Cyphella ferruginea P. Crouan & H. Crouan

An interesting and overlooked cyphelloid fungus

Peter R. Smith[1]

Fig. 1. *Cyphella ferruginea*. A = Gloucestershire, B = Sussex. Photographs © Peter R. Smith.

The cyphelloid fungi are a morphological group in the *Agaricales* with much in common but without clearly defined boundaries. They all form cup-shaped sporophores, at least initially, but in many species these may elongate to become bell- or tube-shaped, or widen to become bowl- or plate-shaped, and in some cases flabelliform. They have evolved independently in at least thirteen different families, mostly from gilled ancestors, where they have lost their gills or have seen them reduced to just a few low ridges. Cyphelloid fungi have been woefully neglected in many of the major works on the *Agaricales*. They are reasonably well represented in Funga Nordica (FN) with keys to 32 species, and more recently with excellent photographs of 38 species in The Fungi of Temperate Europe (FTE), with keys to 67 species to follow in volume 3. However, *Cyphella ferruginea* is absent from FN as it was not recorded in the Nordic countries at the time of publication, and only gets a very brief mention in FTE. In fact, the number of descriptions of this taxon in all the main books on European fungi is zero. The 1867 type description from the extreme

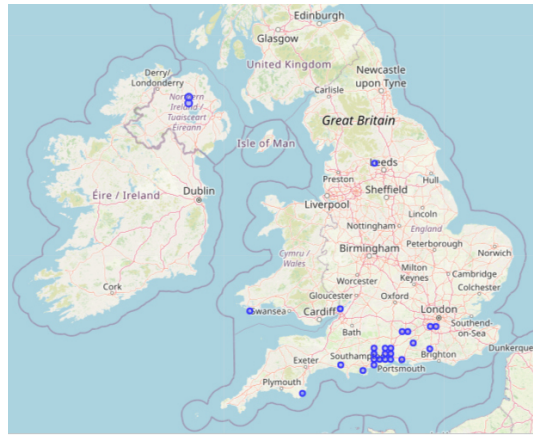

Fig. 2. British distribution of *Cyphella ferruginea* on the Fungal Records Database of Britain and Ireland (British Mycological Society, 2009).

Atlantic coastal area of France is totally inadequate by modern standards. To date, the only other description is in a Dutch paper by Dam & Dam (2012).

Britain appears to be the stronghold for *Cyphella ferruginea* with 33 records on the FRDBI database, dating back to 1980. The British distribution is mainly south-west (see Fig. 2). However, there is one record from Otley in Yorkshire and two from Northern Ireland. Further collections held in the Kew fungarium and cited in the Basidiomycete Checklist (Legon & Henrici 2005) range from the Isle of Skye to the Channel Islands, so it might be expected to turn up anywhere in the UK if searched for. The records suggest the best time to find this species is from late autumn to early winter. The 'Global Biodiversity Information Facility' database (GBIF), accessed in January 2025, also has (excluding duplicates and records that relate only to fungarium locations) single records from Denmark and Portugal, and another single record from Taiwan in 2023. This outlier record is from a very different climate and unfortunately has no supporting microscopy or DNA evidence, however, it is accompanied by some convincing images. In the Netherlands, Dam & Dam (2012) report a collection of this species. After an initial struggle to identify it due to the shortage of literature, they

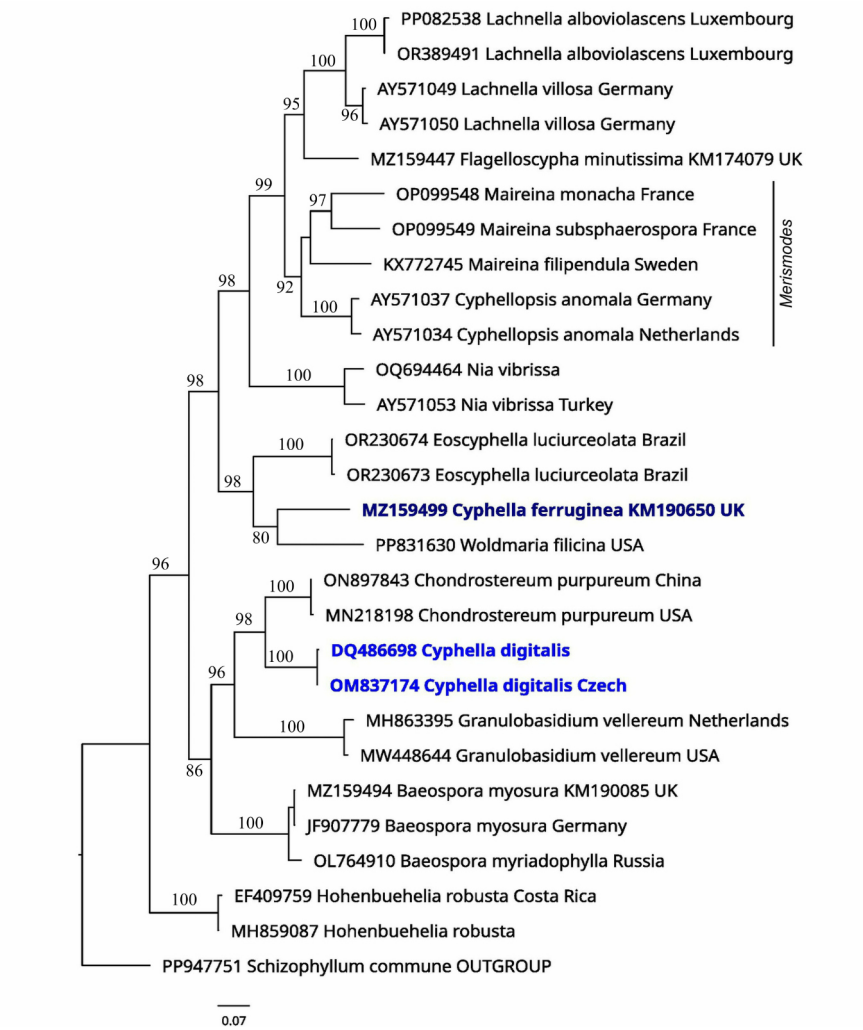

Fig 3. A Maximum Likelihood tree inferred from sequences of the ITS and 5.8S regions with bootstrap values >70% indicated above or near branches, courtesy of David Harries.

Fig. 4. A look-a-like: the ascomycete, *Perrotia flammea*. Photograph © Peter R Smith.

specifically searched for more in a second geographical area, where it was found at another four locations. However, these Dutch records have not yet made it into GBIF.

Although *Cyphella ferruginea* was described in the genus *Cyphella*, it is now clear that it is not related to the type species *C. digitata* and does not belong in this genus. There is only one ITS sequence in Genbank (MZ159499), from a voucher specimen held at Kew. This was collected in East Suffolk, identified by Alick Henrici, and sequenced by staff at Kew. When I subjected this sequence to a 'Blast search' of GenBank records, the nearest match (ITS 79.9% @ 100% cover) was *Eoscyphella luciurceolata*, a recently discovered bioluminescent cyphelloid taxon from Brazil. This has almost identical spirally twisted hairs and similar subglobose spores. Silva-Filho *et al*. (2023) place this taxon at the base of the *Cyphellopsidaceae* close to *Woldmaria*. Fig. 3 is a phylogenetic tree constructed from various ITS sequences from GenBank, which although not as phylogenetically accurate as a tree derived from LSU sequences, it does give a probable insight into the relationships of both *Cyphella ferruginea* and *C. digitalis* to other closely related species, and also demonstrates their separation. It can be seen that *Cyphella ferruginea* will need to be moved out of the *Cyphellaceae* and become the type of its own new genus.

Unlike other known cyphelloid fungi, *Cyphella ferruginea* is found directly on the bark of living trees, especially *Quercus* and *Salix*, but it is also known from *Corylus*, *Malus*, *Fraxinus* and *Acer campestre*. Morphologically it can be mistaken for the uncommon orange-red discomycete *Perrotia flammea* (see Fig. 4) that is usually found on dead branches.

I have yet to find *Cyphella ferruginea* myself but I have been sent fresh material from Gloucestershire, East Sussex and London. Interestingly, the spores from the Gloucestershire collection are slightly more dacryoid (see Fig.5). The basidiocarp colour can also vary between bright ochre and a bright reddish orange.

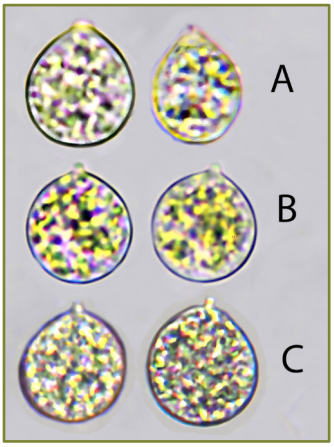

Fig. 5. *Cyphella ferruginea* spores.
A = Gloucestershire;
B = London;
C= Sussex.
Micrographs © Peter R. Smith.

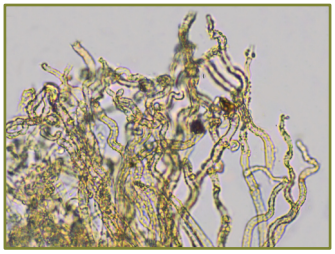

Fig. 6. *Cyphella ferruginea* hairs. Micrograph © Peter R. Smith.

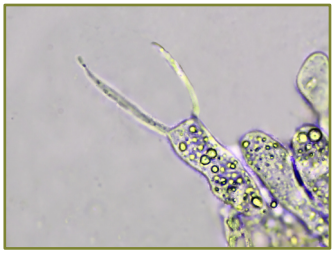

Fig. 7. *Cyphella ferruginea* basidium. Micrograph © Peter R. Smith.

Description

Basionym: *Cyphella ferruginea* P. Crouan & H. Crouan

Synonym: *Solenia ferruginea* (P. Crouan & H. Crouan) Quél.

Etymology: Latin *ferrugo* = iron rust, referring to the rusty brown colour of the basidiocarps.

Basidiocarp: cup-shaped to cone-shaped, 0.5–2 mm diameter, up to 4 mm long. Sessile and centrally attached. Outside covered with long straggly orange-brown or reddish-brown (ferruginous) hairs. **Hairs**: often in a tangled mass, the end sections frequently spirally twisted (Fig. 6) up to 150 µm long and 3–5 µm wide, with rounded tips, +/- covered with fine granules, appearing brown under the microscope. **Trama hyphae**: sparsely septate with clamped septa towards the base. **Hymenium**: creamy white. The margin is often curved inwards and the cups are reluctant to open, often just leaving a small aperture in the centre. **Basidia**: large up to 50 µm long with clamps, mostly four-spored, but occasionally two-spored (Fig. 7), with very long, curved sterigmata up 30 µm long. **Spores**: subglobose to dacryoid, (9.5–) 10–14 (–15) x 10–13.5 µm excluding the apiculus, Q = 1–1.2. Usually containing one oil drop, but may contain many smaller drops. **Substrate**: attached in scattered groups on the bark of living deciduous trees especially *Quercus* and *Salix*, often along with mosses and other lignicolous fungal species.

Acknowledgements

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GBIF The Global Biodiversity Information Facility, www.gbif.org

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