

Two new species of *Cladonia* from Iceland

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Abstract: Two new species, *Cladonia islandica* and *C. glacialis*, are described from Iceland, where the former is widespread and the latter is known from a single locality by a glacier. Both species appear to belong to the “supergroup *Cladonia*” within the genus.

Key words: new species, *Cladonia*, Iceland

Introduction

During the first author’s studies of the lichen flora of Iceland at Duke University in 1968-1970, great care was taken to study the chemical as well as morphological variation within the genus *Cladonia*. However, some problems with the identity of an Icelandic *Cladonia* repeatedly collected in scattered localities throughout the country were encountered. Similar specimens were also discovered in BERNT LYNGE’S collection from Iceland, which he referred to *Cladonia decorticata*, *C. macrophylla* (as *C. alpicola*) or *C. squamosa* (LYNGE 1940). The second author was also reluctant to refer it to any known species, although it resembles *C. subulata* (L.) F.H.Wigg. When we revised the Icelandic herbarium collections of *Cladonia* at AMNH in 2007, we finally concluded that the mysterious lichen must be an undescribed species. During the same survey we also came across another obviously undescribed species. Both of them are described below. The new species are additions to the checklist of Icelandic lichens (KRISTINSSON & HEIDMARSSON 2006), which comprised 738 species recorded in the literature, including 53 species of *Cladonia*.

Cladonia islandica Kristinsson & Ahti, sp. nov.

Thallus primarius squamulosus, squamulae 0.2-1.0 mm longae, parce divisae. Podetia rufescentia, basi medulla melanotica, nitentes, 3-7 cm alta, 0.1-0.5 mm crassa, elongata, gracilia, non vel apice parce ramosa, vulgo ascyphosa, subulata, raro scyphis angustis, margine proliferatis, superficie scaberrima, microsquamulosa et granulosa, esorediosa, basi etiam squamulis majoribus. Conidiomata terminalia vel basalia, pyriformia vel cylindrica. Apothecia rufa. Acidum fumarprotocetraricum continens.

Type: ICELAND. South Iceland (ISu), Árnessýsla, Herdísarvík, 5 m, 30. VI. 1978, H. Kristinsson 22419 [AMNH holotype; C, H isotypes].

Primary squamules persistent, thickish, convex to flat, small to rather large, 0.2-1.0 mm long, little divided, below clearly floccose but with cortice patches, above dark brown, shiny, blackening at base.

Podetia dark brown, greyish in shade, somewhat shiny, the necrotic base strongly melanotic, 3-7 cm tall, 0.1-0.5 mm thick, fairly slender, unbranched or irregularly branched in distal parts, some branchlets long, curved or divaricate, tips acuminate; usually ascyphose, rarely with narrow cups, axils closed but may become perforated with age; surface very rough, not soresiate, but microsquamulose and coarsely granulose; discontinuously corticate even at young stage, cortex fairly thick, transforming into small, bullate squamules, medulla thick, not very hard, surface of central canal minutely papillate; some macrosquamules may also be present towards the base.

Apothecia infrequent, at tips of podetia, small, flat (only immature ones seen), blackish brown; spores not observed.

Conidiomata rather sparse, terminal or basal, broadly pyriform to cylindrical, black, sessile; conidia not observed.

Chemistry: K-, P+ red; contains fumarprotocetraric acid, with traces of protocetraric and confumarprotocetraric acids (TLC).

Ecology and distribution: This species occurs in Iceland on mossy rocks and stone walls, also in dwarf shrub heaths, vegetated lava fields, and in one case in woodland. It is known from scattered localities throughout Iceland, except in the Vestfirðir Peninsula (INv), but is most frequently found around Lake Mývatn (Fig. 3). So far known, it is endemic to Iceland, but is expected to be found in other coastal areas around the North Atlantic.

Remarks: In size and branching habit, the new species has some resemblance to *Cladonia subulata*, but it differs from that by having brown, shiny surface, melanotic basal parts, no distinct soredia, but very rough surface due to abundant microsquamules, and frequently decorticated in upper parts. *C. islandica* apparently belongs to the “supergroup” *Cladonia* in the provisional infrageneric classification by STENROOS et al. (2002).

Specimens examined: Iceland. South Iceland (ISu), Árnessýsla, Herdísarvík, 2-3 m, 1978, Kristinsson no. 22407 [AMNH]; Rangárvallasýsla, Þórsmörk, southern slope of Valahnjúkur, 250 m, 1979, Kristinsson no. 21195 [AMNH]. West Iceland (IVe): Kjósarsýsla, Kjalarnes, Strýtuholar, 1976. Ingibjörg Halldórsdóttir no. 1728 [AMNH]; Reykjavík, Keldur, 1999. Jóna Björk Jónsdóttir no. 987 [AMNH]. Central Highlands (IMi), Kjölur District, Hveravellir, 600 m, 1967, Kristinsson no. 24218 [AMNH]; Skaftártungnaafréttur, Álfavatnskrókar, 500-550 m, 1963, Kristinsson no. 1066 [AMNH]. East Iceland (IAu): Austur-Skaftafellssýsla, Kálfafellsdalur, in woodland, 150 m, 1997, Kristinsson no. 19919 [AMNH]. North Iceland (INo): Suður-Þingeyjarsýsla, Mývatn, Helluvað, 250 m, 1998, Oddný Teitsdóttir no. 803 [AMNH]; Suður-Þingeyjarsýsla, Mývatn, Kálfaströnd, 280 m, 1968, Kristinsson no. 15399 [AMNH]; Suður-Þingeyjarsýsla, Mývatn, Kálfastrandarstrípar, 280 m, 2006, Kristinsson no. 29981 [AMNH]; Norður-Þingeyjarsýsla, Öxarfjörður, Sveltingur, 20 m, 1968, Kristinsson no. 16184 [AMNH]. In addition, there are uncited specimens collected by Lyngé in Oslo (O).



Fig. 1. *Cladonia islandica*. Part of holotype.



Fig. 2. *Cladonia glacialis*. Holotype.

***Cladonia glacialis* Kristinsson & Ahti, sp. nov.**

Thallus primarius squamulosus, squamulis 2-3 mm longis, 1-2 mm latis. Podetia cinerea vel glauco rufescentia, basi medulla melanotica, 3-4 cm alta, 0.8-1.5 mm crassa, gracilia, parce ramosa, subulata vel anguste scyphosa, superficie corticata, verruculosa, saltem basi tuberculosa, scyphi margine parce granuloso-soresiosa et prolifera ramulis 3-7 subulatis. Conidiomata terminalia, late pyriformia, sessilia. Apothecia ignota.

Type: ICELAND. Central Iceland (IMi), Arnarfellsmúlar, 600 m, 22. VII. 1971, H. Kristinsson 24629 [AMNH holotype; H isotype].

(Fig. 2)

Primary squamules inconspicuous, persistent, flat, 2-3 × 1-2 mm wide, little divided, glaucous grey above, purely white below, with melanotic bases.

Podetia deep grey to pale brown, matt, bases melanotic inside, 3-4 cm tall, 0.8-1.5 mm thick, slender, little branched, subulate to scyphose, scyphi 0.5-2 mm wide; surface rough, cortex continuous but verruculose-knobby throughout, at base occasionally bursting into tuberculose, white spots; scyphi forming granulose soresia in patches, often proliferating from margins to form 3-7 subulate branchlets, sometimes branching dichotomously without scyphus formation; podetial squamules scarce, small.

Apothecia not observed (probably brown).

Conidiomata terminal at podetial tips or scyphus margins, broadly pyriform, sessile; conidia not observed.

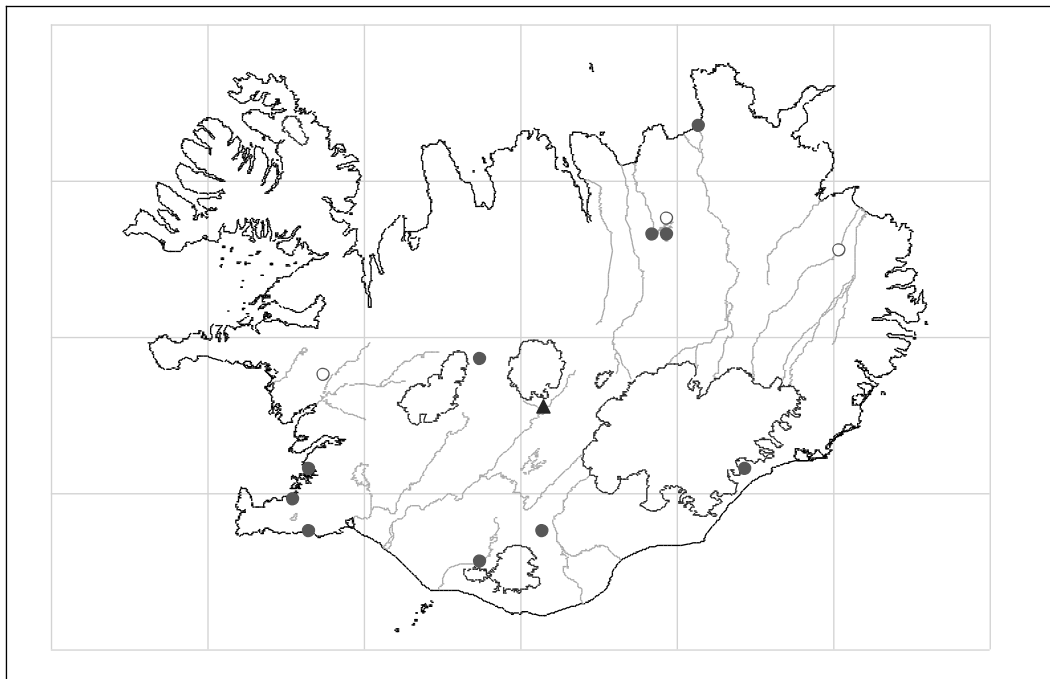


Fig. 3. Distribution of *Cladonia islandica* (dots: specimens cited; circles: LYNGE'S specimens in O, not recently confirmed) and *C. glacialis* (triangle) in Iceland.

Chemistry: K–, P+ red. Contains fumarprotocetraric acid and traces of protocetraric and fumarprotocetraric acid, plus a minor unidentified compound (TLC).

Ecology and distribution: The type locality (Fig. 3) is situated on the SE side of the terminal moraine of Múlajökull, an outlet from the large Hofsjökull glacier. The terminal moraine, Arnarfellsmúlar, is well known for its lush vegetation of *Rhodiola rosea* and *Angelica archangelica* in spite of its young age, probably formed during the glacial maximum in the 19th century. *Cladonia glacialis* is only known from the type locality.

Remarks: Phylogenetically *Cladonia glacialis* apparently belongs to the “supergroup” *Cladonia* (STENROOS et al. 2002), being probably close to *C. phyllophora* Hoffm., which differs by having a smoother, esorediate surface.

References

- KRISTINSSON, H. & HEIÐMARSSON, S. (2006). Checklist of lichens in Iceland. – <http://www.floraislands.is/fletlist.htm>.
- LYNGE, B. (1940). Lichens from Iceland. I. Macrolichens. – Skrifter utg. av det Norske Videnskaps-Akademi i Oslo I. Mat.-Naturv. Klasse 7: 1–56.
- STENROOS, S., HYVÖNEN, J., MYLLYS, L., THELL, A. & AHTI, T. (2002). Phylogeny of the genus *Cladonia* s. lat. (Cladoniaceae, Ascomycetes) inferred from molecular, morphological, and chemical data. – *Cladistics* 18: 237–278.

