

Species of myxomycetes new to Sweden with additional records of some rarely collected species

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Eleven species of myxomycetes are formally reported from Sweden for the first time, namely *Collaria lurida*, *Cribraria persoonii*, *Diderma cinereum*, *Fuligo leviderma*, *Lamproderma pseudomaculatum*, *Physarum crateriforme*, *Stemonitis pallida*, *Stemonitopsis amoena*, *S. gracilis*, *S. subcaespitosa* and *Symphytocarpus impexus*. A possibly undescribed species of *Macbrideola* is discussed and illustrated. New records of several rarely collected species are cited, among them *Hemitrichia abietina*, *H. leiotricha* and *Physarum diderma*. The great variation of *Physarum crateriforme* in moist chamber cultures is discussed.

Key words: Swedish myxomycetes, *Macbrideola*, *Physarum crateriforme*, *Stemonitopsis*

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Introduction

A foray in the provinces of Norrbotten and Lappland in north Sweden, north of 65°30'N, in August 2007 yielded four species of myxomycetes new to Sweden as well as several records of species new to this part of the country. Eleven species new to Sweden are reported in this paper based on records from various provinces. Included are also several new records of selected species collected only a few times before. A deviant collection of *Macbrideola* possibly representing an undescribed species is discussed and illustrated.

Two papers (Marstad 1995, Kylin 1998) with altogether six field-related new records, *Badhamia nitens* Berk., *Badhamiopsis cavifera*

Nann.-Bremek. & Y. Yamam., *Licea operculata* (Wingate) G. W. Martin, *Reticularia splendens* Morgan, *Stemonaria longa* (Peck) Nann.-Bremek., R. Sharma & Y. Yamam. and *Stemonitis lignicola* Nann.-Bremek., were mistakenly overlooked in the most recent summary of Swedish myxomycetes (Eliasson & Gilert 2007). This brings the total number of species now formally reported from Sweden to ca 225. Some of the records based on literature reports remain to be verified.

Although most species of myxomycetes appear to be more or less ubiquitous, developing where the ecological conditions and microhabitats are right, many species show distinct preferences for special climate zones. Few species appear to be absolutely restricted to a particular

region or climatic zone, and most species may occasionally be found as isolated individuals outside their typical distribution area. Relevant examples relating to Sweden are the two species *Hemitrichia calyculata* (Speg.) M. L. Farr and *H. serpula* (Scop.) Rostaf. which are very common in tropical to warm-temperate regions but have so far been found only once and twice, respectively, in Sweden. The first species is known from the province of Västergötland (Gothenburg), the second from the provinces of Västergötland (Gothenburg) and Södermanland. Both species have conspicuous fruitbodies and should have been more frequently collected had the species been more common. The likewise predominantly tropical to warm-temperate species *Physarella oblonga* (Berk. & M. A. Curtis) Morgan has been found in Sweden only under greenhouse conditions (Kylin 1998).

List of species

Species are treated in alphabetical order. The taxonomy follows that of Lado (2001). Provinces of Sweden are cited from south to north. Records resulting from moist chamber cultures have been indicated with "mc", other records are field collections. The collection date of moist chamber developments is that when the substratum was collected. Unless stated otherwise specimens are deposited in herbarium GB.

Arcyria affinis Rostaf.

Norrboten: 25 km SE of Älvsbyn, Nature Reserve Lustgården, Aug 2007 *Eliasson & Adamonyte* 6923.

In Sweden previously known from a single collection from Torne Lappmark in the province of Lappland (Schinner 1983).

Badhamia lilacina (Fr.) Rostaf.

Västergötland: Tölleby, Sep 2001 *Eliasson* 5731, Oct 2006 *Eliasson* 6617. *Västmanland*: Ramnes, Aug 1990 *Jansson s. n.* *Norrboten*: Vicinity of Sikfors, Aug 2007 *Eliasson & Adamonyte* 6716, 6729.

The holotype is from the province of Småland in Sweden. This is the first time the species is reported from other Swedish provinces.

Collaria lurida (Lister) Nann.-Bremek. (*Comatricha lurida* Lister)

Representative specimens from different provinces:

Halland: Ca 20 km ENE of Falkenberg, mc, July 2003 *Eliasson & Gilert* 6143; Särö Västerskog, Sep 2005 *Eliasson* 6404. *Västergötland*: Tölleby, mc, Jan 2008 *Eliasson* 6949. *Norrboten*: Sikfors, Aug 2007 *Eliasson & Adamonyte* 6712.

Collected in the field and obtained in mc cultures on decaying wood of *Picea* and *Quercus*. The widely separate records indicate a widespread, probably common species although overlooked and not previously reported from Sweden.

Cribraria microcarpa (Schrad.) Pers.

Halland: Särö Västerskog, May 2003, mc, *Eliasson & Gilert* 6094, Jan 2007, mc, *Eliasson* 6659. *Västergötland*: Tölleby, Dec 2006, mc, *Eliasson* 6650. *Norrboten*: Vicinity of Sikfors, Aug 2007 *Eliasson & Gilert* 6718.

Although previously reported only from the provinces of Öland and Småland (Santesson 1964) this is almost certainly a common species over most of Sweden but easily overlooked in the field due to its small size. Most fruitbodies have been obtained in moist chamber cultures.

Cribraria persoonii Nann.-Bremek.

Norrboten: Ca 5 km S of Sikfors, Aug 2007 *Eliasson & Adamonyte* 6866.

Characteristic features of this species are dark-stalked globose sporothecae 0.5-0.8 mm diam., a sharply delimited radially wrinkled or striate peridial cup normally with narrow more or less finger-like projections along the margin, slightly thickened nodes of the peridial net and spores 6-7.5 µm in diam. Like in several members of the genus as currently accepted the variation range in several morphological characters overlaps those of other species.

This is the first record of this species from Sweden.

Diderma cinereum Morgan

Norrboten: Ca 1 km S of Sikfors, ca 35 km WSW of Luleå, on *Dicranum* in moist conifer forest with forest floor covered with *Sphagnum* and *Dicranum*, Aug. 2007 *Eliasson & Adamonyte* 6756; between Sikfors and Älvsbyn, Aug. 2007 *Eliasson & Adamonyte* 6786.

The species has not previously been reported from Sweden.

Didymium crustaceum Fr.

Ångermanland: Anundsjö, Sep 1973 *Strid* 13713 (GB, S). Jämtland: Ström, Vågdalen, Sep 1972 *Strid* 11655. Västerbotten: Vännäs, Sep 1971 *Strid* 8992. Norrbotten: Sikfors, Aug 2007 *Eliasson & Adamonyte* 6872.

Apart from an early citation (Fries 1849) from the province of Västergötland no records of this species have ever been published from Sweden.

Fuligo leviderma H. Neubert, Nowotny & K. Baumann

Representative specimens from different provinces:

Bohuslän: Hisingen, Aug 1982 *Eliasson* 3432. Västergötland: Halleberg, Sep 1974 *Hallingbäck s. n.*; Härskogen Nature Reserve, Sep 1994 *Eliasson* 4712; Partille, Oct 2002 *Niklasson s. n.* Närke: Snavlunda, Nov 2003 *Nilsson s. n.*; Viby, Nov 2007 *Nilsson s. n.* Uppland: Ärentuna, Sep 1942 *Lundell s. n.*

An autumn or late-autumn species which is probably spread over the greater part of Sweden but which, until less than two decades ago, has been overlooked and probably generally regarded as a form of the variable *Fuligo septica* (L.) F. H. Wigg. Decaying wood and bark of *Populus* appears to be the favoured substratum.

Hemitrichia abietina (Wigand) G. Lister

Norrbotten: Vicinity of Sikfors, on decaying wood, Aug 2007 *Eliasson & Adamonyte* 6758.

In Sweden previously known from the provinces of Uppland and Ångermanland (Fries 1912).

Hemitrichia leiotricha (Lister) G. Lister

Västergötland: Vårgårda, Mar 1968 *Eliasson* 2586; Alingsås, Östad Säteri, mc, Apr 2007 *Eliasson & Sjögren* 6682.

A rarely collected species in Sweden, previously reported from the provinces of Uppland and Jämtland (Santesson 1964). The Swedish records show a wide range of different substrata (dead branches of *Betula*, withered rachises of *Dryopteris*, dead leaves of *Elymus* and *Loiseleuria*). Dead stems of *Calluna* have been cited as a common substratum for this species in Great Britain (Ing 1999).

Lamproderma pseudomaculatum Mar. Mey. & Poulain

Dalsland: Rännelanda, on dead *Populus* leaves on the ground, Apr 1972 *Andersson s. n.* (dupl. det. M. Meyer).

A so-called snow-line myxomycete reported for the first time from Sweden.

Licea operculata (Wingate) G. W. Martin

Halland: Särö Västerskog, mc, Sep 2006 *Eliasson* 6600. Västergötland: Alingsås, Östad, mc, April 2007 *Eliasson & Sjögren* 6677. Lappland: Lycksele, Tannfors, mc, April 2005 *Eliasson & Forsberg* 6325.

Obtained in mc cultures on mosses and on leaf and herb litter.

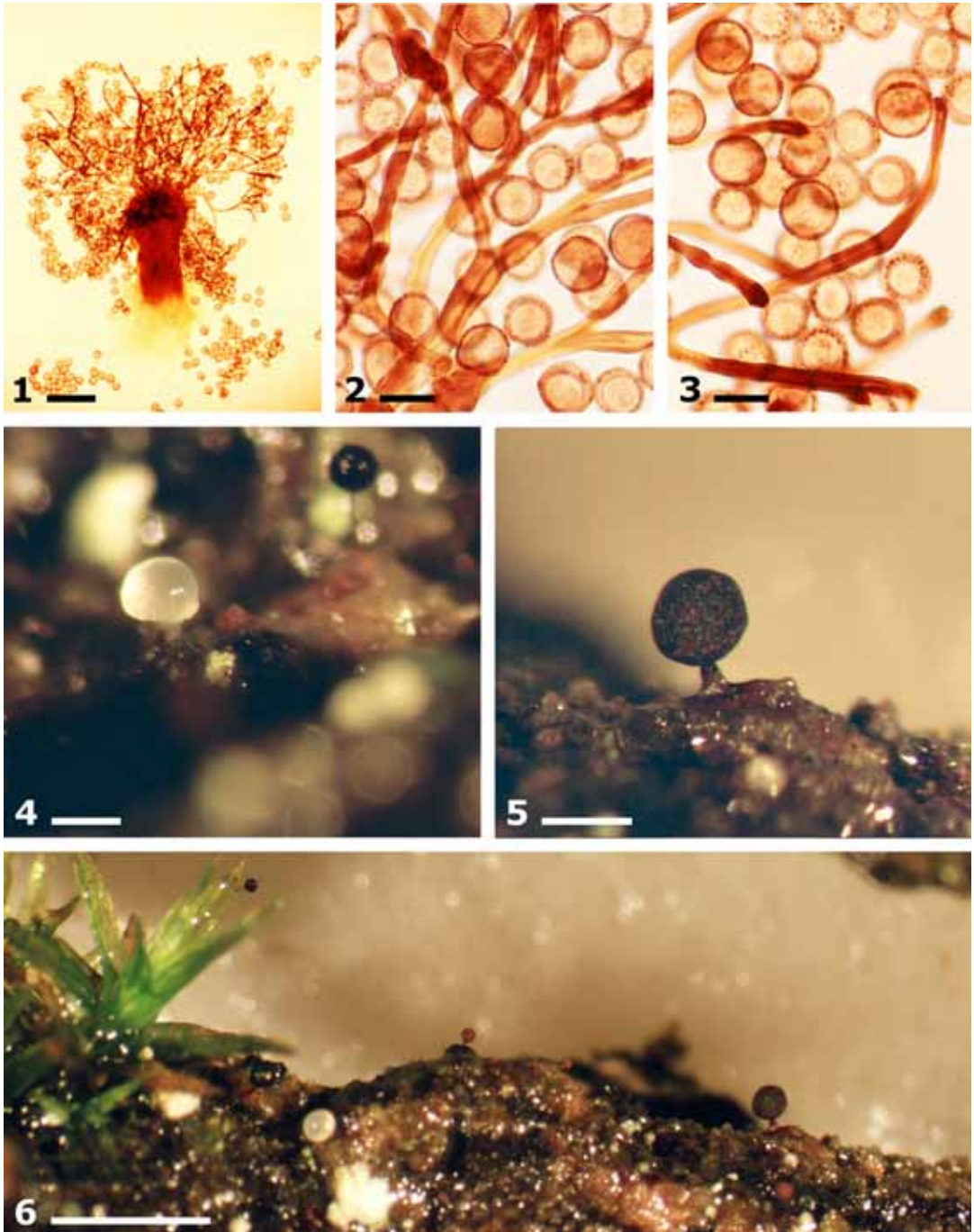
This species was first mentioned from Sweden by Marstad (1995) without providing locality. It is probably a common species but overlooked due to its small size.

Macbrideola sp. – Figs. 1–6

Västergötland: Alingsås, Nohaga, mc culture on bark from living *Acer platanoides*, Aug 2006 *Eliasson* 6578.

Sporothecae globose, 0.20–0.25 mm in diameter (Fig. 5). Stalk mostly robust, shorter to somewhat longer than the sporotheca diameter, translucent at the base, ending in a rounded somewhat swollen columella (Fig. 1). Capillitial threads ca 3.5 µm wide at the base, dichotomously branched, mostly blunt at the apex (Fig. 3) or ending in an up to 5 µm long pointed tip. Spores (Figs. 2, 3) ca 9.5 µm, pale by transmitted light, faintly warted and with darker patches formed by aggregation of warts.

A few sporocarps developed on the substratum in close association with sporocarps of *Macbrideola cornea* (G. Lister & Cran) Alexop. (Fig. 6). Although the variation in stalk length and diameter of sporotheca is considerable, the sporotheca is conspicuously larger than that of *M. cornea* and the stalk is shorter and wider. The rounded swollen columella is very different from that of the latter species. No differences in spore structure can be seen under the light microscope and the possibility of a monstrous development of *M. cornea* has been considered. Further investigations will await the results of additional cultures.



Figs. 1–6. *Macbrideola* sp. (Eliasson 6578). – 1: Slide preparation of whole fruitbody showing translucent stalk base and rounded columella. Bar: 50 μ m. – 2, 3: Capillitium and spores. Bar: 10 μ m. – 4: Immature fruitbody. Bar: 0.2 mm. – 5: Mature sporocarp. Bar: 0.2 mm. – 6: Moist chamber culture with immature (left) and mature (right) fruitbodies. The small fruitbodies in the background are *Macbrideola cornea*. Bar: ca 1 mm.

***Physarum crateriforme* Petch**

Västergötland: Töllesjö, mc, Oct 2005 *Eliasson* 6429, 6436, Mar 2007 *Eliasson* 6662, Oct 2008 *Eliasson* 7021, 7024.

All specimens are moist chamber cultures on bark from living *Acer platanoides* and are from the same locality. The specimens cited are very different from typically developed sporocarps of *P. crateriforme* and would be difficult to key out using standard identification literature.

Sporocarps are sessile or almost so, when dry 0.3–0.7 mm in diam. Columella is lacking and the degree of calcification highly variable. The capillitium varies from physaroid with just a few large nodes to badhamioid, in some sporothecae forming almost simple straight columns attached to the peridium in a way reminiscent of *Badhamiopsis*. Spores are mostly 10–12 µm, globose to somewhat ovoid, characteristically pale by transmitted light with evenly spaced distinct warts or short spines. In young moist sporothecae, at least when calcium is scarce or lacking, the spore mass shines through the translucent peridium and the outer peridial surface may have small invaginations corresponding to where capillitial spines are attached on the inside, a feature reminiscent of *Badhamiopsis*. There is a wide range of variation in the Swedish material in the degree of calcification and the structure of the capillitium. Although sporocarps are predominantly sessile, a tendency to a short black stalk may be seen in some sporocarps.

The great variability of this species and the wide range of deviant fructifications often developed in moist chamber cultures on bark have been commented on by several authors (Lister 1925, Eliasson et al. 1988, Keller 1999). Typically the species has calcified sporothecae on a robust black stalk as long as or longer than the sporotheca, and a cylindrical columella, as apparent from material studied from other parts of the world, for example several states on the American mainland, the Hawaiian Islands and the Galápagos Islands. The spores are distinctive throughout all material studied of this species.

Due to the great variation exhibited by *P. crateriforme* caution should be taken when describing new species with one or several characters, in particular spore structure, in common with that species. Unless accompanied by typically developed fruitbodies sessile acolumellate sporocarps with scanty or no calcium may be difficult

to identify. Many specimens left unidentified in herbaria may well represent forms of *P. crateriforme*. Mitchell's (2003) reduction of *P. columellatum* Nann.-Bremek. & Y. Yamam. to a variety of *P. crateriforme* seems well justified.

Although the thinly scattered sporocarps are inconspicuous and easy to overlook especially when scanty in calcium the species does not seem to be very common in Europe. It has not previously been reported from Sweden.

***Physarum diderma* Rostaf.**

Halland: Tjolöholm, extensive fruiting on large decaying log of *Quercus*, Oct 2001 *Eliasson* 5805.

This is the third Swedish record of this apparently rare species. The two previous collections are from Stockholm and were made in Oct 1882 and Nov 1891 (Harling 1952). Interestingly, they were taken at the same time of year and in the same type of habitat (parkland with broadleaf trees) as the collection cited above.

***Physarum rubiginosum* Fr.**

Lappland: Ca 4 km from Jokkmokk, just N of the Arctic Circle, Aug 2007 *Eliasson & Adamonyte* 6825. *Norrbottnen*: Vicinity of Sikfors, Aug 2007 *Eliasson & Adamonyte* 6771; ca 3 km S of Älvsbyn, Aug 2007 *Eliasson & Adamonyte* 6934. *Halland*: Falkenberg, Askome, Aug 1991 *Marstad* 28C-91.

Previously reported from the provinces of Småland, Östergötland, Uppland and Dalarna (Santesson 1964). Apparently a widespread species although seldom collected.

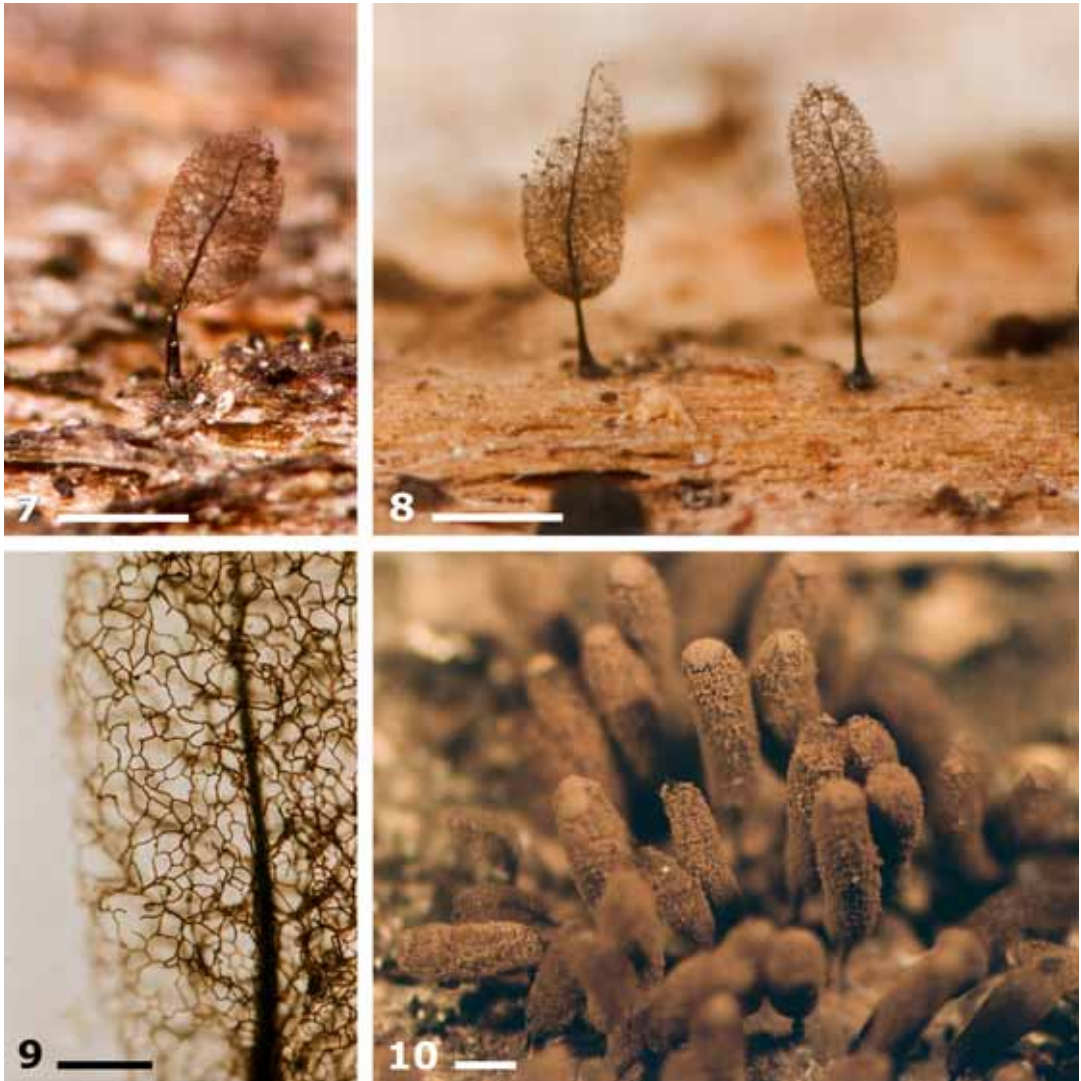
***Stemonitis pallida* Wingate**

Halland: 15–20 km E of Falkenberg, mc, Jul 2003 *Eliasson & Gilert* 6141. *Västergötland*: Askim, Jun 1995 *Eliasson* 4807.

Not previously reported from Sweden but probably an overlooked species.

***Stemonitopsis amoena* (Nann.-Bremek.) Nann.-Bremek. (*Comatricha amoena* Nann.-Bremek.)-Fig. 10.**

Västergötland: Mölndal, Jul 1996 *Eliasson* 4973. Töllesjö, Aug 1970 *Eliasson* 2649, Aug 1997 *Eliasson* 5198, Jul 1998 *Eliasson* 5334, Aug. 1998 *Eliasson* 5339, Aug 2001 *Eliasson* 5718, 5721. All specimens cited are from decaying wood of *Pinus* and *Populus*.



Figs. 7–9. *Stemonitopsis subcaespitosa*. – 7, 8: Mature fruitbodies with spores shed (7, *Eliasson & Adamonyte 6901*; 8, *Eliasson 5158*). Bars: 0.2 mm. – 9: Portion of capillitium showing peripheral net (*Eliasson & Adamonyte 6901*). Bar: 0.1 mm. – Fig. 10: *Stemonitopsis amoena* (*Eliasson 2649*). Bar: ca. 0.5 mm.

Although the ranges of spore size overlap somewhat in *S. amoena* and *S. hyperopta* (Meyl.) Nann.-Bremek., spores of the first species are generally slightly larger and darker in mass as well as seen by transmitted light. Spores of *S. hyperopta* may be almost colourless by transmitted light. The reticulate spore ornamentation in *S. hyperopta* is made up of faint bands, whereas bands are intermixed with warts or short spines in

S. amoena and the number of meshes is higher. The species is new to Sweden.

Stemonitopsis gracilis (G. Lister) Nann.-Bremek. (*Comatricha pulchella* var. *gracilis* G. Lister)

Norrbotten: Ca 5 km S of Sikfors, field collection, Aug. 2007 *Eliasson & Adamonyte 6860*; a group of sporocarps developed in close association with sporocarps of *Physarum notabile* T.

Macbr. on a small *Pinus* twig in the litter layer of open *Pinus* forest on rocky *Cladina*-covered ground.

Total height of sporocarps 1-1.2 mm; spores ca 7 µm, warted, wall thinner on one side; capillitial surface net incomplete.

The species is new to Sweden.

Stemonitopsis subcaespitosa (Peck) Nann.-Bremek. (*Comatricha subcaespitosa* Peck) – Figs. 7–9

Västergötland: Töllsjö, Jul 1971 *Eliasson* 2856, 2863, Jul 1997 *Eliasson* 5158, 5180. *Norrbottnen*: Ca 5 km from Älvsbyn along road to Piteå, Aug. 2007 *Eliasson & Adamonyte* 6898, 6901; on ground-facing side of decorticated decaying branch of *Pinus* on rocky *Cladina*-covered ground in open *Pinus* forest.

Sporocarps ca 1 mm tall; spores 9.5-10.5 µm, faintly but distinctly warted and tending to being paler on one side.

The species is new to Sweden.

Symphycarpus impexus Ing & Nann.-Bremek.

Västergötland: Göteborg, Västra Frölunda, May 2007 *Eliasson* 6689. *Värmland*: Övre Ullerud, July 1996 *Lundqvist* 20458 (S).

The species has not previously been formally reported from Sweden.

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