

# Revisions of British and Irish Lichens



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**Miscellaneous Lecanorales**

Cover image: *Haematomma ochroleucum*, on granite rock, Duirinish, Wester Ross, Scotland.

*Revisions of British and Irish Lichens* is a free-to-access serial publication under the auspices of the British Lichen Society, that charts changes in our understanding of the lichens and lichenicolous fungi of Great Britain and Ireland. Each volume will be devoted to a particular family (or group of families), and will include descriptions, keys, habitat and distribution data for all the species included. The maps are based on information from the BLS Lichen Database, that also includes data from the historical Mapping Scheme and the *Lichen Ireland* database. However, these are not comprehensive and there are many further records that have not yet been digitized. The choice of subject for each volume will depend on the extent of changes in classification for the families concerned, and the number of newly recognized species since previous treatments.

To date, accounts of lichens from our region have been published in book form. However, the time taken to compile new printed editions of the entire lichen biota of Britain and Ireland is extensive, and many parts are out-of-date even as they are published. Issuing updates as a serial electronic publication means that important changes in understanding of our lichens can be made available with a shorter delay. The accounts may also be compiled at intervals into complete printed accounts, as new editions of the *Lichens of Great Britain and Ireland*.

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# *Revisions of British and Irish Lichens* vol. 42

## Miscellaneous Lecanorales

including *Biatorrella* (Biatorrellaceae), *Carbonicola* (Carbonicolaceae), *Haematomma* (Haematommataceae), *Psilolechia* (Psilolechiaceae), *Ramboldia* (Ramboldiaceae), *Scoliciosporum* (Scoliciosporaceae), and *Adelolecia*, *Catinaria*, *Frutidella*, *Herteliana*, *Lithocalla*, *Myochroidea*, *Puttea* and *Schadonia* (of uncertain position)

by

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## BIATORELLACEAE M. Choisy ex Hafellner & Casares (1992)

The family contains the single genus *Biatorella*, so the description of the genus below constitutes that of the family. The family is of uncertain position within the Lecanorales, with no molecular data available and little recent research.

### BIATORELLA De Not. (1846)

**Thallus** crustose, usually thin and poorly developed, unstratified, continuous, effuse and often ill-defined; **prothallus** absent. **Photobiont** chlorococcoid. **Ascomata** apothecia, biatorine, orange-red to red-brown, convex to hemispherical. **Thalline margin** absent. **True exciple** very thin to almost absent, of parallel, colourless to pale yellow hyphae, I+ blue. **Epithecium** yellowish to reddish brown, K–. **Hymenium** colourless or pale straw yellow, I+ deep blue. **Hypothecium** yellowish, I+ pale to green-blue. **Hamathecium** of paraphyses, becoming richly branched and entangled at the epithecium. **Asci** multispored, cylindrical to clavate, *Bacidia*-type with a gelatinous K/I+ blue outer layer and an undifferentiated K/I± faint blue apical dome. **Ascospores** elongate-ellipsoidal to bacilliform, aseptate, thin-walled, colourless. **Conidiomata** not known. **Chemistry**: no lichen products detected by TLC. **Ecology**: terricolous and over bryophytes.

*Sarcosagium* (Thelocarpaceae) also has reddish ascomata and bacilliform ascospores, but differs in having smaller, marginate apothecia with a well-developed true exciple. *Biatoridium* (of uncertain position) has asci with a clearly multilayered, K/I+ blue apical dome and in *Strangospora* (Strangosporaceae) they have a K/I+ blue gelatinous outer layer and an apical dome (tholus) which is I± faint blue. Both of these genera further differ in their globose ascospores. *Sarea* Fr. (1825) and *Zythia* Fr. (1825), the species of which grow on resin, are non-lichenized and, more importantly, have abundant orange or black pycnidia, which produce globose conidia (see Beimforde *et al.* 2020, Mitchell *et al.* 2021).

#### Literature:

Hafellner & Casares-Porcel (1992), James & Duke (2009).

- 1      Ascospores 5–8 µm long; in montane habitats ..... *hemisphaerica*  
           Ascospores 8–13 µm long; in lowland habitats ..... *fossarum*

#### *Biatorella fossarum* (Dufour) Th. Fr. (1874)

EN

Like *B. hemisphaerica*, but apothecia smaller, 0.4–1 mm diam., and ascospores longer, 8–13 × 2.3–3 µm, bacilliform. **BLS 1826.**

On sunny compacted calcareous sandy soil in lowlands; very rare. S.W. England (Dorset, Somerset), N. Wales (Great Orme).

This species has been confused with *B. hemisphaerica*, which is a montane, arctic-alpine species. *Sarcosagium campestre* var. *macrosporum* has similar ascospores, but smaller, marginate apothecia.



#### *Biatorella hemisphaerica* Anzi (1860)

VU

Thallus pale grey, thin, fine-grained to mealy-arachnoid. Apothecia 1–2 mm diam., bright or dull orange-red, convex to hemispherical and immarginate from the start, immersed to appressed, usually ± discrete; without a

visible true exciple; epithecium pale to orange-yellow, sometimes with a dark yellow-brown pruina; hymenium 150–200  $\mu\text{m}$  tall, colourless; hypothecium (100–) 150–300 (–500)  $\mu\text{m}$  tall, pale grey-yellow, of densely packed hyphae *ca* 1  $\mu\text{m}$  diam.; paraphyses *ca* 1  $\mu\text{m}$  diam., thickened and clavate at the apices to 2.5–3.5  $\mu\text{m}$ , clearly visible in water, conglutinate in K. Asci 135–150  $\times$  15–18  $\mu\text{m}$ , cylindrical, not symmetrical, 200- to 400-spored. Ascospores 5–8  $\times$  2–3.5  $\mu\text{m}$ , elongate-ellipsoidal. **BLS 0181.**

Over bryophytes in shady rock crevices and ledges on mica-schist at high altitudes; very rare. C. Scotland (Perthshire, summit of Ben Lawers).



## CARBONICOLACEAE Bendiksby & Timdal (2013)

The family contains a single genus, *Carbonicola*, so its description below constitutes that of the family. The species were formerly placed in *Hypocenomyce* (Umbilicariales, Ophioparmaceae) but molecular data shows that the two genera are quite unrelated.

### CARBONICOLA Bendiksby & Timdal (2013)

**Thallus** squamulose, adnate or ascending and geotropically oriented, (greenish to) medium to dark brown, shiny, not pruinose, without a hypothallus. **Photobiont** chlorococcoid. **Upper cortex** well-developed, with an epinecral layer, **lower cortex** present but poorly developed. **Soralia** sometimes present, then lip-shaped. **Apothecia** brown, convex, weakly marginate when young, soon becoming immarginate, not pruinose. **Thalline margin** absent. **True exciple** composed of conglutinated thick-walled hyphae with thread-like lumina, colourless in the inner part, pale brown in the rim, K–, N–, lacking crystals. **Epithecium** brown, N–, without amorphous substances. **Asci** clavate, 8-spored, without an apical amyloid cap, with a well-developed amyloid tholus containing a deeper amyloid tube. **Ascospores** ellipsoidal, colourless, mostly aseptate. **Conidiomata** pycnidia, the wall brown, N–. **Conidia** filiform. **Chemistry**: colensoic acid, 4-*O*-methylphysodic acid and related compounds in all species. **Ecology**: on lignum, especially burnt wood.

According to data from Bendiksby & Timdal (from which the description above has partly been derived), *Carbonicola* occupies a clade sister to the Cladoniaceae and Stereocaulaceae. Only one species is currently known from our region.

#### Literature:

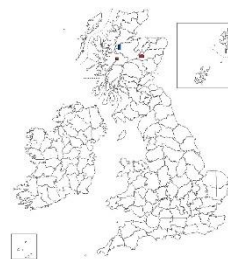
Bendiksby & Timdal (2013), Purvis & James (2009), Timdal (1984).

#### *Carbonicola anthracophila* (Nyl.) Bendiksby & Timdal (2013)

*Hypocenomyce anthracophila* (Nyl.) P. James & Gotth. Schneid. (1980)

Thallus squamulose; squamules to 0.8 (–1.3) mm diam.,  $\pm$  ascending, at first concave, becoming convex, the margin slightly upturned, entire with lip-shaped, farinose soralia; upper surface green-brown, shiny; lower surface pale brown, with grey soralia. Apothecia to 0.8 (–1.3) mm diam., infrequent, attached marginally or laminally to the lower surface of the squamule, solitary or in groups, becoming convex; true exciple becoming excluded; epithecium brown, N–. Ascospores 7–13  $\times$  1.5–2.5  $\mu\text{m}$ , narrowly ellipsoidal-fusiform, 0(-1)-septate. Pycnidia rare, the wall brown, K–, N–; conidia 6.5–12.5  $\times$  *ca* 1  $\mu\text{m}$ , bacilliform to shortly thread-like. Thallus C–, K–, KC–, Pd+ red; soralia and medulla UV+ bluish-white (fumarprotocetraric and protocetraric acids,

EN D



unidentified UV+ substances). **BLS 0575**.

On charred *Pinus* snags and stumps in native pinewoods; very rare. Scotland (Easternness, Westernness and S. Aberdeenshire).

Characterized by the glossy, ascending squamules, with sorediate margins and lower surface, and the Pd+ red (fumarprotocetraric acid) reaction. *C. myrmecina* (Ach.) Bendiksby & Tindal differs by the Pd– thallus and proliferating squamules; the species is widespread in Scandinavia and could occur in Highland Scotland.

## HAEMATOMMATACEAE Hafellner (1984)

The family contains the single genus *Haematomma*, so the description of this taxon below constitutes that of the family. It is monophyletic according to Lumbsch *et al.* (2008), but its nearest relatives within the Lecanorales are not clear.

### HAEMATOMMA A. Massal. (1852)

**Thallus** crustose, weakly corticate, usually partly or ± entirely sorediate. **Photobiont** trebouxoid. **Ascomata** apothecia, sessile, but sometimes ± immersed in soredia; disc red or brown. **Thalline margin** concolorous with the thallus, often sorediate or excluded. **True exciple**, if evident, red or brown. **Hymenium** I+ blue. **Hypothecium** colourless. **Hamathecium** of branched and anastomosed, or rarely unbranched paraphyses, not or only slightly swollen at the apices. **Asci** 8-spored, clavate, *Lecanora*-type (mostly poorly developed), or with a uniformly amyloid apical dome. **Ascospores** fusiform to broadly acicular, transversely multiseptate, colourless. **Conidiomata** pycnidia, immersed. **Conidiophores** branched. **Conidiogenous** cells terminal and axillary, ampulliform, proliferating percurrently. **Conidia** curved-filiform or bacilliform, aseptate, colourless. **Chemistry**: various; all species containing at least atranorin in the thallus and anthraquinone pigment(s) in apothecia and pycnidia. **Ecology**: on bark or rocks, rarely on wood.

*Haematomma* differs from *Loxospora* (Sarrameanaceae) by the ± scarlet-red discs with the pigments russulone (K+ red) or haematimmone (K+ purple), *Lecanora*-type asci, and the absence of atranorin (K+ yellow) in the cortex of the thallus. From *Ophioparma* (Ophioparmaceae), which has ventosin (K+ blue) in the apothecial disc, and from *Pyrrospora* (Lecanoraceae) by the presence of an exciple, and septate spores.

#### Literature:

Lumbsch *et al.* (2008), Rogers & Hafellner (1988), Staiger & Kalb (1995), Wolseley *et al.* (2009).

- |   |  |
|---|--|
| 1 | Thallus ± entirely leprose- or farinose-sorediate; usually delimited by a white cottony prothallus<br>..... <b>ochroleucum</b>     |
|   | Thallus, at least in younger parts, with delimited soralia; prothallus absent or, if present,<br>then not white or cottony ..... 2 |

- 2(1) Soralia K+ bright yellow, Pd+ yellow to orange ..... *Loxospora elatinum*  
 Soralia K+ and Pd+ pale yellowish, or K- and Pd- ..... 3
- 3(2) Soralia whitish or bluish grey, K-, Pd-, UV+ white; prothallus often conspicuous,  
 blue-grey ..... *Mycoblastus caesius*\*  
 Soralia whitish, K+ and Pd+ pale yellowish, UV-; prothallus absent or thin and grey ..... *sorediatum*

\* See also *Loxospora christinae* Guzew-Krzem., Łubek, Kubiak & Kukwa (Guzew-Krzemińska *et al.* 2018), recently reported from Scotland.

### **Haematomma ochroleucum** (Neck.) J.R. Laundon (1970)

Thallus soft, leprose or farinose, often wide-spreading (especially on rocks); prothallus usually conspicuous, white cottony. Apothecia 0.4–1.5 (–2.5) mm diam., uncommon, at first hidden by thallus granules, later emergent; disc scarlet, K+ purplish; thalline margin sorediate, often excluded; epithecium scarlet, K+ purplish; paraphyses richly branched, especially in the upper hymenium. Asci *Lecanora*-type. Ascospores 30–60 × 5–7 μm, 3- to 7-septate. Pycnidia sometimes present, 150–200 μm diam., immersed but the upper part scarlet (K+ purplish); conidia 12–20 × 0.5–0.7 μm, curved-filiform. Thallus C-, K+ pale yellow, Pd- pale yellow, UV- (atranorin, zeorin, porphyritic acid and ± usnic acid). **BLS 0554**.

On acid or slightly calcareous, relatively dry rock-faces, church walls, gravestones, often forming patches 1 m or more across, also on slightly enriched tree trunks, rarely on bark (mainly var. *ochroleucum*). Almost throughout Britain and Ireland.

Two varieties are recognized: var. *porphyrium* (Pers.) J.R. Laundon (1970) [**BLS 0555**; upper map], with a whitish to pale greenish grey thallus (lacking usnic acid), is the commoner, especially in S.E. England; var. *ochroleucum* [lower map], with pale yellow-green or yellow-grey thallus (usnic acid), occurs mainly in E. England & E. Scotland. The two varieties retain their identities when growing together.

When sterile, distinguished from other similar species (e.g. *Lecanora orosthea*, *Lepraria* spp., *Lithocalla ecorticata* and *Pertusaria* s.l. spp.) by the conspicuous white, cottony prothallus. *Phlyctis argena* can be separated by the thallus which is K+ yellow→red (norstictic acid). *Snippocia nivea* is separated by absence of a prothallus, pale pink colour when fresh, presence of *Trentepohlia*, and the Pd+ orange thallus.

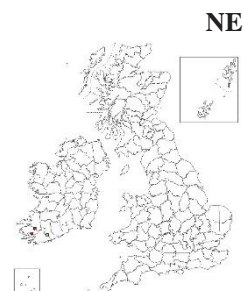
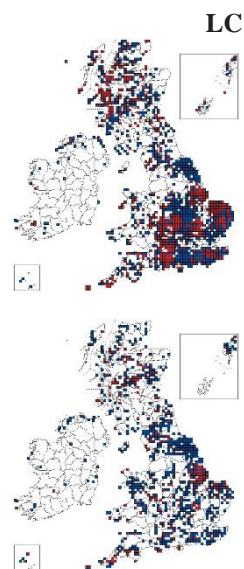
There is a single record of this species being parasitized by *Chaenothecopsis subparvoica*, and also by the ubiquitous *Marchandiomyces corallinus* (Roberge) Diederich & D. Hawksw. (1990).

### **Haematomma sorediatum** R.W. Rogers (1982)

Thallus thin, continuous or weakly rimose, sometimes patchy, pale grey; prothallus grey-black; soralia 0.1–0.3 (–0.7) mm diam., rounded, minutely punctiform or fleck-like, discrete or occasionally contiguous, flat to ± convex; soredia farinose to finely granular. Apothecia 0.2–0.4 (–0.7) mm diam., rare, often poorly developed, ± emergent to sessile at maturity; disc scarlet, K+ purple-black; thalline margin persistent, even or ± crenulate, not or partially sorediate; cortex of thallus and edge of thalline margin densely finely granular, granules dissolving in K, large coarse crystal clusters below and within the photobiont layer and the inner part of the thalline margin, not dissolving in K; hymenium 50–60 (–70) μm tall; epithecium bright orange-red, finely orange granular, K+ dissolving fleeting purplish; paraphyses unbranched, apices not swollen. Ascospores (50–) 60–80 × 4–5 (–5.5) μm, (8-) 9–12 (–16)-septate, elongate, one end ± attenuated. Thallus and soralia C-, K+ pale yellow, KC+ yellow, Pd+ pale yellow, UV- (atranorin, placodiolic acid). **BLS 0553**.

On smooth bark and branches of young *Salix* trees in boggy wooded carrs; very rare. S.W. Ireland (Killarney), and possibly England (Cornwall).

This easily overlooked species can resemble an underdeveloped state of *Pertusaria pupillaris*, the soralia of which, however, are Pd+ rust-red (fumarprotocetraric acid). The presence of crystals in the thallus and apothecia of *H. sorediatum* is diagnostic.



## PSILOLECHIACEAE S. Stenroos, Miądl. & Lutzoni (2014)

The family contains a single genus, *Psilolechia*, so the description of that genus below constitutes that of the family. It appears to occupy a basal clade within the Lecanorales (Miądlkowska *et al.* (2014).

### PSILOLECHIA A. Massal. (1860)

**Thallus** crustose or leprose, rarely granular-areolate, of ± distinct goniocysts interconnected by filamentous hyphae, bright yellow-green or dull green to whitish grey. **Photobiont** *Trebouxia*-like or *Stichococcus*. **Ascomata** apothecia, convex to globose, occasionally becoming tuberculate. **Thalline margin** absent. **True exciple** poorly developed, composed of a narrow zone at the base of apothecia with protruding colourless hyphae. **Epithecium** often not clearly delimited. **Hymenium** laterally reflexed, variously pigmented, I+ blue. **Hypothecium** colourless or pale, I–. **Hamathecium** of paraphyses, unbranched or 1- or 2-forked, the apices not or slightly swollen. **Asci** 8-spored, cylindrical-clavate, apical dome K/I+ pale blue with dark blue apical tube diverging towards the apex, wall colourless with a K/I+ dark blue outer layer, *Porpidia*-like. **Ascospores** aseptate, cylindrical-ovoid or clavate, colourless, without a perispore. **Anamorph**, where known, hyphomycetous with discrete conidiogenous cells arising directly from the thallus surface. **Conidia** ovoid to pyriform, colourless, adhering in chains, aseptate. **Chemistry**: with rhizocarpic or gyrophoric acids, or no lichen products detectable by TLC. **Ecology**: in sheltered, ± humid situations.

Some species of *Micarea* (Pilocarpaceae) are similar; see species accounts for differences.

#### Literature:

Coppins & Purvis (1987), Gilbert *et al.* (2009), Miądlkowska *et al.* (2014), Palice *et al.* (2023).

- 1 Thallus whitish to pale greenish or yellowish grey; without rhizocarpic acid .....2  
Thallus bright yellow-green; with rhizocarpic acid .....*lucida*
- 2(1) Apothecia dark brown to blue-black; thallus C– .....*clavulifera*  
Apothecia pale pink to pale brown, occasionally with a violet tinge; thallus C+ red .....*leprosa*

#### *Psilolechia clavulifera* (Nyl.) Coppins (1983)

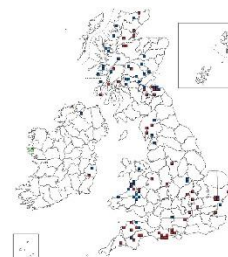
Thallus forming small patches, white to pale greenish grey, granular to granular-verrucose, effuse; photobiont *Stichococcus*. Apothecia 0.1–0.3 (–0.4) mm diam., frequent, dark brown to blue-black, globose to tuberculate, often surrounded by a basal white rim of protruding excipular hyphae; hymenium pale green to blue-green, especially in upper part, N+ purple-red; hypothecium colourless or pale green. Ascospores 4–7 × 1.2–2 µm, teardrop-shaped (dacryoid). Conidiomata absent, but the thallus surface often develops scattered conidiogenous cells 7–12 × 1–2 µm, ± cylindrical; conidia 7–15 × 2–2.3 µm, ± cylindrical. Lichen products not detected by TLC. **BLS 1199**.

On roots, stones and consolidated soil below dry overhangs on banks or the root systems of fallen trees; rare. Scattered throughout Britain, with a few Irish records.

Separated from *Brianaria bauschiana*, *B. tuberculata*, *Micarea farinosa* and *M. myriocarpa* by the smaller, ± clavate spores, the presence of *Stichococcus* and absence of pycnidia.

Host to the lichenicolous fungus *Microcalicium arenarium* (q.v.).

Nb



#### *Psilolechia leprosa* Coppins & Purvis (1987)

LC

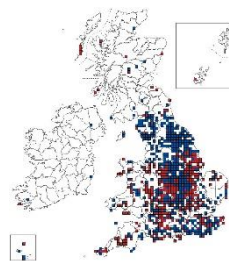
Thallus forming small patches, often merging and wide-spreading to ca 30 cm diam., whitish to pale greenish or yellowish grey, leprose-granular to granular-verrucose, often rimose, effuse; photobiont *Trebouxia*-like, cells 6–9 µm diam. or ellipsoidal and 6–12 × 7–8 µm. Apothecia usually present, 0.1–0.5 mm diam., often becoming



tuberculate, pale pink to pale brown, occasionally with a violet tinge; hymenium (22–) 27–35  $\mu\text{m}$  tall; hypothecium colourless. Ascospores 4.5–6.5 (–7)  $\times$  1.5–2  $\mu\text{m}$ , 0- to 1-septate, ovoid to dacryoid. Conidiomata and conidia unknown. Thallus C+ red, K–, KC–, Pd–, UV $\pm$  glaucous (gyrophoric acid,  $\pm$  porphyritic acid). **BLS 1637.**

On vertical copper-rich rocks in sheltered walls of derelict mine buildings, mineralized rock outcrops and on mortar and stonework near copper lightning conductors, below metal window grills, etc. on church buildings; frequent. Throughout Britain but apparently rare in Scotland, perhaps under-recorded in Ireland.

Locally abundant with few associated species; characterized by the C+ beetroot-red reaction which separates it from *Micarea myriocarpa* and other species under dry overhangs. Pale blue inclusions of copper oxalate are sometimes visible where abraded.



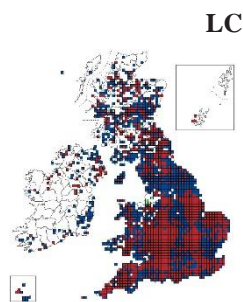
### **Psilolechia lucida** (Ach.) M. Choisy (1949)

Thallus wide-spreading, bright yellow-green, leprose-granular and often rimose, rarely granular-areolate, effuse; photobiont usually *Trebouxia*-like, very rarely with *Stichococcus*. Apothecia rather rare, often  $\pm$  hidden in well-developed thalli, mainly 0.1–0.3 mm diam. and convex, rarely tuberculate and to 0.5 (–0.7) mm diam., yellow-green to yellow-orange; upper part of hymenium with yellow granules, the remaining tissues  $\pm$  colourless. Ascospores 4–7  $\times$  1–2  $\mu\text{m}$ , cylindrical-ovoid. Conidiomata and conidia unknown. Thallus C–, K–, KC–, Pd–, UV+ dull to bright orange (rhizocarpic acid). **BLS 1200.**

Often conspicuous in dry, shady situations on non-calcareous rocks and walls, sometimes on soil, rarely recesses in dry bark and wood, frequent in towns on brick and dressed stone; common. Throughout Britain and Ireland.

When sterile may be confused with *Chrysothrix* species, which differ in containing an additional unidentified substance with rhizocarpic acid and preferring more exposed situations; sterile specimens of *Chaenotheca furfuracea* have *Stichococcus*, contain vulpinic acid and are UV $\pm$  lemon-yellow or pale orange. The saxicolous *Chrysothrix chlorina* has a thick, bright yellow, almost luminous woolly thallus of irregular granules. See *Lithocalla ecorticata* (below) for differences from that species.

Host to the lichenicolous fungus *Microcalicium arenarium* (q.v.). The thallus has been reported to be parasitized by *Intralichen* sp.



## **RAMBOLDIACEAE** S. Stenroos, Miadl. & Lutzoni (2014)

The family contains a single genus *Ramboldia*, so the description of the genus below constitutes that of the family. Most species are independent lichens, but the only British representative is a presumed parasite of *Lecanora* species that subsequently develops an independent thallus.

### **RAMBOLDIA** Kantvilas & Elix (1994)

**Thallus** crustose, areolate, effuse or inconspicuous. **Photobiont** trebouxoid. **Ascomata** apothecia, lecideine, reddish brown to black. **Thalline margin** absent. **True exciple** persistent or becoming excluded in very mature apothecia, consisting of radiating colourless, conglutinated, branched and anastomosing hyphae. **Hypothecium** colourless. **Hamathecium** of sparsely branched and anastomosing paraphyses, with the apices sometimes swollen and/or pigmented. **Asci** 8-spored, clavate, *Lecanora*-type. **Ascospores** narrowly ellipsoidal to bacillar, aseptate, colourless, without a

perispore. **Conidiomata** pycnidia, immersed. **Conidia** filiform. **Chemistry**: contains  $\beta$ -orcinol derivatives, some with anthraquinones. **Ecology**: lignicolous, saxicolous or corticolous; one species lichenicolous.

*Ramboldia* resembles *Pyrrhospora* but lacks the K+ crimson or purple anthraquinones in the apothecia. It is also similar to *Carbonea*, *Lecidella*, *Miriquidica* and the *Lecanora symmicta* group, all of which differ in their ascus or exciple structure.

**Literature:**

Dobson (2009), Kalb *et al.* (2008), Kantvilas & Elix (2007), Miądlikowska *et al.* (2014).

**Ramboldia insidiosa** (Th. Fr.) Hafellner (1995)

Thallus lichenicolous, at first parasitizing the host thallus, then becoming granular and almost rimose-cracked, green-brown; hyphae I+ violet. Apothecia 0.2–0.5 (–0.7) mm diam., black,  $\pm$  with a bluish bloom when wet, convex; margin soon excluded; in section, true exciple dark green-brown at the outer edge, paler within, hyphae I+ violet; epithecium dark green, N+ purple-red, surface layer brown, of minute crystals that dissolve in K; hymenium 40–60  $\mu$ m tall; hypothecium colourless or pale brownish or greenish; paraphyses 1–1.8  $\mu$ m diam., unbranched or sparingly branched; apices swollen to *ca* 3  $\mu$ m and often with a dark green hood or brown cap. Ascospores (8–) 9–12  $\times$  4.5–5.5 (–6)  $\mu$ m, ellipsoidal. Chemistry: TLC data reported includes psoromic and usnic acids, but these are probably derived from the host lichen. **BLS 1741**.

On *Lecanora varia*. S. & W. England (E. Kent, Shropshire), Northumberland, N. Ireland, S.E. Scotland (Berwick).

The widespread but sparse distribution in Britain suggests that it is probably overlooked, possibly being mistaken for *Lecanora* species with black discs such as *L. aitema*. *R. insidiosa* is the only lichenicolous species of the genus.



NT

## SCOLICIOSPORACEAE Hafellner (1984)

The family contains a single genus *Scoliciosporum*, so the description of the genus below constitutes that of the family.

### SCOLICIOSPORUM A. Massal. (1852)

**Thallus** crustose, glaucous green, green, grey-white or brown-black, thin, not corticate, finely granular-scurfy to almost powdery; prothallus absent, **Soralia** rare or poorly defined. **Photobiont** chlorococcoid, often forming gonocysts. **Ascomata** apothecia, at first flat, soon convex, sessile, constricted at the base, whitish, yellowish, pale brown to black. **Thalline margin** absent. **True exciple** evident in young apothecia, soon excluded, of radiating, branched and anastomosing hyphae, pale or colourless. **Epithecium** colourless, brownish, blue-green or olivaceous, sometimes interspersed with granules. **Hymenium** colourless, I+ blue. **Hypothecium** colourless or pale, upper part of erect hyphae, randomly orientated below. **Hamathecium** of paraphyses, septate, branched and anastomosed in a gelatinous matrix, resembling excipular hyphae; apices not or only slightly thickened, sometimes a few with dark brown caps in young apothecia. **Asci** 8- (rarely 16)-spored, broadly clavate or clavate-cylindrical, *Lecanora*-type with a broad apical cushion. **Ascospores** variously shaped, acicular, sickle-shaped or bent helically, or elongate-fusiform and attenuated towards one end, colourless, with 1 to many transverse septa, the septa very thin and often indistinct.

**Conidiomata** not reliably reported. **Chemistry**: occasionally traces of gyrophoric acid but lichen substances not detected by TLC. in most species. **Ecology**: corticolous, lignicolous, saxicolous, foliicolous and also on man-made surfaces.

Similar to *Micarea* in having weakly marginate apothecia, branched paraphyses and a similar exciple structure, but differing in its *Lecanora*-type asci, large-celled photobiont and (in young apothecia) some paraphyses with dark brown apical caps.

According to Miądlikowska *et al.* (2014), the genus as circumscribed by Edwards *et al.* (2009) is polyphyletic, and *Scoliciosporum intrusum* was therefore transferred to *Micarea* (Pilocarpaceae) in the LGBI3 account (Cannon *et al.* 2022). However, their sequence was subsequently discovered to be erroneous (Svensson & Fryday 2022), and the species is therefore reinstated. Additionally, *S. pruinosum* is divergent in several characters, including its *Biatora*-type asci, and requires transfer to another genus. Kantvilas (2008) suggested placement in *Jarmania*, but more work is needed.

#### Literature:

Cannon *et al.* (2022), Edwards *et al.* (2009), Kantvilas (2008), Miądlikowska *et al.* (2014), Svensson & Fryday (2022).

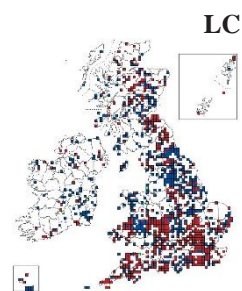
- |      |  |                     |
|------|--|---------------------|
| 1    | Ascospores <17 µm long, ellipsoidal or shortly fusiform and curved, mostly 1-septate .....   | 2                   |
|      | Ascospores >19 µm long, elongate-fusiform to S-shaped, 3- or more septate at maturity .....  | 3                   |
| 2(1) | Asci 8- to 16-spored; ascospores curved or lunate, with acute apices; on leaves .....  | <i>curvatum</i>     |
|      | Asci 8-spored; ascospores ellipsoidal, with rounded apices; on rocks .....   | <i>intrusum</i>     |
| 3(1) | Ascospores elongate-fusiform, straight to slightly curved, ± straight in the ascus .....   | <i>chlorococcum</i> |
|      | Ascospores strongly curved to S-shaped, helically twisted in the ascus .....   | 4                   |
| 4(3) | Apothecia white, pruinose, UV+ white; epithecium with K+ dissolving crystals .....   | <i>pruinosum</i>    |
|      | Apothecia pale brown or darkly coloured, not pruinose, UV-; epithecium without crystals .....  | 5                   |
| 5(4) | Thallus scurfy, with ± delimited, yellow-green soralia (C+ fleeting red in squash preparations);<br>apothecia pale to dark brown ..... | <i>sarothamni</i>   |
|      | Thallus unevenly nodular or scurfy-granular, not sorediate; apothecia blackish, less<br>often brown .....                              | <i>umbrinum</i>     |

#### ***Scoliciosporum chlorococcum* (Graewe ex Stenh.) Vězda (1978)**

Thallus wide-spreading, irregularly granular, the granules scattered or contiguous, rarely eroded and partly sorediate, dirty grey-green, dark green or black-green; photobiont cells 7–14 (–20) µm diam. Apothecia occasional, mostly 0.2–0.3 mm diam., convex, dark brown-black, often shiny; epithecium pale brown to deep fuscous brown (K–, N–), occasionally with a green-blue tinge (K–, N+ purple), rarely entirely deep blue-green. Ascospores 20–40 × 4–5 µm, mostly 7-septate, elongate-fusiform, tapered at one end, straight or curved. Pycnidia not seen. No lichen products detected by TLC. **BLS 1320.**

On shaded damp ± nutrient-rich or -enriched bark, often on branches or twigs, less often on wood and *Calluna* stems, rarely on siliceous rock and boulders, pollution-tolerant, now often replacing *Lecanora conizaeoides*; very common. Throughout Britain and Ireland.

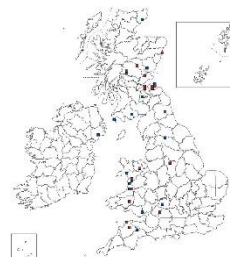
Resembles, and often occurs with, the alga *Desmococcus olivaceus* and may form similarly large, amorphous patches. The straighter ascospores distinguish this species from the otherwise similar *S. sarothamni* and *S. umbrinum*. Critical studies are required as some sorediate morphs may be referable to the segregate species *S. gallurae* Vězda & Poelt (1987) which is known from Continental Europe.



**Scoliciosporum curvatum** Sérus. (1993)

NE

Thallus effuse, composed of small green granules to 50 µm diam., at first scattered but soon coalescing to form a thicker thallus; photobiont cells 7–12 (–15) µm diam. Apothecia usually abundant, 0.1–0.16 mm diam., the disc rounded, flat when young but soon becoming convex to hemispherical, sometimes contiguous and fused in well-developed specimens, pale to orange, becoming brown in old specimens; exciple only visible in young apothecia; epithecium and hypothecium colourless, paraphyses abundant only in young apothecia, unbranched or furcate and rarely anastomosing. Ascospores 8–16 per ascus, fusiform, with acute ends, curved or lunate to slightly sigmoid, 1-septate, 7–11 (–14) × 1.5–3.5 µm. Pycnidia not seen. **BLS 1358.**



On the leaves of evergreen shrubs such as *Buxus*, *Camellia* and *Rhododendron*, in sheltered and humid sites; rare but easily overlooked. Known at present from scattered sites in S.W. and N. England, N. to S. Wales, S.W. & N.E. Scotland and N. Ireland.

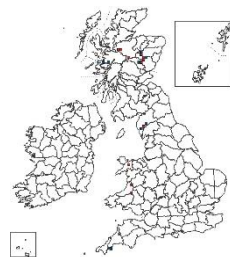
A minute and easily overlooked foliicolous species often growing along the leaf midrib of evergreen shrubs. In Scandinavia it has been found on the needles of coniferous trees.

**Scoliciosporum intrusum** (Th. Fr.) Hafellner (2004)

Nb

*Micarea intrusa* (Th. Fr.) Coppins & Kilius (1983)

Thallus effuse, or forming small patches to 1 cm diam., areoles convex, scurfy or granular-verrucose, dark dull olivaceous-brown to grey-black; photobiont cells 7–21 µm diam. Apothecia 0.14–0.4 mm diam., convex, black, glossy or dull; true exciple reflexed and excluded, colourless to pale brown or dark brown on the outside edge; hymenium 40–50 µm tall; epithecium aeruginose-green, K– lighter green; hymenium colourless or greenish above; hypothecium colourless or faintly olivaceous, sometimes dull orange (K+ purplish-red) in the upper part, ascus and ascospore contents also sometimes with orange, K+ purplish-red pigment; paraphyses 1–1.5 (–1.7) µm diam., branched, apices not swollen. Ascospores (7–) 9–14 (–17) × 4–6 µm, 0- or 1(-3)-septate (the septum often eccentric), ellipsoidal or ovoid-ellipsoidal, rarely cylindrical-fusiform and ± curved. Pycnidia not seen. **BLS 0878.**



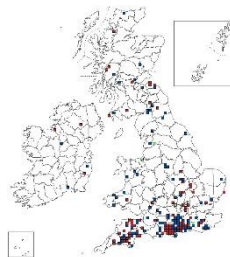
On exposed, hard acid rocks, apparently establishing on the edges of crustose lichens, e.g. *Rhizocarpon* spp; rare. Scotland (Highlands), W. Wales, N.W. & S.W. England (Westmorland, E. Cornwall).

In the field, *S. intrusum* closely resembles *Scoliciosporum umbrinum*, which has elongate, helically twisted ascospores. Can be mistaken for *Micarea subnigrata* (Pilocarpaceae), which has a brown epithecium and a smaller-celled photobiont.

**Scoliciosporum pruinoseum** (P. James) Vězda (1978)

LC

Thallus thin, sub-leprose-granular or almost absent, glaucous to grey-white, often wide-spreading, effuse; photobiont 7–14 µm diam. Apothecia abundant, often crowded, 0.1–0.3 mm diam., convex from initiation, becoming almost globose; true exciple obscured, sometimes becoming irregularly tuberculate; disc very pale pinkish, yellow- or brown-white, becoming browner when mature, ± white-pruinose; epithecium colourless or pale brown-yellow, with numerous colourless interspersed granules to 1 µm diam., dissolving in K; paraphyses 1–1.5 µm diam., not swollen at the apices. Asci *Biatora*-type. Ascospores (22–) 25–32 (–40) × 1–1.2 µm, helically twisted in the ascus, sigmoid-curved or more rarely straight on release; septa 3–5, very indistinct. Pycnidia not seen. Apothecia fleetingly KC+ violet, UV+ white (lobaric acid in apothecia, as pruina). **BLS 1321.**



On acid bark in sheltered situations, especially *Quercus*; possibly widespread but overlooked. Mainly S. & S.W. Britain, extending locally to S. Scotland with occasional outliers further north; scattered in Ireland.

Characterized by the tiny white-pruinose white to pale pink ± crowded apothecia, the densely granular epithecium and true exciple, and the helical twisting of the spores in the asci. Superficially recalls *Mycobilimbia sphaeroides* (Ramalinaceae) which has larger non-pruinose and more deeply coloured apothecia and broader, 1- to 3-septate ascospores. *Micarea* species, e.g. *M. pycnidiophora* or *M. stipitata*, have similar but non-pruinose and UV– apothecia and are usually accompanied by numerous white-pink stalked pycnidia; *M. alabastrites* is similar but has a non-granular epithecium and differently shaped spores.

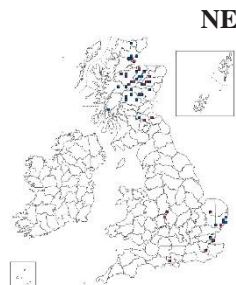


***Scoliciosporum sarothamni* (Vain.) Vězda (1978)**

Thallus in ± coalescing patches, <1.5 cm diam., thin and ± warty or wrinkled, without cracks, grey-yellow to grey, rarely becoming dark green; prothallus not apparent; soralia few to numerous, at first discrete, punctiform, to 0.2 mm diam., becoming ± contiguous, green-yellow, soredia rather loosely arranged, efflorescent. Apothecia rare, to 0.3 mm diam., sessile, disc dilute to dark red-brown (K-, N-) or pale green (K-, N+ purple) or a combination of both pigments (as in *S. chlorococcum*); paraphyses 1.5–2 µm diam., apices ± clavate. Ascospores 20–40 × 2–3 µm, 3- to 7-septate, ± helically arranged in the ascus, mostly S-shaped. Pycnidia not observed. Soralia C+ red (fugitive and best seen in squash preparations), K-, KC-, Pd-, UV- (gyrophoric acid). **BLS 1805.**

On ± nutrient-rich or -enriched bark of boles, branches and twigs of a wide range of trees; probably widespread but overlooked. S.E. and C. England and throughout Scotland; probably elsewhere, especially in the east.

Sterile specimens with green thalli can be difficult to separate from more granular forms of *S. chlorococcum* but in such cases the contrasting pale yellow-green, C+ red soralia of *S. sarothamni* from the overall uniform, C- colour of *S. chlorococcum* is diagnostic. In fertile material the mature ascospores of *S. chlorococcum* are 4–5 µm diam. and less strongly curved.



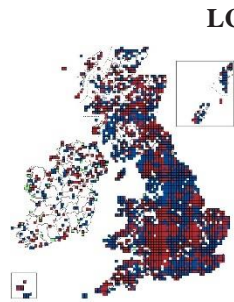
NE

***Scoliciosporum umbrinum* (Ach.) Arnold (1871)**

Thallus very variable, thin, scurfy-uneven and ± cracked, to rather thick, nodular-uneven, grey-green or dark green-brown to black, occasionally rusty; photobiont 7–17 (–20) µm diam. Apothecia frequent, 0.3–0.8 mm diam., dark brown-black or less often dark red-brown, glossy when young, sometimes a dull pale brown in extreme shade; epithecium blue-green, green-brown or olive-brown, colours often intermixed, paler true exciple sometimes persisting. Ascospores (15–) 20–30 (–40) × 2–3 µm, 3- to 7-septate, needle-shaped, helically twisted. Pycnidia not seen. All parts C-, K-, KC-, Pd- (no lichen products detected by TLC). **BLS 1322.**

On ± basic or siliceous rocks, memorials, metal-rich scree, rusty metal work, walls, compacted acid soil, branches, twigs, wood and man-made substrata in coastal and upland areas, inconspicuous but widespread and pollution-tolerant; common. Throughout Britain and Ireland.

The helically twisted ascospores in the ascus are characteristic and may give the illusion of a multisporous ascus. The species as treated here is very variable and with a wide ecological amplitude; often forming dark, poorly organized thalli amongst other lichens. A species complex may be involved. Some records on twigs may be referable to *S. sarothamni* (q.v.).



LC

## GENERA OF LECANORALES OF UNCERTAIN POSITION

### ADELOLECIA Hertel & Hafellner (1984)

**Thallus** crustose, epilithic and areolate or endolithic, to 12 cm diam. Hypothallus, soredia and isidia absent. **Photobiont** trebouxoid. **Ascomata** apothecia, sessile, constricted at the base, black, the disc concave to flat or somewhat convex; margin prominent, persistent. **True exciple** dark brown at the surface but paler internally, of broad radially orientated hyphae, almost pseudoparenchymatous in parts, the single British species with yellow crystals, K+ magenta solution (7-chloroemodin). **Thalline margin** absent. **Epithecium** green to dark blue in section. **Hymenium** colourless to bluish, K/I+ deep blue; usually with conspicuous croziers. **Hamathecium** of unbranched or sparingly branched and

septate paraphyses, not markedly expanded at the tips, immersed in a greenish epithelial gel, conglutinate but separating in K. **Asci** cylindrical-clavate, *Biatora*-type, 8-spored. **Ascospores** narrowly ellipsoidal, aseptate, colourless, smooth, lacking a distinct perispore. **Hypothecium** pale to dark brown, with ascogenous hyphae reaching far beyond the hymenium. **Conidiomata** pycnidia, immersed, 60–100 µm diam., pigmented, dark brown in the uppermost part. **Conidia** aseptate, colourless, bacilliform. **Chemistry**: sometimes atranorin and occasionally traces of xanthenes and other compounds (e.g. the anthraquinone 7-chloroemodin in *A. pilati*) but lichen compounds often not detectable by TLC. **Ecology**: on weakly basic to highly siliceous, weathered rock types (maybe metalliferous), occasionally corticolous.

This genus is characterized by its *Biatora*-type asci, and (in the single British species) the intense K+ magenta solution reaction (7-chloroemodin) of the true exciple, and sometimes hypothecium, when sections are flooded with K. It differs from *Bacidia* s.l. (Ramalinaceae) in the aseptate to rarely 1-septate ascospores.

The genus was included in the Ramalinaceae by Lücking *et al.* (2017), but phylogenetic data presented by Ekman *et al.* (2008) and Kistenich *et al.* (2018) indicate that *Adolelecia* does not belong in that family.

#### Literature:

Ekman *et al.* (2008), Hertel & Rambold (1995), Hitch & Hawksworth (2009), Kistenich *et al.* (2018), Lücking *et al.* (2017).

#### **Adolelecia pilati** (Hepp) Hertel & Hafellner (1984)

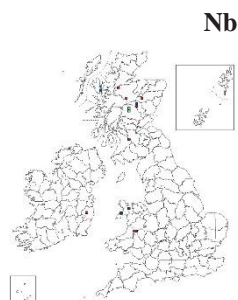
Thallus of dark grey to whitish areoles, or ± endolithic and scarcely apparent. Hypothallus not discernible. Apothecia (0.5–) 1.5–2 (–5) mm diam., sometimes aggregated together and then angular and mosaic-like to tuberculate. True exciple well-developed, persistent, blackish green, K+ magenta; epithecium greenish, N+ purple-red; hymenium 30–50 (–60) µm tall, faintly greenish; paraphyses with branched tips and terminal cells swollen to ca 5 µm diam. Ascospores (6–) 8–11 (–13) × (3–) 3.5–5 µm. Hypothecium colourless to faintly brown. Thallus C–, K–, KC± pink, Pd–, UV– (unidentified compound in some specimens); 7-chloroemodin in apothecia.

#### **BLS 0762.**

On vertical or overhanging siliceous boulders, rare. N. and W. Wales, Scotland (Highlands), one record from E. Ireland.

A distinctive species easily identified by the internal colour reactions of the apothecia and the narrowly ellipsoidal spores. Sometimes confused with the coastal species *Lecidea sarcogynoides* which has *Lecidea*-type asci, narrower ascospores, and a weak K+ purplish reaction to the hymenium and exciple.

A morph having a thicker (0.1–0.25 mm thick), cracked-areolate, shiny thallus containing zeorin with smaller apothecia 0.4–0.8 mm diam., and smaller ascospores 7–8 × 3–4 µm, is known from south-facing vertical boulders of quartzites or schists in upland/alpine situations of Scotland (Ben Lawers, Glen Coe) and Wales (Cardiganshire, Radnorshire). It is probably worthy of taxonomic recognition, though some specimens lack zeorin by TLC.



### CATINARIA Vain. (1922)

**Thallus** crustose, thin and granular to inconspicuously areolate or apparently absent (then saprotrophic on bryophytes). **Cortex** absent. **Soralia** not developed, **isidia** present in one undescribed species. **Photobiont** chlorococcoid, *Dictyochloropsis*. **Ascomata** apothecia, round, flat to slightly convex, adnate to sessile, reddish brown to dull black. **Thalline margin** absent. **True exciple**

generally concolorous with the disc but sometimes darker, of branched radiating hyphae, well-developed, later often excluded, or pseudoparenchymatous in one species. **Hamathecium** of unbranched or sparingly branched septate paraphyses; apices usually swollen, often with a pigmented hood. **Asci** clavate, with a  $\pm$  uniformly K/I+ blue apical dome, 8- to 16-spored, *Catillaria*-type. **Ascospores** 1- or rarely 3-septate, colourless, ellipsoidal to broadly ellipsoidal, smooth or warted, with a compact gelatinous perispore; **Conidiomata** not seen. **Chemistry**: lichen products not detected by TLC. **Ecology**: epiphytic on bark or lignicolous, usually associated with bryophytes; some species are considered as possible parasites of leafy liverworts.

*Catinarina* differs from *Catillaria*, *Megalaria* and *Phyllopsora* by the ascospores with a perispore and lack of differentiation of the apical tholus of the ascus. Included in the Ramalinaceae by Lendemer *et al.* (2016) and Lücking *et al.* (2017) but found to occupy a position outside of that family by Kistenich *et al.* (2018).

*Catinarina* needs further revision, including a comprehensive phylogenetic analysis. There are several taxa in Britain of uncertain status, in addition to those included below. Material with delicately- to obviously warted spores has features that vary along with apothecium size, exciple characters, etc., and does not appear to have any relationship to other taxonomic or ecological characters. The warts may derive from degeneration of the perispore rather than structural ornamentation.

An apparently undescribed species resembling *C. atropurpurea* is known with warted 3-septate ascospores  $14\text{--}21 \times 4\text{--}6 \mu\text{m}$ , apothecia 0.2–0.4 mm diam., on bark of *Fagus* and *Quercus* in Somerset, Hampshire (New Forest), Sussex, Northumberland. Mid-Perthshire & E. Ross, also on coniferous bark in Belgium & Switzerland. It appears to be distinct from *C. occidentalis* which has longer, smooth-walled ascospores that are mostly 3- or 5-septate (Van den Boom 2020), which could also occur in our region.

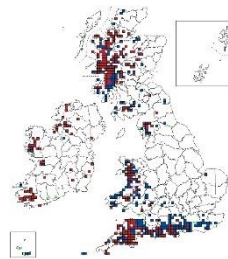
#### Literature:

Gilbert (2009), Kistenich *et al.* (2018), Lendemer *et al.* (2016), Lücking *et al.* (2017), Van den Boom (2020).

- |      |   |
|------|---|
| 1    | Thallus coralloid-isidiate; paraphyses without pigmented apical hoods..... <i>isidioides</i><br>Thallus smooth, often inconspicuous or evanescent; paraphyses often pigmented at the apices.....2 |
| 2(1) | Asci 8-spored ..... <i>atropurpurea</i><br>Asci 12- to 16-spored ..... <i>neuschildii</i>   |

#### *Catinarina atropurpurea* (Schaer.) Vězda & Poelt (1981)

Thallus effuse, evanescent, thin, pale to dark grey-brown, often minutely granular; granules  $15\text{--}70 \mu\text{m}$  diam.,  $\pm$  immersed, often scattered giving a minutely speckled appearance when on light-coloured bark; photobiont cells  $5\text{--}9 \mu\text{m}$  diam. Apothecia 0.2–0.6 (–0.8) mm diam., reddish brown to dull black; true exciple dark, at first prominent, later sometimes excluded, dark brown at the edge, colourless to pale brown within, the hyphae coherent in K,  $1.5\text{--}2.5 \mu\text{m}$  diam. but thickened by pigment at the outer edge; disc at first concave, later flat or weakly convex, occasionally with islands of excipular tissue within the disc; epithecium yellowish to dark brown, K–, N–; hymenium  $60\text{--}75 \mu\text{m}$  tall, colourless; hypothecium colourless to pale brownish; paraphyses  $0.8\text{--}1 \mu\text{m}$  diam., the apices  $\pm$  swollen to *ca*  $2 \mu\text{m}$  diam., often with a dark brown hood  $3\text{--}(4) \mu\text{m}$  diam. Asci 8-spored. Ascospores  $10\text{--}15 \times 4.5\text{--}7 \mu\text{m}$ , ellipsoidal, with smooth to warted walls to  $1.5 \mu\text{m}$  thick. **BLS 0183**.



On bark or bryophytes on trunks of mature trees (especially *Fraxinus* and *Quercus*), sometimes on mossy branches; mainly in *Lobartion* communities in ancient woods or parkland. Widespread in Britain and Ireland, especially in the N. & W., but absent from C. and E. England.

Usually easily recognized in the field by the reddish brown to black apothecia, but can be confused with *Bryobilimbia hypnorum* (Lecideaceae) which often occurs in similar habitats.

**Catinaria isidioides** Sanderson, P.F. Cannon & Aptroot (2024)

NE

Thallus bright green when wet, grey-green and cracked when dry, with granular coralloid-branched isidia. Isidia to about 125 µm diam., brown-green and darker grey at the apices when dry, swelling in the wet to appear brighter green and globose, the cortex smooth with few projecting cells. Photobiont *Dictyochloropsis*, with spherical cells 8–10 µm diam. Apothecia 0.6–0.8 (–1.0) µm diam., to ca 250 µm tall, scattered or more rarely in clusters of up to 6, sessile with a distinctly constricted base, mid brown when young and maturing to dark blackish-brown (observations on dried material). Exciple slightly paler than the disc, to ca 60 µm thick, at first slightly raised but soon becoming excluded, occasionally with islands of excipular tissue within the disc, K+ orange-brown, composed of branched epidermoid to radiating hyphae with a largely occluded medulla, the inner part almost colourless. Epithecium brown, hymenium brownish towards the epithecium and colourless below, hypothecium yellow-brown above, K+ intensifying, reddish brown below. Paraphyses hardly swollen at the tip, without a pigmented hood. Asci 60–70 × 13–15 µm, cylindrical-clavate, with a K/I + solid blue apical dome (*Catillaria*-type), (4-) 8-spored. Ascospores arranged biserially, (12.5–) 14.5–17 (–25) × (5–) 6–7 (–9) µm, colourless, 1-septate (very occasionally 2-septate), rather variable in shape but usually ellipsoidal to clavate, hardly constricted at the septum, thick-walled, smooth with a gelatinous perispore that is not well-differentiated from the spore wall. **BLS 2885**.

On base-rich bark of veteran trees, mostly on *Fagus* but found once on *Fraxinus*, New Forest.

Similar to *Catinaria atropurpurea* but with a coralloid-isidiate thallus (which can appear inconspicuous when dry), paraphyses without pigmented hoods, and slightly larger smooth-walled ascospores. In the LGBI2 account of *C. atropurpurea* (Gilbert 2009), sterile thalli were considered to resemble those of the isidiate *Porina coralloidea* (Porinaceae), and these might be assignable to the New Forest species. Very easily overlooked as *Bacidia biatorina* which also has green isidia and similar dark apothecia, but the wet swollen isidia have a different look, the islands of excipular tissue within the disc are never seen in *B. biatorina*, and internally the spores are very different.

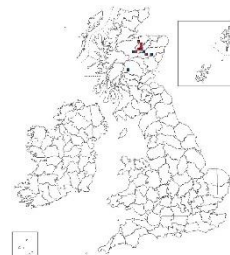
The species is formally described on p. 20 of this publication.

**Catinaria neuschildii** (Körber) P. James (1965)

VU

Like *C. atropurpurea* but with asci that are 12- to 16-spored, and smooth-walled ascospores that are slightly smaller at 9–13 × 5–6 µm. **BLS 0184**.

On bark of *Betula*, *Juniperus* and *Populus tremula*; rare. C. and N. Scotland (mainly the Cairngorm and Strathspey regions).

**FRUTIDELLA** Kalb (1994)

**Thallus** crustose, areolate or strongly warted-papillate with ± isidioid granules that may develop into soredia, greenish, grey or bluish to almost black. **Prothallus** present or absent. **Photobiont** chlorococcoid. **Apothecia** biatorine, subglobose to ± hemispherical, sometimes tuberculate, sessile (partly hidden by thallus granules), bluish black or with blue-grey pruina especially when wet. **Thalline margin** absent. **True exciple** well-developed, not carbonized, colourless or yellowish, of radiating conglutinated hyphae. **Epithecium** and upper part of the hymenium bright blue-green, K–. **Hypothecium** ± colourless to reddish brown or almost violet. **Hamathecium** of sparsely branched paraphyses, the apices not markedly swollen. **Asci** 8-spored, *Lecanora*-type. **Ascospores** aseptate, ellipsoidal, colourless, without a perispore. **Conidiomata** pycnidia with a pigmented apex. **Conidia** filiform, borne at the apex of bottle-shaped conidiogenous cells. **Chemistry**: sphaerophorin, thiophanic acid and occasionally isoarthothelin and asemone. **Ecology**: on acid soil overgrowing mosses in montane areas, or corticolous on acid bark.

*Frutidella* contains two species, both occurring in our region. The genus has been assigned variously to the Ramalinaceae and Lecanoraceae, but studies by Andersen & Ekman (2005), Miądlkowska *et al.* (2014) and Kistenich *et al.* (2018) have excluded *Frutidella* from these families.



**Literature:**

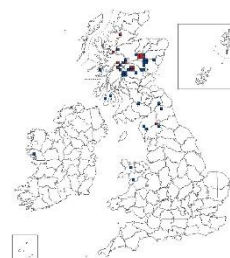
Andersen & Ekman (2005), Gilbert (2009b), Kalb (1994), Kistenich *et al.* (2018), Miądlikowska *et al.* (2014), Svensson *et al.* (2017).

- 1      Thallus of ± isidioid granules, K± weakly yellowish, KC+ orange; overgrowing mosses in arctic-alpine habitats ..... *caesioatra*  
       Thallus granular, becoming soreciate, K-, KC-; on acid bark..... *furfuracea*

**Frutidella caesioatra** (Schaer.) Kalb (1994)

Nb

Thallus crustose, rather thick, strongly warted-papillate, with dense subglobose, ± isidioid granules 0.1–0.2 mm diam., grey to dark grey or almost black, whitish when eroded; prothallus absent; photobiont chlorococcoid, cells 6–12 µm diam. Apothecia frequent, subglobose to ± hemispherical, sometimes tuberculate, sessile, often partly hidden by thallus granules, (0.3–) 0.5–1 (–1.2) mm diam., bluish black or with blue-grey pruina especially when wet; true exciple well-developed, not carbonized, colourless or with the outer parts dull yellowish, of radiating conglutinated hyphae (in K) *ca* 1.5–2 µm diam.; epithecium and upper part of the hymenium bright blue-green, K-; hymenium 50–65 (–75) µm tall; hypothecium ± colourless to reddish brown or almost violet, K+ reddish orange; paraphyses 1.3–1.8 µm diam., sparsely branched, sometimes anastomosing, apices not markedly swollen but with individual colourless gel coats. Asci 8-spored, 50–60 × 15–20 µm, elongate-clavate, with a broad, K/I+ blue, apical cushion. Ascospores aseptate, (11–) 15–19 (–26) × 5–7 (–9) µm, ellipsoidal, colourless, without a perispore. Pycnidia occasional, immersed or half immersed, globose or pear-shaped with pigmented apices; conidia filiform, 15–25 × 0.7–1 µm. Thallus C-, Pd-, UV+ blue-white (sphaerophorin, thiophanic acid and occasionally isoarthothelin and asemone). **BLS 0705.**



On mosses, particularly *Andreaea*, *Grimmia* and *Racomitrium*, over acid soil or schistose boulders; locally abundant above 700 m particularly in areas of late snow lie. N.W. England (Lake District, Cross Fell), Wales (Snowdonia), Scotland (especially the Highlands), Ireland (Galway).

Sometimes mistaken for *Micarea assimilata* and *M. incrassata*, which have apothecia without a bluish-pruinose bloom, smaller photobiont cells (4–7 µm diam.), and have thalli which are UV-.

**Frutidella furfuracea** (Anzi) M. Westb. & M. Svensson (2017)

DD

*Lecidea pullata* (Norman) Th. Fr. (1874)

Thallus forming ± irregular patches, ± innate or thin, areolate; prothallus ± distinct, blue or blue-grey, blue pigment N+ red, areoles almost absent to distinct, mostly discrete, always minute, bursting apically to form soralia; soralia mainly *ca* 0.1 mm diam., pale green or with brown tinges, mainly discrete or a few continuous, rarely partly contiguous to form a ± interrupted leprose crust. Apothecia (not recorded in British material), biatorine, markedly convex, *ca* 0.6 mm diam., blackish, often ± bluish pruinose. Thallus and soralia C-, K-, KC-, Pd-, UV+ white (sphaerophorin and ± isosphaeric acid). **BLS 2488.**



On bark of *Juniperus* and *Pinus*, known only from two records. Scotland (Moray, N. Aberdeenshire).

For sterile material TLC. is recommended for separation from some forms of *Lecidea nylanderii* (divaricatic acid) and *Mycoblastus caesius* (perlatolic acid). The convex blackish often bluish-pruinose apothecia typical of this species are not present on the Scottish specimens, but are not uncommon in material from Scandinavia.

**HERTELIANA** P. James (1980)

**Thallus** crustose, superficial, pale in colour. **Photobiont** chlorococcoid. **Ascomata** apothecia, immersed to sessile, red-brown; disc convex. **Thalline margin** absent. **True exciple** persistent, pseudoparenchymatous, pale brown to orange. **Epithecium** orange-brown, ± granular. **Hymenium** ±

colourless to pale orange, I+ blue. **Hypothecium** well-developed, root-like,  $\pm$  colourless to yellow-orange. **Hamathecium** of unbranched or sparsely branched paraphyses, the apices swollen. **Asci** elongate-clavate, with a thickened K/I+ blue tholus including a less intensely staining ocular chamber, almost *Bacidia*-like, 8-spored. **Ascospores** broadly fusiform, somewhat pointed at the apices, aseptate to 3-septate, colourless, smooth, lacking a distinct perispore. **Conidiomata** pycnidia, immersed, black. **Conidia** thread-like, falcate, aseptate, colourless, arising singly from the apices of the conidiogenous cells. **Chemistry**:  $\beta$ -orcinol (atranorin) and orcinol (confluent acid) para-depsides, and unidentified products. **Ecology**: on damp siliceous rocks in oceanic regions.

This genus is close to *Biatora* in morphology, which differs in the often anastomosing hamathecial filaments, which are not swollen at the apices; distinctive falcate conidia are also produced in *Herteliana*. The root-like hypothecium, best seen in strongly convex apothecia, and yellow-orange internal pigmentation, are particularly characteristic. There are four species currently recognized, only one of which occurs in our region.

#### Literature:

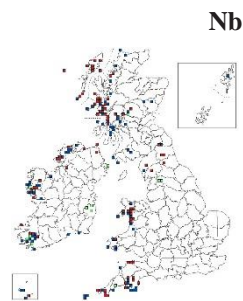
Ekman (1996), Gilbert & James (2009), Hafellner (1984).

#### **Herteliana gagei** (Sm.) J.R. Laundon (2004)

Thallus to 30 cm across, creamy white, pale greenish white or glaucous to bluish green (duck egg colour), thick, continuous or rimose-cracked; prothallus  $\pm$  distinct, black, delimiting. Apothecia 0.5–0.7 mm diam., immersed at first, becoming sessile by rupturing the thallus surface which remains as a rim round the exciple as in *Trapelia coarctata* s.l.; red-brown, strongly convex to tuberculate; paraphyses 1–2  $\mu$ m diam., the apices swollen to 3–4.5  $\mu$ m. Ascospores (16–) 18–22 (–25)  $\times$  8–10 (–11)  $\mu$ m, with pointed ends. Conidia 17–20  $\times$  ca 1  $\mu$ m. Thallus C–, K+ yellow, KC+ yellow, Pd– or Pd+ yellow (atranorin, confluent acid, 2 unidentified substances). **BLS 0557**.

On siliceous rocks below damp overhangs, or on damp exposed boulders in sheltered woodlands, sometimes with *Gyalidea hyalinescens* and *Lecidea phaeops*, Pd+ yellow (psoromic acid) in mainly oceanic situations; local. It is a characteristic species of the Macaronesian element of the flora of Britain and Ireland. S.W. England (Cornwall, Devon) through Wales and the Lake District to N.W. Scotland, N.E. England (Northumberland), W. Ireland, Channel Islands.

*Lecidea phaeops* is similar but there the apothecia are persistently immersed, *Aspicilia*-like, and the thallus chemistry is different. The thallus of *H. gagei* often forms continuous wide-spreading sterile glaucous-green patches minutely dotted with incipient apothecia and pycnidia. Mature apothecia are often sparse or absent, the result of snail-browsing. Once established, the patches of *H. gagei* thalli are resistant to colonization by adjacent bryophytes. A morph with clusters of granular soredia abundantly developed from the surface of the areoles has been collected in W. Cornwall (The Lizard).



### LITHOCALLA Orange (2021)

**Thallus** crustose, leprose, diffuse, arising from aggregations of separate granules, eventually forming a cracked crust; lower parts of thallus comprising decolorized granules. **Medulla** and **hypothallus** not differentiated. **Prothallus** occasionally seen in shade, sparse. **Photobiont** chlorococcoid. **Ascomata** and **conidiomata** unknown.

*Lithocalla* as currently circumscribed contains two species, the type (described below) and a cryptic but phylogenetically distinct species from the Falkland Is. The genus was placed in the Ramalinaceae by Orange (2021), but it occupies a basal clade within that family and the phylogenetic signal is not strong. A placement within the Lecanorales but without a definite family seems appropriate. No ascomata or conidiomata are known in either species.

*Literature:* Orange (2021).

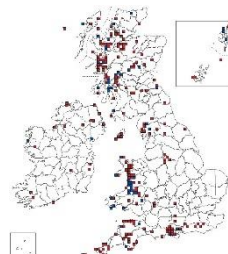
**Lithocalla ecorticata** (J.R. Laundon) Orange (2021)

*Lepraria ecorticata* (J.R. Laundon) Kukwa (2006)

Thallus crustose, diffuse, often forming large colonies, arising from aggregations of separate granules to form a leprose crust, pale yellow-green, becoming blue-grey locally in deep shade; thallus eventually to 2 mm thick, but then most of the thickness is of dead decolorized granules; thicker thalli may become cracked; granules fine, 60–100 µm diam., ecorticate, without projecting hyphae. Photobiont chlorococcoid. Medulla and hypothallus not developed. Prothallus occasionally seen in shaded colonies, sparsely developed. Ascomata and conidiomata unknown. Chemistry: C–, K–, KC+ pale yellow, Pd–, UV– (usnic acid, atranorin (accessory), stictic acid (accessory), fatty acids, terpenoids).

On acidic siliceous rocks below overhangs, extending deeply into crevices, on cliffs, below boulders and on drystone walls, frequent in N. & W. Britain, from Scilly Isles to W. Scotland, also scattered throughout southern England and Ireland.

Distinguished in the field by the finely granular, yellow-green thallus on acidic rocks. *Psilolechia lucida* differs in the brighter yellow-green colour. *Lecanora orosthea* differs in the presence of a prothallus and corticate areas of thallus. Corticolous records for this species refer to *Andreiomycetes obtusaticus*, and some of these may be included erroneously in the map.



LC

**MYOCHROIDEA** Printzen, T. Sprib. & Tønsberg (2008)

**Thallus** crustose, poorly delimited, warted-areolate or of goniocyst-like granules; areoles weakly to strongly convex or almost coralloid; surface matt, grey to olive-brown. **Photobiont** trebouxiioid. **Ascomata** apothecia, biatorine, sessile with a constricted base. **Disc** reddish or blackish brown, rarely ochre, matt or slightly glossy, flat to strongly convex, not or faintly pruinose (only visible when wet). **Thalline margin** absent. **True exciple** colourless to pale orange-brown within, the outer parts more or less concolorous with the epithecium, composed of strongly gelatinized radiating hyphae. **Hypothecium**, **subhymenium** and **hymenium** colourless. **Epithecium** pale ochre to reddish brown. **Hamathecium** of paraphyses, colourless below, weakly to moderately branched and anastomosing, the apical cells usually brown and then slightly thickened. **Asci** 8-spored, tholus I+ dark blue with a darker staining central tube (resembling the *Micarea*-type). **Ascospores** aseptate, colourless, fusiform or broadly ellipsoidal. **Conidiomata** not seen. **Chemistry:** fatty acids, lobaric acid, xanthenes or no substances.

*Myochroidea* was described by Printzen *et al.* (2008) for four species of the “*Lecidea*” *leprosula* group, only one of which occurs in our region. They considered that the genus might have affinities with the Pilocarpaceae, but no sequence data appear to be available to confirm this hypothesis. *Myochroidea* was included in the Lecanorales by Lücking *et al.* (2017) but not assigned to a family within that order.

**Myochroidea porphyrospoda** (Anzi) Printzen, T. Sprib. & Tønsberg (2008)

*Lecidea porphyrospoda* (Anzi) Th. Fr. (1873)

Thallus forming a brownish crust that becomes greenish when growing in shade, indeterminate, areolate, sorediate; prothallus whitish, visible between the areoles and surrounding the thallus as a border; areoles indistinct or rarely discrete to contiguous, rounded, sometimes subsquamulose, to 0.4 mm diam., the cortex soon bursting to release soredia; soralia greyish brown or pale brown due to external pigmentation, greenish in shade, irregularly punctiform at first, soon becoming confluent to form an entirely leprose crust; soredia fine, 20–40 (–

NT

50)  $\mu\text{m}$  diam.; photobiont green, globose to broadly ellipsoidal, to 15 (–20)  $\mu\text{m}$  diam. Apothecia (not known in Britain) constricted at the base, to 1.2 mm diam., red-brown, glossy, the margin disappearing with age; disc flat to convex. Thallus C–, K–, KC–, Pd–, UV+ white (lobaric acid). **BLS 1988.**

On lignum of standing old *Pinus*, in native pinewoods; rare. N.W. Scotland.

The more or less brownish, sorediate thallus containing lobaric acid is diagnostic for sterile specimens.



### PUTTEA S. Stenroos & Huhtinen (2009)

**Thallus** indistinct, effuse, consisting of a thin layer of delicate hyphae and small algal cells. **Photobiont** chlorococcoid. **Ascomata** apothecia, whitish,  $\pm$  circular in outline, minute, convex and immarginate. **Thalline margin** absent. **True exciple** composed of an outer layer of parallel, gelatinized hyphae with narrow lumina running perpendicular to the outer surface, and an inner layer of gelatinized intertwined hyphae. **Epithecium** and upper wall of the exciple with a thin gelatinous layer with crystals above, dissolving in K and N. **Hymenium** colourless. **Hamathecium** of branched and anastomosed paraphyses. **Asci** clavate, thick-walled, 8- or multispored, faintly amyloid with a tholus penetrated by a canal surrounded by darker blue walls in IKI, *Psora*-type. **Ascospores** colourless, thin-walled, smooth, ellipsoidal to subfusiform, aseptate, with prominent vacuolar contents. **Conidiomata** not known. **Ecology**: on rotten wood or overgrowing bryophytes

Stenroos *et al.* (2009) suggested that *Puttea* may have affinities with the Pilocarpaceae, but preliminary (unpublished) molecular data indicates a sister relationship with “*Lecidea*” *hypopta* (see Fryday *et al.* 2024) within the Malmideaceae.. Four species are currently recognized, of which two occur in our region. They are characterized by having unusually small ascospores, but there appears to be wide variation in their size and further revision of the included species may be needed.

#### Literature:

Davydov & Printzen (2012), Dilman *et al.* (2012), Fryday *et al.* (2024), Stenroos *et al.* (2009), Svensson *et al.* (2017).

- 1      Asci 8-spored; on rotting coniferous wood .....*caesia*  
        Asci 16- to 24-spored; overgrowing bryophytes on bark or (rarely) limestone .....*duplex*

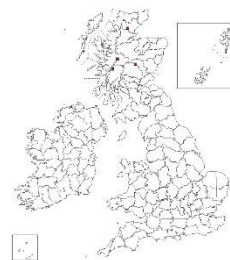
#### **Puttea caesia** (Fr.) M. Svensson & T. Sprib. (2012)

NE

Thallus indistinct, effuse, endoxylic. Apothecia gregarious, pale to brownish, 0.1–0.2 mm diam., immarginate, pulvinate. True exciple composed of gelatinized hyphae perpendicular to the surface, that are apically thickened (to *ca* 4  $\mu\text{m}$ ) and often with brown-pigmented caps, which then give the apothecia a characteristic dark rim when dry; epithecium gelatinized, with a layer of minute crystals; hypothecium colourless. Asci clavate, 8-spored with a K/I+ blue tholus. Ascospores ellipsoidal, aseptate, 5–8  $\times$  1.5–2.5  $\mu\text{m}$ . Chemistry: all reactions negative. **BLS 2648.**

On rotting lignum of coniferous stumps, Scottish Highlands; probably overlooked, at least elsewhere in Scotland.

British collections have somewhat larger ascospores than those measured by Dillman *et al.* (2012), who gave a size range of 3–7  $\times$  1–2.5  $\mu\text{m}$ . The species has historically been confused with *Lecanora symmicta*, which has a better-developed UV+ dull orange thallus and much larger ascospores.





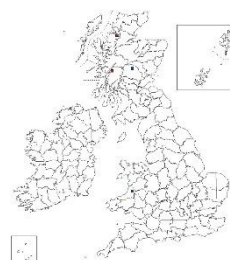
**Puttea duplex** (Coppins & Aptroot) M. Svensson (2017)*Fellhanera duplex* Coppins & Aptroot (2008)

Thallus continuous, very thin, inconspicuous, forming a pale grey to brownish film on decaying mosses. Apothecia sessile, round, (0.1–) 0.15–0.2 mm diam.; disc pale yellowish brown, flat; margin similar or slightly darker; true exciple poorly differentiated, nearly colourless, K–; hypothecium colourless; paraphyses branched and anastomosing, 1–1.5 µm diam., the apices not thickened. Asci 16- to 24-spored. Ascospores broadly ellipsoidal, aseptate, (2.5–) 3–4 (–5) × 2–2.3 µm. Conidiomata not known. Lichen substances not detected.

On bleached decaying bryophytes on bark, more rarely on moss on limestone; Wales (Cardiganshire), Scotland (Argyll, Mid-Perthshire, W. Ross).

Most likely to be confused with a small *Micarea*, but differs in the 16- to 24-spored asci. A collection on *Betula* bark (not bryophyte-associated) from Sweden has larger ascospores, measuring up to 9 µm in length (Svensson *et al.* 2017).

Nb IR

**SCHADONIA** Körb. (1859)

**Thallus** crustose, scurfy, verrucose to coralloid, effuse, sorediate in some species. **Photobiont** chlorococcoid. **Ascomata** apothecia, sessile, constricted towards the base; disc black, concave to flat. **Thalline margin** absent. **True exciple** prominent, even or somewhat flexuose, ± pseudoparenchymatous, cells ± isodiametric, radially orientated. **Hypothecium** dark. **Hamathecium** of paraphyses, thin, branched and anastomosed, not or slightly thickened at the apex. Asci 1- to 8-spored, cylindric-clavate with a strongly K/I+ blue tholus, *Bacidia*-type. **Ascospores** ellipsoidal, richly muriform, colourless. **Conidiomata** unknown. **Chemistry**: lichen products not detected by TLC. **Ecology**: encrusting mosses, plant debris and rock, montane.

Similar to *Lopadium* (Lopadiaceae) but differing in the 2- to 8-spored asci, K/I+ dark blue tholus and branched-anastomosing paraphyses without swollen, pigmented apical cells. Included in the Ramalinaceae by Lücking *et al.* (2017), but excluded from that family by Kistenich *et al.* (2018) and placed in the Pilocarpaceae by Lendemer & Hollinger (2023). Resurrection of the Schadoniaceae, introduced by Hafellner (1984), might be justified. Five species are currently recognized, only one of which occurs in our region.

**Literature:**

Gilbert *et al.* (2009), Hafellner (1984), Kistenich *et al.* (2018), Lendemer & Hollinger (2023), Lücking *et al.* (2017).

**Schadonia fecunda** (Th. Fr.) Vězda & Poelt (1980)

Thallus thin to moderately thick, ± continuous, unevenly minutely verrucose to granular, greyish brown. Apothecia 0.5–1.5 mm diam.; disc flat, matt, black; margin prominent, somewhat inrolled when young, shiny; epithecium overlain by a dark brown layer, K+ purplish-brown; hymenium 150–170 µm tall, colourless or in part pale yellow-brown; hypothecium deep brown, K+ deep red-brown; paraphyses thin, 1–1.5 µm thick, richly branched and anastomosed, apices not swollen. Asci (4-) 8-spored, 90–140 × 30–50 µm. Ascospores (30–) 40–50 (–60) × 10–18 (–20) µm, markedly muriform, ellipsoidal to obovoid, colourless. **BLS 1310**.

Encrusting mosses, plant debris and acid rocks, montane, over 1000 m; very rare. N. Scotland (Perth, Ben Lawers; W. Ross).

VU D2



## Nomenclature

**Catinaria isidioides** Sanderson, P.F. Cannon & Aptroot, **sp. nov.**

**IF 902664**

*Typification*: UK England: S. Hampshire, New Forest, Great Wood, Black Bush, UK grid ref. SU25301596, on base-rich bark of old *Fagus*, 14 Apr. 2017, *N.A. Sanderson* 2263 (**K(M)** 1444042 – holotype of *Catinaria isidioides*).

*Etymology*: referring to the isidiate thallus, apparently unique in the genus..

*Diagnosis*: similar to *Catinaria atropurpurea* (Schaer.) Vězda & Poelt (1981) but with a coralloid-isidiate thallus, paraphyses that lack dark apical hoods, and slightly larger ascospores ((12.5–) 14.5–17 (–25) × (5–) 6–7 (–9) μm versus 10–15 × 4.5–7 μm in *C. atropurpurea*).

*Description*: thallus bright green when wet, grey-green and cracked when dry, with granular coralloid-branched isidia. Isidia to about 125 μm diam., brown-green and darker grey at the apices when dry, swelling in the wet to appear brighter green and globose, the cortex smooth with few projecting cells. Photobiont *Dictyochloropsis*, with spherical cells 8–10 μm diam. Apothecia 0.6–0.8 (–1.0) μm diam., to ca 250 μm tall, scattered or more rarely in clusters of up to 6, sessile with a distinctly constricted base, mid brown when young and maturing to dark blackish-brown (observations on dried material). Exciple slightly paler than the disc, to ca 60 μm thick, at first slightly raised but soon becoming excluded, occasionally with islands of excipular tissue within the disc, K+ orange-brown, composed of branched epidermoid to radiating hyphae with a largely occluded medulla, the inner part almost colourless. Epithecium brown, hymenium brownish towards the epithecium and colourless below, hypothecium yellow-brown above, K+ intensifying, reddish brown below. Paraphyses hardly swollen at the tip, without a pigmented hood. Asci 60–70 × 13–15 μm, cylindric-clavate, with a K/I + solid blue apical dome (*Catillaria*-type), (4-) 8-spored. Ascospores arranged biserially, (12.5–) 14.5–17 (–25) × (5–) 6–7 (–9) μm, colourless, 1-septate (very occasionally 2-septate), rather variable in shape but usually ellipsoidal to clavate, hardly constricted at the septum, thick-walled, smooth with a gelatinous perispore that is not well-differentiated from the spore wall.

*Ecology*: on base-rich bark at the base of old (veteran) trees, usually *Fagus sylvatica*, in *Fagus–Quercus–Ilex* pasture woodland.

*Other specimens examined* (all in the New Forest, S. Hampshire, UK): Rushpole Wood, Fair Cross, GR SU30500956, on base-rich bark on old *Fagus*, 8 Jan. 2017, *N.A. Sanderson & A.M. Cross* 2228 (**K(M)** 1444047); Stricknage Wood, GR SU26141269, on mildly base-rich bark on old *Fagus*, 6 Feb. 2017, *N.A. Sanderson* 2232 (**K(M)** 1444045); Busketts Wood, Great Stubby Hat, GR SU30691091, on flushed base-rich bark on ancient *Fagus*, 16 Feb. 2017, *N.A. Sanderson* 2245 (**K(M)** 1444044); Roydon Woods NR, Baker Copse, GR SU31610149, on base-rich *Fraxinus* bark, 16 May 2017, *N.A. Sanderson* 2275 (**K(M)** 1444043); Shave Wood, GR SU28921251, on base-rich bark on an ancient *Fagus*, 15 May 2019, *N.A. Sanderson* 2616 (**K(M)** 1444046).

*Notes*: Species definition in *Catinaria* is troublesome (see generic account above), but this appears to be the only species known with an isidiate thallus. *C. isidiza* (Makhija & Nagarkar) Sipman 1983, based on *Megalospora isidiza* Makhija & Nagarkar 1981, was transferred to *Lopezaria* by Aptroot & Sipman (in Aptroot *et al.* 2007) and then to *Megalaria* by Fryday & Lendemer (2010); that genus has a distinct axial body (*masse axiale*) within the tholus of the asci.

Illustrations of the new species may be found at <https://fungi.myspecies.info/all-fungi/catinaria-isidioides>.

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