

Interesting lichenized and lichenicolous fungi found during the Nordic Lichen Society excursion in Nord-Trøndelag, Norway 2015

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In August 2015, the Nordic Lichen Society held its 21st bi-annual meeting and excursion in Steinkjer, Nord-Trøndelag, Norway. During the excursion various habitats, including boreal rainforest, calcareous rocks with pine forest, coastal heath, heavy metal containing rock and montane spruce forest, were investigated. The most interesting findings are recorded herewith. *Didymocyrtis pseudeverniae* and *Unguiculariopsis manriquei* are new to Scandinavia, and six species are new to Norway: *Absconditella celata*, *Catillaria aphanata*, *Micarea contexta*, *Scytinium aquale*, *Tremella wirthii* and *Verrucaria sparsiuscula*. Notes on a number of red-listed and/or rarely collected species in Norway are also provided.

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Introduction

From 3 to 7 August 2015, the Nordic Lichen Society held its 21st meeting in Steinkjer, Nord-Trøndelag, central Norway, during which 32 lichenologists from 12 countries attended. As well as evening laboratory sessions in the microscopy, sampling for DNA-barcoding, presentations, and a General Meeting on the 5 August, there were three full-day and one half-day excursions. Various habitats, including boreal rainforest (oceanic spruce forest), coastal heath, montane spruce forest, mining areas with rocks containing heavy metals, calcareous rock and calcareous pine forest, were investigated (Table 1). A main focus of the meeting was DNA barcoding of lichens and lichenicolous fungi, in which all participants were invited to take part during the excursion. In return, the contributors will get the fungal barcode region (ITS) sequence for their submitted specimens. Despite the rather comprehensive procedures (introduced during the first evening and assisted throughout the meeting), the participation was remarkable, 14 contributors sampling more than 150 specimens. The epiphytic lichen flora of the area is fairly well known, but less is known about saxicolous crustose lichens in general, pyrenocarpous lichens in particular, and our knowledge of lichenicolous fungi is even poorer. These poorly known groups received particular attention during the meeting, including presentations on relevant ongoing projects.

The aim of this paper is to present the most interesting lichens and lichenicolous fungi found during the NLS excursion in Steinkjer, which include species that are either new to Scandinavia or Norway, or are rarely collected or red-listed in Norway.

Table 1. Localities visited. Position is given as central point. Abbr.: Nature Reserve = NR

Date	Municipality	Locality	Latitude	Longitude	Habitat
04.Aug.2015	Steinkjer	Mokk	63.96201°N	12.11886°E	Montane <i>Picea abies</i> forest
04.Aug.2015	Steinkjer	Gruvfjellet	63.96721°N	12.13972°E	Heavy metal containing rock, old mines
04.Aug.2015	Steinkjer	Litl–Gaulstad	63.97440°N	12.11937°E	Calcareous rock, stream ravine
05.Aug.2015	Flatanger	Dale NR	64.44294°N	10.96942°E	Boreal <i>Picea abies</i> rainforest
05.Aug.2015	Flatanger	Vikvatnet	64.44591°N	10.78441°E	Humid deciduous forest with <i>Populus tremula</i>
05.Aug.2015	Flatanger	Nordstraumen	64.50379°N	10.79394°E	Humid coastal heath
06.Aug.2015	Snåsa	Bergsåsen NR	64.25407°N	12.40768°E	Calcareous <i>Pinus sylvestris</i> forest
06.Aug.2015	Steinkjer	Bøla river	64.14595°N	11.93887°E	Schistose rock and mixed coniferous forest
07.Aug.2015	Steinkjer	Hoøya	64.01871°N	11.35389°E	Maritime rock and mixed coniferous forest

Species new to Scandinavia

Didymocyrtis pseudeverniae (Etayo & Diederich) Ertz & Diederich

This species was described from Spain by Etayo & Diederich (1996b) as *Macrophomina pseudeverniae* and later recombined as *Diederichia pseudeverniae* by Hawksworth (2003). Based on molecular data, Ertz et al. (2015) recently transferred it to the genus *Didymocyrtis*. It has black immersed pycnidia on pinkish, necrotic parts of the thallus of *Pseudevernia furfuracea* (see illustration in Ertz et al. 2015). *Didymocyrtis pseudeverniae* differs from other species in the genus by its rather large, multi-guttulate conidia. So far the species has been reported from Czech Republic, Germany, Great Britain, Italy, Latvia, Lithuania, Spain and Switzerland (Brackel 2014, Ertz et al. 2015, Motiejūnaitė 2011, Motiejūnaitė & Grochowski 2014). The specimens from Steinkjer were found on thallus of *Pseudevernia furfuracea*.

Specimens: Nord-Trøndelag: Steinkjer, Mokka, 63.97000°N, 12.13319°E, *Suija* (TU 75667); *Motiejūnaitė* (BILAS 10803); *Tsurykau* (GSU 2183).

Unguiculariopsis manriquei Etayo

This species is characterized by brownish to ochre ascomata, up to 0.65 mm in diam., with a distinct incurved excipulum, rather long excipular hairs and simple, hyaline, rather small ascospores (Etayo & Diederich 1996a). The apothecia grow solitary or in small clusters on the lower tomentose surface of *Lobaria pulmonaria* and *L. scrobiculata*. The Norwegian specimen (Fig. 1) was growing on the underside of *Lobaria scrobiculata* on *Picea abies*, in a boreal rain forest with dominant spruce and scattered deciduous trees. So far the species has only been recorded from the Canary Islands (La Gomera), the French Pyrenees and the British Isles (Etayo & Diederich 1996a, Hitch 2000).

Specimen: Nord-Trøndelag: Flatanger, Dale Nature Reserve, 64.44194°N, 10.96305°E, *Westberg 15-018* (TU 76275), det. A. Suija.

Species new to Norway

Absconditella celata Döbbeler & Poelt

This species is characterized by its very small, reddish-brown to yellowish ascomata, less than 0.1 mm in diam., and 3-septate, broadly ellipsoid ascospores. Young apothecia are immersed in the substrate, becoming sessile at maturity. It was originally described from Torne Lappmark, Sweden by Döbbeler & Poelt (1977) where it was found on *Sphagnum* in somewhat disturbed habitats. It has also been recorded from the British Isles where it has been found on dead wood and clayey soil (Coppins 2009a), and from Estonia, Finland, Poland and Slovakia (Aptroot et al. 2005, Bielczyk & Kiszka 2002, Palice 1999). The Norwegian specimen was growing on wood of *Pinus sylvestris* in calcareous pine forest. The species is possibly overlooked due to its minute size.

Specimen: Nord-Trøndelag: Snåsa, Bergsåsen Nature Reserve, 64.25453°N, 12.39803°E, *Jonsson 6268* (TRH).

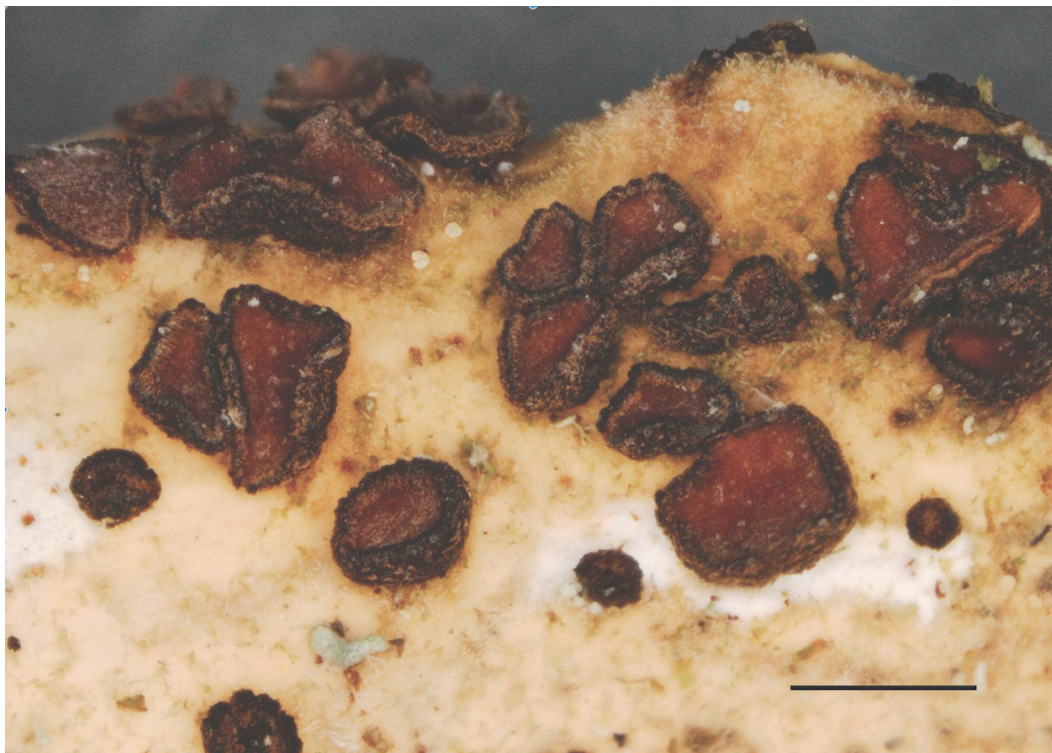


Figure 1. *Unguiculariopsis manriquei*, Westberg 15-018 (TU76275). Bar 0.5 mm. Photo: Ave Suija, Ede Oja

Catillaria aphan (Nyl.) Coppins

This rarely collected species is characterized by its greyish, thin to slightly verrucose or almost immersed thallus, small dark brown to black apothecia (Fig. 2) and simple to 1-septate, rarely 2- or 3-septate, ascospores. The exciple and epihymenium contain two different pigments, one greyish-brown reacting K+ greenish and one reddish-brown reacting K+ purplish (Coppins 1989, Fletcher & Coppins 2009). The species is similar to *C. scotinodes* which differs mainly in its longer ascospores and mostly dark green pigments in the ascomata (Coppins 1994). So far *C. aphan* has only been recorded from the British Isles, Sweden and Estonia (Fletcher & Coppins 2009, Jüriado et al. 2002). The specimen from Steinkjer was growing on overhanging schistose rock just above the intertidal zone.

Specimen: Nord-Trøndelag: Steinkjer, Hoøya, 64.01746°N, 11.35293°E, *Klepsland 15-L408a* (TRH).

Micarea contexta Hedl.

This small species is similar to the common *M. melaena* and differs mainly by its endoxylic thallus, smaller ascomata, 1-septate ascospores, fewer paraphyses and shorter microconidia (Coppins 1983). The species has long been known from central parts of Sweden, and is also known from the British Isles, Czech Republik and Switzerland (Coppins 1983, 2009b, Palice 1999). According to Czarnota (2011), who provides excellent illustrations of the species, it is also

known from Poland and Russia. The Norwegian specimen was found on wood of a leaning snag in a boreal rain forest within a ravine.

Specimen: Nord-Trøndelag: Flatanger, Dale Nature Reserve, 64.44319°N, 10.96519°E, *Jonsson 6269* (TRH).



Figure 2. *Catillaria aphana*, *Klepsland 15-L408a* (TRH). Photo: Kim Abel.

Scytinium aquale (Arnold) Otálora et al.

This rare and possibly somewhat overlooked species is mainly characterized by its minutely crustose thallus, apothecia with a more or less crenulate thalline margin, muriform spores, and growing periodically submerged on calcareous rock by streams (Jørgensen 1994). According to Jørgensen (2007a) and Nordin et al. (2016) the species is unknown from Norway, but in Artskart (2016) a specimen from Norway collected by Du Rietz in 1960 is mentioned, but with no further details. Therefore this appears to be the first confirmed documentation of this species from Norway. The specimen from Steinkjer was found on calcareous rock by a waterfall.

Specimen: Nord-Trøndelag: Steinkjer, Litl-Gaulstad, 63°58.471'N, 12°7.211'E, *Prieto 299* (S).

Tremella wirthii Diederich

This lichenicolous fungus was described from Germany growing on an unidentified crustose lichen (Diederich 1996). The host was later described as *Protoparmelia hypotremella* by Aptroot et al. (1997) who also reported *Tremella wirthii* on both *Protoparmelia hypotremella* and the closely related *P. oleagina* from the Netherlands. Recently *Tremella wirthii* was also reported from Sweden where it was growing on *Protoparmelia oleagina* in Dalarna (see Westberg et al. 2015) which also gives updated information on the morphological variation in *Tremella wirthii*. The Norwegian specimens were growing on *Protoparmelia oleagina* on decorticated wood of *Pinus sylvestris* in a calcareous pine forest.

Specimens: Nord-Trøndelag: Snåsa, Bergsåsen Nature Reserve, 64°15'16.45"N, 12°23'51.4"E, *Jonsson 6270* (TRH); *Holien 14815* (TRH), both det. A. Millanes.

Verrucaria sparsiuscula Nyl. (syn. *V. christiansenii* Servít)

According to Pykälä (2011), who gives a circumscription of the species, it is not rare in southern Finland and is probably much overlooked. The colour of the thallus varies from grey to dark brown (usually pale brown to medium brown) and the involucrellum covers half of the exciple or extends to the exciple base. The specimen from Flatanger was collected from a parking lot on calciferous pebbles.

Specimen: Nord-Trøndelag, Flatanger, Nordstraumen, 64°30'13.6"N, 10°47'33.1"E, *Pykälä 48341* (H).

Red-listed and rarely collected species

Atla alpina Savíc & Tibell

This rather conspicuous species was described by Savíc & Tibell (2008), who cited specimens from Austria, Germany, Norway, Novaya Zemlya, Spitsbergen and Sweden. The record from Norway was based on one specimen from Vega in Nordland, cited as *Polyblastia theleodes* (Degelius 1978), now in UPS, but not listed in Artskart (2016). The present specimens, the second and third known records of this species in Norway, were found on calcareous pebbles in a steep S-exposed rock outcrop and on a calcareous boulder in a steep N-facing slope.

Specimens: Nord-Trøndelag: Snåsa, Bergsåsen Nature Reserve, 64°15'05.0"N, 12°23'20.3"E, *Pykälä 48378* (H); Steinkjer, Mokka to Litl-Gaulstad, 63°58'30.3"N, 12°07'07.7"E, *Pykälä 48331* (H, filed under *Verrucaria* sp.).

Diplotomma lutosum A. Massal. (syn. *Buellia subdispersa* Mig.)

Previously this species has only been recorded from two areas in Norway, one being Gildeskål in Nordland where it was collected several times by Norman more than 100 years ago. The only recent record is from Oppland (Sør-Fron) in 2010 (Artskart 2016). Accordingly this is the second recent record (see Nordin 1999, Foucard et al. 2002). It seems to have a wide distribution in Europe, N and S America, Siberia, but is apparently rare throughout. The specimen from Steinkjer was growing on overhanging schistose rock just above the intertidal zone together with *Catillaria aghana* (see above).

Specimen: Nord-Trøndelag: Steinkjer, Hoøya, 64.01746°N, 11.35293°E, *Klepssland 15-L409* (TRH).

Hypogymnia incurvoides Rass.

This rather rare species was reported from Norway by McCune et al. (2007) based on two old collections from Oslo 1869 and Nord-Trøndelag 1938. Some additional records have recently been added indicating a scattered distribution along the Norwegian coast (Artskart 2016). For a description and good illustration of the species, see Westberg et al. (2011). The species is so far known from Canada, Norway, Russia, Sweden and USA. It may have been overlooked in Norway due to confusion with the very common *Hypogymnia physodes*. In Flatanger, *H. incurvoides* occurred rather abundantly in two boreal rainforest localities on *Betula pubescens* and *Picea abies*.

Specimens: Nord-Trøndelag: Flatanger, Dale Nature Reserve, 64.44314°N, 10.97279°E & 64.44197°N, 10.96137°E, *Klepsland 15-L374, 15-L375* (O); *Holien* (TRH-L-16183 & L-16184); Flatanger, Vikvatnet, 64.44895°N, 10.77640°E, *Klepsland 15-L376* (O).

Lichenocodium erodens M. S. Christ. & D. Hawksw.

This species grows on a wide range of host species and for well-illustrated descriptions see Hawksworth (1977 & 1981). In Norway it has previously been reported from Troms, Skibotn (see Alstrup et al. 2008), but it is probably much overlooked. The specimens from Flatanger and Mokka were growing on the thalli of *Parmelia saxatilis* and *Pseudevernia furfuracea* respectively.

Specimens: Nord-Trøndelag: Flatanger, Dale Nature Reserve, 64.4425°N, 10.97181°E, *Motiejūnaitē* (BILAS 10760); Steinkjer, Mokka, 63°58'083"N, 12°08'208"E, *Tsurykau* (GSU 2183).

Lichenopuccinia poeltii D. Hawksw. & Hafellner

A description with good illustrations of this highly characteristic species is given by Hawksworth (1984). In Norway it has previously been reported from Nord-Trøndelag, Grong (see Holien & Tønsberg 1994), but is not shown in Artskart (2016). The specimens from Flatanger were growing on thalli of *Parmelia sulcata* and *P. saxatilis*.

Specimens: Nord-Trøndelag, Flatanger, Dale Nature Reserve, 64.4425°N, 10.97181°E, *Suija* (TU 75640); *Motiejūnaitē* (BILAS 10766, 10772).

Opegrapha dolomitica (Arnold) Clauzade & Cl. Roux

This rarely collected species in Norway is similar to *O. calcarea*, but differs in its longer ascospores, different pigmentation of the apothecial tissues and by more or less irregular apothecia with longitudinal furrows (Pentecost & James 2009). The specimens from Nord-Trøndelag were growing under shaded calcareous rock overhangs.

Specimens: Nord-Trøndelag, Steinkjer, Litl-Gaulstad, 63.97491°N, 12.11879°E, *Klepsland 15-L373* (TRH); 63.97639°N, 12.11722°E, *Westberg 15-015* (S F278164); Snåsa, Bergsåsen Nature Reserve, 64°15.316'N, 12°24.026'E, *Frisch 15/102* (TRH).

Petractis clausa (Hoffm.) Kremp.

This small, but easily identified species on calcareous rock is rare and red-listed as endangered in Norway (Henriksen & Hilmo 2015). It has been recorded previously from seven nearby localities in Steinkjer on the west side of Lake Snåsa as well as from Bømlø in Hordaland and the area of Lake Tyrifjorden in Buskerud (Artskart 2016). This is the first record of the species east of Lake Snåsa where it was found in several spots in the calcareous pine forest, on sloping, naked rock which is continuously exposed, probably by eroding ice and snow in the winter.

Specimen: Nord-Trøndelag: Snåsa, Bergsåsen Nature Reserve, 64.25157°N, 12.38981°E & 64.25185°N, 12.39350°E, *Klepsland 15-L393, 15-L401* (TRH).

Placynthium stenophyllum (Tuck.) Fink

This is a distinct, but rarely collected species which has been reported from just a few localities in Northern Norway (Nordland & Troms) and from Buskerud and Hedmark in the south (see Jørgensen 2007b & Artskart 2016). It is red-listed as endangered (EN) in Norway (Henriksen & Hilmo 2015). The specimen from Snåsa was growing on calcareous rock in an open situation.

Specimens: Nord-Trøndelag: Snåsa, Bergsåsen Nature Reserve, 64.25157°N, 12.38981°E, *Klepsland 15-L388a* (TRH); 64.25305°N, 12.38833°E, *Westberg & Košuthová 15-025* (S F278180).

Staurothele succedens (Rehm ex Arnold) Arnold

This is another rarely collected species which in Norway has previously been recorded from only two nearby localities in Hordaland, Etne in 1984 (Artskart 2016). It is characterized mainly by its thin, dark thallus, often with a black film of cyanobacteria, partly immersed black perithecia with a pale papillate ostiole, and rather large, pale muriform spores (Orange et al. 2009a, Pykälä 2013). The cited specimens were growing on calcareous rock by a small river.

Specimen: Nord-Trøndelag: Steinkjer, Litl-Gaulstad, 63°58'28.4"N, 12°07'12.1"E, *Pykälä 48309, 48325* (H).

Thelidium fontigenum A. Massal.

This species has previously been recorded in Norway from Ladehammeren in Trondheim in 1886 and from Hordaland in 1978 (Artskart 2016). According to Orange (2009) it is mainly recognized by its small perithecia which are most often developed within pits on rock, thin apical involucrellum and the 3-septate ascospores. The thallus may contain a yellow, K+ purple pigment. The specimen from Steinkjer was found on calcareous rock by a small river.

Specimen: Nord-Trøndelag: Steinkjer, Litl-Gaulstad, 63°58'28.2"N, 12°07'12.6"E, *Pykälä 48310* (H & O).

Verrucaria viridula (Schrad.) Ach.

This species has only been collected once in Norway, from Bømlø, Hordaland in 1989 (Artskart 2016). It grows on calcareous rock and is probably under-collected and overlooked as it is said to be common in the British Isles (Orange et al. 2009b). It is distinguished by its large perithecia leaving pits, often pear-shaped exciple, apical involucrellum and large ascospores. The specimens from Snåsa were found on calcareous stones in a pine forest.

Specimen: Nord-Trøndelag: Snåsa, Bergsåsen Nature Reserve, 64°15'04.8"N, 12°23'02.2"E, *Pykälä 48345, 48346, 48353, 48397* (H).

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