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Notes on the lichen flora of the mountains Saana and Malla in NW Finland

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Twenty lichens are reported as new to Finland from Mt. Saana and Mt. Malla in NW Finland: *Caloplaca approximata*, *Caloplaca exsecuta, Eiglera flavida, Frigidopyrenia bryospila, Hymenelia melanocarpa*, *Hymenelia prevostii*, *Hymenelia rhodopis*, *Ionaspis ceracea*, *Lecanora torrida*, *Staurothele hymenogonia*, *Strigula muscicola*, *Thelidium decussatum**, *Thelidium submethorium**, *Verrucaria cinereorufa**, *Verrucaria disjuncta**, *Verrucaria papillosa*, *Verrucaria pinguicula**, *Verrucaria subfuscata, Verrucaria subjunctiva** and *Verrucaria tenebrica.* The six species marked with an asterisk are also new to Fennoscandia. Additional 24 species are new to the biogeographical province Enontekiö Lapland (EnL). The Finnish records of *Thelidium pyrenophorum* are corrected to represent *T. auruntii*. Most of the species new to Finland were found on calcareous rocks (dolomite), but two were collected on calcareous soils and three on schistose rocks.

1. Introduction

The lake Kilpisjärvi is situated in the northwestern corner of Finland, in the Enontekiö municipality of the biogeographic province Enontekiö Lapland (EnL). It is the only area where the Scandinavian Caledonian Range reaches Finland (Lehtovaara 1995). The highest mountains in Finland are situated in the Kilpisjärvi area. Dolomitic rocks occur in some of the region, and they host a large number of rare species (for Finland) of several organism groups. In the Kilpisjärvi area are also situated the botanically most famous mountains in Finland, Saana and Malla.

The lichens of Saana and Malla have been less studied than vascular plants and bryophytes. However, numerous rare lichens were reported from Saana by Huuskonen (1949). He also collected additional material on Saana in the 1950's and 1960's. Huuskonen visited Malla only very shortly, because it was already at that time a strict nature reserve, and thus not suitable for collecting exsiccate specimens of lichens, which he was particularly searching for (Huuskonen 1949). Several rare species on Saana and Malla have also been collected by other lichenologists (e.g., Aino Henssen, Lauri E. Kari, Pekka Halonen). However, while numerous lichen specimens are available from Saana, only rather few from Malla are present in the Finnish herbaria. Most of those collected by Aino Henssen or Björn Federley are not yet available in the collections.

Among the earlier recorded lichens at least 13 lichen species have their only known Finnish locality on Saana: *Aspicilia disserpens* (Zahlbr.) Räsänen, *A. njuljae* (H. Magn.) Räsänen, *A. polychroma* Anzi, *Clauzadeana macula* (Taylor) Coppins & Rambold, *Dimelaena oreina* (Ach.) Norman, *Placidium norvegicum* (Breuss) Breuss, *Placopsis lambii* Hertel & W. Virth, *Porpidia zeoroides* (Anzi) Knoph & Hertel, *Rhizocarpon fuscosquamosum* Räsänen, *R. intermediellum* Räsänen, *R. saanaënse* Räsänen, *Solorina octospora* Arnold, and *Umbilicaria havaasii* Llano. Most of these are

species of siliceous rocks, which is somewhat surprising, as the rare vascular plants and bryophytes of Saana are mostly species of calcareous habitats. This suggests that the lichens of calcareous habitats have been insufficiently studied on Saana.

The rich nature of Saana and Malla is based on their geology and geomorphology (steep slopes, considerable altitudinal range). Schistose rocks, such as slates, are predominant (Lehtovaara 1995), but both fells have dolomite rock outcrops on steep slopes, being mainly situated above the treeline. Because of the absence of trees these sites are sun-exposed and rocks, boulders and stones are less invaded by bryophytes than in areas shaded by trees. Very few mountains elsewhere in Finland have calcareous rocks.

Also the schistose rocks, such as slates, in the mountains are lichenologically rich substrates (Huuskonen 1949). They can host arctic-alpine lichens that may prefer intermediate rocks, lacking on typical acid siliceous rocks strongly dominating in Finland.

Malla was the first official nature reserve in Finland, being established in 1916 (Borg 2008). Since 1988 the southern slope of Saana has mostly been protected as a nature reserve as well, but other parts of Saana are not protected despite many threatened or rare species are also known to exist outside the present reserve.

2. Materials and methods

During an annual national floristic excursion I shortly visited Saana and Malla in 2007. Voucher specimens were collected of the observed species. In all, 179 lichen specimens were collected on 27–28 July 2007, mainly within the nature reserves. Saana was studied more intensively (121 specimens) than Malla (58 specimens). On Malla only the peak Pikku Malla was visited.

The specimens were mainly collected on calcareous rocks and stones. Only few specimens growing on siliceous rocks or on soil were collected. Most collections come from above the treeline. It is mentioned on the list, if a specimen derived from the mountain birch forest on lower elevations.

The collections are kept in the herbarium H. The collection number is given after the date of the record. The size of the perithecia of pyrenocarpous lichens is given in surface view.

3. Results

Despite the short time to visit Saana and Malla numerous interesting specimens were collected, although none of the rarest species previously collected in the area were refound. It is evident that Saana and Malla are among the most valuable sites for lichens in Finland and numerous rare species are still waiting to be found.

Twenty lichen species found are reported here as new to Finland and additional 24 species are new to the biogeographical province Enontekiö Lapland (Enontekiön Lappi, Lapponia enontekiensis; EnL or Le). Six species are new to Fennoscandia (Fennoscandia defined as in Santesson et al. 2004). Several pyrenocarpous specimens belonging to *Polyblastia* and *Verrucaria* are still unidentified and probably belong to species not reported from Finland. Although only few specimens growing on siliceous rocks were collected, three species new to Finland are from siliceous substrates.

Fourteen species new to Finland were collected on Saana and nine on Pikku Malla. Three species new to Finland from Saana were collected outside the nature reserves (*Caloplaca approximata*, *Hymenelia prevostii*, *Eiglera flavida*) and one (*Hymenelia rhodopis*) occurred both in the reserve and outside the reserve. *Verrucaria tenebrica* was collected outside the reserve in Saana, but inside the reserve in Pikku Malla.

3.1. Species new to Finland

Caloplaca approximata (Lynge) H. Magn.

Specimen examined: Saana, N-slope, on dolomite stone, 69°03’N, 20°48’E, alt. 665 m, 28.VII.2007, 31690.

The species usually occurs on schistose rocks in northern Fennoscandia (Foucard 2001, Santesson et al. 2004).

Caloplaca exsecuta (Nyl.) Dalla Torre & Sarnth.

Specimen examined: Saana, SW-slope, beneath a schistose rock wall, on pebble, 69°02’N, 20°50’E, alt. 810 m, 27.VII.2007, 31583.

The species occurs rather widely in arctic and alpine areas on siliceous rocks. It occurs also in the Antarctic (Søchting & Olech 1995).

Eiglera flavida (Hepp) Hafellner

Specimens examined: Saana, N-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 680 m, 28.VII.2007, mixed in 31719 (*Hymenelia prevostii)*; Pikku Malla, 69°03'N, 20°45'E, stony E-slope, on dolomite stone, alt. 550 m, 28.VII. 2007, 31628 and NE-slope, on dolomite boulder, alt. 660 m, 28.VII.2007, 31663.

The species is not particularly rare in Sweden (Foucard 2001) and is therefore expected to be more widespread in Finland.

Frigidopyrenia bryospila (Nyl.) Grube

(Pyrenocollema bryospilum (Nyl.) Coppins ex Fox)

Specimen examined: Pikku Malla, calciferous NE-facing slope, muscicolous, 69°03'N, 20°45'E, alt. 570 m, 28.VII.2007, 31633.

Description based on the Finnish specimen: Thallus poorly developed, brown; perithecia 0.2–0.25 mm in size, ¼–¾-immersed, often conical; no involucrellum; exciple dark; paraphysoids 2 µm wide, richly branched; spores 1-septate 25–40(–50) × 8–11 µm. The characters fit well with those given for *F. bryospila*, but the size of the perithecia of the species is usually larger (Orange 2008). In the Nordic countries earlier reported from a few places in Swedish Lapland and Finnmark in Norway (Santesson et al. 2004).

Hymenelia melanocarpa (Kremp.) Lutzoni

Specimens examined: Pikku Malla, NE-slope, 69°03'N, 20°45'E, on dolomite boulder, alt. 570 m, 28.VII.2007, 31639b and alt. 650 m, 28.VII.2007, mixed in 31652 (*Polyblastia* sp.).

The species is rare on calcareous rocks in Fennoscandia (Santesson et al. 2004). According to Magnusson (1933) it prefers dolomite.

Hymenelia prevostii (Duby) Kremp.

Specimen examined: Saana, N-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 680 m, 28.VII.2007, 31719.

The species is rather widely distributed on calcareous rocks in Fennoscandia (Santesson et al. 2004).

Hymenelia rhodopis (Sommerf.) Lutzoni

Specimens examined: Saana, SW-slope, beneath a dolomite rock wall on dolomite stone, 69°02'N, 20°50'E, alt. 880 m, 27.VII.2007, 31578 and N-slope, 69°03'N, 20°48'E, on dolomite stone, alt. 665 m, 28.VII.2007, 31693 and on dolomite boulder, alt. 680 m, 28.VII.2007, 31717.

The species occurs rather widely in Fennoscandia (Santesson et al. 2004).

Ionaspis ceracea (Arnold) Hafellner & Türk

Specimens examined: Saana, under overhanging SW-facing wall of siliceous rock, on pebbles, 69°02'N, 20°50'E, alt. 810 m, 27.VII.2007, 31582; Pikku Malla, stony E-slope, on siliceous pebble, 69°03'N, 20°45'E, alt. 550 m, 28.VII. 2007, 31629.

This species generally occurs on wind-blown mountain tops (Jørgensen 1989), but the Finnish sites are mountain slopes where it was found on siliceous pebbles. *I. ceracea* has been known only from few sites in Fennoscandia (Santesson et al. 2004).

Lecanora torrida Vain.

Specimen examined: Saana, W-slope, on dolomite boulder, 69°02'N, 20°50'E, alt. 810 m, 27.VII.2007, 31584.

The species is widely distributed on calcareous rocks in arctic and alpine areas (Šliva 2007), but but is only reported from Torne lappmark in Fennoscandia (Magnusson 1952, Santesson et al. 2004) and one locality in Norway (Šliva 2007).

Staurothele hymenogonia (Nyl.) Th. Fr.

Specimen examined: Saana, W-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 680 m, 27.VII.2007, 31609.

The species is rare in Fennoscandia, having been reported from southern Sweden and Troms in Norway (Santesson et al. 2004).

Strigula muscicola F. Berger, Coppins, Cl. Roux & Sérus.

Specimens examined: Saana, W-slope, on soil, 69°03'N, 20°48'E, alt. 690 m, 27.VII.2007, 31622, 31623b.

Description based on the Finnish specimens: Thin thallus white; photobiont *Trentepohlia*; perithecia 0.2–0.25 mm in size, ½–¾-immersed,

often in clusters of 2–4; exciple pale to darkening; involucrellum to the exciple-base level; pseudoparaphyses 1.5 µm wide, sparsely branched; three-septate spores 15–20 × 4–6 µm. This recently described species is known from Scotland, Norway and Austria (Sérusiaux et al. 2005).

Thelidium decussatum Zschacke

Specimen examined: Saana, SW-slope, on dolomite stone, 69°02'N, 20°51'E, alt. 760 m, 27.VII.2007, 31571.

Description based on the Finnish specimens: Thallus white, almost endolithic; perithecia 0.25–0.3 mm, ¾–1-immersed, leaving pits in the rock; exciple dark, 0.2–0.25(–0.3) mm; involucrellum apical or extends to the middle of the exciple; spores 1-septate 18–23 × 9–12 µm.

The specimen fits rather well with the description of the species by Zschacke (1933). According to him the species has slightly larger perithecia (0.3–0.4 mm) and spores (21–27 × 8–11 µm) and thalli are bordered by dark prothalline lines. The species is known from Germany, Austria (Clauzade & Roux 1985) and Romania (Ciurchea 2007).

Thelidium submethorium (Vain.) Zahlbr.

Specimens examined: Saana, SW-slope, birch forest, in two small brooks, on siliceous stones and pebbles, 69°02'N, 20°48'E, alt. 530 m, 27.VII.2007, 31544, 31546, 31547.

Description based on the Finnish specimens: Thallus very thin, dark brown to black; perithecia 0.2–0.25 mm, ¼–½-immersed; involucrellum covering half of the exciple or reaching to the base of the exciple, somewhat diverging from the exciple; exciple pale; spores 1-septate (21–)23–27 × (9–)10–12 µm. The size of the spores is slightly smaller than reported for the species by Thüs & Nascimbene (2008): (26–)28–32(–39) × (9–)13–15(–18) µm, but compatible with the spore size reported by Vainio (1921): 20–30 × 11–14 µm.

T. methorium (Nyl.) Hellb. (= *T. aeneovinosum* (Anzi) Arnold) has larger perithecia and spores (Thüs & Nascimbene 2008). *T. submethorium* is a rarely collected species previously known from few sites in Germany and Italy (Thüs & Nascimbene 2008) and from the type collection in Russian Karelia (Vainio 1921). New to Fennoscandia, if Fennoscandia is defined as in Santesson et al. (2004). In Saana the species was found in two nearby brooks that were the only brooks superficially studied.

Verrucaria cinereorufa Schaer.

Specimen examined: Pikku Malla, NE-slope, on dolomite boulder, 69°03'N, 20°45'E, alt. 570 m, 28.VII.2007, 31636.

Description based on the Finnish specimen: Thallus endolithic, white; perithecia 0.3–0.6 mm, ½-immersed; exciple dark; involucrellum apical; spores 30–35 × 12–15 µm. The specimen fits rather well with the descriptions of *V. cinereorufa* (Zschacke 1933, Breuss 2002), but the spores are slightly narrower. Typical spore size of *V. cinereorufa* is 31–41 × 13–18 µm (Breuss 2008b). *V. cinereorufa* occurs in Germany (Zschacke 1933), France (Roux et al. 2006), Austria (Breuss 2002), Spain (Renobales 1996), Greece (Christensen et al. 1991) and Slovenia (Breuss 2008). Furthermore, the characters given by Magnusson (1952) for *V. devergens* Nyl. in Sweden fit better with *V. cinereorufa*. New to Fennoscandia.

Verrucaria disjuncta Arnold

Specimen examined: Pikku Malla, NE-slope, on dolomite stone, 69°03'N, 20°45'E, 660 m a.s.l., 28.VII.2007, 31660.

Description based on the Finnish specimen: Thallus very thin, rimose, grey to greyish brown; perithecia 0.25–0.35 mm in size, ¾-immersed; exciple pale and small; involucrellum apical, very thick and somewhat outstanding; spores (10–)11–14 × 6–8 µm.

The perithecia of *V. disjuncta* are macroscopically rather similar to the perithecia of *V. muralis* Ach., but sectioned perithecia remind of *Parabagliettoa dufourii* (DC.) Gueidan & Cl. Roux having a very thick involucrellum. However, involucrellum is not outstanding in *P. dufourii* and spores are larger. Some spores of *V. disjuncta* are usually one-septate (Breuss 2008a). In the present specimen only non-septate spores were seen, but only few mature spores were found. The species has previously been known from Central Europe (Breuss 2008a). New to Fennoscandia.

Verrucaria papillosa Ach.

Specimen examined: Pikku Malla, NE-slope, on dolomite boulder, 69°03'N, 20°45'E, alt. 650 m, 28.VII.2007, 31654.

Description based on the Finnish specimen: Thallus white, endolithic; perithecia 0.3–0.4 mm, ½-immersed; exciple dark; involucrellum slightly arches away from the exciple (lacerate) and extends over half of the exciple; spores large 25–30(–33) × 12–16 µm. Typical for the species is that involucrellum is usually lacerate reaching halfway or to the base of the exciple (see figures in Breuss 2007). *V. papillosa* is widely distributed occurring in Europe, Siberia, Australia (McCarthy 2001) and North America (Breuss 2007). It is known from Sweden (Santesson et al. 2004).

V. papillosa has been synonymized to *V. viridula* (Schrad.) Ach. (Orange 2004), but the species have several differences (Breuss 2007, 2008). *V. viridula* has an apical involucrellum, usually pear-shaped perithecia that are almost fully immersed in thallus, and the thallus is often thicker and has some brown or green coloration.

Verrucaria pinguicula A. Massal.

Specimen examined: Saana, SW-slope, on dolomite stone, 69°02'N, 20°50'E, alt. 810 m, 27.VII.2007, 31579.

Description based on the Finnish specimen: Thallus pale brown, rather frequently cracked, 0.1–0.2 mm thick; perithecia 0.2–0.3 mm in size, ¾–1-immersed in thallus; exciple pale, but darkening in older perithecia, 0.2–0.25 mm; involucrellum to the base of the perithecia; spores 13–16 × 6–8 µm. Perithecia occur more densely compared to most *Verrucaria* species.

The Finnish specimen matches with the description of *V. pinguicula* by Orange (2008). *V. pinguicula* was erroneously reported from Sweden, Norway and Finland by Santesson et al. (2004), because *V. integra* (Nyl.) Nyl. was considered as a synonym of *V. pinguicula*. The identity of *V. integra* is uncertain. It remains to be studied, if *V. integra* is a valid species or conspecific with *V. viridula* or *V. hochstetteri* Fr. Vainio (1921) cites three specimens in H-Nyl that he considers to belong to the type material of *V. integra*. Two of these are close to or conspecific with *V. viridula,* and the third one is a species unknown to me. New to Fennoscandia.

Verrucaria subfuscata H. Magn.

Specimens examined: Pikku Malla, SW-slope, on dolomite pebbles, 69°03'N, 20°43'E, alt. 630 m and alt. 650 m, 28.VII.2007, mixed in 31677 (*Parabagliettoa dufourii)* and 31683.

Description based on the Finnish specimens: Thallus thin (0.05–0.1 mm thick), grey, pale grayish brown or pale green; perithecia 0.2–0.25 mm in size, ¼–½-immersed; exciple pale to dark (dark in most mature perithecia), 0.15–0.2 mm; involucrellum to the exciple-base level, ca. 40–60(–80) µm thick; spores 9–13(–15) × 5–6(–7) µm.

V. subfuscata has been earlier known only from the type specimen (Sweden, Torne Lappmark, Jukkasjärvi, Abisko, Abiskojokk, alt. 400 m, in crevices by Abiskojokk 28.VII.1921 A. H. Magnusson 5972 (UPS)). In the type specimen thallus is thicker (0.1–0.2 mm thick) and pale brown (mostly) to medium brown. *V. subfuscata* is close to *V. dolosa* Hepp. *V. dolosa* has slightly larger spores (11–17 × 5–7 mm), pale exciple and thinner involucrellum.

Verrucaria subjunctiva Nyl.

Specimens examined: Saana, SW-slope, on dolomite pebbles, 69°03'N, 20°50'E, alt. 820 m, 27.VII.2007, 31572, 31573.

Description based on the Finnish specimens: Thallus endolithic or thin, continuous to rimose, white or pale brownish; perithecia 0.25–0.35 mm, ½–¾-immersed; exciple dark; involucrellum apical, often slightly or moderately diverging from the exciple; spores 25–35 × 10–12 µm.

The type specimen of *V. subjunctiva* in H-NYL (Russia, Chukchi Okrug, Fretum Behring, Konyam Bay, E. Almquist) is very small and most perithecia seem overmature. The size of the half-immersed perithecia is 0.3–0.4 mm. White thallus is endolithic. One perithecium was sectioned. The involucrellum was apical and exciple dark agreeing with the figures annotated by Nylander and A. H. Magnusson included in the folder of *V. subjunctiva*. The size of immature spores was 25–30 × 10–12 µm. According to the original description (Nylander 1884) the size of the spores is 27–32 × 12–14 µm and the size of the perithecia 0.5 mm. The size of perithecia was possibly not measured in surface view, which may explain the difference. *V. subjunctiva* differs from *V. cinereorufa* by smaller perithecia (0.3–0.6 mm in *V. cinereorufa*, 0.25–0.4 mm in *V. subjunctiva*) and narrower spores (30–40 × (12–)13–18 µm in *V. cinereorufa*,

25–35 × 10–14 µm in *V. subjunctiva*). New to Fennoscandia.

Verrucaria tenebrica H. Magn.

Specimens examined: Pikku Malla, S-slope, on dolomite stone, 69°03'N, 20°45'E, alt. 670 m, 28.VII.2007, 31668; Saana, N-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 675 m, 28.VII.2007, 31698, 31704.

Description based on the Finnish specimens: Thallus rimose to areolate, 0.1–0.2 µm thick, dark brown to black; perithecia 0.2(–0.25) µm, (½–)¾-iµmersed; exciple pale to dark, (0.15–)0.2 µm; involucrellum to the exciple-base level and sometimes incurved beneath the exciple, 40–60 µm thick; involucrellum dark brown, sometimes with purplish tingle; spores 12–16(–18) × 6–7(–8) µm.

The Finnish specimens fit with the type specimen of *V. tenebrica* from northern Sweden: Torne Lappmark, Karesuando par., Kuolpaåive 1909 Thore C. E. Fries (UPS). In the type specimen thallus is slightly thicker (0.15–0.25(–0.3) µm thick), and the involucrellum has clearer red brown coloration compared to the Finnish specimens. *V. tenebrica* has been known from two calcareous rocks in northern Sweden (Magnusson 1952).

Several species are difficult to separare from *V. tenebrica*. *V. dolosa* has green or brown, not black, thallus, which is usually thinner. The involucrellum is usually thinner, and the exciple is pale in mature perithecia. *V. rejecta* Th. Fr. is rather similar to *V. tenebrica*, but has larger spores (15–19 × (6–)7–8 µm) and granular-areolate thallus. *V. memnonia* (Körb.) Arnold has initially dark exciple, usually thinner non-areolate thallus and the involucrellum is not incurved beneath the exciple.

3.2. Species new to the biogeographic province EnL

Agonimia gelatinosa (Ach.) Brand & Diederich

Specimen examined: Saana, W-slope, on soil, 69°02'N, 20°48'E, alt. 690 m, 27.VII.2007, mixed in 31623 (*Polyblastia* sp.).

This species was recently reported as new to Finland from SW Finland (Pykälä 2007), but based on its distribution in Sweden and Norway, *A. gelatinosa* should occur widely in limestone areas of Finland.

Agonimia tristicula (Nyl.) Zahlbr.

Specimen examined: Pikku Malla, S-slope, on dolomite stone, 69°03'N, 20°45'E, alt. 670 m, 28.VII.2007 mixed in 31667 (*Dacampia hookeri)*.

The species is rather common on calcareous sites in southern Finland. Previously one record is known from northern Finland (InL).

Bagliettoa calciseda (DC.) Gueidan & Cl. Roux *(Verrucaria calciseda* DC.*)*

Specimen examined: Pikku Malla, NE-slope, on dolomite boulder, 69°03'N, 20°45'E, alt. 650 m, 28.VII.2007, mixed in 31654 (*Verrucaria papillosa)*.

The species has previously been found only in SW Finland.

Hymenelia heteromorpha (Kremp.) Lutzoni

Specimens examined: Saana, SW-slope, on dolomite rock and dolomite stone, 69°03'N, 20°50'E, alt. 880 m, 27.VII.2007, 31575, mixed in 31578 (*Hymenelia rhodopis*), on dolomite stone, 69°02'N, 20°50'E, alt. 790 m, 27.VIII.2007, 31585, birch forest, on dolomite boulder, 69°02'N, 20°50'E, alt. 598 m, 27.VII.2007, 31590, N-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 675 m, 28.VII.2007, 31706, mixed in 31717 (*H. rhodopis*) and mixed in 31719 (*H. prevostii*); Pikku Malla, NE-slope, 69°03'N, 20°45'E, 28.VII.2007, on dolomite boulder, alt. 570 m, mixed in 31639b (*H. melanocarpa*) and on dolomite boulder, alt. 650 m and 660 m, 31653, mixed in 31662 (*Polyblastia* sp.).

Only few previous records are known from Finland, but the species seems to be rather common on Saana and Malla.

Lecania nylanderiana A. Massal.

Specimen examined: Saana, W-slope, birch forest, on dolomite boulder, 69°02'N, 20°48'E, alt. 610 m, 27.VII.2007, 31595.

Little recorded in Finland, and most old records may belong to *L. suavis* (Müll. Arg.) Mig.

Parabagliettoa dufourii (DC.) Gueidan & Cl. Roux (*Verrucaria dufourii* DC.)

Specimen examined: Pikku Malla, SW-slope

of dolomite rock, on small dolomite stone, 69°03'N, 20°43'E, alt. 630 m, 28.VII.2007, 31677.

The species was previously found in SW Finland (Pykälä & Breuss 2008). The present find is the northernmost in Fennoscandia.

Polyblastia fuscoargillacea Anzi

Specimens examined: Saana, N-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 680 m, 28.VII.2007, mixed in 31717 (*Hymenelia rhodopis)*; Pikku Malla, on calciferous NE-facing rock, 69°03'N, 20°45'E, alt. 600 m, 28.VII.2007, mixed in 31645 (*Verrucaria* sp.), and on small wall of dolomite rock, 69°03'N, 20°44'E, alt. 700 m, 28.VII.2007, 31669.

Few previous records of the species are known from Finland (Santesson et al. 2004).

Rinodina olivaceobrunnea C. W. Dodge & G. E. Baker

Specimen examined: Saana, SW-slope, on calcareous soil, 69°02'N, 20°51'E, alt. 750 m, 27.VII.2007, 31567.

The species has been previously found in three Finnish biogeographic provinces (EH, Ks, InL) (Santesson et al. 2004).

Sagiolechia protuberans (Ach.) A. Massal.

Specimens examined: Saana, SW-slope, birch forest, on dolomite stone and dolomite boulder, 69°02'N, 20°50'E, alt. 595 m, 27.VII.2007, 31550, 31592 and above tree level, N-slope, on dolomite stone, 69°03'N, 20°48'E, alt. 665 m, 28.VII.2007, mixed in 31693 (*Hymenelia rhodopis)*; Pikku Malla, NE-slope, on dolomite boulder, 69°03'N, 20°45'E, alt. 570 m, 28.VII. 2007, mixed in 31638 (*Thelidium auruntii)*.

The species has been previously found only from SW Finland. It seems to occur in several places in Saana and Malla.

Sporodictyon cruentum (Körber) Körber *(Polyblastia cruenta)*

Specimens examined: Saana, on partly calcareous rock, 69°02'N, 20°51'E, alt. 615 m, 27.VII. 2007, 31553, 31556, and in birch forest, small brook, on siliceous stone, 69°02'N, 20°48'E, alt. 530 m, 27.VII.2007, mixed in 31544 (*Thelidium submethorium)*.

The species has previously been found only in one biogeographic province (EH), but it may prove to be widely distributed in Finland.

Thelidium auruntii (A. Massal.) Kremp.

Specimens examined: Saana, SW-slope, on dolomite pebbles, 69°03'N, 20°51'E, alt. 750 m, 27.VII.2007, 31562; Pikku Malla, NE-slope, on dolomite boulder, 69°03'N, 20°45'E, alt. 570 m, 28.VII.2007, 31637, 31638.

This species was previously reported new to Finland as *T. pyrenophorum* (Ach.) Mudd (Pykälä 2007). However, Breuss (2004) treated *T. auruntii* and *T. pyrenophorum* as separate species, and the Finnish material fits with *T. auruntii*. In *T. pyrenophorum* involucrellum arches away from the exciple, but in *T. auruntii* involucrellum is somewhat appressed to the exciple and shorter (see figures in Breuss 2004). Furthermore, the perithecia of *T. auruntii* are smaller (0.3–0.45 mm) than in *T. pyrenophorum* (0.4–1.0 mm) (Zschacke 1933). The size of the perithecia is in the Finnish material 0.25–0.3 mm and the size of the spores 22–37 × 11–15 µm.

Thelidium fontigenum A. Massal. (*T. microbolum* (Tuck.) Hasse, *T. cataractarum* (Hepp) Lönnr.)

Specimen examined: Pikku Malla, NE-slope, on dolomite stone, 69°03'N, 20°45'E, alt. 660 m, 28.VII.2007, 31659b.

Description based on the Finnish specimen: Thallus thin, pale brownish or yellowish, some patches K+ red; perithecia 0.2–0.25 mm in size, ¾-immersed; exciple dark (initially pale?); involucrellum apical and clearly diverging from the exciple; spores 3-septate, 28–38 × 10–15 µm.

The species was reported new to Finland (as *T. cataractarum*) from SW Finland (Pykälä 2007). *T. fontigenum* has smaller perithecia, involucrellum and spores than *T. papulare* (Fr.) Arnold and usually some K+ red pigment occurs in thallus (Orange 2008).

Thelidium decipiens (Nyl.) Kremp.

Specimens examined: Saana, SW-slope, on dolomite rock, 69°03'N, 20°50'E, alt. 880 m, 27.VII.2007, 31576; Pikku Malla, S-slope, on dolomite stone, 69°03'N, 20°45'E, alt. 670 m, 28.VII.2007, 31666 and top, foxhole excavated to the dolomite rock by German troops during the

Second World War, on wall, 69°03'N, 20°43'E, alt. 650 m, 28.VII.2007, 31682.

The species has been previously found in southern and central Finland.

Toninia aromatica (Sm.) A. Massal.

Specimens examined: Saana, SW-slope, on SW-facing wall of a dolomite rock, on thin soil, 69°03'N, 20°50'E, alt. 840 m, 27.VII.2007, 31574; N-slope, on dolomite stone, 69°03'N, 20°48'E, alt. 665 m, 28.VII.2007, 31695.

The species has been previously recorded only from Kuusamo (Santesson et al. 2004).

Toninia subnitida (Hellb.) Hafellner & Türk

Specimen examined: Pikku Malla, NE-slope, on dolomite boulder, 69°03'N, 20°45'E, alt. 650 m, 28.VII.2007, 31656.

This calcicolous species with small black apothecia has been previously found from few sites in southern and eastern Finland (Santesson et al. 2004).

Verrucaria amylacea Hepp

Specimen examined: Pikku Malla, on top, on dolomite pebble, 69°03'N, 20°43'E, alt. 650 m, 28.VII.2007, 31684.

The species was recently reported new to Finland from calcareous rocks of southern Finland (Pykälä & Breuss 2008).

Verrucaria banatica Servít

Specimen examined: Saana, SW-slope, on dolomite stone, 69°03'N, 20°51'E, alt. 750 m, 27.VII.2007, 31586.

The species was recently reported new to Finland from calcareous rocks of southern Finland (Pykälä & Breuss 2009).

Verrucaria devergens Nyl.

Specimen examined: Saana, N-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 680 m, 28.VII.2007, 31721.

The species was recently reported new to Finland from calcareous rocks of southern Finland (Pykälä 2007), but globally *V. devergens* seems to occur mostly in arctic areas.

Verrucaria epilithea Vain. *(V. schindleri* Servít*)*

Specimens examined: Saana, N-slope, on dolomite boulder, 69°03'N, 20°48'E, alt. 680 m, 28.VII.2007, 31714, 31715.

The type specimen of *V. epilithea* is from southern Finland (Vainio 1921), and matches well with numerous Finnish collections made by the author. The type specimen of *V. epilithea* is similar with the description of *V. schindleri* by Breuss (2007). The size of the perithecia is rather small in the type compared with many other specimens, but the type specimen is small and may not cover the full variation of the size of the perithecia. Here, *V. schindleri* is considered to be conspecific with *V. epilithea*.

Verrucaria fusca Pers.

Specimen examined: Saana, N-slope, on dolomite stone, 69°03'N, 20°48'E, alt. 665 m, 28.VII.2007, 31692b.

The species was recently reported new to Finland from calcareous rocks of southern Finland (Pykälä & Breuss 2008), but may be widely distributed.

Verrucaria memnonia (Körb.) Arnold

Specimens examined: Saana, SW-slope, on small partly calcareous rock, 69°02'N, 20°51'E, alt. 615 m, 27.VII.2007, 31554, W-slope, on siliceous pebbles, 69°03'N, 20°48'E, alt. 650 m, 670 m and 680 m, 27.VII.2007, 31601, 31603, 31607, 31608.

The species was recently reported new to Finland from rocks of southern Finland (Pykälä & Breuss 2008), but it may be among the most common *Verrucaria* species in Finland occurring commonly both on siliceous and calcareous rocks and particularly on pebbles.

Verrucaria muralis Ach.

Specimen examined: Saana, N-slope, on dolomite stone, 69°03'N, 20°48'E, alt. 665 m, 28.VII.2007, 31692.

The species is common in Finland, but more often found on concrete than on calcareous rocks.

Verrucaria rejecta Th. Fr.

Specimen examined: Saana, stony W-slope, on schistose pebble, 69°03'N, 20°48'E, alt. 680 m, 27.VII.2007, 31617.

The species was previously reported as new to Finland from southern Finland (Pykälä 2007), but usually the species occurs in arctic habitats.

Verrucaria transfugiens Zschacke

Specimens examined: Saana, SW-slope, on small dolomite rock, 69°02'N, 20°51'E, alt. 760 m, 27.VII.2007, 31568; Pikku Malla, NE-slope, on dolomite boulder, 69°03'N, 20°45'E, alt. 570 m, 28.VII.2007, 31639.

The species was recently reported new to Fennoscandia from calcareous rocks of southern Finland (Pykälä & Breuss 2008).

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