

OSTEOMORPHA ARNAUD — A VALIDATION

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During the 1977 Spring fungus foray of the Yorkshire Naturalists' Union collections were made of resupinate fungi, many belonging to the Corticiaceae. The weather conditions prior to the meeting had obviously been ideal for the growth and fructification of resupinates, as most of the material was in good condition. So often, members of the Corticiaceae and related families are found lacking mature basidia or other distinctive structures, and it is unfortunate that some collectors are reluctant to discard even such taxonomically useless material.

Amongst the collections from Ilkley were several fully mature specimens belonging to the hydroid fungus *Trechispora farinacea* (Pers. ex Fr.) Liberta (= *Cristella* s. Donk). One particular basidiome was covered in a powdery white to cream-coloured mycelial growth which in places formed cushion-like structures.

Under the microscope, characteristic thallic-arthric conidia were revealed; indeed, the powdery growth was composed in the main of disarticulated vegetative cells (Fig. 1F). In general, the thallic-arthric conidia of a whole range of Aphyllophorales and even Agaricales are morphologically very uniform, but the conidia in the Ilkley collection were immediately recognized by their bizarre shapes as those figured by Arnaud (1951) for his genus *Osteomorpha*.

Arnaud, although proposing new generic names for several intriguing anamorphic fungi, and giving many excellent illustrations, failed to provide Latin diagnoses. Thus, much less attention has been paid to Arnaud's work than it deserves, and of course his taxonomic suggestions are only partially usable because the names he proposed are invalid. Many of the fungi he described have not been collected again, although there is little doubt in our minds that at least some can be tied to basidiferous teleomorphs. For example, Arnaud's *Flahaultia hyalina* is identical to the anamorph of *Sebacina incrustans* (Pers. ex Fr.) Tul. figured by Brefeld (1888).

Most of Arnaud's collections have been lost or destroyed, so although we are basing our conclusions on a collection other than that originally described by him, we believe that we will be performing a service if, using the excellent Yorkshire material, we validate the generic name *Osteomorpha*.

Osteomorpha fragilis [Arnaud] ex Watling & Kendrick gen. et sp. nov.

Fungi Imperfecti, Hyphomycetes

Conidiomata compacta, pulvinata, farinacea, ad 1 mm diam., alba vel cremea, bubalinescentia in aetate, isolata vel dispersa in paginis basidiomatorum *Trechisporae farinaceae*.

Conidiophora inconspicua si adsunt, 1–2.5 μ m lat., ad 5 μ m long., raro longiora, hyphae vegetativae similia.

Conidia thallica, arthrica, composita per disarticulationem hypharum arcte septatarum, fibularum, caespitosarum, ex hyphis vegetativis oriundarum; 2–3.5 (–5) \times 1.5–2.5 μ m; fibulae persistentes in una vel utraque extremitate conidiorum, tumores angulares et conspicuos formantes.

HABITAT: in paginis *Trechisporae farinaceae*, in ligno putrido *Quercus*, Stubham Wood,

Ilkley, Yorkshire, England, 15.v.1977, leg. R. Watling (Holotypus: Wat. 12048 (E); Isotypus: WAT(ERLOO) 1001.

Conidiomata compact, pulvinate, powdery or farinaceous, up to 1 mm across, white to cream-colour, darkening to pale buff with age, isolated or sometimes scattered over the surface of the basidiome of *Trechispora farinacea*. *Conidiophores*, if present, reduced, 1–2.5 µm broad and up to 5 µm long, rarely longer, in all ways resembling the vegetative hyphae. *Ameroconidia* thallic-arthric, formed by the disarticulation of closely septate, clamped, fertile branches which originate in groups from vegetative hyphae, 2–3.5 (–5) × 1.5–2.5 µm, part clamp-connections remaining as conspicuous angular swellings at one or both ends of the cell, and often giving them the 'finger-bone' shape that prompted Arnaud's choice of generic name.

On the basidiome of *Trechispora farinaceae*, on rotten wood of *Quercus*, Stubham Wood, Ilkley, Yorkshire, England. Holotype in E. (Wat. 12048) Isotype in WAT.

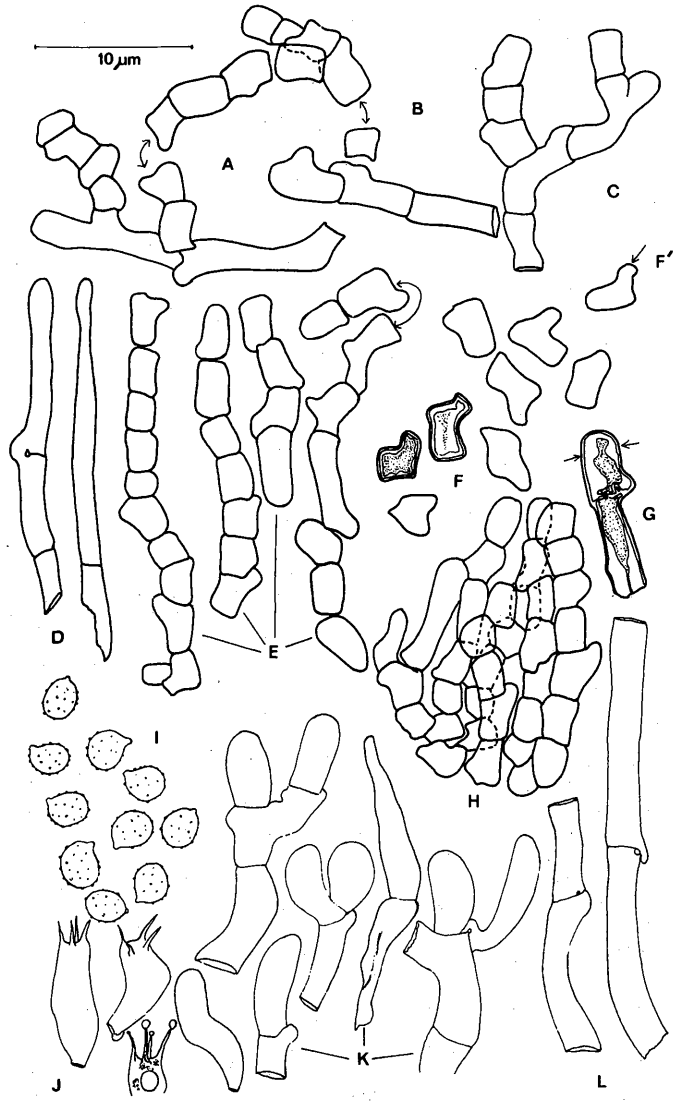
Both Joost Stalpers and John Eriksson (pers. comm.) both appear to have found this same fungus. Stalpers' collection from Bergen (Netherlands) was considered by the late M. A. Donk to be *T. farinacea* in agreement with our findings. J. Eriksson has, however, been acquainted with this arthroconidial fungus for about thirty years "having seen it many times in my own and other collections". He too has found it with *T. farinacea* of which he considers it undoubtedly a conidial state. Unfortunately *T. farinacea* is a very difficult taxonomic problem, the name apparently having been applied in the past to collections covering a wide range of macromorphology e.g., size and density of aculei, and microcharacters e.g., spore size and ornamentation. It is probably a complex of species from which a nomenclatural type must be chosen in the future to stabilise the taxonomy. It is possible that the taxon growing on coniferous wood is what Fries had in mind when he described *Hydnum farinaceum*. This differs from the collection described above in larger aculei and basidiospores. However, until Professor Eriksson has carried out his investigations on the sexual state we refer the collection on oak from Ilkley to *T. farinacea* as outlined by Liberta (1973).

Unfortunately, direct hyphal connection could not be demonstrated between the *Trechispora* and *Osteomorpha*, so it has not been possible to prove whether the latter is the anamorph of the former, a parasymbiont, or even a weak parasite fruiting on the Basidiomycete. However, comparison of the hyphae found solely in the areas with typical hymenial elements (Fig. 1, J & K) including basidia, with those intermixed with the thallic arthroconidia showed similarities in size, and no indication of the presence of two very different fungi. This was supported by observations on the hyphae giving rise to the short conidiophores in the *Osteomorpha* (Fig. 1, A–C). These hyphae of the *Trechispora* were clamped, and 1–2.5 µm broad (Fig. 1, L) in agreement with those of the *Osteomorpha* (1–2 (–2.5) µm; Fig. 1, D). There were unfortunately no distinguishing features "such as encrusting crystals, diverticulae, etc.", to help in this comparison, but it is certainly pertinent to note that Liberta (1973) described similar arthroconidia for *T. farinacea*, as being 'sometimes present, formed by the segmentation of the hyphae in the pulvinate sectors, irregularly shaped, the ends truncate 4–8 × 2.5–4.5 µm, wall smooth, thin to slightly thickened (0.5 µm), hyaline.' The measurements of the Yorkshire material are at the low end of the size range given by Liberta, but his illustration agrees exactly (Fig. 1, F).

The *Trechispora farinacea*, with non-amyloid, hyaline, ovoid to ovoid-ellipsoid basidiospores with slight flattening in profile and echinulate, thin walls, also agrees with Liberta's

Legend to Fig. 1 A.–H. (opposite).

Osteomorpha fragilis: A, B, and C, Conidiophores bearing thallic arthrospores. D, vegetative hyphae. E, 4 chains of arthrospores. F, detached arthrospores (uppermost possibly germinating — arrow); outline of protoplast in cotton blue indicated. G, Arthrospores apparently differentiating; outline of protoplast in cotton blue indicated (position of possible new wall indicated and complex pore-structure accentuated by cotton blue). H, Section through edge of pulvinate fruit-body. I–L. *Trechispora farinacea*: I, Basidiospores. J, Mature basidia. K, Hymenial elements; basidioles and single poorly differentiated cystidium. L, Vegetative hyphae.



description of the suspected teleomorph; the basidiospores measured $3-4 \times 2.5-3 \mu\text{m}$ (Fig. 1, I). Unfortunately, attempts to isolate the *Trechispora*, from basidiospores and tissue, and the *Osteomorpha* from arthroconidia and hyphae, were unsuccessful. Apparently Liberta (1973) who gave a modern description of *T. farinacea* also did not obtain a pure culture of his fungus.

Similar arthroconidia have been found in *Collybia racemosa* (Pers. ex Fr.) Quél. (Watling & Kendrick, 1977), and *Pleurotus cystidiosus* O. K. Miller (Miller, 1969; Moore, 1976); obviously *Arthrosporella ditopa* (Singer) Singer (Singer, 1975) also produces arthroconidia, but the author did not indicate whether they were dicaryotic or monocaryotic. These three fungi are members of the Agaricales, but similar 'beaked' arthroconidia are found in species of *Amylostereum* (*Aphylophorales*) associated with *Sirex noctilio* (Talbot, 1964).

Arthroconidia of *Collybia racemosa* have not been cultured, but because of the presence of clamp-connections it is assumed the cells are dicaryotic. Because of the presence of clamp-connections between adjacent cells in the chains (Fig. 1, E) of arthroconidia of *Osteomorpha*, these conidia are also considered dicaryotic; cytological observations give a varied and confused picture. *Pleurotus cystidiosus* has, however, been cultured (Kaufert, 1933; Miller and Pollack, 1976) and both monocaryotic and dicaryotic arthroconidia have been shown to be formed.

All three agarics produce their conidial anamorph in nature, although *P. cystidiosus* does it in the absence of the basidiome; *Amylostereum* produces such cells only in the hypopleural sacs of *Sirex noctilio*. If grown in culture on agar the cells of the same species-isolate are much narrower, more regular in shape, and lack clamp-connections at the transverse septa. It is unlikely, therefore, that the Yorkshire collection is a parasymbiotic anamorph of an *Amylostereum* sp.; this would be supported by host preferences known for *Amylostereum* spp., but not exhibited in the material described above.

The arthroconidia from *Sirex* bud-off secondary, globose to ellipsoid blastospores; of this there is only slight evidence in *Osteomorpha* (Fig. 1, F).

In *Collybia racemosa* and *Pleurotus cystidiosus* the arthroconidia are formed in coremioid heads, but it is suggested that the pulvinate sectors in the *Osteomorpha*, because of similarities in structure between it and *C. racemosa*, may be equivalent to astipitate coremia (Fig. 1, H).

Dr. Egon Horak recently sent a collection of this same fungus from Switzerland (on *Alnus*, partially covering *Hymenochaete* sp. GR. Schuls-Tarasp, 2.IX.1978, Horak 78/111).

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