

Cladonia islandica (Cladoniaceae, Ascomycota) a species newly discovered in Spain, Alaska and Canada

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Abstract: Pino-Bodas, R.; Ahti, T. & Burgaz, A. R. 2014. *Cladonia islandica* (Cladoniaceae, Ascomycota), a species newly discovered in Spain, Alaska and Canada. *Bot. Complut.* 38: 25-27.

Cladonia islandica is reported as new to Spain (Salamanca) and the exact localities of its known specimens from Alaska (Aleutian Islands, Alaska Peninsula) and Canada (Manitoba, Québec) are given. A brief description is provided.

Key words: *Cladonia*, Lichenized fungi, Spain, Alaska, Canada.

Resumen: Pino-Bodas, R.; Ahti, T. & Burgaz, A. R. 2014. *Cladonia islandica* (Cladoniaceae, Ascomycota), una especie nueva descubierta en España, Alaska y Canadá. *Bot. Complut.* 38: 25-27.

Cladonia islandica se cita por primera vez para España (Salamanca), también se citan para localidades de Alaska (Islas Aleutianas, y la Península de Alaska) y Canadá (Manitoba). Se incluye una breve descripción.

Palabras clave: *Cladonia*, hongos liquenizados, España, Alaska, Canadá.

INTRODUCTION

Since the publication of the checklist of the lichenized fungi of the Iberian Peninsula (Llimona & Hladun 2001), the list has got additions every year, with new species and quotations for the area. In particular, the *Cladoniaceae* flora on the Iberian Peninsula has been widely studied (Burgaz & Ahti 1992, 1994, 1998, 2009; Burgaz *et al.* 1999; Burgaz & Martínez 2008). Nevertheless, new taxa continue to appear. These are, for instance, *Cladonia acuminata* (Ach.) Norrl. (Pino-Bodas *et al.* 2012) and *C. verticillata* (Hoffm.) Schaer. (Pino-Bodas *et al.* 2013). So far, 84 taxa of *Cladonia* have been found on the Iberian Peninsula. *Cladonia nana* Vain., *C. norvegica* Tønsberg & Holien and *C. stereoclada* Abbayes (Burgaz & Ahti 2009) are among the species still expected to be found in the area.

When the first author was reviewing the material of *Cladonia scabriuscula* in the MACB herbarium, she found a specimen that morphologically differed from the rest, and so this specimen was studied in full detail. It turned out to represent *Cladonia islandica*, a species recently described from Iceland. At the same time, the author Ahti

had found new specimens in America, which represent considerable range extensions for this species. Recently, Ahti & Stenroos (2013) reported *Cladonia islandica* only from Iceland and Svalbard, with a brief note that it has recently been recorded from Canada and Alaska.

MATERIALS AND METHODS

The specimens studied are mainly deposited in the herbaria CANL, H, MACB or WIS. The brief description is mainly based on the Spanish material in MACB. The specimens were studied under stereomicroscope LEICA S4E. Hand-cut sections of the podetia were made and measurements of the podetial wall thickness were observed at 400x. The secondary metabolites were studied by TLC, using the solvent A and B (White & James 1985). The photo was taken with a NIKON D800 camera.

RESULTS AND DISCUSSION

Cladonia islandica Kristinsson & Ahti
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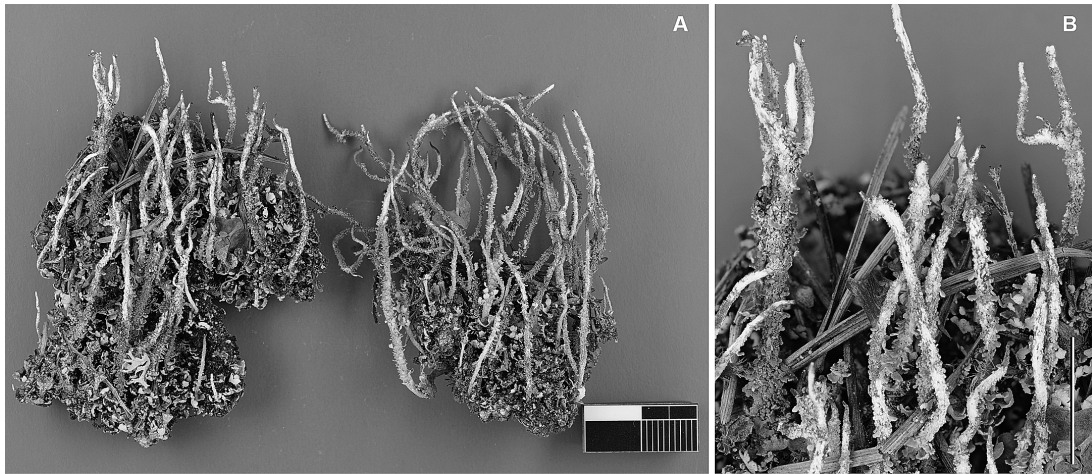


Fig. 1—*Cladonia islandica* Kristinsson & Ahti (Spain, Ávila, A. R. Burgaz, MACB 95828). **A:** thallus habit. **B:** detail of the podetial surface. Bar = 1 cm.

Illustrations: Fig. 1 (see also Kristinsson & Ahti 2009: 281, Ahti & Stenroos 2013: 101).

Primary thallus persistent, squamules 2-5 mm long and 1-2.5 mm wide, divided up to half of their length, upper surface light green, lower surface grey to black at the base and white toward the tips. Podetia 20-30 mm × 0.7-2 mm, brownish to green, simple or irregularly branching above the basal part, generally subulate, with closed axils. Podetium surface covered by microsquamules, corticated at the base. Pycnidia black, terminal on the podetia, cylindrical, 350 × 200 μm. Conidia not observed. Apothecia not observed.

Anatomy. Squamules of primary thallus 200-280 μm thick, cortex 37-55 μm thick, algal layer 25-37 μm, medulla 150-200 μm. Podetial wall 230-335 μm, cortex 20-25 μm thick, medulla 70-112 μm, stereome 135-205 μm.

Chemistry. Thallus Pd+ red, contains fumarprotocetraric and protocetraric acids.

Habitat. In Spain terricolous on mineral soil and rock outcrops facing north under *Pinus sylvestris* woods. In Alaska only found in boreal, hyperoceanic, very windy, treeless areas near sea level. The Canadian localities are also on cold, oceanic coasts near polar timberline.

According to its branching pattern it resembles *C. subulata* (Kristinsson & Ahti 2009), but *C. islandica* is not sorediate. Its phylogenetic relationships are unknown to date but it probably belongs to the “supergroup” *Cladonia* of Stenroos *et al.* (2002). A molecular analysis of Alaskan material is under study.

Cladonia islandica was originally reported only from Iceland (Kristinsson & Ahti 2009), but Øvstedal *et al.*

(2009) found it in Svalbard and Ahti & Stenroos (2013) also from Canada and Alaska, suggesting that it must be more widespread on the North Atlantic coasts. The present Spanish record is the first for the European continent. There exist other species of *Cladonia* that show a disjunct distribution similar to that of *C. islandica*, *i.e.* found in the north and in the south of Europe (mainly along the Atlantic seaboard), such as *C. angustiloba* Ahti & Aprot, known from the Faroes and Azores, or *C. galindezii* Øvstedal, known from Greenland, northern Norway, northern Sweden and Andorra (Hansen & Ahti 2011, Ahti *et al.* 2013, Azuaga *et al.* 2001).

Specimen examined: **SPAIN: SALAMANCA:** Candelario, Parque Nac. Sierra de Candelario, subida a El Travieso, 30TTK668704, 1390 m, acid soil, *Pinus sylvestris* forest, 1-VII-2007, A. R. Burgaz, MACB 95828. **CANADA: MANITOBA:** Hudson Bay Coast, between Fort Churchill and Cape Merry, 58°46'N, 94°08'W, 1956, H. A. Crum & W. B. Schofield 6632 (CANL 8349). **QUÉBEC:** Great Whale River, Sandy Point, 55°17'N, 1947, J. Kucyniak 755 (CANL 8328). 77°45'W. **ICELAND:** Norður-Þingeyjarsýsla, Laxárdalur, Helluvað, 65°35'18»N, 17°08'67»W, on moss in lava, 13-VIII-1998, S. Baldursdóttir, H; Kristinsson & Ahti (2009) cited 13 different localities, with a dot map. **NORWAY: SVALBARD:** A few specimens from Spitsbergen reported by Øvstedal *et al.* (2009). **U.S.A.: ALASKA: ALASKA PENINSULA:** Cold Bay, 1.6 km N of Cold Bay village, on rotting log at base of cliffs, 1971, N. McCartney (WIS). **ALEUTIAN ISLANDS:** Amlia Island, W side of Sviechnikof Harbor, 52°03.082'N, 177°24.113'W, 3 m, on driftwood log in *Leymus mollis*-*Angelica lucida* beach meadow, 17-V-2000, S. S. Talbot 041 (WIS), 355 (WIS), North-Central Amlia Island, 52.08657°N, 173°35597°W, 18-VIII-2010, S. S. Talbot AML008-X-13A (BG, H, UBC), AML008-X-13Ab (C, H), Kiska Island, 51°58'N, 177°32'W, 120 m, log in coastal meadow, 2001, S. S. Talbot, KIS119 (H), Unalga Island, 51°34'W, 179°02'W, 3 m, coastal boulder, 2003, S. S. Talbot UNA001-X-02 (H, WIS).

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