Fungal Portrait: 103

Gibellula attenboroughii H.C. Evans & J.P.M. Araújo

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Fig. 1. *Gibellula attenboroughii*, specimen on orb-weaving spider, *Meta menardi* (*Tetragnathidae*: *Araneae*), showing dense, white mycelium covering the spider body from which arise short projections, the conidia-bearing structures (synnemata), on cave roof, Whitefathers' Caves, County Cavan, Northern Ireland. Photograph © Tim Fogg.

The type specimen (Fig. 2A) was found during filming of the 2021 BBC Winterwatch series and an image was received, via RBG Kew, for comment. Based on the unusual white colour, denoting a lack of pigmentation, as well as the compact nature of the synnemata and the dense conidial chains in blocks, it was posited that this could be a new species of *Gibellula* (*Cordycipitaceae*: *Hypocreales*), a genus parasitic on and specific to spider hosts and, more typically, associated with tropical countries. At the end of the series in 2022, the specimen was collected, air dried and sent for identification. A subsequent morphological and molecular analysis confirmed it as a new taxon sitting in a subclade with two species from Asia. This information, plus the implication that the fungus could be controlling the behaviour of the spider host—since the infected spider had moved from its normal concealed habitat and died fully exposed—was

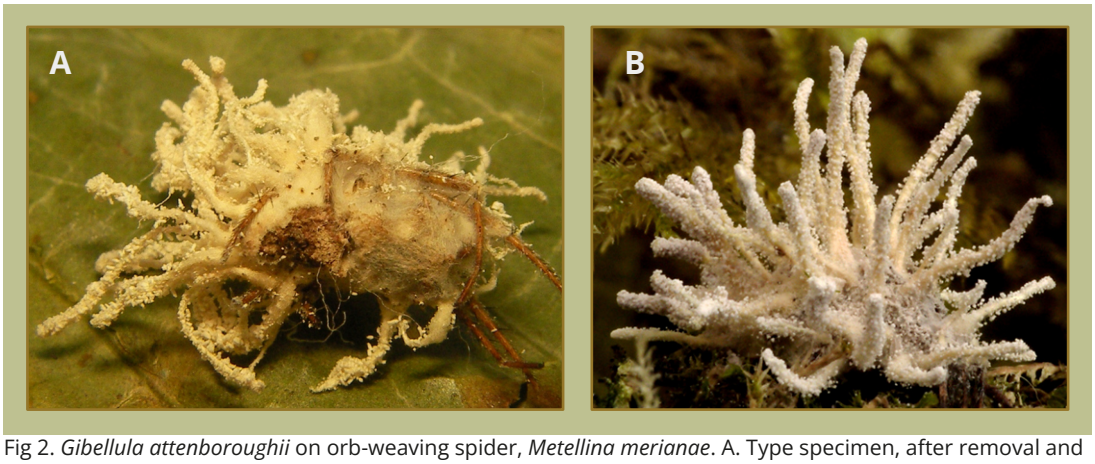

Fig 2. *Gibellula attenboroughii* on orb-weaving spider, *Metellina merianae*. A. Type specimen, after removal and drying to show the spider body, lower surface, and cream-coloured mycelial mat and synnemata; B. *In situ*, attached to *Sphagnum* moss, Lake Vyrnwy, Powys, Wales. Photographs: A. © H.C. Evans, B. © D. McNeil.

presented during the subsequent Springwatch series, with the further speculation that this could be an alien species, based on its phylogeny and the fact that the former owner of Castle Espie worked with the East India Company and regularly imported goods from Asia. Fortunately, a speleologist viewer dispelled this speculation and reported its presence on spiders in caves in Ireland. On request, specimens from several Irish cave systems were sent for identification and the occurrence of the fungus was confirmed on two species of orb-weaving spiders: *Metellina merianae*, a small spider (body length 6–12 mm) found around cave entrance and in the twilight zone; and, *Meta menardi*, a larger spider (body length 10–17 mm; Fig. 1), occupying both the twilight and dark zones within the cave system. The new species was duly described and named in honour of Sir David Attenborough (Evans *et al*., 2025), not least because of his association with the founding of the BBC Natural History Unit.

Description

Spider body covered by a white to pale yellow mycelial mat, bearing numerous white to cream, cylindrical synnemata, up to 1 cm in height. Conidiophores produced along most of the synnematal surface, with long, rough-walled stipes near the base becoming short and almost astipitate nearer the apex, bearing *Aspergillus*-like heads from a smooth, neck region; heads with a central vesicle and metulae forming clavate phialides producing chains of hyaline ellipsoidal, conidia (Fig. 3).

Simpler, penicillioid conidiophore heads also occur occasionally. This is the dominant form on the synnemata formed on the larger spider host, *Meta menardi*, particularly towards the tapered apex (Fig. 1 & 4). It is conjectured that this ecotypic variation is due to the different niches occupied by the spider hosts.

This species is also a psychrotroph (a microbe able to grow at 7 °C, or below) which may explain why it has been collected in the mountains of mid-Wales in the winter months (McNeil, 2012). The latter author collected hundreds of specimens from two lake sites (Bala and Vyrnwy)—on *Sphagnum* moss hanging from the rocks and crevices (Fig. 2B)—demonstrating again the altered behaviour of the infected *Metellina merianae* spiders as they emerged from their hidden lairs to die fully exposed. A similar situation has been reported recently (author, pers. comm.) from the border country in central Ireland with numerous infected spiders hanging from vegetation along a rocky stream, and this has been followed by the observation of infected *Meta menardi* on a cave ceiling in north Yorkshire. It is likely, therefore, that *G. attenboroughii* is a much over-looked fungus which may be common throughout the British Isles, sometimes in epizootic proportions. Undoubtedly, more novel species of *Gibellula* occur on different spider hosts in the British Isles which, historically, would simply have been identified as *G. aranearum* (Evans *et al.*, 2025).

It should be noted that long-legged cellar spiders (*Pholcus* spp.) are frequently infected with the entomopathogenic fungus, *Engyodontium aranearum*, which, although covered in a similar white mycelial mat, can easily be distinguished by the absence of synnemata and the formation of conidia on denticles from simple conidiophores.

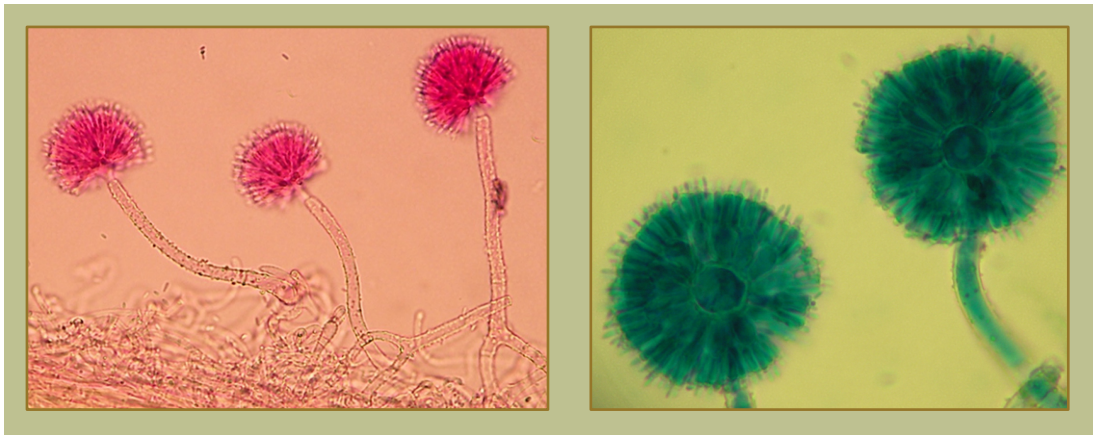

Fig 3. *Gibellula attenboroughii*: micromorphology of the type specimen, showing the rough-walled conidiophores tapering to a smooth neck on which the *Aspergillus*-like heads are produced, with a central vesicle, metulae and spore-bearing phialides. Photographs © H.C. Evans.

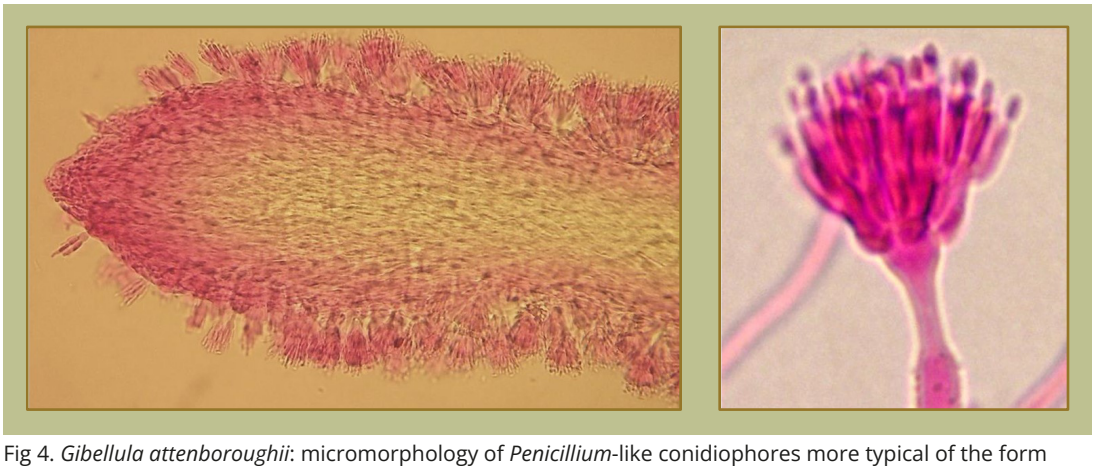

Fig 4. *Gibellula attenboroughii*: micromorphology of *Penicillium*-like conidiophores more typical of the form associated with the synnemata on the larger orb spider, *Meta menardi*. Photographs © H.C. Evans.

Glossary

Conidia – asexual, non-motile spores produced by some species of fungi

Conidiophores – specialised stalked structures which bear conidia

Metulae – conidiophore branches bearing phialides

Phialides – cells producing conidia in basipetal succession

Synnemata – conidia-bearing structures composed of compact, erect hyphae, producing conidiophores laterally

Vesicle – the swollen apex of a conidiophore

References

Evans, H.C., Fogg, T., Buddie, A.G., Yeap, Y.T. & Araújo, J.P.M. (2025). The araneopathogenic genus *Gibellula* (*Cordycipitaceae*: *Hypocreales*) in the British Isles, including a new zombie species on orb-weaving cave spiders (*Metainae*: *Tetragnathidae*). *Fungal Systematics and Evolution* 15: 153–178. doi: https://doi.org/10.3114/fuse.2025.15.07

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