

# Gunneria

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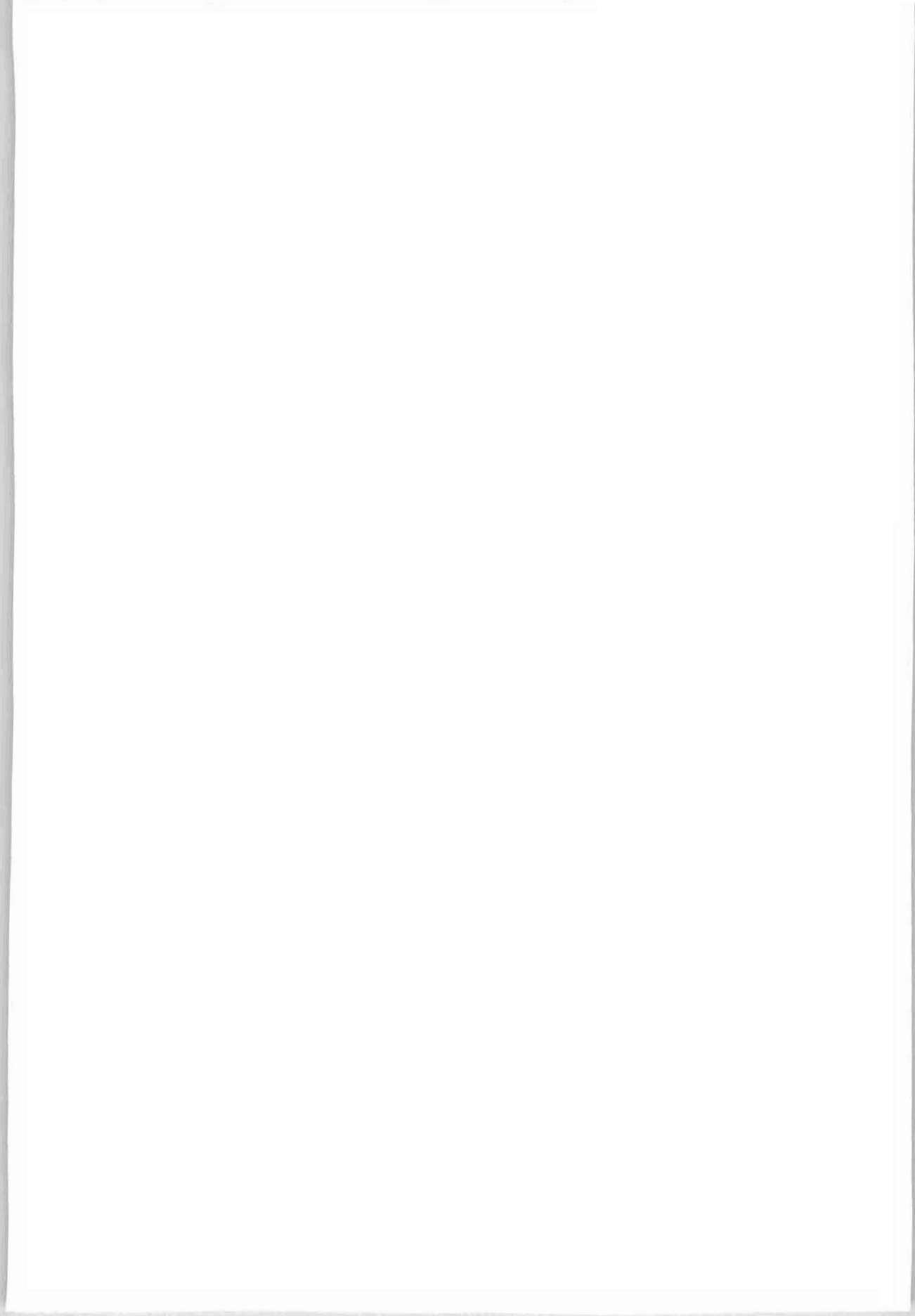
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Håkon Holien & Olga Hilmo

*CONTRIBUTIONS TO THE LICHEN  
FLORA OF NORWAY,  
PRIMARILY FROM THE CENTRAL  
AND NORTHERN COUNTIES*

TRONDHEIM 1991



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Universitetet i Trondheim  
Vitenskapsmuseet

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## ABSTRACT

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New distributional data are given on 52 lichen species from Norway. *Anisomeridium nyssaegenum*, *Lecidea sphaerella*, *Sarcosagium campestre*, *Scoliciosporum perpusillum* and *Strangospora pinicola* are new to Norway. 30 species are new to central Norway. A chemotype of *Lecanora cadubriae* with virensic acid is reported for the first time and a PD-negative chemotype of *Lobaria scrobiculata* is new to Europe. Maps on the distribution in Norway are provided for *Bacidia subincompta*, *Cliostomum griffithii*, *Lecanora cadubriae*, *Micarea cinerea* and *Opegrapha rufescens*. A map is provided concerning the European distribution of *Cladonia metacorallifera* var. *reagens*.

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## 1 INTRODUCTION

Since the publication of the check list of the Scandinavian lichens (Santesson 1984), several reports on the lichen flora of central Norway have been published by Botnen & Tønsberg (1988), Tønsberg (1988) and Holien (1986 & 1989). Reports on the lichen flora of northern Norway have been published by Schwenke (1985), Alstrup & Söchting (1986), Söchting & Alstrup (1986) and Timdal (1987).

## 2 MATERIAL AND METHODS

This paper is primarily based on material collected during the last 12 years, mainly by the first author. The specimens will be deposited in herb. TRH. Herbarium material in BG, O & TRH and material recently collected by Mr. Tor Tønsberg have also been examined.

The nomenclature is according to Santesson (1984) with the following exceptions: *Anisomeridium* follows Egan (1987), *Caliciales* follows Middelborg & Mattsson (1987) except for *Chaenotheca brachypoda* and *C. chlorella* which follow Tibell (1987). *Cliostomum* and *Lecidoma* follow Wirth (1987). Some specimens have been subjected to colour reagent tests and thin-layer chromatography (TLC) according to White & James (1985). Tests for amyloid reactions were made in a modified version of Lugol's iodine solution, where water was replaced by lactic acid. The solution was used after pre-treatment with 10% KOH.

## 3 THE SPECIES

*Acrocordia gemmata* (Ach.) Massal.

Nord-Trøndelag: *Stjørdal*, Bjørdalen, NW of Berg, on a trunk of *Ulmus glabra*, PR 0039/1621 I, alt. 40-120 m, 1991, H.H. 4194 (TRH).

New to central Norway.

*Acrocordia gemmata* is characterized mainly by a whitish, thin or endosubstratal thallus with *Trentepohlia*, large black perithecia, narrow cylindrical asci and 1-septate ellipsoid spores, with rounded ends and a coarsely granular epispore.

In Norway, this species has previously only been reported from southern Norway as far north as Hordaland (Santesson 1984).

*Anisomeridium nyssaegenum* (Ell. & Ev.) R.C. Harris  
(syn. *Arthopyrenia willeyana* R.C. Harris; *Anisomeridium juistense*  
(Erichs.) R.C. Harris)

Sør-Trøndelag: *Oppdal*, N of lake Skardvatnet, SW of Skardet, on *Juniperus communis*, NQ 2854/1520 III, alt. 950 m, 1987, H.H. 2890 (TRH), det. B.J. Coppins. - *Trondheim*, Trondheim City Centre, Tilfredshet churchyard, on *Ulmus glabra*, base of trunk, NR 6932-33/1621 IV, alt. 40 m, 1990-91, H.H. 4133 b (TRH) and T. Tønsberg 13722 (BG).

New to Norway.

*Anisomeridium nyssaegenum* is characterized mainly by its small, shiny perithecia, spore cells of different sizes and particularly by its conical pycnidia and the conidia produced in long, whitish, protruding chains. Because of the pycnidia, the species is easily identified also in a sterile condition (cp. Harris 1973, 1975).

In Scandinavia, this species has been reported from southern parts of Sweden where it is found on bark of deciduous trees, particularly at the base (Foucard 1990). It occurs as far north as Pite Lappmark (Orange 1991) where it grows on rotten wood of *Betula*. The species has certainly been overlooked in Norway.

*Arthothelium norvegicum* Coppins & Tønsb.

Sør-Trøndelag: *Rissa*, along river Nordelva, northfacing slope SW of Lona, on *Sorbus aucuparia*, base of trunk, in old spruce forest, NR 5874/1522 I, alt. 100 m, 1990, H.H. 3986 (TRH).

New to Sør-Trøndelag.

This species was described by Coppins & Tønsberg (1984) and mapped by Botnen & Tønsberg (1988). Later it has also been reported from Ireland and western Scotland by Coppins (1989). In Norway, the species was previously only known from Nord-Trøndelag.

***Bacidia absistens* (Nyl.) Arn.**

Sør-Trøndelag: *Rissa*, along river Nordelva, northfacing slope SW of Lona, on *Sorbus aucuparia* in old spruce forest, NR 5975/1522 I, alt. 120 m, 1990, H.H. 3983 (TRH).

New to Sør-Trøndelag.

This characteristic species was recently reported as new to central Norway from five localities in Nord-Trøndelag by Botnen & Tønsberg (1988). It seems to be an oceanic species.

***Bacidia arceutina* (Ach.) Arn.**

Sør-Trøndelag: *Trondheim*, Trondheim City Centre, Tilfredshet churchyard, on *Ulmus glabra*, shaded base of trunk, NR 6932-33/1621 IV, alt. 40 m, 1990, H.H. 4128 (TRH) and T. Tønsberg 13728 (BG).

New to central Norway.

This species was recently reported as new to Norway from one locality in Hordaland, where it grew on shaded, overhanging, calciferous rock (Botnen 1988). It has been reported from southern parts of Sweden as far north as Upland (Foucard 1990), where it grows on bark of deciduous trees, rarely on coniferous trees or lignum (cp. also Arvidsson *et al.* 1988).

***Bacidia circumspecta* (Nyl. ex Vain.) Malme**

Sør-Trøndelag: *Skaun*, E of Åsslettet by river Hauka, on *Juniperus communis* in old spruce forest, NR 4908/1521 II, alt. 340-400 m, 1991, H.H. 4176 (TRH). - *Trondheim*, Trondheim City Centre, Tilfredshet churchyard, on *Ulmus glabra*, base of trunk, NR 6932-33/1621 IV, alt. 40 m, 1990, T. Tønsberg 13725 (BG).

Nord-Trøndelag: *Leksvik*, Sjettenberglia, on trunk of *Ulmus glabra*, NR 6863/1622 III, alt. 250-300 m, 1980, T. Tønsberg 4862 (BG).

New to central Norway.

*Bacidia circumspecta* is characterized by a thin, somewhat warted bluish grey thallus, black convex apothecia with an inconspicuous margin, narrow cylindrical, mostly 3-7-septate spores, bluish green epihymenium and a pale hypothecium.

In Norway, it has previously been reported only from Møre og Romsdal (Santesson 1984).

***Bacidia phacodes* Koerb.**

Sør-Trøndelag: *Trondheim*, Trondheim City Centre, Tilfredshet churchyard, on trunk of *Ulmus glabra*, NR 6932-33/1621 IV, alt. 40 m, 1990-91, H.H. 4133 a (TRH) and T. Tønsberg 13721 (BG).

New to central Norway.

*Bacidia phacodes* is characterized mainly by its greenish, farinose to granulose thallus, pale, almost whitish convex apothecia with a pinkish or pale brownish tinge and disappearing margin, needle-shaped and slightly curved, 3-septate spores, yellowish epihymenium and colourless to pale brownish hypothecium. It is most likely to be confused with *Bacidia pallens* (Kullh.) Zahlbr. which differs by a different thallus (non-granulose), often slightly pruinose apothecia and smaller spores (cp. Foucard 1990).

In Norway, *B. phacodes* has previously been reported with certainty only from Akershus (Santesson 1984).

***Bacidia subincompta* (Nyl.) Arn.**

Sør-Trøndelag: *Oppdal*, N of lake Skardvatnet, SW of Skardet, on *Juniperus communis*, NQ 2854/1520 III, alt. 950 m, 1987, H.H. 2890 (mixed in a collection of *Anisomeridium nyssaegenum*) (TRH), det. B.J. Coppins. - *Midtre Gauldal*, Budalen valley, N of Bua bridge, on *Sorbus aucuparia*, NQ 7583/1620 IV, alt. 220 m, 1989, H.H. 3375 (TRH). - *Trondheim*, SW-facing slope E of lakelet Heisjøen, on trunk of *Ulmus glabra*, NR 5929/1521 I, alt. 260-300 m, 1991, H.H. 4157 a (TRH); Ladehammeren, on *Populus* ?, 24-03 & 01-11-1878, Kindt (TRH).

Nord-Trøndelag: *Høylandet*, W of lake Storgårningen by river Nylendeelva, on *Sorbus aucuparia*, UM 6171/1724 II, alt. 200 m, 1987, H.H. 2710 (TRH), det. B.J. Coppins. - *Lierne*, Storbekken forest reserve, on dead *Salix*, base of trunk, VM 46-4745/1923 I, alt. ca. 500 m, 1990, H.H. 3621 (TRH). - *Namsskogan*, S of lake Smalvatn, along the brook, on *Alnus incana*, VN 2017/1925 III, alt. ca. 260 m, 1980, T. Tønsberg 5115 & 5125 (BG), det. B.J. Coppins.

Troms: *Bardu*, Indset, on trunk of *Sorbus* ?, 25-05-1910, B. Lyng (O). -



*Målselv*, by Mt. Likkavarre, on trunk of *Sorbus* ?, 02-06-1911, B. Lyng (BG & O).

Finnmark: *Alta*, Talvik, Vassbotn, on trunk of *Salix*, EC 7268/1835 II, alt. 30 m, 1982, T. Tønsberg 7232 (BG).

New to central Norway, Troms and Finnmark.

*Bacidia subincompta* is characterized by its pale greyish green, slightly granulose thallus, large, plane to slightly convex black apothecia with a thin margin, cylindrical, mostly 5-7-septate spores, dark green to greenish black epihymenium and dark reddish brown hypothecium.

In Norway, it has previously been reported from southern Norway as far north as Møre og Romsdal and from Nordland (Santesson 1984). It seems to prefer bark of deciduous trees, especially of *Populus*, *Salix* and *Sorbus*, but it has also been found on coniferous trees and wood. The known distribution in Norway is shown in Fig. 1. It shows a slightly eastern tendency.

*Bryoria furcellata* (Fr.) Brodo & D. Hawksw.

Finnmark: *Alta*, Øytun folkehøgskole, on *Pinus sylvestris*, abundant, EC 8560/1834 I, alt. 60 m, 1987, H.H. 2818 (TRH).

This species has been mapped by Ahlner (1948) and was reported new to Finnmark by Alstrup & Söchting (1986). The locality in Alta represents a new northern limit in Scandinavia.

*Buellia erubescens* Arn.

Sør-Trøndelag: *Åfjord*, SE of lake Momyrvatnet, on *Alnus incana*, NS 7508/1623 III, alt. 270 m, 1987, H.H. 2666 (TRH).

New to central Norway.

*Buellia erubescens* is closely related to the common *Buellia disciformis* (Fr.) Mudd., but differs in its slightly smaller apothecia and significantly smaller spores (6-8 x 14-18 µm versus 7-10 x 16-26 µm) which are scarcely curved. It lacks oil droplets in the hymenium and contains norstictic acid along with atranorin in the thallus (TLC) (cp. Foucard 1990 and James 1971). Moreover, *Buellia disciformis* is distributed throughout most of the country, while *B. erubescens* seems to be restricted to coastal areas.

In Norway, *Buellia erubescens* has previously been reported from Aust-Agder, Hordaland, Møre og Romsdal, Nordland and Troms (Degelius 1982, Santesson 1984).

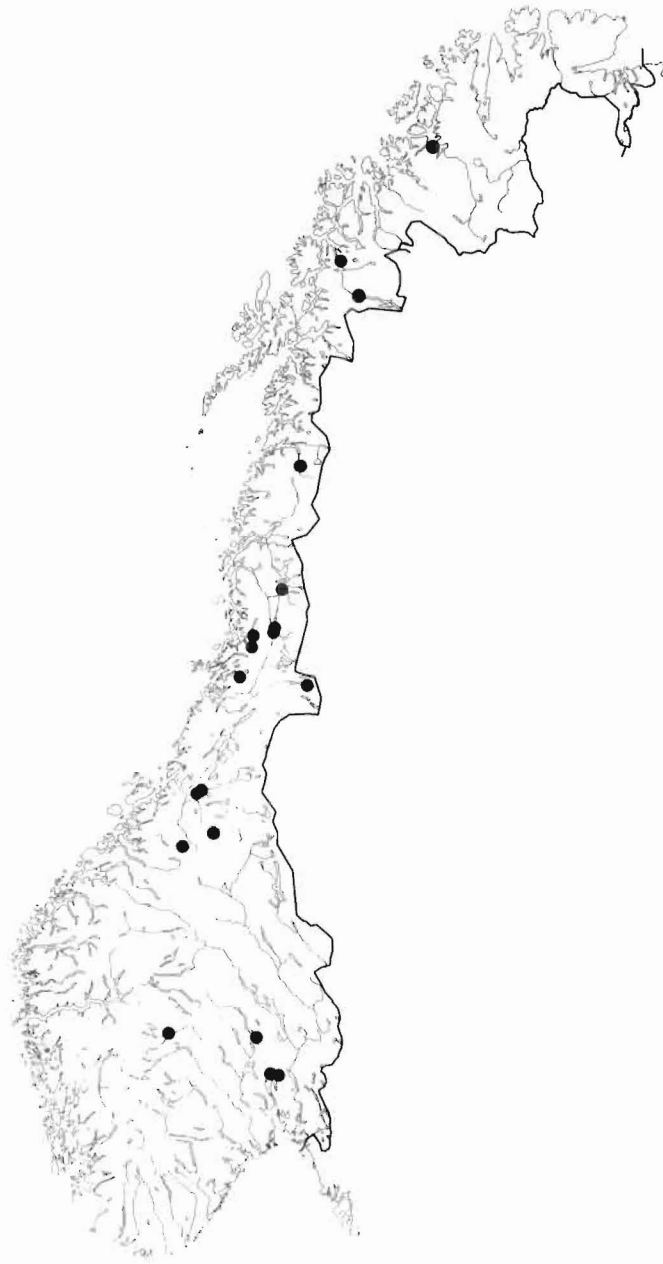


Fig. 1. The known distribution of *Bacidia subincompta* in Norway.

***Buellia nivalis* (Bagl. & Car.) Hertel ex Hafellner**

Nord-Trøndelag: *Levanger*, E of Hopla, south-facing slope of hill 120, on calciferous vertical rock, NR 9854/1622 II, alt. 60-80 m, 1988, H.H. 3146 b (TRH).

New to Nord-Trøndelag.

*Buellia nivalis* is characterized by a whitish thallus, black, plane to slightly convex, usually white-pruinose apothecia with a distinct margin and submuriform spores.

In Norway, it has previously been reported from Oppland, Sør-Trøndelag, Nordland and Finnmark (Santesson 1984).

***Catillaria globulosa* (Flk.) Th.Fr.**

Sør-Trøndelag: *Trondheim*, Trondheim City Centre, Tilfredshet churchyard, on trunks of *Ulmus glabra*, NR 6932-33/1621 IV, alt. 40 m, 1990, T. Tønsberg 13727 & 13729 (BG).

Nord-Trøndelag: *Lierne*, Storbekken forest reserve, on dead *Salix*, base of trunk, in spruce forest, VM 46-4745/1923 I, alt. 460-500 m, 1990, H.H. 3623 b (TRH), det. B.J. Coppins.

Nordland: *Hattfjelldal*, E-facing slope W of Stormyra, on old *Salix* in spruce forest, VN 5359/1925 I, alt. ca. 380 m, 1990, H.H. 3846 (TRH), det. B.J. Coppins.

New to central Norway and Nordland.

*Catillaria globulosa* is characterized by a very thin, somewhat warted, greyish white thallus with small, strongly convex, black, immarginate apothecia, 1-septate spores, greenish black or brownish epihymenium and pale hypothecium.

In Norway, it has previously been reported from Akershus, Troms and Finnmark (Santesson 1984).

***Catinaria atropurpurea* (Schaer.) Vězda & Poelt**

Nord-Trøndelag: *Namdalseid*, NW-facing slope of Furudalshøgda in a forest reserve, on *Sorbus aucuparia*, base of trunk, in spruce forest, NS 95-9618/1623 II, alt. 200-260 m, 1990, H.H. 3677 (TRH).

New to central Norway.

*Catinaria atropurpurea* is easily recognized by its characteristic brownish, plane to concave apothecia with a distinct margin, greyish, inconspicuous thallus and the corticolous habit.

In Norway, it has previously been reported from southern Norway as far north as Sogn og Fjordane and from Nordland and Finnmark (Santesson 1984, Søchting & Alstrup 1986).

***Catinaria neuschildii* (Koerb.) P. James**

Nord-Trøndelag: *Grong*, N of Ekermyra, on trunk of *Alnus incana*, UM 7048/1823 IV, alt. 50-100 m, 1979, T. Tønsberg 4458 d (BG). - *Namsskogan*, Smalåsen, E bank of river Litleelva, on trunk of *Alnus incana*. VN 2017-18/1925 III, alt. ca. 280 m, 1980, T. Tønsberg 5103 & 5119 (BG).

New to central Norway.

*Catinaria neuschildii* is close to *C. atropurpurea* and differs mainly in the number of spores in the asci, 12-16 in the former, 8 in the latter (Poelt & Vězda 1981).

In Norway, this species has previously been reported only from Akershus (Santesson 1984).

***Chaenotheca brachypoda* (Ach.) Tibell**

(syn. *Coniocybe sulphurea* (Retz.) Nyl.)

Sør-Trøndelag: *Meldal*, Urdvatnet forest reserve, by the south-western bank of the lake, on decorticated trunk of *Alnus incana*, NQ 4099/1521 II, alt. 300-310 m, 1991, H.H. 4211 (TRH).

Nord-Trøndelag: *Lierne*, Storbekken forest reserve, on rotten wood of *Picea abies* in old forest, VM 46-4745/1923 I, alt. ca. 450 m, 1990, H.H. 3634b (TRH).

Nordland: *Rana*, Dunderlandsdalen, NW-facing slope SW of Lian by river Ranaelva, on rotten stump of *Betula pubescens* in old spruce forest, VP 8865/2027 I, alt. 180-240 m, 1991, H.H. 4362 (TRH).

New to central Norway and Nordland.

*Chaenotheca brachypoda* is an eastern species which has recently been mapped by Middelborg & Mattsson (1987), who reported it from Hedmark, Oppland and Troms. It is most likely to be confused with the common *Chaenotheca furfuracea* (L.) Tibell, but differs mainly by an endosubstratal thallus, shorter apothecia and a darker brown mazaedium.

*Chaenotheca chlorella* (Ach.) Müll. Arg.  
(syn. *Chaenotheca carthusiae* (Harm.) Lettau)

Sør-Trøndelag: *Meldal*, Urdvatnet forest reserve, on dead corticated trunk of *Picea abies*, NQ 4199/1521 II, alt. ca. 320 m, 1991, H.H. 4216 (TRH).

Nord-Trøndelag: *Stjørdal*, Nævra forest reserve, on rotten wood of *Picea abies* in old forest, NR 95-9626/1621 I, alt. ca. 340 m, 1990, H.H. 3953 (TRH).

New to central Norway.

This characteristic and slightly southern species has recently been mapped by Middelborg & Mattsson (1987), who reported it from four localities in southernmost Norway and one locality in Nordland.

*Chaenotheca ferruginea* (Turn. ex Sm.) Migula

Nord-Trøndelag: *Høylandet*, NW of lake Storgørningen, W of Ytterengåsen, on dead *Pinus sylvestris*, UM 6272/1724 II, alt. 260 m, 1987, H.H. 2879 (TRH), det. L. Tibell.

New to central Norway.

*Chaenotheca ferruginea* is also a slightly southern species and has recently been mapped by Middelborg & Mattsson (1987). It is usually easily recognized by its granulose or warty greyish thallus containing spots of a yellow to reddish pigment reacting K+ deeply red and black apothecia without pruina. However, the specimen from Høylandet is devoid of this pigment.

*Chaenotheca gracillima* (Vain.) Tibell

Sør-Trøndelag: *Åfjord*, N of Austdalsvatna in a ravine, on rotten stump of *Picea abies*, NR 5985/1522 I, alt. 120-160 m, 1987, H.H. 2916 b (TRH).

Nord-Trøndelag: *Stjørdal*, Nævra forest reserve, on well decomposed lignum of *Picea abies* in old forest, NR 95-9626/1621 I, alt. ca. 340 m, 1990, H.H. 3952 & 3954 (TRH).

New to Sør-Trøndelag.

*Chaenotheca gracillima* is an eastern species and was mapped by Middelborg & Mattsson (1987) who, in addition to one locality in Nord-Trøndelag, reported it from Hedmark, Oppland, Nordland and Troms. The species is regarded as endangered in Sweden mainly due to modern forestry (Ingelög et al. 1984). It may be confused with *Sclerophora coniophaea* (Norm.) Middelb. & Mattsson (see that species), but differs by the more slender apothecia having poorly developed excipulum, somewhat darker mazaedium and less conspicuous pruina.

*Chaenotheca subroscida* (Eitn.) Zahlbr.

Sør-Trøndelag: *Meldal*, Urdvatnet forest reserve, on trunk of *Picea abies*, NR 4100/1521 II, alt. ca. 320 m, 1991, H.H. 4429 (TRH).

Nord-Trøndelag: *Lierne*, along river Guselva, on trunks and lignum of *Picea abies* in old forest, VM 31-3227/1923 IV, alt. ca. 450 m, 1990, H.H. 3605b & 3612b (TRH); Storbekken forest reserve, on trunks of *Picea abies*, VM 46-4745/1923 I, alt. ca. 500 m, 1990, H.H. 3636c & 3624b (TRH).

Nordland: *Grane*, N of river Gåsvasselva by Stateroad 803, on trunk of *Picea abies*, VN 1845/1925 IV, alt. ca. 280 m, 1990, H.H. 3863 (TRH). - *Rana*, Dunderlandsdalen, NW-facing slope SW of Lian, on trunk of *Picea abies*, VP 9066-67/2027 I, alt. 200-350 m, 1991, H.H. 4274 & 4286 a (TRH); Dunderlandsdalen, W of lakelet Langbakktjørna along the brook, on trunk of *Picea abies*, VP 74-7565/2027 IV, alt. 140-200 m, 1991, H.H. 4351 (TRH); Blakkådalen, W-facing slope by river Blakkåa, on trunk of *Picea abies*, VP 7073/2027 IV, alt. 140-180 m, 1991, H.H. 4325 (TRH); Plurdalen, between Skonsengalmliå and river Plura, on trunk of *Picea abies*, VP 7359/2027 IV, alt. 180-220 m, 1991, H.H. 4335 (TRH).

New to Sør-Trøndelag.

*Chaenotheca subroscida* is an eastern species and was recently mapped by Middalborg & Mattsson (1987). They only reported it from one locality in Nord-Trøndelag (Verran), and one locality in Nordland (Hattfjelldal), along with several localities in Hedmark, Oppland and Buskerud. The species has certainly been overlooked in central and northern Norway. However, it is dependent on old spruce forests and may be endangered due to modern forestry.

*Cladonia metacorallifera* Asah. var. *reagens* Asah.

Nord-Trøndelag: *Namdalseid*, Trebostad, among mosses on stone with a humus layer in young spruce plantation, PS 1326/1723 III, alt. 100-120 m, 1980, H.H. 473-80 (TRH). - *Namsos*, Otterøy, E of Viksetra, on rotten stump of *Pinus sylvestris* in open pine forest, PS 1357/1724 III, alt. 100 m, 1981, H.H. 208 d-81 (TRH); Skakanovdalen, on stone with a humus layer in mature spruce forest, PS 2460/1724 III, alt. 60-100 m, 1981, H.H. 142-81 (TRH). - *Høylandet*, by river Kjølstadelva, on stone with a humus layer in young spruce plantation, UM 7479/1824 III, alt. 80 m, 1980, H.H. 699-80 (TRH). - *Lierne*, along river Guselva, on *Betula pubescens*, base of trunk, in spruce forest, VM 31-3227/1923 IV, alt. 400-500 m, 1990, H.H. 3604 (TRH).

*Cladonia metacorallifera* var. *reagens* differs from var. *metacorallifera* by containing thamnolic acid (PD+ orange) instead of squamatic acid (PD-). No morphological differences have been recognized between the two chemotypes. However, var. *reagens* has a very restricted distribution compared with var. *meta-*

*corallifera*, and is confined to central Norway, adjacent parts of central Sweden and Japan (Tønsberg 1979, Stenroos 1989). The distribution in Scandinavia of *Cladonia metacorallifera* var. *reagens* corresponds quite well with that of *Cavernularia hultenii* Degel. (Ahlner 1948) and *Pannaria ahlneri* P. M. Jørg. (Jørgensen 1978). The present new localities from Trøndelag update the map presented by Tønsberg (1979), see Fig. 2.

***Cladonia parasitica* (Hoffm.) Hoffm.**

Sør-Trøndelag: *Meldal*, Urdvatnet forest reserve, S-facing slope N of the lake, on rotten stumps of *Pinus sylvestris*, NQ 4199/1521 II, alt. ca. 320 m, 1991, H.H. 4213 & 4214 (TRH).

Nord-Trøndelag: *Namdalseid*, S of lake Rørvatnet along brook Kjølbecken, on rotten stump of *Pinus sylvestris*, PS 1924/1723 III, alt. ca. 160 m, 1981, H.H. 715-81 (TRH); N-facing slope S of lake Altvatn, on rotten stump of *Pinus sylvestris*, PS 0640/1623 I, alt. 80-120 m, 1983, T. Tønsberg 8246 (TRH).

New to Sør-Trøndelag.

In central Norway, this species has previously only been reported from one locality in Nord-Trøndelag (Tønsberg & Øvstedal 1982). The species seems to have a scattered distribution throughout most of the country, but with a slightly eastern tendency. Apart from central Norway, the species is known from Hedmark, Oppland, Oslo, Buskerud, Telemark, Aust-Agder, Hordaland and Finnmark (cp. Hasselrot 1942, Tønsberg 1980, 1983).

***Cliostomum griffithii* (Sm.) Coppins**  
(syn. *Catillaria griffithii* (Sm.) Malme)

Nord-Trøndelag: *Stjørdal*, E of Langstein, on trunk, twigs and rotten wood of *Picea abies*, NR 9448/1622 II, alt. 60 m, 1988, T. Tønsberg 10780, 10781 & 10782 (BG). - *Steinkjer*, south of river Figga, on trunk of *Picea abies*, 31-07-1931, O.A. Høeg, det. T. Tønsberg (TRH). - *Namdalseid*, Holstadmarka, N of Holstad, on trunk of *Picea abies*, PS 07-0821/1723 III, alt. 80-100 m, 1991, H.H. 4233 (TRH). - *Flatanger*, Eidbygds-kardet, on trunk of *Picea abies*, NS 97-9842/1623 I, alt. 160 m, 1987, H.H. 3042 (TRH); Gaupdalen, on trunk of *Picea abies*, NS 8939/1623 I, alt. ca. 100 m, 1990, H.H. 3729 (TRH). - *Namsos*, along south side of river Duna, on trunk of *Picea abies*, PS 3466/1724 II, alt. 40 m, 1987, H.H. 3076 (TRH).

Nordland: *Bindal*, along river Aunelva, on trunk of *Picea abies*, UN 8519/1825 III, alt. 80 m, 1990, H.H. 3905 (TRH); NE of Djupvikenget, on trunk of *Picea abies*, UN 6416/1725 II, alt. 40-80 m, 1982, T. Tønsberg 6861 (BG).

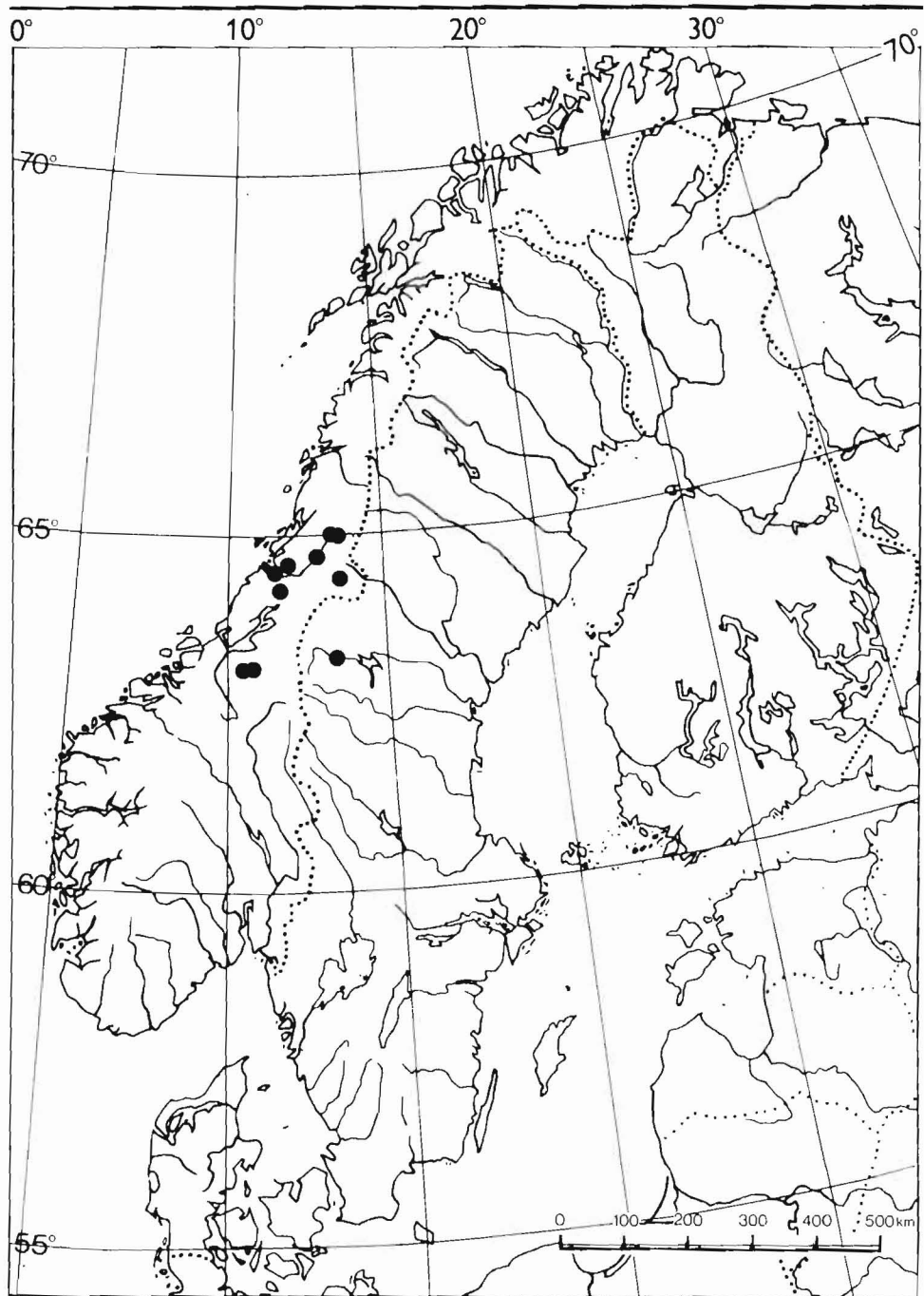


Fig. 2. The known distribution of *Cladonia metacorallifera* var. *reagens* in Europe.



Troms: *Harstad*, north-facing slope S of Kasfjordvatn, on *Betula pubescens*, underside of leaning trunk near base, WS 5435/1332 IV, alt. 60 m, 1987, T. Tønsberg 10413 (BG).

New to Nord-Trøndelag and northern Norway.

*Cliostomum griffithii* is easily recognized by its whitish, slightly granulose or warted thallus bearing a multitude of black pycnidia, brownish flat to concave, slightly grey-pruinose apothecia with a grey pinkish or blackish tinge and a distinct margin and 1-septate spores. Five specimens analysed by TLC contained atranorin and a fatty acid in the thallus. The fatty acid has been recognized as roccellic acid by T. Tønsberg (pers. comm.).

In Norway, *C. griffithii* seems to prefer *Picea*, both trunks and twigs, but it has also been recorded on *Alnus incana*, *Betula*, *Calluna*, *Ilex* and *Sorbus*. It has previously been reported only from Rogaland, Hordaland and Sør-Trøndelag (Santesson 1984). In Sweden, it has been reported as far north as Ångermannland (Foucard 1990). The locality in Troms is therefore a new northern limit in Scandinavia. The known distribution of the species in Norway is shown in Fig. 3. In view of the Swedish distribution it seems to be a suboceanic species. It should be looked for in the surroundings of Oslo.

***Collema occultatum* Bagl. var. *occultatum***

Sør-Trøndelag: *Afjord*, along river Amunddalselva, on trunk of *Sorbus aucuparia*, NR 7492/1622 IV, alt. 220 m, 1990, H.H. 3773 (TRH).

New to Sør-Trøndelag.

*Collema occultatum* was reported from central Norway by Tønsberg & Øvstedal (1982). It is also known from Aust-Agder and from Nordland to Finnmark (Degelius 1954, Krog *et al.* 1980).

***Cyphelium inquinans* (Sm.) Trevis.**

Sør-Trøndelag: *Holtålen*, Høgvollen, Øggdalen, on worked timber, PQ 971/1620 I, alt. ca. 610 m, 1990, H.H. 4063 (TRH).

New to Sør-Trøndelag.

*Cyphelium inquinans* has recently been mapped by Middelborg & Mattsson (1987) and seems to have a scattered distribution throughout most of the country.

This is the second report from central Norway.



Fig. 3. The known distribution of *Cliostomum griffithii* in Norway.

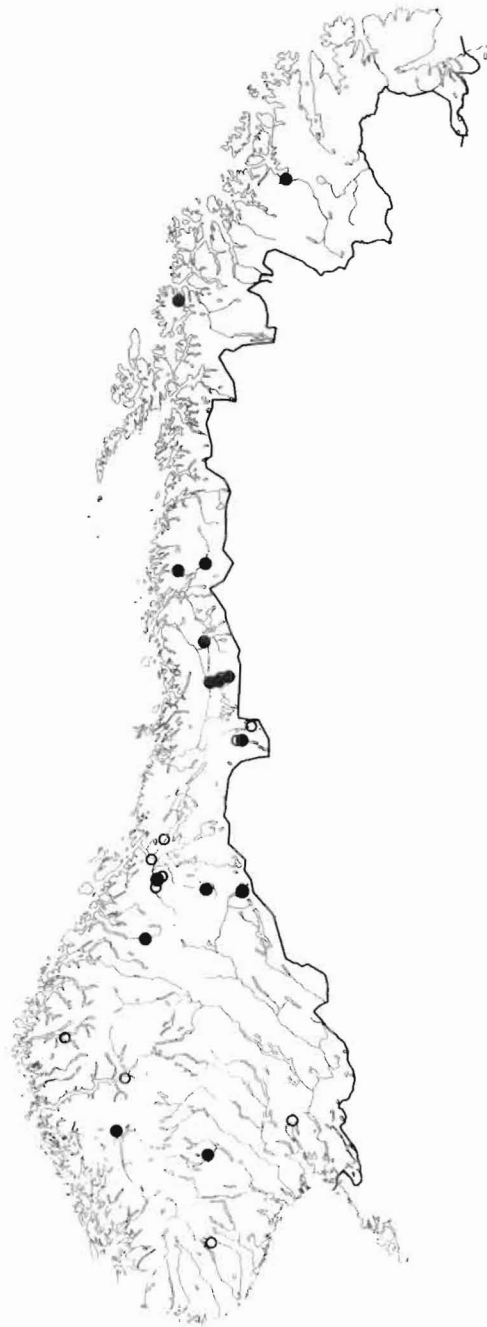


Fig. 4. The known distribution of *Lecanora cadubriae* in Norway. Filled circles are chemotype 1 and open circles are chemotype 2.

*Epilichen scabrosus* (Ach.) Clem. ex Hafellner

Nord-Trøndelag: *Fosnes*, Skrøyvdalsfossen, lichenicolous on *Baeomyces placophyllus* Ach., UM 5985/1724 I, alt. 90 m, 1981, H.H. 1054-81 (TRH).

New to Nord-Trøndelag.

In Norway, *Epilichen scabrosus* has previously been reported only from Sør-Trøndelag and Finnmark (Santesson 1984). It is a lichen which starts as a parasite on species of *Baeomyces*, and subsequently becomes an autonomous lichen.

*Fuscidea gothoburgensis* (H. Magn.) V. Wirth & Vězda

Sør-Trøndelag: *Trondheim*, Skjøla, along brook Damtjørnbekken, on overhanging rock, NR 7021/1621 IV, alt. 250 m, 1987, H.H. 2631 (TRH). - *Bjugn*, Lysøysund, S of lake Vikavatnet, on siliceous overhanging rock, abundant, NR 4481-82/1522 I, alt. 100 m, 1987, H.H. 3006 (TRH).

New to central Norway.

*Fuscidea gothoburgensis* occurs on siliceous rock along the coast. In Norway, it has previously been reported from Vest-Agder to Hordaland (Santesson 1984) and from Vega in Nordland (Degelius 1982), which is the northern limit of the species in Scandinavia.

*Lecanora allophana* (Ach.) Nyl.

Nord-Trøndelag: *Namsos*, Løkkemoen, on *Populus tremula*, PS 2360/1724 III, alt. 50 m, 1981, H.H. 677-81 (TRH), det. O. Vitikainen.

New to Nord-Trøndelag.

In Norway, *Lecanora allophana* has previously been reported from Aust-Agder to Sør-Trøndelag (Santesson 1984). The specimen contains atranorin and two unidentified substances in the thallus (TLC) (cp. Brodo 1984).

*Lecanora cadubriæ* (Massal.) Hedl.

Sør-Trøndelag: *Røros*, Sølendet nature reserve, on rotten wood, PQ 4553/1720 II, alt. 700-720 m, 1990, H.H. 3769, chemotype 1 (TRH). - *Holtålen*, north-facing slope of Øggdalen, on trunk of *Picea abies*, PQ 08-0971/1620 I, alt. 480-560 m, 1990, H.H. 4072, chemotype 1 (TRH). - *Meldal*, Urdvatnet forest reserve, S-facing slope N of the lake, on dead corticated trunk of *Pinus sylvestris*, NQ 4199/1521 II, alt. ca. 320 m, 1991, H.H. 4212, chemo-

type 2 (TRH). - *Orkdal*, hill SE of lakelet Rørtjørna, on trunk of *Picea abies*, NR 4403/1521 II, alt. ca. 340 m, 1991, H.H. 4171, chemotype 1 (TRH); Måneskinnsvika, on trunk of *Pinus sylvestris*, NR 473536/1521 I, alt. 50-100 m, 1980, T. Tønberg 4608 b, chemotype 2 (BG). - *Skaun*, E of Åsslettet by river Hauka, on trunk of *Picea abies*, NR 4908/1521 II, alt. 340-400 m, 1991, H.H. 4177, chemotype 2 (TRH).

Nord-Trøndelag: *Leksvik*, southfacing slope of Himmelriket, SW of river Lille Bjørnåa, on trunk of *Picea abies*, NR 7354/1622 III, alt. ca. 300 m, 1990, H.H. 4085, chemotype 2 (TRH). - *Lierne*, Storbekken forest reserve, on trunk of *Picea abies*, VM 46-4745/1923 I, alt. 460-500 m, 1990, H.H. 3624 (TRH), chemotype 2 (TRH); along river Guselva, on trunk of *Picea abies*, VM 31-3227/1923 IV, alt. 400-500 m, 1990, H.H. 3612 a & 3606 a, chemotypes 1 & 2 (TRH). - *Røyrvik*, east of river Vierma by lake Namsvatn, on trunk of *Picea abies*, VN 4415/1925 II, alt. ca. 470 m, 1990, H.H. 3998, chemotype 1 (TRH). - *Namsskogan*, Smalåsen, Langtjønna, on trunk of *Picea abies*, VN 21-2220/1925 III, alt. 300 m, 1980, T. Tønberg 4575, chemotype 1 (BG); Børgefjell Nat. Park, Namskroken, N bank of river Namsen, on trunk of *Picea abies*, VN 2518/1925 III, alt. 330-340 m, 1983, T. Tønberg 7988 b, chemotypes 1 & 2 (BG).

Nordland: *Grane*, Majavatn, W slope of Lillefjellet E of Majavatn St., on trunk of *Picea abies*, VN 2328/1925 III, alt. 340-350 m, 1981 & 1983, T. Tønberg 6051, 6272 b & 7991 a, chemotype 1 (BG); N of lake Smalvatnet, on trunk of *Picea abies*, VN 2321/1925 III, alt. 280-290 m, 1983, T. Tønberg 8106, chemotype 1 (BG). - *Hattfjelldal*, NW of hill Gryteselvásen by State-road 73, on trunk of *Picea abies*, VN 4472-73/1926 II, alt. ca. 420 m, 1990, H.H. 3804 & 3809 b, chemotype 1 (TRH). - *Rana*, Dunderlandsdalen, NW-facing slope SW of Lian by river Ranaelva, on trunk of *Picea abies*, VP 9066-67/2027 I, alt. 200-350 m, 1991, H.H. 4270, chemotype 1 (TRH); hill N of Fisktjørna, on trunk of *Picea abies*, VP 4975/1927 I, alt. 140-160 m, 1991, H.H. 4320, chemotype 1 (TRH).

Troms: *Lenvik*, Gibostad, on trunks of *Pinus sylvestris*, 17-05-1910, B. Lyng, chemotype 1 (O).

Finnmark: *Alta*, Øytun folkehøgskole, on trunks of *Pinus sylvestris*, EC 8560/1834 I, alt. 60 m, 1987, H.H. 2817, chemotype 1 (TRH), det. B.J. Coppins.

New to central and northern Norway.

*Lecanora cadubriae* is usually easily recognized by its whitish or greenish grey, more or less areolate thallus reacting PD+ orange, occasionally with black pycnidia, brownish or blackish brown, plane and somewhat grey-pruinose apothecia with a more or less conspicuous margin (young apothecia with a distinct margin) and simple spores. In the field it may be confused with *Cliostomum griffithii* (see that species), which, however, has a slightly different thallus appearance (more granulose), concave apothecia with a pinkish tinge and a more distinct margin and a different thallus chemistry. It may also be confused with *Lecidea hypopta* Ach. with which it is often found growing. However, this species differs

by more convex apothecia usually without a margin and by a mostly endosubstratal thallus containing an unidentified fatty acid, Rf 3-4 in TA (TLC).

Two chemotypes of *L. cadubriæ* have been recognized:

Chemotype 1 contains norstictic acid with a trace of connorstictic acid in the thallus. Some of the collections also contain an unidentified fatty acid, Rf 5-6 in TA (TLC).

Chemotype 2 contains virensic acid as the major compound along with two unidentified substances.

According to Culberson (1970) and Culberson *et al.* (1977), virensic acid has not been reported from *L. cadubriæ* before or to our knowledge from any Norwegian crustose lichen. This lichen compound is only known from the pendulous macrolichen genera *Oropogon* (Esslinger 1989), *Sulcaria* (Hawksworth 1971) and *Usnea* (Culberson *et al.* 1981, Holien 1982). We have not found any morphological difference between the two chemotypes. They have also been found growing together on the same trunk of *Picea*. The chemotypes are easily separated by their K-reaction; K+ red in the former, K- in the latter.

The species seems to prefer rather old pine or spruce forests in Norway, where it is confined to the lower parts of trunks. It has also been found on rotten wood.

In Norway, *L. cadubriæ* has previously only been reported as far north as Møre og Romsdal (Santesson 1984). The known distribution of the species in Norway is shown in Fig. 4.

#### *Lecanora chlarotera* Nyl.

Sør-Trøndelag: *Melhus*, N of Hågån, on *Sorbus aucuparia*, NQ 6494/1621 III, alt. 100 m, 1989, H.H. 3388 (TRH).

Nord-Trøndelag: *Namsos*, along river Duna, on *Alnus incana*, PS 3465/1724 II, alt. 30 m, 1987, H.H. 3058 (TRH).

New to central Norway.

Both specimens contain gangaleoidin and atranorin in the thallus (TLC) (cp. Brodo 1984).

In Norway, *Lecanora chlarotera* has previously been reported from Rogaland, Hordaland, Møre og Romsdal and Nordland (Santesson 1984).

#### *Lecanora populicola* (DC.) Duby

Sør-Trøndelag: *Trondheim*, Frøset by lake Leirsjøen, on *Populus tremula*, abundant, NR 6429/1621 IV, alt. ca. 200 m, 1990, H.H. 4123 (TRH).

Nord-Trøndelag: *Namdalseid*, Holstad, on *Populus tremula* PS 0820/1723 III, alt. 100 m, 1991, H.H. 4136 (TRH).

New to central Norway.

In Norway, *Lecanora populicola* has previously been reported from Hordaland, Sogn og Fjordane and Nordland (Santesson 1984).

*Lecanora pulicaris* (Pers.) Ach.

Aust-Agder: *Åmli*, Simenåsen hill, on twigs of *Picea abies*, ML 5715/1512 I, alt. 420-440 m, 1989, I. Bruteig (TRH); W of lake Våvatnet by Vå, on twigs of *Picea abies*, ML 5508/1512 II, alt. ca. 240 m, 1989, I. Bruteig (TRH). - *Gjerstad*, N of lakelet Øygardstjørna, on twigs of *Picea abies*, ML 9035/1612 IV, alt. 380-400 m, 1989, I. Bruteig (TRH).

Sør-Trøndelag: *Roan*, along brook Dalamarktjørnbekken, on *Alnus incana*, NS 7610/1623 III, alt. 300 m, 1985, H.H. 26-85 (TRH), det. O. Vitikainen.

New to Aust-Agder and central Norway.

The specimens react PD+ red in the excipulum due to the presence of fumarprotocetraric acid (TLC).

In Norway, *Lecanora pulicaris* has previously been reported from Vest-Agder, Rogaland and Hordaland (Santesson 1984).

*Lecidea atroviridis* (Arn.) Th. Fr.

Vestfold: *Andebu*, Skoger-Gjerstad, on *Fagus sylvatica*, 28-05-1921, O.A. Höeg (TRH). - *Hedrum*, Haugenskogen by Bølevandsbakken, on *Fagus sylvatica*, 24-08-1922, O.A. Höeg (TRH).

Sør-Trøndelag: *Rissa*, along river Nordelva, northfacing slope SW of Lona, on trunk of *Sorbus aucuparia* in spruce forest, NR 58-5974/1522 I, alt. ca. 120 m, 1990, H.H. 3990 c (TRH), det. B.J. Coppins.

Nord-Trøndelag: *Høylandet*, along river Besa, on trunk of *Sorbus aucuparia*, UM 7472/1824 III, alt. 100-140 m, 1990, H.H. 3937 b (TRH).

New to Vestfold and central Norway.

*Lecidea atroviridis* is characterized by the warted, areolate, greyish to greenish thallus, grey-black apothecia, ca. 0.4-0.7 mm in diameter with a thin, paler margin and a blue-green, J+ reddish pigment in the hymenium and hypothecium. The thallus reacts PD+ red due to the presence of argopsin, previously not reported in this species. *L. atroviridis* is most often confused with a presumably undescribed species (Holien in prep.) which differs by an even

more warted thallus, reacting PD- and C+ orange due to the presence of xan-  
thones, usually somewhat paler apothecia and by lacking the blue-green pigment  
in the hymenium. The type specimen of *L. atroviridis* has not been available  
for chemical investigation by the present authors.

In Norway, *L. atroviridis* has previously been reported only from Akershus  
(Santesson 1984).

***Lecidea betulicola* (Kullh.) H. Magn.**

Sør-Trøndelag: *Trondheim*, Lauglo, on twigs of *Picea abies*, NR 6125/1621 IV,  
alt. 140-200 m, 1989, R. Wang (TRH); Leirsjøen, on twigs of *Picea abies*,  
NR 6329/1621 IV, alt. 180 m, 1988, R. Wang (TRH).

Nord-Trøndelag: *Namdalseid*, along brook Trettengbekken, on twigs of *Picea*  
*abies*, PS 0619/1623 II, alt. ca. 80 m, 1990, H.H. 3757 (TRH). - *Høylandet*,  
Tyllurda by lake Storgrønningen, on twigs of *Picea abies*, UM 6573/1724  
II, alt. 200 m, 1988, I. Bruteig (TRH).

New to central Norway.

*Lecidea betulicola* resembles *Lecidea atroviridis*, but the apothecia are paler  
(never black), often with a brownish or reddish tinge and somewhat smaller,  
ca. 0.2-0.5 mm in diameter, with polysporous asci (12-16 spores per ascus).  
Moreover, the hymenium and hypothecium are pigment deficient and the thallus  
is devoid of lichen substances. *L. betulicola* may also be confused with *Lecidea*  
*epiphaea* Nyl., and according to Clauzade & Roux (1985) they may be conspec-  
ific. However, the latter differs by a reddish brown pigment in the epihyme-  
nium, K+ yellow thallus and a slightly different ecology, usually lignicolous or  
muscicolous. *L. betulicola* is corticolous.

In Norway, *L. betulicola* has previously been reported only from Akershus  
(Santesson 1984). In central Europe this species is found in humid montane  
spruce forests (Wirth 1980).

***Lecidea sphaerella* Hedl.**

Sør-Trøndelag: *Trondheim*, SW-facing slope E of lakelet Heisjøen, on trunk of  
*Ulmus glabra*, NR 5929/1521 I, alt. 260-300 m, 1991, H.H. 4157 a (mixed  
in a collection of *Bacidia subincompta*) (TRH).

Nord-Trøndelag: *Namdalseid*, NW-facing slope of Furudalshøgda in a forest  
reserve, on *Sorbus aucuparia*, base of trunk, in spruce forest, NS 95-9618/  
1623 II, alt. 200-260 m, 1990, H.H. 3677 (TRH).

Nordland: *Bindal*, south-facing slope of Heia, on trunk of *Populus tremula*, UN  
8715/1825 III, alt. ca. 160 m, 1990, H.H. 3919 b (TRH).

New to Norway.



*Lecidea sphaerella* is characterized by a thin, greenish white or endosubstratal thallus, small, brownish, strongly convex apothecia with a paler or disappearing margin, simple or 1-septate spores and pale epihymenium, hymenium and hypothecium. No lichen acids were detected by TLC. The species may look like a young *Lecidea helvola* (Koerb. ex Hellb.) Hedl., with which it has been found growing. However, *L. helvola* has a more conspicuous, warted or areolate thallus reacting PD+ red due to the presence of argopsin (not reported from this species before) and larger, less convex apothecia with an inconspicuous margin.

In Scandinavia, *L. sphaerella* has previously been reported from Sweden as far north as Jämtland and Ångermannland (Foucard 1990).

*Lecidoma demissum* (Rutstr.) G. Schneider & Hertel  
(syn. *Lecidea demissa* (Rutstr.) Ach.)

Sør-Trøndelag: *Oppdal*, Kongsvold, on soil, 1877, Kindt (TRH); Knutshø, on soil, 1876, Kindt (TRH). - *Åfjord*, northfacing slope of Mt. Vasslifjellet, terricolous in coastal heath, NS 75-7608/1623 III, alt. 320 m, 1987, H.H. 2682 (TRH); Stokksund, S of Harbak, terricolous near seashore, NS 5005/1523 II, alt. 10 m, 1987, H.H. 2731 (TRH).

Nord-Trøndelag: *Meråker*, Stenfjeldet, 1880, Kindt (TRH). - *Høylandet*, NW of lake Storgårningen between Millastholet and river Skiftesåa, terricolous in open heath vegetation, UM 61-6272-73/1724 II, alt. 300-320 m, 1987, H.H. 2692 a (TRH).

New to central Norway.

In Norway, this species has previously been reported from Rogaland, Hordaland, Møre og Romsdal, Nordland and Troms (Santesson 1984, Timdal 1987).

*Lobaria scrobiculata* (Scop.) DC.  
PD-negative chemotype

Nord-Trøndelag: *Steinkjer*, Kvam, Vallemsåsen, PS 3617/1723 II, alt. 90 m, 1980, H.H. 830-80 (TRH). - *Namdalseid*, N of Hallaberget, PS 0922/1723 III, alt. 80 m, 1979, H.H. 302-79 (TRH). - *Namsos*, Sævik along river Barstadelva, PS 2047/1723 IV, alt. 40 m, 1981, H.H. 534-81 (TRH). - *Overhalla*, Granbekkdalen, PS 3448/1723 I, alt. 50 m, 1981, H.H. 945-81 (TRH). - *Grong*, Ekermyra. UM 7048/1823 IV, alt. 90 m, 1981, H.H. 1039-81 (TRH).

New to Europe.

All specimens grew on twigs of *Picea abies* in old, humid forests. The specimens contain scrobiculin and small amounts of usnic acid (TLC). This chemotype has



previously been reported only from Alaska (Krog 1968). It is noteworthy that all Alaskan specimens of this chemotype were found in very humid forests similar to the Norwegian localities (Krog pers. comm.). However, there is no morphological difference between this chemotype and the stictic acid chemotype.

*Micarea cinerea* (Schaer.) Hedl.

Sør-Trøndelag: *Klæbu*, Lersmoen, on twigs of *Picea abies*, NR 7111/1621 IV, alt. 180 m, 1988, O. Hilmo (TRH), det. T. Tønsberg; Moan by lake Selbusjøen, on *Sorbus aucuparia*, NR 7614-15/1621 IV, alt. 160 m, 16-09-1979, P.W. James & T. Tønsberg (BG). - *Rissa*, along river Nordelva, northfacing slope SW of Lona, on twigs of *Picea abies*, NR 58-5974/1522 I, alt. 100-140 m, 1990, H.H. 3990 b (TRH). - *Åfjord*, SW of Ugedal along brook Dølavikbekken, on *Sorbus aucuparia*, NR 6794/1622 IV, alt. 40 m, 1988, H.H. 3195 d (TRH).

Nord-Trøndelag: *Namdalseid*, along brook Trettengbekken, on twigs of *Picea abies*, PS 0619/1623 II, alt. ca. 80 m, 1990, H.H. 3757 b (TRH). - *Snåsa*, 1 km NE of lake Heimsjøen, on *Alnus incana*, UM 60-6126/1723 II, alt. 125 m, 1980, T. Tønsberg 4765, 4766 & 4769 (BG). - *Overhalla*, S of Grande, on twigs of *Picea abies*, PS 4354/1723 I, alt. 50 m, 1988, H.H. 3340 b (TRH). - *Grong*, along Namsen S of Migandbekken, on *Alnus incana*, UM 7355/1824 III, alt. 50 m, 1980, T. Tønsberg 4759b (BG). - *Høylandet*, along river Besa, on *Alnus incana*, UM 7472/1824 III, alt. 120 m, 1990, H.H. 3932 b (TRH).

Nordland: *Bindal*, Åbygda, near the bridge E of Fuglstad, on *Alnus incana*, UN 8315/1825 III, alt. 20-40 m, 1982, T. Tønsberg 6820 c (BG).

New to central and northern Norway.

*Micarea cinerea* is characterized by a greenish thallus consisting of convex, rounded areoles, pale to dark greyish convex apothecia, sometimes with a thin margin, cylindrical and slightly curved 4-7-septate spores, a greenish to brownish epihymenium and a pale hypothecium. Areoles and apothecia react C+ red due to the presence of gyrophoric acid (TLC).

The species seems to favour the trunks of deciduous trees with smooth bark, but it has also been found on coniferous trees, trunks as well as twigs (cp. Coppins 1983).

In Norway, this species has previously been reported from Rogaland, Hordaland and Møre og Romsdal (Fries 1874, Santesson 1984). In Sweden, *M. cinerea* has been reported as far north as Västmanland (Foucard 1990). The locality in Bindal is therefore a new northern limit in Scandinavia. The known distribution in Norway is shown in Fig. 5. The species seems to be an oceanic species.



Fig. 5. The known distribution of *Micarea cinerea* in Norway.

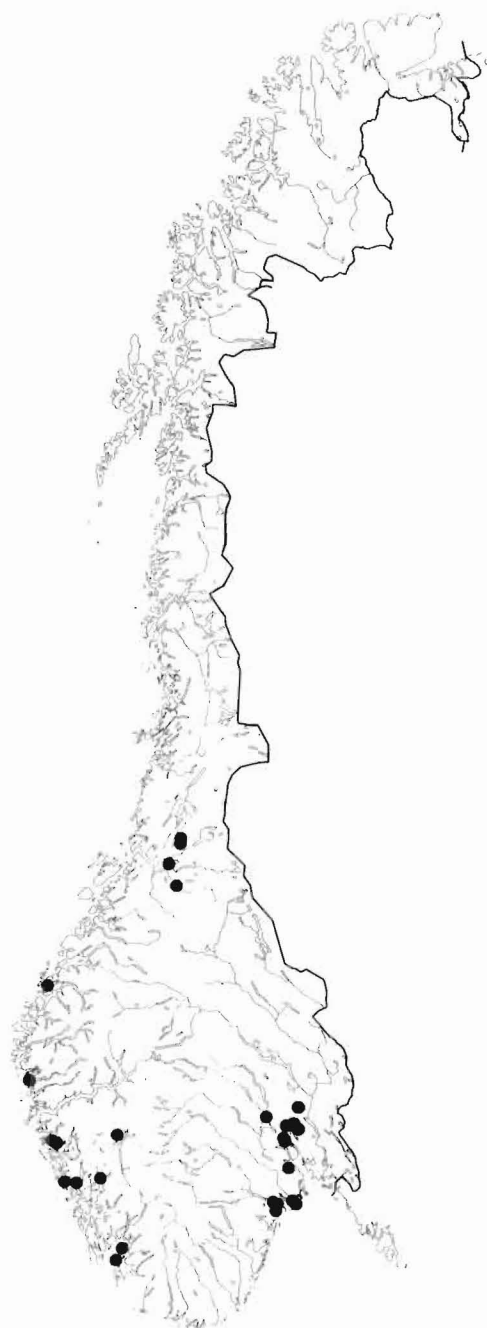


Fig. 6. The known distribution of *Opegrapha rufescens* in Norway.

*Micarea nitschkeana* (Lahm ex Rabenh.) Harm.

Sør-Trøndelag: *Klæbu*, Lersmoen, on twigs of *Picea abies*, NR 7111/1621 IV, alt. 180 m, 1988, O. Hilmo (TRH), det. A. Botnen & T. Tønsberg.

New to central Norway.

*Micarea nitschkeana* is characterized by a greenish grey areolate thallus, plane or convex, black or brownish apothecia, usually 3-septate, slightly curved spores, pale hymenium and hypothecium and olivaceous epihymenium reacting K+ violet.

In Norway, this species has previously been reported only from Rogaland (San-  
tesson 1984). New northern limit in Scandinavia (cp. Foucard 1990).

*Microcalicium disseminatum* (Ach.) Vain.

Sør-Trøndelag: *Holtålen*, Øggdalen, on the rotten stump of *Picea abies*, PQ 0971/1620 I, alt. ca. 500 m, 1990, H.H. 4060 (TRH). - *Skaun*, E of Åsslettet by river Hauka, on *Picea abies*, base of trunk, NR 4908/1521 II, alt. 340-400 m, 1991, H.H. 4178 (mixed in a collection of *Lecidea hypopta*) (TRH). - *Trondheim*, by lake Jonsvatnet SE of top 184, on trunk of *Picea abies*. NR 8028/1621 IV, alt. 160 m, 1988, H.H. 3219 (TRH). - *Åfjord*, N of lakes Austdalsvatna in a ravine, on rotten stump of *Picea abies*, NR 5985/1522 I, alt. 130 m, 1987, H.H. 2916 c (TRH).

Nordland: *Rana*, Blakkådalen, W-facing slope by river Blakkåa, on trunk of *Picea abies*, VP 7073/2027 IV, alt. 140-180 m, 1991, H.H. 4327 (TRH); Dunderlandsdalen, NW-facing slope SW of Lian by river Ranaelva, on rotten wood of *Pinus sylvestris*, VP 8865/2027 I, alt. 180-240 m, 1991, H.H. 4357 (TRH).

New to Sør-Trøndelag and Nordland.

In central and northern Norway this species has previously been reported only from one locality in Nord-Trøndelag and one locality in Finnmark (Middelborg & Mattsson 1987). *Microcalicium disseminatum* may be confused with *Microcalicium ahlneri* Tibell, but differs mainly in the apothecial habit, sessile in the former, stalked in the latter.

*Opegrapha rufescens* Pers.

Sør-Trøndelag: *Melhus*, SW-facing slope N of Hågån, on *Alnus incana* and *Sorbus aucuparia*, NQ 6494/1621 III, alt. 110 m, 1989, H.H. 3358 & 3382 (TRH). - *Trondheim*, along river Nidelva, E of Sjetntrøa, on *Populus tremula* and *Alnus incana*, NR 7126/1621 IV, alt. 80 m, 1990, H.H. 3999 & 4000 (TRH).

Nord-Trøndelag: *Stjørdal*, Langstein, S of Steinshammaren in a ravine, on *Sorbus aucuparia*, NR 9448/1622 II, alt. 90 m, 1987, H.H. 2772 (TRH). - *Levanger*, E of Hopla, southfacing slope of top 120, on *Corylus avellana* and *Sorbus aucuparia*, NR 9854/1622 II, alt. 70 m, 1988, H.H. 3111 & 3123 (TRH).

New to central Norway.

*Opegrapha rufescens* is easily recognized by its reddish brown thallus, black immersed lirelliform apothecia often surrounded by a whitish zone consisting of crystals of calciumoxalate (cp. Arvidsson *et al.* 1988), black pycnidia and 3-septate, slightly curved spores.

*O. rufescens* seems to favour smooth bark of deciduous trees. In Norway, it has previously been reported as far north as Sogn og Fjordane (Santesson 1984). The known distribution in Norway is shown in Fig. 6. It seems to be a suboceanic species, but with a more southern tendency than *Cliostomum griffithii* (see that species). All localities in central Norway are situated within the boreonemoral or southern boreal zone according to Dahl *et al.* (1986). The locality in Levanger represents a new northern limit in Scandinavia.

#### *Opegrapha vulgata* Ach.

Møre og Romsdal: *Smøla*, Kuli, on *Corylus avellana*, MR 5318/1321 I, alt. 0-20 m, 1983, T. Tønsberg 8306 (BG).

Sør-Trøndelag: *Agdenes*, Stordalen, SE of lake Storvatnet, on *Sorbus aucuparia*, NR 3252/1522 III, alt. ca. 20 m, 1990, H.H. 3764 (TRH). - *Trondheim*, NE of Svartdalsfjellet, northfacing slope, on *Sorbus aucuparia* in spruce forest, NR 6336/1621 IV, alt. 100-160 m, 1990, H.H. 4106 (TRH), det. P.M. Jørgensen. - *Bjugn*, SE-facing slope of Båtfjellet by Koet, on *Corylus avellana* and *Sorbus aucuparia*, NR 3578/1522 I & IV, alt. 10-40 m, 1991, H.H. 4386 & 4392 (TRH).

Nord-Trøndelag: *Leksvik*, E of Vanvikan, southfacing slope, on *Sorbus aucuparia* in spruce forest, NR 6048/1622 III, alt. 60-80 m, 1981, H.H. 42-81 (TRH).

New to Møre og Romsdal and central Norway.

*Opegrapha vulgata* may be confused with *O. rufescens*, but differs by having raised apothecia without a whitish zone, paler and more inconspicuous thallus and almost needle-shaped, 3-7-septate spores.

In Norway, this species has previously been reported only from Akershus and Vest-Agder (Santesson 1984).

*Pachyphiale fagicola* (Hepp ex Arn.) Zw.

Sør-Trøndelag: *Trondheim*, SW-facing slope E of lakelet Heisjøen, on trunk of *Ulmus glabra*, NR 5929/1521 I, alt. 260-300 m, 1991, H.H. 4157 b (TRH).

New to central Norway.

*Pachyphiale fagicola* is characterized mainly by its thin or endosubstratal thallus with *Trentepohlia*, yellowish or reddish brown concave apothecia which are more or less immersed in the substrate, polysporous asci (16-32 spores per ascus) and 3-7-septate spores.

In Norway, this species has previously been reported from southern Norway as far north as Sogn og Fjordane and from Nordland and Troms (Santesson 1984).

*Pannaria ignobilis* Anzi

Nordland: *Meløy*, *Grønøy*, on *Populus tremula?*, leg. J.M. Norman 1876 (TRH).

This old collection was found in herb. TRH labelled under *Parmeliella corallinoides* = *Parmeliella triptophylla* (Ach.) Müll.Arg. No exact locality is given. This is a new northern limit in Scandinavia (cp. Jørgensen 1978). Associated species in the herbarium packet were *Nephroma laevigatum* Ach. and *Pannaria rubiginosa* (Ach.) Bory.

*Pannaria sampaiana* C. Tav.

Sør-Trøndelag: *Ørland*, *Storfosna*, *Fosenheia*, on trunk base of a tree (species unknown) in a ravine, NR 2157/1522 III, alt. 100 m, 24-04-1986, O. Hilmo (TRH), det. P.M. Jørgensen.

New to Sør-Trøndelag.

The species has been mapped by Jørgensen & Ryvarden (1970) and Jørgensen (1978). Northern limit in Scandinavia is Salen in Nord-Trøndelag. That locality has been disturbed by forestry and the species has not been observed there for many years (Holien unpubl.). The locality in Ørland is then apparently the northernmost locality where *P. sampaiana* is still growing. The report from Sør-Trøndelag in Santesson (1984) appears to be based on a misunderstanding (Jørgensen pers. comm.).

*Pertusaria flavicans* Lamy

Sør-Trøndelag: *Klæbu*, *Hyttfossberga*, on calciferous rock, NR 7315/1621 IV, alt. 170 m, 1989, H.H. 3421 (TRH).

New to central Norway.

This species was recently reported as new to northern Norway by Botnen & Tønsberg (1988).

The specimen from Klæbu differs from the other Norwegian collections by a thinner and paler thallus, by being less soresiate and more isidiate and by containing the stictic acid complex in addition to thiophaninic acid. Hanko (1983) reports two chemotypes of this species, one with and one without the stictic acid complex. The stictic acid chemotype was known from central Europe and is here reported from Norway for the first time.

***Rinodina cinereovirens* (Vain.) Vain.**

Nord-Trøndelag: *Grong*, S of Gartlandssetran, on *Alnus incana*, UM 7360/1824 III, alt. 90 m, 1984, H.H. 71-84 (TRH), det. R. Moberg. - *Høylandet*, along river Besa, on *Sorbus aucuparia*, UM 7472/1824 III, alt. 100-140 m, 1990, H.H. 3937 a (TRH).

New to central Norway.

This species has previously been reported only from the three northernmost counties in Norway (Santesson 1984).

***Sarcosagium campestre* (Fr.) Poetsch & Schiedem.**

Oppland: *Dovre*, Grimsdalshytta by river Grimsi, on calciferous soil, NP 3484/1519 III, alt. 925 m, 22-08-1985, S. Sivertsen (TRH).

Nord-Trøndelag: *Levanger*, Borrsøya, on calciferous soil and on mosses, PR 1573/1722 IV, alt. 0-20 m, 1978, A.A. Frisvoll (TRH).

New to Norway.

*Sarcosagium campestre* is characterized mainly by its thin crustose thallus, sessile yellowish to reddish brown, plane to concave apothecia (almost translucent when wet), which become narrower towards the base, young apothecia with a conspicuous margin, and polysporous asci without a tholus. Because of its minute size it has certainly been overlooked in Norway.

In Scandinavia, the species has previously been reported from Skåne to Torne Lappmark in Sweden (Foucard 1990).

*Sclerophora coniophaea* (Norm.) Mattsson & Middelb.

Nord-Trøndelag: *Lierne*, Storbekken forest reserve, on rotten wood in old spruce forest, VM 46-4745/1923 I, alt. ca. 500 m, 1990, H.H. 3633 (TRH).

New to central Norway.

*Sclerophora coniophaea* is an eastern species which has recently been mapped by Middelborg & Mattsson (1987). It is most likely to be confused with *Chaenotheca gracillima* (Vain.) Tibell, both having reddish brown pruina on the apothecia. However, the former differs by a well developed excipulum, a more yellowish mazaedium and by a different algal partner. Usually the pruina is also more pronounced covering the whole apothecium, at least in early stage. The species is regarded as endangered in Sweden due to modern forestry (Ingelög et al. 1984).

*Sclerophora peronella* (Ach.) Tibell

Nord-Trøndelag: *Namdalseid*, NW-facing slope of Furudalshøgda in a forest reserve, on dead *Sorbus aucuparia* in old spruce forest, NS 95-9618/1623 II, alt. ca. 230 m, 1990, H.H. 3669 (TRH).

New to central Norway.

The specimen fits well with the descriptions given by Tibell (1978), but the reddish-brown pigment in the pruina, reacting K+ violet, mentioned by Middelborg & Mattsson (1987) was not observed. The reddish brown pigment in the stalk is particularly conspicuous.

This is a rare, southern species in Scandinavia (Tibell 1978), and in Norway it has previously been collected from only one locality, in Hordaland, on lignum of *Fraxinus* (Middelborg & Mattsson 1987). The species is regarded as endangered in Denmark and Sweden (Ingelög et al. 1984, Alstrup & Søchting 1989).

*Scoliciosporum perpusillum* Lahm ex Koerb.

Troms: *Storfjord*, 0,5 km N of Elsnes, on *Alnus incana*, dead trunk, DB 62-6393/1633 IV, alt. 0-20 m, 1982, T. Tønsberg 7305 c (BG), det. A. Vezda.

New to Norway.

*Scoliciosporum perpusillum* is characterized by its greyish green, nonsorediate, granular thallus and brownish apothecia with 3-septate spores and olive brownish epihymenium. In Scandinavia, it has previously been reported only from southernmost Sweden (Foucard 1990).

*Strangospora pinicola* (Massal.) Koerb.

Vest-Agder: *Kristiansand*, Torsøy, on *Juniperus* in maritime situation, MK 4940/1511 II, alt. 0-20 m, 1988, T. Tønsberg 10875 (BG).

Sør-Trøndelag: *Trondheim*, Ringve Botanical Garden, on *Acer pseudoplatanus*, NR 7236/1621 IV, alt. 40 m, 1989, H.H. 3341 b (TRH), det. P.M. Jørgensen.

Nord-Trøndelag: *Namdalseid*, hill 139 (Holstadberget), on *Pinus sylvestris*, PS 0821/1723 III, alt. 120-140 m, 1991, H.H. 4232 (TRH).

New to Norway.

The specimens fit in all descriptions given by Poelt & Vězda (1977). *Strangospora pinicola* is distinguished from the closely related *Strangospora moriformis* (Ach.) B. Stein mainly by the colour of the epihymenium, brownish in the former and greenish yellow in the latter. This difference is slight, and the two species may need to be united. Usually *S. pinicola* grow on coniferous trees, but in the Trondheim locality it was growing on an old *Acer*.

In Scandinavia, it has previously been reported from southern Sweden as far north as Västmanland and Upland (Foucard 1990) and from Denmark (Alstrup & Søchting 1989).

*Verrucaria muralis* Ach.

Sør-Trøndelag: *Roan*, Mt. Skurvklumpan, top 540, on serpentinic rock, NS 8312/1623 III, alt. 530 m, 1988, H.H. 3244 (TRH), det. R. Santesson.

New to central Norway.

This species is usually confined to calciferous rock and in Norway it has previously been reported with certainty only from Akershus and Nordland (Santesson 1984).



#### 4 SUMMARY

New distributional data are given on 52 lichen species from Norway. The records are mainly a result of field work, particularly in old spruce forests of central Norway. The following species are new to Norway: *Anisomeridium nysaegenum*, *Lecidea sphaerella*, *Sarcosagium campestre*, *Scoliciosporum perpusillum* and *Strangospora pinicola*.

The following species are new to central Norway: *Acrocordia gemmata*, *Bacidia arceutina*, *B. circumspecta*, *B. phacodes*, *B. subincompta*, *Buellia erubescens*, *Catillaria globulosa*, *Catinaria atropurpurea*, *C. neuschildii*, *Chaenotheca brachypoda*, *C. chlorella*, *C. ferruginea*, *Fuscidea gothoburgensis*, *Lecanora cadubriae*, *L. chlarotera*, *L. populicola*, *L. pulicaris*, *Lecidea atroviridis*, *L. betulicola*, *Lecidoma demissum*, *Micarea cinerea*, *M. nitschkeana*, *Opegrapha rufescens*, *O. vulgata*, *Pachyphiale fagicola*, *Pertusaria flavicans*, *Rinodina cinereovirens*, *Sclerophora coniophaea*, *S. peronella* and *Verrucaria muralis*. New to northern Norway are: *Cliostomum griffithii*, *Lecanora cadubriae* and *Micarea cinerea*.

Virensic acid is reported from a Norwegian crustose lichen, *Lecanora cadubriae*, for the first time and a PD-negative chemotype of *Lobaria scrobiculata* is reported as new to Europe. Argopsin is reported from *Lecidea atroviridis* and *Lecidea helvola* and roccellic acid from *Cliostomum griffithii* for the first time.

*Lecidea betulicola* is regarded as a distinct species.

Distribution maps are provided for *Bacidia subincompta*, *Cladonia metacorallifera* var. *reagens*, *Cliostomum griffithii*, *Lecanora cadubriae*, *Micarea cinerea* and *Opegrapha rufescens*.

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