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FOUR NEW FAMILIES OF HYMENOMYCETES

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Four new families are proposed, viz. Bankeraceae, excluded from the Thelephoraceae trib. Hydnelleae; Echinodontiaceae; Gomphaceae, for the Clavariaceae trib. Ramarieae in an emended circumscription; and Clavulinaceae, a former tribe raised in rank.

Bankeraceae Donk, *fam. nov.*

Receptaculum stipitatum, pileatum, (certe in sicco) odorem *Trigonellae* vel *Meliloti* forte praebens. Hymenophorum aculeatum; aculei albescentes vel cinerascentes nunquam ob sporas brunnescentes. Basidia clavata, haud septata, apice sporis 2–4. Sporae globosae, minutae (3–5 μ diam.), breve echinulatae, accumulatae colore albido, haud amyloideae. Terrestres. — Typus: *Bankera* Coker & Beers ex Pouz.

The two genera which make up the contents of this family are *Phellodon* P. Karst. and *Bankera* Coker & Beers ex Pouz. I assigned them previously to the Thelephoraceae (Phylacteriaceae) tribus Hydnelleae Donk and their removal now leaves in the tribus, *Sarcodon* Quél. ex P. Karst., *Hydnellum* P. Karst. (synonym, *Calodon* Quél. ex P. Karst.) and *Hydnodon* Banker. These remaining genera are quite typical of the Thelephoraceae as to their spores and several other features, which cannot be said of *Bankera* and *Phellodon*. In founding the new family the difficult definition of the Thelephoraceae is considerably facilitated. The two genera were placed in the Hydnelleae mainly because of a high degree of superficial resemblance, more in particular of *Bankera* to *Sarcodon*, and of *Phellodon* to *Hydnellum*. However, their spores show none of the features typical of the spores of the Thelephoraceae; they are neither more or less sinuose in outline nor coarsely tuberculate or spiny, and in addition are not brown coloured.

It is a pleasure by the choice of the type genus to commemorate in the family name that outstanding student of the hydnaceous fungi, H. J. Banker.

Echinodontiaceae Donk, *fam. nov.*

Receptaculum sessile et dimidiatum vel conchatum, vel effuso-reflexum. Contextus lignosus, coloratus; hyphae fibulatae. Hymenophorum subirregulare dentatum, aculeis lignosis. Hymenium crassescens. Cystidia ventricoso-subulata, colorata et setas aemulantia, vel hyalina. Basidia clavata, haud septata, apice sporis 4. Sporae ovoideae vel ellipsoideae; paries levis, amyloideus. Lignicolae. — Typus: *Echinodontium* Ell. & Ev.

The Echinodontiaceae consists of a single genus comprising only a few species of which one is well known in the North American continent as the Indian-paint fungus. It has been assigned to both the artificial families Hydnaceae and Polyporaceae, but its hymenophore conforms to neither, the latter being intermediate

in its configuration. Patouillard (*1900:* 117) was the first to stress its isolated position by erecting a "Série des Echinodonties" for it among his "Hydnés". "Cette série", he remarked, "est dans les Hydnés la correspondante exacte des Ignaires dans les Porés." His 'Ignaires' are the polyporoid Hymenochaetaceae.

Superficially *Echinodontium tinctorum* (Ell. & Ev.) Ell. & Ev. does indeed resemble a woody species of the Hymenochaetaceae, and the presence of setae-like cystidia would confirm this. However, the cystidia are really chemically quite different from setae and the hyphae bear clamps, and I am now convinced that there is no relationship with the Hymenochaetaceae. Its remarkable microscopic features, inclusive of the amyloid spores, form an obstacle to its inclusion in the Polyporaceae; and with the Hydnaceae (*sensu stricto*, ultimate type, *Hydnum repandum* L. per Fr.) it has also no connections.

Gomphaceae Donk, *fam. nov.*

Ramarieae Donk, Rev. niederl. Homob.-Aphyll. **2**: 103. 1933.

Nevrophyllaceae Heinemann *in* Bull. Jard. bot. Bruxelles **28**: 434. 1958 (nomen illegitimum). — Holotype: *Nevrophyllum* Pat. apud Doass. & Pat. (1887); not *Neurophyllum* Torr. & Gray (1840; Umbelliferae); not *Neurophyllum* Presl (1843; Hymenophyllaceae).

Receptaculum resupinatum (hymenophoro levi vel dentato) vel erectum (coralloideum hymenophoro levi usque ruguloso, vel cantharelloideum hymenophoro ramoso- et radiato-plicato). Contextus monomiticus; hyphae fibulatae. Cystidia inconspicua vel absentia. Basidia graciliter clavata, haud septata, sporis 2–4. Sporae plus minus ellipsoideae usque oblongae (recte vel subsigmoideae), mediocres vel sat magnae, adaxillariter distincte applanatae, plus minus distincte coloratae et varie ornatae; paries forte "Cotton Blue" absorbens. Humicolae vel in ligno putrescenti inveniuntur. — Typus: *Gomphus* Pers. per S. F. Gray.

When studying the corticioid fungus *Ramaricium occultum* John Erikss., its author (Eriksson, *1954*) concluded that a close relationship existed between *Ramaricium* John Erikss., *Kavinia* Pilát, and *Ramaria* (Fr.) Bonord. emend. Donk. He found several items of agreement, more in particular in connection with the spores; he also found that the spore wall in all three strongly absorbs Cotton Blue. These three genera have been placed in various families by modern mycologists: Corticiaceae (*Ramaricium*), Hydnaceae (*Kavinia*), Clavariaceae (*Ramaria*). This series is to be extended with a genus that has been placed in the Agaricaceae and the Cantharellaceae.

Maire (*1914:* 216) took the first step in the recognition of this series when he remarked that the spores of two species of *Nevrophyllum* Pat. had "la plus grande ressemblance avec les spores des Clavaires du groupe *Clavariella* (*C. aurea, formosa, flava*, par example). Si l'on ajoute a cette similitude celle de la teinte des spores en masse, celle des basides, on ne peut qu'en conclure à une affinité extrême des *Nevrophyllum* et des *Clavariella*." Donk (l.c.) went a step further: he redefined the clavariaceous genus under the name *Ramaria* (Fr.) Bonord. and placed it with *Gomphus* Pers. per S. F. Gray (the correct name for *Nevrophyllum*) in a special tribus, Ramariae, characterized by the spores. Now that Eriksson has demonstrated that

the spore type of *Ramaria* also occurs in some of the resupinate genera (*Kavinia*, *Ramaricium*), it is proposed to enlarge the tribus and raise it to the rank of a family. Since the name *Ramaria* (Fr.) Bonord. is illegitimate in view of *Ramaria* S. F. Gray (a proposal has been moved for its conservation), that generic name is avoided in making the family name and the name Gomphaceae chosen, although some confusion might be expected in the future with the family name Gomphidiaceae given to a small group of agarics.

Recently Heinemann introduced the family Nevrophyllaceae for *Nevrophyllum* Pat. as well as *Clavariadelphus* Donk "et, probablement, *Polyozellus* Murr." I do not think the three are closely related and I would leave *Clavariadelphus* in the still artificial family Clavariaceae. Furthermore I agree with Imazeki (*1953*) that *Polyozellus* Murrill should be referred to the Thelephoraceae. Heinemann's family name could not be adapted since it is derived from an illegitimate generic name, *Nevrophyllum* Pat. being preoccupied.

Clavulinaceae Donk, *stat. & fam. nov.*

Basionym: Clavulineae Donk, Rev. niederl. Homob.-Aphyll. **2**: 16. 1933. — Monotype: *Clavulina* J. Schroet.

The only genus of this family is usually included in the Clavariaceae. Donk (*1933:* 16) made it a special tribus in his emendation of the Cantharellaceae mainly on the basis of cytological information concerning the basidia published by Maire, Juel, and Bauch, but I now believe it to be sufficiently distinct for separate treatment as a family. For a recent study of the hymenium and its components see Corner (*1950:* 59).

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