Taxonomic novelties and new records of Fennoscandian crustose lichens

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Abstract

We present taxonomic, distributional and ecological notes on Fennoscandian crustose lichens and lichenicolous fungi, based on new collections as well as revision of herbarium material. Two new combinations are proposed: Frutidella furfuracea comb. nov. for F. pullata and Puttea duplex comb. nov. for Fellhanera duplex. Lecidea byssoboliza, L. carneoglauca and Variolaria torta are all reduced to synonymy with Bacidia antricola, Bacidia invertens is synonymized with B. igniarii, B. atrolivida with Mycobilimbia tetramera, and Gyalidea fruticola with Thelenella pertusariella. A new description is provided for Micarea hylocomii. 25 species of lichens and lichenicolous fungi are reported as new to Finland, Norway and/or Sweden: Absconditella lignicolia (Norway), Bacidia antricola (Norway), B. polychroa (Norway), B. pycnidata (Sweden), Bacidina adastra (Sweden), Biatora veteranorum (Norway), Briancoppinsia cytospora (Finland), Catillaria scotinodes (Norway), Cliostomum subtenerum (Norway), Dirina fallax (Sweden), Fellhaneropsis alnquistiorum (Norway), Gyalidea subscutellaris (Sweden), Lecania inundata (Norway), L. suavis (Norway), Micarea capitata (Norway), M. diminuta (Norway), M. hylocomii (Sweden), M. lynceola (Sweden), M. soralifera (Sweden), M. subconfusa (Sweden), Mycoblastus sanguinarioides (Finland, Sweden), Paralecia pratorum (Sweden), Puttea duplex (Sweden), Sarcogyne algoviae (Finland) and Toninia subnitida (Norway). Lectotypes are designated for Bacidia antricola, Lecidea byssoboliza, Lecidea carneoglauca, Lecidea subconfusa and Lecidea submoestula.
Key words
Ascomycota, lectotypification, lichens, Ramalinaceae, Pilocarpaceae

Introduction

The diversity of lichen-forming and lichenicolous fungi in Fennoscandia is often considered to be reasonably well-known, yet new species are discovered continuously. In 2004, the Fennoscandian checklist included 2414 lichen-forming species (Santesson et al. 2004), while the most recent one includes 2538 species (Nordin et al. 2017). Although new discoveries of macrolichens are indeed made (e.g., Arvidsson et al. 2012, Frödén and Thell 2010, Klepsland 2013, Westberg et al. 2015, 2016), the main uncharted territory is found within the world of small, crustose lichens (e.g., Arup et al. 2014, Ekman 2015, Svensson and Palice 2009, Westberg et al. 2011, 2015, 2016). Crustose lichens comprise about two thirds of all lichens in Fennoscandia, but the taxonomic status, distribution and ecology of several hundred of these species are virtually unknown. The aim of this paper is to contribute to the understanding of Fennoscandian crustose lichen species by reporting a number of species as new to one or more Fennoscandian countries and by providing taxonomic and nomenclatural novelties, including new combinations, synonymizations and lectotypifications, on a series of crustose lichens and lichenicolous fungi.

Material and methods

Light microscopy measurements were made on material mounted in water using an oil-immersion lens, with a precision of 1 µm. Only well-developed ascospores lying outside the asci were measured. Measurements of asci and paraphyses of *Micarea hylocomii* were made on material cut to sections 12–18 µm thick using a freezing microtome and stained with lactophenol cotton blue. HPTLC was performed using the method described by Arup et al. (1993). Coordinates are in the WGS84 map datum unless otherwise stated.

Taxonomy

*Absconditella lignicola* Vězda & Pišút

New to Norway. Reported from much of the Northern hemisphere as well as Tasmania (Coppins 2009a, Urbanavichus 2010).

In Norway, this species has usually been collected from the upper side of large, relatively recently decorticated logs of *Picea abies*, but once also on a stump (not cut). It has, however, also been collected on logs of *Populus tremula* and *Pinus sylvestris*. The species is mostly found in association with slimy biofilms, in Norway often accompanied by *Micarea peliocarpa* (Anzi) Coppins & R.Sant. All Norwegian finds have been made in lowland *Picea* forests in the Oslofjord area. Most of the localities are characterized by high productivity with moderate to large amounts of dead wood.


**Bacidia antricola** Hulting


**Variolaria torta** Taylor in Mackay, Fl. Hibern. 2: 114 (1836), nom. rejic. prop. (ICN Art. 56.1). – Type: Ireland, Co. Kerry, “shaded rocks, Askew Wood”, T. Taylor (BM 000974464, holotype or syntype, seen by SE).


**New synonyms.** New to Norway. Previously known from the United Kingdom, Ireland, Sweden, the Netherlands, Luxembourg, Belgium, Germany, Austria, and the Czech Republic (Hulting 1872, Bouly de Lesdain 1910, van den Boom et al. 1999, Palice 1999, Aptroot et al. 2004, Coppins and Aptroot 2009, Berger and Türk 1993, Wirth et al. 2013, Diederich et al. 2014). Previously reported from Norway by Santesson et al. (2004), but the material on which this report was based has later been shown to be misidentified.

The types of *Variolaria torta*, *Bacidia antricola*, *Lecidea carneoglauca*, and *L. byssoboliza* are clearly conspecific. *Variolaria torta*, by far the oldest name, has after its introduction only been briefly mentioned by Adams (1909) and Zahlbruckner (1928) as a dubious name. Therefore, in the interest of nomenclatural stability, a proposal to reject *Variolaria torta* has been submitted (Ekman 2017). The type material of this name in BM consists of a small but well preserved and readily identifiable specimen with abundant pycnidia but no apothecia, sent to W. J. Hooker by Taylor. Among the remaining names, the combination *Bacidia carneoglauca*, introduced by Smith (1911) is currently the most widely used. However, *Bacidia antricola* was validly published in the dissertation of Johan Hulting no later than 27 May 1872 (Hulting 1872) and is consequently older than *Lecidea carneoglauca*. *Bacidia antricola* has been included in every subsequent lichen flora or checklist of Swedish lichens (e.g., Fries 1874, Forsell and Blomberg 1880, Magnusson 1936, Santesson 1984, Foucard 1990, Foucard 2002). Furthermore, there are reports under this name from Belgium (Bouly de Lesdain 1910), as well as a further Swedish record (Hulting 1925). Therefore, this name is adopted here. The lectotype of *Bacidia antricola* selected here is the largest and most well developed of the five available syntypes, with numerous pycnidia and several apothecia in various states of development.

Although geographically widely separated, both of the newly discovered Norwegian sites for *B. antricola* are situated close to the west-coast, with an oceanic climate. At both sites, the species grew on somewhat metal-enriched rocks in shady and humid situations, below overhanging cliffs and sheltered from rain. At the southernmost locality, the species was largely confined to steep or almost vertical rock walls at the entrance of an old (copper?) mine. The entrance to the cave is situated in a steep ESE-facing hillside, close to but well above the fjord, and is surrounded by a lush forest dominated by *Corylus avellana*, *Fraxinus excelsior*, and *Ulmus glabra*. At the northern locality, the species was mainly found on horizontal or slightly inclined rocks along a small stream, deep underneath an overhang at the bottom of a small but topographically uneven south-facing hill. The surrounding forest is dominated by *Betula pubescens* and *Populus tremula*, with scattered *Corylus avellana*.

**Additional specimens examined:** NORWAY: Hordaland, Kvinnherad, Djupevika (Varaldsøy naturreservat), på skyggefullt, jernrikt berg i gruveåpning. Rik edelløvskog,
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Bacidia igniarii (Nyl.) Oxner


New synonym. Bacidia invertens was listed as an accepted species by Stenroos et al. (2016). The type material, however, consists of a well developed and typical specimen of Bacidia igniarii, and the former is consequently reduced into synonymy. There is some doubt whether the specimen in H was the only one available to Vainio at the time of description. Surprisingly, there does not seem to be any material of B. invertens deposited in TUR (Alava 1988).

Bacidia polychroa (Th.Fr.) Körb.


New to Norway. This species is distributed across Europe and eastern temperate North America (Ekman 1996). Reports from other areas of the world probably represent other species. Bacidia polychroa is red-listed as threatened or regionally extinct in a number of countries where it has been assessed, viz. Sweden (ArtDatabanken 2015), Finland (Jääskeläinen et al. 2010), Germany (Wirth et al. 2011), and the United Kingdom (Woods and Coppins 2012).

The Norwegian find of B. polychroa was made at the base of an old Acer platanoides situated in a narrow and rather deep ravine in a region of mixed temperate woodland composed of e.g. Corylus avellana, Fagus sylvatica, Fraxinus excelsior, Picea abies, Pinus sylvestris, Quercus robur, and Ulmus glabra. The site is sheltered and characterized

**Specimen examined:** NORWAY: Vestfold, Larvik municipality, Fjærevardåsen E, on bark at base of old *Acer platanoides* in a deep, narrow wooded ravine, 59.1873°N 10.0515°E, alt. 150 m, 23 June 2016, J. T. Klepsland JK16-420 (UPS L-785596).

### *Bacidia pycnidiata* Czarnota & Coppins

Fig. 1A–B

Lichenologist 38: 407 (2006). – Type: Czech Republic, Eastern Sudetes, Rychlebské hory Mts, W of Bila Voda village, vicinity of worked-out quarry of marble ‘Kukačka’ near the border of Poland, 50°26′18″N 16°53′14″E, alt. c. 360 m, on bryophytes over marble rock within mixed spruce-ash forest, 23 April 2004, P. Czarnota 4157 (GPN, holotype, not seen; E, UGDA, isotypes, not seen).

**New to Sweden.** *Bacidia pycnidiata* has been reported from Belgium, Poland, the Czech Republic, Slovakia, Lithuania, Estonia, Finland, Ukraine, and Russia (Republic of Mordovia and Republic of Adygea) in Europe, as well as the Republic of Buryatia south of Lake Baikal in Asian Russia (assuming that the watershed through Greater Caucasus is taken as the geographic border between Europe and Asia) (Czarnota and Coppins 2006, Suija et al. 2007, Erzt et al. 2008, Pykälä 2008, Motiejūnaitė et al. 2011, Dymytrova 2013, Maliček et al. 2014, Urbanavichus and Urbanavichchus 2013, Urbanavichene and Urbanavichus 2014, Urbanavichene and Palice 2016). The species is mostly found on trunks of deciduous trees and shrubs, either directly on the bark or over bryophytes, in more or less shady and humid habitats. The autecological amplitude seems to be wide, however, and there are scattered finds on coniferous trees, more or less moribund cyanolichens, soil, as well as stones (or bryophytes on stones) on the ground, including metal-rich waste (Vondrák et al. 2010, Czarnota and Hernik 2014 in addition to references above). It has been suggested that the species is favoured by anthropogenic impact (Czarnota and Hernik 2014), although its ecological repertoire also includes semi-natural old-growth forests (Suija et al. 2007).

The Swedish find was made on bark of an old *Acer platanoides* in a semi-open stand of *Quercus robur* in a grazed field. The locality is situated at the outskirts of the town of Kalmar, and the surroundings consist partly of cultivated fields, partly of urbanized land (roads, housing, manufacturing, commerce, small airport etc.). Although frequently reported only in an anamorphic state, *B. pycnidiata* was found to produce abundant apothecia in the Swedish site.

**Specimens examined:** SWEDEN: Småland, Kalmar par., Hagbygärde, ekbacke S om Lantmännen, grov lönn i ekdominerad betad hagmark, 56.67492°N 16.30616°E,
Figure 1. A–B *Bacidia pycnidiata* (UPS L-681835), A group of apothecia B pycnidia with long and curved necks. C–D *Bacidina adasta*. C close-up of thallus with apothecia, note intermingled black fibers belonging to the polypropylene fabric on which the specimen grows (UPS L-779918) D overview of thick, sterile thallus (UPS L-779932). Scale bars: 0.25 mm (A–B), 1 mm (C–D).

27 September 2011, T. Knutsson 2011-067 (UPS L-681835). ESTONIA: Jõgevamaa, Puurmani comm., Altnurga village, Pikknurme forestry, Altnurga ash forest, alt. 20–30 m, 58°32'40"N 26°17'00"E), on a fallen Prunus padus, 22 June 2005, G. Thor 18981 (UPS L-159702).

**Bacidina adastra** (Sparrius & Aptroot) M.Hauck & V.Wirth

Fig. 1C–D)


New to Fennoscandia. This species has been reported from the Netherlands, Belgium, United Kingdom, Ireland, Germany, Poland, Estonia, Czech Republic, Austria, Switzerland, France, Ukraine, Armenia, and Ecuador (Sparrius and Aptroot 2003, Kubiak and Sparrius 2004, Aptroot et al. 2005, Aptroot and Honegger 2006, Vondrák 2006, Coppins and Aptroot 2009, Khodosovtseva 2009, Berger and Priemetzhofer 2010, Roux 2012, Gasparyan and Sipman 2016). In several instances, however, reports have been based on sterile material, a questionable practice given that the species does not produce any secondary substances. In an addendum to Smith et al. (2009) (available at [http://www.britishlichensoociety.org.uk/recording-mapping/downloads](http://www.britishlichensoociety.org.uk/recording-mapping/downloads), accessed 21 November 2016), **Bacidina adastra** is considered rare and strongly over-reported, being confused with crusts of free-living green algae. Morphologically, **B. adastra** is somewhat reminiscent of **B. neosquamulosa** (Aptroot & Herk) S. Ekman, which in its current delimitation may turn out to include more than one species. **B. neosquamulosa** in the strict sense forms imbricate, finely dissected microsquamules that may later disintegrate to form goniocysts. **B. adastra**, on the other hand, starts out as minute, sometimes somewhat flattened, granules that soon bud off new granules in a more or less coralloid manner, the end result being a thick, finely granular and pale green crust. In addition, the thallus surface tends to be more shiny in **B. neosquamulosa** than in **B. adastra**.

In Fennoscandia, **Bacidina adastra** is currently known from two sites in southern Skåne. The first find was made in a churchyard surrounded by houses in an otherwise open, agricultural landscape, where the species occurred in fair quantity and sparingly fertile on a young, planted Ulmus. The second find was made in the northern outskirts of the town of Lund, in public plantations with a variety of shrubs where the ground had been covered by a black fabric of non-woven polypropylene to prevent weeds from establishing. This fabric is colonized by a variety of lichens, mostly crustose lichens during the first years, whereas later successional stages are dominated by Peltigera didactyla (With.) J.R.Laundon and species of Cladonia. The crustose lichen flora is richest in species and individuals in slopes with moderate shade from shrubs.
Slopes seem to be preferred because leaf litter does not easily accumulate on the fabric. The richest spots are downhill from fences cutting through the plantations, where the concentration of metal ions is probably high. Apart from large spots of abundantly fertile *Bacidina adastra*, other lichens encountered on the ground cover fabric were *Agonimia globulifera* M.Brand & Diederich, *Bacidina chloroticula* (Nyl.) Vězda & Poelt, and *Peltigera didactyla*.


*Biatora veteranorum* Coppins & Sérus.


The Norwegian finds were made on old and hard wood, in one case on the underside of a decorticated, leaning trunk of *Sorbus aucuparia* in a rain-sheltered site under an over-hanging rock, and in two other cases on wood of very old but living *Taxus baccata*, both on the underside of decorticated branches and on vertical surfaces inside a hollow trunk. All known localities consist of humid oldgrowth forests dominated by spruce and aspen or by birch and aspen. No apothecia were observed in the Norwegian sites, but numerous white and stalked pycnidia were present. Conidia in the Norwegian specimens measure c. 4 × 1.5 µm, and the photobiont is chlorococcoid, 6–15 µm diam. By comparison, conidia and photobiont cells in an isotype of *Catillaria alba* (UPS L-030528) measure 3.1–4.2 × 1.5–1.9 and 7–13 µm, respectively.

**Additional specimens examined:** NORWAY: Aust-Agder, Evje og Hornnes, Prestøygardsvatnet Ø, på hard ved på undersiden av lutende gammel rogn, skyggefull

**Briancoppinsia cytospora** (Vouaux) Diederich et al.


New to Finland. *Briancoppinsia cytospora* is widespread in Europe and has also been reported from the United States. (Diederich et al. 2012). In Fennoscandia, the species has previously been reported from Norway and Sweden (Santesson 1993). A member of the Arthoniaceae (Arthoniales), this species is a lichenicolous fungus on *Lecanora conizaeoides* Nyl. ex. Cromb., *Cladonia* spp., *Pertusaria* spp., and various parmelioid lichens (Diederich et al. 2012). It is recognized by the globose pycnidia with initially punctiform ostioles that later expose the white conidial mass, the KI+ red pycnidial gel, and the slightly curved conidia measuring 5.8–6.8 × 1.6–2.0 µm (Diederich et al. 2012).

*Briancoppinsia cytospora* was first encountered on *Hypogymnia physodes* (L.) Nyl. growing on *Ulmus*. Subsequently, we examined all Finnish collections of *H. physodes* in herbarium UPS, which resulted in five additional finds.

**Specimens examined:** FINLAND: Nylandia, 3 km SE Helsinki downtown, Suomenlinna (Sveaborg) fortress, on *Ulmus glabra*, elev. 15 m, 60°08’38”N 24°59’08”E (WGS84, ±150 m), 31 July 2016, G. Thor 33920 (UPS). Regio Aboensis, Raisio, base of Kullavuori hill, 26 May 1969, R. Alava, K. Alho & U. Laine (UPS L-189538, filed under *H. physodes*). Tavastia australis, Toijala, 15 August 1931, G. Degelius (UPS L-086913, filed under *H. physodes*). Tavastia australis, Kylmäkoski, Taipale in vicinity of the farm Matti Seppälä, 28 March 1965, L. Kärenlampi (UPS L-189542, filed under *H. physodes*). Savonia borealis, Pielavesi, W-Sävä, Alava prope Matopuro, 10 October 1960, A. J. Huuskonen (UPS F-785388). Ostrobottnia Media, Nykarleby, Döbeln-monumentet, 27 June 1957, G. Degelius (UPS L-086920, filed under *H. physodes*).
Catillaria scotinodes (Nyl.) Coppins
Fig. 2A


New to Norway. Previously reported from Sweden (Coppins 1994), United Kingdom (Coppins 1989), and Switzerland (Groner 2006). Reports from the Ukraine of ‘Catillaria aff. scotinodes’ (Khodosovtsev et al. 2007), based on material that is similar to C. scotinodes except in having brown instead of green pigment in the epihymenium, possibly refers to Catillaria aphana (Nyl.) Coppins or Bacidia freshfieldii (Vain.) Zahlbr.

The Norwegian locality is situated close to the Barents Sea, just within the southern part of the arctic climate zone. The site is characterized by dwarf-shrub heath and sharp rocky ridges of layered, steeply inclined, metamorphic rocks of varying composition, both acid and base-rich. Catillaria scotinodes was found growing on a fairly exposed ridge of calciferous sandstone with layers of dolomite.

Additional specimens examined: NORWAY: Finnmark, Vardø municipality, Persfjord NW, on ridge of calciferous sandstone in subarctic heath, fairly exposed, 70.4253°N 30.7574°E, alt. 40 m, 1 July 2014, J. T. Klepsland JK14-L355 (UPS L-785594). SWEDEN: Dalarna, Idre par., Mount Valåberget (just E of Idre), at the top of the very steep uppermost part of the mountain, on rocks in open situation, 61°50’N 12°49’E, alt. 600 m, 7 October 1989, R. Moberg 9040 (UPS L-13858). Jämtland: Åre par., Handöl Rapids in river Handölån, W of lake Ånnsjön, E shore of the river, S of the suspension bridge and N of the small hill with boulders c. 400 m SSW of the bridge, on flat part of schistose rock on the shore, 63°23’N 12°45’E, alt. 570 m, 31 July 1993, B. Owe-Larsson H93-47a (UPS L-696344). Lycksele lappmark, Tärna par., Ume älv, Strimasund, udde S om Strimasundet, svagt lutande kalkstrandklippa i övre geolitoral, 66°03’N 14°52’E, alt. 520 m, 1 September 1963, G. E. Du Rietz 700b (UPS L-132194).

Cliostomum subtenerum Coppins & Fryday


New to Norway. This species was recently described from two sites in the British Isles, one in Wales and one in Scotland (Fryday and Coppins 2012).

C. subtenerum was encountered at the Helgeland coast in central Norway, only 200 m from the coastline, where it occupied a shelf appearing on a roughly horizontal rock
face under an overhang formed by a big mica-schist boulder. This site is part of an extensive boulder field at the nearly horizontal north foot of the very steep Mt. Skjeggen. The boulder field is partly covered by open birch forest, while flat patches between the boulders are mostly covered by small bogs. Other notable lichens found at the site include *Coccotrema citrinescens* P.James & Coppins, *Pannaria hookeri* (Borrer ex Sm.) Nyl., *Spilonema paradoxum* Bornet, and *Sporodictyon cruentum* (Körb.) Körb. Although extensively searched for in the surrounding area, no additional finds were made.

Dirina fallax De Not.


New to Sweden. Dirina fallax is mainly distributed in the western part of the Mediterranean Region and along the Atlantic coast from northern Morocco to Scotland, with an outpost locality in the Canary Islands. Records from Baden-Württemberg in Germany and the South Bohemian and South Moravian Regions of the Czech Republic are geographically closest to the the Swedish locality (Tehler et al. 2013). However, Norwegian material determined as D. massiliensis Durieu & Mont. has not been examined by us and may partly represent D. fallax.

Dirina fallax was first collected in Sweden 1998 on Mt. Omberg in the province of Östergötland and was reported as D. massiliensis f. sorediata by Nordin and Hermansson (1999). They noted the siliceous substrate and the thin, dark thallus. The species was again observed at the same locality when visited by the Swedish Lichenological Society during an excursion in 2015 (Westberg and Arup 2016). The Swedish material is sorediate and lacks apothecia (see photograph in Westberg and Arup 2016, Fig. 3).

For a long time, Dirina fallax was treated as a synonym of D. massiliensis. Molecular data, however, show that they are distinct species, although closely related (Tehler et al. 2013). The shape and size of apothecia, ascospores and conidia as well as the secondary chemistry (erythrin, ± lecanoric acid and unidentified substances) are the same in both species. D. fallax, however, has a thinner and usually more brownish grey thallus compared to the thicker, whitish and chalk-like thallus of D. massiliensis (Tehler et al. 2013). The thallus and apothecial thalline margin of D. fallax vary considerably in colour, from dark brown over greyish to creamy white. D. fallax is confined to acidic rocks, D. massiliensis to calcareous rocks. Sorediate specimens of Dirina fallax are morphologically indistinguishable from sorediate specimens of D. canariensis Tehler & Ertz, which is considered endemic to the Canary Islands (Tehler et al. 2013).


Fellhaneropsis almquistiorum S.Ekman

New to Norway. Previously reported from central Sweden, central Germany (Ekman 2015), and Finland (Pykälä 2017).

The Norwegian finds are located c. 20 km apart in the area between the Oslofjord and lake Øyeren, in sheltered sites with old-growth bilberry-spruce forest. At both sites, the species was found exclusively on mineral-rich black biotite rock in deep shade, sheltered from rain and trickling water by overhanging rocks. The only associated lichen species recorded was *Brianaria lutulata* (Nyl.) S.Ekman & M.Svensson (found at both sites).

**Additional specimens examined:** NORWAY: Akershus, Enebakk municipality, Gaupestein, on deeply shaded rock (biotite gneiss) below huge overhang in old-growth bilberry-spruce forest, MGRS PM 1203 2028 [= 59.7054°N 10.9910°E], alt. 235 m, 17 May 2014, J. T. Klepsland JK14-L118 (O-L-206531, UPS L-785595). Oslo, Oslo kommune, Sarabråten N, på nesten vertikal bergflate (giumergneiss) i skyggefull berg-sprekk, bergskrent i eldre granskog, MGRS PM 0522 4106 [=59.8937°N 10.8806°E], alt. 230 m, 27 April 2014, J. T. Klepsland JK14-L678 (O-L-206547).

MycoBank: MB819390


**Remarks.** The complicated nomenclature of this species was clarified by Jørgensen et al. (2002, see also Printzen 1995). In summary, the oldest name is *Biatora furfuracea*, validly and legitimately described in 1864, while *B. amaurospoda* is either an invalid or illegitimate name (depending on whether it is considered effectively published or
not). *Lecidea furfuracea* (Anzi) Jatta is, however, not available in *Lecidea* because of the existence of an earlier homonym, *L. furfuracea* Pers., described in 1826. As pointed out by Jørgensen et al. (2002), the younger synonym *L. pullata* should therefore be used as long as the species is treated in *Lecidea*. However, when transferred to *Frutidella*, as was done by Schmull et al. (2011), the oldest epithet becomes available and *F. furfuracea* is consequently the correct name.

**Gyalidea subscutellaris** (Vězda) Vězda

Fig. 2B


New to Fennoscandia. When originally described, *Gyalidea subscutellaris* was placed in *Gyalecta* (Vězda 1960). It was found overgrowing mosses at a high-elevation locality in the Tatra Mountains of Slovakia. Later, it was reported from the Polish part of the Tatra Mountains (Flakus 2007) and in the United Kingdom (Gilbert et al. 2009). The species is characterized by small apothecia (up to 0.5 mm diam., but usually smaller) with a dark brown to black rim and a brownish concave disc, developed on an inconspicuous thallus encrusting soil and bryophytes on basic, metal-rich (Britain) or slightly acidic ground (Tatra). According to Gilbert et al. (2009), the ascospores are muriform and measure (15–)17–20(–22) × 7–10 µm. The Swedish material agrees well with the isotypes at UPS, except that ascospores in Nordin 6631 are poorly developed and do not exceed 16 × 8 µm. In addition, the disc is black and concolourous with the rim in this specimen, a phenomenon potentially caused by environmental factors. In southern Sweden (Gotland and Uppland), *G. subscutellaris* was collected on calcareous ground, whereas the northern sites in Jämtland are situated on metal-rich soil at an old copper mine as well as on acidic ground.

**Lecania inundata** (Hepp ex Körb.) M.Mayrhofer


New to Norway. This species is widely distributed in Europe and North America (Mayrhofer 1988, van den Boom and Ryan 2004).

The Norwegian specimen is typical of the species in having a coarsely papil late thallus surface. The papillae have a cortex and are larger than the blastidia in the otherwise similar *L. erysibe* (Ach.) Mudd. The material was collected in a steep, south-facing rock wall composed of calciferous meta-sandstone subjected to trickling water. The site is located close to the large river Lågen, near the bottom of the valley Gudbrandsdalen. This part of Gudbrandsdalen is one of the driest and most summer-warm places in Norway, with a weakly continental climate. Several saxicolous lichen species are, at least in modern times, largely confined to a limited inner section of this or a few neighbouring valleys, e.g. *Lecanora margacea* Poelt, *Lobothallia praeradiosa* (Nyl.) Hafellner, *Peltula placodizans* (Zahlbr.) Wetmore, *Rhizocarpon vorax* Poelt & Hafellner, *Squamarina magnussonii* Frey & Poelt, *S. pachylepidea* (Hellb.) Poelt, *Tönninia cinereovirens* (Schaer.) A.Massal., and *T. ruginosa* (Tuck.) Herre.

**Specimens examined:** NORWAY: Oppland, Sør-Fron municipality, Steberg S, kalkrikt skråberg, sigevannspåvirket, MGRS NP 5352 2443 [= 61.5496°N 10.0071°E], alt. 260 m, 4 August 2011, J. T. Klepsland JK11-L552 (O L-183713). GERMANY: Baden-Württemberg, “an Granitfelsen im Neckar bei Heidelberg”, before 1860, W. von Zwackh-Holzhausen in Zwackh-Holzhausen: Lichenes exsiccati 258 (UPS, probable topotype, seen by SE, according to Körber 1860 collected at the same or nearby locality as the lectotype).

**Lecania suavis** (Müll.Arg.) Mig.


New to Norway. Apparently widespread in much of Europe, although with a concentration of finds in Central Europe and relatively few finds in eastern Europe (Mayrhofer 1988, Gavrylenko and Khodosovtsev 2009, Urbanavichus and Urbanavichene 2011).

Currently known from two sites in northern Norway, both in the county of Troms. At both sites, the species was found growing on calcareous rock under overhangs, on
limestone and marble, respectively. Despite being sheltered from rain, both sites are fairly open and sun-exposed. The Balsfjord locality lies at the rim of a lake and is surrounded by birch forest, whereas the Lavangen locality is situated in the low-alpine zone.

**Specimens examined:** NORWAY: Troms, Lavangen, Kolbanelva S, på berghylle (marmor) under overheng, lavalpin sone, MGRS CB 7976 2104 [=68.6752°N 18.0363°E], alt. 650 m, 23 August 2015, J. T. Klepsland JK15-L853 (O-L-207256). Troms, Balsfjord, Sagelvatnet NV, på soleksponert kalkberg, under overheng, ferskvannsstrandsone, MGRS DB 2433 7833 [=69.2024°N 19.0902°E], alt. 96 m, 22 August 2015, J. T. Klepsland JK15-L827 (O-L-206522).

### Micarea capitata M.Svensson & G.Thor

Lichenologist 43: 401 (2011). – Type: Sweden, Härjedalen, “Tännäs parish, the E slope of Mt. Ramundberget, above the holiday village of Kvarnbäcken, subalpine deciduous forest, on *Hylocomium splendens* on boulder”, 62°41’654”N 12°23’662”E, alt. 730 m, 2 June 2007, M. Svensson 1004 (UPS L-532764, holotype, seen by MS).

New to Norway. Previously known only from two Swedish collections (Svensson and Thor 2011).

A small patch of this species was found growing on the upper side of a leaning (almost horizontal), moss-covered trunk of a living *Sorbus aucuparia* in an old-growth forest dominated by *Betula pubescens* and *Populus tremula*. The site lies close to the coast at the island Meløya in Nordland county, northern Norway. The site is further characterized by big boulders and a few vertical rock walls, which contribute to a sheltered and humid microclimate. *M. capitata* inhabited both *Hylocomium splendens* (Hedw.) Schimp and *Hypnum cupressiforme* Hedw. Another rare muscicolous lichen, *Gyalideopsis muscicola* P.James & Vězda, was found on the same trunk.

*Micarea capitata* is perhaps most likely to be confused with *M. hylocomii* Poelt & Döbbeler (see note under that species below). Another species similar to *M. capitata* is *M. olivacea* Coppins, which was not discussed by Svensson and Thor (2011). Our observations indicate that *M. olivacea* differs from *M. capitata* by having apothecia without a clearly constricted base, a dark olivaceous K+ green pigment in the hymenium and hypothecium, and abundant pycnidia (unknown in *M. capitata*). *M. olivacea* has been found growing on lignum and on rock, not over bryophytes (Coppins 1983, 2009b).

**Additional specimen examined:** NORWAY: Nordland, Meløy, Meløytinden N, på mosekledd, nesten liggende stamme av rogn, eldre bærling-osp-bjørkeskog omgitt av bergvegger og store steinblokker, MGRS VQ 3154 1489 [=66.8444°N 13.4397°E], alt. 25 m, 14 July 2016, J. T. Klepsland JK16-609 (O-L-206446).

Specimen examined of *Micarea olivacea*: Scotland, Caledonia, “Mid Ebudes: Mull, Aros, Drumfin, on V. C. 1o3, on a stump by a conifer plantation”, 15 May 1968, P. W. James (BM 000975572, holotype, seen by MS).
**Micarea deminuta** Coppins


New to Fennoscandia. Initially described on material from Belgium and Great Britain (Coppins 1995), the distribution of *M. deminuta* has proven to be wide. Apart from additional European records (e.g., the Czech Republic, Palice 1999; Poland, Czarnota 2007), the species is now also known from Japan, North America, and Tasmania (Coppins 2009b, Czarnota 2004).

The species was found colonizing an extensive area of soft wood on the upper side of a large, moderately to well decomposed log of *Populus tremula*. The site is an old-growth forest dominated by *Picea abies* and *Populus tremula*, between a lakelet in the east and a steep hill to the west, and consequently sheltered from direct sun. We also found an additional Norwegian specimen in UPS, where the species grew over plant debris, but any other ecological information is lacking.

**Specimen examined:** NORWAY: Aust-Agder, Åmli, Lyngvatn V, på myk yteved av morken ospelåg, eldre blåbær-smyle-granskog med osp, MGRS ML 6334 1262 [=58.7521°N 8.3665°E], alt. 455 m, 10 August 2016, J. T. Klepsland JK16-723 (O-L-206476). Hordaland, Ulvik, Finse, L. Finsenut, 21 July 1916, G. Einar Du Rietz (UPS L-598807).

**Micarea hylocomii** Poelt & Döbbeler

Fig. 2C


*Thallus* forming small patches on leaves of *Hylocomium splendens*, thin, faint grey-greenish grey, episubstratal. *Photobiont* cells regularly globose, 4–7 µm diam. (–10 µm according to Poelt and Döbbeler 1975), occurring in clusters inside the thallus. *Apothecia* numerous, scattered, immarginate, convex-hemispherical, ± adnate or sometimes with slightly constricted base, black or rarely grey (when young or when lacking green pigment), when wet often with a faint blue-green tinge, 0.06–0.12 mm diam. *Hymenium* indistinct, light–dark blue-green, sometimes with dark brown tinges, c. 5 µm high, K–, C–, N+ red. *Hymenium* hyaline to light-dark blue-green in streaks, 19–35 µm tall, C– (blue-green pigment rapidly fading), N± red, I+ blue, K–,KI+ blue. *Hypothecium* hyaline to light brown without any red or purple tinge, K–, C–, N– (N± red if the blue-green pigment reaches the hypothecium). *Paraphyses* few and difficult to discern, simple or sparingly branched, colourless, 1–1.5(–2) µm wide, apices not or slightly thickened (–3 µm wide), hyaline. *Exciple* not seen, even in sections of young.
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Apothecia. *Asci* clavate, apically thickened, 8-spored, with wall KI+ blue throughout the length of the ascus, 18–32 × 8–13 μm. *Ascospores* narrowly ellipsoid, straight or slightly curved, 0–1-septate, (7–)8–10(–15) × (1.5–)2(–3) μm. *Pycnidia* not seen.

**Chemistry.** Thallus K–, C–, Pd–, UV–. No lichen substances detected by HPTLC.

New to Sweden. Initially described from Austria (Poelt and Döbbeler 1975), *M. hylocomii* has subsequently been reported from Norway and Switzerland (Poelt and Buschardt 1978, Poelt, Plantae Graecenses, Lichenes, no. 94).

After noting some discrepancies between the Scandinavian material and the original description, we examined all available material of *M. hylocomii*, including the holotype. The main difference between our new description and the original one concerns the paraphyses, which Poelt and Döbbeler (1975) described as having spherical apices with dark brown or black pigment hoods. Generally, the extremely small size of the apothecia and the scarcity of paraphyses make these characters difficult to observe, but although the apices are slightly thickened in the Scandinavian material, no dark brown or black pigment hoods were seen. Subsequent examinations revealed that there are no such apical pigment hoods in the holotype either. However, the dark blue-green and brown pigments present in *M. hylocomii* are often concentrated to the upper part of the apothecium and seemingly adhere to the outer surface of the paraphyses, thus sometimes giving the impression of faint pigment hoods. Another discrepancy concerns the ascospores, which Poelt and Döbbeler (1975) described as 1-septate, but there are non-septate ascospores present in the holotype. There is generally some variation in the proportion of simple and 1-septate ascospores between the specimens, ranging from the exclusively simple ascospores in Svensson 725 to the mostly 1-septate ascospores in Svensson 1050.

The anatomy of the paraphyses as well as the uniformly KI+ blue ascus wall led Poelt and Döbbeler (1975) to suggest that *M. hylocomii* belongs in an undescribed genus, an opinion that was shared by Coppins (1983). As described here, however, the anatomy of the paraphyses is not clearly inconsistent with a placement in *Micarea*, which is true of most other characters as well (e.g. ascospores, size of the photobiont). Unfortunately we were, in spite of many attempts, unable to observe a well-developed apical apparatus. As noted by the original authors, however, the asci do seem somewhat unusual in displaying a strong, uniformly KI+ blue reaction throughout their length. Whether this is an indication of a different generic affiliation than *Micarea* should be further investigated using molecular methods.

In Norway and Sweden, *Micarea hylocomii* has always been collected on *Hylocomium splendens*, usually where the bryophyte is hanging down the vertical side of a boulder, though not in rain-protected situations. The species has been found on one- to three-year-old shoots of its host, indicating that its substrate is short-lived and that *M. hylocomii* is adapted to frequent dispersal. The ubiquitousness of its host suggests that *M. hylocomii* is likewise common. Jørgensen (1996) suggested that *M. hylocomii* could be a suboceanic species. Although the number of collections is too low to enable an evaluation of this suggestion, *M. hylocomii* may at least turn out to have quite
specific requirements in terms of humidity, since most of the localities are quite humid, either because they are situated in swampy forests or close to a stream.

*M. hylocomii* is most likely to be confused with *M. capitata*, which also inhabits *Hylocomium splendens*. *M. capitata*, however, differs from *M. hylocomii* by having larger apothecia (0.10–0.35 mm diam.) with a more clearly constricted base, broader ascospores (~4 µm), and by possessing a blue-green pigment that does not fade rapidly in C (Svensson and Thor 2011). Furthermore, *M. capitata* has numerous, branched and anastomosing paraphyses, while paraphyses are scarce and difficult to discern in *M. hylocomii*. Other *Micarea* species with a thin or immersed thallus and minute (~0.2 mm diam.), black apothecia, such as *M. contexta* Hedl., *M. deminuta* Coppins, *M. eximia* Hedl., and *M. olivacea*, may also be confused with *M. hylocomii*, although none of them is known to grow on *H. splendens* (Coppins 1983, Czarnota 2007). *M. deminuta* is readily distinguished by its dark brown pigment in the hypothecium and broader (3–6 µm wide) ascospores (Coppins 1995). More care is needed to separate the other three species, since they too have a green, N+ red pigment in their apothecia. *M. contexta* differs in having constantly 1-septate ascospores with one cell larger than the other. Also, it has a dark green and/or a dark purple pigment in the hypothecium, reacting K+ green (Coppins 1983). *M. eximia* has a light reddish brown, K+ green hypothecium (Coppins 1983). *M. olivacea* has numerous paraphyses, mostly 1-septate ascospores, and a dark olivaceous or olive brown hypothecium that reacts K+ green (Coppins 1983).

**Additional specimens examined:** NORWAY: Hordaland, Lindås–Halvøya, kleiner Mischwald in geschützter Lage bei Syslak, wenige Meter über dem Lurefjord, 8 September 1976, A. Buschardt, P. M. Jørgensen & J. Poelt (two collections with the same label data, GZU). SWEDEN: Härjedalen, Tännås par., the W slope of Mt. Trappåsen, 150 m E of the road to Ramundberget, by the small stream Röllekbäcken, subalpine deciduous forest, on *Hylocomium splendens* on boulder by the stream, alt. 725 m, 62°40′N 12°25′E, 4 June 2007, M. Svensson 1038 & 1045 (UPS L-803528, L-803529). Tännås par., 1.6 km NNE of Bodrösten, old-growth mixed coniferous forest, on *Hylocomium splendens* on an old stump of Pinus sylvestris, alt. 730 m, 62°35′N 12°29′E, 4 June 2007, M. Svensson 1050 (UPS L-803556). Jämtland, Käll par., 3.5 km E the small village Öster-Kjoland, S side of the small river Öster-Kjolån, old-growth *Picea abies* forest, on *Hylocomium splendens* on a boulder, alt. 420 m, 63°35′N 12°54′E, 26 May 2006, M. Svensson 725 (UPS L-803526). Västerbotten, Degerfors par., 6 km NE the village Vindeln, 500 m SW the house Nymyrkälen, on c. 1.5 m high boulder in clear-cut with scattered old *Pinus sylvestris*, alt. 200 m, 64°13′55″N 19°49′05″E, 30 May 2012, G. Thor 27772 (UPS L-803527). Åsele Lappmark, Doro-tea par., Måntorp, alt. 400 m, 64°23′N 16°26′E, 9 June 2011, M. Lif 240 (UPS L-803525). SWITZERLAND: Graubünden, Oberengadin, Gemeinde Silvaplana, God Surlej, SO Champfer, WNW-seitige, locker von Arven und Lärchen bewaldete Hänge, alt. 1800–1900 m, 11 September 1970, J. Poelt (Pl. Graec. Lich. no 94, GZU, absent from duplicate UPS L-047264).
**Micarea lynceola** (Th.Fr.) Palice

Fig. 2D


New to Sweden. *M. lynceola* was described from Norway in 1874, but has so far not been correctly reported from Sweden. The species has also been recorded from Ireland, United Kingdom, the Netherlands, Belgium, Germany, Austria, the Czech Republic, Poland, Finland, and the Murmansk Region of Russia (Palice 1999, Aplet and van Herk 1999, Ertz et al. 2008, Urbanavichus et al. 2008, Coppins 2009b, Czarnota 2011).

*M. lynceola* is a pioneer species of siliceous rocks and the Swedish collection was made on a loose rock on a road-bank. It is easily confused with *M. polycarpella* (Erichsen) Coppins & Palice, which has similar ecology and to which earlier Swedish records of *M. lynceola* belong (Palice 1999). *M. lynceola*, however, has a well-developed, 30–40 µm wide exciple which is readily distinguished as a non-amyloid zone after treatment with KI, while *M. polycarpella* has 7–10 µm wide excipular rim of pigmented hyphae that does not contrast with the hymenium in KI (Palice 1999).

**Additional specimens examined:** NORWAY: Akershus, Oslo, Tveten, 20 September 1868, N. G. Moe 257 (UPS L-094386, topotype). SWEDEN: Östergötland, Risinge par., 2.5 km NNW of Lotorp, 250 m N of the tarn Skirgölen, E side of the road, 58.754343°N 15.803343°E, alt. 70 m, 31 May 2011, M. Svensson 2129 (UPS L-778164).

**Micarea soralifera** Guz.-Krzemiń. et al.


New to Fennoscandia. This recently described species was originally reported from Poland and the Czech Republic (Guzow-Krzemińska et al. 2016). It belongs to the *Micarea prasina* group and is characterized by having distinct soralia and containing micareic acid. In Sweden it has been found in the nature reserve Fiby urskog near Uppsala, where it occurs on decaying logs in an old-growth forest dominated
by conifers, and in one locality in the outskirts of Uppsala, where it grew on wood of *Salix*.

**Specimens examined.** SWEDEN: Uppland, Husby-Ärlinghundra par., Östra Steninge, along jogging trail c. 500 m NW of the Syrian Orthodox Church, on dead mossy boughs of *Salix* on the ground, 59.62033°N 17.81340°E, 4 October 2016, A. Nordin 8056 (UPS L-797384, HPTLC: micareic acid). Uppland, Vänge par., Fiby urskog Nature Reserve, S part of the reserve, c. 350 m west of Kvarnberg, on decaying log by the trail in old-growth forest dominated by conifers, 59.8827°N 17.3514°E, 8 April 2016, M. Westberg, S. Ekman & G. von Hirschheydt (UPS L-790650, HPTLC: micareic acid). Ibid., E part of the reserve, 50 m E of the river Fibyån and 600 m S of the lake Fibysjön, on dry spruce twig in spruce-dominated forest (old overgrown hayfield from the 1930s), 59.8873°N 17.3457°E 11 May 2016, G. von Hirschheydt, M. Westberg & S. Ekman (UPS L-790652, HPTLC: micareic acid).

**Micarea subconfusa** (Nyl.) Alstrup

Fig. 3A


New to Fennoscandia. *Micarea subconfusa* is a rarely recorded species, currently known from Ireland, Scotland, and the Faeroe Islands (Alstrup et al. 1994, Coppins 2009b, Coppins and James 1992).

*M. subconfusa* belongs to the *M. assimilata* group and inhabits acid rocks in the lowlands. It is similar to the alpine *M. paratropa* (Nyl.) Alstrup, but lacks K+ violet pigmentation in the hymenium and has a K – hypothecium. The Swedish specimen grew on wood of an old pilework close to the seashore, which likely represents a case of a primarily saxicolous species occasionally growing on dust-enriched wood. Due to superficial similarities with other, not closely related saxicolous lecideoid lichens, *M. subconfusa* is possibly an overlooked species.

Alstrup in Alstrup et al. (1994) referred to the collections C-L-76662 and C-L-76663 as the “holotype” of *Lecidea subconfusa*, thus effectively designating both as lectotype. We here further specify this by designating the specimen C-L-76663 as lectotype. This specimen has the words “specimen primarium” written with red ink on the sheet to which it is glued, as well as an indication that the specimen has been sent to Nylander (“a Rostrup Nylandro missum”). According to Alstrup et al. (1994), the handwriting is that of Rostrup.
Syntypes of *Lecidea submoestula* are available in BM and H-NYL. The specimen H-NYL 19033 only gives the locality as “route de Westport” and the year as 1876. Two collections in BM are possible duplicates of the Nylander specimen, but give the date as February 1876 and March 1876 respectively, which means that it cannot be ascertained which constitutes a duplicate of the specimen in H-NYL. Consequently, the specimen H-NYL 19033 is chosen here as lectotype of *L. submoestula*.


*Myobobilimbia tetramera* (De Not.) Vitik. et al. ex Hafellner & Türk


– Type: Norway, S. C. Sommerfelt (RO, lectotype, selected by Printzen 1995 [ICN Art. 9.9], not seen).

New synonym. Bacidia atrolivida was listed as an accepted species by Stenroos et al. (2016). The type material, however, consists of typical Mycobilimbia tetramera, and the former is consequently reduced into synonymy. According to Vainio (1922), Bacidia atrolivida is supposed to differ from ‘Bilimbia obscurata’ (i.e., Mycobilimbia tetramera) in having a sparsely sorediate thallus, an observation we were unable to confirm. The type material in TUR-V is cited here as the holotype, because it appears to have been the only specimen available to Vainio at the time of description (Alava 1988).

Mycoblastus sanguinarioides Kantvilas
Fig. 3B

Lichenologist 41: 172 (2009). – Type: Australia, Tasmania, Pelion Plains, 1 km W of Pelion Hut, 41°50’ S 146°02’ E, 890 m altitude, on eucalypt stump in Eucalyptus delegatensis open forest, 11 March 1992, G. Kantvilas 267/92 (HO, holotype, not seen; BM, isotype, not seen).


New to Finland and Sweden. This species was described from Tasmania, Australia (Kantvilas 2009), but has later been shown to be widespread in the Northern Hemisphere (Canada, Japan, Russia, USA; Spribille et al. 2011). There is one collection each from Finland and Sweden in herbarium UPS. Both localities are apparently very humid (near a waterfall and a rapid, respectively). The Swedish locality harbours several rare lichens, such as Pannaria conoplea (Ach.) Bory, Pilophorus robustus Th.Fr., Placopsis gelida (L.) Lindsay, and Ramalina thrausta (Ach.) Nyl. (herbarium material in UPS). The Fennoscandian localities are in keeping with the occurrence of the species in humid regions in eastern Eurasia and coastal western and eastern North America.

Mycoblastus sanguinarioides is similar to M. sanguinarius (L.) Norman but can be distinguished by often having flat apothecia surrounded by a thin ring of whitish thalline tissue. In contrast, small apothecia of M. sanguinarius are usually distinctly convex with a constricted base. Furthermore, the hymenium of M. sanguinarioides contains birefringent hymenial crystals, visible in polarized light (see Spribille et al. 2011, Fig. 2). The chemistry of the two Fennoscandian specimens (bourgeanic acid and atranorin) agrees with the chemistry of M. sanguinarioides elsewhere in the Northern Hemisphere. Both compounds occur in M. sanguinarius as well, but always together with one or several additional compounds. M. sanguinarius has four chemotypes (Spribille, unpublished data), three of which are found in northern Europe: (1) rangiformic acid and atranorin (common, northern), (2) bourgeanic acid, caperatic acid and atranorin (mainly in the south), (3) bourgeanic acid, rangiformic acid and atranorin (northern)
and (4) lichesterinic and protolichesterinic acid (currently known from a single saxicolous specimen from the Yukon). Some of these chemotypes might warrant recognition as distinct species (Spribille et al. 2011).

**Specimens examined.** FINLAND: Karelia borealis [=Pohjois-Karjala], Koli [=Koli National Park], Tarhapuro [water fall], on _Betula_ at the water fall, 16 June 1954, G. Degelius (UPS L-202809). SWEDEN: Lule lappmark, Jokkmokk socken, Muddus nationalpark, V-sidan av Mudduskanjon, blockravin några km S om fallet, torr gran, 28 August 1944, B. H. Svenonius MS423 (UPS L-550384).

**Paralecia pratorum** Brackel et al.


New to Fennoscandia. The recently proposed monotypic genus _Paralecia_ has been suggested to belong in the Squamarinaceae (Liu et al. 2015). The single species _P. pratorum_, a lichenicolous fungus on _Protoparmeliopsis muralis_, has brown, lecideine apothecia growing on the lobes and apothecal margins of the host. It is further characterized by asci with an I+ dark blue tube-like apical structure, and hyaline and simple ascospores. _Paralecia pratorum_ was found growing on its host on the island Runmarö in the Stockholm archipelago. The locality is rich in lichens and with a variety of calcareous and non-calcareous rocks facing the Baltic Sea. The species is so far known only from Italy and Sweden.

**Specimen examined.** SWEDEN: Uppland, Djurö par., Runmarö, Norestrand, NE of Nore, 59.27868°N 18.79664°E, alt. 20 m, 30 June 2009, M. Westberg & T. Berglund 09-399 (UPS F-787462).

**Puttea duplex** (Coppins & Aptroot) M.Svensson, comb. nov.

MycoBank #MB819389


**Remarks.** New to Sweden. Originally described from Scotland and Wales (Coppins and Aptroot 2008), and was recently reported from Norway (Tønsberg 2016).

When describing this species, Coppins and Aptroot (2008) assigned it to _Fellhanera_ on account of its similarity to _F. margaritella_ (Hulting) Hafellner. Subsequently, _F. margaritella_ was transferred to _Puttea_ by Stenroos et al. (2009). _Puttea_ was initially
monotypic, but Stenroos et al. listed several other candidates for inclusion, of which two were later combined into the genus: \textit{P. exsequens} (Nyl.) Printzen & Davydov (Davydov and Printzen 2012) and \textit{P. caesia} (Fr.) M.Svensson & T.Sprib. (Dillman et al. 2012). \textit{P. duplex} is distinct from the other three species by having 16–24 ascospores per ascus, but otherwise fits well in \textit{Puttea} on account of having minute, pale apothecia, asci with a \textit{KI}+ blue tholus penetrated by a canal that slightly widens towards the apex, and crystals that dissolve in \textit{K} in the epihymenium and hymenium.

According to Coppins and Aptroot (2008), the exciple of \textit{P. duplex} is paraplectenchymatous, which would be consistent with a placement in \textit{Fellhanera} (Lücking 2008), while \textit{Puttea margaritella} (the type species of that genus) has a strongly gelatinized exciple composed of branched, parallel hyphae (Stenroos et al. 2009). Although the exciple of \textit{P. duplex} is often poorly developed and difficult to observe, we found that it is in fact quite similar to that of \textit{P. margaritella}, being strongly gelatinized and consisting of dichotomously branched hyphae with narrowly cylindrical cell lumina.

The Swedish specimen was found on bark of \textit{Betula} in a mature coniferous production forest. The specimen differs from the original description in having longer ascospores (–9 µm versus –5 µm) and by growing directly on bark and not over bryophytes. However, as the original description of \textit{F. duplex} was based on only three specimens, the range of variation in ascospore size is possibly larger than indicated there and the ecology of the species may likewise be broader. Since the Swedish specimen agrees well with the holotype in other respects, we prefer to include it in \textit{P. duplex} pending further studies.

**Additional specimen examined:** SWEDEN: Hälsingland, Bollnäs par., 8,5 km SW of Hanebo church, 1 km S of Hällbo, SE of Skidtjärnen, on stem of living \textit{Betula pubescens} (23 cm diam.) in mature coniferous forest, alt. 120 m, 61°12'N 16°25'E, 22 August 2012, F. Jonsson FU9206 (UPS L-786606).

**Sarcogyne algoviae** H.Magn.


New to Finland. Previously known from the Alps, \textit{Sarcogyne algoviae} was recently reported from Sweden and Norway (Westberg et al. 2015).

The newly discovered specimen was collected on calcareous rock in northernmost Finland. The species is characterized by apothecia with a strongly carbonized margin, a colourless hypothecium, and narrowly ellipsoid ascospores (Westberg et al. 2015).

**Additional specimen examined:** FINLAND: Lapponia inarensis, Utsjoki, Kevo Subarctic Research Station, c. 3 km SW cliff Kotkapatha in Kevojoki valley, 20 August 1965, T. Ahti 20905 (H).
Thelenella pertusariella (Nyl.) Vain.


Gyalidea fruticola M.Svensson & G.Thor, Lichenologist 39: 335 (2007). – Type: Sweden, Uppland, Häggeby par., 3 km NW of Häggeby church, along the road between Skadevi and Eknäs, broadleaved deciduous forest, on decaying bark on old Lonicera xylosteum, alt. 20 m, 59°41’N 17°32’E, 15 January 2006, M. Svensson 616 (UPS L-167526, holotype, seen by MS and GT; S F68480, isotype, seen by MS and GT).

New synonym. Gyalidea fruticola was described mainly from material collected on Lonicera xylosteum in southern Sweden and seemingly fit into Gyalidea on account of having a KI– hymenium (the KI+ pale red-brown reported by Svensson and Thor 2007 is the colour of the iodine), sparingly branched paraphyses, and submuriform ascospores (Svensson and Thor 2007). However, subsequent collections have made it clear that G. fruticola cannot be separated from Thelenella pertusariella. Like Gyalidea, the genus Thelenella belongs to the Ostropomycetidae (Nelsen et al. 2017) and displays similar hymenial and ascospore characters. Thelenella, however, differs by having perithecia instead of apothecia. Southern morphs of T. pertusariella are often very small and perithecia in poor condition often get a gyalectoid appearance, hence the mistaken assignment to Gyalidea.

Additional specimens examined: ITALY: Trentino Alto Adige, Trento Prov., Stelvio National Park, Val de la Mare, 400 m SE of Malga Prabon, Bosco di Celvestrè, mixed old growth coniferous forest, on dead twig of Lonicera alpigena, alt. 1780 m, 46°24’N 10°41’E, 27 July 2006, M. Svensson 853 (UPS L-167599). NORWAY: Varanger, Båtsfjord municipality, the top of the valley Skogdalen, subalpine deciduous forest, on bark of Salix sp., alt. 200 m, 70°53’N 29°69’E, 2 July 2014, M. Svensson 2912 (UPS L-803559). SWEDEN: Härjedalen, Ljusnedal par., 1.2 km WN of Djupdalsvallen, along the track to Mt Gruvvålen, small stream in open subalpine deciduous forest, on dead stem of Salix lanata close to the water, alt. 900 m, 62.71832°N 12.43697°E, 24 August 2007, M. Svensson 1114 (UPS L-176178). Jämtland, Kall par., Skäckerfjällen Nature Reserve, 600 m N of Sägen, E side of the river from Lake Nedre Ottsjön, deciduous forest on the shore of the river, on decaying bark of Alnus incana, alt. 450 m, 63°44’N 12°33’E, 17 August 2008, M. Svensson 1351 (UPS L-803565). Södermanland, Aspö par., 150 m NW of Aspö church, deciduous forest, at the base of dead stem of Lonicera xylosteum, alt. 5 m, 59°29’N 17°23’E, 26 March 2006, M. Svensson 632 (UPS L-166883). Södermanland, Sköldinge par., N of Lake Silingen, by the ruins of the ancient fortress Tjugesta skans, broadleaved deciduous forest, on decaying bark on old Lonicera xylosteum, alt. 55 m, 59°01’N 16°16’E, 19...

Uppland, Gryta par., 3.2 km N the village Örsundsbro, just W of gravel road, near ditch, coniferous forest, on Lonicera xylosteum, alt. 40 m, 59°45′N 17°18′E, 2 October 2006, G. Thor 20100 (UPS L-166884). Uppland, Knivsta parish, 1.7 km W of Valloxsäby, c. 400 m N of lake Valloxe, broadleaved deciduous forest, on decaying bark on old Lonicera xylosteum, alt. 25 m, 59°44′N 17°50′E, 29 January 2006, M. Svensson 623 (UPS L-167527). Uppland, Sånga par., 1.5 km SE of Sånga church, S of Svartsjö djurgård, E of the road, broadleaved deciduous forest, on decaying bark on Lonicera xylosteum, alt. 10 m, 59°20′N 17°43′E, 10 March 2006, M. Svensson 628 (UPS L-167251). Uppland, Söderby-Karl par., 5 km SW of Söderby-Karl church, along the road between Koludden and N. Järsö, Svarþbåcksviken, broadleaved deciduous forest, on decaying bark of Lonicera xylosteum, alt. 15 m, 59°51′N 18°37′E, 2006, M. Svensson 624 (UPS). Västmanland, Vittinge par., 700 m SE of Månsbo, N shore of Lake Ekholmsjön, deciduous forest, on decaying bark of Lonicera xylosteum, alt. 70 m, 59°51′N 17°02′E, 4 February 2007, M. Svensson 947 (UPS L-167523). Östergötland, S:t Anna par., Djursö, 300 m NW of the farm, broadleaved deciduous forest, on decaying bark on old Lonicera xylosteum, alt. 5 m, 58.40098°N 16.79018°E, 6 May 2007, M. Svensson 994 (UPS L-171652).

**Toninia subnitida** (Hellb.) Hafellner & Türk


 Probably new to Norway. Kilias (1981) reported this species from one locality in Nordland in northern Norway based on a specimen collected by G. Degelius. We have, however, been unable to trace this specimen. The same specimen was reported as *Catillaria hypochlorella* (Vain.) Zahlbr. (syn. *Lecidea hypochlorella* Vain., Vainio 1883) by Degelius (1955), who discussed the distinction from *Catillaria subnitida* Hellb. Degelius pointed out the agreement with Vainio’s descriptions (1881, 1934), and the identification of this specimen, along with another specimen from Torne lappmark in northern Sweden (Magnusson 1952) as *L. hypochlorella* was upheld by Santesson (1984, and later editions). Vainio (1934) discussed the similarity between *L. hy-
pochlorella and *T. subnitida*, mentioning that they differ only in the hymenium being entirely green in the former, whereas the latter has a bluish ep hymenium. There are, however, additional differences. In *L. hypochlorella*, the hypothecium contains a mixture of green and dull brown pigments, which contrast to the strongly darker proper exciple. In *T. subnitida*, on the other hand, the hypothecium and proper exciple are very similar in hue (dark red-brown) and do not contrast. Furthermore, ascospores in *L. hypochlorella* are 1(–2)-celled, whereas they are consistently 2-celled in *T. subnitida*. The material from Torne lappmark in Sweden (UPS L-785614) represents *L. hypochlorella*. The Norwegian specimens of *T oninia subnitida* had been misidentified as *Bacidia coprodes* (Körb.) Lettau and were discovered while revising material filed under that species (Ekman 2014).

Kiliás (1981) reported *T. subnitida* (as *Catillaria tristis*) also from Sweden, Finland, Russia, Germany, Czech Republic, Switzerland, Austria, and Italy. It has later been recorded also from Spain and Montenegro (Hladun and Gómez-Bolea 1982, Knežević and Mayrhofer 2009). Reports from North America are doubtful, as the name was introduced in the checklist of Egan (1987) with reference to Kiliás (1981). The latter author, however, does not mention any North American finds.


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