

NOTES ON SOME BASIDIOMYCETES  
(APHYLLOPHORALES AND HETEROBASIDIOMYCETES)

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Some taxa of Aphyllophorales and Heterobasidiomycetes are discussed and several new genera and new combinations are proposed. For the genus *Eocronartium* with septal pores without parenthosomes, a new family is described.

ON PELLICULARIA ASPERULA

This species belongs to the *Botryobasidium*-complex, but differs from *Botryobasidium* s. str. in its ornamented spores with small warts (*Botryohypochnus* has spores with distinct spines). It is probably more closely related to *Cyanobasidium*, but differs from that taxon in its 6-8-spored basidia lacking strongly cyanophilous guttules.

**Cyanohypha** Jülich, *gen. nov.*

Carposomata resupinata, effusa, hypochnoidea, laevia. Systema hypharum monomiticum. Hyphae hyalinae vel basales pallide brunneae, effibulatae, valde cyanophileae. Cystidia desunt. Basidia hyalina, cylindracea, 6-8-spora. Sporae hyalinae, ellipsoideae, verrucosae, cyanophileae, inamyloideae.

Typus: *Pellicularia asperula* D. P. Rogers 1943, in *Farlowia* 1: 100.

Basidiocarp resupinate, effused, several cm large, loosely adnate, hypochnoid, context homogeneous, margin thinning out, rhizomorphs absent. Hymenial surface even, whitish when fresh, cream-coloured to ochraceous when old. Hyphal system monomitic. Hyphae hyaline in the subhymenium, pale yellow to medium brown in the trama, distinct, cylindrical, loosely arranged, thin- to somewhat thick-walled, smooth or warted, with strongly cyanophilous walls. Cystidia absent. Basidia hyaline, cylindrical, thin-walled, with 6-8 subulate sterigmata. Spores hyaline, ellipsoid, somewhat thick-walled, densely covered with small warts, the walls strongly cyanophilous.

**Cyanohypha asperula** (D. P. Rogers) Jülich, *comb. nov.*

Basionym: *Pellicularia asperula* D. P. Rogers 1943, in *Farlowia* 1: 100.

ON SCOPULOIDES (Massee) Höhn. & Litsch.

This genus was validly published by Höhnel & Litschauer (1908) in their account on Austrian Corticiaceae. Hjortstam & Ryvarde (1979), however, stated that the genus was not validly published, since Höhnel & Litschauer used the name only provisionally. The crucial sentence in Höhnel & Litschauer's publication is the following: 'Vertreter der Gattungen *Aldrigea*, *Scopuloides* (Massee als Sektion von *Peniophora*) und *Hypochnella* haben wir nicht gesehen und

daher diese drei Gattungen nur provisorisch in die Tabelle aufgenommen.' From this sentence we can only safely conclude that according to these authors the place of *Scopuloides* within their key to the genera of Corticiaceae is provisional, but not necessarily the genus itself (they did not write 'provisorische Gattungen'). — I therefore follow Donk (1957) and accept the genus *Scopuloides* as published by Höhnel & Litschauer, since there is no convincing evidence that their genus is not validly published.

The genus remained monotypic up to now. Its only species, *S. hydroides* (Masse & Cooke), is characterized by ceraceous, odontoid basidiocarps, clamp-less hyphae, heavily encrusted lamprocystidia, narrowly clavate basidia, and hyaline, ellipsoid, thin-walled, smooth, and inamyloid spores. The genus is certainly related to *Phanerochaete*. One of the most striking characters not found in *Phanerochaete*, is the presence of an additional type of cystidia: those are septate, heavily encrusted and confined to the centre of the teeth, with the lamprocystidia present only at the lateral and basal parts. Type studies revealed that there exists an older specific name for the taxon in question, viz. *Peniophora rimosa* Cooke. The type specimens of both, *Peniophora hydroides* and *P. rimosa* are conspecific.

***Scopuloides rimosa* (Cooke) Jülich, comb. nov.**

Basionym: *Peniophora rimosa* Cooke 1881, in *Grevillea* 9: 94. Type specimen: *Peniophora rimosa* Cke. Coed Coch, on bark, Oct. 1880 (K).

The synonymy with *P. hydroides* was already suggested by Wakefield (in litt. ad Rea 1922: 693).

There is another species with similar septate cystidia and similar spores (but without one-celled lamprocystidia), viz. *Peniophora septocystidiata* Burt. This taxon was recently transferred to *Phanerochaete* by Eriksson & Ryvarden (1978) where it represents a deviating element because of the septate cystidia: almost all taxa of *Phanerochaete* have subulate to conical cystidia which may be either thin- or thick-walled, smooth or encrusted, but which are invariably one-celled; very few species have no cystidia at all. *Peniophora septocystidiata* can be better placed in the genus *Scopuloides*.

***Scopuloides septocystidiata* (Burt) Jülich, comb. nov.**

Basionym: *Peniophora septocystidiata* Burt 1929, in *Ann. Mo. bot. Gdn.* 12: 260.

#### ON TYROMYCES s. lat.

The poroid genus *Tyromyces*, characterized by soft, light coloured basidiocarps, mono- or dimitic hyphal system and hyaline, inamyloid spores was recently treated by David (1980). Contrary to Lowe's revision (1975), she divided the genus into a number of smaller genera, based on cytological and cultural characters, as well as on wood rot and the reaction with Cresyl blue. For the preparation of a key to the European species of *Tyromyces* s. lat., I studied a number of additional taxa and realized that for the species with metachromatic hyphae and brown rot a generic name had to be found. David (l.c.) used the name *Spongiporus* Murrill 1905, but an older name is available which has to be used, viz. *Postia* Fr. 1874. This genus was described by Fries for a number of poroid taxa with soft basidiocarps, small pores, and thin dissepiments. One year

later, Boiss. & Blanch. (1875) described a new genus of Compositae, also with the name *Postia*; this genus remained very small with only four described species. Since it was published one year earlier, the Friesian name has priority and can be used for the group of taxa in question.

POSTIA Fr. 1874, Hymen. Europ. p. 586.

Basidiocarp lignicolous, resupinate, effused-reflex or pileate, sessile or slightly stipitate, poroid. Context light coloured, fleshy when fresh, hard when dry. Hyphal system monomitic. Generative hyphae hyaline, thin to thick-walled, with clamps, metachromatic in Cresyl blue. Cystidia or cystidioles present or absent, hyaline, thin to slightly thick-walled. Basidia hyaline, narrowly clavate or suburniform, four-spored. Spores hyaline, allantoid, cylindrical or ellipsoid, smooth, thin-walled, inamyloid or rarely amyloid. Producing a brown rot.

Type species: *Polyporus lacteus* Fr. 1821.

The genera recognized within *Tyromyces* s. lat. can be distinguished as follows.

1a. With amyloid cystidia . . . . .	<i>Amylocystis</i>
1b. Cystidia absent or inamyloid . . . . .	2
2a. Hyphal walls not metachromatic, not stained in Cresyl blue; producing a white rot	<i>Tyromyces</i> s. str.
2b. Hyphal walls metachromatic, distinctly stained in Cresyl blue . . . . .	3
3a. Hyphae without clamps . . . . .	<i>Leptoporus</i>
3b. Hyphae with clamps . . . . .	4
4a. With imperfect state in or near the perfect state . . . . .	<i>Oligoporus</i>
4b. Without imperfect state in nature . . . . .	5
5a. Producing a brown rot . . . . .	<i>Postia</i>
5b. Producing a white rot . . . . .	<i>Ceriporiopsis</i>

The following species are accepted in the genus *Postia*: ***Postia balsamea*** (Peck) Jülich, *comb. nov.* (basonym: *Polyporus balsameus* Peck 1878, in Ann. Rept. N.Y. State Mus. 30: 46). — *Postia caesia* (Schrad. ex Fr.) P. Karst. 1881 — ***Postia ceriflua*** (Berk. & Curt. in Berk.) Jülich, *comb. nov.* (basonym: *Polyporus cerifluus* Berk. & Curt. in Berk. 1872, in Grevillea 1: 50). — ***Postia floriformis*** (Quél. in Bres.) Jülich, *comb. nov.* (basonym: *Polyporus floriformis* Quél. in Bres. 1884, Fung. trident. 1: 61). — ***Postia fragilis*** (Fr.) Jülich, *comb. nov.* (basonym: *Polyporus fragilis* Fr. 1828, Elench. Fung. 1: 86). — ***Postia guttulata*** (Peck) Jülich, *comb. nov.* (basonym: *Polyporus guttulatus* Peck 1883, in Ann. Rept. N.Y. State Mus. 33: 37; in Sacc. 1888, Syll. Fung. 1: 86). — ***Postia hibernica*** (Berk. & Br.) Jülich, *comb. nov.* (basonym: *Polyporus hibernicus* Berk. & Br. 1871, in Ann. Mag. Nat. Hist., Ser. 4, 7: 428). — ***Postia inocybe*** (David & Malenç.) Jülich, *comb. nov.* (basonym: *Tyromyces inocybe* David & Malenç. 1979, in Bull. Soc. mycol. France 94: 406–407). — ***Postia johnstonii*** (Murrill) Jülich, *comb. nov.* (basonym: *Poria johnstonii* Murrill 1920, in Mycologia 12: 303). — ***Postia lactea*** (Fr.) P. Karst. 1881 — ***Postia leucomallela*** (Murrill) Jülich, *comb. nov.* (basonym: *Tyromyces leucomallelus* Murrill 1940, in Bull. Torrey bot. Club 67: 63). — ***Postia leucospongia*** (Cooke & Harkness in Cooke) Jülich, *comb. nov.* (basonym: *Polyporus leucospongia* Cooke & Harkness in Cooke 1883, in Grevillea 11: 106). — ***Postia lowei*** (Pilát) Jülich, *comb. nov.* (basonym: *Leptoporus lowei* Pilát 1953, in Sborn. Nar. Mus. Praha 9 B 2: 101). — ***Postia luteocaesia*** (David) Jülich, *comb. nov.* (basonym: *Spongiporus luteocaesius* David 1980, in Bull. Soc. linn. Lyon 49: 29). — ***Postia sericeomollis*** (Romell) Jülich, *comb. nov.* (basonym: *Polyporus sericeomollis* Romell 1911, in Ark. Bot. 11 (3): 22). — ***Postia simanii*** (Pilát) Jülich, *comb. nov.* (basonym: *Leptoporus simanii* Pilát 1953, in Sborn. Nar. Mus. Praha 9 B 2:

100-101). — *Postia stiptica* (Pers. ex Fr.) Jülich, *comb. nov.* (basionym: *Polyporus stipticus* (Pers.) ex Fr. 1821, Syst. Mycol. 1: 359). — *Postia subcaesia* (David) Jülich, *comb. nov.* (basionym: *Tyromyces subcaesius* David 1974, in Bull. Soc. linn. Lyon, num. spéc., 43: 119). — *Postia tephroleuca* (Fr.) Jülich, *comb. nov.* (basionym: *Polyporus tephroleucus* Fr. 1821, Syst. Mycol. 1: 360). — *Postia undosa* (Peck) Jülich, *comb. nov.* (basionym: *Polyporus undosus* Peck 1883, in Ann. Rept. N.Y. State Mus. 34: 42).

#### ON POLYPORUS FRACTIPES

The systematic position of *Polyporus fractipes* Berk. & Curt. was dubious for a long time. The species was transferred at first to the genus *Grifola* by Murrill (1907), and was placed later in the genera *Abortiporus* (Bondartsev, 1959), *Heteroporus* (Fidalgo, 1964) and *Spongipellis* (Kotl. & Pouz. 1976). The latter authors also described a separate subgenus *Loweomyces* for this species. There are a number of differences between *Spongipellis* s. str. and *Polyporus fractipes* which have to some extent been discussed by David & Candoussau (1974), Jahn (1974), and Kotlaba & Pouzar (l.c.): (i) spore germination is easily obtained in *Spongipellis*, but could not yet be induced in *P. fractipes*; (ii) basidia are quite large in *Spongipellis* (18–25 µm long in *S. spumeus*, 20–35 µm long in *S. pachyodon*), but are short in *P. fractipes* (9–12–14 µm long); (iii) skeletoid hyphae are common in *Spongipellis*, but are absent or confined to the basal part or the stipe in *P. fractipes*; (iv) tubes, plates or spines are 10–20–30 mm long in the European species of *Spongipellis*, but are only 0.5–2 mm long in *P. fractipes*.

The differences are large enough to justify a separate genus.

#### *Loweomyces* (Kotl. & Pouz.) Jülich, *stat. nov.*

Basionym: *Spongipellis* Pat. subgen. *Loweomyces* Kotl. & Pouz. 1976, in Mem. N.Y. Bot. Gard. 28 (1): 121.

*Loweomyces fractipes* (Berk. & Curt.) Jülich, *comb. nov.* Basionym: *Polyporus fractipes* Berk. & Curt. in Berk. 1872, in Grevillea 1: 39.

A second species, viz. *Tyromyces wynnei*, can be placed in *Loweomyces*. The species has also cyanophilous, clamped hyphae, small basidia and subglobose spores. It was recently excluded from *Tyromyces* s. str. (David, 1980).

*Loweomyces wynnei* (Berk. & Br.) Jülich, *comb. nov.* Basionym: *Polyporus wynnei* Berk. & Br. 1859, in Ann. Mag. Nat. Hist. ser. III, 3: 358.

#### ON FIBULOPORIA

For some taxa with resupinate and poroid hymenophors and fibulate hyphae, Bondartsev & Singer (in Singer, 1944) described *Fibuloporia*, a genus based on *Polyporus molluscus* (Pers.) ex Fr. 1821. Unfortunately, the type species had to be transferred to the genus *Trechispora* (Donk, 1967) which makes *Fibuloporia* a synonym of *Trechispora*. The correct name for *Polyporus molluscus* sensu Bond. & Sing. is *Polyporus mucidus* (Pers.) ex Fr. 1821. The systematic position

of that species is somewhat doubtful. Domański (1965, 1969) and Ryvarden (1976) accepted *Fibuloporia* (with the misapplied type species) as a distinct genus, while Ryvarden & Johansen (1980) mention the species in their key to the taxa of *Tyromyces*. The genus is probably not related to *Tyromyces* (David, 1980), since it differs in its non-ceraceous hymenophor. It differs furthermore from *Anomoporia* in its inamyloid spores. To accommodate *P. mucidus*, a new genus is described.

***Porpomyces* Jülich, gen. nov.**

Carposoma resupinatum, cremeum vel ochraceum, membranaceum; poris minutis, subangulatis, 0.2–0.4 mm diam. Systema hypharum monomiticum. Hyphae hyalinae, tenuiter vel paulo incrassate tunicatae, semper fibulatae, laeves vel granulis ornatae. Cystidia desunt. Basidia hyalina, parva, distincte clavata, tetraspora. Sporae hyalinae, late ellipsoideae, tenuiter tunicatae, laeves, inamyloideae.

ETYMOLOGY: η πόρπη – clamp, ο μνκης – fungus

TYPUS: *Porpomyces mucidus* (Pers. ex Fr.) Jülich, *comb. nov.* (basionym: *Polyporus mucidus* (Pers.) ex Fr. 1821, Syst. Mycol. 1: 382.) — Syn.: *Fibuloporia donkii* Domański 1969, in Acta Soc. Bot. Pol. 38: 463.

Basidiocarp resupinate, cream-coloured or ochraceous, membranaceous, with small, subangular pores (0.2–0.4 mm wide). Hyphal system monomitic. Hyphae hyaline, thin to somewhat thick-walled, always with clamps, smooth or the basal ones covered with granules. Cystidia absent. Basidia hyaline, small, distinctly clavate, four-spored. Spores hyaline, broadly ellipsoid, thin-walled, smooth, inamyloid.

ON *EOCRONARTIUM*

The genus *Eocronartium* occupies an isolated position within the Auriculariales. Formerly placed in the Auriculariaceae, it was removed from that family because of its deviating ultrastructural characters (Khan & Kimbrough, 1980 a, b).

The fungus which is parasitic on the gametophytes of bryophytes, forms similar thin, cylindrical basidiocarps as *Typhula* but differs from the latter genus in its transversely divided basidia and the occurrence of spore repetition. The binucleate hyphal cells are divided by perforate septa, composed of two outer electron-dense layers separated by an inner electron-transparent layer. Near the pore, the cross walls become somewhat thicker, while septal pores are occluded by electron-dense material on one or both sides; a pore cap is absent. The last mentioned character, i.e. the absence of a parenthosome or pore cap, is a typical characteristic for many parasitic Heterobasidiomycetes (Uredinales, Ustilaginales, Septobasidiales, and some members of the Filobasidiaceae). On the other hand, parenthosomes are present in all Homobasidiomycetes, and also in the Tremellales and Auriculariales studied so far. The similarities in the septal ultrastructure indicate a closer relationship between *Eocronartium* and the Uredinales or Septobasidiales, but *Eocronartium* cannot be placed in one of the families of parasitic Heterobasidiomycetes, since thick-walled teliospores are lacking. Therefore, a new family is described for this genus. Further studies will show whether this new family will remain monotypic, or should include other parasitic Auriculariales like *Iola*, *Herpobasidium*, or

*Platycarpa*. The systematic position of this family is, however, with the Uredinales (=Pucciniales, Jülich 1982) rather than with the Auriculariales.

#### **Eocronartiaceae Jülich, fam. nov.**

Carposomata stipitata, anguste clavata, haud ramosa. Systema hypharum monomiticum. Hyphae hyalinae, cylindratae, tenuiter vel incrassate tunicatae, haud fibulatae, septatae, poris septorum absque parenthosomatibus. Basidia cylindrata, 3 septis transversalibus. Sporae hyalinae, laeves, tenuiter tunicatae, inamyloideae.

Typus: *Eocronartium* Atkinson 1902, in J. Mycol. 8: 107.

Basidiocarp stipitate, narrowly clavate, not branched. Hyphal system monomitic. Hyphae hyaline, cylindrical, thin- to slightly thick-walled, without clamps, septate, pores of cross walls without parenthosomes. Basidia cylindrical, four-celled. Spores hyaline, smooth, thin-walled, inamyloid.

#### ON CHRISTIANSENIA AND SYZYGOSPORA

Mycoparasitic Basidiomycetes are rare and mainly found in Heterobasidiomycetes. Among the parasitic Aphylophorales, two genera deserve special attention, viz. *Christiansenia* Hauerslev (Boidin, 1970, Ginns & Sunhede, 1978) and *Syzygospora* (Oberwinkler & Lowy, 1981). Both genera are characterized by more or less ceraceous or even tremelloid basidiocarps, narrowly clavate holobasidia with 2-4-6 sterigmata, hyaline spores, and conidia in the teleomorph fructification. Basidiospores are either ballisto- or statismospores, often germinating by blastospores or yeast cells. In the type species of both genera, a special kind of conidia is present, which are called zygoconidia (Boidin, 1970): these are paired, 1-nucleate blastogenous cells which fuse laterally (and thus become 2-nucleate) and are finally dispersed.

The ceraceous context and the narrowly clavate basidia point towards the Meruliales (Jülich, 1981) an order with genera like *Auriculariopsis*, *Dacryobolus*, *Merulius*, *Panellus*, *Phlebia*, and *Plicatura*. But since *Christiansenia* and *Syzygospora* differ in their parasitic habit, special types of conidia, and ballisto- or statismospores germinating with blastoconidia or yeast cells, both genera have to be placed in a family of their own.

#### **Syzygosporaceae Jülich, fam. nov.**

Carposomata parasitica, resupinata, effusa, laevia vel gyrosa, gelatinosa. Systema hypharum monomiticum. Hyphae hyalinae, cylindratae, tenuiter vel paulo incrassate tunicatae, saepe fibulatae. Cystidia desunt. Basidia hyalina, (anguste) clavata vel paulo suburniformia, 2-4-6 sterigmatibus. Sporae (ballistosporae vel statismosporae) hyalinae, cylindratae ad late ellipsoideae, tenuiter tunicatae, laeves, inamyloideae, saepe blastosporis. Conidia (partim zygoconidia) adsunt.

Typus: *Syzygospora* Martin 1937, in J. Wash. Acad. Sci. 27 (3): 112.

Basidiocarps parasitic, resupinate, effused, smooth or folded tremelloid, gelatinous. Hyphal system monomitic. Hyphae hyaline, cylindrical, thin- to somewhat thick-walled, often with clamps. Cystidia absent. Basidia hyaline, (narrowly) clavate or slightly suburniform, with 2-4-6 sterigmata. Spores (ballisto- or statismospores) hyaline, cylindrical to broadly ellipsoid, thin-walled, smooth, inamyloid, often germinating with blastospores. Conidia (partly zygoconidia) present.

SCOPE: *Christiansenia* Hauerslev 1969, *Syzygospora* Martin 1937.

Oberwinkler & Lowy (1981) who had studied *Syzygospora alba*, found dolipore septa without or with parenthosomes of the *Filobasidium*-type. This would mean that the taxon in question belongs to the Heterobasidiomycetes. But since they have only studied dried, several years old herbarium material, new studies based on fresh specimens should be carried out before any further systematic conclusions can be drawn.

## SOME ADDITIONAL NEW COMBINATIONS

**Cerocorticium pseudomucidum** (Petch) Jülich, *comb. nov.*

Basionym: *Hydnum pseudomucidum* Petch 1916, in *Ann. R. bot. Gdns Peradeniya* 6: 156.

**Jacksonomyces lividus** (Burt) Jülich, *comb. nov.* Basionym: *Peniophora livida* Burt 1926, in *Ann. Mo. bot. Gdn* 12: 239.

**Jacksonomyces subcretaceus** (Litsch.) Jülich, *comb. nov.*

Basionym: *Corticium subcretaceum* Litsch. 1939, in *Österr. bot. Z.* 88: 110.

**Skeletocutis azorica** (Reid) Jülich, *comb. nov.*

Basionym: *Incrustoporia azorica* Reid in Dennis, Reid & Spooner 1977, in *Kew Bull.* 32: 106.

**Trametes multicolor** (Schaeffer) Jülich, *comb. nov.*

Basionym: *Boletus multicolor* Schaeffer 1774, *Fung. Bavar. Palat. Ratisb. icones*, vol. 4: 91, pl. 269.

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