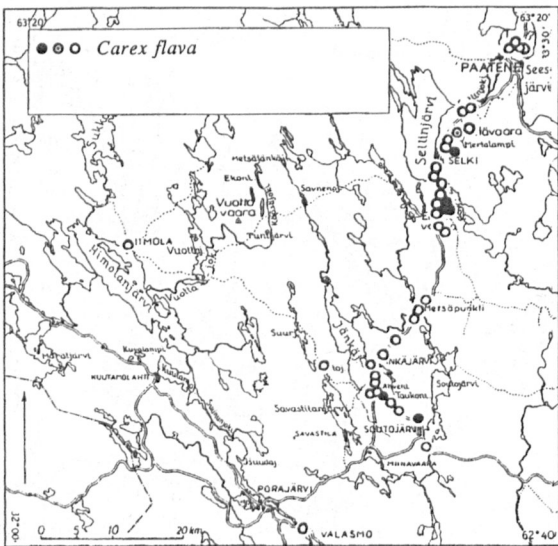




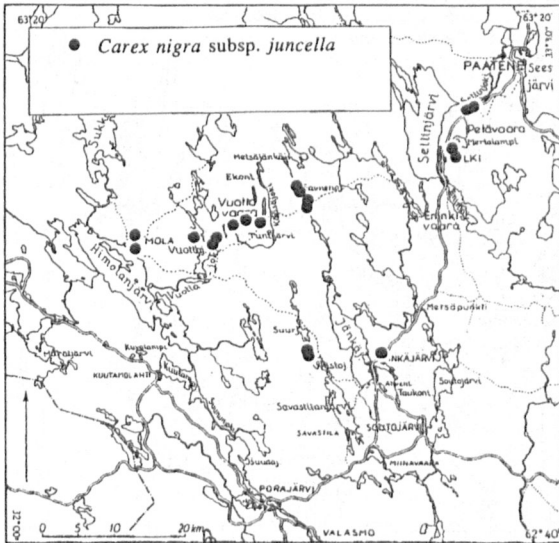
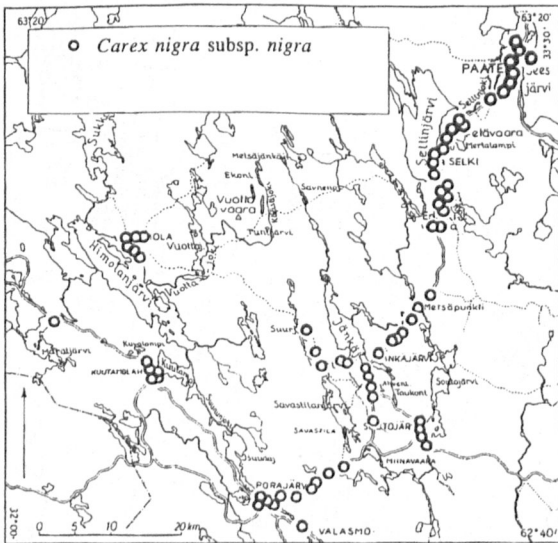
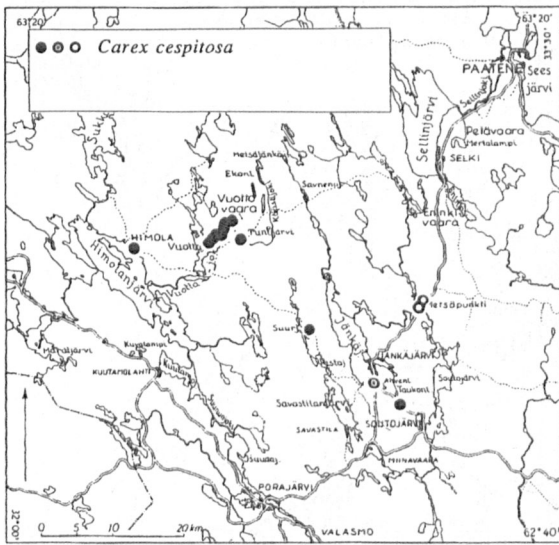
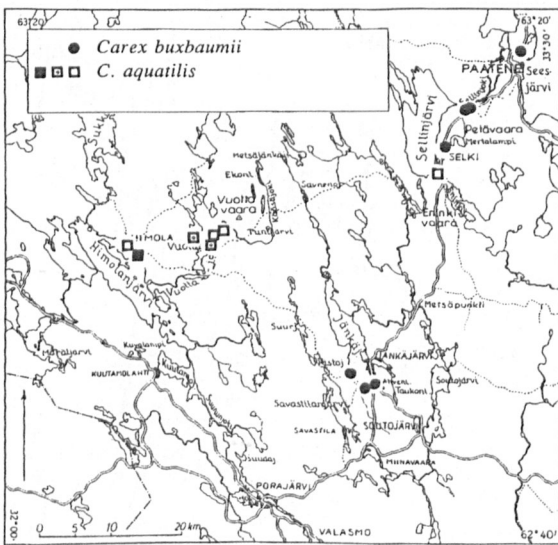
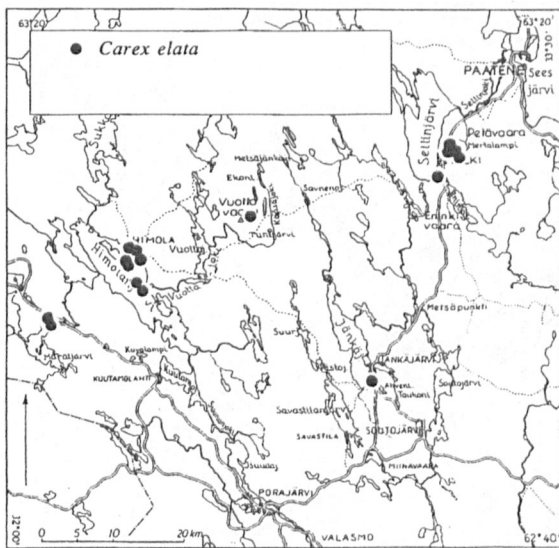
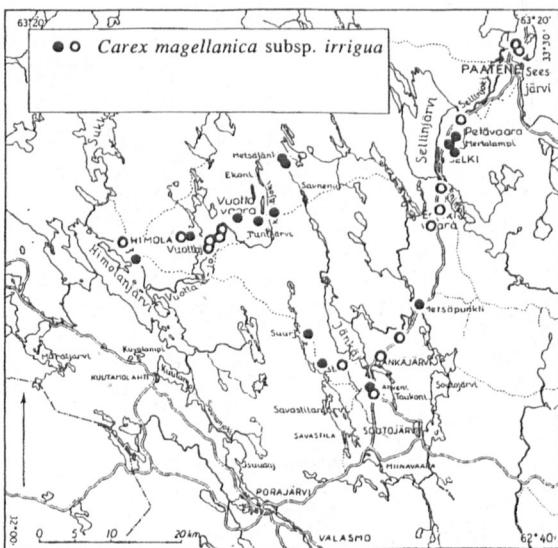


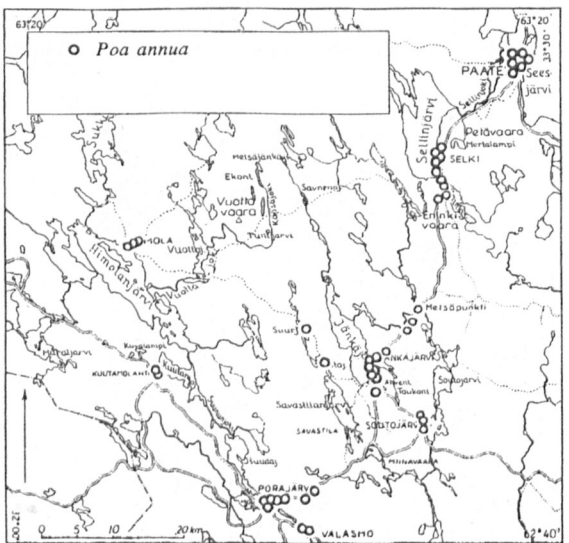
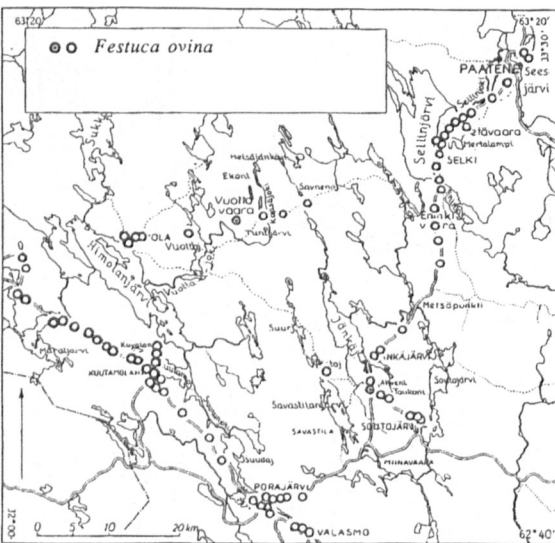
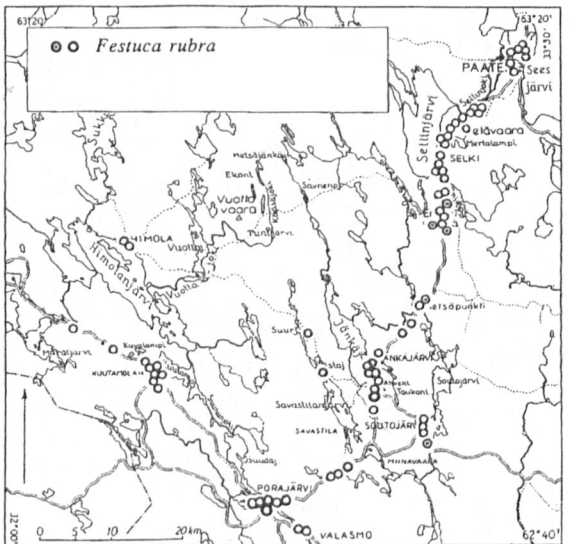
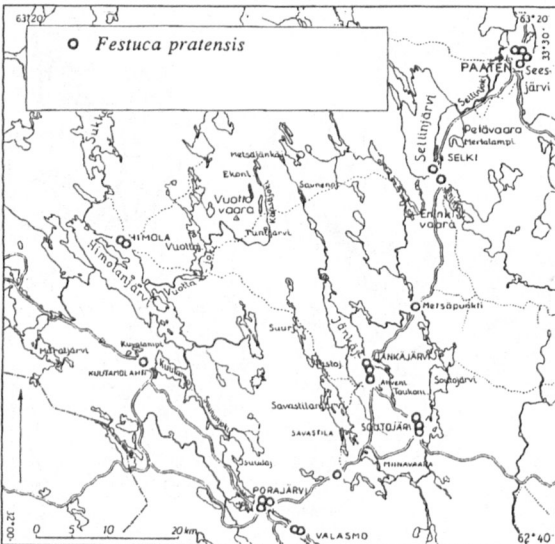
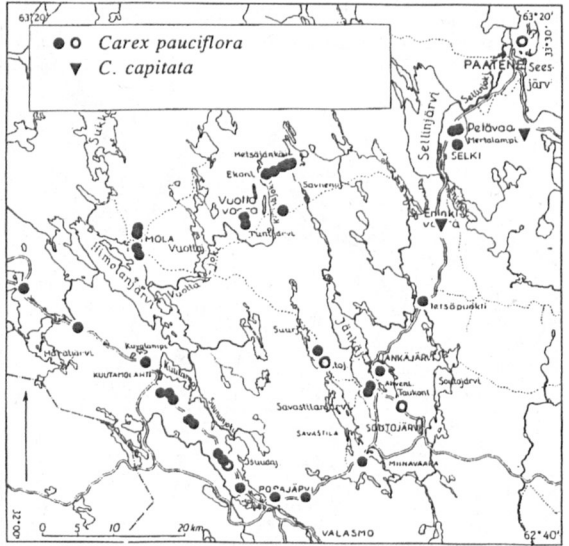
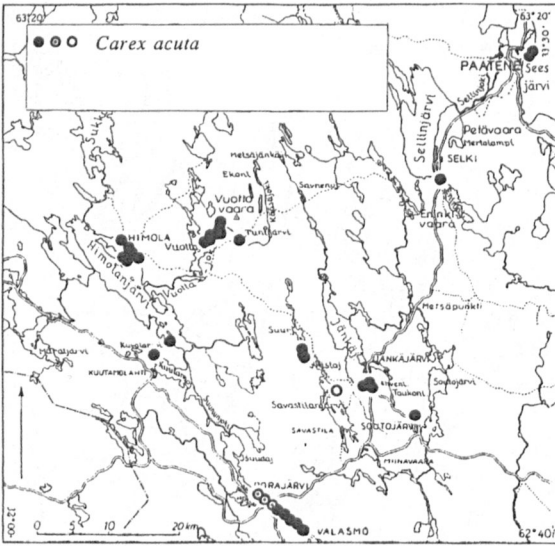


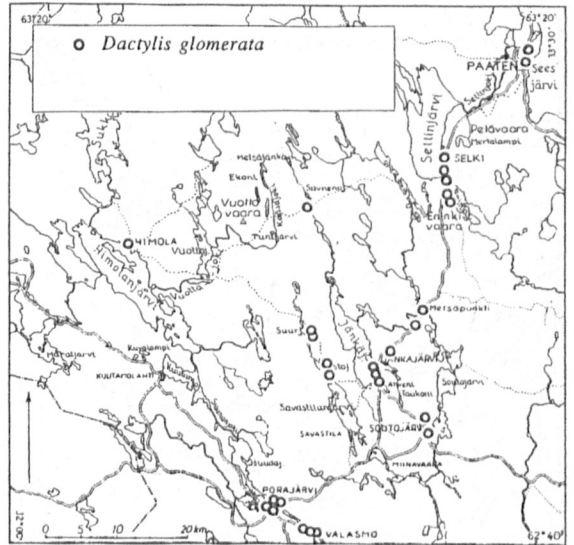
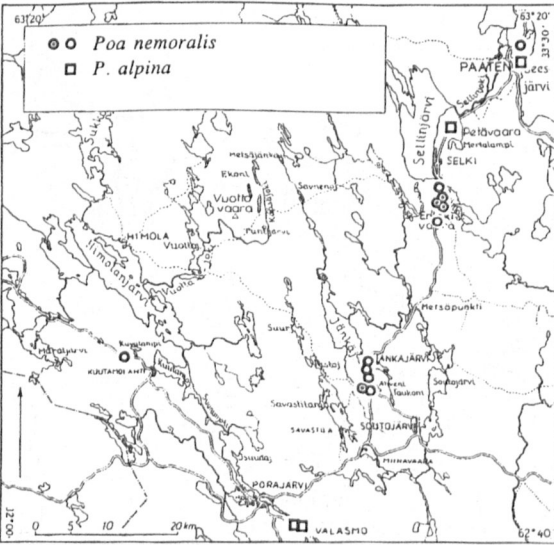
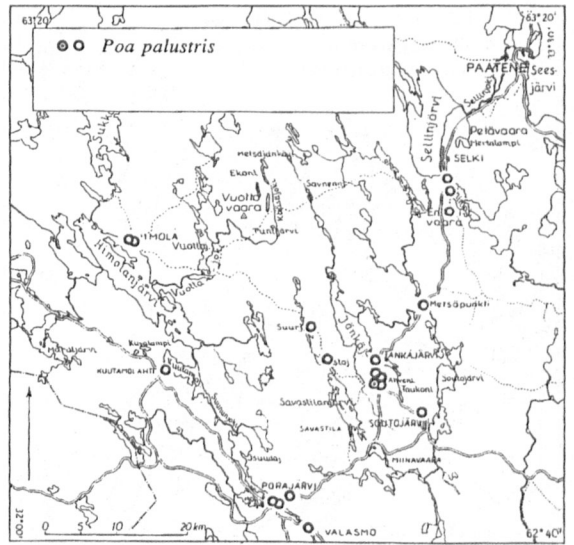
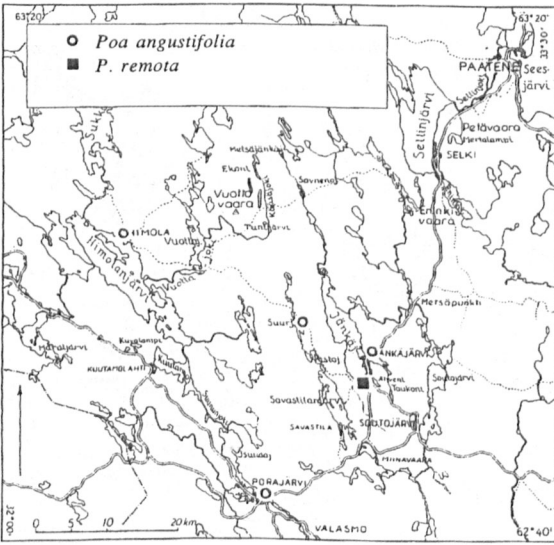
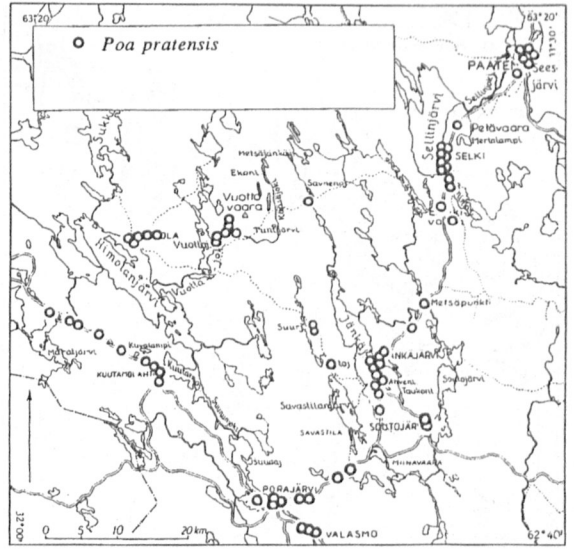
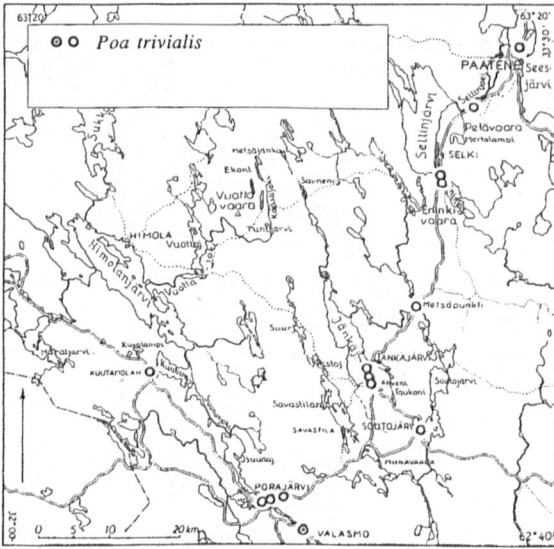


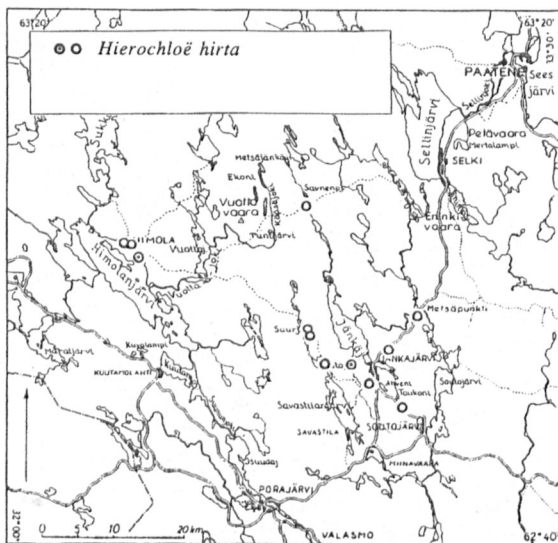
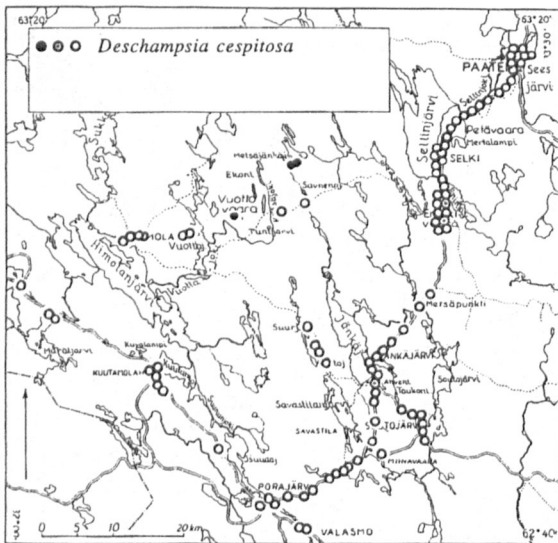
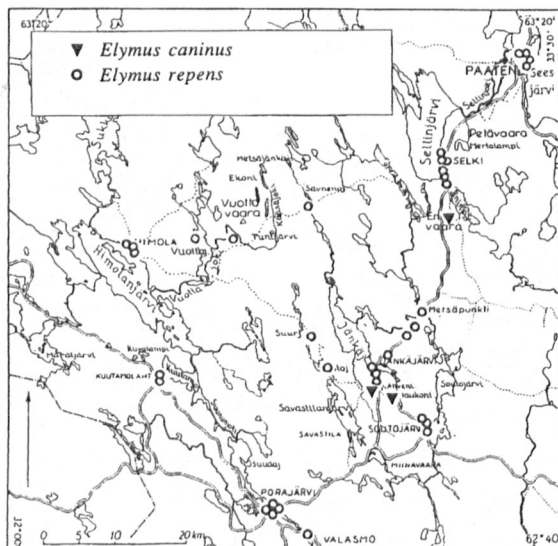
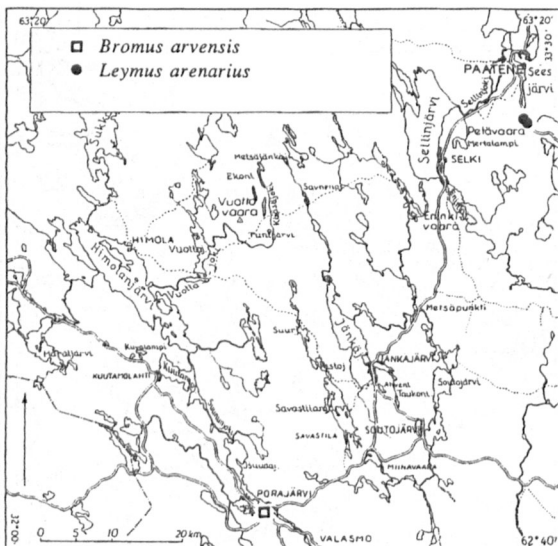
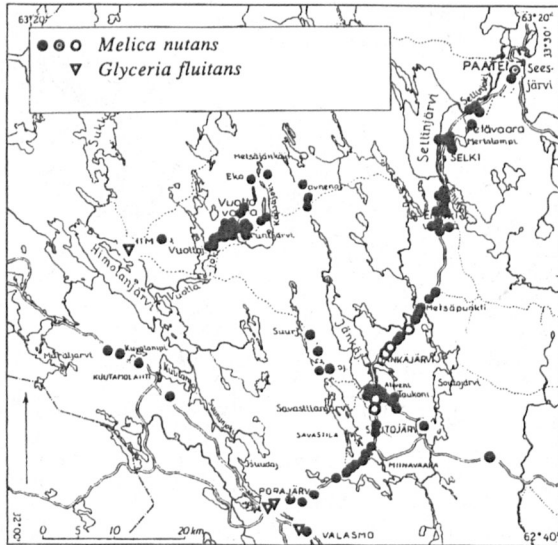
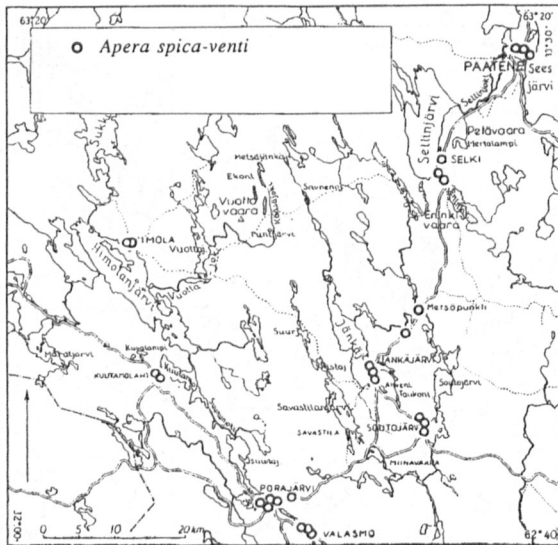


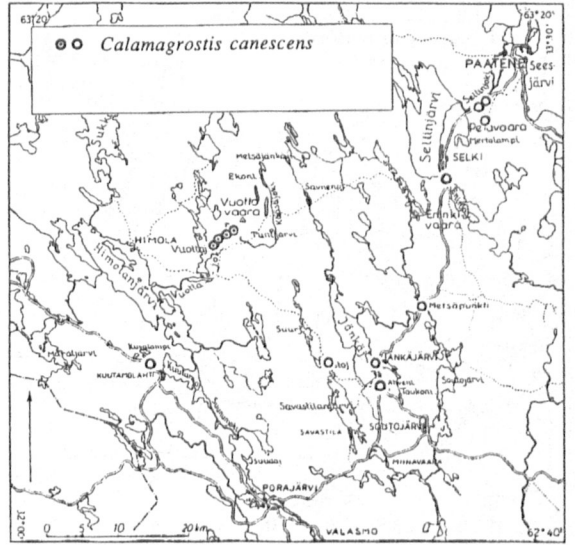
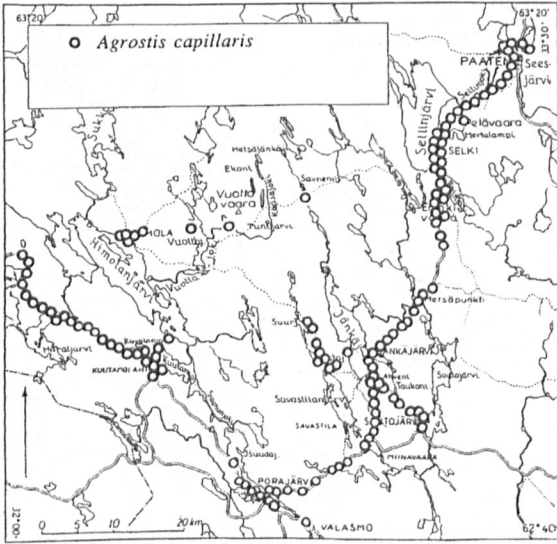
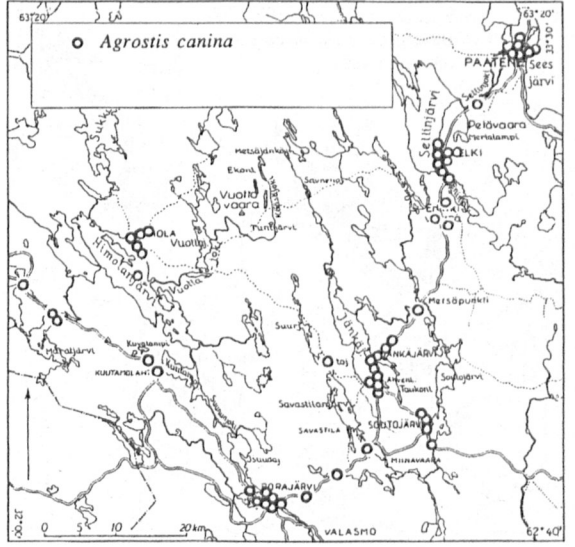
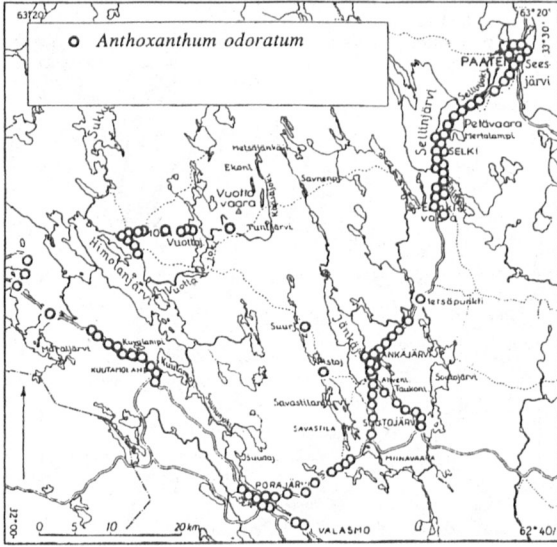


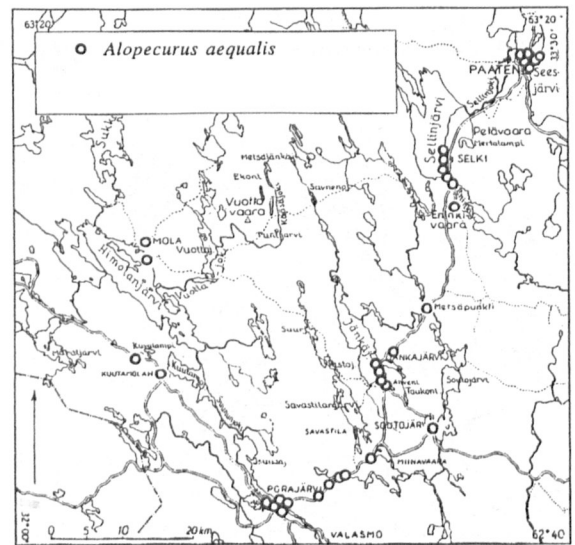
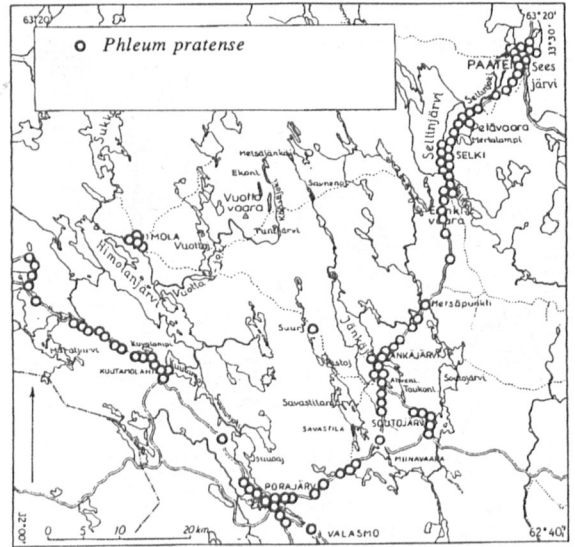
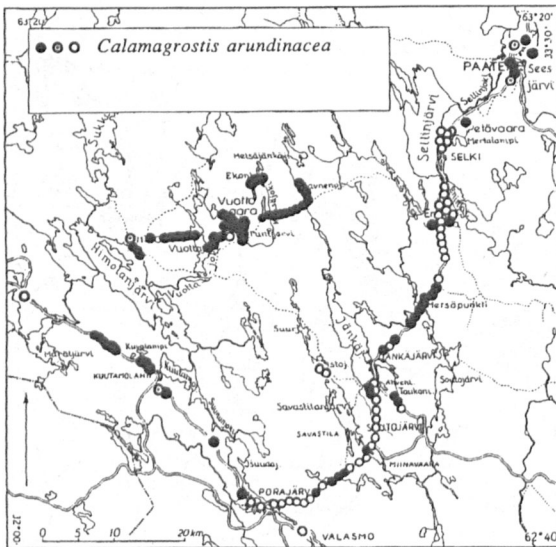
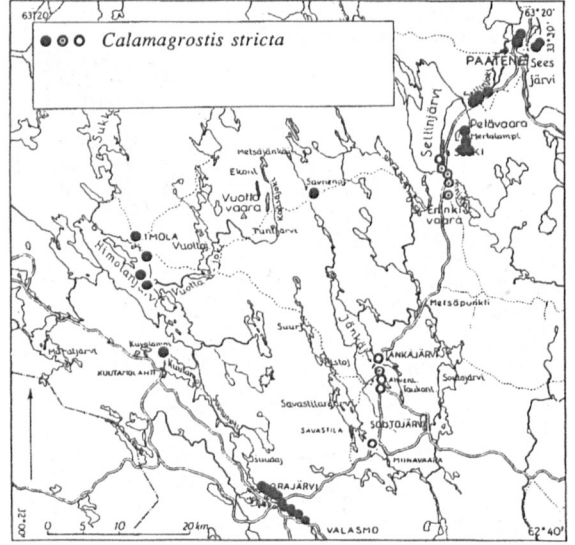
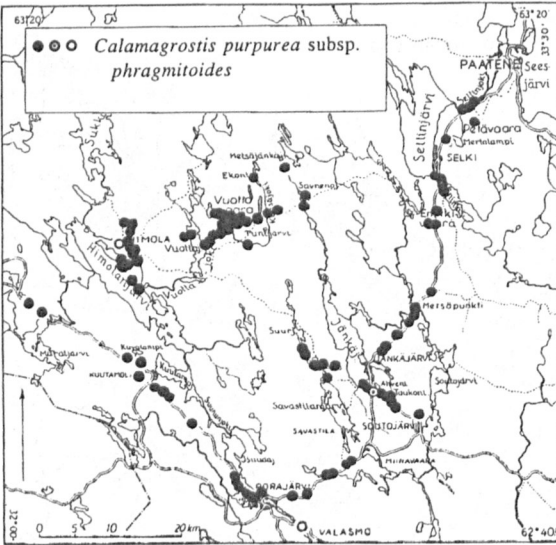


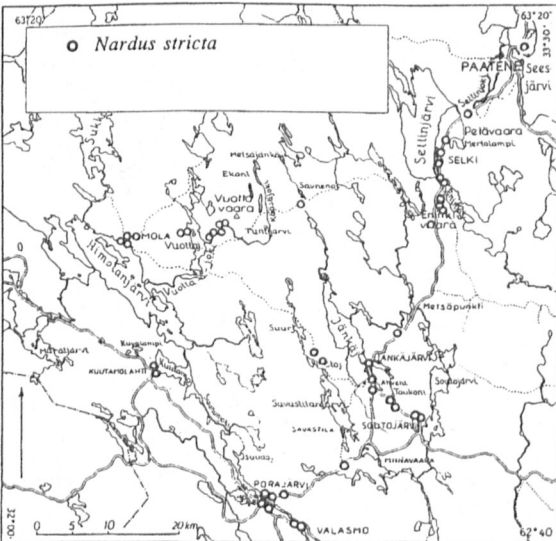
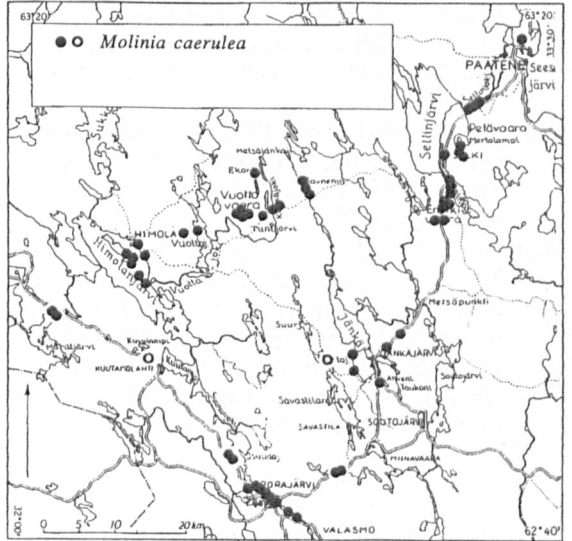
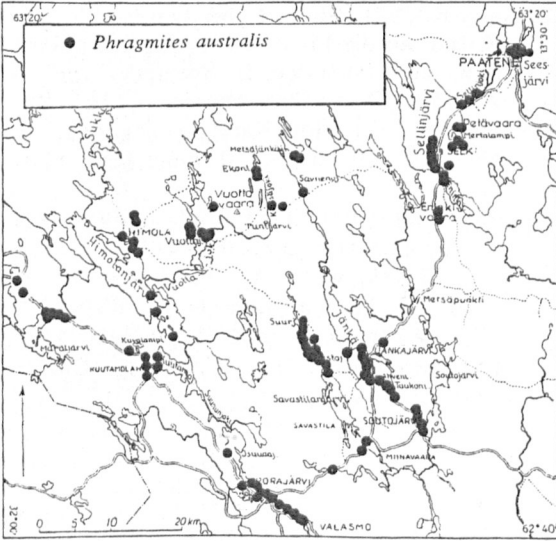
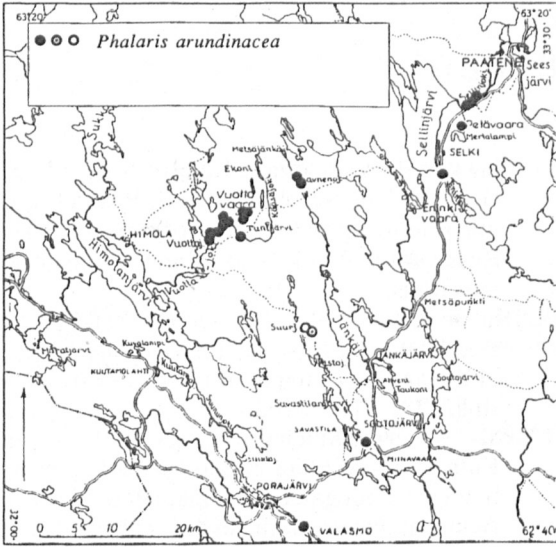












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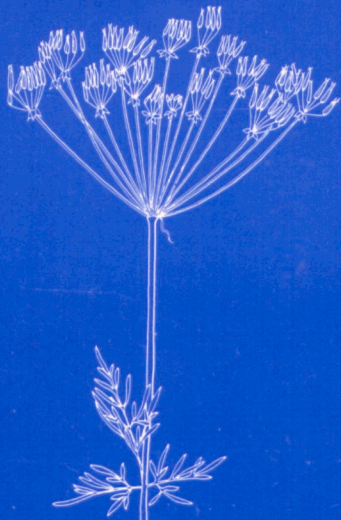
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