

Halecania pannarica new to Sweden

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Halecania pannarica is reported for the first time in Fennoscandia from the provinces of Dalsland, Närke, Jämtland, Värmland and Västergötland in Sweden. It was found to contain pannarin rather than pannaric acid which was reported in the protologue.

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Introduction

Halecania currently comprises c. 25 species and occurs world-wide on a wide range of substrates. Three of the saxicolous species are sorediate, *H. giraltiae* van den Boom & Etayo, *H. pannarica* and *H. pepegospora* (H. Magn.) van den Boom. *Halecania giraltiae*, known from Spain, Portugal and Greece, and *H. pepegospora* described from North America, are both characterized by containing argopsin and norargopsin in the thallus (van den Boom & Etayo 2001, van den Boom & Elix 2005). *H. pannarica* was originally described from Switzerland and also reported from France (van den Boom 2009). The lichenicolous species *H. giraltiae* and *H. pannarica* seem to be very similar in both morphology and ecology, but differ chemically, in *H. pannarica* having pannaric acid instead of argopsin and norargopsin. (van den Boom 2009, van den Boom & Etayo 2001). Sorediate, lichenicolous material of a *Halecania* species have been collected in several provinces in Sweden and also found in unidentified collections in the herbarium at UPS. Our investigation has identified this material as *H. pannarica* which is here reported new to Fennoscandia.

Material and Methods

Specimens were initially studied using a dissecting microscope. Anatomical features were examined on hand-cut apothecial sections and squash preparations mounted in water using a compound microscope. HPTLC was performed following the method described by Arup et al. (1993). Type material was not available for comparison but we received a recently collected specimen from the type locality.

The Species

Halecania pannarica M. Brand & van den Boom

Fig. 1

Bryologist 112: 830 (2009). Type: Switzerland, Valais, Val d'Hérens, 0.5 km WNW of Evolène, shore of Borgne, just N of bridge, 46°6.9'N, 7°29.4'E, on large boulders of schist in stream, 1340 m, 6 Aug. 1990, M. Brand 24858 (L, holotype).



Figure 1. *Halecania pannarica*. Habitus of thallus with many small, scattered, dark greyish soralia and in upper corner three apothecia. Arup L18152, L18168 (LD). Bars = 1 mm.

Halecania pannarica is a mainly lichenicolous species occurring on a number of saxicolous, crustose hosts such as *Aspicilia*, *Rhizocarpon* and sometimes *Lecanora*, but it may also grow as an autonomous lichen directly on siliceous rocks. Apart from the primarily lichenicolous life-style, it is characterized by the often numerous, 0.1–0.3 mm wide, discrete, dark greyish to brownish to blackish soralia (often with a characteristic bluish tinge) that may cover large parts of the areolate thallus. Apothecia are rare (but occur sparsely in several of the Swedish localities), 0.2–0.6 mm wide, dark brown to black, and lecanorine with a usually visible, smooth thalline margin. The ascospores are one-septate, hyaline, $9\text{--}12 \times 5.5\text{--}6.5 \mu\text{m}$ and has a thin perispore. In most of the Swedish localities *H. pannarica* grows on flat, mostly horizontal rock surfaces on shores of lakes and rivers, which agrees well with the type locality in Switzerland where it grows on boulders in a stream.

Halecania pannarica was first mentioned from Sweden as *H. giraltiae* by Owe-Larsson et al. (2018) but that species was never included in the Fennoscandian checklist (Westberg et al. 2021) as some uncertainties about the identity of the specimens remained. HPTLC was performed on six of the Swedish specimens and they were all found to contain pannarin. Pannarin reacts P+ orange and this reaction was confirmed in our material by spot tests. Pannaric acid, which was reported in the protologue for *H. pannarica* has no reaction with P (Elix 2014). The type material of *H. pannarica* was unfortunately not available for comparison but a recently collected specimen from the type locality was investigated and was found to contain pannarin as well. We suspect that the report of

pannaric acid was a confusion of this substance with pannarin, which is supported by the fact that *H. pannarica* was described to react P+ orange in the original paper (van den Boom 2009). Curiously, one Swedish specimen was found to contain both pannarin and argopsin which, if not a contamination, raises questions about the differences between *H. giraltiae* and *H. pannarica*. For now we report the Swedish specimens as *H. pannarica*.

Specimens examined: SWEDEN. *Dalsland*: Skällered par., E side of Valbergs udde, c. 1.5 km NE of Köpmannebro, the shore of Lake Vänern, 58.78515°N 12.53044°E, 5 May 2022, M. Westberg & R. Isaksson (UPS L-1039585, HPTLC: pannarin and argopsin); *Närke*: Hammar par., Lake Vättern, south part of Hargemarken Nature Reserve, c. 1 km NW of Hillevik, 58.75727°N 14.96748°E, 25 April 2021, M. Westberg, O. Hammarström, R. Isaksson & T. Berglund (UPS L-998780); *Jämtland*: Åre par., Handöl Rapids in river Handölan, W of lake Ännsjön, E shore of the river, between the suspension bridge and the gravel road at the old power station, 63.233°N 12.45°E, alt. 540 m., on flat, schistose rock on the shore, 31 July 1993, B. Owe-Larsson H93-60a, H93-60b (UPS L-998781, HPTLC: pannarin; L-998782, HPTLC: pannarin); *ibid*, W shore of the river, below the northernmost rapid, 63.2333°N 12.4333°E, on vertical rock, 26 June 1986, L-E Muhr 9272 (UPS L-999133, HPTLC: pannarin); *Värmland*: Eskilsäter par., the island Lurön, promontory on the south side of the island, 58.78913°N 13.2386°E, 21 April 2018, M. Westberg (UPS L-903985, HPTLC: pannarin; L-903986); *ibid*, 58.78932°N, 13.24052°E, on *Schaereria fuscocinerea* on siliceous rock on the shore in the epilitoral zone, 21 April 2018, B. Owe-Larsson (UPS L-989473); *ibid*, directly on acid rock above the shore, 58.79040°N 13.23631°E, 21 April 2018, U. Arup L18152 (LD); *ibid*, directly on acid rocks just above water line and on *Rhizocarpon* sp., 58.78894°N 12.23991°E, 21 April 2018 U. Arup L18167, L18168 (LD); *ibid*, the southeast promontory, close to the lighthouse, 58.78957°N 13.25069°E, on *Rhizocarpon geminatum* on siliceous rocks, 21 April 2018, M. Westberg (UPS L-903999, HPTLC: pannarin); Säffle par., Duse udde, SE side of the promontory and E of the lighthouse, 59.07837°N, 12.88378°E, on crustose lichen on siliceous rocks above the shore, 22 April 2018, M. Westberg (UPS L-904009, HPTLC: pannarin); *Västergötland*: Otterstad par., Stora Gåsen, 58.7128°N 13.1047°E, 26 June 1956, G. Einar Du Rietz (UPS L-1023107, L-1023110, L-1033681). SWITZERLAND. *Valais*: Evolène, c. 40 m NW of the bridge Route de Lanna across the river La Borgne, 46.11372°N 7.48997°E, 8 May 2022, M. Vust & G. von Hirschheydt (UPS L-1049871, HPTLC: pannarin).

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