Revisions of British and Irish Lichens

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Basidiomycota

Cover image: *Lichenomphalia hudsoniana* on peaty soil amongst mosses, Kindrogan, E. Perthshire.

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to compile new printed editions of the entire lichen biota of Britain and Ireland is extensive, and many parts are out-of-date even as they are published.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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Basidiomycota

including *Multiclavula* (Hydnaceae) and *Arrhenia*, *Dictyonema*, *Eonema* and *Lichenomphalia* (Lichenomphaliaceae).

by

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HYDNACEAE Chevall. (1826)

The family contains the well-known genera *Cantharellus*, *Craterellus* and *Hydnum*, as well as clavarioid groups including *Clavulina* and *Multiclavula* (treated here), also various minute lichenicolous taxa including the British *Burgellopsis* and *Burgoa* listed below (Cao *et al*. 2021, Diederich *et al.* 2022).

MULTICLAVULA R.H. Petersen (1967)

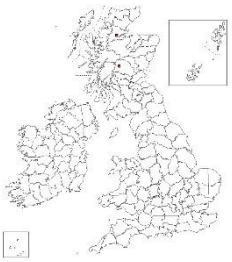
Thallus granular or absent. **Photobiont** unknown, probably *Coccomyxa*, absent in strictly terricolous species or not observed. **Basidiomata** club-shaped, small, rarely more than 30 mm high, the basidia borne on amphigenous hymenia, narrowly club-shaped, usually simple, more rarely sparsely branched, pale coloured in shades of straw or even white at first, then darkening to ochre or orange-buff, tough although brittle when dry. **Hyphae** parallel to the axis of the basidioma, loosely arranged upwards from a tightly packed basal zone, thin or slightly thick-walled. **Clamp connections** present or absent. **Basidia** formed as side branches from thin-walled subhymenial hyphae running parallel to the contextual hyphae, shortly club-shaped, stout, 2-, 4- or up to 8-spored, weakly sterigmatic. **Basidiospores** ovoid or ellipsoidal to elongate-ellipsoidal, thin-walled, prominent guttules present or absent, smooth walled, I–. **Spore print** white or ivory where known. **Chemistry**: unknown. **Ecology**: on soil or rotten wood amongst bryophyte protonema and associated with algal scums.

Literature:
Petersen (1967), Watling (2009).

1 Basidiomata on rotten wood..... ***mucida***
Basidiomata on soil..... 2

2(1) Basidiomata white or cream, narrowly club-shaped..... ***corynoides***
Basidiomata cream-orange to ochraceous, club-shaped to spathulate..... ***vernalis***

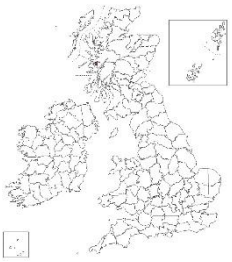
Multiclavula corynoides (Peck) R.H. Petersen (1967) **NE**



Thallus *Botrydina*-type. Basidiomata simple, lobed or primordially branched to sublacerate, 1–2.5 cm high, often subspathulate or laterally compressed toward the apex; white to pale yellowish to straw or pinkish shades, subtranslucent at least toward the base; with a whitish apex, especially on drying. Basidia 4- (to 6-) spored, with a basal clamp connection. Basidiospores 5.5–8 × 2–3.5 µm, thin-walled, elongate-ovoid to cylindrical, sometimes slightly curved, weakly and laterally apiculate, I–. **BLS 2755**.

On soil and over moribund bryophytes, Scotland (Mid Perthshire, E. Ross).

Multiclavula mucida (Pers.) R.H. Petersen (1967) **LC**

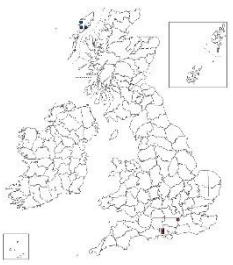


Thallus *Botrydina*-type. Basidiomata simple or branched at the base, narrowly club-shaped to cylindrical or narrowly fusiform, the apex acute to obtuse, 2–5 × 0.5–1.5 mm, smooth and waxy, subtranslucent, white to cream, darkening to pale grey or buff, the tip often remaining white. Basidia 4- to 6-spored with an inconspicuous basal clamp connection often obscured. Basidiospores 4.5–7 × 1.8–3 µm, ellipsoidal to elongate ovoid, colourless, smooth, thin-walled, I–. **BLS 2559**.

On rotten wood by a lake shore, Scotland (W. Inverness).

This and *M. corynoides* cannot easily be separated except by substrate, and the two species are closely related (Cao *et al*. 2021). British material might need reinterpretation.

Multiclavula vernalis (Schwein.) R.H. Petersen (1967) **Nb**



Thallus *Botrydina*-type consisting of crustose, granular, dark green clusters of algal cells intermingled with fungal hyphae. Basidiomata simple, club-shaped to elongate spoon-shaped or very slightly branched at the base and then only once, the apex obtuse to truncate, 7–15 (–20) mm in height, smooth becoming slightly rugulose, cream colour to straw colour then cream-orange to ochraceous upwards, drying dull ochraceous buff but usually retaining a paler, even white, tip. Basidia 4-spored with basal clamp-connection often obscured. Basidiospores 8–10 × *ca* 2.5µm, ellipsoidal to elongate ovoid, colourless, smooth, thin-walled, I–. **BLS 1779**.

On cyanobacteria and moss-covered wet peaty soil in open grazed or disturbed patches or damp crevices and gulleys in heathland; rare. England (Hampshire, New Forest & Hawley Common), Scotland (Outer Hebrides & Shetland).

Characterized by the small, cream to orange clubs, clamp-connections, relatively large spores and 4-spored basidia.

LICHENOMPHALIACEAE (Lücking & Redhead) Vizzini, Consiglio & P. Alvarado (2024)

The Lichenomphaliaceae occupies a distinct clade within the Hygrophoraceae s.l. (Lawrey *et al.* 2009, Lodge *et al.* 2014, Vizzini *et al.* 2024), and includes all of the lichenized and lichenicolous taxa. It was treated as a tribe within the Hygrophoraceae by Lodge and colleagues, and that arrangement is equally valid in phylogenetic terms.

Lichenicolous species of this and other families of the Basidiomycota have recently been included in a comprehensive monograph (Diederich *et al.* 2022).

ARRHENIA Fr. (1849)

Thallus absent (lichenicolous in a few species). **Basidiomata** spathulate or membranous with a gilled, veined or smooth hymenophore. **Cap** spathulate, cupulate, kidney-, fan-, shell- or funnel-shaped, or convex to flat with a ± depressed centre, smooth to finely scaly, translucently striate or not, grey brown to almost bluish. **Gills** absent, veined or normally developed, decurrent, mostly distant, sometimes forked and anastomosing, grey to grey brown. **Stem** absent or lateral, eccentric or central, cylindrical to compressed, smooth to pubescent, concolorous with the cap or paler. **Spore print** white. **Cheilocystidia** mostly absent, when present cylindrical, clavate to narrowly lageniform, thin-walled, colourless. **Pleurocystidia** absent. **Caulocystidia** absent, but cylindrical to clavate hairs are often present. **Clamp-connections** present or absent. **Basidia** 2- or 4-spored. **Basidiospores** subglobose, ellipsoidal, ovoid, amygdaloid, cylindrical or dacryoid, smooth, colourless, thin-walled, without iodine reactions, not cyanophilous. **Ecology**: saprotrophic or parasitic on mosses and lichens.

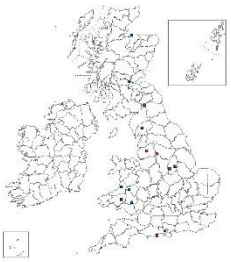
The generic description has been adapted from Elborne (2008).

Literature:

Barrasa & Rico (2010), Elborne (2008), Voitk *et al.* (2024).

Arrhenia cupulatoides (Orton) I. Saar & Voitk (2024) **NE**

Arrhenia peltigerina auct. br., *non* (Peck) Redhead, Lutzoni, Moncalvo & Vilgalys (2002)



Thallus absent, lichenicolous. Basidiomata agaricoid, *Omphalina*-like, 8–30 mm tall, with the basidia borne on well-developed gills. Cap 5–20 mm diam., initially convex and then umbilicate to infunduliform, the margin incurved and then wavy or crenate, striate when wet, colour of milky coffee, hazel or pale snuff-brown. *Gills* decurrent, distant, 8–12 (–15) mm long, thick, forked near the cap, somewhat veined, ± concolorous with the stipe, with a darker edge. Stipe 8–20 × 0·8–3 mm, cylindrical with a slightly thicker base, vinaceous–buff or clay–buff to fairly deep milky coffee in colour, pruinose to pubescent, floccose at the base. Flesh concolorous, whitish when dry. *Smell* none. Basidia 30–40 × 7–10 µm, subclavate, 4-spored, sterigmata 6–10 µm long. Basidiospores 6.0–11.1 × 4.2–6.5 µm, mean 7.9 × 5.1 µm, length/breadth ratio 1.2:1–2.1:1, mean 1.8:1, cylindric- or elongate-ellipsoidal, with a prominent oblique apiculus, smooth, non-amyloid. **BLS 2908**.

On thalli of *Peltigera hymenina*, mostly developed from the lower surface of the lichen thallus. Scattered throughout upland Britain, also in the New Forest [the map is a composite of *A. cupulatoides* and *A. mohniensis*]. Confirmed records from England (Dorset) and Scotland (Mid Perthshire, Rannoch).

The description has been adapted from Barrasa & Rico (2010) and Voitk *et al.* (2024). Voitk *et al.* (2024) established that *A. peltigerina* is a North American species, and that *A. cupulatoides* appears to be confined to *Peltigera hymenina*. However, *A. mohniensis* also occurs on that lichen (see below).

Arrhenia mohniensis Voitk, Burzynski & I. Saar (2024) **NE**

Similar to *A. cupulatoides* but spores that are ovoid (amygdaliform) with a narrowed apex and prominent blunt apiculus, with a marginally smaller length/breadth ratio. **BLS 2909**.

On *Peltigera hymenina*, Scotland (Stirlingshire, Doune Ponds).

According to Voitk *et al*. (2024), *A. mohniensis* is the commonest species in Europe, so it may be more widespread in our region.

DICTYONEMA C. Agardh (1822)

Thallus densely filamentous, paper-like or membranous spreading over woody substrata and mosses. **Photobiont** *Scytonema*. **Basidiomata** sessile or crust-like, lacking a stipe, single or united into regular or irregular rosettes, small or to *ca* 20 cm diam., greyish or some shade of olivaceous green or bluish green, upper surface glabrous or covered with soft hairs, or radially fibrillose, zonate or sulcate. **Hyphae** thin-walled, septate, colourless or slightly yellowish, 3–11 (–13) µm broad, clamp-connections present or absent. **Lower surface** even, granulose, reticulate. **Hymenium** restricted to the lower surface or with concentric bands of basidium-producing tissue. **Basidia** in fascicles, clavate to subcylindrical, four-spored. **Basidiospores** colourless, aseptate, subcylindrical, narrowly ellipsoidal to boat-shaped, thin-walled, I–. **Spore print** white or whitish. **Chemistry**: no lichen products reported. **Ecology**: on soil, covering mosses and liverworts or on woody substrates.

Dictyonema is a large, primarily tropical genus with perhaps more than 1000 species (Lücking *et al*. 2014b), challenging traditional species concepts that were found to be much too broad. Only one is found in Britain and Ireland.

Literature:

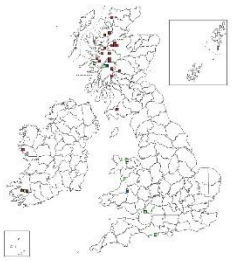
Dal Forno *et al.* (2013), Lücking *et al.* (2013, 2014a, b), Woods & Watling (2009).

Dictyonema coppinsii Lücking, Barrie & Genney (2014) **Nb**

Dictyonema interruptum auct. br., *non* (Carmich. ex Hook.) Parmasto (1978)

Thallus filamentous, a hyphal shell around the photobiont. Photobiont *Rhizonema* sp. Basidiomata fibrillose-encrusting, filaments in places adhering to form close, erect tufts; hymenium composed of a compact layer of basidioles with scattered basidia among branched and anastomosing hyphae 3.8–7.5 µm diam. which become thick-walled, arising from a subhymenium of ± vertically oriented, mostly dichotomously branched hyphae 4–8

µm diam.; clamp connections sparing on generative and subhymenial hyphae; hymenial layer irregular, conspicuously pure white and ± smooth when young, developed beneath the upper compacted, filamentous primary thallus. Basidia 4-spored with curved sterigmata, clavate, colourless, often replaced by basidioles 12–20 × 5–7 (–8) µm. Basidiospores 6–7.7 × 3.5–4 µm, narrowly ellipsoidal to obovoid, colourless, smooth, I–. **BLS 0488**.



Characterized by the inconspicuous fibrillose encrusting basidiomata overgrowing mosses, liverworts and, rarely, foliose lichens on sheltered tree trunks and rocks in moist, relict woodland and along streams in gorges with a single record from a non-wooded, upland cliff; very rare but probably much overlooked. Widespread in N. and W. Scotland and W. Ireland, older records from Wales and S. England.

Any well-developed blue-green felted mats of cyanobacteria overgrowing bryophytes, such as *Isothecium myosuroides, Frullania* spp. and *Diplophyllum albicans,* should be turned over and examined for the characteristically chalk-white (when young) hymenial layer which is normally invisible from above; easily overlooked as flattened, interwoven tufts of free-living *Scytonema*.

EONEMA Redhead, Lücking & Lawrey (2009)

The genus is monotypic, so the description of *E. pyriforme* below constitutes that of the genus. It has been adapted from Kotiranta & Mukhin (2000).

Literature:
Khodosovtsev *et al.* (2018), Kotiranta & Mukhin (2000), Lawrey *et al*. (2009).

Eonema pyriforme (M.P. Christ.) Redhead, Lücking & Lawrey (2009) **NE**

Basidiomata resupinate ("mushrooms" not produced), thin, whitish, finely poroid, not athelioid. Hyphal system monomitic, all hyphae simple-septate. Basal hyphae sparingly septate, to 7 µm diam. with thickened walls; subhymenial hyphae *ca* 4 µm diam., thin-walled, very faintly CB+, IKI–. Cystidia absent. Basidia clavate, with a simple septum at the base, stalked, (15–) 18–23 × (5.5–) 6.5–7.5 µm, with four sterigmata to *ca* 6 µm long. Basidiospores pyriform or lacrymoid, (5.2–) 5.9–7.0 (–7.4) × (4.0–) 4.7–5.6 (–6.2) µm, mean 6.5 L=6.5 × 4.9 µm, length/breadth ratio 1.1:1–1.4:1 with a prominent apicular region, smooth, thin-walled, CB– (contents blue), IKI–. **BLS 2725**.

Overgrowing thalli of *Cetraria aculeata*, Scotland (Moray) – the only lichen-associated collection, on other hosts/substrata scattered throughout Britain, mostly on rotten wood and leaves.

A lichenicolous collection from Ukraine, also associated with *Cetraria aculeata*, was described and illustrated by Khodosovtsev *et al*. (2018). Molecular studies would be useful, it may well be that more than one species is involved.

LICHENOMPHALIA Redhead, Lutzoni, Moncalvo & Vilgalys (2002)

Thallus granular (*Botrydina*-type) or squamulose (*Coriscium*-type). **Photobiont** *Coccomyxa*. **Basidiomata** agaricoid, the basidia borne on well-developed gills. **Cap** small, convex then flattened or becoming funnel-shaped, thin-fleshed, often with translucent lines when fresh but soon matt, smooth, dull or brightly coloured. **Cuticle** little differentiated, of ± radially arranged filamentous hyphae. **Flesh** thin, anastomosing, concolorous with the cap and stem. **Hyphae** thin-walled, narrow, lacking clamp connections and ornamentation. **Gills** shortly to broadly decurrent, sometimes thick

and rather distant, cystidia absent. **Stem** central or at most slightly excentric, slender, lacking a veil but sometimes with thin-walled, poorly differentiated cystidia. **Basidia** 2- to 4-spored. **Basidiospores** ovoid to ellipsoidal, smooth, thin-walled, colourless, I–. **Spore-print** white or whitish. **Gill trama** bidirectional. **Chemistry**: lichen products not detected. **Ecology**: on soil, plant remains and wood, and in *Sphagnum*.

The squamules of *Normandina* (Verrucariaceae) are superficially similar to the *Coriscium* morph, but are pale grey, only corticate above, some ± sorediate below and usually occur on trees.

Literature:
Lücking *et al.* (2017), Voitk *et al.* (2023), Watling & Woods (2009).

Key to collections with basidiomata

1 Basidiomata bright lemon- to chrome-yellow or orange ..... ***alpina***
Basidiomata brown or whitish to ivory, straw-coloured or with distinct yellow-brown shades 2

2(1) Basidiomata accompanied by squamulose thalli (*Coriscium*-type)..... ***hudsoniana***
Basidiomata accompanied by granular thalli (*Botrydina*-type)..... 4

3(2) Basidiomata whitish to ivory white, straw-coloured or yellowish brown ..... ***ericetorum***
Basidiomata dark brown, becoming paler with age, finally pale grey-brown ..... ***velutina***

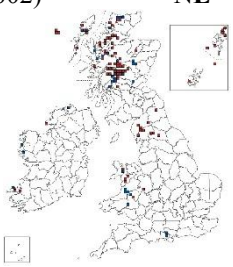
Key to collections without basidiomata

1 Thallus squamulose, of *Coriscium*-type..... ***hudsoniana***
Thallus granular, of *Botrydina*-type 2

2(1) Hyphae amongst granules 2-3 µm diam., thin-walled..... ***velutina***
Hyphae amongst granules broader, (2.5–) 3–4 (–6) µm diam., thick or thin-walled..... 3

3(2) Hyphae and cortical cells of granules ± thickened, walls <1–1.5µm thick..... ***alpina***
Hyphae and cortical cells of granules generally unthickened, walls infrequently greater than 1 µm thick..... ***ericetorum***

Lichenomphalia alpina (Britzelm.) Redhead, Lutzoni, Moncalvo & Vilgalys (2002) **NE**

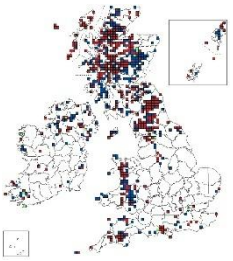


Thallus granular, *Botrydina*-type; cortical cells of granules with slightly thickened walls; hyphae amongst granules mostly with walls 1–1.5 µm broad or more. Cap 5–15 mm diam., flat to plano-convex, bright lemon- to chrome-yellow or orange, margin often crenulate, translucent-striate; gills distinctly decurrent, concolorous with the cap or slightly paler, thick, often distant, veined and sometimes forked. Stem 10–15 × 1.5–2.5 µm, concolorous with the cap or gills, pubescent throughout; hairs hyaline, cylindrical; pigment vacuolar in hyphae and intercellular, partly deposited on hyphal wall; clamp connections absent. Basidia usually 4-spored, sometimes 1- or 2-spored, clavate, colourless, 25–35 × 6–8.5 µm; basidiospores 6.5–9.5 × 3.5–4.5 µm, ellipsoidal, thin-walled. **BLS 0935**.

On peaty, often water-logged soil in montane to submontane regions, more common northwards; rather frequent in suitable habitats. Highlands & islands of Scotland, N. England, Wales, W. Ireland. Records from S. England (New Forest) are likely to be erroneous.

Easily recognized by the almost uniformly rich yellow fruit bodies; even in rarely occurring faded specimens these rich colours are retained by the stem. Distinguished from *L. hudsoniana* by the thallus morphology and lack of pinkish tinges to the stem, and from *L. ericetorum,* with which it may occur, by the brighter colours, the lack of any brown zone at the top of the stem apex and narrower spores.

Lichenomphalia ericetorum (Pers.) Voitk, Thorn & I. Saar (2023) **NE**



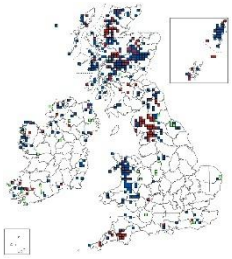
Lichenomphalia umbellifera auct. mult., *non* (L.) Redhead, Lutzoni, Moncalvo & Vilgalys (2002)

Thallus granular, *Botrydina*-type; cortical cells of granules with more or less thickened walls, hyphae amongst granules (2.5–) 3–4 (–6) µm diam. with walls 0.5–1 µm thick. Cap 5–20 (–25) mm diam., convex to plano-convex then depressed, often funnel-shaped, brown to purplish white when young but soon becoming yellowish brown and finally straw-coloured or almost white, in some collections retaining a darker centre or furrows, smooth to very finely scurfy; margin entire or crenulate, furrowed, translucent-striate; gills broadly decurrent, whitish or pale cream, distant. Stem 10–30 × 1–2 mm, dark brown with a more or less purplish tinge at first which is often retained at the stem apex as a coloured zone at maturity, otherwise concolorous with the cap, very finely pubescent above, white-tomentose below; hairs colourless, cylindrical. Hyphae with pigment intercellular, frequently deposited on the hyphal wall with age in some collections; clamp connections absent. Basidia 1-, 2- or 4-spored, clavate, colourless, (40–) 45–50 × 6–7.5 (–8) µm. Basidiospores 7–10 × 6–7 µm, colourless, ellipsoidal, thin-walled. **BLS 0931**.

On soil, peaty substrata, rotten wood and tree trunks, tussocks of grasses and amongst mosses, especially *Sphagnum* in wet soaks and montane regions; common. Throughout Britain and Ireland, more local in lowland England but certainly under-recorded there.

A very variable species, ranging in colour from distinctly pigmented to almost totally white; this has led to several distinct taxa being recognized. The pigmented form always retains a purplish brown zone at the stem apex at maturity by which it can be separated from *L. hudsoniana*. The pale forms, on the other hand, can be recognized by the ever-present *Botrydina*-type thallus. The cap and stem are never as brown as in *L. velutina* and there is neither a lilac hue to the stem nor hints of an intense bright yellow to the fruit body. This species has variable mating patterns and some populations are known to be parthenogenetic, which may explain some of the wide range of colour forms.

Lichenomphalia hudsoniana (H.S. Jenn.) Redhead, Lutzoni, Moncalvo & Vilgalys (2002) **NE**



Thallus squamulose, *Coriscium*-type; squamules 1–2 mm diam., scattered or ± continuous, rounded or shell-like, green, dark green when moist, often with a pale margin when young, white below, corticate on both surfaces, attached by pale rhizomorphs. Cap (5–) 10–15 mm diam., convex then plano-convex or convex-depressed, sometimes becoming funnel-shaped, cream colour to buff or pale orange-yellow, often fading to almost white after heavy periods of cold rain; margin slightly crenulate, weakly translucent-striate; gills shortly to strongly decurrent, more or less concolorous with the cap, moderately and often veined. Stem 10–25 × 2–3 mm, pale lilaceous at first, soon becoming whitish to cream-coloured and concolorous with the cap but generally retaining a pinkish zone at the stem apex, finely pubescent throughout or restricted to the apex; hairs colourless, cylindrical. Hyphal pigment intercellular; clamp-connections absent. Basidia 4-spored, clavate, colourless, 35–45 × 5–7 (–7.5) µm; basidiospores (7–) 8.5–10 × (3.5–) 4–5 (–5.2) µm, colourless, ellipsoidal, thin-walled. **BLS 0934**.

On peaty soil, less often amongst moss, decaying vegetation or on rotten wood, mainly in upland regions; rather frequent fruiting especially in montane regions. Throughout upland Britain and Ireland, rare and apparently declining in lowland England.

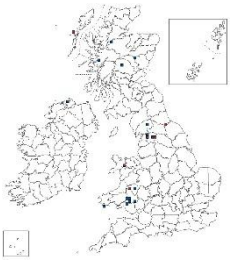
Easily distinguished in the field by the pale colours contrasting with the pale lilac stem and the squamulose thallus, the latter immediately separating it from *L. ericetorum,* which often occurs in the same habitats.

Thelocarpon epibolum sometimes inhabits the squamules.

Lichenomphalia velutina (Quél.) Redhead, Lutzoni, Moncalvo & Vilgalys (2002) **NE**

Thallus granular, *Botrydina*-type; cortical cells and hyphae between granules 2-3 µm diam. Cap 5–11 mm diam., slightly convex to plano-convex, dark brown becoming grey-brown and fading to light brown when dry; margin furrowed, crenulate, translucent-striate; gills broad and shortly decurrent, whitish or pale greyish at first, contrasting markedly with both cap and stem, slowly turning grey-brown later or tinged brown but always paler

than cap. Stem 15–30 × 1–3 mm, ± concolorous with the cap or paler, slightly pubescent; hairs brown, encrusted at least at the base, apex colourless. Hyphal pigment intraparietal to encrusting; clamp-connections absent. Basidia mostly 2-spored, clavate, colourless, 5–6 µm broad. Basidiospores 6–8 (–9) × 3–4 (–5) µm, colourless, ellipsoidal, thin-walled. **BLS 0932**.



On wet sandy soil often in more upland communities, often under overhangs along path sides, tracks and erosion runnels. Throughout Britain and Ireland.

Characterized by the contrasting white or pale gills and the brown cap and stem. The combination of colours distinguish it from all other members of the genus although care must be taken separating it from some similarly coloured, non-lichenized omphalinoid agarics, e.g. *Arrhenia cupulatoides* and *A. mohniensis* (q.v.), which occurs on *Peltigera* thalli, *A. griseopallida* (Desm.) Watling and *A. rickenii* (Hora) Watling, both of which may be found in similar sites to the *Botrydina* stage of *L. ericetorum.* These species all differ in possessing clamp connections.

In addition to the species treated above, there is a series of lichenicolous fungi with basidiomycetous affinities, that are comprehensively treated in Diederich *et al*. (2022) and so are not described here. The British and Irish species are as follows:

Species	**Classification**	**BLS no.**	**Comments**
Athelia arachnoidea	Atheliales, Atheliaceae	1822	Very common especially in lowland Britain, a broad-spectrum necrotrophic parasite of many corticolous lichens
Athelia bombacina			Two records on unidentified lichens from Yorkshire
Athelia epiphylla			Mostly non-lichenicolous, records overgrowing a corticolous *Lecanora* sp. from Essex and on *Xanthoria parietina* from N. Hampshire
Biatoropsis hafellneri	Tremellales, Tremellaceae	2685	On *Usnea cornuta* and other in the *U. fragilescens* agg. Early records of *B. usnearum* on these hosts probably belong here.
Biatoropsis usnearum		1934	On *Usnea subfloridana*, *S. wasmuthii* and relatives.
Burgellopsis nivea	Cantharellales, Hydnaceae	2643	On an unidentified sterile crustose lichen, Scotland (E. Lothian)
Burgoa angulosa	Cantharellales, Hydnaceae	2644	On algal scum on a moribund moss, England (Westmorland) and on dead patches of *Hypnum* and *Metzgeria,* Wales (Glamorgan, Merioneth)
Burgoa moriformis		2824	Over moribund mosses and lichens on *Salix*, Ireland (Fermanagh)
Ceratobasidium bulbillifaciens	Cantharellales, Ceratobasidiaceae	2642	Associated with *Lecidella elaeochroma* and *Physconia grisea*, England (Bedfordshire, S. Essex)
Crittendenia absistentis	Agaricostilbales, Crittendeniaceae	2815	On thalli of *Bacidia absistens*, Scotland (Argyll, Mid Ebudes, W. Ross)
Crittendenia coppinsii		2031	On thalli of *Melanelixia* spp., Scotland (Westerness, W. Ross)
Crittendenia lecidellae		2816	On thalli of *Lecidella elaeochroma*, Scotland (Kintyre, W. Ross, Sutherland)
Crittendenia lichenicola		2425	On thalli of *Micarea micrococca*, Scotland (Kintyre, Skye, W. Ross)
Erythricium aurantiacum	Corticiales, Corticiaceae	2108	On *Physcia* spp., mostly *P. adscendens* and *P. tenella*, very common and widespread
Laetisaria lichenicola	Corticiales, Corticiaceae	2667	On *Physcia* spp., mostly *P. adscendens* and *P. tenella*, widespread but commoner in the south
Marchandiomyces corallinus	Corticiales, Corticiaceae	2109	Plurivorous, very widely distributed
Penttilamyces lichenicola	Boletales, Coniophoraceae	2627	On *Cladonia* cf. *ciliata*, Caithness
Tremella aspiciliae	Tremellales, Tremellaceae	2826	On *Aspicilia caesiocinerea*, Wales (Caernarvon)
Tremella caloplacae		2389	On *Variospora thallincola*, S. Devon (*T. caloplacae* s. str.). Collections on *Caloplaca cerinella* probably belong elsewhere, and those on *Calogaya oblitterata* could be *T. pusilla* or an undescribed species; Freire-Rallo *et al*. (2023)
Tremella candelariellae		2602	On *Candelariella vitellina*, E. Suffolk
Tremella cetrariicola		2246	On *Tuckermannopsis chlorophylla*, Highland Scotland
Tremella cladoniae		2395	On *Cladonia coniocraea*, Wales (Cardigan, Merioneth)
Tremella conidiopunctelia		2827	On *Punctelia subrudecta*, England (New Forest)
Tremella coppinsii		1917	Frequently recorded on *Platismatia glauca*, N. and W. Britain
Tremella hypogymniae		2247	On *Hypogymnia physodes*, common in Scotland, also England (Cumbria, Devon)
Tremella imshaugiae		2781	On *Imshaugia aleurites*, Scotland (Easterness)

Species	Classification	BLS no.	Comments
Tremella lichenicola	Tremellales, Tremellaceae	2248	On *Violella fucata*, common in Scotland and N. England
Tremella lobariacearum		2249	On *Lobaria pulmonaria* and *Ricasolia virens*, W. Scotland and Devon A species complex, some records may belong elsewhere
Tremella nimisiana		2918	On *Xanthocarpia fulva*, England (Northumberland, Holy Island); ID based on host, part of the *Tremella caloplacae* complex; Freire-Rallo *et al*. (2023)
Tremella normandinae		2250	On *Normandina pulchella*, Scotland (Argyll, Westerness)
Tremella occultixanthoriae		2887	On the lower surface of thalli of *Xanthoria parietina*, Scotland (E. Lothian)
Tremella parietinae		2896	On *Xanthoria parietina*
Tremella parmeliarum		2640	On *Parmotrema perlatum*, *P. pseudoreticulatum* and *P. reticulatum*, England (Cornwall), Ireland
Tremella pertusae		2828	On *Pertusaria pertusa*, England (Dorset, W. Sussex) and Scotland (Wester Ross)
Tremella pertusariae		2251	On *Pertusaria hymenea*, frequent in S.W. England but also present in most other regions of Britain and Ireland
Tremella phaeographidis		2252	On *Phaeographis* spp., common in S.W. England
Tremella phaeophysciae		2253	On *Phaeophyscia orbicularis*, England (Gloucestershire), scattered throughout Scotland
Tremella protoparmeliae		2254	On *Protoparmelia badia*, England (Derbyshire, Leicestershire, Yorkshire) and Scotland (Kincardineshire)
Tremella pusillae		2919	On *Calogaya pusilla*, Scotland (Kincardineshire); ID based on host, part of the *Tremella caloplacae* complex; Freire-Rallo *et al*. (2023)
Tremella ramalinae		2615	On *Ramalina fraxinea* and rarely on *R. fastigiata*; widespread in Highland Scotland, also records from S.W. England. Probably not conspecific with the type
Tremella rhizocarpicola		2684	On *Rhizocarpon lavatum*, Scotland (Argyll)
Tremella tubulosae		2785	On *Hypogymnia tubulosa*, England (Devon), E. and N. Scottish Highlands
Tremella tuckerae		2478	On *Ramalina canariensis*, *R. fastigiata* and *R. fraxinea*; S.W. England, Scotland (Moray) and Ireland. Probably confused with *T. ramalinae* s. lat.
Zyzygomyces aipoliae	Filobasidiales, Filobasidiaceae	2829	On *Physcia aipolia*, S.W. England
Zyzygomyces bachmannii		2239	On various *Cladonia* species, N. and W. Britain, quite frequent
Zyzygomyces physciacearum		2240	On *Physcia tenella*, widepread. Material on *P. aipolia* may well be *Z. aipoliae*
Zyzygomyces physconiae		2830	On *Physconia grisea*, S.W. England
Zyzygomyces polyblastidii s. lat.		2878	On *Heterodermia obscurata*, Devon and Somerset

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