Amanita opaca and *A. coryli*, two closely related species present in the UK

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In a recent article on the fungi of Richmond Park (Overall, 2021) I described and illustrated a pale cream *Amanita* collected under *Carpinus betulus*, evidently belonging somewhere in Section Vaginatae. DNA had shown it was identical to a Danish collection then awaiting description as a new species. It has now been described in Varga *et al*. (2024) as *Amanita opaca* Hanss, Dima, Bidaud & Varga.

This is one of an ever growing number of species formerly lumped as 'The Grisette' *Amanita vaginata* or its supposed 'var. *alba*'. *A. opaca* is a close relative of *A. coryli*, another fairly recent addition to the British list, now known from two British sites. Thanks to DNA no less than five more very recently described members of Section Vaginatae are also known to be British, two that were illustrated in FM last year, *A. fulvoides* and *A. dryophila* (Overall, 2023) and three more illustrated in Kibby (2023), *A. alseides*, *A. huijsmanii* and *A. vladimirii*.

Fig. 1. *Amanita opaca* showing the pale cap and yellowish bruising of the volva. Photo © Andy Overall.

Amanita opaca and *A. coryli* sit within the *Coryli* stirps which also includes *A. prudens*, recorded from Hungary, Italy and Spain, and *A. cistetorum* recorded from Italy. A phylogenetic tree showing sequences of *A. opaca*, *A. coryli* and *A. prudens* was kindly produced by David Harries (Fig. 2).

Amanita opaca was described as robust in habit and 'always' with different colour zones on the pileus. However, the collection by AO was fairly uniform in colour, at least in this young stage. The holotype was a collection by A. Bidaud in Aug 2011 with *Quercus pubescens* and *Carpinus betulus* on calcareous soil.

Upon receiving news from Pierre-Arthur Moreau of the publication of *A. opaca*, Martyn Ainsworth at Kew was contacted to alert him to this newly described species and the collection from Richmond Park. He replied to say that he was already aware of this new species and that following the sequencing of Kew collections labelled *Amanita* sp. a collection had been found that matched the holotype sequence of *A. opaca*. He has drafted a note for the next CBIB update to include my collection and that of one made in 2019 in East Gloucestershire from Buckholt Wood, with *Fagus sylvatica*.

Amanita opaca is also known from Germany, Greenland, Hungary, and now the UK, making it potentially more widespread in Europe. It was surprising not to see the Denmark collection, to which the UK sequence was originally matched, among those countries listed, but Pierre-Arthur said that the Danish collection was indeed that of *A. opaca*, it just wasn't studied by Varga at the time.

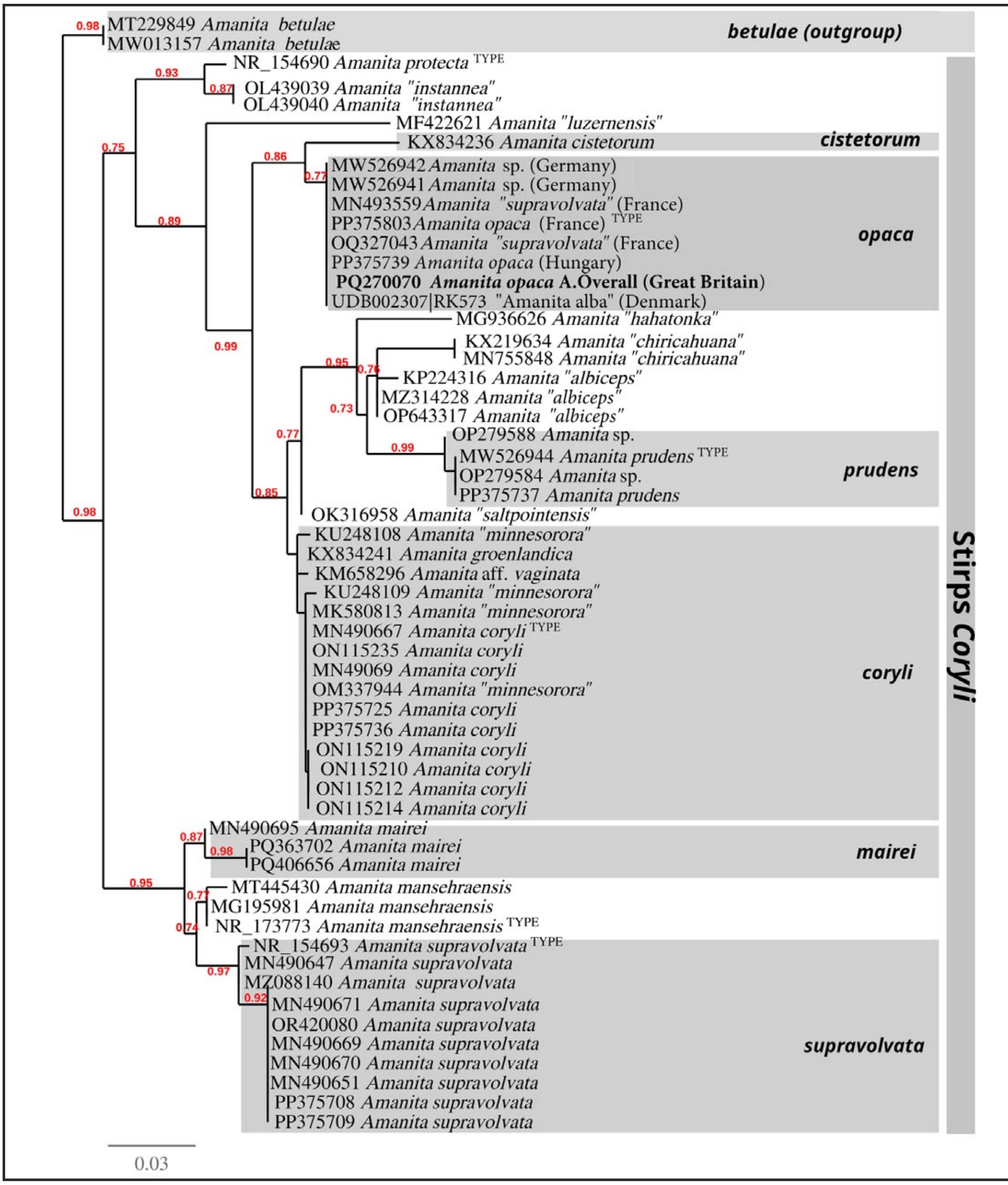

Fig 2. Phylogenetic reconstruction of *Amanita* stirps *Coryli* (sect. *Vaginatae*) based on ITS sequences (Maximum likelihood). European species are indicated in grey.

Following DNA sequencing, the description and further examination of the micromorphological features, *A. opaca* is seen to have some characteristic features that will help with the determination of collections. The volva reveals, tight, elongated hyphae enveloping groups of oval cells which form cylinder-like structures. Similar cells also occur in *A. coryli* and *A. prudens* (not yet British) but it is in *A. opaca* that they are the tightest and most striking. For this reason, the authors propose to call this original volva structure "opaca type". The spores are also larger in *A. opaca* than in *A. coryli*.

Description of the Richmond Park Collection of *Amanita opaca*

Found beneath *Carpinus betulus* on a sandy loam topsoil upon London Clay.

Cap 80–85 mm, conic, ovoid, convex, smooth, pale buff to almost white with very weak, grey

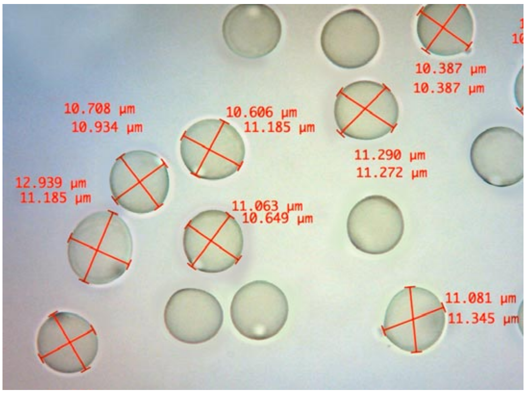

Fig. 3. Spores of *Amanita opaca*. Photo © Andy Overall.

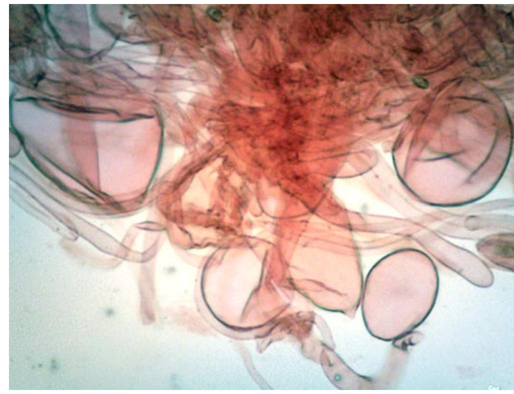

Fig. 4. Volval tissues showing the inflated cells with thinner hyphae wrapping around them. Photo © Andy Overall.

olivaceous hints. Margin deeply striate.

Gills free, white-cream, crowded, edge concolorous and somewhat crumbly.

Stem 185 x 24 mm, apex narrowing to 18 mm, cylindrical, white, smooth, fibrous, base volvate and slightly enlarged.

Volva saccate 80 mm deep, whitish staining yellow.

Spores subglobose-globose, smooth, 10.0–11.0 x 9.9–10.9 µm. Spore deposit white. Basidia 4–spored (Fig. 3).

Volval tissue with oval cells and slender bounding hyphae with swollen, bladder-like end cells (Fig. 4).

Amanita coryli

Described by Neville & Poumarat (2009), the original collections were recorded from under *Corylus avellana*, hence its specific epithet but subsequent collections in the years following have shown that it can also grow with other hosts e.g. *Betula* (Pierre-Arthur Moreau pers. comm.).

The first British collection was in 2012 from a hazel copse in the conservation area of Kew Gardens (Fig. 5) where it has reappeared many times in subsequent years (Fig. 6). There is also a collection in Kew from Wales and we know of a further collection from North Wales sequenced and confirmed by Rod Tulloss (Simon Harding pers. comm.).

Description of the 2012 Kew collection of *Amanita coryli*

Cap 8 cm diameter, broadly umbonate, margin coarsely sulcate up to 1.5 cm. Pale hazel to darker, drab at centre, paler clay-buff at margin; smooth to very slightly pruinose at centre.

Gills moderately spaced, approx 75 per 180 degrees circumference, 7 per cm; intermediates uncommon, pale cream to very pale buff, margin-minutely flocculose, concolorous.

Stem 17 cm long, 1 cm thick at apex, 1.7 cm thick at base, surface with distinct zig-zag hazel-drab veil remnants down to upper edge of volva.

Volva saccate, membranous, rather cylindric,

Fig. 5. The original 2012 collection of *Amanita coryli* under *Corylus avellana* in Kew Gardens, Richmond. Photo © Geoffrey Kibby.

often pinched in at base, white, unstaining; very pale buff internally. Limbus internus set very deep within volva.

Flesh with 2% phenol at first pale vinaceous pink then fading in 2 mins.

Volval tissues outer tissues predominantly filamentous mixed with numerous long, acrophysalid-like cells. Filamentous hyphae 3–4 µm across, very wavy and irregular, tangled; 'acrophysalids' like long balloons 50–65 x 10–12 µm. Deeper into the volva there are scattered, rounded or ellipsoid sphaerocysts 25–30 µm across.

Spores globose to slightly subglobose, very rarely more broadly ellipsoid 9–11 µm.

Amanita coryli can also occur in an all-white form described as forma *albida* Neville, Poumarat & M. Rovira. This white form has been found growing in the hazel copse at Kew alongside normally pigmented fruitbodies.

Acknowledgements

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Fig. 6. Two of a large number of *A. coryli* found in the hazel copse in Kew gardens, October 2017. Note the pale beige hue inside the volva. Photo © Geoffrey Kibby.

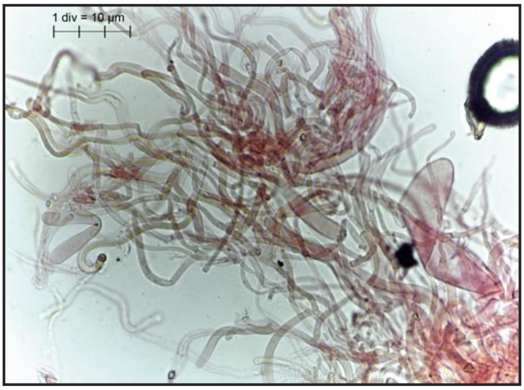

Fig. 7. Volval tissue showing narrow, tangled hyphae along with swollen, balloon-like cells. Photo © Simon Harding.

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