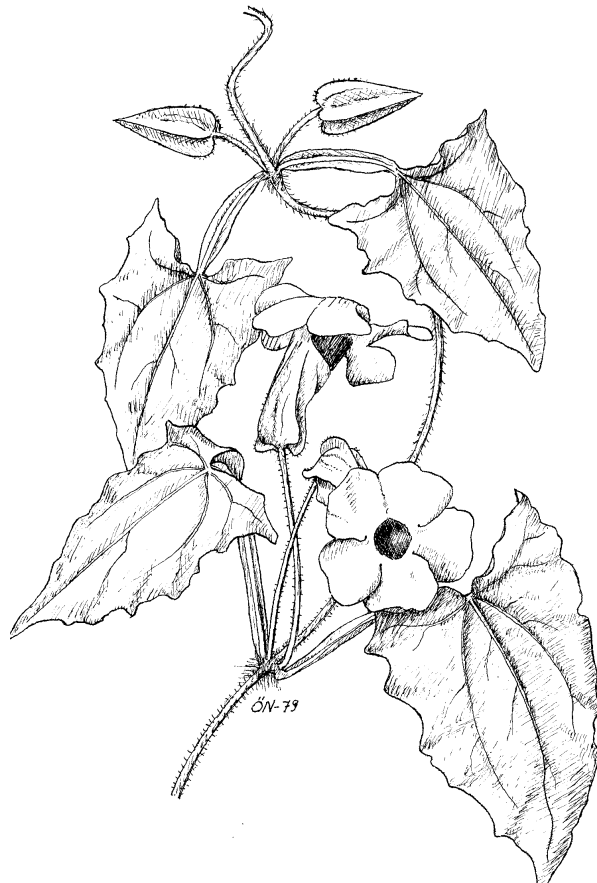


THUNBERGIA

32



Anders Nordin

Du Riet's lichen collections 1956-1965 from riverbanks and shores of lakes in connection with planned water regulations

THUNBERGIA is the continuation of "Publications from the Herbarium, University of Uppsala", of which 19 numbers were issued between 1978 and 1986. The name is given in memory of Carl Peter Thunberg (1743–1828), a disciple of Linnaeus and a famous traveller to South Africa and Japan. His collections, about twentyseven thousand sheets, were transferred to our University in 1785, and became the foundation of the Botanical Museum. Thunberg succeeded Linnaeus filius as professor in 1785 and held the professorship to his death.

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Editor: Roland Moberg

Museum of Evolution
Botany Section
Uppsala University
Norbyvägen 16
SE-752 36 Uppsala, Sweden
Fax: +46 18 471 2794
E-mail: Roland.Moberg@evolmuseum.uu.se

THUNBERGIA 32

**Du Riet's lichen collections 1956-1965
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UPPSALA 2003

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Material collected by G. E. Du Rietz 1956–1965, mainly from banks of rivers and shores of lakes in northern Sweden, is presented, together with notes from his documentation in notebooks and reports. The material is now successively transferred to and investigated at the Botany section of the Museum of Evolution. The result from the investigation of less than 10% of the collections shows that the collections are of uttermost value to science. Two species new to Sweden, *Agonimia repleta* and *Leptogium aquale*, have been recorded, and further 60 species are new to one or more of the provinces investigated (Lycksele Lappmark, Norrbotten, and Pite Lappmark). Of particular interest are the new observations of *Arthopyrenia angermannica*. Furthermore, new knowledge on the lichen zonation on shores has been obtained. The investigations have been made possible thanks to support from Richert's fund.

Introduction

G. Einar Du Rietz (1895–1967), professor of Botany at “Växtbiologiska Institutionen” (now Department of Plant Ecology) in Uppsala 1934–1962, took a great interest in the effect of water regulations in northern Sweden. Already at the beginning of the 1940-ies he was commissioned by the Nature Protection Committee of the Royal Swedish Academy of Sciences to organize a botanical and zoological investigation of the lake system in the valley of river Långan, Jämtland. This commission was followed by several others, and Du Rietz remained intensely engaged in water regulation issues until his untimely death in 1967.

A great number of collaborators were engaged in the work, covering botany, zoology and geology, and resulting in a great number of reports and publications – botanical reports and publications are listed in Lundqvist (1970). However, in his own field investigations of riverbanks and shores of lakes in 1956–1965 (at least some time each year between early August and mid-October) (Fig. 1, Table 1) Du Rietz mainly concentrated on the lichen flora and vegetation and only to a minor extent on other organisms (vascular plants, mosses, algae, and cyanobacteria). He collected an extensive lichen material, most of which he unfortunately never got the time to unpack and investigate more closely, and only a small number of preliminary reports were produced (Du Rietz 1961, 1965 etc.). The only publication on lichens resulting from the water regulation projects organized by Du Rietz, was published

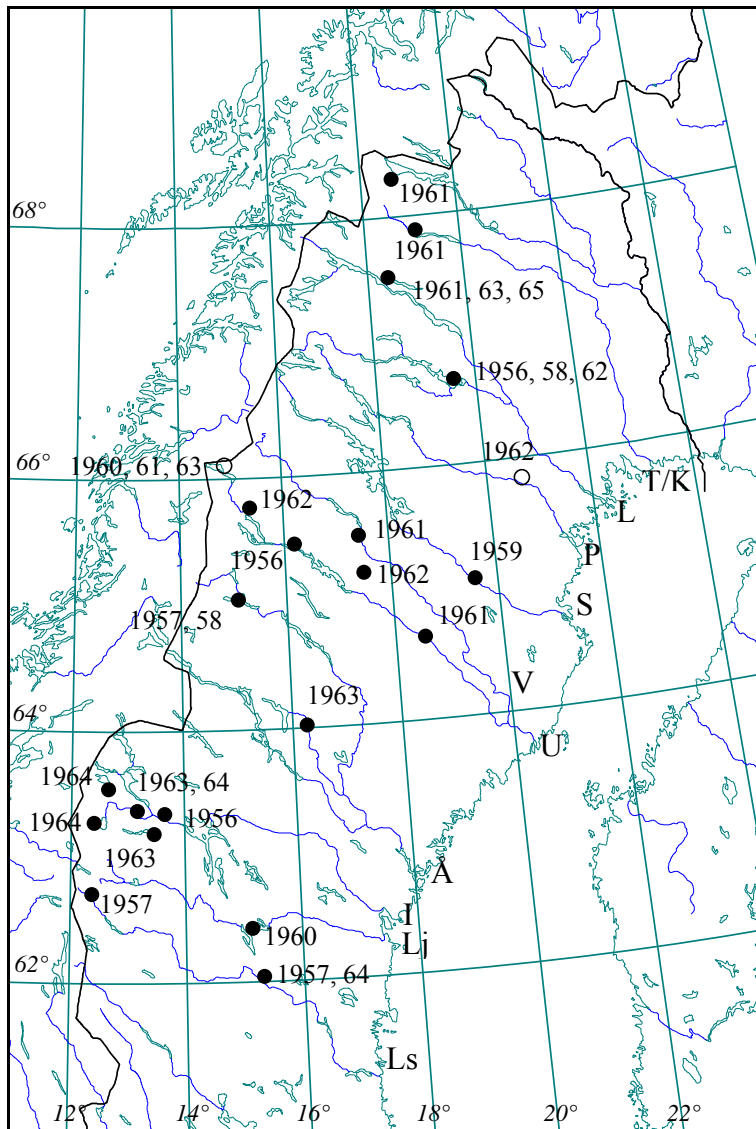


Fig. 1. Map of G. E. Du Rietz' collections from river banks and lake shores in northern Sweden 1956-1965, showing central parts of collection areas and collection years. T/K = Torne and Kalix älv, L = Lule älv, P = Pite älv, S = Skellefte älv, V = Vindaleälven, U = Ume älv, Å = Ångermanälven, I = Indals-älven, Lj = Ljungan, Ls = Ljusnan. Open circle = material completely or partly investigated; solid circle = material not yet investigated.

Year	Date	Collections	Notebook	River
1956	11–19/8	539	1956:5–7	Indalsälven
1956	20–25/8	313	1956: 7-8	Ume älv
1956	27–28/8	209	1956: 8	Lilla Luleälven
1957	18–20/9	166	1957: 7	Ljusnan
1957	19–30/8	1705	1957: 3–6	Ångermanälven
1958	3/9	37	1957: 10	Lilla Luleälven
1958	4–5/9	163	1958: 11	Stora Luleälven
1958	6–7/10	66	1958: 12	Lilla Luleälven
1958	22–26/9	215	1958: 9–10	Ångermanälven
1959	29/8–7/9	608	1958: 5–8	Skellefte älv
1960	5–9/8	333	1960: 5–6	Ljungan
1960	16/8–4/9	663	1960: 6–11	Ume älv
1961	9–11/9	123	1961: 10	Juktån
1961	17–25/8	340	1961: 5–7	Stora Luleälven
1961	27–31/8	318	1961: 7–9	Torne and Kalix älv
1961	6–8/9	43	1961: 9–10	Ume älv
1961	11–16/8	187	1961: 4–5	Vindeleälven
1961	12/9	6	1961: 11	Vindelälven
1962	20–22/9	129	1962: 7–8	Juktån
1962	14–21/8	329	1962: 3–4	Lilla Luleälven
1962	23–28/8	235	1962: 4–5	Pite älv
1962	13–25/9	378	1962: 5–8	Ume älv
1963	12/10	46	1963: 9	Fjällsjöälven
1963	16/10	21	1963: 10	Fjällsjöälven
1963	5–10/10	310	1963: 7–8	Indalsälven
1963	13–15/10	139	1963: 9	Rörströmsälven:
1963	14–23/8	270	1963: 1–4	Stora Luleälven
1963	25/8–5/9	402	1963: 4–6	Ume älv
1964	3–4/10	33	1964: 4	Handölan
1964	5/10	22	1964: 4	Enaälven
1964	6–8/10	66	1964: 4–5	Indalsälven
1964	10–13/10	114	1964: 5–6	Ljusnan
1964	2/9	22	1964: 4	Lakes
1964	7/10	26	1964: 5	Lakes
1965	20–29/8	260	1965: 3–4	Stora Luleälven
		Σ 9096		

Table 1. Du Rietz's collections. Year, date and number of collections, notebook number and rivers or lakes.

by Ahlner (1944), who investigated the lichen flora of the valley of river Långan.

The material collected by Du Rietz was stored in well-arranged, labelled drawers in cupboards and placed in the basement of the building housing the Department of Plant Ecology. The meticulous notes from the collection trips along lakes and rivers in Northern Sweden are found in 53 of his altogether 216 notebooks. The notebooks were recently looked through and ordered by Mikael Niva and all localities visited by Du Rietz were listed together with collection numbers.

After the completion of the new herbarium at the Museum of Evolution in Uppsala it was decided that all herbarium material formerly stored at the Department of Plant Ecology should be transferred to the Museum of Evolution. The unrevised lichen material collected by Du Rietz then became a problem, but due to a generous grant from Richert's fund ("Stiftelsen för teknisk vetenskaplig forskning till minne av J. Gust. Richert") the present author could begin the successive transfer and revision of the material. By that the first steps were taken towards a deepened knowledge of the lichen flora and vegetation of banks and shores when still unaffected by water regulations. Continued support from Richert's fund has made it possible to continue the work also in 2002. The granted money covers a half-time employment at the Museum of Evolution, Evolutionary Biology Centre, Uppsala University.

The notebooks

Prior to the revision the notebooks and preliminary reports were studied. Apart from giving details about localities and collections, the notebooks also served as diaries, where the activities of each day of the fieldwork were carefully described.

These notes disclosed a hardworking field botanist devoted to his task. The days were usually filled with work from early mornings to late evenings.

1956

15/8 ... Worked with collections and notes till 3.30 in the night.

16/8. Woke up after 4 hours' sleep. Went to Storbofallet... worked with collections and notes and packing till 3.30 in the night.

17/8. Got up at 6.30 after 3 hours' sleep and left Mörsil by train at 8.15 for Östersund...

27/8 ... Went after lunch along the road towards the Kaitum Fall, but took off to the left into the forest and came to a rocky shore of the river quite a bit above the fall. It was so interesting that I got stuck there in the lower

geolitoral zone and knocked off an enormous number of pieces, which I hardly got the time to gather and put into packets before the darkness came, making both that and the walk home impossible. Could hardly manage to get home with my burden of stone in the darkness. Back home just after 21...

Fieldwork was sometimes made impossible due to rainy weather, but apparently there was no room for relaxation:

1960

1/9. Rain the whole morning and a little longer. Sat in Gunnar Wassén's cottage and worked with all the samples in plastic bags from the area of Stora Lulevattnet. In the afternoon it stopped raining and we went by motor-boat a bit eastwards to Gunnar Wassén's profile 32 just E of Ånäset...

1956

26/8. Rain. No fieldwork...Devoted the day to notes, collections, ordering of things, laundry etc. Numbered reels of coloured photos. A couple of these are possibly incorrectly ordered...Prepared future work by studies of literature and maps etc. Studied the documents on nature protection I got from The Committee for Nature Protection before the departure from Uppsala, about Porsi, the water system of river Ume älv, lake Kultsjön and river Klarälven, and handled correspondence in connection with that. Rain all day long.

At some occasions the collecting activity was interrupted by other activities, such as excursions and formal or informal meetings with people engaged in nature protection or problems concerning water regulations, but apparently Du Rietz resumed his collecting as soon as possible.

1960

24/8. After breakfast in Hemavan we went at 10.00 down to the chapel where the water court assembled for the first trial of the regulations of Överuman. After the proceedings the whole congregation went up to the ski lift of Skidfrämjandet, starting just above the hotel and going up to a plateau in the uppermost part of the birch region. ... From the open, cleared slope up there Olle Rune gave a lecture on the delta area and Akasjömyren below. Meanwhile I collected lichens.

Although deeply engaged in his work Du Rietz also had room for more marginal notes, making the notebooks interesting from a more general point of view. There are notes about small misfortunes, people he meets, place-names, prices etc.

1962

25/8. ...Collected then lots of lichens...from the part of the rocky shore where I broke the hammer the first day...

1960

5/9. Got up early in Gardvik. Completed the packing. Collected on the stone foundation of the house, in the SE corner, the following lichens: *Acarospora*, *Caloplaca*, *Lecanora* etc. Very interesting things! Unfortunately they were left to be rescued by Gunnar Wassén, and he never did it, so they were lost.

23/8. When I stood hammering at the rapid and packed pieces of stone with the aid of the taxi driver Rannebäck, Gunnar Wassén and Nisse Dahlbäck came down to the shore. They had made a tour on lake Stora Umevattnet and on their way back they had seen the taxi and heard the bangs of my hammer. ND invited me to take part in a flight on Aug. 26th to the lakes Abelvattnet and Övre Ältsvattnet.

1962

23/8. ... Drove further...to the new bridge over the rapid Benbryteforsen (according to Engström more correctly "Benbröteforsen", since the name originates from the fact that a "bröte" (a jam of logs) once was formed in the narrowest part of the rapid, and a man got his leg crushed in this jam!)

1956

25/8 ... Got good assistance with the things from a young mr Dardenius from Stockholm, with whom I travelled together on the train. Got after some waiting a car with the things to Hotel Engelmark. Taxi for the 22 items 5 kr.

Another important element of the notebooks is the multitude of notes on the flora and vegetation of both lichens, mosses and vascular plants. Being the most prominent advocate of the Uppsala school of plant sociology, Du Rietz of course used a sociological terminology, and it seems that he was constantly keen on revising and refining the details of the complicated system. Of particular interest are his notes on the zonation of the lichen vegetation on riverbanks and shores of lakes.

Vertical zonation of the lichen vegetation of shores

There are several notes on the vertical zonation of the lichen vegetation on the shores, and for the majority of the collections the zonal situation is specified. Du Rietz distinguishes between the hydrolitoral, the geolitoral and the epilitoral zones, but since there are no lichens in the hydrolitoral zone, there are only a few notes from this. The geolitoral zone is divided into a lower, a middle and an upper part. The lower part is usually submerged and above water only at extremely low water

levels, the middle part is submerged only at high water-levels, and the upper part is submerged only rarely at extremely high water-levels or sprayed with water from the waves. The epilitoral zone is the part of the shore adjacent to the uppermost part of the geolitoral and unaffected by inundation or spray from the waves. The borders between the different parts are diffuse. Sometimes Du Rietz hesitates and cannot decide with certainty the zonal position for the collections at issue.

Du Rietz regarded some species as typical representatives for the different zones (Table 2), but since much of the material remained unrevised the list is not comprehensive. A more comprehensive list from river Pite älv will be given in connection with the presentation of the results below (Table 3).

Preliminary reports

Du Rietz put together 21 preliminary reports from the fieldwork in Northern Sweden. Ten of these were written for The Nature Protection Committee of the Royal Swedish Academy of Sciences (KVA:s naturskyddskommitté), one each for The Nature Protection Committee of the State (Statens Naturvårdskommitté), The Swedish Nature Protection Society (SNF), and The Water Courts of Norrbygden and Mellanbygden (Norrbygdens och Mellanbygdens vattendomstolar). The remaining ones were summaries of notes from the notebooks. All reports are stored in a bookcase in the basement of the building housing the Department of Plant Ecology.

In most of the reports the preliminary nature is stressed, and it is pointed out 1) that most of the material remains to be revised, 2) that it contains many interesting specimens, 3) that it is most important that it is taken care of and 4) that more investigations should be carried out. In several cases field observations alone have been the basis for an evaluation of the areas investigated.

Revision of the material

The work with Du Rietz's collections began in February 2001. After the material had been located and the notebooks and preliminary reports had been studied the revision of the material could start. First to be investigated was material collected in 1962 at river Pite älv above and below Vidsel, inclusive of river Varjisån, an area in the boreal zone with

Species	Geolitoral			Epilitoral
	Lower	Middle	Upper	
<i>Arctoparmelia centrifuga</i>				x
<i>Aspicilia cinerea</i>				x
<i>Aspicilia verrucigera</i>				x
<i>Ephebe lanata</i>		x		
<i>Frutidella caesioatra</i>				x
<i>Hymenelia lacustris</i>			x	
<i>Ionaspis odora</i>	x	x		
<i>Koerberiella wimmeriana</i>		x		
<i>Lecanora argopholis</i>			x	
<i>Lecanora frustulosa</i>			x	
<i>Lecanora intricata</i>			x	
<i>Lecanora polytropa</i>			x	
<i>Lecidea praenubila</i>			x	
<i>Lecidella stigmatea</i>			x	
<i>Lobothallia melanaspis</i>	x			
<i>Melanelia soresiosa</i>				x
<i>Miriquidica complanata</i>			x	
<i>Miriquidica plumbeoatra</i>			x	
<i>Ophioparma ventosa</i>				x
<i>Phaeophyscia sciastra</i>			x	
<i>Phylliscum demangeonii</i>			x	
<i>Physcia caesia</i>			x	
<i>Placynthium asperellum</i>		x		
<i>Placynthium pannariellum</i>	x	x		
<i>Porpidia tumida</i>		x	x	
<i>Rhizocarpon badioatrum</i>		x		
<i>Rhizocarpon eupetraeum</i>				x
<i>Rhizocarpon geminatum</i>		x		
<i>Rhizocarpon geographicum</i>			x	
<i>Rhizocarpon lavatum</i>		x	x	
<i>Staurothele fissa</i>		x		
<i>Verrucaria margacea</i>	x			
<i>Verrucaria pachyderma</i>	x			
<i>Vestergrenopsis isidiata</i>		x		
<i>Xanthoparmelia somloënsis</i>				x

Table 2. Lichen species assigned to zones by Du Rietz. The scientific names are modernized according to Santesson et al. (2002).

uniformly siliceous bedrock not changed by subsequent water regulations. Some of the localities are situated in Norrbotten (e. g. the rapids Fällforsen, Storforsen, and Åkerseleforsen), others in Pite Lappmark (e. g. the rapids Benbryteforsen, Krokugforsen, and Trollforsen).

After that the extensive material collected in 1960 at lake Över-Uman and surrounding lakes, brooks and rivers in Lycksele Lappmark was chosen for investigation. This area has a much more varied geology, with

both siliceous, calciferous, calcareous and ultra-basic rocks and schist, and it is situated in the subalpine birch region. Contrary to the former area this area has been greatly affected by water regulations: the lakes Över-Uman, Gäuta and Gardiken were all dammed and transformed into water-magazines after 1960. How this has affected the lichen flora of the shores might be investigated later, when the investigation of this material has been completed – about 200 collections still remains to be revised.

The material has successively been removed from the basement of the Department of Ecology building and transported on a handcart to the museum. After a week in the freezer (standard procedure to kill unwanted microbes) the material has been ready for investigation.

Each numbered collection consists of one or a few paper bags with rarely one but usually several pieces of stone (sometimes more than 20), rarely pieces of bark, wood, mosses, soil or clay. The pieces of stone are usually wrapped in paper from old newspapers.

All pieces were investigated under a dissecting microscope and all lichen species identified. Apothecia or perithecia of specimens not directly identifiable were sectioned with a razorblade; thin sections were put in a drop of water on a slide, covered with a cover slip, and investigated under a light microscope, often with additional stains and reagents added. Sometimes squash preparations of fruiting bodies or thalli were used. Often also the thalli were tested with standard reagents for spot reactions under the dissecting microscope. In a few cases TLC (thin layer chromatography) was employed for the identification of secondary metabolites (for methods, see White & James 1985).

Specimens were selected for herbarium collections (usually one, rarely more, of most species from each locality). For the preparation of the collections the aid of a stone cutting device was often necessary. Small pieces of stone (or other substrates harbouring the lichen specimens) were glued on sheets of cardboard and put into herbarium envelopes, and the packets were labelled. Label data were made available to the Fytotek database, accessible on Internet at <http://www.evolmuseum.uu.se/fytotek>

Results

So far altogether 700 herbarium collections have been prepared from 636 of Du Rietz's numbered collections (totally more than 9000 collections, see Table 1). In some cases the specimens have only been determined to genus, in some cases to an uncertain affinity with a species, in a few cases not at all (mainly sterile material), but in most cases to species.

Uncertain determinations will be further investigated and are not included in the species list.

Below the localities are specified and numbered, and a commented list of species is provided. The distribution of the species on vertical zones of the shore at localities along river Pite älv (locality 24–33) is shown in Table 3. In the table the number of localities where the species was found in a particular zone is given. Lichenicolous fungi are excluded, so also several species with one occurrence each in the epilitoral zone.

The species list includes 327 species, one with two varieties. Sixteen species are non-lichenized lichenicolous fungi and one is a non-lichenized fungus, saprobic or parasitic on *Betula* (*Phaeocalicium flabelliforme*). Two species are recorded for the first time from Sweden, *Leptogium aquale* and *Agonimia repleta*, both inconspicuous species not observed in the field by Du Rietz. Additionally 60 species are new to Lycksele Lappmark, Norrbotten, and/or Pite Lappmark. Of particular interest are the collections of *Arthopyrenia angermannica* (see that species). Two species are redlisted, *Fuscopannaria confusa* and *Thelopsis flaveola*, the former regarded as endangered (EN) and the latter as vulnerable (VU) in the most recent Swedish Red List (Gärdenfors 2000).

Although less than 10% of Du Rietz's collections have been investigated so far, they have already yielded much new knowledge, and it is obvious that they represent an utterly valuable documentation of areas affected by water regulations. They provide indispensable background data for future investigations of the impact of water regulations on the lichen flora and vegetation along lakes and rivers.

Localities

LYCKSELE LAPPMARK, Tärna par, 1960:

1. Lake Över-Uman, Bredviken, at the path above the dam limit, Aug. 17.
2. The SE-most inlet of lake Över-Uman, "1:a Sedum"-island, Aug. 17–18.
3. The SE-most inlet of lake Över-Uman, "Elyna"-island, Aug. 17.
4. Lake Över-Uman, Bredviken, at the landing stage, Aug. 18-19.
5. The SE-most inlet of lake Över-Uman, shore SW of "Sedum acre"-islands, Aug. 18.
6. Lake Över-Uman, Rörsundet, Aug. 19.
7. The SE-most inlet of lake Över-Uman, bog on the SW shore, Aug. 19.
8. The SE-most inlet of lake Över-Uman, "The mica schist island with the cloudberry swamp", Aug. 19.
9. The SE-most inlet of lake Över-Uman, "Kobresia"-island, Aug. 19.
10. The SE-most inlet of lake Över-Uman, mouth of brook 500 m SW of "Kobresia"-island, Aug. 19.
11. Lake Över-Uman, the island SW of Bredviken, Aug. 20.
12. Lake Över-Uman, Kåtaviken, rocky shore, Aug. 21–23.

13. S side of lake Gardiken, mouth of the brook Mangibäcken, Aug. 22.
14. River Ume älv, rapid Märkesforsen between Umfors and Klippen, Aug. 23.
15. Lake Över-Uman, the brook NW of Kåtaviken, below the bridge, Aug. 23.
16. Hemavan, at the ski lift, Aug. 24.
17. Klippens, small brook at the boarding house, Aug. 24.
18. Umfors, close to the dam under construction N of the village, Aug. 24.
19. Lake Över-Uman, Högstabyänaset's SW-base, rocky shore, Aug. 24.
20. Lake Över-Uman, peninsula at S side of Lejnäset, Aug. 25.
21. Lake Nedre Jovattnet, Aug. 26.
22. Lake Övre Ältsvattnet, the NE-shore close to the point, Aug. 26.
23. Över-Uman, Högstabyänaset, slopes close to the point, Aug. 27–28.

NORRBOTTEN, Älvsby par., 1962:

24. River Pite älv, rapid Fällforsen, N side above the rapid, Aug. 28.
25. River Pite älv, rapid Storforsen, W side, Aug. 23, 25–26.
26. River Pite älv, rapid Åkerselforsen, lower part, N side, Aug. 26–27.
27. River Pite älv, rapid Åkerselforsen, upper part, Aug. 27.

PITE LAPPMARK, Arvidsjaur par., 1962:

28. River Pite älv, rapid Benbryteforsen, close to the bridge, N side, Aug. 23.
29. River Pite älv, rapid Benbryteforsen, S side, at the narrowest part below the bridge, Aug. 26.
30. River Pite älv, rapid Krokugforsen, S side, Aug. 23–24.
31. River Pite älv, rapid Nedre Ljusseleforsen, S side, just below the bridge, Aug. 24.
32. River Pite älv, rapid Trollforsen, lower part, N side close to the bridge, Aug. 24.
33. River Varjisån, NE-side just above the upper bridge, Aug. 27.

Species

Locality numbers (1–33) are given directly after the species names. When preserved in the herbarium of UPS the collections are indicated by collection numbers separated from the locality numbers by a colon. *^L, *^N, *^P indicates species new to Lycksele Lappmark (LyL), Norrbotten (Nb), and Pite Lappmark (PL) respectively. The scientific names follow Santesson et al. (2002).

Absconditella sphagnum, 7.

Acarospora badiofusca, 2: 931b, 32: 485.

Acarospora fuscata, 2, 27, 33.

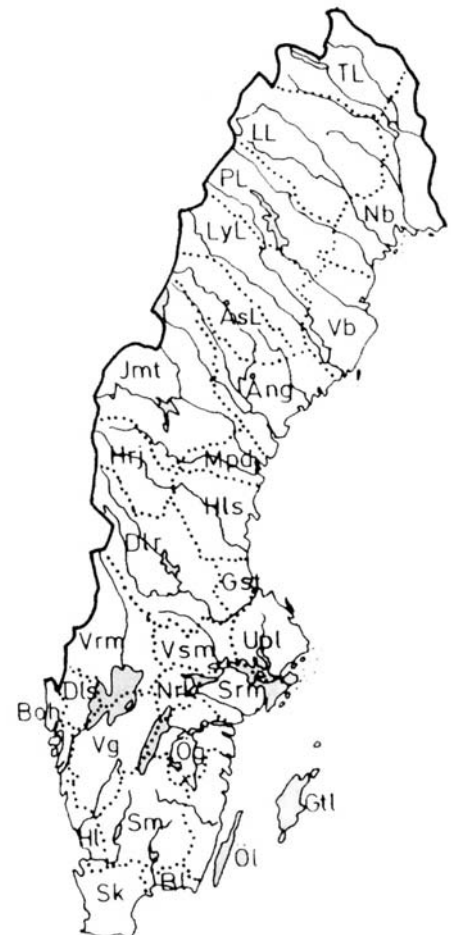
Acarospora glaucocarpa, 2: 910d, 23.

*Acarospora hospitans**^N, 25: 524. On

Rhizocarpon sp. In Sweden previously known from Västergötland, Jämtland, Torne Lappmark.

Acarospora macrospora, 22: 1180e, 23.

Acarospora sinopica, 2: 900c, 3: 887a, 9, 11, 18.



- Acarospora smaragdula*, 2: 936e.
- Acarospora veronensis*, 20: 1166b.
- Adelolecia kolaënsis*, 2: 933d.
- Agonimia repleta**^L, 12: 1083d. New to Sweden. Recently described from Poland (Czarnota & Coppins 2000). On twigs of *Salix phylicifolia* hanging out over the water on shore with small blocks. It was associated with *Anisomeridium polypori*, *Biatora subduplex*, *Fuscopannaria confusa*, *Lecidea pullata*, *Leptogium subtile*, *Mycobilimbia carneoalbida*, *Parmeliella triptophylla*, *Placynthium flabellusum*(!), *Protopannaria pezizoides*, and *Thelopsis flaveola*.
- Agonimia tristicula**^L, 23: 2105a. On mossy base of *Betula*, with perithecia. In Sweden previously known from several provinces up to Gästrikland.
- Allantoparmelia alpicola*, 8: 969d.
- Amygdalaria consentiens*, 2: 897g, 911b.
- Amygdalaria panaeola*, 2: 910b, 25: 414c, 547a, 28, 30, 32, 33: 627a.
- Anisomeridium polypori**^L (syn. *A. nyssaegenum*), 12: 1081d (in collection of *Mycobilimbia carneoalbida*).
- Arctoparmelia centrifuga*, 25, 26, 27, 28, 29, 32, 33. According to notes in Du Rietz's notebooks the most typical marker of the transition from the upper geolitoral zone to the epilitoral zone.
- Arctoparmelia incurva*, 2: 934c, 32.
- Arthonia mediella*, 18.
- Arthonia lapidicola*, 20: 1167b.
- Arthonia stereocaulina**^L, 8: 969e. A non-lichenized lichenicolous fungus, here growing on *Stereocaulon* cf. *vesuvianum*. In Sweden previously known only from Torne Lappmark.
- Arthopyrenia analepta* (syn. *A. lapponina*), 2: 909b.
- Arthopyrenia angermannica**^{LNP}, 12: 1090, 25: 537a, 551a, 26: 567b, 587c, 27: 604b, 31: 472. Previously only known from the type locality in Ångermanland (Degelius 1931). According to the description the photobiont is *Trentepohlia*. However, this is not the case, neither in the new specimens found, nor in the type material. The photobiont is a *Chroococcus*-like cyanobacteria consisting of small cells forming colonies enclosed in a gelatinous sheath. In other respects the description given by Degelius agrees with the material.
- The species grows on siliceous rocks in the lower or middle geolitoral zone. At the locality in Lycksele Lappmark Du Rietz noted that the unidentified crust grew 10 cm below the water surface and that it was the absolutely lowest growing lichen seen there.
- Additional material found in the herbarium of UPS extends the distribution area to Lule Lappmark (Gällivare par., river Stora Lule älv, Satisjaure; in collection of *Polyblastia cruenta*, leg. Gunnar "Eriksson" = Gilenstam 360, 4.VII.1963) and Blekinge (!) (Tving, at

- shore of lake; in collection of unspecified *Arthopyrenia*, leg. Svanlund 1873). This indicates that it might be widespread in Sweden. The generic affiliation is uncertain.
- Arthopyrenia lomnitzensis**^L, 11: 1001a. A non-lichenized lichenicolous fungus growing on *Ionaspis odora*. In Sweden previously known from Härjedalen, Jämtland, and Torne Lappmark.
- Arthrorhaphis alpina*, 20: 1170.
- Aspicilia aquatica*, 12: 1016d, 12: 1023, 15, 24: 642a, 25: 520, 26, 31: 465, 32.
- Aspicilia cinerea*, 25, 26, 27, 28, 29, 33: 630(1).
- Aspicilia gyrodes*, 11: 988a, 32: 482b.
- Aspicilia laevata*, 33.
- Aspicilia montana*, 2: 902g, 11: 1001c, 12.
- Aspicilia permutata**^L, 20: 1166a. One of rather few *Aspicilia* spp. growing on calcareous rocks in Scandinavia. In Sweden previously known from Lule Lappmark and Torne Lappmark.
- Aspicilia supertegens*, 22: 1184a.
- Aspicilia verrucigera*, 25: 420, 26, 28: 430, 32.
- Aspilidea myrinii* (syn. *Aspicilia myrinii*), 25: 519.
- Bacidina inundata*, 2: 890b, 8: 968b, 11: 983a, 12.
- Bellemerea alpina*, 11: 1000e, 1007c, 18.
- Bellemerea cinereorufescens*, 11: 1008e, 16: 1126, 26: 593a.
- Bellemerea diamarta*, 11: 1000d.
- Biatora subduplex*, 2: 903d, 10: 956a, 12: 1081c.
- Biatora vacciniicola* (syn. *Lecidea* v.), 7: 959.
- Brigantiaea fuscolutea*, 7.
- Brodoa intestiniformis*, 28: 433b.
- Bryoria furcellata*, 29: 584.
- Bryoria simplicior*, 29: 583.
- Buellia aethalea*, 9: 951j.
- Buellia alboatra*, 10: 957a. On *Xanthoria elegans*.
- Buellia geophila*, 2: 931c, 10: 956d.
- Buellia insignis*, 2, 23: 2040d.
- Buellia miriquidica**^P, 30: 451, 33: 621b. On *Schaereria fuscocinerea* on siliceous rocks in the upper geolitoral or epilitoral zones. In Sweden previously known from several provinces between Bohuslän and Torne Lappmark.
- Buellia pulverulenta*, 2: 920. An endoparasitic lichen, here growing on *Phaeophyscia sciastra*.
- Caloplaca approximata*, 2: 937b.
- Caloplaca arenaria*, 22: 1195.
- Caloplaca atrocyaneascens*, 2: 907.
- Caloplaca castellana**^L, 22: 1193. On calcareous rock. In Sweden previously known only from a few collections from Torne Lappmark.

- Caloplaca chlorina**^L, 12: 1018, 22: 1182c, 1198. On siliceous rocks and schist. In Sweden previously known from several provinces between Skåne and Torne Lappmark.
- Caloplaca exsecuta*, 2: 916c.
- Caloplaca holocarpa*, 2: 941.
- Caloplaca nivalis*, 11: 1007a.
- Caloplaca sinapisperma*, 10: 956f.
- Calvitimela aglaea* (syn. *Tephromela a.*), 32: 489a.
- Candelariella placodizans*, 2: 880b, 11: 1007d.
- Candelariella vitellina*, 2: 945b, 20, 25.
- Carbonea aggregantula**^L, 2: 902b, 18: 1145a. A non-lichenized lichenicolous fungus growing on *Lecanora polytropa*. In Sweden previously known only from Jämtland.
- Carbonea intrusa*, 28: 422.
- Carbonea vitellinaria*, 9: 951b. A non-lichenized lichenicolous fungus growing on *Candelariella* spp.
- Carbonea vorticosa*, 2: 902c.
- Catapyrenium cinereum*, 20: 1169.
- Catillaria chalybeia**^L, 2.
- Cercidospora epipolytropa*, 3: 888c. A non-lichenized lichenicolous fungus, here growing on *Lecanora polytropa*.
- Cetraria aculeata*, 2.
- Cetraria ericetorum*, 29: 582c.
- Cetraria islandica*, 29.
- Cetraria odontella*, 29: 582a, 33: 616.
- Cetraria sepincola*, 6.
- Cetrariella delisei*, 29: 582b.
- Cladonia arbuscula*, 29.
- Cladonia bellidiflora*, 29.
- Cladonia gracilis*, 29.
- Cladonia mitis*, 7.
- Cladonia pyxidata*, 11.
- Cladonia squamosa*, 32: 488.
- Cladonia uncialis*, 32.
- Clauzadea monticola*, 2: 931a, 3: 888a.
- Collema ceraniscum*, 20: 1171.
- Collema cristatum*, 6: 974e, 23: 2111, 2022a.
- Collema fuscovirens*, 2: 902j, 22: 1183b, 23.
- Collema glebulentum*, 2: 921i, 9.
- Collema parvum*, 6: 974c, 23: 2032b, 2103, 2026, .
- Collema polycarpon*, 23: 2035, 2110.
- Collema undulatum*, 23: 2099c.

- Cryptothele granuliformis**^{NP}, 26: 569b, 28: 435a, 32: 483a. On siliceous rock in the upper geolitoral zone. In Sweden previously known from southern Sweden up to Uppland.
- Dactylospora amygdalariae*, 25: 414a (in collection of *Pyrenopsis subareolata*). A non-lichenized lichenicolous fungus, here growing on *Amygdalaria panaeola*.
- Dactylospora attendenda*, 11: 987a, 24, 25, 26, 27: 613b, 31: 475. A non-lichenized lichenicolous fungus, here growing on *Porpidia ochrolemma*.
- Dactylospora australis**^L, 2: 902a. A non-lichenized lichenicolous fungus, here growing on *Porpidia macrocarpa*. In Sweden previously known only from Torne Lappmark.
- Dactylospora protohallina**^L, 2: 921j. A non-lichenized lichenicolous fungus, here growing on an unidentified cyanolichen. In Sweden previously known from Härjedalen and Torne Lappmark.
- Dermatocarpon miniatum*, 12: 1016b.
- Diploschistes scruposus*, 25: 511, 32.
- Endococcus perpusillus**^{NP}, 25, 33: 627c. A non-lichenized lichenicolous fungus, here growing on *Rhizocarpon geographicum*. In Sweden previously known from several but not all provinces between Skåne and Torne Lappmark.
- Endococcus propinquus*, 25: 414f, 28, 33: 621a. A non-lichenized lichenicolous fungus, here growing on *Lecanora intricata*.
- Endococcus rugulosus**^{LP}, 11: 998a, 1008c, 22: 1184b, 30: 459b. A non-lichenized lichenicolous fungus, here growing on *Rhizocarpon* spp. In Sweden previously known from Öland, Härjedalen, Jämtland, and Torne Lappmark.
- Ephebe lanata*, 2: 897b, 25, 26.
- Euopsis granatina*, 2, 18: 1147b, 25: 538b.
- Euopsis pulvinata*, 11: 1004b.
- Farnoldia jurana*, 2: 902m, 23: 2093b.
- Flavocetraria nivalis*, 2.
- Frutidella caesioatra*, 11: 1008a.
- Fuscopannaria confusa**^L (syn. *Pannaria c.*), 12: 1083c. On twigs of *Salix phylicifolia* hanging out over the water on shore with small blocks (for associated species, see *Agonimia repleta*). Redlisted and regarded as endangered in Sweden (Gärdenfors 2000). Previously known from Värmland, Dalarna, Jämtland, Åsele Lappmark, and Lule Lappmark.
- Fuscopannaria leucophaea* (syn. *Pannaria l.*), 10: 955a, 12: 1020a, 21, 23: 2107b.
- Fuscopannaria praetermissa* (syn. *Pannaria p.*), 2: 903e, 11, 23.
- Gyalidea fritzei**^L, 2: 925a, 14, 17. In the upper and middle geolitoral zone. In Sweden previously known from Härjedalen and Jämtland.

- Gyalidea rivularis**^{NP}, 25: 555, 26: 567a, 30: 459a. On siliceous rock in the middle geolitoral zone. In Sweden previously known from Härjedalen, Åsele Lappmark, and Lule Lappmark.
- Halecania alpivaga*, 2: 916a, 928.
- Hymenelia lacustris*, 2: 901b, 11, 14, 24, 25: 541a, 26, 28, 30: 456b, 31: 466c, 32.
- Hymenelia obtecta**^N, 26: 566. On siliceous rock. In Sweden previously known from several provinces between Dalsland and Torne Lappmark.
- Hypocenomyce leucococca*, 26, 29, 30.
- Hypogymnia physodes*, 2, 26, 29, 30.
- Icmadophila ericetorum*, 7.
- Imsahaugia aleurites*, 29, 26.
- Ionaspis carnosula**^L, 23: 2083. On calcareous rock in the upper geolitoral zone. In Sweden previously known from several provinces between Gotland and Härjedalen.
- Ionaspis cyanocarpa*, 2: 913b, 9: 949a, 9, 11, 14: 1114, 23: 2010, 2069, 2091, 30: 458.
- Ionaspis heteromorpha*, 23: 2093a.
- Ionaspis melanocarpa**^L, 23: 2072. On calcareous rock in the upper geolitoral zone. In Sweden previously known from several provinces between Öland and Torne Lappmark.
- Ionaspis odora*, 2: 913a, 935b, 5, 9, 11: 1006, 12: 1071b, 14, 19, 23: 2016, 25: 557d, 26: 587a, 31: 466d.
- Ionaspis rhodopis*, 23: 2023a, 2079.
- Ionaspis suaveolens*, 11: 1010.
- Koerberiella wimmeriana*, 2: 897a, 11: 1002a, 12: 1037, 1064, 14, 15.
- Lecanora albescens*, 10: 957b.
- Lecanora castaneoides*, 3: 889c, 9: 1162.
- Lecanora cenisia*, 25: 514a.
- Lecanora chloroleprosa*, 28: 428, 433a, 29, 32: 489d.
- Lecanora chlorophaeodes*, 2, 25: 413, 26, 30: 453, 32: 483c.
- Lecanora epibryon*, 2: 942.
- Lecanora frustulosa*, 2: 882h.
- Lecanora fuscescens*, 2: 909a, 6, 16, 18.
- Lecanora intricata*, 11, 25, 26, 29, 33: 627e.
- Lecanora leucococca**^L, 2: 910c, 3, 20, 22: 1194b. On siliceous rock in the upper geolitoral zone. In Sweden previously known from Härjedalen, Jämtland, Lule Lappmark, and Torne Lappmark.
- Lecanora polytropa*, 2: 936d, 9, 11, 12, 14, 24, 25, 26, 28, 32: 486a, 33.
- Lecanora umbrina*, 2: 945c.
- Lecanora umbrosa*, 12: 1027, 22: 1187.
- Lecidea albohyalina*, 18.
- Lecidea confluens*, 9: 951i.

- Lecidea diapensiae*, 9: 952a.
- Lecidea epiphaea*, 2: 910f.
- Lecidea lapicida*, 11: 1000b, 12: 1025, 18, 25: 414b, 30: 446, 32.
- Lecidea praenubila*, 14, 25, 26: 590, 28, 32: 479, 33: 630(2), 630(6), 632(1).
- Lecidella subcongrua**^P, 24: 642c, 33: 621e. On siliceous rock in the middle geolitoral zone (locality 24) and the epilitoral zone (locality 33). In Sweden previously known from Norrbotten, Lycksele Lappmark, and Torne Lappmark.
- Lecidoma demissum*, 2: 903h, 30: 448.
- Lempholemma isidioides*, 22: 1180b.
- Lempholemma polyanthes*, 2: 902n, 23: 2039a.
- Lempholemma radiatum*, 2: 859, 862a, 23: 2021.
- Lepraria neglecta*, 25, 28, 32, 33. The only *Lepraria* sp. so far identified, but further species will probably be added later after future TLC analyses.
- Leptogium aquale*, 862b. New to Sweden. A rarely collected lichen previously known from Austria and Switzerland. Identifiable thanks to the publication on small *Leptogium* species by Jørgensen (1994), who has also confirmed the determination. Sparsely on calcareous rock in the lower geolitoral zone.
- Leptogium imbricatum**^L, 2: 911c, 921h, 10: 956b, 23: 2114c.
Muscicolous and terricolous. In Sweden previously known from several provinces between Öland and Torne Lappmark.
- Leptogium lichenoides*, 2: 933, 23: 2039b.
- Leptogium subtile**^L, 12: 1083b. On twigs of *Salix phylicifolia* hanging out over the water on shore with small blocks. For associated species, see *Agonimia repleta*. In Sweden previously known up to Jämtland.
- Lobothallia melanaspis*, 12: 1016a, 1017a, 14, 24: 643b, 32: 482a.
- Lopadium coralloideum*, 2: 903f.
- Massalongia carnosia*, 11: 1008f.
- Megaspora verrucosa*, 2: 921e, 23.
- Melanelia commixta*, 11: 1008d.
- Melanelia disjuncta*, 25: 419b.
- Melanelia hepatizon*, 25, 26, 33.
- Melanelia panniformis*, 25: 417.
- Melanelia solediosa*, 2: 924d, 25: 419a.
- Melanelia stygia*, 30: 447.
- Micarea turfosa*, 7: 965, 18: 1157.
- Miriquidica atrofulva*, 11: 1000a, 18: 1145c, 25: 414d.
- Miriquidica complanata*, 2: 897i, 882f, 11: 1001b, 14, 25, 26: 570, 28: 435b, 30: 452b, 32: 483b, 33: 627f.
- Miriquidica griseoatra*, 9: 951h, 11: 1000f, 18: 1145d.
- Miriquidica leucophaea*, 18: 1145e.

Species	Geolitoral			Epilitoral
	Lower	Middle	Upper	
<i>Acarospora fuscata</i>			1	1
<i>Acarospora hospitans</i>			1	
<i>Amygdalaria panaeola</i>			2	3
<i>Arctoparmelia centrifuga</i>				4
<i>Arthopyrenia angermannica</i>	1	3		
<i>Aspicilia aquatica</i>		3	3	
<i>Aspicilia cinerea</i>			3	3
<i>Aspicilia gyrodes</i>			1	
<i>Aspicilia verrucigera</i>			1	3
<i>Aspilidea myrinii</i>			1	
<i>Bellemerea cinereorufescens</i>			1	
<i>Brodoa intestiniformis</i>			1	1
<i>Buellia miriquidica</i>			1	1
<i>Candelariella vitellina</i>			1	
<i>Carbonea intrusa</i>			1	1
<i>Cryptothele granuliformis</i>			3	
<i>Diploschistes scruposus</i>				2
<i>Ephebe lanata</i>		2		
<i>Gyalidea rivularis</i>		3		
<i>Hymenelia lacustris</i>		7	2	
<i>Ionaspis cyanocarpa</i>		1		
<i>Ionaspis odora</i>		2	2	
<i>Lecanora cenisia</i>				1
<i>Lecanora chloroleprosa</i>			1	2
<i>Lecanora chlorophaeodes</i>			4	
<i>Lecanora intricata</i>		1	3	3
<i>Lecanora polytropa</i>			4	3
<i>Lecidea lapicida</i>			1	2
<i>Lecidea praenubila</i>			4	2
<i>Lecidella subcongrua</i>		1		1
<i>Lepraria neglecta</i>			3	2
<i>Lobothallia melanaspis</i>		1	2	
<i>Melanelia hepatizon</i>			1	3
<i>Melanelia panniformis</i>				1
<i>Melanelia solediosa</i>			1	1
<i>Melanelia stygia</i>				3
<i>Micarea erratica</i>			1	
<i>Miriquidica atrofulva</i>			1	
<i>Miriquidica complanata</i>		1	5	3
<i>Miriquidica plumbeoatra</i>		4	2	
<i>Miriquidica pulvinatula</i>				1
<i>Ophioparma ventosa</i>				1
<i>Phylliscum demangeonii</i>			2	

Table 3. Lichens from localities at river Pite älv distributed on zones. The numbers refer to the number of localities where the species were found.

Species	Geolitoral			Epilitoral
	Lower	Middle	Upper	
<i>Placynthium flabellum</i>	1	5		
<i>Placynthium pannariellum</i>		1	2	
<i>Polyblastia cruenta</i>	1	1	1	
<i>Porpidia cinereoatra</i>				1
<i>Porpidia crustulata</i>			2	2
<i>Porpidia glaucophaea</i>		1		
<i>Porpidia macrocarpa</i>			1	1
<i>Porpidia ochrolemma</i>		3	2	
<i>Porpidia superba</i>		3	1	
<i>Porpidia tuberculosa</i>			2	2
<i>Protoparmelia badia</i>				1
<i>Protoparmelia leproloma</i>			3	
<i>Pyrenopsis subareolata</i>		3	4	1
<i>Rhizocarpon amphibium</i>		1	1	
<i>Rhizocarpon atroflavescens</i>			1	
<i>Rhizocarpon badioatrum</i>			4	4
<i>Rhizocarpon cinereonigrum</i>			2	
<i>Rhizocarpon copelandii</i>			1	
<i>Rhizocarpon eupetraeoides</i>			2	1
<i>Rhizocarpon eupetraeum</i>			2	5
<i>Rhizocarpon expallescens</i>			1	1
<i>Rhizocarpon geminatum</i>		1	4	1
<i>Rhizocarpon geographicum</i>			6	4
<i>Rhizocarpon grande</i>			1	2
<i>Rhizocarpon hochstetteri</i>			1	
<i>Rhizocarpon lavatum</i>		2	3	
<i>Rhizocarpon lecanorinum</i>				1
<i>Rhizocarpon obscuratum</i>			1	2
<i>Rhizocarpon polycarpum</i>				2
<i>Rhizocarpon rubescens</i>			2	1
<i>Rinodina tephraeaspis</i>			1	
<i>Sarcogyne clavus</i>			1	
<i>Schaereria fuscocinerea</i>			1	5
<i>Spilonema revertens</i>			2	
<i>Staurothele fissa</i>		2		
<i>Stereocaulon subcoralloides</i>				1
<i>Tephromela atra</i>				1
<i>Umbilicaria deusta</i>			2	1
<i>Umbilicaria hyperborera</i>				3
<i>Umbilicaria polyphylla</i>				1
<i>Verrucaria aethiobola</i>	1	1		
<i>Verrucaria latebrosa</i>	1	3		
<i>Verrucaria pachyderma</i>	2	1		

Table 3 (continued).

- Miriquidica plumbeoatra*, 9, 11: 981b, 14, 24: 643c, 25, 26: 589, 30: 459c, 31: 466e.
- Miriquidica pulvinatula**^P, 28: 429b.
- Muellerella lichenicola**^L, 23: 2105e. A non-lichenized lichenicolous fungus, here growing on the apothecia of *Caloplaca cerina*. In Sweden previously known from several provinces between Öland and Torne Lappmark.
- Muellerella pygmaea* v. *pygmaea**^P, 28. A non-lichenized lichenicolous fungus, here growing on *Lecidea praenubila*.
- Muellerella pygmaea* v. *ventosicola**^P, 29: 580. A non-lichenized lichenicolous fungus, here growing on *Rhizocarpon geographicum*. In Sweden previously known from Södermanland, Härjedalen, Jämtland, and Torne Lappmark.
- Mycobilimbia berengeriana*, 2: 921d, 4: 893, 23: 2041c.
- Mycobilimbia carneoalbida*, 12: 1081d.
- Mycobilimbia hypnorum*, 2: 921a, 10: 956e.
- Myxobilimbia lobulata* (syn. *Mycobilimbia lobulata*.), 23: 2115.
- Naetrocymbe punctiformis* (syn. *Arthopyrenia p.*), 18.
- Nephroma arcticum*, 7.
- Nephroma bellum*, 6: 977, 21: 2000.
- Nephroma expallidum*, 2: 903i.
- Nephroma parile*, 12: 1019b, 21.
- Ochrolechia androgyna*, 23: 2040b.
- Ochrolechia frigida*, 2: 903c, 902l, 7: 964.
- Ophioparma ventosa*, 32: 496.
- Parmelia omphalodes*, 2.
- Parmelia saxatilis*, 2: 940c, 32.
- Parmelia sulcata*, 2.
- Parmeliella triptophylla*, 2: 934f, 11, 12: 1083a.
- Parmeliopsis ambigua*, 16, 29, 30.
- Parmeliopsis hyperopta*, 16, 18.
- Peltigera didactyla*, 23.
- Peltigera aphthosa*, 23.
- Pertusaria bryontha*, 2: 921b.
- Pertusaria carneopallida*, 10: 954a, 18, 23: 2105g.
- Pertusaria oculata*, 7: 962a.
- Phaeocalicium flabelliforme**^L, 6: 978. A non-lichenized saprobic or parasitic fungus growing on twigs of *Betula*. Previously only known from two collections from Norrbotten.
- Phaeophyscia endococcina*, 12: 1031.
- Phaeophyscia sciastra*, 2: 903b, 21, 23: 2099a, 2105f.
- Phylliscum demangeonii*, 2: 934d, 28: 440b, 32: 501.
- Physcia caesia*, 2: 940b, 23: 2120a.
- Physcia dubia*, 2: 940a.

- Physconia muscigena*, 2: 921f.
Placidium lachneum, 2: 921g .
Placopsis gelida, 2: 936b, 3.
Placynthium asperellum, 2: 910e, 924a, 882b, 3, 11.
Placynthium dolichoterum, 2: 878c, 915.
Placynthium flabellusum, 2: 897e, 8: 968a, 11, 12: 1054, 1085, 1093, 1097, 24: 639b, 25: 551b, 27: 606, 28, 29, 30: 460. Usually on siliceous rocks in the lower half of the geolitoral zone, but once found on twigs of *Salix phylicifolia* (see under *Agonimia repleta*).
Placynthium nigrum, 6: 975, 22: 1180d, 23: 2013, 2044.
Placynthium pannariellum, 2: 874a, 882d, 901c, 904a, 11: 981a, 12: 1024, 22: 1194a, 27: 615, 32: 502.
Placynthium stenophyllum, 6: 974d, 23: 1173b, 1178, 2022b, 2107a.
Polyblastia albida, 22: 1183a, 23: 2011, 2025, 2062, .
Polyblastia bryophila, 23: 2114b.
Polyblastia cruenta, 5, 12: 1093a, 1094b, 14: 1117, 17, 23: 1173c, 25: 537b, 26.
*Polyblastia cupularis**^L, 2: 878a, 937a. In the middle geolitoral and the epilitoral zones. In Sweden previously known from Dalarna and Torne Lappmark.
Polyblastia melaspora, 2: 897f, 11: 1002b.
Polyblastia moravica, 2: 880a.
Polyblastia singularis, 22: 1182a.
Polyblastia theleodes, 2: 930b.
Polychidium muscicola, 2: 911a, 23: 2109.
Polysporina simplex, 2: 924e, 20.
*Porocyphus coccodes**^L, 2: 932c. In the upper geolitoral zone. In Sweden previously known from several provinces between Blekinge and Torne Lappmark.
Porpidia cinereoatra, 2: 881c, 901a, 26: 562, 33: 621d.
Porpidia crustulata, 12, 28, 32, 33.
Porpidia flavicunda, 2.
*Porpidia glaucophaea**^{LP}, 14: 1116b, 30: 456c. On siliceous rocks in the middle geolitoral zone. In Sweden previously known from several provinces between Skåne and Torne Lappmark.
*Porpidia grisea**^N, 26: 563. On horizontal, siliceous rock. In Sweden previously known from several provinces between Halland and Västerbotten.
Porpidia macrocarpa, 2: 924b, 3, 11, 12: 1071a, 14, 25.
*Porpidia ochrolemma**^{LNP} (syn. *Hymenelia o.*), 2: 900a, 11: 1000c, 14: 1123, 24: 640b, 25: 410a, 27: 609, 32: 481a. On siliceous rocks in the middle and upper geolitoral zones. In Sweden previously known from several provinces between Värmland and Torne Lappmark.
Porpidia speirea, 2: 902h, 9: 1161.

- Porpidia superba*, 2: 878d, 3, 9, 11, 12, 14, 25: 557c, 27, 30: 462a, 31: 471.
- Porpidia tuberculosa*, 25: 527, 26, 28: 429a, 30, 32: 491, 494, 33: 630(4).
- Protoblastenia siebenhaariana*, 2: 897h, 23: 2018.
- Protopannaria pezizoides* (syn. *Pannaria p.*), 2: 903a, 11, 12: 1081b.
- Protoparmelia badia*, 2, 12, 18, 25: 419c.
- Protoparmelia leproloma*, 26: 569a, 30: 455, 32: 499b.
- Protothelenella corrosa*, 18: 1145b, 1147a, 32: 489b, 492d. On shaded siliceous rocks. The characteristic green colour of the thallus had faded away, which made the species very inconspicuous.
- Pseudephebe pubescens*, 8: 969a.
- Psora decipiens*, 2: 911d.
- Psoroma hypnorum*, 2: 903g, 23: 2040a.
- Psorotichia schaeferi*, 11: 988c, 23: 1173d.
- Pterygiopsis coracodiza**^L, 12: 1096a. On siliceous rock in the lower littoral zone. In Sweden previously known from Västergötland and Bohuslän.
- Pycnothelia papillaria*, 23: 2040c.
- Pyrenopsis grumulifera**^L, 11: 988c. On siliceous rock in the middle geolittoral zone. In Sweden previously known from Dalsland and Närke.
- Pyrenopsis haemalella**^L, 2: 897c. On siliceous rock in the upper geolittoral zone. In Sweden previously known from Västergötland, Bohuslän, and Värmland.
- Pyrenopsis subareolata**^{NP}, 25: 414a, 28: 435c, 30: 456a, 32: 477, 484. On siliceous rocks from the middle geolittoral zone to the epilittoral zone. In Sweden previously known from Skåne, Småland, Västergötland, Bohuslän.
- Rhizocarpon amphibium*, 14: 1116a, 25: 557b, 30: 456d.
- Rhizocarpon atroflavescens**^{LP}, 2: 881d, 32: 500. On siliceous rocks in the upper geolittoral zone. In Sweden previously known from Härjedalen, Jämtland, Lule Lappmark, and Torne Lappmark.
- Rhizocarpon badioatrum*, 11: 1001e, 25: 414h, 26, 28, 32: 492a, 33: 627b, 630(3).
- Rhizocarpon cinereonigrum**^{NP}, 26, 28: 440a. On siliceous rocks in the upper geolittoral zone. In Sweden previously known from a few provinces between Västergötland and Lule Lappmark.
- Rhizocarpon copelandii*, 32: 509.
- Rhizocarpon distinctum*, 9: 951f.
- Rhizocarpon eupetraeoides**^N, 26: 601, 30: 449b. On siliceous rocks in the upper geolittoral zone. In Sweden previously known from Västerbotten, Pite Lappmark, and Torne Lappmark.

- Rhizocarpon eupetraeum*, 8: 969c, 25: 419d, 26: 595, 28, 29, 32: 492b, 33.
- Rhizocarpon expallescens*, 2: 899c, 25: 410b.
- Rhizocarpon geminatum*, 2: 916b, 25: 414e, 26: 594, 27, 28: 434, 31: 466a.
- Rhizocarpon geographicum*, 11, 12, 14, 16, 18, 25: 414g, 26, 28, 29, 32: 478, 33: 627d, 632(2).
- Rhizocarpon grande*, 28, 29, 33: 621f, 632(3).
- Rhizocarpon hochstetteri*, 25: 550b, 28: 432b.
- Rhizocarpon jemtlandicum*, 8: 969b.
- Rhizocarpon lavatum*, 2: 874b, 9, 11, 14, 25: 557a, 27: 608, 31: 466b, 32: 481b.
- Rhizocarpon lecanorinum**^P, 29: 581. On siliceous rock in the epilitoral zone. In Sweden previously known and common in most provinces up to Västerbotten.
- Rhizocarpon obscuratum*, 33.
- Rhizocarpon petraeum*, 2: 930a, 3: 888b.
- Rhizocarpon polycarpum*, 18: 1145f, 25: 416, 547b, 29: 577.
- Rhizocarpon roridulum*, 2: 902i, 923a, 936c, 3: 889b.
- Rhizocarpon rubescens**^P, 28: 436b, 32: 490a. On siliceous rocks in the uppermost geolitoral and the epilitoral zones. In Sweden previously known from Skåne to Ångermanland.
- Rhizocarpon umbilicatum*, 2: 902 k.
- Rimularia furvella*, 9: 951g, 32.
- Rinodina bischoffii**^L, 20: 1167a. On calciferous schist. In Sweden previously known from several provinces between Skåne and Torne Lappmark.
- Rinodina mniaraea*, 2: 921c.
- Rinodina olivaceobrunnea*, 23: 2041b.
- Rinodina parasitica**^L, 11: 1012a. On *Aspicilia* sp. in the epilitoral zone. In Sweden previously known from Skåne, Jämtland, and Lule Lappmark.
- Rinodina septentrionalis*, 23: 2105c.
- Rinodina tephraspis*, 32: 499a.
- Sagediopsis aquatica*, 12: 1017a, 1020b. A non-lichenized lichenicolous fungus growing on *Koerberiella wimmeriana*.
- Sagiolechia protuberans*, 2: 878b, 23: 2019a.
- Sarcogyne clavus**^{LP}, 2: 927, 12: 1038, 32: 486b. On siliceous rocks in the upper geolitoral zone. In Sweden previously known from several provinces between Skåne and Lule Lappmark.
- Sarcogyne privigna**^L, 9: 1163. On schist. In Sweden previously known from Skåne to Härjedalen.
- Schaereria fuscocinerea*, 25: 419e, 26, 28, 30, 32: 490c, 33: 621c.
- Scoliciosporum umbrinum*, 2: 933a, 11.

- Solorina bispora*, 2: 943.
- Solorina crocea*, 6: 976a.
- Solorina spongiosa*, 23: 2041a.
- Sphaerophorus fragilis*, 2.
- Spilonema revertens*, 2: 925b, 28: 436a, 30: 449a.
- Staurothele areolata*, 23: 2033.
- Staurothele fissa*, 11, 12: 1016c, 14, 26: 585, 30: 457.
- Staurothele guestphalica**^L, 23: 2017. On calcareous rock in the middle geolitoral zone. In Sweden previously known Öland, Västergötland, Närke, and Gästrikland.
- Staurothele rupifraga*, 22: 1181, 23.
- Staurothele succedens**^L, 2: 870. On calciferous rock in the lower littoral zone. In Sweden previously known from several provinces between Öland and Torne Lappmark.
- Stereocaulon botryosum*, 2: 911e.
- Stereocaulon depressum**^L, 2: 882i. On rock in the upper geolitoral zone. In Sweden previously known from Jämtland, Pite Lappmark, Lule Lappmark, and Torne Lappmark.
- Stereocaulon subcoralloides*, 32: 487b.
- Tephromela atra*, 2: 926b.
- Thamnolia vermicularis*, 7: 962b.
- Thelenella pertusariella*, 23: 2105b. A rarely collected lichen, here abundantly growing together with *Pertusaria carneopallida* on *Betula*.
- Thelidium aeneovinosum*, 2: 874, 899a, 3: 887b, 5, 9: 949b, 10, 11: 986, 12: 1094a, 14, 15, 16, 19, 22.
- Thelidium aethioboloides**^L, 11: 980. On siliceous rock in the middle geolitoral zone. In Sweden previously known from only one locality in Torne Lappmark.
- Thelidium decipiens*, 23: 1175.
- Thelidium incavatum**^L, 4: 894. On calcareous rock in the middle geolitoral zone. In Sweden previously known from several provinces from Skåne to Torne Lappmark.
- Thelidium pyrenophorum*, 22: 1182b, 23.
- Thelignya lignyota*, 2: 932b, 11: 1011.
- Thelocarpon laureri**^L, 2. Only one specimen found. On rock in the upper geolitoral zone. In Sweden previously known from Bohuslän, Värmland, Gästrikland, and Hälsingland.
- Thelopsis flaveola**^L, 12: 1081a. On twigs of *Salix phylicifolia* hanging out over the water on shore with small blocks (for associated species, see *Agonimia repleta*). Redlisted and regarded as vulnerable in Sweden (Gärdenfors 2000). Previously known from several provinces from Småland to Åsele Lappmark.
- Thermutis velutina*, 2: 882e.
- Toninia aromatica*, 2: 918b, 23: 2087, 2114a.

- Toninia sedifolia*, 20.
Toninia squalida, 2: 921k.
Trapelia placodioides, 11: 987b, 21: 2001.
Tremolechia atrata, 11: 1008b.
Umbilicaria cylindrica, 11: 1013.
Umbilicaria deusta, 2, 11: 1004c, 28, 32, 33.
Umbilicaria hyperborea, 11, 25, 28, 33.
Umbilicaria polyphylla, 28.
Umbilicaria torrefacta, 18: 1147c, 18, 32.
Verrucaria aethiobola, 11: 982, 12: 1046, 1039, 1096b, 14, 17, 22, 23: 2082, 27: 604a, 30: 456e, 462d.
Verrucaria foveolata, 23: 2090.
*Verrucaria hochstetteri**^L, 6: 974b, 23: 2019b. On calcareous rock in the middle or upper geolitoral zone. In Sweden previously known from several provinces between Öland and Ångermanland.
Verrucaria latebrosa, 2: 890a, 8: 968c, 11: 983b, 12: 1040, 25: 409, 27: 605, 30: 464, 462c.
*Verrucaria pachyderma**^{NP}, 12: 1078, 24: 641, 639a, 27: 602.
Verrucaria umbrinula, 12: 1088b.
Vestergrenopsis isidiata, 2: 882c, 910a, 3: 889a.
Vulpicida juniperina, 18: 1146.
Xanthoria elegans, 2: 938b, 20.
Xanthoria sorediata, 9: 952b, 23.

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