

## The genus *Ptychogaster*

JOOST A. STALPERS

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All species classified in the genera *Ptychogaster* Corda and *Ceriumyces* Corda have been studied. *Ptychogaster* is now restricted to anamorphs of *Postia* (Bull. : Fr.) Singer. *Sporotrichopsis* Stalpers is described for the anamorph of *Abortiporus biennis* Fr. and *Caeruleomyces* Stalpers to accommodate *Sporotrichum azureum* Arx. An annotated check-list of all species ever classified in *Ptychogaster* and *Ceriumyces* is given.

Key words: *Caeruleomyces*, *Ceriumyces*, polypores, *Ptychogaster*, *Sporotrichopsis*, taxonomy

Joost A. Stalpers, Centraalbureau voor Schimmelcultures, P.O. Box 85167, NL-3508 AD Utrecht, The Netherlands

*Ptychogaster* was described in 1838 by Corda with only one species, *P. albus* Corda. The genus was soon used to accommodate anamorphs of polypores in the widest sense. The type species, *P. albus*, is the anamorph of the well-known *Polyporus ptychogaster* Ludwig, currently classified in *Postia* (or *Oligoporus* or *Tyromyces* s.l.) (Donk 1933, 1962). *Ptychogaster* was synonymized with *Ceriumyces* Corda by Patouillard (1900), but the type (and only original) species, *C. fischeri* Corda, is a nomen dubium (Donk 1960). Nevertheless *Ceriumyces* has been considered the correct name for this group of fungi for some time, and Clements & Shear (1931) proposed *C. albus* as the type, which would have made it a typonym of *Ptychogaster*. The species described in the genus are now classified in different families and orders: Poriales, Ganodermatales, Hymenochaetales, while also anamorphs of the Corticiaceae and Podoscyphaceae have been classified here.

### Materials and methods

Isolates were grown in polystyrene Petri dishes on neutralized 2% malt extract agar (MEA) and cherry decocotion agar (ChA, pH 4–5) at room temperature in diffuse daylight. Description method and enzyme tests are according to Stalpers (1978). Microscopical slides were

examined with aniline blue in lactic acid. Capitalized colour names refer to Ridgway (1912).

Material examined (data on CBS cultures are not given here. They can be found in the CBS catalogue or on-line on the CBS homepage: <http://www.cbs.knaw.nl>).

*Abortiporus biennis*: Argentina, Quilmes, IV.1904 Spegazzini 408.20 (lectotype of *Ceriumyces pulchellus*, LPS); La Plata, 11.III.1910 (sub *Ceriumyces pulchellus*, LPS); Boca del Riachuelo, 4.IV.1880 Schnyder & Spegazzini 40818 (type of *Ceriumyces schnyderianus*, LPS). Australia, South Australia Adelaide, *J. Burton Cleland* 25149. Cultures: CBS 133.42, 373.59, 676.70, 365.74, 520.85, 224.93

*Amylocystis lapponicus*: Culture: CBS 815.72

*Caeruleomyces azureum*: Culture: CBS 609.71

*Ceriumyces incomptus*: Australia, Kangaroo Island, no 3501, 24.IV.1889 (PAD; type).

*Cymatoderma pallens*: Culture: CBS 327.66

*Ganoderma colossus* Cultures: CBS 216.36, 267.88, 268.88.

*Ganoderma oerstedii*: Culture: CBS 514.92.

*Ganoderma rufoalbum*: West-Africa, Ashanti, *T. Hunter* 238, Lloyd 25153 (type of *Ptychogaster africanus*, BPI). – Ibidem, *Hunter* 246 (Lloyd 19997 BPI). Congo, on trunk, *Thoilon* (type of *Ptychogaster lycoperdon*, FH, Herb. Patouillard). St. Thomé (type of *Ptychogaster rufoalbum*, FH, Herb. Patouillard).

*Ganoderma weberianum*: Culture: CBS 219.36.

*Granulobasidium vellereum*: Cultures: CBS 214.54, 165.6 5, 152.84.

- Hymenochaete rubiginosa*: Culture: CBS 237.39.
- Inonotus rickii*: Cuba (type of *Ptychogaster cubensis*, PC). Brazil, Bahia, on wood, C. Torrend & Lloyd 55501B (type of *Ptychogaster lucidus*, BPI). Cultures: CBS 304.78, 305.78
- Oxyporus obducens*: China, Yunnan (type of *Ptychogaster effusus*, FH). France, Gournay-en-Brie, on trunk of *Salix*, III.1890 Patouillard (as *Poria mollusca* Pers., FH). Germany, Pfaueninsel, on root stump of cf. *Prunus*, 4.X.1968 H. Jahn (herb. Jahn). Czech Republic, Pruhonic near Praha, in garden, in cavity of living *Aesculus hippocastani*, F. Kotlaba (herb. Jahn). Bohemia, Libcic, on cavity of living trunk of *Ulmus* sp., 6.X.1963 Z. Pouzar (herb. Jahn). Germany, Rheinland, Kerpen, Erftauwald near Kerpener Bruch, on *Ulmus* 'Scheitholz', 8.I.1968 H. Gorholt, (herb. Jahn), Brandenburg, Kreis Zossen near Siethen, in cavity of *Acer* sp., D. Benkert, herb. Jahn); Rheinland, Kerpen, on *Populus*, 22.X.1976 H. Gorholt (herb. Jahn); Teutoburger Wald, Donoper Teich near Hiddeser Bent am Kriebsteich, on angiospermous wood, 20.X.1979 H. Jahn (herb. Jahn); West Berlin, Tegeler Forst near Gästehaus, on cf. *Populus platanoideis*, 16.XI.1967 A. Straus (herb. Jahn). Culture: CBS 578.88.
- Parmastomyces mollissimus*: Cultures: CBS 427.48, 293.71.
- Phellinus bambusinus*: Vietnam, Ke' So', on old bamboo, 28.VII.1890 Bon 4468 (type, FH).
- Postia floriformis*: (With conidia) Sweden, Upland, Upsala, Botanic garden, Victoria House, on wooden flowerbox in hothouse, 18.X.1947 J. Eriksson & J.A. Nannfeldt (L). Norway, Oslo, Gaustad, on cf. *Pinus*, 11.IX.1972 L. Ryvarde (O). (Without conidia) Estonia, Kilingi-Nõmme, on trunk and root of *Picea* (L) (not typical). USA, Great Smoky Mountains National Park, Newfound Gap, on gymnospermous wood, 7.VIII.1949
- Lowe 3748 (L). Netherlands, Hilversum, on wooden pole (probably *Picea*), 28.X.1965 J.B.M. Frencken (L). Germany, Kreis Lichtenfels, Grosser Wildhugel near Weidhausen, MTB 5832, H. Engel. (O). Cultures: CBS 253.84, 557.85, 558.85, 559.85, 560.85, 711.85, 278.89.
- Postia guttulata*: Culture: CBS 358.33, 519.85.
- Postia ptychogaster*: Netherlands, Gelderland, Hoge Veluwe, on branchlets of gymnosperm, 7.VIII.1960 W. Sommer-Henniphaas (L); Drente, Lheebroekerzand, Poort twee, on stumps of *Pinus*, 25.IX.1960 M.A. Donk (L). Germany, Bavaria, forest near Wertheim, on very rotten coniferous stump, 2.X.1962 M.A. Donk (L); Königstein, Fungi Rhenani exsicc. 1882 L. Fuckel (L). Cultures: CBS 144.75, 711.84, 712.84, 713.84.
- Postia rennyi*: Finland, Tavastia australis, Tammela, Mustiala, in *Bjerkandera destructor*, 20.X.1891 P.A. Karsten 1245 (lectotype of *Sporotrichum isabellinum*); ibidem 1242, 1243, 1244 (H). France, in Pinetum, on gymnospermous wood, IX.1890 E. Boudier (type, PC). Netherlands, Hilversum, on wood of *Pinus sylvestris*, IX.1973 J.A. Stalpers (CBS). Cultures: CBS 929.72, 259.74, 334.81, 301.82, 516.85, 918.87.
- Ptychogaster fici*: Tunisia, on Robinia, X.1892 (type, PC).
- Punctularia atropurpurascens*: Cuba, on dead wood C. Wright 454 (herb. Berkeley H 269/80-3, type of *Reticularia affinis*, K); C. Wright (herb. Berkeley H 269/80-4, type of *Reticularia atrorufa*, K); C. Wright 675 (herb. Berkeley H 269/80-5, type of *Reticularia venulosa*, K); C. Wright 542, Fungi Cubenses Wrightiani (K). Sri Lanka (Ceylon), XI.1867 G.M.K.J. 84 (sub *Reticularia venulosa*, K). Cultures: CBS 259.38, 388.66, 407.72, 317.75, 318.75, 418.86, 419.85, 420.86, 421.86, 422.86, 423.86, 424.86, 425.86, 426.86.

### Key to cultures of Aphyllophorales producing an anamorph in *Ptychogaster* s.l.

- 1a. Large, more or less globose, intercalary chlamydospores present ..... 2
- 1b. Large intercalary chlamydospores absent ..... 3
- 2a. Clamps present, except at marginal hyphae  
(incl. *Tyromyces trichrous*) ..... *Aurantiporus*, *Climacodon*, *Hapalopilus*
- 2b. Clamps absent or very rare. Anamorph: ..... *Sporotrichum*
- 3a. Causing a brown rot, reaction with alpha-naphthol negative. On gymnosperms ..... 4
- 3b. Causing a white rot, reaction with alpha-naphthol positive. Preferably on angiosperms ..... 5
- 4a. Conidia single, 7.5–13 × 5–9 µm, becoming very thick-walled ..... *Amylocystis lapponicus*
- 4b. Conidia at least when old in chains, smaller, becoming slightly thick-walled. Anamorph: *Ptychogaster* ..... *Postia*
- 5a. Clamps present, except at the very margin. .... *Spongipellis*
- 5b. Clamps absent or present at all primary septa ..... 6
- 6a. Clamps present ..... 7
- 6b. Clamps absent ..... 13
- 7a. Encrusted hyphal ends present ..... Anamorph of *Tyromyces chioneus* (Fr.) Donk
- 7b. Encrusted hyphal ends absent ..... 8
- 8a. Colony becoming blue or purplish red to purplish brown. Gloeocystidia absent ..... 9

- 8b. Colony white to cream-coloured or pink. Gloeocystidia present or absent ..... 10
- 9a. Colony blue when grown in the light. Conidia terminal, subcylindrical to ovoid or pyriform, (7-)8.5-16(-21) × 4.5-7(-8) µm. Anamorph: ..... *Caeruleomyces verae*
- 9b. Colony purplish red or purplish brown to vinaceous drab. Conidia in chains, subglobose to ellipsoid or ovoid, 4-7(-10) × 3-4.5 µm. .... *Punctularia atropurpurascens*
- 10a. Gloeocystidia present (*Sporotrichopsis*) ..... 11
- 10b. Gloeocystidia absent ..... 12
- 11a. Thick-walled skeletoid hyphae present ..... *Abortiporus biennis*
- 11b. Thick-walled skeletoid hyphae absent ..... *Granulobasidium vellereum*
- 12a. Branched skeletal hyphae present. Chlamydospores often ornamented or mainly intercalary ..... *Ganoderma*
- 12b. All hyphae thin-walled. Conidia terminal, smooth, globose to pyriform and then often broader than long, 8-12 × 8-14 µm. Anamorph: ..... *Sporotrichum sporodochiale*
- 13a. Colony white to cream coloured. Conidia in long, often branched chains. Setae and setal hyphae absent. .... *Oxyporus obducens*
- 13b. Colony with ochraceous to brown tinges. Setae or setal hyphae often present ..... *Hymenochaetales*

## Poriales

### 1. *Postia* Fr. (= *Oligoporus* Bref.)

Anamorph: *Ptychogaster* Corda, type: *Ptychogaster albus* Corda

Cultures are generally powdery to pulverulent-floccose or low cottony-woolly when young, margin appressed to downy, colour whitish to cream-coloured when young, often becoming pink, ochraceous, tawny or vinaceous to dark brown. Hyphae hyaline, thin- to in some species thick-walled, 1.5-7 µm wide, with abundant clamps. Branching equivalent or inequivalent. Clamps often with a central hole, regularly sprouting to form a hypha. Conidiogenous hyphae indiscrete, branched, often from clamps, about 2 µm wide, typically slightly swollen at the apex, with a clamp at some distance from the swelling. During conidiogenesis a simple septum is layed down at the base of the swelling or if the swelling is indistinct or absent, at some distance above the last clamp. The wall between the clamp and the simple septum disintegrates and the conidium is liberated. Sometimes another simple septum is formed at the basal and/or more rarely at the apical part of the conidium; the cytoplasm

then withdraws to the largest cell, which then functions as (secondary) conidium. Conidia also formed in botryose clusters and then often only terminal. Conidia when young thin-walled, ellipsoid to cylindrical sometimes angular, when mature rounding off and becoming thick-walled and coloured. After liberation the conidium may become more rounded and more thick-walled, which often goes with a reduction of the maximum size. Crystals present, bipyramidal or prismatic. Growth rate very slow to moderate, 2-35 mm radius in two weeks. Reaction on laccase negative.

All species accepted here in *Ptychogaster* have teleomorphs in *Postia*, which are characterized by a soft, effused to effused-reflexed or flabelliform basidiomes, a monomitic hyphal system with thin- to slightly to distinctly (e.g. *P. floriformis*) thick-walled hyphae with clamps, some with small crystals, relatively small, narrowly ellipsoid to subcylindrical spores, a brown rot and occurrence on gymnosperms (with a strong preference for *Pinaceae*), on which they are saprophytic or mildly parasitic, especially on roots. All species have a bitter taste (sometimes registration takes up to 30 sec.).

**Key to the species of *Postia* with a *Ptychogaster* anamorph**

- 1a. Mat whitish to yellow, tawny or brown ..... 2  
 1a. Mat becoming pink, avellaneous or drab ..... 4  
 2a. Conidia ellipsoid,  $7.5-16.5 \times 4.5-9 \mu\text{m}$  ..... *P. balsamea*  
 2b. Conidia smaller,  $4.5-8.5(-10) \times 3.5-5 \mu\text{m}$  ..... 3  
 3a. Conidia  $(5.5-6.5-8.5(-10)) \times 3.5-5 \mu\text{m}$ . Colony pale ochraceous brown when young, becoming tawny to brown with age. Growth radius 12–25 mm in 2 weeks ..... *P. ptychogaster*  
 3b. Conidia  $4.5-7(-8.5) \times 3.5-5 \mu\text{m}$ . Colony cream-coloured to yellowish, becoming light brown with age. Growth radius 2–15 mm in 2 weeks ..... *P. rennyi*  
 4a. Mat distinctly pink when young, becoming dark reddish brown, conidia  $(4.5-5.5-8(-10)) \times (2.5-3-4) \mu\text{m}$  ..... *P. floriformis*  
 4a. Mat becoming cinnamon drab to avellaneous, conidia  $(4.5-5-7.5 \times (2.7-3-4.5(-5)) \mu\text{m}$  ..... *P. guttulata*

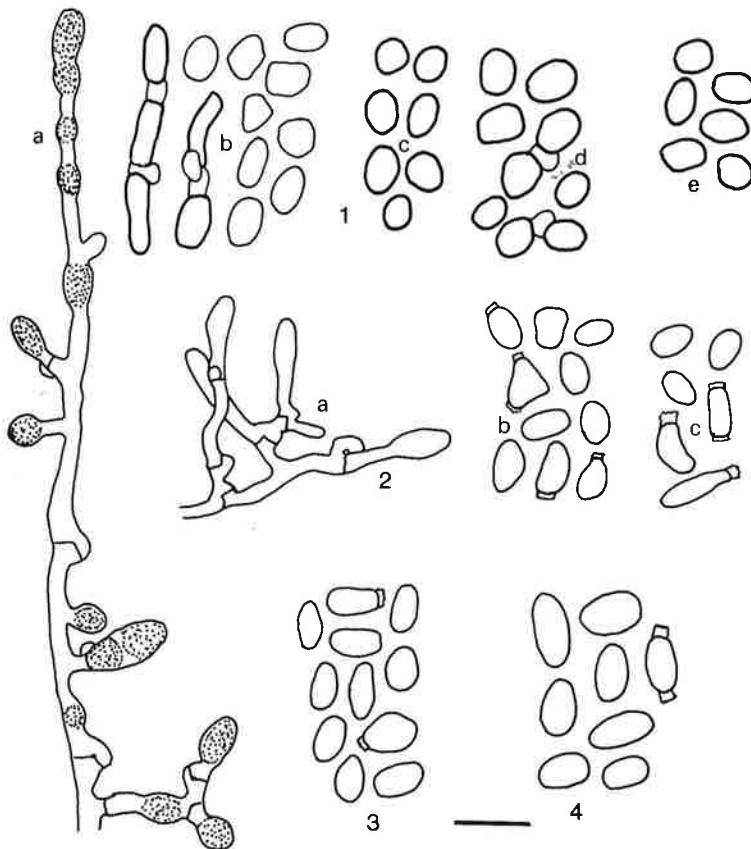


Fig. 1. *Postia rennyi* (*Ptychogaster citrinus*): a. conidiophore (CBS 259.74); b. conidia (CBS 929.72); c. conidia of *Sporotrichum isabellinum* (Karsten 1243); d. conidia of *Sporotrichum isabellinum* (Karsten 1245); e. conidia (CBS 259.74).

Fig. 2. *Postia floriformis* (*Ptychogaster rubescens*): a. conidiophore (CBS 558.85); b. conidia (CBS 559.85); c. conidia (CBS 278.89).

Fig. 3. *Postia guttulata* (CBS 358.33).

Fig. 4. *Postia ptychogaster* (*Ptychogaster fuliginoides*) (CBS 144.75).

***Postia balsamea*** (Peck) Jülich

Colony downy to low cottony, later locally plumose, whitish when young, becoming pinkish buff to cinnamon after 3–4 weeks. Margin appressed, rather dense. Marginal hyphae hyaline, thin-walled, 2–6(–7.5)  $\mu\text{m}$  wide, with clamps. Clamps abrupt, often sprouting. Aerial hyphae hyaline, thin-walled, 2–5  $\mu\text{m}$  wide. Conidia in chains or in clusters, becoming somewhat thick-walled, brown, ellipsoid, 7.5–16.5  $\times$  4.5–9  $\mu\text{m}$ . Growth rate: 10–20 mm radius in 14 days. Reverse unchanged or darker. Reaction with a-naphthol and p-cresol negative. Odour strong, suggesting iodoform.

The description is mainly from Nobles (1948) as no recent strains were available.

***Postia floriformis*** (Quélet) Jülich

Anamorph: *Ptychogaster rubescens* Boudier – Fig. 2

Colony downy to low cottony near the margin, powdery to cottony-woolly or locally slightly plumose, whitish when young, Capucine Buff, Pale Ochraceous Buff, Light Ochraceous Salmon or Pale Pinkish Cinnamon, Light Pinkish Cinnamon or Light Vinaceous Cinnamon after two weeks. The mat becomes more compact and then farinaceous, colour finally Avellaneous to Wood Brown to even Snuff Brown. Margin appressed to raised, rather dense. Marginal hyphae hyaline, thin-walled, (1–)1.5–5(–6.5)  $\mu\text{m}$  wide, with clamps. Clamps abrupt, often sprouting. Septa sometimes ampullate. Branching equivalent or inequivalent, especially at the narrowest and the widest hyphae, normally from or opposite clamps. Aerial hyphae hyaline, thin-walled, (1–)1.5–4(–5)  $\mu\text{m}$ , with clamps. some with small crystals. Clamps often sprouting. Some hyphae strongly staining in Cotton Blue, suggesting gloeoclerous hyphae. Submerged hyphae hyaline, thin to somewhat thick-walled, 2–5(–6.5)  $\mu\text{m}$  wide, often with ampullate septa. Conidia pink in mass, thin-to minutely thick-walled (wall and to a lesser degree cytoplasm strongly cyanophilous, thus easily suggesting a slightly thickened wall), ellipsoid to subcylindrical, sometimes triangular, (4.5–)5–8(–10)  $\times$  (2.5–)3–4.5  $\mu\text{m}$ . Growth rate: 30–39 mm radius in 14 days. Reverse unchanged. Reaction with a-naphthol negative, with p-cresol positive. Odour absent or insignificant.

*P. floriformis* in nature is flabellate, often with several pilei originating from a common base.

The colour is reported as white to cream-coloured or greyish, but some may have a rosy tinge. Conidia are often, but not necessarily present. In nature they are reported to be slightly smaller than in culture, viz. 4–6.5  $\times$  3–4.3  $\mu\text{m}$  (Ryvarden & Gilbertson 1994). The species is also found on timber, where it generally produces conidia in pink hemispherical conidiomata and assumes a pink hue. Molecular studies are necessary for a better understanding of this complex.

***Postia guttulata*** (Peck) Jülich – Fig. 3

Colony powdery to low cottony, locally slightly plumose, whitish when young, becoming Avellaneous to Wood Brown. Margin appressed, rather dense. Marginal and aerial hyphae hyaline, thin-walled, 2–6  $\mu\text{m}$  wide, with clamps. Clamps often sprouting. Some hyphae strongly staining in Cotton Blue, suggesting gloeoclerous hyphae. Conidia ochraceous to pale brown in mass, ellipsoid to subcylindrical, 4.5–7(–7.5)  $\times$  2.5–4.5(–5)  $\mu\text{m}$ .

***Postia ptychogaster*** (F. Ludw.) Vesterh. (= *Oligoporus ustilaginosus* Bref.)

Anamorph: ***Ptychogaster pulverulentus* (Sowerby) Stalpers comb. nov.** Bas.: *Auricularia pulverulenta* Sowerby, Col. Figs Engl. Fungi 2: 90, pl. 214, 1799. Syn. *P. fuliginoides* (Pers.) Donk, *P. albus* Corda; *P. flavescens* Falck & O. Falck – Fig. 4

Colonies powdery, becoming Sayal Brown, Ochraceous Tawny, Buckthorn Brown, Cinnamon Buff or Clay Color. Margin narrow, hyaline, hyphae rather dense. Marginal and aerial hyphae hyaline, thin-walled, 1.5–6(–6.5)  $\mu\text{m}$  wide, with clamps. Clamps often sprouting. Arthroconidia in chains, originating from contracting cytoplasm which forms a new wall and thus becoming separated by empty hyphal parts that contain a clamped septum. Conidia ellipsoid, brownish in mass, thick-walled, (5.5–)6.5–8.5(–10)  $\times$  3.5–5  $\mu\text{m}$ . Chlamydospores present in submerged mycelium, intercalary, ellipsoid, 7–16  $\times$  4–9  $\mu\text{m}$ . Crystals present, both cubical and elongate. Growth rate: 12–25 mm radius in ChA, significantly less on MEA. Reactions on laccase and tyrosinase negative.

The species is common in nature as a root parasite of preferably *Picea*, but also of *Pinus*, on which it forms pustulate conidiomata; the poroid state is usually absent. However, either this species or a close relative with slightly smaller conidia is also found on poles of fences, where it may cause considerable damage.

When young the conidia are thin-walled and narrowly ellipsoid to sometimes cylindrical, clearly revealing their arthroconidial nature. When maturing, the conidium rounds off and becomes more thick-walled, thus decreasing in length and increasing in width. For these reasons conidial measurements of cultures tend to be longer than those on the natural substrate, reports varying from  $4.5\text{--}7 \times 3.5\text{--}4.5 \mu\text{m}$  (Jahn, 1970) to  $5\text{--}10 \times 3.5\text{--}7 \mu\text{m}$  (Ryvarden & Gilbertson 1994).

*Multiporus chlamydoformans* O. & R. Falck (1937) was collected on timber directly below a leaky roof. It produced a white to yellowish white soft fleshy poroid resupinate basidiome, with fibrous structures, hyphae up to  $7 \mu\text{m}$  wide and ellipsoid spores,  $5 \times 3\text{--}3.5 \mu\text{m}$ . On agar and on sterile woodblocks a brown *Ptychogaster* form was produced, besides cushion-shaped structures in which both basidia and conidia were formed. The conidia were given as ellipsoid to nearly cylindrical,  $10\text{--}15 \times 9\text{--}12 \mu\text{m}$ . Type material is not extant, but the description points strongly to *Postia ptychogaster*. However, the dimensions for the conidia are too large, even considering that the measurements by Falck & Falck are often a bit overdone.

*Postia rennyi* (Berk. & Broome) Rajchenb. (= *Oligoporus farinosus* Bref.)

Anamorph: *Ptychogaster citrinus* Boud. – Fig. 1  
Syn.: *Sporotrichum isabellinum* P. Karst.

Colonies at first downy to low cottony, becoming farinaceous, whitish to cream coloured, becoming yellowish or pale ochraceous, Light Buff or Pinkish Buff, finally more yellowish to pale brown. Margin narrow, hyaline, hyphae rather dense. Marginal and aerial hyphae hyaline, thin-walled,  $1.5\text{--}6\text{--}(8) \mu\text{m}$  wide, with clamps. Clamps abrupt, often sprouting. Arthroconidia in chains, originating from contracting cytoplasm which forms a new wall and thus becoming separated by empty hyphal parts that contain a clamped septum. Conidia ellipsoid, yellowish in mass, thick-walled,  $4.5\text{--}7\text{--}(8.5) \times 3.5\text{--}5 \mu\text{m}$ . Crystals present, both cubical and elongate. Growth rate: 2–25 mm radius in ChA, significantly less on MEA. Reactions on laccase and tyrosinase negative.

*Oligoporus friesii* O. & R. Falck (1937) was (invalidly) described as a resupinate, whitish to cream-coloured poroid fungus with cream-col-

oured chlamydospores which become light brown (tobacco brown) with age. Falck and Falck (1937) draw the conidia as ellipsoid, but give as measurements in the text  $5\text{--}6 \times 4.5\text{--}5.5 \mu\text{m}$  and in the key  $6\text{--}8 \times 5\text{--}6.5 \mu\text{m}$ . The spores are narrowly ellipsoid,  $5 \times 2.5\text{--}3 \mu\text{m}$ . In culture growth is very slow and the fungus grows on *Picea*. I have no doubt that *O. friesii* is identical with *Postia rennyi*.

All references to *Tyromyces sericeomollis* (Romell) Bond. & Sing. mentioning a conidial stage actually refer to *P. rennyi*.

**Discussion:** A number of *Postia*, *Oligoporus* or *Tyromyces* species have been mentioned to possess *Ptychogaster* conidia or chlamydospores. Apart from the four species treated above these are:

- a. *Postia stiptica* (Pers.:Fr.) Jülich. This is a well-known bluish species on gymnosperms and certainly congeneric with the above recognized *Ptychogaster* teleomorphs. However, none of the strains available did produce conidia in pure culture. Either chlamydospores may be formed in nature under special conditions, as is the case in many polyporous species, or the record represents a misidentification.
- b. *Postia ceriflua* (Berk. & M.A. Curtis) Jülich (syn.: *T. revolutus* (Bres.) Bond. & Sing.). I do not know this species in pure culture, but it can be confused with *P. floriformis*. It deviates from the *Ptychogaster* forming species by quite thick-walled tramal hyphae, relatively narrow spores and a preference for angiosperms, although it is also reported from gymnosperms.

Some confusion exists on the species concept in the *Postia-Oligoporus* species complex that is characterized by narrowly ellipsoid to short cylindrical spores.

- a. *Oligoporus folliculocystidiatus* Kotl. & Vampola differs from *Postia ceriflua* in the presence of capitate cystidia (cystidioles) and honey-coloured excretion drops. However, 'cerifluus' means 'with wax-coloured liquid', and thus points to a yellowish excretion product. I am not sure, that these species are really different, the more because the size of the cystidioles is similar or slightly larger than that of the basidia, and a basidiole can also be

slightly capitate. Thus it may be, that either *Polyporus revolutus* Bres. is the correct name of *Postia ceriflua* (incl. *O. folliculosocystidiatus*), that actually three species are involved or that we are dealing with a single, variable taxon. Both *P. ceriflua* and *O. folliculosocystidiatus* are sometimes distinguished from related species by a dorsally attached or pendent basidiome, a character which may be connected with the preferential occurrence in crevices and cavities of very rotten wood. Moreover there are also reports describing it as sessile. In general, references in the literature and herbarium material can only be considered as referring to this complex. Conidia (chlamydospores) have been reported for material under any of these names.

- b. The *Postia floriformis-guttulata* complex consists of species with sessile, effused-reflexed to flabelliform or laterally substipitate basidiomes which may be imbricate. The spores are slightly smaller than in the *P. cerifluus* complex, and gloeoplerous hyphae are reported for both species; they are also occasionally present in culture. *P. guttulata* can be recognized by the fusiform cystidioles and the buff to brownish pileus surface which is often studded with small pits; the tubes may have a greenish tinge. *P. floriformis* is smaller and generally described as whitish, becoming straw-coloured. However, material with a slightly pinkish tinge, and occurring on very rotten wood of *Picea* is also with some doubt referred to this species, following Bourdot & Galzin (1928). The anamorph of the latter taxon is *Ptychogaster rubescens*. The reference of von Arx (1973), followed by Stalpers (1978) actually concerns the anamorph of *Punctularia atropurpurascens*.
- c. *Tyromyces albidus* (Schaeff.) Donk and *T. immitis* (Peck) Bond. Both names are now generally considered synonyms of *P. stiptica*, but their concept in the literature has often been rather broad and confusion with *Postia guttulata* has occurred.
- e. *Tyromyces destructor* (Schrader : Fr.) Bond. & Singer. Donk (1974) compared the descriptions of Schrader, Fries 1821 and Fries 1838 and concluded that Fries first accepted Schrader's concept, but later changed his mind. The latter concept may well be *Postia ptychogaster*, but Schrader's fungus grew on

rotten domestic timber, was white, fibrous and, when dry, could easily be rubbed to a mealy powder. The word used was 'conterere', which can be translated with rub, destroy, or wear down. Thus it is not stated that the fungus itself is powdery. Finally the fungus destroyed the wood like '*Merulius lacrymans*', and thus produced a severe brown rot. There are only few resupinate, poroid, brown rotting basidiomycetes with fibrous mycelium growing in houses, and the most likely candidates for this would be either *Antrodia (Fibroporia) vaillantii* (DC. : Fr.) Ryvarden or *Postia placenta* (Fr.) M.J. Larsen & Lombard, species that actually have been confused. The first is white and forms rhizomorphic strands, but also (sometimes sparse) skeletal hyphae, while the second usually is pinkish (when dry cream-coloured to pale buff), with a fimbriate margin and strictly monomitic. My best guess would be the latter fungus, the more as I am not certain that the pink colour will develop under dark circumstances (it does not in culture). Karsten's concept of this species is *Postia rennyi*.

- f. *Tyromyces apalus* sensu Bourdot & Galzin with conidia is *P. rennyi*.

Several related species in different genera do produce thick-walled, chlamydosporous anamorphs, but these are not produced in chains, for example *Osteina (Tyromyces) obducta* (Berk.) Donk and *Parmastomyces mollissimus* (R. Maire) Pouzar – Fig. 5.

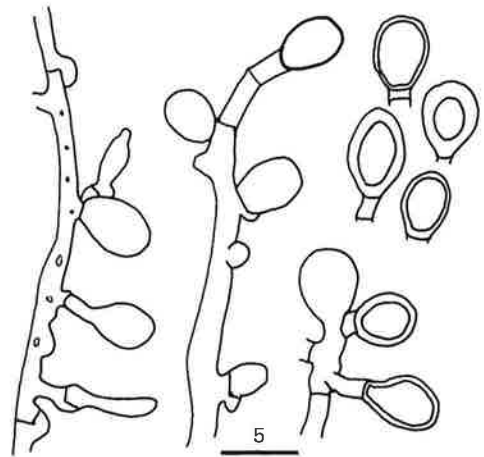


Fig. 5. *Parmastomyces mollissimus* (CBS 815.72).

## 2. *Abortiporus* Murrill

The anamorph of *Abortiporus biennis* is not closely related to *Ptychogaster* because of the non-arthric nature of the conidia and the occurrence of a white rot. *Sporotrichum* differs in the absence of large chlamydo-spores and a postponed reaction on laccase. The teleomorphs, *Postia* and *Laetiporus* resp., are not close to *Abortiporus*. Consequently a new genus is proposed for the anamorph:

### *Sporotrichopsis* Stalpers gen. nov.

Hyphae hyalinae, fibulatae et hyphae crasse-tunicatae, ramosae, aseptatae. Conidiophorae hyalinae, ramosae ex fibulis. Conidia terminales, plus minusve crasse-tunicatae, globosae vel subglobosae. Putredo alba. Teleomorphosis: *Abortiporus*.

Species typica: *Sporotrichopsis terrestris* (S. Schulzer) Stalpers, **comb. nov.** *Ceratomyces terrestris* S. Schulzer, Verh. zool.-bot. Ges. Wien 24: 451. 1874.

### *Abortiporus biennis* (Bull. : Fr.) Singer

Anamorph: *Sporotrichopsis terrestris*

(S. Schulzer) Stalpers – Fig. 6

Syn.: *Ptychogaster alveolatus* Boudier; *Ceratomyces schnyderianus* Speg.; *C. pulchellus* Speg.; *P. rufescens* Lloyd; *P. lindneri* Pilát

Margin even, appressed. Colony whitish at first, becoming pinkish, cottony-woolly. Irregular irpicoid to poroid areas formed after 4–6 weeks,

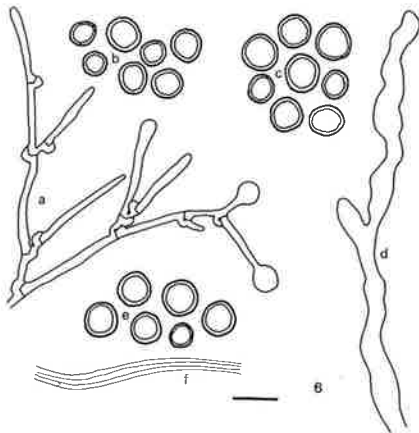


Fig. 6. *Abortiporus biennis* (*Sporotrichopsis terrestris*): a. conidiophore (CBS 365.74); b. conidia (CBS 365.74); c. conidia of *Ptychogaster alveolatus* (type); d. gloeoplerous hypha (CBS 373.59); e. conidia of *Ceratomyces schnyderianus* (type); f. skeletoid hypha (CBS 365.74).

pink. Aerial generative hyphae hyaline, thin-walled, 1.5–6(–7.5)  $\mu\text{m}$  wide, with clamps. Thick-walled hyphae hyaline, branched, 1–2.5  $\mu\text{m}$  wide, without septa and clamps. Gloeocystidia or gloeoplerous hyphae present, contents strongly staining, clavate or irregular, up to 7.5  $\mu\text{m}$  wide. Conidiophores hyaline, thin-walled, racemosely branched from clamp connections. Conidia terminal, thick-walled, globose to subglobose, 6–12(–14)  $\times$  5–11(–12)  $\mu\text{m}$ . Growth rate: 50–75 mm radius in 2 weeks. Reaction on laccase positive.

Anamorphs of two other aphylophoraceous fungi seem to belong here as well:

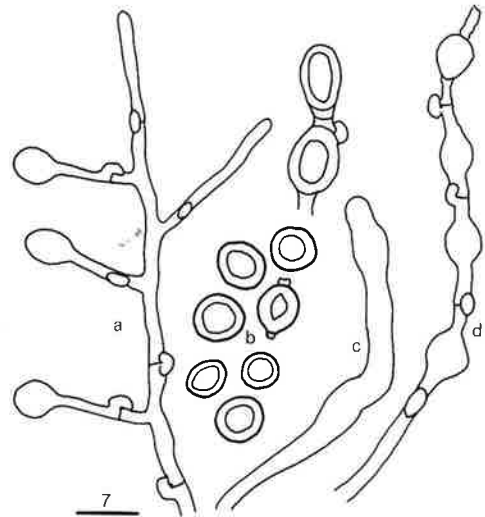


Fig. 7. *Granulobasidium vellereum* (CBS 165.65): a. conidiophore; b. conidia; c. gloeoplerous hyphae; d. conidia in chain.

1. *Granulobasidium vellereum* (Ellis & Cragin) Jülich (Fig. 7). It differs in the absence of the rather narrow, thick-walled hyphae, a slower growth rate (up to 25 mm radius in 2 weeks), a cottony to plumose mat and a Pale Orange Yellow to Light Buff effused, smooth basidiome. The conidiophores are hardly branched and the conidia are terminal, thick-walled, globose to ellipsoid, 6–11  $\times$  5.2–8  $\mu\text{m}$ .

2. *Cymatoderma pallens* Berthet & Boidin (Berthet & Boidin 1966).

## 3. *Oxyporus* (Bourd. & Galz.) Donk

### *Oxyporus obducens* (Pers. : Fr.) Donk

Anamorph: *Ptychogaster effusus* Pat., Journ. Bot. Paris 2: 216 1888. – Fig. 8



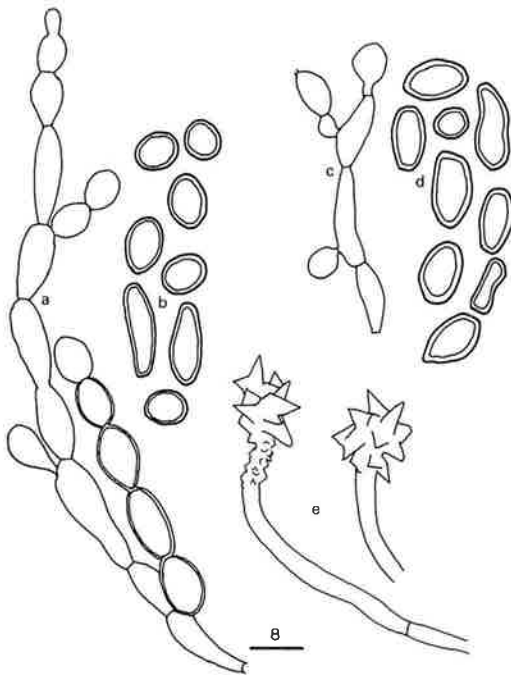


Fig. 8: *Oxyporus obducens* (*Ptychogaster effusus*): a-b. conidiophore and conidia (Straus); b-c. conidiophore and conidia (type); e. cystidia (Jahn 1970).

Conidiome resupinate, effused, farinaceous to felty and rather tough, Warm Buff (pale ochraceous). Conidiome surface even, but poroid teleomorph may be present. Hyphal system monomitic. Hyphae hyaline, with thin to usually thickened walls, 1.5–3  $\mu\text{m}$  wide, septate, without clamps. Conidiophores indiscrete, erect, hyaline, thin-walled but becoming thick-walled during development, 3–4.5  $\mu\text{m}$  wide, arising from thick-walled hyphae. Conidia thallic, in simple or branched chains, the younger apical ones hyaline and thin-walled, the older, basal conidia becoming thick-walled. The thickening process continues after liberation. Conidia typically subglobose to ellipsoid, (6–)8–12(–15)  $\times$  (6–)6.5–8(–9)  $\mu\text{m}$ , but sometimes nearly cylindrical, 10–21  $\times$  4–5.5  $\mu\text{m}$ , often with granulose contents. The separation process seems to be schizolytic, there are no sterile cells between the conidia.

The connected basidiome is annual, effused to rarely narrowly pileate, up to 5 mm thick. Hymenial surface Light Ochraceous Buff to Ochraceous Buff, poroid, 3–5 pores/mm. Pores regular,

dissepiments often somewhat lacerate. Trama Maize Yellow to Pale Orange Yellow, rather soft. Hyphal system monomitic. Tramal hyphae hyaline, thick-walled, 2.5–4(–4.5)  $\mu\text{m}$  wide, septate, without clamps. Subhymenial hyphae hyaline, thin- to slightly thick-walled, 1.5–3  $\mu\text{m}$  wide. Chlamydospores may be present in the trama, often single, Cystidia developing in the trama, clavate and strongly cyanophilous when young, becoming distinctly capitate and there 3.5–6  $\mu\text{m}$  wide, excreting material over a distance of 10–20  $\mu\text{m}$  or more, sometimes amorphous, but usually as coarse crystals. Subhymenium practically absent. Basidia short cylindrical to pedunculate, 9–14  $\times$  4.5–5.5  $\mu\text{m}$ . Spores hyaline, thin-walled, subglobose to broadly ellipsoid, ventrically slightly depressed, 3.5–4.5(–5.5)  $\times$  (2.2–)2.5–2.8(–3.2)  $\mu\text{m}$ , not amyloid, not dextrinoid. On living or dead wood of angiosperms, known from *Acer*, *Aesculus*, *Populus*, *Salix*, *Ulmus*. There is also a single record from *Pinus*.

**Discussion:** The description is mainly based on European material of *Oxyporus obducens*, but the type specimen of *Ptychogaster effusus* fits well. The material falls apart into two groups: those on *Salix* and *Populus* with relatively large spores, 4–5.5  $\times$  2.6–3.2  $\mu\text{m}$ , and on other substrates with spores 3.5–4.5  $\times$  (2.2–)2.5–2.8  $\mu\text{m}$ . Material described by Patouillard (1890) as *Poria mollusca* Pers., collected from *Salix*, is also this species.

#### Ganodermatales

*Ganoderma* species have been repeatedly recorded to form internal chlamydospores, often called 'gasterospores'. Under special circumstances, for example a period of drought after formation of a basidiome initial, probably a number of species can produce a chlamydosporic stage, but only a few species do this regularly.

a. Species also known to produce chlamydospores in culture:

*G. colossus* (Fr.) C.F. Baker, which produces large chlamydospores with spines or sometimes ridges, 16–21  $\mu\text{m}$  diam.

*G. oerstedii* (Fr.) Torrend, chlamydospores smooth, 8–18  $\times$  5–11  $\mu\text{m}$ .

*G. rufoalbum* Bres. & Pat. (anamorph: *Ptychogaster lycoperdon* Pat., *P. rufoalbus* Pat. and *P. africanus* Lloyd), with subglobose to ovoid or broadly ellipsoid chlamydospores, 7.5–10  $\times$  7–9  $\mu\text{m}$ .

*G. weberianum* (Bres. & Henn.) Steyaert, with double-walled chlamydo-spores with costae (ridges),  $11-15 \times 7-10 \mu\text{m}$  (without ornamentation).

b. Species not known in culture:

*G. multiplicatum* (Mont.) Pat. var. *vitalii*, chlamydo-spores  $11.5-29 \times 10-14 \mu\text{m}$ .

*G. rothwellii* Steyaert, chlamydo-spores hyaline to yellowish,  $9.5-14 \times 7-8 \mu\text{m}$ .

*G. subamboinense* (Henn.) Bazzalo & J. Wright with ornamented chlamydo-spores (Bazzalo & Wright 1982).

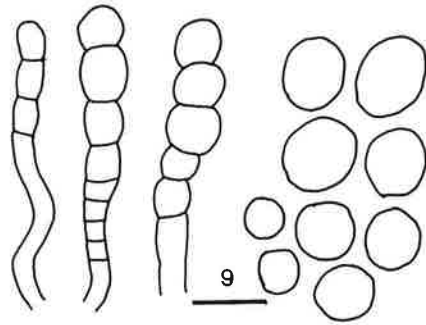


Fig. 9: *Phellinus bambusinus* (type).

There are also a number of records for *G. resinaceum*; these may actually concern various species, although *G. resinaceum* can form chlamydo-spores in culture. All chlamydo-spore species of *Ganoderma* seem to have a hymenoderm pileus crust.

### Hymenochaetales

One member of the Hymenochaetaceae repeatedly forms a *Ptychogaster* anamorph in nature, and a few others at least form abundant chlamydo-spores in culture.

### *Inonotus rickii* (Pat.) D.A. Reid

Anamorph: *Ptychogaster cubensis* Pat. (Fig. 10).  
Syn.: *P. lucidus* Lloyd

The conidiome consists of rather soft, fibrous material, that locally is converted into a reddish brown powdery mass. It is xanthochroic (purplish in KOH). The hyphae are hyaline to yellowish, thin- to somewhat thick-walled, up to  $8(-10) \mu\text{m}$  wide, without clamps. Chlamydo-spores globose to ellipsoid, brown,  $10-20(-30) \times 8-12.5 \mu\text{m}$ , thick- to very thick-walled (up to  $4 \mu\text{m}$ ). Setal hyphae rare to common, subhyaline to brown, acute to rather blunt, up to  $300 \times 8 \mu\text{m}$ , thick-walled.

Lloyd's material of *P. lucidus* belongs here, despite Lloyd's identification as *Polyporus (Ganoderma) lucidus*.

*P. fici* Pat. deviates in several respects. The type material shows only rarely setal hyphae, while these are abundant (and more thick-walled) in the type of *P. cubensis*. The chlamydo-spores of *P. fici* are more ellipsoid ( $14-20(-30) \times 8.5-11(-13) \mu\text{m}$ ) than those of *P. cubensis* and *P. lucidus* and the species is collected in Africa, while the other two are from tropical South America.

*Phellinus bambusinus* Pat. (Fig. 9) forms a different conidial stage: the species produces

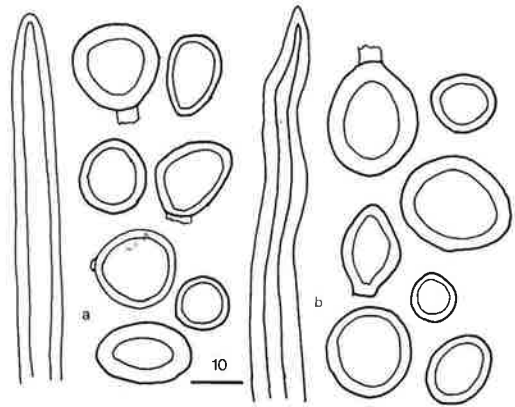


Fig. 10: *Inonotus rickii* (*Ptychogaster cubensis*): a. setal hypha and conidia (type); b. setal hypha and conidia of *Ptychogaster lucidus* (type).

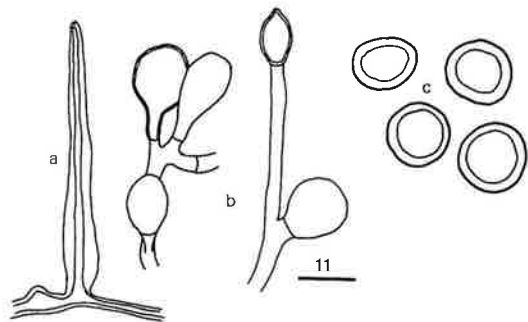


Fig. 11: *Hymenochaete rubiginosa* (CBS 237.39): a. setal hypha; b. conidiophores; c. conidia.

schizolytic conidia in chains, which show a basipetal development: the apical conidia are the largest, while the basal ones are distinctly arthric, cubical to cylindrical. Mature conidia are subhyaline to brownish, globose to broadly ellipsoid,

8–14 × 7–9 µm, rather thin-walled. For this species the name *Ptychogaster ferruginosus* Pat. was cited on the label of the type, but I could not locate a protologue for this name.

*Hymenochaete rubiginosa* (Dicks. : Fr.) Lév. (Fig. 11) produces setal hyphae and abundant chlamydospores in culture (mainly terminal, globose to broadly ellipsoid, thick-walled, brown, 8–13 × 6.5–11 µm). Such a state is not yet known in nature.

*Sporotrichum azureum* Wright & Arx (von Arx 1973) is a later (and thus illegitimate) homonym of *S. azureum* Link (1809), which is identical with *Terana coerulea* (Lamarck : Fr.) Kuntze (Stalpers 1984). There is no anamorph genus name available to accommodate this taxon.

#### *Caeruleomyces* gen. nov.

Colonia ochraceo-brunnea in tenebris, caerulescens in lucis. Hyphae hyalinae, tenui-tunicatae, fibulatae. Hyphae laterales dendriticae praesentes, 1–2 µm diam. Conidiophorae indiscretae. Conidia terminales, tenui-tunicatae, ellipsoidea vel pyriformia.

Species typica: *Caeruleomyces verae* Stalpers.

Colonies ochraceous brown when grown in the dark, becoming blue in the light. Hyphae hyaline, thin-walled, with clamps. Dendritic lateral hyphae present, 1–2 µm wide. Conidiophores indiscrete. Conidia terminal, thin-walled, ellipsoid to pyriform.

*Caeruleomyces verae* Stalpers, nom. nov. for *Sporotrichum azureum* Wright & Arx in Arx, Persoonia 7: 127, 1973, non *S. azureum* Link.

The name is in honour of Vera Holubová-Jechová, who initiated a search for the teleomorph

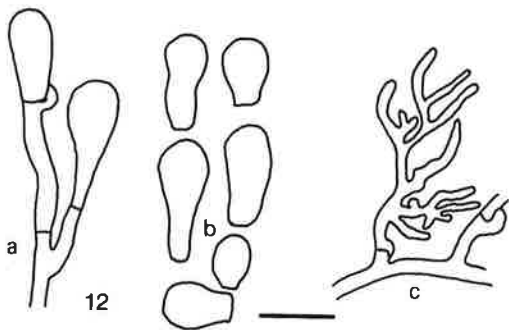


Fig. 12: *Caeruleomyces verae* (CBS 609.71): a. conidiophore; b. conidia; c. dendritic hypha.

of this species, which was interrupted by her untimely death.

Colony appressed, hyaline at first, becoming downy, then farinaceous to velvety. Colour becoming Parula Blue, Delft Blue, Orient Blue or Tyrian Blue, in KOH Dull Violet-Blue to Dusky Dull Violet-Blue. When grown in the dark the colour becomes yellowish brown, assuming bluish tinges within one hour in the light. Margin appressed, hyaline. Marginal hyphae hyaline, thin-walled, 1–2.5(–3) µm wide, with prominent clamps. Dendritically branched hyphae distinct, with basal clamp, branchlets 1–1.5(–1.8) µm wide. Aerial hyphae hyaline, thin-walled, 1.5–3 µm wide, with clamps. Clamps not sprouting. Conidiophores indiscrete, hyaline, thin-walled, branched, each branch producing a terminal conidium. Conidia hyaline to pale yellowish or pale bluish, thin-walled, smooth, pyriform to ellipsoid, sometimes irregular to even subcylindrical, (7–) 8.5–16(–21) × 4.5–8 µm. Some arthroconidia may also be present in older parts. Only growing on acidified media (ChA). Reaction on laccase positive, no delayed reaction.

In nature very thick-walled chlamydospores may also be present, globose to subglobose, 15–20 × 12–18 µm, walls up to 3.5 µm thick. Conidia may also be somewhat different, ellipsoid, 10–15 × 6–10 µm.

#### Check-list of *Ptychogaster* and basidiomycetous anamorphs of *Ceriumyces* Corda

Names of bolets supposed to be combined in *Ceriumyces* Murrill are omitted.

*P. africanus* Lloyd, Mycol. Writ. 6: 886. 1919. The material probably belongs to *Ganoderma rufoalbum*, which is also from Africa.

*P. albus* Corda, Icon. Fung.: 1838. – *Ceriumyces albus* (Corda) Sacc., Syll. Fung. 6: 388. 1888. Generally considered to be a synonym of *P. fuliginoides*, the anamorph of *Postia ptychogaster*.

*P. alveolatus* Boud., Bull. Soc. mycol. Fr. 4: LV, 1888. – *Ceriumyces alveolatus* (Boud.) Sacc., Syll. Fung. 9: 201. 1895. A synonym of *Ceriumyces terrestris*, the anamorph of *Abortiporus biennis*.

*P. aureus* Lloyd, Mycol. Writ. 6: 1063, 1921, invalid. The specimen is *Sporotrichum versisporum*, colonized by an ascomycetous fungus (Stalpers 1978).

*C. bogoriensis* Holterm., Mykologische Untersuchungen aus den Tropen, p. 98. 1998. Donk

(1962) considered the species the anamorph of *Echinoporia hydnochorus* (Berk. & Br.) Ryvar-den, generally known as *Echinodia theobromae* Pat. (Donk, Taxon 11: 84. 1962).

*P. citrinus* Boud., J. Bot. (Morot) 1: 8, 1887. – *Ceratomyces citrinus* (Boud.) Sacc., Syll. Fung. 6: 386. 1888. The anamorph of *Postia rennyi*.

*C. cremaceus* Henn., Verh. bot. Ver. Prov. Brandenb. 40: 132. 1899. Type not extant.

*P. croceus* Lloyd, Mycol. Writ. 7: 1165, 1922, nomen confusum. The type specimen (Lloyd 19995) contains a *Boletus* sp. covered with *Sepe-donium chrysospermum*.

*P. cubensis* Pat., Bull. Soc. mycol. Fr. 12: 133. 1896. – *Ceratomyces cubensis* (Pat.) Sacc., Syll. Fung. 14: 194. 1899. A synonym of *P. fici* Pat., the anamorph of *Inonotus rickii*.

*P. effusus* Pat., Journ. Bot. Paris 2: 216. 1888. – *Ceratomyces effusus* (Pat.) Sacc., Syll. Fung. 9: 202. 1895. The anamorph of *Oxyporus obducens* (Pers.) Donk.

*P. fici* Pat., Expl. sci. Tunisie 4: 4. 1892. – *Ceratomyces fici* (Pat.) Sacc., Syll. Fung. 14: 194. 1899. The anamorph of *Inonotus rickii*.

*C. fischeri* Corda, Deutschl. Fl. (ed. J. Sturm) III, 3: 133. 1837. Nomen dubium.

*P. flavescens* Falck & O. Falck, Hausschwamm Forschungen 12. 1937, invalid name. A synonym of *Ptychogaster fuliginoides* (Pers.) Donk.

*P. frondosus* Lloyd, Mycol. Writ. 7: 1270. 1924, nomen dubium. The type material contains reddish brown labyrinthoid sclerotoid bodies with a textura angularis; some of these cells become thick-walled and form hair-like protuberances.

*P. fuliginoides* (Pers.) Donk, Proc. K. Ned. Akad. Wet., Ser. C, 75: 170. 1972. – *Trichoderma fuliginoides* Pers., Syn. Fung. p. 213. 1801. The anamorph of *Postia ptychogaster*.

*C. hepaticus* Sacc., Syll. Fung. 6: 388. 1888. – *Ptychogaster hepaticus* (Sacc.) Lloyd, Mycol. Writ. 3, polyporoid issue 2: 32. 1909. *Confistulina hepatica* (Sacc.) Stalpers, Can. J. Bot. 61: 1660. 1983. The anamorph of *Fistulina hepatica* (Stalpers & Vlug 1983).

*C. incomptus* Sacc., Bull. Soc. mycol. Fr. 5: 115. 1889. The type specimen (no 3501, leg.: 24-IV-1889, PAD) is subglobose, 6–9 cm diam. and 4.5–6 cm high, white when fresh, but now ochraceous yellow, smooth, suberose-woody, with brown interior. In section incomplete pores are present, 3–4/mm. Hyphal system is monomitic. Hyphae 2–4 µm wide, often swollen at the septa, without

clamps. Setae or setal hyphae absent. Gloeoplerous hyphae present, up to 7 µm wide, with resinous contents. There are many basidiospores, subglobose to ellipsoid, (5.5–)6.5–8.5(–9) × 5.5–6.5 µm. The specimen grew on wood on Kangaroo Island, Australia. The material may belong to *Inonotus*.

*P. japonicus* Lloyd, Mycol. Writ. 5: 681. 1917. – *Ceratomyces japonicus* (Lloyd) Trotter, Syll. Fung. 23: 452. 1925. Nomen dubium. The material is a felty, orange brown clump with a reddish brown crust, consisting of sterile mycelium without clamps.

*P. lindtneri* Pilát, Bull. Soc. mycol. Fr. 53: 86. 1937. – *Ceratomyces lycoperdon* Sacc., Syll. Fung. 6: 388. 1888. A synonym of *Ceratomyces terrestris*, the anamorph of *Abortiporus biennis*.

*P. lucidus* Lloyd, Mycol. Writ. 5: 699. 1917. A synonym of *P. fici* Pat.

*P. lycoperdon* Pat., J. Bot. (Morot) 1: 113. 1887. The anamorph of *Ganoderma rufoalbum*.

*C. mexicanus* De Seynes, Bull. Soc. mycol. Fr. 6: 102. 1890. Type not seen. The specimen is described as cylindrical, capitate, gelatinized, brown, with amyloid hyphae and gloeoplerous hyphae. Conidia ovoid to ellipsoid, 5–6 × 4 µm. The description suggests a member of the Hericiales, but I am not able to suggest a species.

*C. neumannii* Bres., Annl. mycol. 18: 41. 1920. A synonym of *Sporotrichum versisporum*, the anamorph of *Laetiporus sulphureus*.

*P. niger* Lloyd, Mycol. Writ. 6: 1004. 1920. The type material from Cameroon contains a species of *Thelephora*, which encrusts a branch over 15 cm and also forms flabellate pilei. Basidiome is soft fleshy. Pileus surface is black to greyish black, even, somewhat fibrillose. Hymenial surface even, locally rimose, brown to blackish. Subicular hyphae hyaline to brown, thin- to thick-walled, 3–4.5 µm wide, with clamps. Subhymenial hyphae hyaline, thin- to slightly thick-walled, 3.5–5.5(–6) µm wide, with clamps. Basidia clavate, 55–120 × 8–12 µm, cyanescent in KOH, with a basal clamp. Spores brown, globose to subglobose, echinulate to aculeate, 9.5–13 × 9–11 µm, with large apiculus, spines up to 1(–1.5) µm long. The species is *Thelephora atra* Weinm.

*P. nodulosus* Pat., Bull. Soc. mycol. Fr. 34: 198. 1920. Type not seen. The material (Baker no 4385) was collected in the Philippines, where it grew on rotten wood. It consisted of nearly hemispherical

nodules, 3–6 mm diam., white to ochraceous. The hyphae are hyaline, 1–3 µm wide, without clamps. The central part desintegrates into numerous cylindrical arthroconidia, 6–10 × 3 µm. The teleomorph is hydroid with small basidia (12 × 6 µm) and smooth, ovoid basidiospores, 3 × 2 µm. Cystidia were lacking. Patouillard suggested *Acia* as a suitable genus for the teleomorph.

*C. pulchellus* Speg., An. Mus. nac. B. Aires 19: 274. 1909 (generic name published with a question mark). A synonym of *Ceriomyces terrestris*, the anamorph of *Abortiporus biennis*.

*C. pusillus* Sacc., Ann. mycol. 3: 563. 1908, nomen dubium. The type specimen (PAD) contains a lichen with rhizoid structures (probably *Peltigera*) and an immature, more or less clavate, yellowish body, which shows neither conidia nor clamps. The material is not mature, shows no conidia and is completely covered with a species of *Aspergillus*.

*C. richonii* Sacc., Syll. Fung. 6: 388. 1888. Based on *Ceriomyces albus* sensu Richon. No material seen.

*P. rubescens* Boud., J. Bot. Paris 1: 10. 1887. – *Ceriomyces rubescens* (Boudier) Sacc., Syll. Fung. 6: 387. 1888. The anamorph of *Postia floriformis* or a closely related species.

*P. rufescens* Lloyd, Mycol. Writ. 7: 1195. 1923. A synonym of *Ceriomyces terrestris*, the anamorph of *Abortiporus biennis*.

*P. rufoalbus* Bres. & Pat., Bull. Soc. mycol. Fr. 5: 79. 1889. The anamorph of *Ganoderma rufoalbum* Bres. & Pat. 1914.

*C. schnyderianus* Speg., An. Soc. Cient. Argent. 9: 285. 1880. A synonym of *Ceriomyces terrestris*, the anamorph of *Abortiporus biennis*.

*C. spongia* Speg., An. Soc. Cient. Argent. 10: 132. 1880. The type specimen grew on a trunk of *Salix*. It is now shivered, blackish brown, without hymenium, but with secondary fungi, which do form conidia. The hyphae are hyaline, agglutinate, somewhat thick-walled, with clamps. Gloeoplerous hyphae rare. The material is a soft polypore, not identifiable on the species level.

*C. stuckertii* Speg., An. Soc. Cient. Argent. 47: 265. 1899.

*P. subiculoides* Lloyd, Mycol. Writ. 7: 1143, 1922, nomen confusum. The type specimen from Winnipeg, Canada (no. 19999, Bisby 8-VIII-1921) contains *Thelephora (Sebacina) incrustans* Fr. (Martin, note on sheet) and a fungus with ornamented spores. Lloyd described globose

spores of 32 µm diam. which may have been immature basidia of the *Sebacina*.

*C. sulfureus* De Seynes, Bull. Soc. bot. Fr. 37: 111. 1890. Nomen novum for *Ptychogaster aurantiacus* Pat., the anamorph of *Laetiporus sulphureus*.

*C. terrestris* Schulzer, Verh. zool.-bot. Ges. Wien 24: 451. 1874.

*C. terrestris* var. *clavatus* (Boud.) Sacc. & Traverso, Syll. Fung. 19: 258. 1910. Nomen nudum. Said to be based on *P. clavatus* Boud., Icon. mycol. III, where it could not be found. The material is *Ceriomyces terrestris*, the anamorph of *Abortiporus biennis*.

*P. versisporus* (Lloyd) Lloyd, Mycol. Writ. 6: 1005; 1920. – *Calvatia versispora* Lloyd. Currently classified as *Sporotrichum versisporum* (Lloyd) Stalpers, the anamorph of *Laetiporus sulphureus*.

*C. versicolor* De Seynes, Bull. Soc. bot. Fr. 37: 112. 1890. Based on description of a supposed anamorph of *Polyporus versicolor* L.: Fr. by Patouillard (1883, Tab. anal. fung. 1: 62, no. 143). As no anamorph is known for this common fungus, it is unlikely that the fungus concerned is identical with *Trametes versicolor*. Either the species is misidentified or – more likely – it concerns a parasite on the polypore. Patouillard's drawing can easily be interpreted as a species of the genus *Acremonium*, which contains taxa parasitic on basidiomycetes.

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