

Lecidea subhumida Vain., a pine wood specialist new to Scandinavia

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Lecidea subhumida Vain. is reported from Scandinavia for the first time. The locality in Grane, northern Norway, is an old coniferous forest dominated by *Pinus sylvestris* with scattered *Picea abies* and *Betula pubescens*. *Lecidea subhumida* grows on hard wood of pine in open situation. It is elsewhere only known from Finland and Russia.

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Introduction

In the autumn of 2016 the first author sampled lichens in old pine forest in Grane municipality, northern Norway (Holien et al. 2018). Two specimens with small, strongly convex, shiny dark brown apothecia collected on hard pine wood looked very much like *Japewia tornoensis* (Nyl.) Tønsberg in the field. A closer microscopical examination showed that the ascospores were of different shape and much smaller than the ascospores of that species. The specimens were sent to the second author who was able to identify it as *Lecidea subhumida* Vain. (Vainio 1883, Magnusson 1952). As this species has not been reported from Scandinavia before, we present a short description of the morphology, ecology and distribution.

Material and Methods

The study is based on material collected by the first author and deposited in TRH. An isotype was borrowed from the herbarium in Helsinki (H) for comparison. One specimen was tested by thin layer chromatography (TLC) according to standard methods (Orange et al. 2001). For anatomical studies we used a Zeiss light microscope (with magnification of 400×, 630× and 1000×) and an Olympus CX41 light microscope (100×, 400×, 600× and 1000×). Ascospore measurements were made in K (i.e. a 10 % solution of potassium hydroxide).

The Species

Lecidea subhumida Vain.

Type: Finland. Lapponia Inarensis: Inari, Paatsjoki, supra lignum Pini in regione pinifera, 1878-07-13, E.A. Vainio (TUR-V 23289, lectotype selected by Printzen 1995 [ICN Art. 9.9], not seen; H 9503555, isolectotype, seen by HH), see Vainio (1883).

Description of the Norwegian specimens: (Fig. 1) Thallus dark olive grey to brownish, thin, consisting of distinct granules or goniocysts, partly endoxylic or bursting up from the substrate, 15–40 µm in diam. Goniocysts formed by brown pigmented to hyaline hyphae depending on exposure, firmly enclasp the photobiont cells in one layer. Hyphae (2–) 2.5–3 (–4) µm broad, intricately interwoven. Photobiont trebouxiod, with a distinct parietal pyrenoid, (5–) 7–16 (–17) µm in diam., with a quite thick wall (c. 1–1.5 µm).

Apothecia reddish brown, dark brown to brown-black, distinctly glossy, early becoming convex, (0.3–) 0.5–0.8 (–1.1) mm in diam. Excipulum colourless and indistinct inside, rather thin, laterally 15–40 µm wide, of parallel to branched hyphae with lumina c. 1–1.5 µm, inner basal part merging with hypothecium, reduced with age, external part brown pigmented (KOH+ olive-brown), reaching to the base of the apothecia, composed of distally enlarged cells of excipular hyphae up to 6 µm in diam., with a thin apical pigment cap. Hypothecium pale, non-inspersed of interwoven hyphae c. 1.5–2.5 µm. Hymenium 60–75 µm high, pale, amyloid. Epihymenium 0–15 µm high, with brown amorphous pigment, KOH+ olive-brown, dispersed around paraphyses apices and occasionally streaking into hymenium. Paraphyses simple to sparsely branched, conglutinate, c. 1–1.3 µm broad at mid of hymenium, apically slightly thickened to sometimes capitate, 3–6 µm at apices. Asci 40–50 × 12–15 µm, cylindrical to clavate, of *Lecanora*-type. Ascospores simple, non-halonate, ellipsoid to broadly ellipsoid/ovoid, occasionally subglobose, (7–) 8–10 (–10.5) × (3–) 3.5–5 (–6) µm.

Pycnidia not seen.

Chemistry: No secondary compounds.

Distribution and Ecology: The type locality in Inari Lapland, northern Finland is not far from the Finnish-Norwegian-Russian border in Pasvik. According to Alava et al. (2004) the locality is near the outflow of the Paz river (Pasvikelva) E of Laiti, ca. 68°55'N, 28°26'E. In addition it has been recorded from a few localities in southern Finland (Santesson et al. 2004). Recently it has also been published from Russia close to the Norwegian border in Pasvik (Urbanavichus & Fadeeva 2018). As this is a rather small species it may have been overlooked to some extent. However, it is likely that this is a northern, pine forest species. Spribille et al. (2008) list the species among a group of crustose, lignicolous lichens from Fennoscandia that has not been collected or rarely collected since they were described in the late 1800s.

The Norwegian locality in Danielåsen, Grane (see below) is a pine dominated forest in the slightly oceanic section of the northern boreal vegetation zone (Moen 1999). The pine forest is mixed with scattered birch and spruce trees (Fig. 2) and small, mostly rather poor, minerotrophic mires and surrounded by old spruce forest which is largely protected as nature reserve. Only a part of the pine dominated area is included in the reserve. The forest history in the locality has been investigated by Holien et al. (2018). A dendrochronological study documented tree ages between 300 and 612 years for pine and up to 330 years for spruce. The amount of dead wood is high with so-called kelo trees, dead standing trees and snags, as well as stumps and upturned, windblown

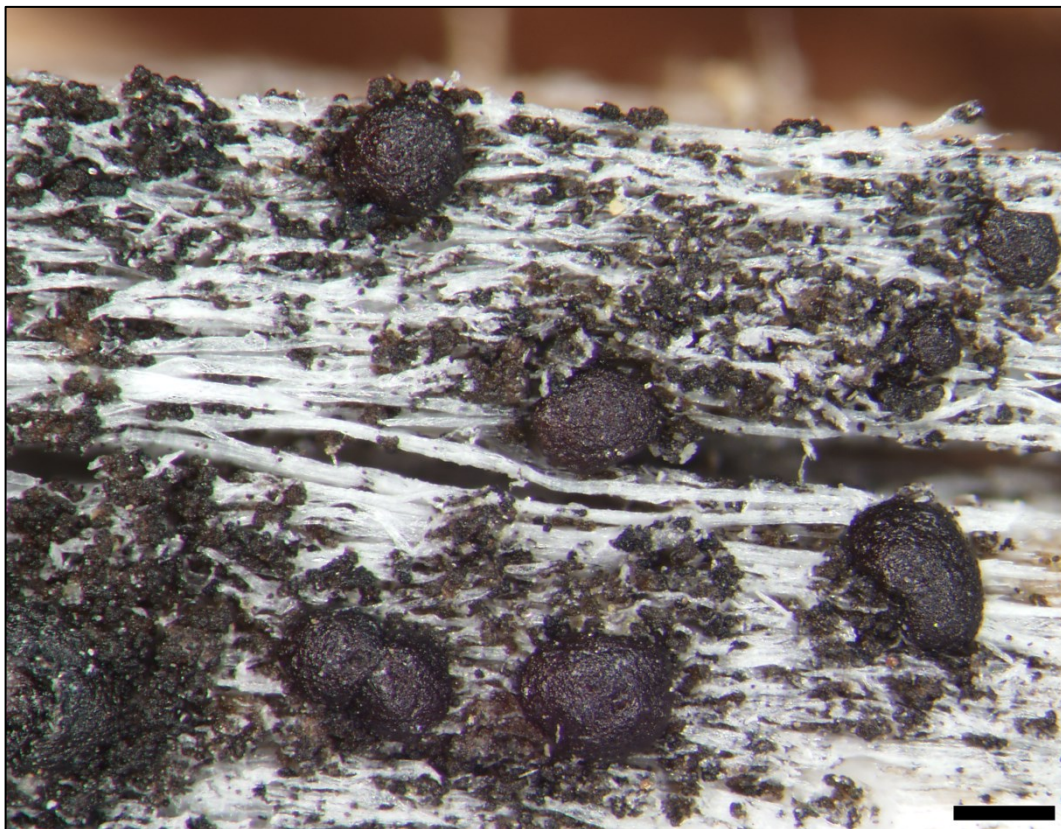


Figure 1. *Lecidea subhumida*, HH 15344, TRH-L17961, scale = 0.4 mm.

trees. Many stumps and kelo trees show signs of a severe wildfire in 1831 which probably destroyed most of the spruce, but a lot of pine trees survived. Since then no severe wildfires have been documented from the area.

Lecidea subhumida seems to prefer naked, rather hard pine wood. Among closely associated species were *Buellia arborea* Coppins & Tønsberg, *Lecanora circumborealis* Brodo & Vitik., *Lecanora phaeostigma* (Körb.) Almb., *Lecidea turgidula* Fr., *Mycoblastus sanguinarius* (L.) Norman, *Ochrolechia gowardii* Brodo, *O. mahuensis* Räsänen, *Pycnora praestabilis* (Nyl.) Hafellner and *Ramboldia elabens* (Fr.) Kantvilas & Elix as well as the nonlichenized fungus *Coccomycetella richardsonii* (Leight.) Sherwood (Holien & Diederich 2012). On kelo trees nearby the red-listed pin lichens/allied fungi *Calicium denigratum* (Vain.) Tibell and *Chaenothecopsis fennica* (Laurila) Tibell occurred.

Specimens examined: **Norway.** *Nordland:* Grane, Danielåsen, 65.54470°N, 13.61826°E, on dead decorticated branch of living *Pinus sylvestris*, 350 m alt., 2016-10-10, H. Holien 15374, J. Lorås & S. E. Eidissen (TRH L-17962); *ibid.*, 65.54482°N, 13.61361°E, on hard wood, stump of *Pinus sylvestris*, 350 m alt., 2016-10-10, H. Holien 15344, J. Lorås & S. E. Eidissen (TRH L-17961).



Figure 2. The habitat for *Lecidea subhumida* in Danielåsen, northern Norway showing an open forest dominated by *Pinus sylvestris* including snags and kelo trees with scattered *Picea abies*.

Discussion

As already indicated by Vainio (1883) *Lecidea subhumida* is habitually similar to *Japewia tornoenensis*. That species is distinguished by its thick-walled, broadly ellipsoid, much bigger ascospores, c. $8\text{--}15 \times 15\text{--}24 \mu\text{m}$. Vainio (l.c.) however argued it is more closely related to another taxon. The epithet «subhumida» refers to the similarity with *Lecidea humida* (Kullh.) Th. Fr., a terricolous cyanophilic lichen currently known as *Gregorella humida* (Kullh.) Lumbsch (Ostropomycetidae, Arctomiaceae). Indeed, this lichen is somewhat similar externally forming convex redbrown apothecia and greyish granulose thalli, but the size of both ascospores and

goniocyts are larger (Vondrák et al. 2013). Nevertheless, the terricolous habitat and Nostoclean photobiont doubtlessly prevent any misidentification.

The small granules of *Lecidea subhumida* might be interpreted as soredia in a broad sense (see Tønsberg 1992). Other lecideoid species with red-brown apothecia growing on coniferous wood that may form distinct granulose or sorediate thalli include some species of *Myochroidea* and *Placynthiella*. Both genera are unrelated and have quite a different anatomy and asci. The latter genus deviates even macroscopically in producing matt, non-glossy, often distinctly marginate apothecia. Members of both above mentioned genera that may grow on wood are recognizable even when sterile due to a content of secondary lichen metabolites except the poorly known *Myochroidea minuta* Printzen, T. Sprib. & Tønsberg known only from the Pacific Northwest of America (see Printzen et al. 2008). Some extreme morphs of *Lecanora phaeostigma* with finely areolate, quasi-granulose thalli may be somewhat similar to *Lecidea subhumida*, but these specimens do not show any grey tinge of thalli and are easily recognizable anatomically due to differently shaped and sized ascospores as well as by asci of the *Fuscidea*-type (Wirth et al. 2013).

As already stated by Printzen (1995) *Lecidea subhumida* neither belongs to *Lecidea* nor to *Biatora*, but probably is a member of Lecanoraceae. This was also confirmed by our microscopic examination of asci.

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