

Lophiotrema borealiforme, a new species close to *L. boreale*

GEIR MATHIASSEN, ALFRED GRANMO and ØYVIND STENSRUD

MATHIASSEN, G., GRANMO, A. & STENSRUD, Ø. 2017: *Lophiotrema borealiforme*, a new species close to *L. boreale*. – *Karstenia* 57: 11–15. DOI <http://doi.org/10.29203/ka.2017.479>. HELSINKI. ISSN 0453–3402.

Lophiotrema borealiforme (Ascomycota, Lophiotremataceae) is described as a new species. The description is based mainly on the holotype collection, but also on the eight other known specimens. Similarities and differences to the closest related species, *Lophiotrema boreale*, are described. *Lophiotrema borealiforme* is only known from southeastern, and the very southern part of Sweden.

Keywords: Ascomycota, Lophiotremataceae, Sweden, taxonomy

Geir Mathiasen, Department of Natural Sciences, Tromsø University Museum, University of Tromsø - The Arctic University of Norway, NO-9037 TROMSØ, Norway; e-mail: geir.mathiasen@uit.no

Alfred Granmo, Granitvegen 5, NO-9022 Krokelydalen, Norway; e-mail: alfred.granmo@gmail.com

Øyvind Stensrud, Damvegen 14, NO-2033 Åsgreina, Norway; e-mail: oyvind.stensrud@ibv.uio.no

Introduction

Kerstin and Lennart Holm found this small ascomycete for the first time in 1977. They found it near their home “Jerusalem” in Sweden, in the municipality Dalby in Uppland. In the following years, they found several specimens, all from Uppland, and published these as *Lophiotrema boreale* Math. (Holm & Holm 1988). However, all those specimens turned out to represent an undescribed species (Mathiasen 1993). They found a further specimen in 1989 in Skåne, in the very southern part of Sweden.

Material and methods

The collections of *Lophiotrema borealiforme* were studied using a Wild M10 dissecting microscope and a Leitz

DMRBE light microscope. Microscopic slides were prepared from dried herbarium material and mounted in water for measurements and photographs. The photo was taken with an Olympus DP27 digital camera. The specimens are deposited in Museum of Evolution, Uppsala University (UPS).

Taxonomy

***Lophiotrema borealiforme* Math., Granmo & Stensrud, sp. nova** – Figs. 1–3

MycoBank no.: MB 820743

Pseudothecia (200–) 250–300 (–375) µm diametro, immersa vel erumpentia, sparsa aut densa, globosa sive pyroformia, nigra; collo saepe demisso sive minuto, crista tamen distincta (75–) 100–150 µm longa instructo; huc illuc, in cortice quoad grana plerumque perpendiculariter sese



Fig. 1. *Lophiotrema borealiforme*. Ascomata in the inner bark of *Betula*, associated with *Diatrype stigma* (bar = 500 μm). Holotype. – Photo: G. Mathiassen.

tendentia. Superficies ligni inter pseudothecia paulum obscurata. *Peridium* 25–40 μm crasum, textura plus minusve angulari. Extrema parte, lateraliter ad basim cellulae prismaticae strata aliquot saepe formant. *Asci* 70–90 (–100) \times (6–) 7–8 μm , stipitibus brevissimis, cylindrici, bitunicati, 8-sporei. *Paraphysoides* numerosae, anastomosantes, septatae, e filamentis (0.7–) 1.0–1.7 μm crassis formatae. *Ascospores* (12.5–) 14–17.5 (–18.7) \times 2.5–4 μm , ellipsoides vel fusiformae, interdum leviter curvatae, uniseptatae, constrictae, super septum paulo inflatiores, hyalinae, biseriatae, sive etiam oblique uniseriatae.

Holotypus: Die 16 mensis Aprilis anni 1980 in Tunaskog prope vicum Dalby in Uplandia Sueciae, in cortice et ligno *Betulae* sp. una cum *Diatrype stigmata* crescens a K. & L. Holm lectus, siccus in Museo Upsaliensi depositus (UPS, F-634463).

Pseudothecia (200–) 250–300 (–375) μm diam., immersed-erumpent, scattered or crowded, globose - pyriform, black, neck often low or reduced but with a distinct crest (75–) 100–150 μm long, orientated in several directions, but in bark often perpendicular to the direction of the grain. Wood

surface slightly blackened between the pseudothecia. *Peridium* 25–40 μm thick, \pm *textura angularis*. A few layers of long, prismatic cells often observed outermost laterally at base. *Asci* 70–90 (–100) \times (6–) 7–8 μm , cylindrical, short-stiped, bitunicate, 8-spored. *Paraphysoids* (0.7–) 1.0–1.7 μm diam., abundant, branched, anastomosing, septate. *Ascospores* (12.5–) 14–17.5 (–18.7) \times 2.5–4 μm , ellipsoid-fusiform, often slightly curved, 1-septate, constricted, somewhat inflated above the septum, hyaline, biseriata, but also obliquely uniseriate.

Etymology: *borealiforme* - from borealis, northern and -formis, similar to, i.e. similar to *Lophiotrema boreale* Math.

Discussion

Holm & Holm (1988) briefly described, illustrated and discussed *Lophiotrema borealiforme*, but they erroneously treated this species as *L. boreale*. Later, Mathiassen (1993) found that eight of the eleven collections mentioned by Holm & Holm actually represented an undescribed *Lophiotrema* species, which is described here as *L. borealiforme*. Unfortunately, we did not succeed in extracting DNA from any of the examined specimens.

Lophiotrema borealiforme is similar to *L. boreale*, but distinctive by the shape and size of the ascospores, which remain 1-septate, and lack the typical guttules (observed in water). They are also reminiscent of *Lophiostoma fuckelii* Sacc., but lack terminal appendages (cf. Holm & Holm 1988). The spores are biseriata, but asci with obliquely uniseriate spores are also observed.

The ascomata grow on wood, but most often on the inner bark of the hosts *Betula*, *Corylus*, *Fagus* and *Fraxinus*. In bark they are very often orientated parallel to the long axis of the host substrate. *Lophiotrema boreale* is predominantly lignicolous, and only found on rather decayed substrates of *Alnus*, *Betula* and *Salix* (Mathiassen 1989).

Lophiotrema borealiforme has a rather restricted distribution in Sweden (Fig. 3), and is only known from the boreonemoral region in southeast Sweden (Uppland), and in the nemoral region (Påhlsson & Danielsson 1984, Granmo et al. 1999) in the very southern part (Skåne). *Lophiotrema boreale*, on the other hand, is more

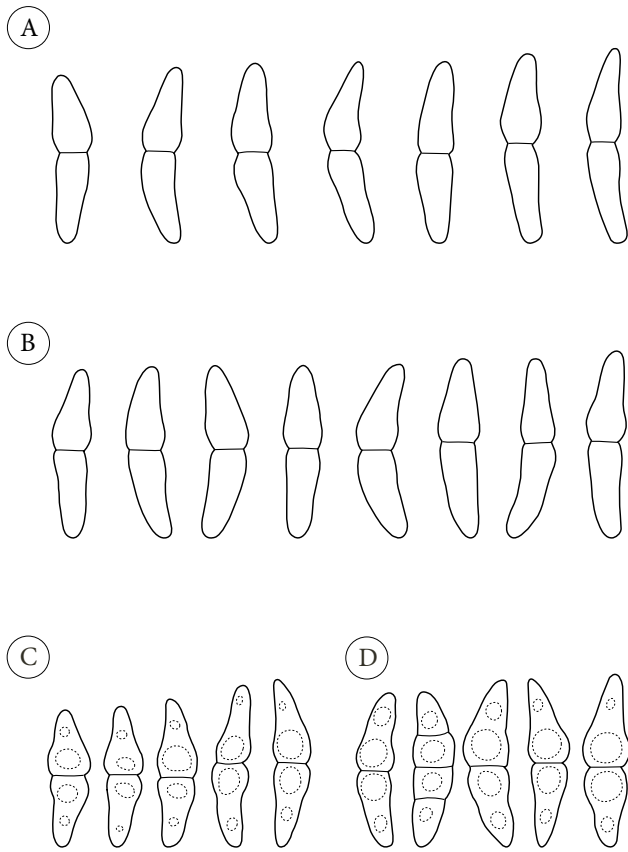


Fig. 2. *Lophiotrema borealiforme* (A–B), *L. boreale* (C–D). Ascospores (bar = 10 µm). (A) Holotype. (B) K. & L. Holm 1967b. (C) Holotype. (D) Mathiassen 207. – Drawing: (A–B) Mathiassen & E. Høgtun, (C–D) Mathiassen (1993).

widely distributed (Mathiassen 1989, 1993, Nordén & Paltto 1997, Granmo 2008, Mathiassen & Granmo 2012). In Fennoscandia (Fig. 3), its main distribution is in the north boreal and low alpine areas (Påhlsson & Danielsson 1984, Moen 1998, Granmo et al. 1999). It probably occurs all along the Scandinavian mountain range, and seems to be more frequent in continental areas. The southernmost locality in Norway is near Oslo, but it is found elsewhere almost throughout the country. The hitherto northernmost locality is in Oksevågdaalen Nature Reserve, Lebesby, Finnmark (Granmo 2008). In Sweden, it is found in the central and northern part, but was once re-

ported as far south as Öland (Nordén & Paltto 1997). In Finland, it was found only once in the far north, viz. in the Kilpisjärvi area.

Specimens of *Lophiotrema borealiforme* examined: SWEDEN. **Uppland.** Dalby, ca. 500 m SW of “Jerusalem”, on bark of *Betula verrucosa*, with *Diatrype* sp., 8.IV.1977 Holm & Holm 960c (UPS, F-634456); Tunaskog, ca. 500 m NE of Östbergstorpet, on bark and wood of *Betula* sp., with *Diatrype stigma*, 16.IV.1980 Holm & Holm 2018c (holotype – UPS, F-634463); “Jerusalem”, near the eastern barn bridge, on bark of *Fraxinus excelsior*, 23.II.1984 Holm & Holm

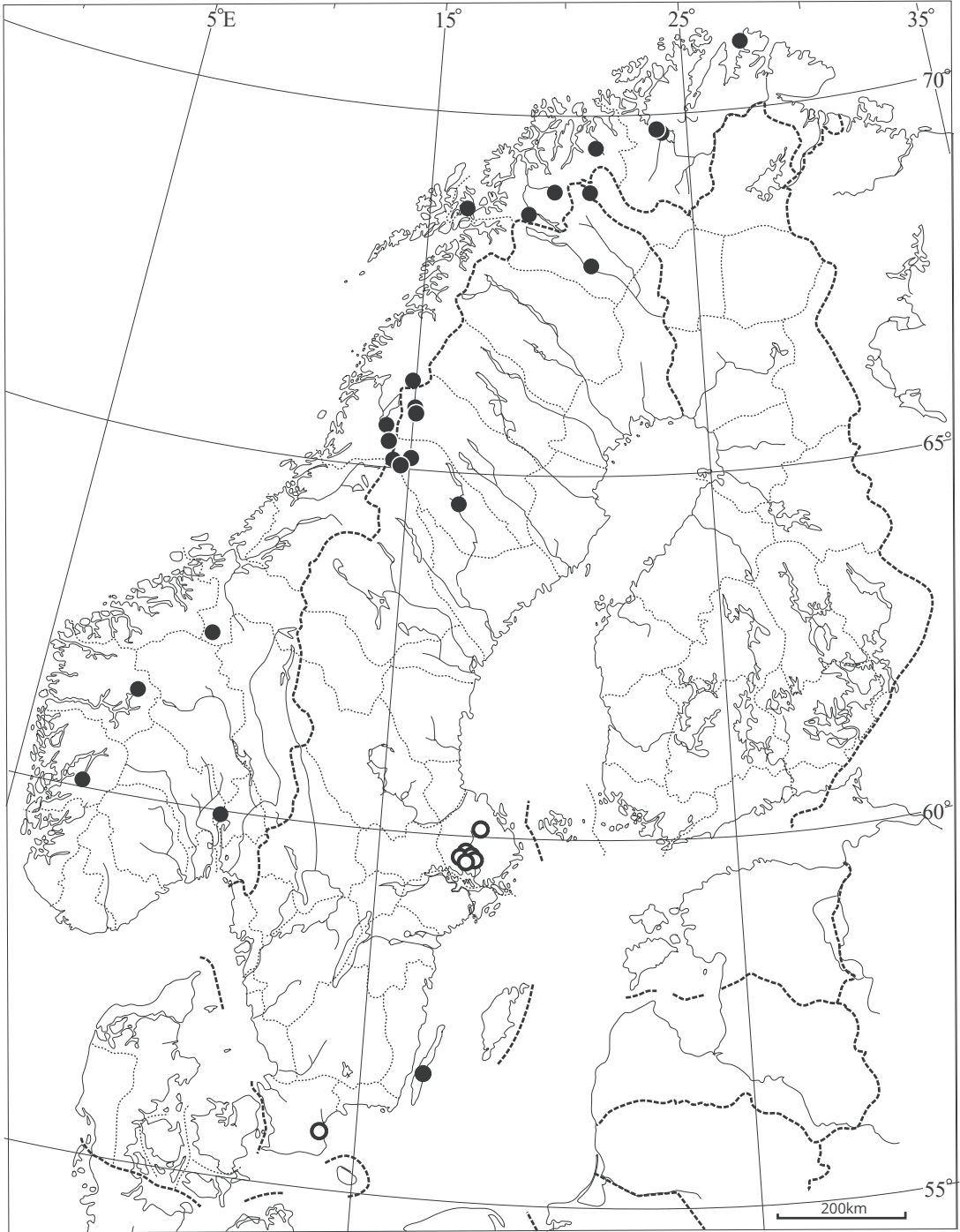


Fig. 3. Distribution. *Lophiotrema borealiforme* (circles), and *L. boreale* (dots). – Map: Ernst Høgtun ©, Tromsø University Museum, 2017.

3010e (UPS, F-634464); near Björkdal, on old bark of *Betula pendula*, 17.III.1985 Holm & Holm 3414b (UPS, F-634459); south of Dalby farm, on bark of *Betula* sp., 21.IV.1985 Holm & Holm 3445a (UPS, F-634458); Dannemora, hazel grove between Ekvik and Ralby, on bark and wood of *Corylus avellana*, 5.VII.1984 Holm & Holm 3163a (UPS, F-634457), 3164b (UPS, F-634461); Skokloster, ca. 200 m NE of Botorp, on bark of *Betula* sp., 11.III.1980 Holm & Holm 1967b (UPS, F-634462). **Skåne.** Degerberga, beech forest ca. 1 km N of Forsaker, on bark of *Fagus sylvatica*, 17.IV.1989 Holm & Holm 5401g (UPS, F-709910).

Specimens of *Lophiotrema boreale* examined:
FINLAND. Enontekiön Lappi. SE of Kilpisjärvi, Muotkataikka, on wood of *S. glauca* ssp. *glauca*, 9.IX.2002 Mathiassen 11632 (TROM, F-14941). **NORWAY.** Troms. Harstad, Sørvik-Sørvikfjellet, on wood of *Salix nigricans* ssp. *nigricans*, 7.VII.1981 Mathiassen 218 (holotype – TROM, F-6942).

Acknowledgements: We want to express our gratitude to the late Professor Lennart Holm, and to his wife Kerstin Holm, Uppsala, who made a preliminary study of our fungus. We also thank curator Stefan Ekman (UPS) for the loan of specimens. Per Pippin Aspaas is thanked for writing the Latin diagnosis, and Rob Barrett for correcting the English. Ernst Høgtun is thanked for technical assistance with the illustrations, and Teppo Rämä for other technical assistances. Björn Nordén is thanked for information about the new find of *Lophiotrema boreale* in Western Norway.

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