Cyphelloid fungi in Scandinavia – a preliminary synopsis

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Synopsis Fungorum 46

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Introduction

Cyphelloid fungi have for a long time been one of the most neglected groups of fungi in Scandinavia. The reason is twofold, partly because their basidiocarps with a few exceptions are small, often less than 5 mm wide, and partly because there has been no coherent survey of the group with descriptions and keys.
The present preliminary synopsis is to my knowledge the first collected presentation of the cyphelloid species known to occur in Scandinavia.

It is important to underline that it is not a taxonomic treatise, only a compilation of descriptions based on my own observations and written sources of different kinds.
It goes without saying that there must be omissions and mistakes in the descriptions and keys. I would be grateful to receive all corrections and added observations or information of any kind to make this manual better. This include also hosts and distributional data.

As this is a preliminary draft, there are no colour pictures or drawings. These will be added in a later planned printed version. Should you happen to have nice colour pictures of any of the species described here, I would be happy to receive them and you will of course, if they are used, receive a copy of the coming book besides that I am willing to pay a reasonable fee.

Main key

A. Basidiocarp pileate, reddish and soft when fresh ..... **Fistulina hepatica**
A. Basidiocarps resupinate, poroid, cupulate to tubular ..... **B**

B. Basidiocarps resupinate, pipshaped or tubular **1**
B. Basidiocarps cupulate **7**

Generic key

1. Basidiocarps coherent with immersed fertile cupula or pores **2**
1. Basidiocarps single, although sometimes in dense aggregates **3**

2. Hyphal system dimitic ..... **Porothelium**
2. Hymenial system monomitic ..... **Resupinatus**

3. Basidiocarps tubular to pipshaped **4**
3. Basidiocarps cupulate **7**

4. Growing on *Matteucia struthiopteris* ..... **Woldmaria**
4. Growing on other substrates **5**

5. Basidiocarps brown ..... **Merismodes**
5. Basidiocarps more or less white **6**

6. Generative hyphae with clamps ..... **Henningsomyces**
6. Generative hyphae with simple septa ..... **Rectipilus**

7. Spores brown **8**
7. Spores hyaline **10**

8. Spores ornamented **9**
8. Spores smooth ..... **Episphaeria**

9. Basidiospores 6-8 µm long, on different substrates ..... **Pellidiscus**
9. Basidiospores 8-10 µm long, on mosses and haptics ..... **Chromocyphella**

10. Spores longer than 10 µm, growing on dead grass ..... **Cellhypha**
10. Spores shorter than 10 µm, on different substrates **11**

11. Growing on mosses ..... **Rimbachia**
11. Growing on other substrates **12**

12. Generative hyphae with simple septa ..... **Pseudolasiobolus**
12. Generative hyphae with clamps **13**

13. Basidiocarps yellowish brown ..... **Mareina**
13. Basidiocarps white, citric yellow to greyish **14**

14. External hairs with a thin smooth whip like apex ..... **Flagelloscypha**
14. External hairs with rounded, smooth or encrusted apex **15**

15. Basidiocarps discoid, sessile, whitish to pale violet, external hairs, thick walled, spores longer than 10 µm ..... **Lachnella**
15. Basidiocarps tubular, soon bell shaped, whitish, external hairs thin walled, spores of different lengths **16**

16. Basidiocarps brown to greyish at base, external hairs cylindrical ..... **Reidiella**
16. Basidiocarps white to yellow at base, external hairs coralloid ..... **Calyptella**

Synoptic Key

Substrates

On gymnosperms: *Flagelloschya abieticola, Porotheloium fimbriatum Resupinatus griseopallidus*

On ferns: *Flagelloscypha filicina, Flagelloscypha mairei*, *Woldmaria filicina* (on *Struthiopteris*)

On fungi: *Flagelloscypha parasitia* (Dead pyrenomycetes)

On grasses and sedges: *Cellhypha goldbachii*

On mosses and hepatics: *Rimbachia* species

On Herbs: *Calyptella campula* (*Urtica dioica*), *Calyptella gibbosa* (*Solanum tuberosum*) *Flagelloscypha orthospora, Flagelloscypha pilatii, Lachnella villosa,*
Maireina filipendula (*Filipendual ulmaria*)

Spores

Brown: *Episphaera, Pellidiscus*

Hyaline: Rest of genera.

Ornamented: *Pellidiscus, Resupinatus griseopallidus*
Smooth: Rest of species

DESCRIPTIONS

CALYPTELLA Quel.,

Enchir. Fung. p. 216, 1886.
Basidiocarps pendant, cupulate to funnel shaped, stipitate or with contracted base, white, grey to yellow with a smooth to finely pubescent pileus, hyphae with clamps, cystidia present or absent, basidiospores smooth and non--amyloid. On dead wood or herbs.
Type species: *Peziza capula* Holmskj.
Remarks. The genus is characterized by its hanging, relatively wide, mostly white stipitate basidiocarps.

Key to species

1. Growing on *Sambucus*, cystidia present ..... **C. cernua**
1. Growing on other substrates, cystidia absent **2**

2. Spores 5-7 x 2.5-4.5 µm, most often on *Solnaum tuberosum* ..... **C. gibbosa**
2. Spores larger, on different herbs ..... **C. capula**

Calyptella capula (Homskj.) Quel.

Fl. Mycol. France p. 25, 1888. – *Pezizia capula* Holmskj., Beata Ruris otia fungia Danicis 1:286, 1799. - *Calyptella campanula* (Nees.:Fr.) W. B. Cooke, Beih. Sydowia 4:32, 1961. – *Calyptella laeta* (Fr.) W. B. Cooke, Beih. Sydowia 4:40, 1961.
Basidiocarps annual, pendant, first tubular soon bell-shaped, 3-8 mm wide, white to pale citric yellow, pileus smooth and finely pubescent, stipe smooth or finely pubescent.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide
External hairs irregularly branched and coralloid like and slightly encrusted, 2-5 µm wide.
Cystidia absent.

Basidia 20-25 x-8 µm, clavate, bi- or tetrasterigmatic.
Basidiospores 7-12 x 3.5-5 µm, sub cylindrical to pip shaped.
Substrate. On rotten herbs, most common on *Urtica dioica*, but also recorded on other hosts.
Distribution. Central Norway, Sweden and Denmark and Central Europe.
Remarks. The species is recognized by the bell-shaped, white to yellow basidiocarps and growing on dead herbs.

Calyptella cernua (Schum.) W.B. Cooke,

Beiheft Sydowia 4:36, 1961. – *Peziza capula* var. *cernua* Schumach. Enum. Pl. København, 2: 421, 1803.
Basidiocarps annual, pendant, first tubular soon bell-shaped, 2-5 mm wide, white, pileus smooth and finely pubescent, stipe smooth or finely pubescent.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide
External hairs irregularly branched and coralloid like and slightly encrusted, 2-5 µm wide.
Cystidia present among the basidia slender cylindrical to mucronate.
Basidia 20-25 x-8 µm, clavate, bi- or tetrasterigmatic.
Basidiospores 9-11 x 4-5 µm, elliptic.
Substrate. On bark of *Sambucus nigra.*
Distribution. Unknown, described from Central Europe.
Remarks. The species is recognized by cystidia and elliptic spores.

Calyptella gibbosa (Lev.) Quel.,

Enchir. Fung. P. 216, 1886. – *Cyphella gibbosa* Lev., Ann. Sci. Nat. Bot. Ser. 3, 9:126, 1848.
Basidiocarps annual, pendant, first tubular soon bell-shaped with wavy margin, 2-6 mm wide, white to greyish, pileus finely pruinose.
Hyphal system monomitic, generative hyphae with clamps, 2-4 µm wide
External hairs regular to irregularly branched and coralloid like and slightly encrusted, 2-5 µm wide.
Cystidia absent.
Basidia 20-25 x-8 µm, clavate, bi- or tetrasterigmatic.

Basidiospores 5-7 x 2.5-4.5 µm, elliptic to sub cylindrical.
Substrate. On rotten stems of *Solanum tuberosum*, rarely on ferns.
Distribution. Denmark, southern Sweden and Finland.
Remarks. The species is recognized by the irregular way white basidiocarps, the host and small spores.

CELLHYPHA Donk,

Persoonia 1:84, 1959.
Basidiocarps cupulate, white, hairy, hymenophore smooth to wrinkled, spores large, on grasses and sedges, rarely on other substrates, monotypic genus.
Type species: *Cellhypha goldbachii* (Weinm.) Donk.
Remarks: The finely white and tomentose basidiocarps with large spores and capitate external hairs make this a distinct species.

Cellhypha goldbachii Donk,

Op. cit. – *Cyphella goldbachii* Weinm., Hymen. Gastr. Imp. Ross. Obs. p. 522, 1836.
Basidiocarps annual, cupulate, white, pileus hairy, hymenophore smooth to finely wrinkled.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide
External hairs 25-60 x 2-3.5.5 µm, smooth to slightly encrusted, irregularly flexuous, tapering towards the capitate apex, the latter up to 6 µm in diameter.
Basidia 30-35 x 6-8 µm, bi- to rarely tetrasterigmatic.
Basidiospores 10-13.5 x 3.5-4 µm, elliptic to fusiform.
Substrate. On dead culms of grasses, rarely on sedges or other substrates, often gregarious.
Distribution. Southern Norway, Sweden and Denmark
Remarks. The species is recognized by the cupulate basidiocarps on dead grasses besides the large spores and capitate external hairs.

CHROMOCYPHELLA De Toni & Levi,

Naturalist p. 158, 1888.
Basidiocarps cupulate, outside white and finely floccose, inner side smooth and pale brown, hyphal system monomitic with clamped generative hyphae, spores slightly angular and brown, parasitic on mosses. Monotypic genus.
Type species: *Chromocyphella muscicola* (Fr.) Donk.
Remarks. The genus is distinct because of the slightly angular brown spores and its habitat as parasite on mosses.

Chromocyphella muscicola (Fr.) Donk,

Persoonia 1:95, 1959. – *Cyphella muscicola* Fr., Syst. Mycol. 2:2020, 1822.
Basidiocarps cup to bell shaped, 1-5 mm wide, outside white and silky to finely pubescent, cream coloured when dry, inner side smooth to slightly wrinkled, pale to rusty brown with maturity.
Hyphal system monomitic, generative hyphae with clamps, 4-6 µm.
Hairs along the cup margin cylindrical, glabrous, up to 50 µm long and 4-6 µm wide, apex rounded or tapering, sometimes secondary septate, some hairs slightly dextrinoid.
Basidia 30-35 x 4-6 µm, tetrasterigmatic.
Basidiospores 8-10 x 6.5-8.5 µm, subglobose to broadly elliptic, finely warted, pale brown and slightly dextrinoid.
Substrate. Mosses and hepatics living on dead or living trees.
Distribution. Southern Norway along the coast.
Remarks. The habitat and the coloured and finely warted spores make this a distinct species.

EPISPHAERIA Donk,

Persoonia 2:336, 1962.
Basidiocarps small, white, covered with white curly hairs, hymenium pale brown, spores brown and smooth, usually on *Fraxinus* spp.
Type species: *Cyphella fraxinicola* Berk. & Broome.
Remarks. The genus is monotypic and characterized by tiny basidiocarps covered with curly white hairs and occurrence of brown spores, a rare characteristic among the cyphelloid fungi.

Episphaeria fraxinicola (Berk. & Broome) Donk,

Persoonia 2:336, 1962. – *Cyphella fraxinicola* Berk. & Broome, Ann. Mag. Nat. Hist. Ser. 4, vol. 15:32, 1875.
Basidiocarps annual, white, round and almost spherical and dorsally attached, externally covered with curly hairs, hymenophore smooth may become slightly wrinkled, cream coloured becoming cinnamon brown by maturity.
External hairs 50-150 x 1.5-3 µm**,** unbranched, evenly encrusted.
Basidia 15-20 x 4.5-5.5 µm clavate, tetrasterigmatic.
Basidiospores 6.5-8.5 x 4.5-6 µm, brown, elliptic to amygdaloidal when vied sideways and smooth.
Substrate. On twigs and bark, mostly on *Fraxinus* sp.
Distribution. Poorly known and easily overlooked, Southern Scandinavia, probably follows the host in Europe.
Remarks. The white tiny and spherical basidiocarps more or less closed and covered with white curly hairs, a brown hymenium and browns spores make this a distinct species.

FLAGELLOSCYPHA Donk,

in Singer, Lilloa 22: 312, 1951.
Basidiocarps cup-, bell-shaped or turbinate to cone shaped, sessile or with a short stipe, external surface densely white haired, up to 1 mm wide, similar to a discomycete, cystidia absent, clamps present, basidia clavate to suburniform, collapsing rapidly after spore discharge, basidiospores pip shaped to fusiform, smooth, non-amyloid, external hairs thin to thick walled, wholly or partly encrusted, cylindrical with an obtuse apex or in most species with a whip like flagella, rarely apically capitately swollen, non-amyloid or weakly dextrinoid. Both on hard wood and coniferous wood.
Type species: *Flagelloscypha minutissima* (Burt) Donk.
Taxonomic synonyms:
Cephaloscypha Agerer (*Cyphella mairei*).
Nochascypha Agerer (*Cyphella flicina*).
Setiscyphella Agerer *(Seticyphella tenuispora*).
Remarks. The genus is characterized by the external hairs with a distinct flagellum like end.

Key to species

1. Growing on dead ferns **2**
1. Growing on dead wood, leaves or dead fungi..... **3**

2. Spores pip shaped, 8.5-11 x 3-4 µm ..... **F. mairei**
2. Spores elliptic, 5-6.5 x 3-3.5 µm ..... **F. filicina**

3. Growing on dead pyrenomycetes ..... **F. parasitica**
3. Growing dead wood or leaves **4**

4. Growing on coniferous wood ..... **F. abieticola**
4. Growing on herbs or hard woods **5**

5. Spores 4-5 µm wide **6**
5. Spores 2-4 µm wide..... **7**

6. Spores 7-10.5 x 4-6 µm, pipshaped to citriform, usually on hardwood ..... **F. minutissima**
6. Spores 6-8 x 4-5 µm, elliptic, on dead herbs .....**F. orthospora**

7. On dead grasses and sedges (*Carex* spp.)..... **F. pilatii**
7. Usually on dead leaves **8**

8. Radial hairs strongly radiating, spores fusiform .....**F. niveiola**
8. Radial hairs mostly collapsed when dry, spores elliptic to pipshaped..... **9**

9. Spores 7.5-9.5 x 2-3 µm..... **F. punctiformis**
9. Spores wider..... **10**

10. Spores elliptic 6-8 x 2.5-3.5 µm..... **F. donkii**
10. Spores pipshaped 7-9 x 3-4 µm ..... **F. kavinae**

Flagelloscypha abieticola W. B. Cooke,

Cyphella abieticola P. Karst., Not. Sällsk. Fauna et Fl. Fenn. Förh. 11: 221, 1870. - Nom. illegit., non *Cyphella abieticola* P. Crouan & H. Crouan 1867.
Basidiocarps annual, cup shaped with a thin stipe, up to 1 mm in diameter (check) e, externally white haired.
External hairs unbranched, coarsely encrusted with needle like to rhomboid crystals, thick walled except for thin walled, glabrous and flagellate apex.
Basidia 15-20 x 4.5-5.5 µm clavate, tetrasterigmatic.
Basidiospores 7-8.5 x 2.4-3.5 µm, narrowly pipshaped.
Substrate. On coniferous woods.
Distribution. Finland, the type came from the southern part.
Remarks. The species is recognized by the host and the pipshaped spores.

Flagelloscypha donkii Agerer,

Sydowia 27: 211, 1975.
Basidiocarps annual, cup shaped 0.4 mm wide, slightly stipitate, externally white haired.
External hairs thin walled and often collapsed at base, finely encrusted with needle like to granulose crystals, cylindrical, apex thin, but not flagella like, hyaline and smooth, up to 15 µm long.
Basidia 17-25 x 5-7 µm clavate, tetrasterigmatic.
Basidiospores 6-8 x 2.5-3.5 µm, pip shaped to elliptic.
Substrate. On leaves of hard woods and dead herbs.
Distribution. Scattered and rare, but known from Norway, Sweden and Finland.
Remarks. Recognized by the spores and substrates??

Flagelloscypha filicina (P. Karst.) Donk,

in Singer, *Agaric. mod. Tax.*, p. 415, 1962. - *Cyphella filicina* P. Karst., Not. Sällsk. Fauna et Fl. Fenn. Förh. 11:220, 1870.
Basidiocarps annual, cup shaped 1 mm wide and 0.3 mm high, externally white haired.
External hairs soft, often curled when dry**,** unbranched, thick walled, finely encrusted, cylindrical with obtuse apex.
Basidia 14-18 x 4-6 µm clavate, tetrasterigmatic.
Basidiospores 5-6.5 x 3-3.5 µm, irregularly elliptic.
Substrate. On dead ferns.
Distribution. Little known, but recorded from Norway and Finland.
Remarks. The species is recognized by the small spores and the hosts.

Flagelloscypha kavinae (Pilát) W. B. Cooke,

Beih. Sydowia 4: 62, 1961. - *Cyphella kavinae* Pilát, Annls. mycol. 23: 157, 1925.
Basidiocarps annual, deeply cup shaped with a thin stipe, up to 0.6 mm, externally white haired.
External hairs unbranched, coarsely encrusted with needle like to rhomboid crystals, thick walled except for a glabrous and flagellate and apex up to 30 µm long.
Basidia 18-25 x 5-6.5 µm clavate, tetrasterigmatic.
Basidiospores 7-9 x 3-4 µm, pipshaped.
Substrate. On leaves and herbs.
Distribution. Little known.
Remarks. The species is recognized by the pipshaped spores.

Flagelloscypha mairei (Pilát) Knudsen,

Nordic J. Bot. 11:478, 1991. – *Cyphella mairei* Pilát, Annls. mycol. 22:211, 1924.
Basidiocarps annual, cup shaped 1 mm wide, externally white haired.
External hairs unbranched, at least some hairs glabrous and inflated, rarely with a collapsed base, coarsely encrusted with needle like crystals, thick walled except for a glabrous and flagellate apex up to 35 µm long.
Basidia 20-25 x 5-7 µm clavate, tetrasterigmatic.
Basidiospores 8.5-11 x 3-4 µm, narrowly pip shaped.
Substrate. On dead ferns, such as *Blechnum*.
Distribution. Little known, recorded from Norway, Sweden and Finland.
Remarks. The species is recognized by the large spores and the hosts.

Flagelloscypha minutissima (Burt) Donk,

Lilloa 22: 312, 1951. - *Cyphella minutissima* Burt, Ann. Rep. Missouri Bot. Gard. 1: 367, 1914.
Basidiocarps annual, cup shaped 0.5 mm wide, externally white haired.
External hairs thin walled and often collapsed at base, coarsely encrusted with rhomboid and needle like crystals, cylindrical, apex thin, flagella like, hyaline and smooth, up to 55 µm long.
Basidia 17-23 x 5-6 µm clavate, bisterigmatic.
Basidiospores 7-10.5 x 4-6 µm, pip shaped to citriform.
Substrate. Hard woods, rarely on coniferous wood and dead herbs.
Distribution. Said to be the most common species in the genus.
Remarks. Recognized the spores and the bisterigmatic basidia.

Flagelloschypha niveiola (Sacc.) Knudsen,

Funga Nordica, p. 913, 2008. - *Cyphella niveiola* Sacc., Syll. Fung. 6:678, 1888. - *Seticyphella niveiola* (Sacc.) Agerer, Mitt. Bot. St. Saml. München 19:284, 1983.
Basidiocarps gregarious, tiny, round, 0.5 high and wide with short stipe, white with erect radiating hairs, hymenophore smooth and white.
Hyphal system monomitic, generative hyphae with clamps.
Hairs cylindrical, thick walled, slightly pointed, finely encrusted, up to 10 µm wide at the base
Basidia 16-19 x 4-6 µm, tetrasterigmatic.
Basidiospores 7.5-9 x 2-3 µm, fusiform with prominent apiculus.
Substrate. On dead leaves of scrubs and hardwood trees, such as *Corylus*.
Distribution. In Scandinavia known only from Denmark, but easily overlooked.
Remarks. The erect and radiating white hairs and the fusiform spores make this a distinct species.

Flagelloscypha orthospora (Bourdot & Galzin) Berthier & Malencon,

Acta Phytotax. Barcinon. 19: 30, 1977. - *Cyphella villosa* var. *orthospora* Bourdot & Galzin Bull. Soc. mycol. Fr. 26: 224, 1910.
Basidiocarps annual, cup shaped 0.3 mm wide, sessile, externally white haired.
External hairs thin walled and often collapsed at base, finely granulose encrusted cylindrical, apex thin and flagella like.
Basidia 22-30 x 7-8.5 µm clavate, tetrasterigmatic.
Basidiospores 6-8 x 4-5 µm, broadly elliptic, flattened on one side.
Substrate. On dead herbs, in Denmark found on *Lycopus.*
Distribution. Scattered and rare.
Remarks. Recognized by the broadly elliptic spores and substrates.

Flagelloscypha parasitica (Berk. & Broome) Agerer,

Mycotaxon 9:464, 1979. - *Cyphella parasitica* Berk. & Broome, J. Linn. Soc., Bot. 14:74, 1873.
Basidiocarps annual, cup shaped, 1.0 mm wide, externally white haired.
External hairs unbranched, coarsely encrusted, thick walled except for a glabrous and flagellate and up to 30 µm long apex, frequently collapsing at the base.
Basidia 20-25 x 6-8 µm clavate, tetrasterigmatic.
Basidiospores 7.5-8.5 x 3.5-4.5 µm, oblong elliptic to almost cylindrical.
Substrate. On dead pyrenomycetes.
Distribution. Little known, recorded from Finland.
Remarks. The species is recognized by the hosts.

Flagelloscypha pilatii Agerer,

Sydowia 27: 239, 1975.
Basidiocarps annual, low cup shaped 0.3 mm wide, slightly stipitate, externally white haired.
External hairs unbranched, coarsely encrusted, thick walled except for a glabrous and flagellate and apex up to 35 µm long, frequently collapsing at the base.
Basidia 20-25 x 6-8 µm clavate, tetrasterigmatic.
Basidiospores 7.5-8.5 x 3-3.5 µm, elliptic, often flattened on one side.
Substrate. On stems of dead herbs or leaves.
Distribution. Little known, recorded from Denmark.
Remarks. The species is recognized by the hosts.

Flagelloscypha punctiformis (Fr.) Agerer,

Sydowia 27: 246, 1975. - *Peziza punctiformis* Fr. Syst. mycol. 2:105, 1822.
Basidiocarps annual, cup shaped 0.3 mm wide, sessile, externally white haired.
External hairs thin walled and often collapsed at base, finely encrusted with needle like crystals, cylindrical, apex thin, but not flagella like, hyaline and smooth, up to 10 µm long.
Basidia 15-20 x 5-6 µm clavate, tetrasterigmatic.
Basidiospores 7.5-10.5 x 2-3 µm, pip shaped.
Substrate. On leaves of hard woods, such as *Alnus, Betula, Myrica* and *Salix*.
Distribution. Scattered and rare.
Remarks. Recognized by the spores and substrates.

FISTULINA Bull:Fr.

Syst. Mycol. 1:396, 1821. - Hist. Champ. France p. 313, 1791.
Basidiocarps annual, sessile to laterally stipitate; pileus surface reddish to brown, scurfy to tomentose; context reddish and fleshy with a red sap or white to ochraceous and firmfibrous; tubes separate but closely packed, 46 per mm; hyphal system monomitic; clamps present or absent; trichocysts present or absent; basidia clavate, 4sterigmate; basidiospores ovoid, hyaline, negative in Melzer's reagent, 34.5 x 23 µm. Causing a brown rot of dead and living hardwoods. Cosmopolitan genus with one species in Europe.
Type species: *Fistulina hepatica* (Schaeff.: Fr.) With.
Remarks. The genus does belong in the Cyphellaceae (in a wide sense) due to the individual tubes lined with basidia.

Fistulina hepatica (Schaeff.: Fr.) With. Fig. 119

Bot. Arrang. Br. Plants 2:405, 1792. - *Fistulina hepatica* (Schaeff.: Fr.) Fr. Syst. Mycol. 1:396, 1821.
Basidiocarps annual, sessile or laterally stipitate, single or several from a branched base or stipe; pileus dimidiate to reniform or sub circular, up to 20 cm in diam and 6 cm thick, at first soft and fleshy and readily exuding a reddish watery sap when squeezed or bruised, eventually more fibrous and tough in older specimens; pileus surface pinkish brown to more reddish or purplish brown, finely hispid to scurfy with hyphae aggregating in crowded papillae tufts, later smooth, slimy, reddish to pale purplish brown cuticle with minute darker scales or radial striations; pore surface white at first, bruising darker on handling and becoming dull brown with age and drying, the individual tubes crowded, about 4-6 per mm; context reddish, fleshy and juicy when fresh, with a bloodlike exudate where cut or broken, in older specimens or on drying becoming softfibrous, pale woodbrown, up to 5 cm thick; stipe lateral, scurfy with papillae tufts, these merging with tubes on the decurrent tube layer, reddish at first, darkening to blackishbrown on the basal portion, up to 5 cm long and 3 cm wide.
Hyphal system monomitic; contextual generative hyphae thinwalled, with simple septa and clamps, rarely branched, mostly 4-10 µm in diam, but with inflated portions up to 20 µm in diam; gloeopleurous hyphae present in context; tramal hyphae hyaline, thinwalled, agglutinated and difficult to separate in sections from dried specimens, with rare branching and abundant clamps, 2-5 µm in diam.
Basidia clavate, tetra sterigmatic, 15-20 x 5-6 µm.
Basidiospores 3.5-4.5 x 2.5-3 µm, ovoid to tearshaped.
Distribution. Seemingly follow *Quercus* sp. everywhere in Europe, north to Oslo in Norway.
Substrata. In North Europe almost exclusively on living *Quercus*, in Central and South Europe also common on *Castanea,* very rarely on *Acer, Alnus, Betula, Corylus, Fagus* and *Tilia*. In North America also reported on other hardwood genera.
Remarks. The reddish, soft and watery basidiocarps with numerous pipe like tubes on the lower side, make this an unmistakeable species.

HENNINGSOMYCES O. Kuntze,

Basidiocarps cyphelloid, tubular, whitish, almost smooth or hairy, 1-2 mm long, 0.1 -0.2 in diameter, sessile or with a short stipe, generative hyphae with clamps or simple septa, somewhat thickened walls and gelatinous, thus often agglutinated, cystidia absent or rudimentary present, basidia cylindrical to clavate or suburniform, external hairs simple or branched, often mixed with irregular crystals, basidiospores elliptic to subglobose or pyriform, smooth, hyaline, non-amyloid. Saprotrophic on dead wood, usually in dense clusters. Two species in Northern Europe.
Type species: *Solenia candidus* Fr.
Remarks. The genus is separated from the other cyphellaceous tubular genera by the external branched hairs, while they are branched and thick walled in *Rectipilus* which is impossible to distinguish without a microscopical examination.

Key to species

1. Basidiocarps almost smooth, marginal hairs branched ..... **H. candidus**
1. Basidiocarps entirely pubescent, margin hairs unbranched..... **H. puber**

Henningsomyces candidus (Pers.) Kuntze,

Revis. Gen. pl. 3:483, 1898. – *Solenia candidus* Pers., Ann. Bot. 1:36, 1794.
Basidiocarps annual, tubular, up to 1 mm long and 0.3 mm in diameter, whitish to pale cream, cylindrical, almost smooth.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide
External hairs irregularly tree –like branched, slightly thick walled side branches stiff and upright, 2-3 µm wide at base, irregular hyaline large crystals abundant
Cystidia absent; hyphoid cystidiols common in the tubes in sterile specimens.
Basidia 16-18 x 4-6 µm, clavate, tetrasterigmatic.
Basidiospores 4.5-6 x 4.5 µm, subglobose to broadly elliptic.
Substrate. On rotten hard woods.
Distribution. Southern Norway, Sweden and Denmark
Remarks. The species is easy to recognize because of the dense aggregation of the individual white tubular basidiocarps.

Henningsomyces puber (Romell ex W. B. Cooke) D. A. Reid,

Persoonia 3:119, 1964. - *Solenia puber* Romell ex W. B. Cooke, Beiheft. Sydowia 4:26, 1961.
Basidiocarps annual, first cup shaped, then tubular, up to 1 mm long and 0.2 mm in diameter, white, externally entirely pubescent and covered with hairs.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide.
External hairs dominant, thin walled to occasionally thick walled, slightly sinuous, those at the margin unbranched and short, i.e. up to 60 µm, those at the base longer, up to 100 mm long, irregularly tree –like branched, slightly thick walled, side branches stiff and upright, 2-3 µm wide at base, irregular hyaline large crystals abundant.
Cystidia absent.
Basidia 19-28 x 7-8 µm, clavate, tetrasterigmatic.
Basidiospores 5-6 x 4-5 µm, globose to subglobose.
Substrate. On rotten hard woods.
Distribution. Little known, probably as for *H. candidus*.
Remarks. The species is separated from *H. candidus* by a more densely pubescent basidiocarps and unbranched hairs along the margin

LACHNELLA Fr.,

Fl. Scan. P. 343, 1836.
Basidiocarps cyphelloid with external white hairs, cup shaped or disc shaped, sessile or with a short stipe, hymenial disc 0.5-2 cm in diameter, white to grey, waxy when fresh, tough and persistent when dry, outside covered with long white hairs, basidiospores elliptic, cystidia absent or present, clamps present, external hairs thick walled with a narrow lumen, usually with a rounded apex, more rarely tapering to a whip like apex, smooth at base, densely encrusted towards the apex, spores elliptic, smooth and non-amyloid. On dead twigs, rarely trunks of hardwoods or dead stems of herbs. Widespread, but easily overlooked.
Type species: *Lachnella alboviolascens* (Alb. & Schwein.) Fr.
Remarks. The genus is distinct by it fairly large spores.

Key to species

1. Hymenial surface white, white hairs along the margin, cystidia present .....**L. villosa**
1. Hymenial surface bluish to pale violet, margin glabrous, cystidia absent .....**L. alboviolascens**

Lachnella alboviolascens (Alb. & Schwein.:Fr.) Fr.,

Summa veg. Scand., p. 365, 1849. - *Peziza alboviolascens* Alb. & Schwein: Fr., Syst. Mycol. 2:96, 1822. - *Peziza alboviolascens* Alb. & Schwein., Consp. Fung. (Leipzig), p. 322, 1805.
Basidiocarps annual, disc shaped, 1-2 mm wide, hymenium greyish with bluish violet tinges, margin incurred, externally covered with long hairs, basally brownish, white towards the margin.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide

External hairs external hairs thick walled with a narrow lumen, usually with a rounded apex, more rarely tapering to a whip like apex, smooth at base, densely encrusted towards the apex,
Cystidia absent.
Basidia 50-75 x 10-16 µm, clavate, tetrasterigmatic.
Basidiospores 10-15 x 7.5.12 µm, broadly elliptic.
Substrate. Hard woods, often on twigs, and dead herbs of different kinds.
Distribution. North to Central Scandinavia.
Remarks. The species is recognized by the disc like basidiocarps with a bluish to violet tinges, besides the fairly large elliptic spores.
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Lachnella villosa (Pers.: Fr.) Gillet,

Champignons de France, Discom., Vol. 3: 80, 1880. - *Peziza villosa* Pers., Syn. meth. Fung. 2: 655, 1801.
Basidiocarps annual, disc to cup shaped, about 1 mm wide, sessile, hymenium white, margin with long white hairs, partly covering the hymenium, externally covered with long white hairs.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide
External hairs external hairs thick walled with a narrow lumen, usually with a rounded apex, more rarely tapering to a whip like apex, smooth at base, finely encrusted along the full length.
Cystidia lanceolate and pointed, up to 60 µm, thin-walled and smooth
Basidia 40-50 x 10-16 µm, clavate.
Basidiospores 9-12 x 7-9 µm, broadly elliptic to subglobose with numerous oil drops.
Substrate. On dead herbs of many kinds, more rarely on twigs of hard woods, often growing in small clusters or groups.
Distribution. North to Central Scandinavia.
Remarks. The species is recognized by the disc like white basidiocarps with curly hairs along the margin besides the lanceolate cystidia.

MAIREINA W. B. Cooke,

Beiheft Sydowia 4:83, 1961.
Basidiocarps cyphelloid, yellowish brown, densely covered with silky, crystal covered hairs, cystidia absent, large spores, on different substrates from herbs and ferns to hard woods.
Type species: *Cyphella monacha* Speg.
Remarks. The genus is characterized by the basidiocarps being covered with yellowish to brown crystal covered hairs.
Literature: Bodensteiner, P. 2007: *Maireina afibulata* and *M. attenuatipilis*, new members of the cyphelloid genus *Maireina* (Basidiomycota, Agaricomycetes), Mycological Progress, 6: 221–228.

Key to species

1. Spores 10.5-15 µm long, on dead plants or branches..... **M. monacha**
1. Spores 5-6 x 2.5-3 µm, at the base of *Filipendula ulmara*..... **M. filipendula**

Maireina filipendula Læssøe,

Karsteinia 56:40, 2016.
Basidiocarps annual, oblong cupulate, yellowish brow and covered with silky hairs, up to 1 mm long and 0.5 mm in diameter,
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide
External hairs thick-walled, brown and covered with fine grains.
Cystidia absent.
Basidia not seen.
Basidiospores 5-6 x 2.5-3 µm, drop shaped.
Substrate At the base of dead leaves of *Filipendula ulmaria*.
Distribution. Known only in Central Sweden and in Denmark.
Remarks. The species is characterized by its yellowish basidiocarps and the host.

Maireina monacha (Speg.) W. B. Cooke,

Beiheft Sydowia 4:90,1961. – *Cyphella monacha* Speg., Michelia 2:303, 1881.
Basidiocarps annual, circular, cup shaped, 2-3 mm wide, externally brown and densely covered with hairs, hymenophore smooth, whitish to pale grey.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-4 µm wide
External hairs thick walled, pale brown and covered with fine crystals.

Cystidia absent.
Basidia 12-18 x 4-6 µm, tetrasterigmatic.
Basidiospores 10.5- 15 x 5.5-8.5 µm, elliptic.
Substrate. On rotten stems of plants and bark of hard wood trees,
Distribution. Southern Norway, Sweden and Denmark.
Remarks. The species is characterised by the brownish basidiocarp being covered with thick walled crystal hairs. covered with crystals.

MERISMODES Earle,

Bull. New York Bot. Gard. 5: 406, 1909.
Basidiocarps cyphelloid, usually crowed on the substrate, cup shaped, covered with brown hairs, sessile to stipitate, hymenium whitish to ochraceus, hyphae with clamps, spores elliptic to allantoid, cystidia absent, hairs up to 250 µm long, thick walled, encrusted in upper part, smooth below, in some hairs the apex is smooth and breaks of as a conidium some hairs pointed and bent. Saprotrophic both on dead wood and herbs.
Type species: *Merismodes fasciculata* (Schwein.) Donk.
Synonym: *Cyphellopsis* Donk.
Remarks. The genus is usually recognized by the numerous basidiocarps that occur together in often wide patches.

Key to species

1. On herbs, rarely on thin twigs ..... **M. granulosa**
1. On dead wood **2**

2. Spores allantoid ..... **M. confusa**
2. Spores elliptic to sub cylindrical ..... **M. anomala**

Merismodes anomala (Pers.: Fr.) Singer,

Agaric. mod. Tax., 3. Edn., Vaduz, p. 665 1975. - *Peziza anomala* Pers., Observ. Mycol. 1:29, 1796. - *Solenia anomala* (Pers.:Fr.) Fuckel, Jharb. Nassau Verhand Naturk. 25:290, 1871.
Basidiocarps annual, cup shaped, stipitate, stem shorter or rarely longer than cup, up to 1 mm high, about 0.5. mm wide, each stem with only one cup, often cup margins are grown together so in fresh conditions the basidiocarps appear coherent as a mat when fresh, then cracking up in polygons when dry or old, usually numerous together, external surface covered with yellow to brown hairs, hymenium smooth and white, subiculum present, pale golden brown.
Hyphal system monomitic, generative hyphae with clamps, brown, 2-5 µm wide in the subhymenium hyaline, external hyphae thick walled, brown and hyaline towards the apex, smooth in lower part, granulose to strongly encrusted towards the apex, straight or with a crosier or S-shape at the apex, some hyphae with a swollen hyaline to brown apex, apparently as a conidium.
Basidia 25-30 x 6-8 mm, tetrasterigmatic.
Basidiospores 8-11 x 3.5-5 µm, elliptic to sub cylindrical, smooth hyaline and non-amyloid.
Substrate. On dead hard woods of all kinds, very rarely on conifers, such as *Abies* or rarely on the stems of dead herbs. Often occurring on or close to large pyrenomycetes breaking through the bark
Distribution. Very widespread, most common late autumn and spring.
Remarks. The numerous dark brown basidiocarps with a whitish hymenium inside the cup are characteristic from this species. Separated from the other species in the genus by the spores.

Merismodes granulosa (Fuckel) Knudsen,

Funga Nordica, p. 913, 2008. - *Solenia granulosa* Fuckel, Jharb. Nassau Verhand. Naturk. 25:7, 1871
Basidiocarps annual, single, cup shaped, sessile, up to 1 mm high, about 0.5. mm wide, external surface with greyish to brown hairs, hymenium smooth and white, subiculum present, pale golden brown.
Hyphal system monomitic, generative hyphae with clamps, brown, 2-5 µm wide in the subhymenium hyaline, external hyphae thick walled, stiff, straight brown and hyaline towards the apex, smooth in lower part, granulose to strongly encrusted towards the apex and attenuated and without conidia.
Basidia 25-40 x 6-8 µm, tetrasterigmatic.
Basidiospores 7.5-9.5 (12) 5-7 (8) µm, broadly elliptic to slightly reniform, smooth hyaline and non-amyloid.
Substrate. On dead herbs of many kinds where basidiocarps occur one by one.
Distribution. Rare, but probably overlooked by the substrate and small size.
Remarks. The small single basidiocarps and the stiff straight attenuated hairs characterize this species.

Merismodes fasciculata (Schwein.) Donk,

Lilloa 22: 345, 1949. – *Cantharellus fasciculatus* Schw., Trams Am. Phil. Soc. N. Ser. 4:152, 1832. - *Cyphella confusa* (Bres.) Bourdot & Galzin, Hymen. France p. 164, 1928. – *Solenia confusa* Bres. Ann. Mycol. 1 :84, 1903.
Basidiocarps annual, cup shaped, stipitate, stem shorter than cup, up to 1 mm high, about 0.5. mm wide, each stem with only one cup, often cup margins are grown together so in fresh conditions the basidiocarps appear coherent as a mat when fresh, then cracking up in polygons when dry or old, usually numerous together, external surface covered with yellow to brown hairs, hymenium smooth hand white, subiculum present, pale golden brown.
Hyphal system monomitic, generative hyphae with clamps, brown, 2-5 µm wide in the subhymenium hyaline, external hyphae thick walled, brown and hyaline towards the apex, smooth in lower part, granulose to strongly encrusted towards the apex, straight or with a crosier or S-shape at the apex, some hyphae with a swollen hyaline to brown apex, apparently as a conidium.
Basidia 25-30 x 6-8 µm, tetrasterigmatic.
Basidiospores 7.5-11 x 2-3 µm, allantoid, smooth hyaline and non-amyloid.
Substrate. On dead twigs and branches of hard woods, such as *Betula* and *Salix*.
Distribution. Southern boreal zone and southwards.
Remarks. The allantoid spores make this a distinct species.

PELLIDISCUS Donk,

Persoonia 1:90, 1959.
Basidiocarps shallowly cupulate to discomycete like, centrally attached, but over time may become more or less adnate, first white then pale brown, hyphal structure monomitic, generative hyphae with simple septa, basidia bi- to tetrasterigmatic, clavate, spores first hyaline and smooth, by maturity pale brown and finely ornamented, elliptic to amygdaliform. On herbs, leafs, grasses, sedges and hard woods.
Type species: *Pellidiscus pallidus* (Berk. & Broome) Donk.
Remarks: The genus is unique by its discoid basidiocarp and the pale brown, finely ornamented spores.

Pellidiscus pallidus (Berk. & Broome) Donk,

Persoonia 1: 90. 1959. - *Cyphella pallida* Berk. & Broome, Ann. Mag. nat. Hist. IV 11: 343. 1873. - *Cyphella bloxamii* Berk. & Phill., Ann. Mag. nat. Hist. 7: 129. 1881. - *Cyphella sarothamni* Pilát, Ann. mycol., Berl. 23: 149. 1925. - *Cyphella involuta* Pilát, Ann. mycol., Berl. 23: 151, 1925. - *Cyphella sessilis* Burt, Ann. Mo. bot. Gdn 13: 317-318. 1926. - *Pellidiscus subiculosus* W. B. Cooke, Beih. Sydowia 4: 115. 1961.
Basidiocarps first cupulate to flattened-discoid, first with a small central point of attachment, but when flattened and discoid more or less completely adnate to the substrate, up to 2 mm in diameter, first pure white gradually becomes pale brown and in cupulate basidiocarps this contrasts with the white exterior, which under a lens appears minutely tomentose, very thin context from which a coherent hymenium arises.
Hyphal system monomitic, generative hyphae with simple septa, 2.5 -4 µm wide, the exterior hairs up to 120 µm long and 2-4 µm wide.
Cystidia and gloeocystidia absent.
Basidia 13-20 x 6-8 µm, either bi- or tetrasterigmatic.
Basidiospores 6-8 x 3-5-4.5) µm, at first smooth and hyaline, becoming brown and asperulate, elliptic to distinctly amygdaliform.
Substrate: On dead wood, fallen branches, herbaceous stems, leaves and also on remains of grasses and sedges.
Distribution. Widespread in Europe besides North America. Rare species. In Norway found on a *Salix* leaf.
Remarks. The brown, finely asperulate spores and the small basidiocarps. make this a distinct species. DNA investigations have shown that the species is related to the agaric genus *Crepidotus*.

POROTHELIUM Fr.

Observ. Mycol. 2.272, 1818
Basidiocarps resupinate, margin rhizomorphic; hymenium lining crowded to confluent papillae which open by an apical pore to form a poroid hymenophore; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae present; cystidia or other sterile elements absent; spores oblong to elliptic, hyaline, smooth, thin-walled, negative in Melzer's reagent. On dead hardwoods and conifers, causing a white rot. Monotypic cosmopolitan genus.
Type species: *Polyporus fimbriatus* Pers.: Fr.
Syn. *Stromatschypha* Donk, Reinwardtia 1:218, 1951, nomen illegit.
Remarks. The genus is unique as it is the only dimitic cyhelloid species.

Porothelium fimbriatum (Pers.) Fr

Observ. Mycol. 2:272, 1818. - *Poria fimbriata* Pers., Mag. Bot. (Neues) 1:109, 1794. - *Stromatoschypha fimbriata* (Pers.: Fr.) Donk, Reinwardtia 1:219, 1951.
Basidiocarps annual, resupinate, becoming widely effused, soft, readily separable; margin conspicuously rhizomorphic, often up to 2 or 3 cm wide, white to cream-colored; pore surface ivory or cinereous, the pores developing by the development of an apical pore in isolated papillae which later become crowded or confluent to form a typical tube layer, circular to angular, 3-5 per mm in mature specimens, with thick dissepiments; subiculum white to cream coloured, soft-fibrous, azonate, up to 1 mm thick, tube layer ivory to pale tan, distinct from the subiculum, up to 0.5 mm thick; taste mild.
Hyphal system dimitic; subicular generative hyphae hyaline in KOH, thin-walled, rarely branched, with clamps, 2.5-3.5 µm in diam; subicular skeletal hyphae thick-walled, nonseptate, rarely branched, 2-4 µm in diam; tramal hyphae similar.
Basidia 20-30 x 5-6 µm cylindrical to narrowly clavate.
Basidiospores 4.5-5 x 2-3 µm short-cylindrical to elliptic, hyaline, smooth, thin-walled.
Substrata. Dead conifers and hardwoods in numerous genera.
Distribution. Widely distributed throughout Europe. Circumglobal species.
Remarks. The development of the tubes from papillae which rupture at the apex, is a unique feature of this species and readily separates it from other resupinate poroid fungi. The often conspicuous rhizomorphs are also rather characteristic.

PSEUDOLASIOBOLUS Agerer,

Mitt. Bot. Stat-Sammelung. München 19:279, 1983.
Basidiocarps cyphelloid, white, densely covered with silky, unevenly long crystal covered hairs and simple septate hyphae, on dead wood. Monotypic genus.
Type species: *Pseudolasiobolus minutissimus* Agerer.
Remarks. The genus is characterized by the tiny basidiocarps being covered with curly and unevenly long hairs.

Pseudolasiobolus minutissimus Agerer, op. cit.
Basidiocarps annual, cupulate, tiny, white, circular and marginally with long, unevenly oblong white hairs, hymenophore smooth and white.
Hyphal system monomitic, generative hyphae simple septate.
External hairs thick-walled, white and covered with amorphous crystals.
Basidiospores 6-8 x 5-6 µm, elliptic.
Substrate. On dead herbs and dead hard wood.
Distribution. Known only from Central Europe, but probably overlooked.
Remarks. The unevenly long curly white marginal hairs and simple septate hyphae characterized this very rare species.

RECTIPILUS Agerer,

Persoonia 7:413, 1973.
Basidiocarps annual, tubular to semi closed discoid, whitish, external hairs unbranched and smooth, cystidia absent, spores elliptic, non-amyloid.
Type species: *Solenia fasciculatus* Pers.
Remarks. The genus is related to *Henningsomyces*, but separated by the unbranched, glabrous external hairs.

Key to species

1. Hyphae with simple septa ..... **R. afibulatus**
1. Hyphae with clamps ..... **R. fasciculatus**

Rectipilus afibulatus Lucas & Dentinger,

Kew Bull. 70:3, 2015.
Basidiocarps annual, first cup shaped, later tubular, up to 1 mm wide, white.
Hyphal system monomitic, generative hyphae with simple septa
External hairs: Unbranched, thick-walled, glabrous with round apex.
Basidia 18-25 x 5-7 µm, tetrasterigmatic.
Basidiospores 5-7 x 3.2-4 µm, broadly elliptic.

Substrate. On rotten hard woods such as *Alnus* and *Salix*.
Distribution. Northern Europe, but certainly overlooked.
Remarks. The simple septate hyphae separate it from *R. fasciculatus* and one may suspect that it is a haploid form of the latter.

Rectipilus fasciculatus (Pers.) Agerer,

Persoonia 7: 419, 1973. - *Solenia fasciculata* Pers., Mycologia European 1: 335 1822.
Basidiocarps annual, tubular, up to 2 mm long and 0.2 mm in diameter, white to light ochraceous, glabrous, each basidiocarps arise from the substrate and subiculum absent. In section with three layers, the inner one is a dense layer with basidia the subhymenium consisting of thick walled hyphae and then a layer with thick walled hyphae 2-3.5 µm wide and often secondary septate.
Hyphal system monomitic, generative hyphae with clamps, hyaline and 2-5 µm wide.
External hairs: Unbranched, irregularly thickened and glabrous.
Basidia 18-25 x 5-7 µm, clavate with two sterigmata.
Basidiospores 5-6 x 3.5-5 µm, broadly elliptic.
Substrate. On rotten hard woods.
Distribution. Widespread, but rare in Europe.
Remarks. The genus is separated from *Henningsomyces* by the thick-walled, non-branched external hairs.

REIDIELLA Ryvarden,

Synopsis Fung. 46: 20, 2022.
Calathella D. A. Reid, Persoonia 3:122, 1964. – nomen illegitimate, non *Calathella* Florin 1929 (Algae).
Basidiocarps cup- to bell shaped, 1-2 mm high, hairy, external hairs unbranched, basidiospores cylindrical to elliptic, on hard woods.
Type species: *Peziza eruciformis* P. Micheli ex Batsch.
Remarks. The unbranched hairs separate this genus from *Calyptella* where they are coralloid.

Reidiella eruciformis (Batsch:Fr.), Ryvarden,

Synopsis Fung. 46: 20, 2022. - *Peziza eruciformis* Batsch, Elench. Fung. p. 125, 1783. – *Peziza eruciformis* Batsch: Fr., Syst. Mycol. 2:203, 1822. - *Calathella eruciformis* (Batsch.: Fr.) D. A. Reid, Persoonia 3:123, 1964, nomen invalidum - illegitimate generic name.
Basidiocarps tubular, cup shaped, bell-shaped to turbinate with contracted base, 1-2 mm high and wide, hairy, in lower part greyish brown, whitish along the margin,
Hyphal system monomitic, generative hyphae with clamps, brown, 4-6 µm wide in the subhymenium hyaline.
Hairs cylindrical, fragile, finely encrusted or glabrous, up to 250 µm long and 4-6 µm wide, apex rounded or tapering, sometimes secondary septate, some hairs slightly dextrinoid.
Basidia 30-35 x 4-6 µm, tetrasterigmatic.
Basidiospores 7-9 x 2.5-3.5 µm, cylindrical to narrowly elliptic, smooth, hyaline and non-amyloid.
Substrate. On dead hardwoods, preferably on *Populus* spp., more rarely on other trees like *Sorbus* and *Pyrus*, occurring mostly early in spring.
Distribution. Southern Sweden, Finland and Norway and further southwards.
Remarks. The greyish basidiocarps and unbranched external hairs distinguish this monotypic genus.

RESUPINATUS Gray,

Nat. Arr. Brit. Pl. **1**: 617, 1821.
Basidiocarp cyphelloid, poroid to cupulate, cap when present, up to 15 mm wide, cup to bell shaped, pale grey to brown, gills absent, reduced or present, distant to crowed, pale grey, constituency soft, slightly gelatinous, basidiospores subglobose to globose, smooth to angular negative in Melzers reagent, cheilocystidia absent or present, dendrohyphidia present or absent, if present often encrusted, context gelatinous, hyphae l system monomitic, generative hyphae with clamps. On hard woods, rarely on coniferous wood.
Type species: *Resupinatus applicatus* (Batsch) Gray.
Synonym.: *Stigmatolemma* Kalchbr.
Remarks. In North Europe the genus includes 4 species, out of which the two cyphelloid ones are described here.

Key to cyphelloid species

1. Spores globose and smooth, basidiocarps in a coherent mat, common species ..... **R. poriaeformis**
1. Spores angular with warts, basidiocarps single, rare species ..... **R. griseopallidus**

Resupinatus griseopallidus (Weinm.) Knudsen & Elborne,

in Knudsen & Vesterholt, Funga Nordica, p. 913, 2008. - *Cyphella griseopallida* Weinm., Hym. à Gast. Imp. Ross. Obs. p. 522, 1836.
Basidiocarps annual, resupinate, cup shaped, solitary or in small groups, not in a coherent mycelial mat, cup up to 1.5 mm wide and 1 mm high, straight with an incurved grey margin; hymenium smooth dark greyish brown, context tough, slightly gelatinous, externally covered with pale brown finely encrusted dendrohyphidia.
Hyphal system monomitic, generative hyphae hyaline with clamps, 2.5-3.5 µm in diam.
Basidia 15-20 x 5-6 µm, bi- or tetrasterigmatic.
Basidiospores 5-6 x 4.5-5 µm, subglobose, slightly angular with 3-4 low warts or protuberances, hyaline, negative in Melzer's reagent,
Substrata. Both on conifers and hard woods like *Clematis, Lonicera, Populus, Syringia* and *Quercus*.
Distribution. In Scandinavia known from Denmark, probably overlooked.
Remarks. The greyish hymenium, the finely encrusted external dendrohyphidia and the angular spores make this a distinct species.

Resupinatus poriaeformis (Pers.: Fr.) Thorn, Moncalvo & Redhead,

Mycologia 97: 1148, 2006. - *Peziza poriaeformis* Pers.: Fr., Syst. Mycol. 2: 106, 1821.
Basidiocarps annual, resupinate, consisting of a grey subiculum with scattered to crowded grey cupules 200-300 µm in diam, apical pore conspicuous, outer surface of cupules appearing granular under a 30 x lens; subiculum tomentose to cottony or very thin and arachnoid, sometimes white at the margin.
Hyphal system monomitic; subicular hyphae thin-walled, hyaline, nodose-septate, 2-3 µm in diam, with occasional branching; profusely branched and contorted dendrohyphidia at the apex of the cupules, these from hyphae 2-2.5 µm in diam, branches 1 µm in diam or less.
Basidia 20-30 x 5.5-7 µm, broadly clavate to clavate, tetrasterigmatic with a basal clamp.
Basidiospores 4.5-6 µm in diam, globose, hyaline, smooth, thin-walled, negative in Melzer's reagent.
Substrata. Dead hardwoods including *Acacia, Betula, Fraxinus, Populus, Prunus, Quercus, Sorbus* and *Tilia*.
Distribution. Seemingly with an eastern distribution in Europe, but information about this species is scanty. Also known in North America and probably circumpolar.
Remarks. The numerous individual grey basidiocarps on a coherent mat make this a distinct species.

RIMBACHIA Pat.,

Bull. Soc. Mycol. Fr. 7:159, 1891.
Basidiocarps cupulate to disc like, white and hanging, hymenophore smooth to rudimentary gilled with low ridges, hyphae with clamps, spores smooth and non-amyloid, parasitic on mosses.
Type species: *Rimbachia paradoxa* Pat.
Taxonomic synonyms;
Minopetalum Donk & Singer.
Pleuromycenula Singer.
Remarks. The genus is distinct by its white finely felty basidiocarps and being parasitic on mosses.

Key to species

1. Hymenophore finely veined ..... **R. bryophila**
1. Hymenophore smooth **2**

2. Spores 4-5 x 4-5 µm, subglobose to globose ..... **R. arachnoidea**
2. Spores 7.5-11 x 5-7 µm, elliptic to drop shaped ..... **R. necherae**

Rimbachia arachnoidea (Peck) Redhead,

Can. J. Bot. 62:878, 1984. – *Cyphella arachnoidea* Peck, Ann. Rep. Reg. N. Y. Sate Mus. 44:134, 1891.
Basidiocarps bell shaped, up to 1 cm wide, outside white, inside white to cream, smooth, outside finely felty, dorsally attached to mosses.
Hyphal system monomitic, generative hyphae with clamps, 4-6 µm wide.

Basidia 15-25 x 4-6 µm, tetrasterigmatic.
Basidiospores 4-6 x 4-5 µm, globose to subglobose.
Substrate. On mosses, especially *Minum* sp. In damp places, such as *Alnus incana* thickets
Distribution. Southern Sweden, Finland and Norway and further southwards.
Remarks. The substrate makes this a distinct species.

Rimbachia bryophila (Pers.) Redhead,

Can. J. Bot. 62:878, 1984.
Basidiocarps tubular, cup to bell shaped, 1-3 mm wide, pileus white and finely velutinate, hymenophore veined and white.
Hyphal system monomitic, generative hyphae with clamps.
Basidia not known.
Basidiospores 6-7.5 x 5-6 µm, globose to subglobose.
Substrate. On mosses such as *Minum* and *Rhynchostegium* spp.
Distribution. Southern parts of Sweden, Finland and Norway and further southwards.
Remarks. The veined hymenophore makes this a distinct species among the parasitic species.

Rimbachia necherae (Fr.) Redhead,

Can. J. Bot. 62:879, 1984.
Basidiocarps cup to bell shaped, 2-5 mm wide, pileus white and finely velutinate, hymenophore smooth, white to cream coloured.
Hyphal system monomitic, generative hyphae with clamps.
Basidia 20-25 x 4-6 µm, tetrasterigmatic.
Basidiospores 7.5-11 x 5-7 µm, elliptic to drop shaped.
Substrate. On mosses, often in damp calcareous sites.
Distribution. Southern parts of Sweden, Finland and Norway and further southwards.
Remarks. The larger spores separate it from the related *R. archnoidea*.

WOLDMARIA W. B. Cooke,

Beiheft. Sydowia 4:29, 1961.
Basidiocarps cylindrical, brown, spores fusiform, smooth, hyphae with clamps, at the base of *Matteucia struthiopteris*.
Type species: *Solenia filicina* Peck.
Remarks: Monotypic genus, and the type species follows the host wherever it grows.

Woldmaria filicina (Peck) Knudsen,

Nordic J. Bot. 16:219, 1996 – *Solenia filicina* Peck, Ann. Rep. N. Y. State Mu. Nat. Hist. 28:52, 1876. – *Solenia crocea* P. Karsten Hedwigia 23:88, 1884.
Basidiocarps annual, tubular, often several together, up to 4 mm long and 0.3-0.5 mm in diameter, golden brown with hairy external surface, yellow hairs around the opening.
Hyphal system monomitic, generative hyphae with clamps, brown, 2-5 µm wide in the subhymenium hyaline, those on the external surface darker and 100-150 x 4-5 µm, smooth and with a rounded apex.
Basidia 24-30 x 6-8 µm, tetrasterigmatic.
Basidiospores 12-13.5 x 4-5 µm, fusiform.
Substrate. At the base of dead frons of *Matteucia struthiopteris*.
Distribution. Almost wherever the host occurs, but rare in the boreal zone.
Remarks. The genus is monotypic and easy to recognize because of the host and the large fusiform spores.