

Eleven Myxomycete species new to Finland

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The following 11 Myxomycete species new to Finland are described: *Clastoderma debaryanum*, *Comatricha longipila*, *Cribraria atrofusca*, *C. mirabilis*, *C. pertenuis*, *C. stellifera*, *Licea eleanorae*, *Physarum braunianum*, *P. flavicomum*, *P. mutabile* and *Stemonitis marjana*. *Cribraria pertenuis*, *C. stellifera*, *C. longipila* and *L. eleanorae* were collected from moist chamber cultures. The rest of the specimens were collected from field. The known biota of Myxomycetes in Finland now includes altogether 225 species.

Key words: Myxomycetes, Finland, distribution

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Introduction

The aim of the present paper is to introduce 11 new Myxomycete species for Finland. The latest extensive publication of Finnish Myxomycetes by Härkönen & Varis (2012, in Finnish) presented altogether 213 species based on specimens stored in Finnish herbaria (H, JOE, JYV, KUO, TUR, OULU). Since then Kunttu et al. (2013) presented one new species for Finland – *Dianema corticatum* Lister – and several new findings from the Åland Islands. Knowledge about biodiversity of Myxomycetes in Finland still remains incomplete.

Material and methods

The specimens were obtained from collections made directly in the field and from moist chamber cultures prepared with samples of various types of organic material known to support the growth of Myxomycetes. The material examined is deposited in the herbaria of Turku University (TUR) and Natural history collections of Jyväskylä University Museum (JYV). The description of each species is based on the writers' own observations and measurements of the listed specimens. Total 30 spores of each species were measured to obtain the range and to calculate the mean value. The nomenclature of the species is revised using an on line nomenclatural information system of Eumycetozoa (Lado 2005-2016). The notes on the general distribution are based on Poulain et al. (2011) and Global Biodiversity Information Facility, GBIF (2016). The grids are given in Finnish uniform grid 27°.

List of Species

Clastoderma debaryanum A. Blytt – Fig. 1

Specimen examined: Pohjois-Häme. Muurame, Kuusimäki, grid 6902196:341764, on a slightly decayed trunk of *Pinus sylvestris*, 1.VI.2015 Prättälä (JYV LC.14575).

Sporangia gregarious, erect or slightly bended, stalked, total height 1–2 mm. *Stalk* long, slender and flexuous, dark brown at the base and granular matter inside, light yellowish brown and thinner towards the top. A conspicuous, translucent, yellow to red-brown swelling at 2/3 of the height, after which it becomes darker (Fig. 1). *Sporocysts* globose, dark brown from the spore mass, about 1/5 of the total height. *Hypothallus* small and inconspicuous. *Peridium* stays as fragments in the tips of capillitium and sometimes as a collar on the stalk. *Columella* short or absent. *Capillitium* erect, branching dichotomously 2–3 (4) times, pale yellowish brown in transmitted light. *Spores*, minutely warted, some of them irregular in outline, 8.5–9.5–11 µm in diam.

Easy to identify to genus level based on the stalk and the peridial fragments in the tips of the capillitium. Cosmopolitan (Poulain et al. 2011) having over 600 records all over the world according to GBIF (2016). Nearest records from Sweden, Russia (GBIF) and Lithuania (Adamonytė 2007).

Comatricha longipila Nann.-Bremek. – Figs. 2, 3

Specimens examined: Varsinais-Suomi. Turku, Ruissalo, grid 671198:323193, in moist chamber culture on a decayed log of *Quercus robur*, I.2015 Karhilahti (TUR 205645); Raisio, Kuloinen, grid 671753:323665, in moist chamber culture on a decayed *Pinus sylvestris* stump, 18.IV.2016, collected 15.V.2016 Karhilahti (TUR 206311).

Sporangia in small groups, stalked, dark brown, total height 1.5–2.5 mm. *Stalk* blackish brown, 1/3 of total height. *Sporocysts* cylindrical or ovoid, 0.3–0.6 mm in diam (see Fig. 2). *Hypothallus* inconspicuous. *Peridium* evanescent. Thin collar usually present at the tip of the stalk. *Columella* black, reaching almost the top of the sporocyst

(see Fig. 3). *Capillitium* branching dichotomously 3–4 times, the main branches perpendicular to the columella, many ± horizontal free ends, dark brown. *Spores* pale red-brown, warted, 6.0–7.0 µm in diam, spore mass dark brown.

As noted by Nannenga-Bremekamp (1991): “*C. longipila* is characterized by the lax internal capillitium, with long free ends at the periphery and its small spores.” Over 40 records of *C. longipila* all over the world (GBIF 2016). Found from Europe, USA, and Australia.

Cribraria atrofusca G.W. Martin & Lovejoy – Figs. 4, 5

Specimen examined: Pohjois-Häme. Muurame, Kuusimäki, grid 6902449:3421997, on a highly decayed trunk of *Picea abies*, 9.V.2015 Prättälä (JYV LC.14574).

Sporangia gregarious and mostly erect, sessile, total height 1.5–3 mm. *Stalk* slender, purple-brown, nearly black, rather long. *Sporocysts* globose to pyriform, shiny, dark purplish brown (see Fig. 4), diameter 0.4–0.7 mm, 1/6 to 1/4 of total height. *Hypothallus* indistinct, brown, small. *Peridium* remains as a cup with horizontal granular bands and longitudinal folds (see Fig. 5). *Peridial net* regular with few free ends, nodes dark brown to almost black, angular and irregular in shape, granular. Granules pale brown to dark red-brown, 1–2.5 (3) µm in diam. *Spores* minutely warted, sometimes with an irregular network of small ridges on the surface, 6.5–8–8.5 µm in diam, spore mass dark red-brown.

C. atrofusca resembles *C. dictyospora* G.W. Martin & Lovejoy, but the latter has short transverse lines of dark granules in the cup and more conspicuous folds on the spores. Cosmopolitan (Poulain et al. 2011). According to GBIF (2016) there are altogether 46 records from Norway, France, Germany, Austria, Mexico, Russia and Japan. Records also from Lithuania (Adamonytė 2007), China (Schnittler et al. 2013) and New Caledonia (Kylin et al. 2013).

Fig. 1. *Clastoderma debaryanum*, the conspicuous swelling in the stalk (JYV LC.14575). – Photo: A. Puisto

Figs. 2. *Comatricha longipila*. Stalked sporangia (TUR 205645). – Photo: A. Karhilahti

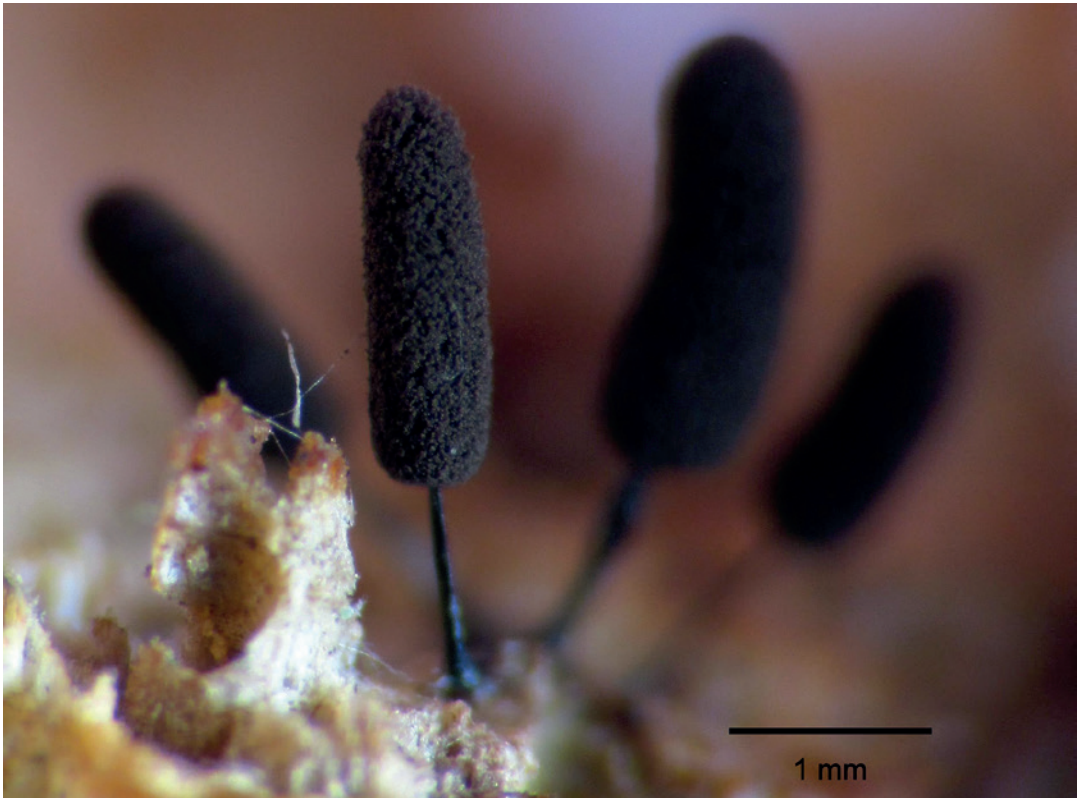
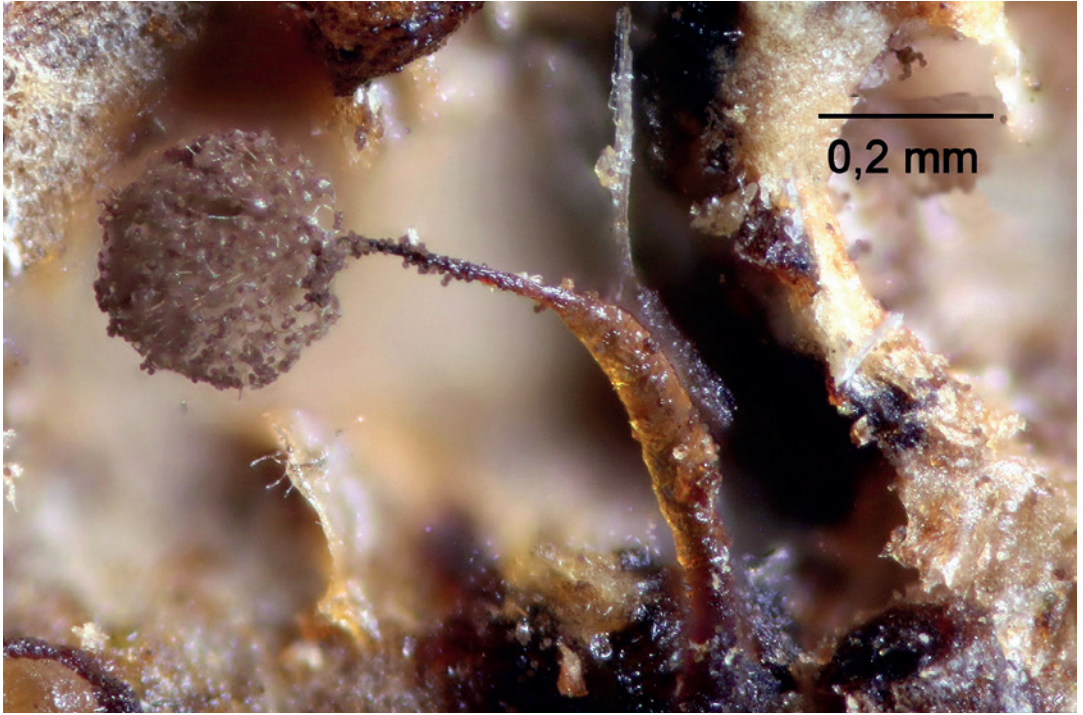




Fig. 3. *Comatricha longipila*. Columella and capillitium. Primary branches of the capillitium at right angles to the columella, branching dichotomously (TUR 205645). – Photo: A. Karhilahti



Fig. 4. *Cribraria atrofusca*. Pyriform sporocysts and purplish brown coloration. Angular and almost black nodes of the peridial net (JYV LC.14574). – Photo: A. Puisto

Cribraria mirabilis (Rostaf.) Masseur

– Figs. 6, 7

Specimen examined: Etelä-Häme. Tampere, Kauppi, grid 6826907:3330232, on a highly decayed trunk of *Picea abies*, 10.VII.2016 Varis 424 (TUR 206316).

Sporangia gregarious, stalked, erect or curved, often 2 to 3 sporangia twined together (see Fig 6), total height 1.5–3 mm. *Stalk* furrowed, red-brown to blackish, about 1/3 of the sporangium. *Sporocysts* globose or subglobose, iridescent red-brown, 0.7–1 mm in diam. *Hypothallus* indistinct. *Peridial cup* small and irregular or absent. *Peridial net* membranous and shiny, consisting 30 or more iridescent and flattened longitudinal ribs, which are joined laterally by thin threads. Ribs form an irregular network in the upper part of the sporocyst, nodes lacking (see Fig 7). The ribs and often the spores bearing dark dictydine granules, 1–2 µm in diam. *Spores* light reddish-brown, minutely and unevenly warted. Warts tend to form a very faint reticulation, seen at 1000 x magnification, 6–6.5–7 µm in diam, spore mass reddish-brown.

C. mirabilis resembles *C. cancellata* (Batsch) Nann.-Bremek. *C. cancellata* has more longitudinal ribs (40 to 50) than *C. mirabilis* and the ribs usually reach the top of the sporocyst. *C. cancellata* has rarely a minute apical net [in var. *anomala* (E. Jahn) Y. Yamam.] whereas longitudinal ribs of *C. mirabilis* give rise to an apparent network. *C. cancellata* also has a longer stalk (3 to 7 times sporocyst's diam).

According to GBIF there are 127 records all over the world (2016). Widely distributed. Reported from Europe, North-America, New Zealand and Japan. Nearest findings from Norway, Denmark and Sweden. Known also from Brazil (Cavalcanti et al. 2006) and Costa Rica (Stephenson & Rojas 2008).

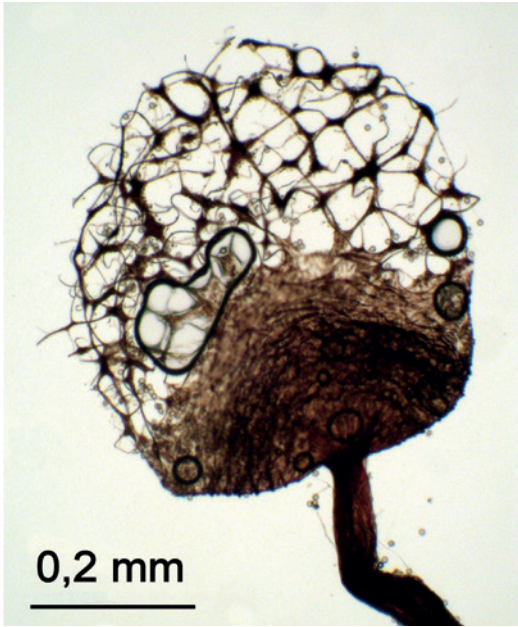


Fig 5. *Cribraria atrofusca*. Cup with horizontal granular bands (JYV LC.14574). – Photo: E. Varis



Fig. 6. *Cribraria mirabilis*. Sporangia twined together (TUR 206316). – Photo: A. Puisto

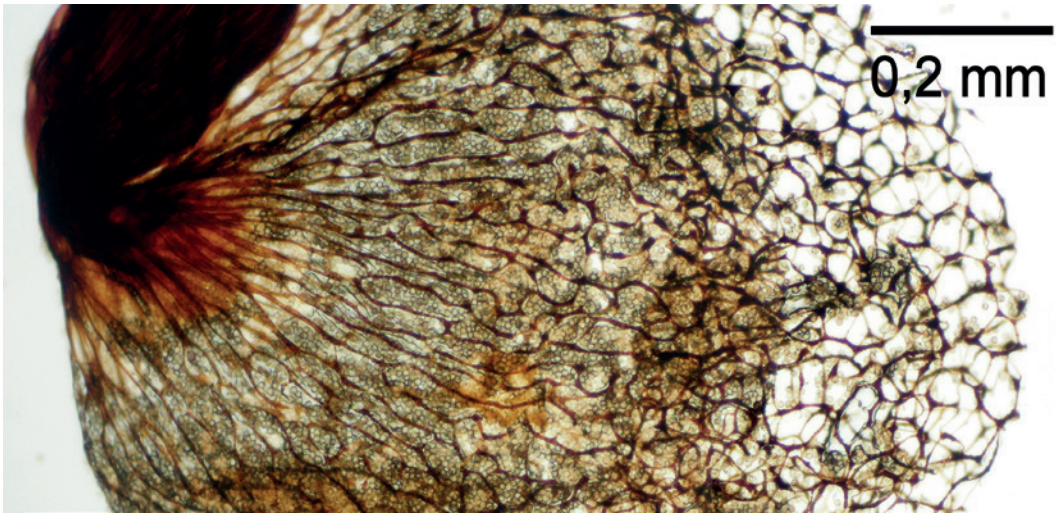


Fig. 7. *Cribraria mirabilis*. Small peridial cup and distinctive net in the upper part of the sporocyst, the net without nodes (TUR 206316). – Photo: E. Varis

Cribraria pertenuis Flatau & Schirmer

– Fig. 8

Specimens examined: Varsinais-Suomi. Raisio Kuloinen, grid 671753:323665, on a decayed stump of *Pinus sylvestris*, moist chamber culture, 18.IV.2016, collected 15.V.2016 *Karhilahti* (TUR 205644); **Sompion Lappi.** Sodankylä, Ukkoluosto, grid 74488:34966, on a decayed stump of *Pinus sylvestris*, moist chamber culture 5.VIII.2016, collected 20.VIII.2016 *Karhilahti* (TUR 206310); Sodankylä, Luosto, Aarnilampi E-beach, grid 7450632: 3497230, on a rotten trunk of *Pinus sylvestris*, moist chamber culture 5.VIII.2016, collected 10.XI.2016 *Karhilahti* (TUR 205642).

Sporangia solitary or a few sporangia together, stalked, ochre to yellowish brown, total height 0.8–1 (1.6) mm. *Stalk* slender, dark brown, thicker and paler at the base. *Sporocysts* globose, ochre brown, small, 0.08–0.17 mm in diam. *Hypothallus* concolorous or colourless. *Peridial cup* reduced, edge with granules (2 µm in diam) and low irregular ridges, 1/5–1/4 of the sporocyst. *Peridial net* with few (4–6) meshes from base to top (see Fig. 8). Nodes angular, with few free ends, small, covered in dictydine granules. *Spores* globose, pale brown, warted with some larger warts, 7–8 µm in diam, spore mass yellowish brown.

C. pertenuis resembles *C. macrostipitata* H. Neubert & Nann.-Bremek. *C. macrostipitata* has a longer stalk (3–5 mm) and bigger sporocysts (0.3–0.5 mm in diam) and the peridial net has more meshes. According to GBIF there are two records from France (2016). Bochynek (2015) has collected the species from ten different locations in Poland.

Cribraria stellifera Nowotny & H. Neubert

– Figs. 9, 10

Specimen examined: Varsinais-Suomi. Turku, Kuninkoja, grid 671763:323771, on a decayed stump of *Picea abies* in moist chamber culture, 25.XII.2015, collected VI.2016 *Karhilahti* (TUR 205643)

Sporangia in scattered groups. *Stalk* slender, narrowing towards the sporocyst (see Fig. 9), dark,

tapering up to 2.5 mm high. *Sporocysts* yellowish ochre, 0.25–0.30 mm in diam. *Peridial cup* reduced, almost planar with low ridges, edge covered with the same size of granules as attached to the net nodes (2–3.5 µm). *Peridial net* nodes chubby, with several free ends (up to 5), blackish (see Fig. 10). *Spores* light yellow brown, minutely warted, 8.5–9 µm in diam, spore mass yellowish ochre to light brown.

C. stellifera is one of the small-sized *Cribraria* with yellow or ochre sporocyst; resembling *C. macrostipitata*, *C. pertenuis* and *C. microcarpa* (Schrad.) Pers. *C. stellifera* has more free ends on the net nodes and the spores are little bit bigger. The granules of the specimen are not as big as in the original description (3–4 µm, Neubert et al. 1993). According to GBIF *C. stellifera* has been found five times, twice from Germany and France and once from Australia (2016).

Licea eleanorae Ing

– Fig. 11

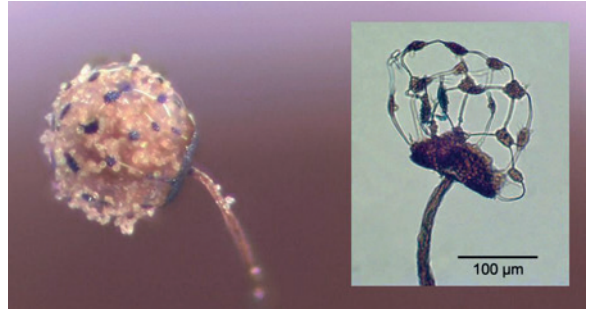
Specimen examined: Varsinais-Suomi. Raisio, Kuloinen, grid 671756:323662, in moist chamber culture on death *Sambus racemosa* branch, 15.II.2015, collected III.2015 *Karhilahti* (TUR 202598).

Sporangia in loose groups, stipitate, total height 0.3–0.5 mm. *Stalk* robust, wrinkled, dark brown, height 0.2–0.35 mm. *Sporocysts* obovoid, blunt at apex, covered with crystals and refuse matter (see Fig. 11), area of dehiscence as a greyish band in the middle of the sporocyst, clearly visible in fresh fructifications, 0.1–0.15 mm in diam. *Hypothallus* scanty, almost black. *Peridium* double, outer layer dark coloured with golden iridescence, containing refuse matter. *Spores* subglobose, pale yellow, smooth, 8–11 µm in diam.

According to Wrigley de Basanta & Lado (2005): "L. eleanorae is unlike any other stipitate *Licea* covered with birefringent crystals." According to GBIF (2016) and Wrigley de Basanta & Lado (2005) there are about ten records from Europe and Thailand.

Fig. 8. *Cribraria pertenuis*. Peridial net with only few meshes with dark, flat, angular nodes. (TUR). – Photo: A. Karhilahti & V. Rinne

Fig. 9. *Cribraria stellifera*. The long stalk and dark nodes of the peridial net (TUR 205643). – Photo: A. Puisto



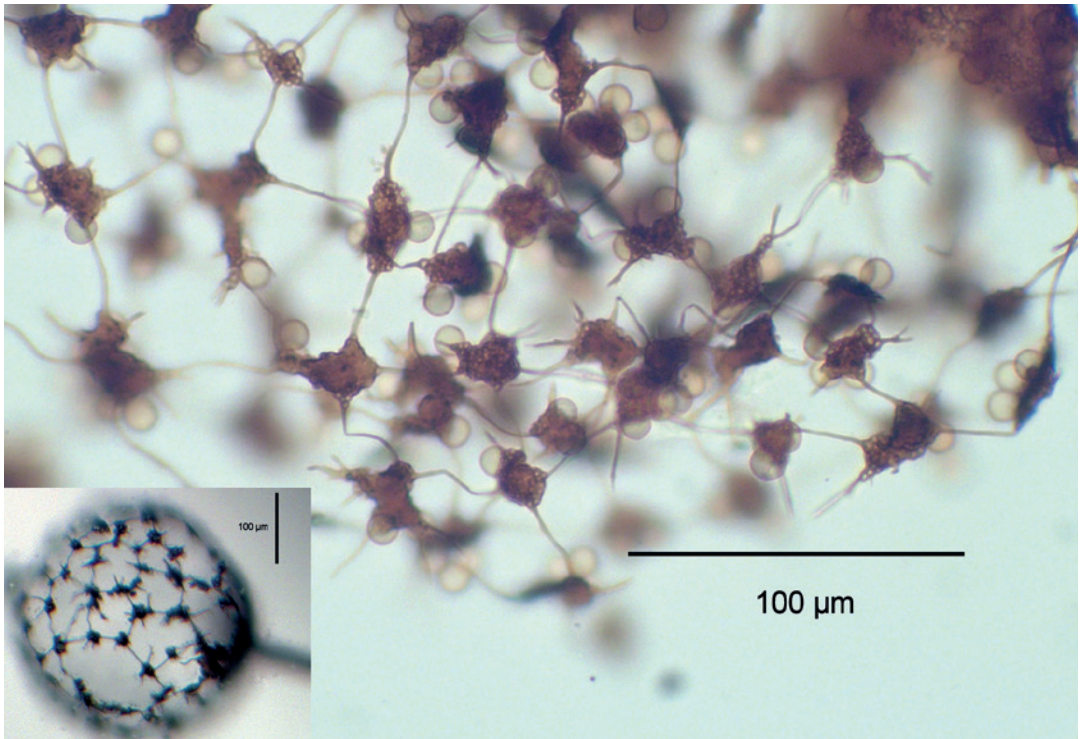


Fig. 10. *Cribraria stellifera*. Nodes of the peridial net with several free ends (TUR 205643). – Photo: A. Karhilahti

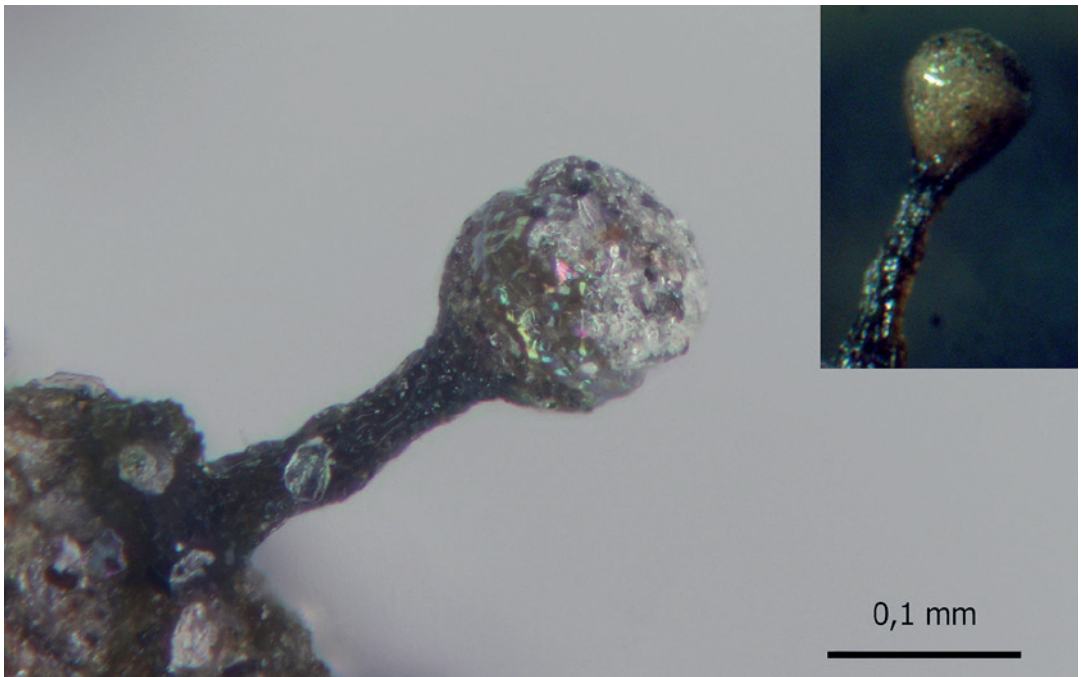


Fig. 11. *Licea eleanorae*. Blunt sporocyst covered with crystals and refuse matter (TUR 202598). – Photo: K. Kaunisto & A. Karhilahti

Physarum braunianum de Bary – Fig. 12

Specimen examined: Etelä-Häme. Pirkkala, Killo Nature Reserve area, grid 6821805:3323351, on dead stems of annual *Apiaceae*-plants, 20.VIII.2016 *Varis* 421 (TUR 206315).

Sporangia scattered to loosely gregarious, sessile, total height 0.5–0.8 mm. *Sporocysts* subglobose or obovoid, constricted at base, orange-yellow to brownish orange, 0.5–0.7 mm in diam. *Hypothallus* lacking or indistinct. *Peridium* membranous, colourless, covered with clusters of yellow or brownish orange lime granules which often form angular fragments (see Fig. 12). *Columella* lacking. *Capillitium* a dense network of hyaline threads with small, angular or lightly branched, yellowish brown to brownish lime nodes about 25–40 µm in diam. *Spores* light brown, minutely and unevenly warted with slightly packed darker groups of warts, 7.5–8–8.5 µm in diam, spore mass dark brown.

Other *Physarum* species with single peridium and red-brown or orange-brown colours are *P. lateritium* (Berk. & Ravenel) Morgan and *P. rubiginosum*. Fr. & Palmquist. The orange surface granulation and small, angular and yellowish or brownish lime nodes of the capillitium of *P. braunianum* are the main separating characteristics between these species. Over 30 collections around the world (GBIF 2016). Reported from Europe (the nearest collection from Germany), North and South America and Japan (Zoll & Stephenson 2013). Found also in Taiwan (Liu et al. 2002).

Physarum flavicomum Berk. – Fig. 13

Specimen examined: Etelä-Häme. Nokia, Katajisto, grid 6818943:3308481, on decayed bark of *Picea abies*, 28.VIII.2016 *Varis* 423 (TUR 206314).

Sporangia loosely clustered, stalked, often nodding, total height 1–2 mm. *Stalk* slender, greyish brown, darker at the base, light yellow and thinner near the sporocyst. *Sporocysts* lenticular, flattened below, covered with deciduous, thin, greyish yellow lime particles (see Fig. 13), up to 0.5 mm in diam. *Hypothallus* radiating or indistinct, brownish, small. *Peridium* delicate,

often nearly limeless with blue and golden iridescence, fragmenting into small flakes which remain attached to the capillitium. Part of the peridium remains as a colourless plate at the base of the sporocyst. *Columella* lacking. *Capillitium* persistent, radiating from base to top and may form branches, nearly colourless in transmitted light. Lime nodes of the capillitium scanty, yellow and irregular, small. *Spores* light violaceous brown, roughly and unevenly warted with some scattered groups of warts, 9–9.5–10 µm in diam, spore mass brown.

It's easy to confuse *P. flavicomum* with a few similar species. Other colourful *Physarum* species with lenticular, subglobose or oblate sporocysts are for instance *P. bethelii* T. Macbr. ex G. Lister and *P. viride* (Bull.) Pers. *P. flavicomum* is distinguished by its small, irregular, scanty, yellow or orange lime nodes and notable metallic iridescence in the lower part of the sporocyst. *P. bethelii* tends to have bigger spores (up to 12 µm) and sporocysts are broadly umbilicated below. Sporocysts of *P. viride* are covered with a persistent thick calcareous layer. Widely distributed, cosmopolitan (Poulain et al. 2011). Nearest finding from Norway (GBIF 2016). Recent reports from Vietnam and Japan (Tran et al. 2014, Liu et al. 2013).

Physarum mutabile (Rostaf.) G. Lister – Fig. 14

Specimen examined: Pohjois-Karjala. Rääkkylä, Oravisalo, grid 6916302:3629045, abundant growth on living stems of *Impatiens glandulifera*, 22.VII.2016 *Varis* 407 (TUR 206312).

Various types of fructification in the same population: erect, stalked or sessile sporangia and different-sized plasmodiocarps (see Fig. 14), sporangium being the most abundant type, total height 0.5–1 mm. *Stalk*, when present, yellowish, occupying up to 1/5 of sporangium. *Sporocysts* subglobose to ovoid or prolate, pale grey or almost white with faint tinge of blue, 0.4–0.6 mm wide. *Hypothallus* membranous, ochraceous or white. *Peridium* single, fragile, thin, wrinkled, usually with lime deposits. *Capillitium* dense, reticulate, the lime nodes white and irregular, varying in size. Lime nodes forming persistent, cylindrical, yellowish white or white pseudo-

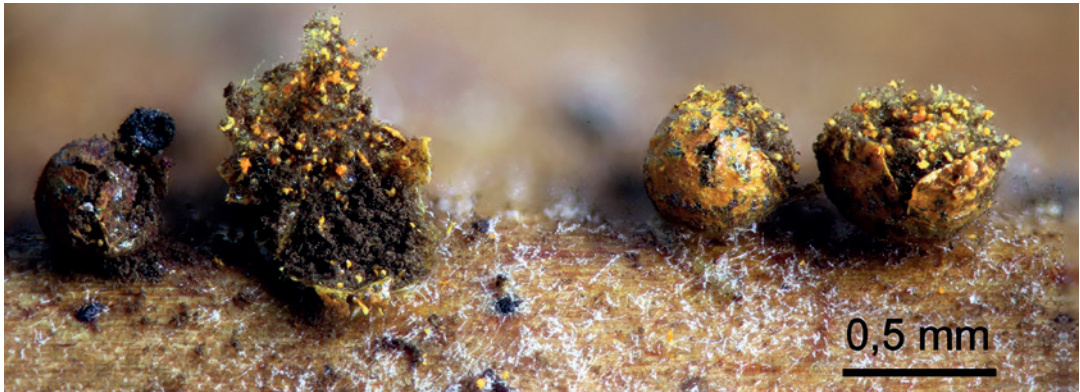


Fig. 12. *Physarum braunianum*. Loosely gregarious sporangia, peridium with clusters of orange to brownish lime granules (TUR 206315). – Photo: A. Puisto



Fig. 13. *Physarum flavicomum*. Stalked sporangia and lenticular sporocysts with metallic iridescence, capillitium radiating from base to top (TUR 206314). – Photo: A. Puisto



Fig. 14. *Physarum mutabile*. Different growing types: stalked and sessile sporangia and plasmodiocarps (TUR 206312). – Photo: A. Puisto



Fig. 15. *Stemonitis marjana*. Reddish sporangia, sporocysts rounded at both ends (TUR 206313). – Photo: A. Puisto

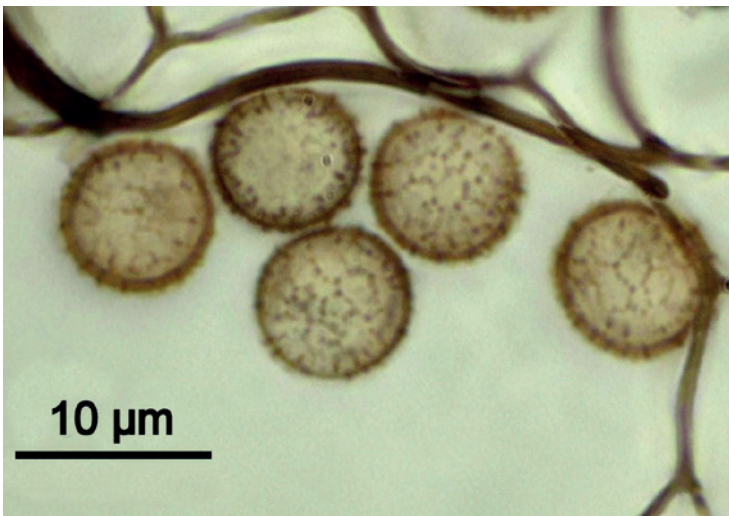


Fig. 16. *Stemonitis marjana*. Typical ornamentation of the spores: a net of flexuous rows of large and small spinules (TUR 206313). – Photo: J. Korhonen

columella in the centre of the sporocyst (see Fig. 15). *Spores* pale purple-brown, unevenly warty, 8.5–9–10 µm in diam, spore mass dark brown.

P. mutabile is difficult to identify because of its variable habitus. When the sporangia are present one is able to identify the species by the erect prolate sporocyst, single and fragile peridium and robust pseudocolumella. Widely distributed, cosmopolitan (GBIF 2016, Poulain et al. 2016). Nearest finding from Sweden. Recent records from Italy and Japan (Compagno et al. 2012, Liu et al. 2013).

Stemonitis marjana Y. Yamam. – Figs. 15, 16

Specimen examined: **Etelä-Häme.** Tampere, Tesoma, grid 6826557:3319414 on a decayed trunk of coniferous tree, 28.VII.2016 *Varis* 410 (TUR 206313).

Sporangia clustered in a small colony, stalked, reddish brown, total height 3–4 (5) mm. *Stalk* perforated at the very base, shining, black, about 1/5 of sporangium. *Sporocysts* cylindrical, rounded at both ends (see Fig. 16). *Hypothal-lus* common to the colony, membranous, light brown. *Columella* narrowing upwards and nearly reaching to the apex, almost black. *Capillitial threads* arising from the entire length of the columella, branching and anastomosing, forming an angular-meshed internal net and complete, dense surface net, free ends pointing outwards, pale red brown in transmitted light. *Spores* pale reddish brown, unevenly spinulose, forming an irregular reticulation of spines without connecting bands between the spines (see Fig. 16), spinules up to 1 µm long, 7–7.5–8.5 µm in diam, spore mass reddish brown.

Small size, reddish colour and ornamentation of the spores (spines forming a disjointed net) are typical characteristics of this species. Not common. Found from Japan and Netherlands (GBIF 2016). A fresh record from China (Bo & Yu 2016).

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