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Massalongia olechiana (Massalongiaceae, Peltigerales), a new lichen species from the Antarctic

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Abstract: A new species of lichenized ascomycete, *Massalongia olechiana* Alstrup *et* Søchting, sp. nov. (Massalongiaceae) is described from the South Shetland Islands and the Antarctic Peninsula. The species is distinguished by laminal isidia and 5–7-septate ascospores. The relationships with the other species of the genus are discussed. From *Massalongia carnosa*, recorded from both the Arctic and the Antarctic, the new species is distinguished by its lack of isidioid squamules and in having pluriseptate ascospores instead of 1-septate ascospores.

Key words: Antarctic, lichens, lichenized ascomycetes, *Massalongia*.

Introduction

The genus *Massalongia* was described by Körber (1854) with the type species *Massalongia carnosa* (Dicks.) Körb. based on *Lichen carnosus* Dicks., the type of which comes from Scotland. The genus belongs to family Massalongiaceae (Jørgensen, 2007). *M. carnosa* is a common and circumpolar species frequently recorded in boreal and Arctic regions of the Northern Hemisphere. This taxon was also reported from the Southern Hemisphere (*e.g.* Galloway 1985; Øvstedal and Smith 2001), where at least the reports from New Zealand seem reliable (Galloway 1985). The other known members of the genus are: *Massalongia microphylliza* (Nyl. ex Hasse) Henssen, *M. intricata* Øvstedal and *M. griseolobulata* Øvstedal. *Massalongia microphylliza*, known only from western North America, was added to the genus by Henssen (1963). Two other species have been described from the Southern Hemisphere (see discussion below).

While studying the Antarctic material of *Massalongia* a taxon was discovered whose morphology and anatomy did not agree with any of the currently distinguished species. It is described here as new and compared with related species.

Materials and methods

The collections of *Massalongia* from the Antarctic Region held in the herbaria of the Jagiellonian University, Cracow (KRA) and the Botanical Museum, University of Copenhagen (C) were studied by traditional microscopic methods and thin layer chromatography (TLC; methods followed Orange *et al.* 2001).

Taxonomy

Massalongia olechiana Alstrup *et* Søchting, sp. nov.
(Fig. 1)

Diagnosis: Differt a *Massalongia carnosa* (Dick.) Körb. in isidia laminalis et ascosporae 5–7-septatae.

Types: South Shetland Islands, King George Island, Admiralty Bay, Bransfield Strait, Red Hill, alt. 100 m, *M. Olech* 4862 (KRA-holotype) (Fig. 1a, b).

Description. — *Thallus* (Fig. 1a) squamulose, forming rosettes, dark brown, 1–3.5 cm diam. Lobes flattened, elongate, horizontal to ascending, irregularly branched, often overlapping. *Isidia* laminal, globose to cylindrical. Upper cortex pseudoparenchymatous, lower cortex not developed. Lower surface of the thallus smooth, pale, with sparse rhizines. Photobiont *Nostoc*. *Apothecia* rare, up to *ca* 2 mm diam., with true exciple. *Disc* flat to convex, red-brown. *Paraphyses* branched, anastomosing. *Asci* cylindrical, with internal amyloid sheath, 8-spored. *Ascospores* (Fig. 1b) hyaline, narrowly ellipsoid with distinctly narrower lower end, 34–42 × 5–8 µm, rarely shorter, mostly 5–7-septate, rarely with fewer septa. *Pycnidia* not seen.

Chemistry. — TLC: negative.

Etymology. — The new species is named in honor of our mutual friend and colleague, Prof. Maria Olech, expert on Arctic and Antarctic lichens.

Ecology. — The new species grows on mosses, soil and plant remains in cold, moist areas.

Distribution. — *Massalongia olechiana* sp. nov. is known from King George Island and Livingston Island (South Shetland Islands), and two islands off the Loubet Coast (Antarctic Peninsula).

Discussion

A revision of a large amount of Antarctic material of *Massalongia carnosa* including all specimens quoted in the papers by Olech (1989, 1994, 2004) and Søchting, Øvstedal and Sancho (2004) indicated that the collection undoubtedly

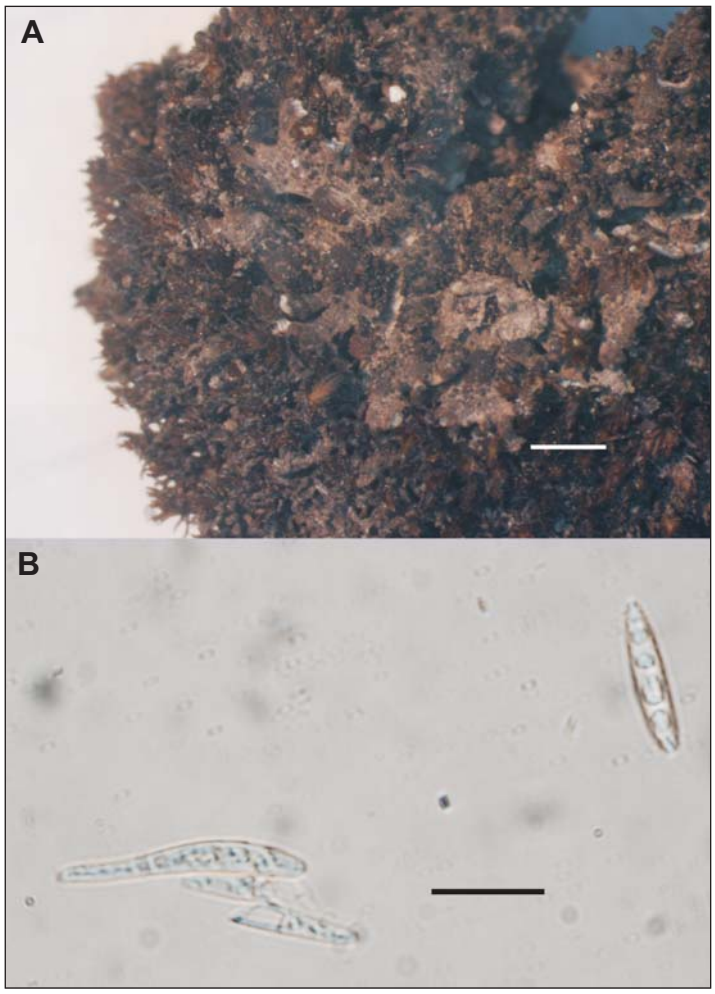

Fig. 1. *Massalongia olechiana* sp. nov., holotype. A – habit, scale bar 1 mm; B – ascospores, scale bar 20 µm.

represents the newly described species. Therefore other records of *M. carnosa* from the Antarctic should be critically examined to establish and confirm the actual distributions of both species. The main differences between the two taxa, as well as three other species of the genus, are as follows.

Massalongia carnosa has marginal isidioid squamules which are absent in the new species, and mostly 1-septate, ellipsoid to narrowly ellipsoid ascospores. It is worth noting that there are divergences in the descriptions of the ascospores between authors. According to Thomson (1984), the spores are 2–3-celled,11–27 × 4.5–8.5 µm; Krog *et al*. (1994) describe them as 1-septate spores without giving measurements; Benfield and Purvis (2009) describe the spores as 1(–2)-septate, (16–)18–24(–30) × (4.5–)6–7.5(–8.5) µm; and Jørgensen (2007) as 1–2-septate,

15–35 × 5–7(–8) µm. According to Wirth (1995) the ascospores are 2–4-celled, while according to Galloway (1985) they are 1–2-septate and 11–27 × 4.5–8.5 µm. In specimens from Greenland we have observed only 1-septate ascospores, of the size 15–30 × 5–7 µm. As the ascospores can be variable in size and shape even in the same thallus, there is no reason to suppose that these differences are enough to distinguish different species. *Massalongia microphylliza* (Nyl. ex Hasse) Henssen, known in North America from California to British Columbia, is characterized by marginal to submarginal, globose to cylindrical isidia and 1–3-septate ascospores measuring 17–28 × 6.5–9 µm (Nash 2002).

Massalongia intricata Øvstedal, another species recorded from the Antarctic Peninsula, South Shetland Islands and South Orkney Islands (Øvstedal and Smith 2001; Olech 2004), differs from *M. olechiana* in forming grey cushions up to 1 cm tall and composed of terete, ramified lobes, and by having 3–4-septate ascospores 22–24 µm long.

Massalongia griseolobulata Øvstedal, recently described from subantarctic islands of the south Atlantic (Gough Island), has grey-orange thalline squamules and marginal lobules. The species produces (4–)6–7-septate ascospores but they are 25–30 µm long. It also differs from other species members of Massalongiaceae in having asci with an indistinct apical ring-structure instead of the usually observed apical cap-structure (Øvstedal and Gremmen 2010).

Additional collections examined.

Massalongia olechiana: Antarctic. South Shetland Islands, Livingston Island, South Bay, Punta Polaca, *Søchting 7599* and *7866* (C). Livingston Island, South Bay, foothills of Mt. Reina Sofia, *Søchting 7880* (C). Antarctic Peninsula, Loubet Coast: Ryder Bay of Adelaide Island, Léonie Island, 67.5931S, 68.3360W, alt. 37 m, N-exposed ledges, 19 January 2011, *Søchting 11480* (C); Lagoon Island, 67.5925S, 68.2391W, alt. 20 m, on humid ledge, 20 January 2011, *Søchting 11516* (C); Rothera Point, Reptile Ridge, 67.5574S, 68.1528W, alt. 250 m, on soil and moss, 24 January 2011, *Søchting 11551* (C), all paratypes.

Massalongia intricata: Collections reported by Olech (1989, 1994, 2004).

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