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Additions to the lichen flora of Iceland I.

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ABSTRACT: Fourteen lichen taxa are reported as new for Iceland. Short description of the specimens and their location is given.

The last treatment of the macrolichen flora of Iceland was published by Bernt LYNGE 1940 [21]. Since then some additions have been made by P. DUVIGNEAUD 1941, E. DAHL 1950, Z. CERNOHORSKY 1954, G. DEGELIUS 1954, 1957, K. KERSHAW 1962 and H. KRISTINSSON 1964. The results presented here are based on material collected in Iceland 1961 to 1971. The names of the herbaria, where the cited specimens are deposited are abbreviated as follows: AEY, Náttúrugripasafnið á Akureyri, Iceland; CPH, Botanical Museum, The University of Copenhagen; DUKE, Duke Herbarium, Durham, North Carolina; O, Botanical Museum, The University of Oslo; NK, Náttúrugripasafnið á Neskaupstað, Iceland; RVÍK, Náttúrufræðistofnun Íslands, Reykjavík.

Cladonia amaurocraea (Floerke) Schaer.

Closely related and morphologically similar to *C. uncialis,* differing by usually having narrower branches, by the presence of small cups, which never occur in *C. uncialis,* and by chemical criteria. The morphological differences are sometimes too weak to rely on alone without

chemical tests. In addition to usnic acid, which both species contain, *C. amaurocraea* has barbatic acid, and *C. uncialis* squamatic acid. Since squamatic acid is fluorescent in UV-light, which barbatic acid is not, the two species can usually be distinguished under the UV-lamp. While fluorescence in the medulla can be taken as a safe criterium for *C. uncialis,* lack of fluorescence is an indication for *C. amaurocraea,* but may also be due to unusually low concentration of squamatic acid in *C. uncialis.*

C. uncialis is a very common species throughout Iceland, but *C. amaurocraea* is rather rare, found only in the NV and N. It is common in Greenland [3, 12, 13], northern Europe [18], and also found in the Alps [24].

Specimens examined: Ísafjarðarsýsla: Dagverðardalur, *A. Andersen,* 1938 (CPH). — Húnavatnssýsla: Víðidalur, Bakkabrúnir, *H. Kr. 12326,* 1967 (DUKE). Langidalur, Engihlíð, *H. Kr. 12120,* 1967 (DUKE). — Skagafjarðarsýsla: Ketubjörg Cliffs, *H. Kr. 13359,* 1967 (DUKE). — Eyjafjarðarsýsla: Mt. Þrastarhólsfjall, *H. Kr. 24,* 1961 (AEY).

Cladonia carneola (Fr.) Fr.

Cup-forming species, sorediate, the cups richly proliferating. All the Icelandic specimens contain usnic acid, zeorin and rhodophyscin. The last substance, an orange-brown pigment giving violet K-reaction, is limited to the base of the podetia and the squamules. The chemical components are the same for this species, as for one of the two strains of *C. coccifera* in Iceland.

C. carneola is known only from the northwestern side of the Vestfirðir Peninsula, where it is apparently relatively common. The species is common in Greenland [3, 12, 13], also found in the Scottish Highlands [8], and in the coniferous forests of Europe [24].

Specimens examined: Ísafjarðarsýsla: Sandsheiði Pass, *H. Kr. 10532,* 1968 (DUKE). Skálavík, Breiðabólsdalur Valley, *H. Kr. 10285,* 1968 (DUKE). Skjaldfannardalur, Laugaland, *Helgi Jónasson,* 1964 (AEY). Hesteyrardalur, *H. Kr. 10230,* 1968 (DUKE).

Cladonia luteoalba Wheld. & Wils.

This species reminds of *C. coccifera* (L.) Willd., but has larger squamules, which are distinctly yellow beneath. Cups are relatively rare and indistinct, narrow. The Icelandic specimens contain usnic acid,

barbatic acid, and probably a trace of norbarbatic acid (identified by chromatography only).

Cladonia luteoalba is found in two localities in Iceland, on thin soil over basalt rock. It is known from Britain [1], Norway and Alaska [4], but not from Greenland.

Specimens examined: Vestur-Skaftafellssýsla: Brunahraun, *H. Kr. 20172,* 1967 (DUKE, AEY). — Central Highlands: Þjórsárver, Tjarnaver, *H. Kr. 24712,* 1971 (AEY).

Cladonia strepsilis (Ach.) Vain.

In Iceland found only as primary squamules, podetia lacking. In that state, the plant is similar to primary squamules of species such as *C. pyxidata, C. verticillata* and *C. chlorophaea,* but was classified as *C. strepsilis* on the basis of the green C-reaction. The specimen contains strepsilin, identified by chromatography.

C. strepsilis has been found only in one locality in eastern Iceland, growing on vegetated soil in a rather dry heathland close to the sea. It is widespread through Europe, especially in costal areas [18, 24], also in N.-America [10], but not in Greenland.

Specimens examined: Suður-Múlasýsla: Neskaupstaður, *H. Kr. 18359,* 1968 (DUKE, AEY).

Collema callopismum Mass.

This tiny species of *Collema* forms small, black cushions, less than 5 mm in diameter, on bare face of basalt rock, the lobes about 1/10 mm broad. It is found only in one locality in the western part of the country. It is rather rare in Europe from northern Scandinavia south to Portugal, generally on limestone [5], also found in one isolated locality in Greenland on basalt [5].

Specimens examined: Mýrasýsla: Hraunfossar Falls, *H. Kr. 4092,* 1967 (DUKE, AEY).

Collema subfurvum (Müll. Arg.) Degel.

A species with rounded, dark, about 5—8 mm broad lobes, densely covered with tiny, globular isidia, which often resemble pulverlike mass on the lobe surface. Found in one locality near the southern coast, growing among mosses on wet, vertical face of móberg formation. The

species is widespread along the Atlantic coast of Europe from Norway to Portugal [24], also in Britain [8], usually growing on trees rather than rocks. Unknown to me from Greenland, but found in N.-America [10].

Specimens examined: Vestur-Skaftafellssýsla: Fagradalshamrar Cliffs, *H. Kr. 20004,* 1967 (DUKE, AEY).

Cornicularia normoerica (Gunn.) DR.

This species, the second of *Cornicularia* found in Iceland, has 1—2 cm long, stiff, black branches, usually tipped with disc-like apothecia, growing on rock. It is easily distinguished from *C. aculeata,* which is common everywhere in Iceland and always on soil.

I saw *C. normoerica* first on a single, rather big basalt boulder at Gunnólfsvík in the northeast.*) Later on I sent a sample to Hjörleifur Guttormsson, a botanist investigating the mountain vegetation of eastern Iceland at that time. As a result of this, he added new localities for *C. normoerica* in the East. Its distribution appears to be limited to that part of the country. It is common in the mountains of northern Europe [18], also in North America [10], but not known from Greenland.

Specimens examined: Norður-Múlasýsla: Gunnólfsvík, *H. Kr. 17166,* 1968 (DUKE, RVÍK, AEY, NK). Borgarfjörður District, Mt. Búrfell, *Hj. Guttormsson* 1970 (NK). — Austur-Skaftafellssýsla: Hornafjörður District, Stokksnes, *Hj. Guttormsson* 1970 (NK).

Parmelia glabratula (Lamy) Nyl. ssp. **fuliginosa** (Fr. ex Duby) Laund.

A foliose lichen with dark brown thallus, the lobes 2—3 mm broad, the upper surface more or less covered with fine isidia. The medulla gives red KC-reaction.

In Iceland found in three localities in the NW, and one in the NE. It grows on rock. This species is known from Faroe Islands [7], Britain [8], Europe and N.-America, but not found in Greenland.

Specimens examined: Barðastrandasýsla: Skálanes, *H. Kr. 9379,* 1968 (DUKE, AEY). — Strandasýsla: Hvalsá, *H. Kr. 11127,* 1967 (DUKE, AEY). Krossnes, *H. Kr. 11259,* 1967 (DUKE, AEY). — Húnavatnssýsla: Cape Vatnsnes, Hrafnanýpa, *H. Kr. 12259,* 1967 (DUKE, AEY). — Norður-Múlasýsla: Vindfellsháls, *H. Kr. 17850, 1968* (DUKE).

*) *C. normoerica* has been recorded by Piet Oosterveld from Lambafjöll and Gæsavatn (S.-Þing.) in his analyses of Icelandic heath vegetation [23], but I have not checked his specimens.

Parmeliella arctophila (Th. Fr.) Malme

A small species with granular, dark brown thallus growing over mosses on the ground, often with small, reddish brown apothecia, which are up to one half mm in diameter.

First detected 1970 in a collection from Þjórsárver in the Central Highlands of Iceland. 1971 it was found again in many localities in the same area; the species is apparently common there. It is easily overlooked, and may therefore be more widely distributed in Iceland, than these localities indicate. It is high arctic species, found in Lappland [24], Spitzbergen [19], and Jan Mayen [20]. Unknown from Greenland and North-America [10].

Selected specimens examined: Central Highlands: Þjórsárver, E of Nautalda, *H. Kr. 24413,* 1970 (AEY). Þjórsárver, N of Ólafsfell, *H. Kr. 24658,* 1971 (AEY). Arnarfellsver, *H. Kr. 24697,* 1971 (AEY). Oddkelsver, *H. Kr. 24574,* 1971 (AEY).

Peltigera scabrosa Th. Fr.

Rather large, foliose lichen, differing from other *Peltigera* species by being scabrous all over the upper surface. This is a rather rare species in Iceland, found only in the northern part, growing on vegetated soil in hillsides and mountain slopes. Widespread in northern Europe, lacking in Britain, common in Spitzbergen [19] and in some parts of Greenland, especially in the north [3, 13].

Specimens examined: Ísafjarðarsýsla: Skálavík, *H. Kr. 10291,* 1968 (DUKE). — Eyjafjarðarsýsla: Siglufjörður, Mt. Dalbæjarfjall, *H. Kr. 14216,* 1967 (DUKE, RVÍK, AEY). Þorvaldsdalur Valley, Þverárdalur, *H. Kr. 1249,* 1963 (AEY). — Norður-Þingeyjarsýsla: Þistilfjörður, near Svalbarð, *H. Kr. 16415,* 1968 (DUKE).

Psoroma hypnorum (Vahl) S. Gray var. **paleaceum** (Fr.) Rostr.

This species has granular to squamulous thallus, with relatively large (to 4 mm), concave apothecia, growing over mosses on soil and is common throughout Iceland. Var. *paleaceum* differs from var. *hypnorum* by having marginal hears on the apothecia and on the thallus squamules.

Var. *paleaceum* was first found in a collection sent to me by Piet Oosterveld during his studies on Icelandic vegetation in 1966 and 1967. Since then it has been found in several localities, and appears to be

relatively widespread throughout the country. It is known from Scandinavia and the Alps [24].

Specimens examined: Snæfellsnessýsla: Berudalur, *H. Kr. 7142,* 1967 (DUKE). — Ísafjarðarsýsla: Kaldalón, Trimbilstaðir, *H. Kr. 10088,* 1968 (DUKE). Kaldalón, Trimbilstaðahlíð, *H. Kr. 10093,* 1968 (DUKE, AEY). — Strandasýsla: Fellsdalur, *H. Kr. 11243,* 1967 (DUKE). — Eyjafjarðarsýsla: Siglufjörður, Mt. Dalabæjarfjall, *H. Kr. 14217,* 1967 (DUKE, AEY). Hrísey Island, Yztibær, *H. Kr. 14472,* 1968 (DUKE). — Rangárvallasýsla: Fljótshlíð, Múlaheiði, *H. Kr. 21133, 1965* (DUKE).

Solorina octospora (Arn.) Arn.

Morphologically similar to *S. saccata,* but the asci have eight spores instead of four, and it contains methylgyrophorate (KC+red), which is lacking in *S. saccata.*

S. octospora is very rare in Iceland, found only once. It is also rare in northern Europe and in the Alps [24], it is recorded from N.-America, and from Greenland, where it gets more common towards north [3, 12, 22].

Specimen examined: Skagafjarðarsýsla: Vesturdalur Valley, between Hof and Gil, *H. Kr. 13020,* 1967 (DUKE, RVÍK, AEY).

Umbilicaria aprina Nyl.

Foliose lichen, growing on rock, usually 1—3 cm in diameter, light grey above and sooty black below, covered with greyish rhizines, which are black around the base. Apothecia rare.

Frequent in some areas of Iceland, especially in the higher mountains and in the Central Highlands. In the area of Eyjafjörður it is common in all mountains exceeding 1100 m. Some previous records of *U. vellea* in Iceland [11, 16, 21] stand for this species. Outside Iceland *U. aprina* is known only from a few mountains in the world, in Africa, Norway, Greenland and Baffin Island [25].

Specimens examined: Barðastrandasýsla: Kleifaheiði Pass 400 m, *H. Kr. 9105,* 1968 (DUKE, AEY). — Eyjafjarðarsýsla: Mt. Bóndi 1200 and 1330 m, *H. Kr. 1261* and *1268,* 1963 (AEY). Mt. Byggðafjall, *H. Kr. 47,* 1961 (AEY). Mt. Hlíðarfjall, Blátindur 1300 m, *H. Kr. 759,* 1962 (AEY). Mt. Kerling 1400 m, *H. Kr. 1271,* 1963 (AEY). — Suður-Þingeyjarsýsla: Svalbarðsströnd, Hallland 200—360 m, *H. Kr. 585,* 1962 (AEY). Herðubreiðarlindir, *H. Kr. 501,* 1962 (AEY). — Norður-Múlasýsla: Mt. Snæfell 1350 m and 1660 m, *H. Kr. 17760* and *17780,* 1968 (DUKE, AEY). — Suður-Múlasýsla: Mt. Gagnheiðarhnjúkur, *J. Lid,* 1939 (O). Oddsskarð Pass, Magnúsartindur, *H. Kr. 18442,*

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Umbilicaria hirsuta (Sw. ex Westr.) Ach.

Upper surface pale grey or grey-brown, sorediate towards margin, lower side brown, rhizinous. Found only in one lacality in Iceland, in the west on rock. The species occurs in Europe, rare in Britain [8], here and there in the southern parts of Greenland [3], also in N.-America.

Specimen seen: Dalasýsla: Hvammur, Krosshólaborg, *H. Kr. 8131,* 1967 (DUKE).

Umbilicaria rigida (DR.) Frey

Upper surface brownish black to black, finely areolate throughout, lighter and coarsely verrucose towards center. Lower side naked, smooth, blackish brown, darker at the periferie than around the center.

Found only in one locality in the center of Iceland at an elevation of 1500 m, growing on basalt rock. The main distribution area of the species are the arctic mountains.

Specimen seen: Central Highlands: Mt. Tungnafellsjökull, *H. Kr. 23134,* 1967 (DUKE).

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