Synopsis Fungorum 51

POROID GENERA - A WORLD SYNOPSIS

Leif Ryvarden

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Fungiflora

ABSTRACT

All known genera which includes one or several species with a hydnoid hymenophore are described in full with all known and accepted species, except for a few general like *Hydnellum Sarcodon* and *Steccherinum*, where only European species are included. A key to all accepted genera including hydnoid species is provided.

CONTENT

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ABSTRACT

All known genera which include one or several species with a poroid hymenophore are described with its type species. A key to all accepted genera including poroid species is provided together with a list of taxonomic synonymous genera.

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INTRODCTION

This book is a companion to" Hydnoid genera - a world synopsis" (Synopsis Fungorum 50 -Ryvarden 2024 can be downloaded for free at Fungiflora.no) as it tries to give a survey of all genera described for fungi with a poroid hymenophore. Thus, it includes not only those where all species are poroid, but also those where only one or several species have a poroid hymenophore. Examples are *Trichaptum* and *Spongipellis*. These are fully treated in the manuals covering poroid fungi of Europe, Africa and North America (Ryvarden 2022a, 2022b and 2024).

KEY TO GENERA WITH POROID REPRESENTATIVES

KEY TO FAMILIES AND GENERA

1. Spores pale brown to yellowish with two walls separated by interwall pillars ..... **Ganodermataceae**
1. Spores hyaline to rusty brown with a simple wall **2**

2. Tubes separate, but closely packed ..... **Fistulina**
2. Tubes coherent; hymenophore poroid, lamellate, daedaleoid, or hydnoid to strongly incised **3**

3. Basidiocarps brown, becoming black with KOH; generative hyphae simple-septate; dark brown hymenial setae or setal hyphae present or absent; cystidia absent ..... **Hymenochaetaceae**
3. Basidiocarps variably coloured, generative hyphae with clamps or simple septa; dark brown hymenial setae or setal hyphae absent; cystidia present or absent ..... **Polyporaceae**

KEY TO GANODERMATACEAE

1. Spores with small discrete round papillae, a few irregular, small fused outgrowths may occur **2**
1. Spores with coarse longitudinal ridges or crests or with a coarse, angular, coherent and more or less hexagonal pattern of low ridges **3**

2. Spores distinctly truncate, basidiocarps sessile to semi-stipitate, frequently on wood, more rarely on the ground ..... **Ganoderma**
2. Spores round to elliptic, basidiocarps stipitate, mostly on the ground ..... **Amauroderma**

3. Spores with coarse, longitudinal crests or ridges ..... **Haddowia**
3. Spores with large hexagonal and angular patterns ..... **Humphreya**

KEY TO HYMENOCHAETACEAE

1. Basidiocarp pendant or more or less centrally stipitate, usually on the ground; setae absent **2**
1. Basidiocarp resupinate or pileate, sometimes with a lateral, tapering base; setae present or absent **3**

2. Basidiocarps pendant, small, spores finely ornamented ..... **Coltriciella**
2. Basidiocarps more or less stipitate, spores smooth ..... **Coltricia**

3. Hymenophore hydnoid to semiporoid ..... **Hydnochaete**
3. Hymenophore distinctly poroid **4**

4. Hyphal system dimitic with skeletal hyphae; basidiocarps mostly woody **5**
4. Hyphal system monomitic or pseudo-dominantly so, basidiocarps mostly fragile when dry, annual; species growing on living bushes belong here **6**

5. Basidiospores non-dextrinoid ..... **Phellinus**
5. Basidiospores dextrinoid ..... **Fomitiporia**

6. Context distinctly duplex, upper loose part often separated from the lower dense part by a black zone; setae absent; spores usually abundantly present, elliptic, pale yellowish, shorter than 4.5 µm; mostly on living trees or shrubs **7**
6. Context homogeneous; setae present or absent; spores hyaline to rusty brown; longer than 4.5 µm, on dead wood ..... **Inonotus**

7. Setae absent; spores usually abundantly present, elliptic, pale yellowish; basidiocarps 5-20 mm thick; on living trees or shrubs ..... **Phylloporia**
7. Setae present; spores usually difficult to observe, cylindrical, hyaline; basidiocarps 1-3 mm thick; on dead wood..... **Cyclomyces**

POLYPORACEAE, CONDENSED KEY TO MAIN SECTIONS

1. Basidiocarps more or less centrally stipitate (all species with numerous pilei from a common base belong here)..... **Key A**
1. Basidiocarps resupinate to pileate, then effused-reflexed to sessile, sometimes with a tapering lateral base or stipe **2**

2. Hymenophore irregular, hydnoid, lamellate, or pores daedaleoid to sinuous..... **Key B**
2. Hymenophore with circular to angular pores, dissepiments sometimes slightly split and dentate **3**

3. Spores ornamented..... **Key C**
3. Spores smooth..... **4**

4. Spores, cystidia or hyphae amyloid or dextrinoid in Melzer's reagent ..... **Key D**
4. Spores, cystidia, or hyphae negative in Melzer's reagent **5**

5. Generative hyphae simple-septate..... **Key E**
5. Generative hyphae with clamps **6**

6. Context and tubes brown, purplish black, orange, brick red or cinnabar red ..... **Key F**
6. Context and tubes white, ochraceous, yellow to pale brown **7**

7. Cystidia present in hymenium or context..... **Key G**
7. Cystidia absent from hymenium or context..... **8**

8. Dendrohyphidia present in hymenium..... **Key H**
8. Dendrohyphidia absent in hymenium **9**

9. Hyphal system monomitic..... **Key I**
9. Hyphal system di- or trimitic ..... **Key J**

POLYPORACEAE AND SOME POROID SPECIES FROM OTHER FAMILIES

Key A. Basidiocarps more or less centrally stipitate
1. Spores ornamented..... **2**
1. Spores smooth..... **6**

2. Spores amyloid or dextrinoid in Melzer's reagent..... **3**
2. Spores negative in Melzer's reagent **5**

3. Spores dextrinoid in Melzer's reagent..... **Diachanthodes novo-guineensis**
3. Spores amyloid in Melzer's reagent **4**

4. Spores coarsely crested, 5-8 µm in diam ..... **Bondarzewia**
4. Spores finely asperulate, 4-5 µm in diam ..... **Amylosporus campbellii**

5. Spores coarsely tuberculate; basidiocarps grayish..... **Boletopsis**
5. Spores globose with a double wall separated by inter wall pillars (ganodermoid) ..... **Polyporoletus sublividus**
6. Basidiocarps with many pilei from a common base..... **7**
6. Basidiocarps with pilei single or a few fused or lobed..... **11**

7. Basidiocarps sessile, ungulate to columnar with numerous small pilei; context brown, with a granular core..... **Globifomes graveolens**
7. Basidiocarps stipitate, branched; context white to ochraceous..... **8**

8. Individual pilei more or less circular, 1-3 cm in diam; hyphal system dimitic with dendritic skeleto-binding hyphae..... ..... **Polyporus umbellatus**
8. Individual pilei fan shaped to flabelliform; hyphal system monomitic **9**

9. Hyphae with clamps..... **Grifola frondosa**
9. Hyphae simple-septate **10**

10. Basidiocarps large and fleshy with thick pilei and regular pores; spores 4.5-6 µm in diam..... **Meripilus giganteus**
10. Basidiocarps up to 10 cm in diam; pilei thin, pliable; hymenophore hydnoid to irregularly poroid; spores 3.5-5 x 2.5-3.5 µm ..... **Hydnopolyporus fimbriatus**

11. Basidiocarps with gills ..... **Lentinus**
11. Basidiocarps with pores **12**

12. Hyphal system dimitic; basidiocarps tough when fresh **13**
12. Hyphal system monomitic; basidiocarps usually fleshy and soft when fresh **18**

13. Growing on *Abies* ..... **Podofomes**
13. Growing on hard woods **14**

14. Growing on the ground from a sclerotium ..... **Lignosus**
14. Growing on wood **15**

15. Skeletal hyphae amyloid, spores dextrinoid, known only from Mozambique ..... **Pseudopiptoporus**
15. Skeletal hyphae non-amyloid, spores non dextrinoid, very widespread genera..... **16**

16. Pores almost invisible, coralloid hyphae present in the dissepiments ..... **Microporus**
16. Pores variable, usually 3-6 per mm, coralloid hyphae absent in dissepiments **17**

17. Dendroid skeleto-binding hyphae present; spores cylindrical to elliptic ..... **Polyporus**
17. Skeletal hyphae rarely branched; spores subglobose ..... **Microporellus**

18. Basidiocarps becoming rusty brown; thin-walled cystidia present ..... **Phaeolus schweinitzii**
18. Basidiocarps differently coloured; cystidia absent..... **19**

19. Basidiocarps large, fleshy; pileus grey to pinkish brown or blackish; dextrinoid gloeopleurous hyphae in subhymenium and context ..... **Laetiporus persicinus**
19. Pileus different **20**

20. Spores fusiform, spindle-shaped, 12-17 x 4.5-6 µm ..... **Jahnoporus hirtus**
20. Spores more or less elliptic, shorter than 10 µm..... **20**

20. Acantocystidia present on pore edges..... **22**
20. Acanthocystidia absent **23**

22. Basidiospores 10-12.5 µm long, basidiocarps mostly red to yellow, pores angular to elliptic, 0.5-3 mm long .. **Favolaschia**
22. Basidiospores 4-5.5 µm long, basidiocarps white to tan, pores more or less round 4-5 per mm..... **Panellus**

23. Context duplex, fibrous; contextual hyphae with thickened walls; gloeocystidia present ..... **Abortiporus**
23. Context fleshy, homogeneous; contextual hyphae thin walled, inflated; gloeocystidia absent ..... **Albatrellus**

Key B. Hymenophore lamellate, labyrinthine to hydnoid

1. Context brick red or woody brown to dark brown..... **2**
1. Context whitish or ochraceous; hymenophore pale violet to brownish..... **6**

2. Context brick red to light brown; spores amyloid, minutely echinulate ..... **Echinodontium**
2. Context wood brown to dark brown; spores non-amyloid, smooth **3**

3. Hymenophore dark sepia brown to whitish farinose, often with a greenish tinge, mostly labyrinthine to hydnoid; dendrohyphidia present; basidiocarps mostly resupinate ..... **Fuscocerrena portoricensis**
3. Hymenophore wood brown to rusty or yellowish brown, daedaleoid to lamellate, dendrohyphidia absent; basidiocarps pileate, rarely resupinate **4**

4. Cystidia present in the hymenium; basidiocarps mostly rusty to yellowish brown, mostly small and often imbricate or in clusters ..... **Gloeophyllum**
4. Cystidia absent; basidiocarps ochraceous to sepia brown, single, often large **5**

5. Pileus semiglossy, smooth, faintly zonate; hymenophore lamellate or with sinuous pores; context sepia brown; spores 7-11 µm long..... **Daedaleopsis confragosa**
5. Pileus dull, finely velutinate to irregularly tufted, mostly azonate; hymenophore daedaleoid or with sinuous pores; context tan to ochraceous; spores 5.5-7 µm long,..... **Daedalea quercina**

6. Hymenophore lamellate; sword-like hyphal endings present in the hymeniu ..... **Trametes betulina**
6. Hymenophore irregular to hydnoid; sword like hyphal endings absent from hymenium..... **7**

7. Incrusted cystidia present in hymenium, either as hymenial cystidia or as incrusted skeletal hyphae **8**
7. Incrusted cystidia absent from hymenium **9**

8. Pilear and pore surfaces white to cream; cystidia as incrusted skeletal hyphae; generative hyphae with simple septa; spores up to 6 µm long ..... **Irpex lacteus**
8. Pileus greyish to pale brown; pore surface vivid to pale purplish when fresh, pale brown when dry; cystidia hymenial; generative hyphae with clamps; spores longer than 6 µm ..... **Trichaptum**

9. Pileus hirsute to velutinate; thin black zone present between the upper tomentum and the context..... **10**
9. Pileus, when present, smooth. glabrous; black zone absent in the context..... **11**

10. Hymenophore labyrinthine to daedaleoid, greyish with age; tomentum persistent, often greenish from algae; mostly temperate-boreal species; spores elliptic ..... **Cerrena unicolour**
10. Hymenophore dentate to hydnoid, pale straw coloured with age; tomentum often wearing away in some zones, white to ochraceous; tropical species; spores cylindrical..... **Trametes maximus**

11. Basidiocarps effused-reflexed; pores slightly sinuous; pileus white to ochraceous with reddish cuticle spreading from the base; tropical genus..... **Earliella scabrosa**
11. Basidiocarps pileate or resupinate; hymenophore with sinuous pores or lamellate; reddish cuticle absent..... **12**

12. Basidiocarps pileate, often with contracted base; pileus smooth, white to ochraceous. hymenophore poroid to lamellate with 1-2 lamellae per mm..... **Trametes elegans**
12. Basidiocarps resupinate to effused-reflexed; hymenophore poroid with dentate dissepiments or irregularly hydnoid **13**
13. Spores globose to broadly elliptic, thick-walled, sterile elements absent in hymenium; ..... **Spongipellis**
13. Spores subglobose to narrowly elliptic, thin-walled, capitate hyphal ends scattered in hymenium; ..... **Schizopora**

Key C. Spores ornamented

1. Spores amyloid or dextrinoid in Melzer's reagent **2**
1. Spores negative in Melzer's reagent **4**

2. Spores amyloid; basidiocarps without anise odour **3**
2. Spores dextrinoid; basidiocarps with strong anise odour; usually on Salix ..... **Haploporus odorus**

3. Basidiocarps resupinate; skeletal hyphae more or less dextrinoid..... **Wrightoporia**
3. Basidiocarps pileate; skeletal hyphae negative in Melzer's reagent ..... **Amylosporus campbellii**

4. Spores oblong-elliptic, striate or ridged, longer than 10 µm..... **Haploporus**
4. Spores globose or broadly elliptic, shorter than 10 µm..... **5**

5. Basidiocarps mostly narrowly pileate; pileus crustose, brown, glabrous; skeletal hyphae dextrinoid; spores very finely asperulate..... **Heterobasidion**
5. Basidiocarps resupinate; hyphal system monomitic; spores warted to spiny **6**

6. Spores asperulate, less than 5 µm in diam ..... **Trechispora**
6. Spores strongly echinulate, more than 5 µm in diam ..... **Lindtneria**

Key D. Spores, cystidia or hyphae amyloid or dextrinoid in Melzers reagent

1. Spores amyloid in Melzer's reagent **2**
1. Spores dextrinoid or negative in Melzer's reagent **4**

2. Spores smooth, hyphal system monomitic ..... **Anomoporia**
2. Spores minutely asperulate; hyphal system dimitic **3**

3. Basidiocarps resupinate; on wood ..... **Wrightoporia**
3. Basidiocarps pileate; usually terrestrial or at the base of living woody plants ..... **Amylosporus campbellii**

4. Cystidia amyloid ..... **Amylocystis lapponica**
4. Cystidia absent **5**

5. Spores brown at maturity, dextrinoid; pore surface dark brown when dry; basidiocarps resupinate; context whitish to pale brown, strikingly different from the tubes ..... **Meruliporia incrassata**
5. Spores hyaline at maturity; context more or less of same colour as tubes; basidiocarps resupinate or pileate **6**

6. Hyphal system monomitic; hyphae with clamps, negative in Melzer's reagent; spores cylindrical, thin-walled, dextrinoid ..... **Sarcoporia**

6. Hyphal system di- or trimitic; generative hyphae with clamps or simple-septate; skeletal hyphae dextrinoid, amyloid, or negative; spores subglobose to elliptic or truncate, dextrinoid or negative in Melzer's reagent **7**

7. Spores smooth, elliptic or truncate, usually distinctly thick walled, weakly to strongly dextrinoid or negative; skeletal hyphae dextrinoid, amyloid, or negative ..... **Perenniporia**
7. Spores smooth or finely asperulate, thin-walled, skeletal hyphae dextrinoid **8**

8. Spores subglobose, finely asperulate; generative hyphae with simple septa; on conifers, rarely on angiosperms ..... **Heterobasidion**
8. Spores cylindrical to oblong-elliptic, smooth; generative hyphae with clamps **9**

9. Skeletal hyphae dextrinoid; spores longer than 10 µm; causing white rot of dead hardwoods; subtropical ..... **Dichomitus**
9. Skeletal hyphae strongly to weakly amyloid in some species; spores shorter than 10 µm; boreal to temperate, causing brown rot ..... **Antrodia**

Key E. Generative hyphae with simple septa

1. Cystidia present in hymenium and/or trama **2**
1. Cystidia absent **6**

2. Basidiocarps orange to reddish or dark brown; cystidia smooth, thin walled **3**
2. Basidiocarps white, cream, beige, reddish to blackish; cystidia thick-walled or thin-walled and then mostly to apically encrusted **4**

3. Basidiocarps reddish to orange; spores cylindrical to oblong-elliptic; cystidia hyaline, causing brown rot of dead conifers, rarely hardwoods ..... **Pycnoporellus**
3. Basidiocarps rusty to dark brown; spores elliptic to ovoid; cystidia with yellowish to dark coloured content; causing brown butt rot in living conifers ..... **Phaeolus schweinitzii**

4. Spores 8-11 x 5.5-7 µm, spores thick walled ..... **Leucophellinus**
4. Spores smaller and thin walled **5**

5. Pore surface white to cream; soft to tough-fibrous when dry ..... **Oxyporus**
5. Pore surface reddish, orange, beige or greyish black; hard and rigid when dry ..... **Rigidoporus**

6. Basidiocarps orange to sulphureus yellow, pinkish brown, or purplish black, pileate **7**
6. Basidiocarps differently coloured or resupinate **9**

7. Basidiocarps orange to sulphurous yellow or pinkish brown, soft, fleshy ..... **Laetiporus**
7. Basidiocarps purplish black, hard and woody **8**

8. Basidiocarps resupinate, pores irregular 1-2 x 2-3 mm ..... **Melanoporela carbonacea**
8. Basidiocarps pileate, pores 6-9 per mm ..... **Nigrofomes melanoporus**

9. Spores allantoid to cylindrical or oblong-elliptic **10**
9. Spores globose to subglobose **13**

10. Spores oblong-elliptic; hyphae often inflated up to 25 µm in diam ..... **Wolfiporia**
10. Spores allantoid to cylindrical, hyphae 2-6 µm wide **11**

11. Pore surface white/tan or brightly coloured; tube layer not gelatinous when fresh; Hymenium restricted to tube walls... **12**
11. Pore surface reddish to purplish at least when dry; tubes shallow and hymenium continuous over dissepiment edges ..... **Gloeoporus**

12. Basidiocarps pileate, fleshy when fresh; causing brown rot of dead conifers ..... **Leptoporus mollis**
12. Basidiocarps resupinate, thin and fibrous when fresh; causing white rot of dead conifers and hardwoods ..... **Ceriporia**

13. Basidiocarps pileate to resupinate, reddish to beige or greyish, drying hard and rigid ..... **Rigidoporus**
13. Basidiocarps resupinate, white to cream, sometimes changing to reddish or blackish when touched or dried; soft and fragile to firm and brittle when dry **14**

14. Pore surface yellowish to ochraceous or bluish; not changing on drying; rhizomorphic, soft-fibrous; spores thick-walled,.. ..... **Byssoporia terrestre**
14. Pore surface white to pinkish, waxy when fresh; hard when dry, spores thin walled **15**

15. Hyphal system dimitic with wide binding hyphae, paleotropical rare genus ..... **Macrohyporia**
15. Hyphal system monomitic, cosmopolitan genus ..... **Physisporinus**

Key F. Generative hyphae with clamps; pore surface and context brown,purplish black, orange, to brick or cinnabar red

1. Tubes and context orange or brick to cinnabar red **2**
1. Tubes and context brown to purplish black **4**

2. Basidiocarps perennial, often ungulate; context brick red; spores truncate, thick-walled, dextrinoid; on *Juniperus* spp ..... **Pyrofomes demidoffii**
2. Basidiocarps annual, pileate to resupinate; tubes and context orange to cinnabar red, on different hosts **3**

3. Growing on coniferous wood ..... **Erastia**
3. Growing on hardwood **4**

4. Basidiocarps sappy, orange-red when fresh, resupinate or pileate; hyphal system monomitic; ..... **Hapalopilus**
4. Basidiocarps tough-fibrous, cinnabar red, pileate; hyphal system trimitic ..... **Trametes**

5. Basidiocarps small, rarely above 5 mm wide, pendent ..... **Porodisculus pendulus**
5. Basidiocarps larger, sessile to resupinate **6**

6. Basidiocarps perennial, applanate to ungulate; pileus very hard, smooth, with a crust in grey to brown colours; mycelial core present at base of context ..... **Fomes**
6. Basidiocarps annual to biennial, resupinate to pileate, soft to tough-fibrous; pilear surface without a hard crust; mycelial core absent in context **7**

7. Pore surface and context dark violet to purplish black **8**
7. Pore surface and context brown **9**

8. Basidiocarps resupinate, purplish black; spores elliptic..... **Melanoporia nigra**
8. Basidiocarps pileate, vinaceous brown to violet; spores cylindrical ..... **Nigroporus**

9. Basidiocarps fleshy and sappy when fresh; hyphal system monomitic although some sclerified clamped hyphae may occur. **10**
9. Basidiocarps tough-fibrous to woody when fresh; hyphal system di- to trimitic **11**

10. Pileus cinnamon brown, tissue cherry to violet with KOH ..... **Hapalopilus**
10. Pileus dark brown to blackish; pore surface whitish when fresh, darkening when touched or dried; no red reaction with KOH..... **Ischnoderma resinosum**

11. Basidiocarps resupinate..... **12**
11. Basidiocarps pileate **16**

12. Pores 8-20 per mm, red zones present in the wood below basidiocarps ..... **Porogramme**
12. Pores larger, no red zones below the basidiocarps..... **13**

13. Basidiocarps perennial, woody; spores elliptic..... **14**
13. Basidiocarps annual, soft to tough, spores cylindrical..... **15**

14. Spores 7-10 mm long, basidiocarps soft, flexible; on charred conifer wood; with a brown rot..... **Gloeophyllum**
14. Spores shorter, basidiocarps hard when dry, on hard woods with a white rot **15**

15. Spores 4.5- 7 x 2.5-3.5 µm, mostly on oak; temperate cosmopolitan genus ..... **Donkiporia expansa**
15. Spores 3. 4.5 x 2-3 µm, on different hardwoods, in Central to Eastern US ..... **Melanoporia**

16. Basidiocarps, flexible, cinnamon brown; spores navicular to boat shaped with distinctly thickened walls; subtropical, subtropical species ..... **Navisporus sulcatus**
16. Basidiocarps tough-fibrous to woody; dark tobacco brown to cinnamon; spores cylindrical, thin walled, widespread genera..... **17**

17. Context dark umber brown, separated from tomentum by a black layer; basidiocarps often effused-reflexed; pileus smooth, greyish to blackish; hyphal system dimitic..... **Datronia**
17. Context mostly in shades of rusty to umber brown, tomentum, if present, not separated from context by a black layer; pileus often becoming glabrous, then greyish to pale brown, hyphal system di-trimitic..... **18**

18. On conifers, causing a brown rot; mostly boreal to temperate; pileus either glabrous, tomentose, or scrupose-warted..... **Gloeophyllum**
18. On hardwoods, causing a white rot; mostly tropical to southern temperate; pileus villose to velutinate ..... **Hexagonia**

Key G. Cystidia present in hymenium or context

1. Hyphal system dimitic with skeletal hyphae; pore surface pinkish, yellow, cocoa coloured, pale brown, violet or white to cream **2**
1. Hyphal system monomitic; pore surface white to discoloured sordid ochraceous or orange when dry..... **5**

2. Pileus hairy or irregularly hydnoid and with conidia, tropical America ..... **Echinoporia**
2. Pileus if present smooth or adpressed hairy, no conidia present, cosmopolitan genera..... **3**

3. Basidiocarps pileate; pileus ochraceous to greyish white; pore surface often with purplish shades when fresh; spores cylindrical, longer than 7 µm ..... **Trichaptum**
3. Basidiocarps resupinate; pore surface cream, pinkish, orange-cinnamon, or yellow; spores shorter than 7 µm..... **4**

4. Cystidia large, ventricose; skeletal hyphae few, restricted to the context; pore surface yellow..... **Auriporia**
4. Cystidia clavate, formed by the incrusted ends of skeletal hyphae; skeletal hyphae dominating; pore surface orange-cinnamon, pinkish, or ochraceous..... **Junghuhnia**

5. Growing on coniferous wood **6**
5. Growing on hardwood **7**

6. Basidiocarps pileate, large and sappy; pileus hirsute; cystidia ventricose, up to 50 µm long, occurring usually in large numbers ..... **Climacocystis borealis**
6. Basidiocarps pileus or resupinate, pileus if present, dense to soft, glabrous or velutinous, cystidia up to 25 µm, occurring singly..... **Oligoporus**

7. Basidiocarps semistipitate to dimidiate, orange, gloeopleurous hyphae present, very rare Central American genus..... .....**Aurantiopileus**
7. Basidiocarps resupinate to pileate, white to ochraceous, tough-fibrous to soft, pileus glabrous or finely velutinate; cystidia ventricose to tubular, widespread genera..... **8**

8. Cystidia tubular, thin-walled, smooth; spores allantoid, 3-4 µm long ..... **Chaetoporellus latitans**
8. Cystidia clavate to ventricose, apically encrusted, spores cylindrical to allantoid, longer than 4 µm ..... **Oligoporus**

Key H. Dendrohyphidia present in hymenium

1. Spores 15-20 x 7.5-11 µm, very rare African genus..... **Grammothelopsis**
1. Spores smaller..... **2**

2. Skeletal hyphae dextrinoid, hymenophore poroid, hymenium developed on pore walls..... **Grammothele**
2. Skeletal hyphae non dextrinoid, hymenophore angular to semi labyrinthine, hymenium present only in the bottom of the pores ..... **Theleporus**

Key I. Hyphal system monomitic

1. Spores drop-shaped to globose.....**2**
1. Spores differently shaped **6**

2. Basidiocarps pileate, often large; spores thick walled,.....**Spongipellis**
2. Basidiocarps resupinate; spores thin walled.....**3**

3. Basidiocarps with scattered cup shaped basidiocarps on a coherent mat of hyphae..... **Resupinatus**
3. Basidiocarps with pores **4**

4. Pore surface yellowish; basidia urniform, seis- to octasterigmatic, hyphae with numerous oil drops ..... **Sistotrema**
4. Pore surface white; basidia clavate, tetrasterigmatic, hyphae without oil drops.....

5. Tube layer becoming resinous and dense when dry, spores subglobose to oval, 4.5-5.5 x 4-4.5 µm, rare genus..... **Obba**
5. Tube layer more or less unchanged when dry, spores different, widespread genus..... **Ceriporiopsis**

6. Pileus adpressed-velutinate, dark brown, or glabrous with a reddish black wrinkled surface; pores and tubes whitish to pale brown when fresh..... **Ischnoderma resinosum**
6. Pileus white, greyish or discoloured, but never reddish black and wrinkled.....**7**

7. Growing on *Taxus* or *Larix*, rare Russian genus ..... **Bondarcevomyces**
7. Growing on hard woods, widespread genera..... **8**

8. Pore surface pale pink to deep reddish, tubes dense and gelatinous; hymenium continuous over the dissepiment edges; context white, cottony..... **Gloeoporus**
8. Pores surface white, cream, or dark grey; tubes fragile to fibrous; hymenium absent on the dissepiment edges; context concolorous with tubes or paler..... **9**

9. Tube layer buff or smoky grey to blackish; context white separated from tubes by a thin dark zone ..... **Bjerkandera**
9. Tubes and context concolorous, or tubes at least not grey to almost black; no dark zone between context and tubes.....**10**

10. Basidiocarps resupinate; causing a white rot ..... **Ceriporiopsis**
10. Basidiocarps resupinate to pileate; causing a brown rot..... **Oligoporus**

Key J. Hyphal system di- or trimitic

1. Pore surface covered with a volva, except for a small hole close to the base, North American species **Cryptoporus volvatus**
1. Pore surface not covered by a volva, widespread genera **2**

2. Spores coloured **3**
2. Spores hyaline **4**

3. Basidiocarp soft, resupinate to pileate, hymenophore meruloid to folded, causing brow rot, spores scattered..... **Serpula**
3. Basidiocarps hard, resupinate, hymenophore poroid, causing white rot, spores abundantly present ..... **Abundisporus**

4. Spores truncate to broadly elliptic, thick-walled.....**Perenniporia**
4. Spores allantoid to elliptic, thin walled **5**

5. Basidiocarps mostly effused-reflexed, thin and pliable; pileus with a bay to reddish cuticle spreading from the base; pores often slightly sinuous, at least in part; tropical ..... **Earliella scabrosa**
5. Basidiocarps without the combination of a reddish cuticle and a flexible and pliable consistency..... **6**

6. Pileus with an entangled mass of hairs with conidia; tropical species..... **Echinopora aculeifera**
6. Pileus glabrous to hispid; conidia absent on pileus, temperate to boreal genera..... **7**

7. Basidiocarps large and punky; pileus with a smooth, papery cuticle..... **Piptoporus**
7. Basidiocarps large to small; pileus without a thin, papery cuticle **8**

8. Dendritic skeleto-binding hyphae present **9**
8. Dendritic skeleto-binding hyphae absent; rarely branched skeletal hyphae present; much branched, tortuous binding hyphae present or absent **11**

9. Basidiocarps resupinate to effused-reflexed or sessile ..... **Dichomitus**
9. Basidiocarps pileate, fan shaped to dimidiate with a contracted base.....**10**

10. Context very thin; tubes shallow; pileus often tessulate; dendrohyphidia present in the hymenium, unbranched or with a few branches or lobes, but difficult to observe; skeleto-binding hyphae often weakly dextrinoid; tropical-subtropical species ..... **Pseudofavolus cucullatus**
10. Context 1-2 mm thick; tubes up to 4-5 mm deep; pileus smooth to scaly; dendrohyphidia absent in hymenium; ..... skeleto-binding hyphae not dextrinoid; cosmopolitan genus..... **Polyporus**

11. Basidiocarps pinkish to purplish grey; bright red zones present in wood below the basidiocarp, tropical-subtropical species ..... **Tinctoporellus epimiltinus**
11. Basidiocarps white to cream or ochraceous to sordid pale brown; no red zones below basidiocarp; widely distributed genera..... **12**

12. Basidia longitudinally septate ..... **Aporpium**
12. Basidia without septa..... **13**

13. Basidiocarps annual or perennial, pileate, effused-reflexed to sessile, tough-fibrous to woody; pileus glabrous, sometimes with a distinct crust that often spreads from the base in reddish or black colours, or hirsute to tomentose, in some cases with a black line between tomentum and context..... **14**
13. Basidiocarps annual, resupinate to effused-reflexed or sessile, pileus narrow, glabrous to velutinate, crust or black line absent under tomentum **17**

14. Basidiocarps annual and short-lived, soft and watery when fresh; pileus mostly white to sordid brown when old or dried, binding hyphae absent; skeletal hyphae relatively few in the context, generative hyphae dominate.....**Tyromyces**
14. Basidiocarps perennial or annual but persistent and long-lived; tough-fibrous to woody. pileus glabrous to hirsute, white or ochraceous to sordid brown or with a reddish to blackish cuticle spreading from the base; binding hyphae present, often difficult to observe in some species; skeletal hyphae dominating.....**15**

15. Basidiocarps annual but long-lived; tough-fibrous to woody; pileus white, greyish, sordid brown, or blackish when dry, glabrous to hirsute; black layer between the tomentum and context in some species; causing a white rot..... **Trametes**
15. Basidiocarps perennial or annual, tough-fibrous to woody; pileus white, sordid brown to reddish or blackish, sometimes with a cuticle spreading from the base, finely velutinate to glabrous; causing white or brown rot.....**16**

16. Context mostly pale olivaceous brown, often duplex with a stronger colour in the lower part; pileus ochraceous to pale olivaceous brown, often with a reddish cuticle spreading from the base; causing a white rot; along Gulf Coast in North America .....**Fomitella supina**
16. Context white to pale wood brown; pileus whitish to sordid pale brown, black or

reddish when cuticle is present; causing a brown rot; widely distributed ..... **Fomitopsis**

17. Skeletal hyphae in the dissepiments finely incrusted with pointed or pyramidal crystals. spores allantoid, mostly less than 1 µm wide ..... **Skeletocutis**
17. Skeletal hyphae mostly not incrusted, occasionally with scattered large irregular crystals. spores cylindrical, allantoid, or elliptic, mostly 1.5-3 µm wide **18**

18. Skeletal hyphae with a wide lumen, totally dominating; generative hyphae difficult to observe; basidia longitudinally septate; rare species ..... **Protomerulius**
18. Skeletal hyphae thick-walled to solid; generative hyphae usually easily observed; basidia not septate; widespread genera with many common species **19**

19. Basidiocarps with coherent subiculum with separate papillae with apical pores ..... **Stromatoscypha**
19. Basidiocarps with coherent pore layer **20**

20. Causing a brown rot ..... **Antrodia**
20. Causing a white rot **21**

21. Spores strongly bent (lunate to allantoid) **22**
21. Spores different **23**

22. Basidiocarps pileate with brown tomentum, context duplex ..... **Piloporia**
22. Basidiocarps resupinate, subiculum coherent ..... **Sidera**

23. Spores elliptic, rarely above 4 µm long; basidiocarps semi translucent whitish when fresh, becoming dense and pale ochraceous when dry, pileate to resupinate ..... **Antrodiella**
23. Spores elliptic to allantoid, mostly longer than 4 µm; basidiocarps white to greyish, resupinate ..... **Diplomitoporus**

DESCRIPTIONS OF GENERA

ABORTIPORUS Murrill,

Bull. Torrey Bot. Club 31:421, 1904.
Basidiocarps annual, substipitate and infundibuliform to sessile and dimidiate; context white to pale buff, duplex, upper layer soft, spongy, lower layer firm, fibrous; pores angular to daedaloid; hyphal system monomitic; generative hyphae with clamps; chlamydospores present or absent in upper context; cystidia present or absent; basidiospores hyaline, smooth, subglobose to elliptic, negative in Melzer's reagent.
Type species. *Abortiporus distortus* (Schw.) Murrill, an irregular form of *A. biennis*.
Remarks. The genus seems to be related to *Spongipellis* sharing with it the duplex context, monomitic hyphal system and slightly thick-walled spores. Basidiocarps of the type species are very variable in shape and size and it has repeatedly been described as new.

Abortiporus biennis (Bull.: Fr.) Singer,

Mycologia 36:68, 1944. - *Daedalea biennis* Bull.: Fr., Syst. Mycol. 1:332, 1821.
Basidiocarps annual, laterally or centrally stipitate to sessile; stipe tomentose, up to 5 cm long and 1.5 cm thick; pilei usually solitary, sometimes imbricate, almost circular to dimidiate, up to 15 cm in diam; pileus whitish to pale brown, azonate or faintly zonate, tomentose, shallowly sulcate or appressed-fibrillose around the margin; pore surface light buff, pores angular or daedaloid, 3-6 per mm, with thick, entire dissepiments which become thin and lacerate; upper context soft-fibrous, ochraceous, the lower part firm-corky, cream- coloured, the whole up to 8 mm thick; tube layer concolorousand continuous with the lower context, up to 6 mm thick.
Hyphal system monomitic; generative hyphae with clamps, 2.5-4 µm in diam.
Gloeocystidia 20-75 x 7-9 µm, infrequent to abundant, irregular or broadly clavate to cylindrical with swellings and constrictions.
Basidiospores 4-6.5 x 3.5-5 µm, broadly elliptic to ovoid.
Chlamydospores present in context, subglobose to elliptic, thick-walled, hyaline, smooth, 5-8.5 µm in diam.
Substrata. Numerous hardwood genera, rarely on conifers. Often on the ground from buried roots.
Distribution. A cosmopolitan species, widely distributed north to the boreal zone.
Remarks. *A. biennis* differs from similar stipitate polypores in its abundant gloeocystidia and chlamydospores. A much-distorted form of this species has no apparent orientation of tubes and may appear poroid over its entire surface and has been described as *Polyporus biennis* var. *distortus* (Schwein.) P.W. Graff.

ABUNDISPORUS Ryvarden,

Belg. J. Bot. 131:154, 1998.
Basidiocarps resupinate to pileate, annual to perennial, pileus when present glabrous, mostly sulcate, grey, brown to fuscous, pores small to medium, entire, round to angular, pore surface more or less of same colour as pileus, tubes concolorous with pore surface, context homogenous and brown to dark fuscous, hyphal system tri-dimitic, generative hyphae with clamps, skeletal hyphae yellow to brown, binding hyphae present or absent, cystidia none, spores abundantly present, thin to thick-walled, pale yellow, ellipsoid to truncate and variably dextrinoid.
Type species: *Polyporus fuscopurpureus* Pers.
Remarks. The genus is characterized by a deep brown, slightly purplish colour throughout the basidiocarps, a di- to trimitic hyphal system and presence of very abundant, small yellow basidiospores and a lack of any sterile organs in the hymenium.

Abundisporus fuscopurpureus (Pers.) Ryvarden,

Belg. J. Bot. 131:154, 1998. - *Polyporus fuscopurpureus* Pers., in Gaudichaud-Beaupré in Freycinet, p. 172, 1827.
Basidiocarps perennial, solitary, broadly attached or dimidiate with a contracted base, applanate to slightly conchate or ungulate, woody hard, up to 12 cm long, 8 cm wide and 3 cm thick at the base, pileus first finely tomentose and umber brown, then glabrous, dark umber, fuscous to vinaceous brown or black, often ochraceous to pale brown along the margin, sulcate in concentric zones and frequently radially striate or rugulose, some warts may occur, cortex present, up to 150 µm thick, black in section, margin acute to rounded, often deflexed in dry specimens, pore surface first pale, pinkish to buff with age, chocolate or vinaceous brown, pores very small, 79 per mm, tubes concolorous with the pore surface or darker, often stratified, 13 mm in each stratum, up to 20 mm deep at the base, context up to 3 mm thick, chocolate to deep vinaceous brown.
Hyphal system tri-dimitic, generative hyphae with clamps, 2 4 µm wide, skeletal hyphae thick walled, mostly 36 µm wide, but in the context some hyphae up to 10 µm wide, pale yellow to fuscous brown.
Basidiospores 2.2-3.2 x 1.5-2 µm, elliptic to slightly angular, often with one side flattened, pale yellowish, thick walled and slightly dextrinoid with age. Always abundantly present.
Distribution. Paleotropical species, widespread in Central Africa. Described from Java. **Remarks**. The species may can easily be confused for a *Phellinus* species, but presence of clamped generative hyphae and small and slightly thick-walled spores, will immediately exclude that genus.

ALBATRELLUS Gray,

Nat. Arr. Brit. Plants 1:645, 1821.
Basidiocarps annual, stipitate, terrestrial or on buried wood, fleshy; pilear surface smooth to rimose or scaly; tube layer not readily separated; stipe central to lateral; hyphal system monomitic; generative hyphae with clamps or simple-septate, hyphae often inflated; cystidia absent; basidiospores elliptic to subglobose, smooth, negative or amyloid in Melzer's reagent.
Type species: *Polyporus ovinus* Fr.
Taxonomic synonyms with type species.
Xanthoporus Audet (*Scutiger syringae* Parmasto).
Polypus Audet (*Polyporus dispansus* Peck).
Laeticutis Audet (*Polyporus cristatus* Pers.).
Neoalbatrellus Audet (*Polyporus caeruleoporus* Peck).
Remarks. All species in the genus are probably mycorrhizal. DNA sequencing has shown that the genus is related to Hericiaceae, a family including a series of genera with hydnoid basidiocarps.

Albatrellus ovinus (Schaeff.: Fr.) Kotl. & Pouzar,

Ceska Mykol. 11:154, 1957. - *Polyporus ovinus* Schaeff.: Fr., Syst. Mycol. 1:346, 1821.
Basidiocarps annual, centrally to laterally stipitate, usually single, occasionally confluent; stipe cream coloured to brownish, very finely tomentose, drying rugose, up to 7 cm long and 3.5 cm thick; pilei circular to reniform, up to 15 cm in diam and 2.5 cm thick, pilear surface cream- coloured to buff, glabrous, usually becoming areolate with pale yellow colouration in the cracks, drying rugose, greyish or pale olivaceous, pore surface pale yellow when fresh, drying dark-olivaceous to pinkish olivaceous or cinereous, pores circular to angular, 3-5 per mm, context cream coloured to pinkish straw coloured to darker pinkish brown, with a dark layer next to the tubes, fleshy when fresh, drying firm, up to 2 cm thick near the stipe, blackish where touched with Melzer's reagent; tube layer decurrent, yellowish when fresh, drying pinkish buff or olivaceous buff, brittle, up to 4 mm thick, aromatic with a pleasant odour.
Hyphal system monomitic; hyphae thin-walled, simple-septate, highly variable in diam with irregular swellings and constrictions, 4 to 30 µm in diam, gloeopleurous hyphae also present, often sinuous and with bulbous swellings, up to 13 µm in diam.
Basidiospores 4-5 x 3-3.5 µm, ovoid to subglobose.
Substrata. On the ground in coniferous forest ecosystems and ectomycorrhizal.
Distribution. Circumboreal in the northern conifer forest ecosystems.
Remarks. Basidiocarps of *A. ovinus* are edible and often occur in large numbers and are often collected in large quantities.

AMAURODERMA Murrill,

Bull. Torr. Bot. Cl. 32:366, 1905.
Basidiocarps annual or reviving for a second season, centrally-laterally stipitate, consistency corky to woody hard, pileus round, reniform to fan-shaped, concave, umbilicate to strongly infundibuliform, white, ochraceous, brown to almost black, dull to glossy, stipe rather thin and long, finely tomentose to glabrous, pore surface whitish to ochraceous to brown, pores round to angular and entire, context white, ochraceous to dark brown, cystidia absent, hyphal system dimitic, generative hyphae with clamps, skeletal hyphae arboriform, often dextrinoid, basidiospores hyaline to pale yellow, sub-globose to cylindrical, dextrinoid to non-dextrinoid, finely asperulate or rarely smooth. Usually parasitic on roots of living trees. A tropical genus with a white rot.
Type species: *Fomes reguli colour* Cooke, (=*Polyporus schomburgkii* Mont. & Berk.).
Remarks. The genus is related to *Ganoderma*, except for the consistently stipitate basidiocarps and round to oblong spores, which are truncate in *Ganoderma*.

Amauroderma schomburgkii (Mont. & Berk.) Torrend,

Broteria Bot. 18:140, 1920. - *Polyporus schomburgkii* Mont. & Berk., Lond. J. Bot. 3:331, 1844. - *Polyporus brunneo-pictus* Berk. J. Bot. 8:176, 1856. - *Polyporus cassiae colour* Berk. Ibid. 181, 1856. - *Polyporus glaziovi* Berk. Vidensk. Medd. Dansk Naturforh. Copenhagen 31/32: 31, 1880. - *Polyporus ocellatus* Berk. Ibid. p.172, 1856. - *Polyuporus semiclausus* Berk. ibid. p. 193, 1856. - *Polyporus xylodes* Berk. ibid. p. 171, 1856. - *Fomes regulicor* Cooke, Grevillea 15:123, 1886. - *Polyporus papillatus* Lloyd, Lloyd Mycol. Writ. 4:567, 1916.
Basidiocarps annual, centrally to laterally stipitate; pileus single, convex to applanate, spatulate or flabelliform to infundibuliform, slightly undulate, 3-10 cm in diam, 6-10 mm thick, woody, glabrous, dull, dark reddish brown, often with concentric zones, in section with a thin darker crust; margin sharp and deflexed when dry, pore surface whitish grey when fresh and actively growing, becoming dark brown with age and drying, pores angular with entire dissepiments, 5-7 per mm; tubes concolorous, often darker than the context, up to 5 mm deep, context golden to dark brown, darker when old and dry, up to 4 mm thick.
Stipe 4-9 cm long, 5-8 mm thick, tubular, dull, concolorous with the pileus.
Hyphal system dimitic, generative hyphae with clamps, hyaline, thin-walled, 2-4 µm wide, , solid, hyaline, 2-3 µm in diameter, skeletal hyphae thick-walled, hyaline, arboriform , those of the dissepiment with apical protuberances, 2-6 µm wide, the cortex on the upper surface consists of agglutinated hyphae without any distinct structure.
Basidia not seen.
Basidiospores globose, thick-walled with distinct endosporic projections, yellow, negative in Melzer´s reagent, 7-10 µm in diam.
Substrata. Known from dead deciduous wood.
Distribution. Known from southern Brazil to Cuba, Puerto Rico and Jamaica and seemingly the most common *Amauroderma* seen in the neotropics and locally rather abundant.
Remarks. The reddish-brown pileus, the brown context, the small pores and the globose basidiospores characterize this species. *A. sprucei* is separated only by its white to pale cream context.

AMYLOCYSTIS Bond. & Singer,

Mycologia 36:66, 1944.
Basidiocarps annual, sessile or effused-reflexed; pilear surface tomentose to hispid; pore surface and context white, bruising or drying reddish brown; hyphal system monomitic; generative hyphae with clamps, amyloid; cystidia thick-walled, often incrusted at apex, amyloid; basidiospores cylindrical. Monotypic genus.
Type species: *Amylocystis lapponica* (Romell) Singer.
Remarks. The characters of this genus are like those of *Oligoporus* with the exception of the amyloid hyphae and presence of cystidia.

Amylocystis lapponica (Romell) Singer,

Mycologia 36:66, 1944. - *Polyporus lapponicus* Romell, Ark. Bot. 11, 3:17, 1911.
Basidiocarps annual, sessile or effused-reflexed, dimidiate, up to 15 cm wide; pileus surface white to light buff, becoming dark reddish brown on bruising or drying, tomentose to hispid, azonate; pore surface white when fresh, becoming dark reddish brown with age, bruising, or drying, the pores 3-4 per mm, angular; context pale buff, sometimes with a darker layer near the upper surface, corky, azonate, up to 2 cm thick; tube layer slightly darker than the context, up to 4 mm thick; taste slightly bitter, anise-like.
Hyphal system monomitic**;** generative hyphae with abundant clamps, mostly thick-walled with a narrow and sinuous lumen, weakly to strongly amyloid in Melzer's reagent, 4-10 µm in diam.
Cystidia 30-45 x 5-9 µm, projecting to 15 µm, abundant, mostly thick-walled, fusiform, moderately to strongly amyloid in Melzer's reagent, some incrusted at the apex.
Basidiospores 8-11 x 2.5-3.5 µm, cylindrical.
Substrata. Coniferous trees.
Distribution. Circumboreal in the continental coniferous forest ecosystems.
Remarks. *Amylocystis lapponica* is particularly common on spruce logs and often its basidiocarps develop near melting snow early in the spring.

AMYLOSPORUS Ryvarden,

Norw. J. Bot. 20:1, 1973.
Basidiocarps annual, terrestrial or lignicolous, sessile to stipitate; pilear surface cream to buff, finely tomentose; context white to pale tan, soft; pores regular, 2-4 per mm; hyphal system dimitic; generative hyphae with simple septa, either single, double, or multiple clamps; skeletal hyphae thick-walled, unbranched to moderately branched; gloeopleurous hyphae present; cystidia absent; basidiospores elliptic, smooth to finely ornamented, weakly to strongly amyloid in Melzer's reagent. Causes a brown rot. Monotypic genus.
Type species: *Tyromyces graminicola* Murrill.
Remarks. *Amylosporus* is a rather distinct genus with its sessile to stipitate basidiocarps, a dimitic hyphal system with double and multiple clamps on the generative hyphae and amyloid spores. The spores are finely warted and indicate a possible relationship to the Hericiaceae rather than to other polypore genera.

Amylosporus campbellii (Berk.) Ryvarden,

Norw. J. Bot. 24:217, 1977.- - *Polyporus campbellii* Berk., Hooker's J. Bot. Kew Gard. Misc. 6:228, 1854. - *Tyromyces graminicola* Murrill, Tropical Polypores, p. 21, 1915. - *Polyporus propinquus* Lloyd, Mycol. Writ. 7:1109, 1922. - *Scutiger tisdalei* Murrill, Lloydia 6:227, 1943.
Basidiocarps annual, pileate, centrally or laterally stipitate to sessile, single or clustered, soft when fresh, drying very light and fragile; pilear surface white at first, becoming cream- coloured to buff, when dry mostly ochraceous buff with darker spots to cinnamon brown, finely tomentose, smooth to uneven, azonate; stipe short to almost absent, usually tapering to a root-like base, up to 6 cm high, indistinctly intergrading with the pileus, ochraceous to darker brownish, often with darker spots, pore surface at first white, becoming concolorous with the upper surface with age or drying, the pores circular to angular, 2-4 per mm, context homogeneous, white when fresh, fissile, crisp and breaking cleanly, light buff to pale brownish on drying, soft and fragile, up to 2 cm thick; tube layer concolorous with pore surface, white when fresh, becoming ochraceous, pale resinous brown when dry and then brittle, up to 10 mm thick; fresh specimens becoming malodorous like decaying vegetables or garbage.
Hyphal system dimitic; generative hyphae thin-walled, readily collapsed, with simple septa and occasional single, double, or multiple clamps, 3-14 µm in diam; skeletal hyphae thick-walled, unbranched or with irregular to dendritic branching, mostly 2.5-7 µm in diam; gloeopleurous hyphae present, mostly in the context, thin-walled and filled with refractive contents, 3-10 µm in diam.
Basidiospores 4-5.5 x 2.5-4 µm, elliptic to ovoid, amyloid, smooth to finely ornamented.
Substrata. Connected to roots of living plants of different kinds, mostly in grassland and savannas.
Distribution. Pantropical.
Remarks. The large semistipitate white basidiocarps make this a distinct species. Microscopically the variable septation and amyloid spores are distinctive characters.

ANOMOLOMA Niemelä & K.H. Larsson.,

Mycotaxon 100: 312, 2007.
Basidiocarps annual, resupinate, loosely attached, soft to brittle, margin with rhizomorphs; pore surface white to yellow; hyphal system monomitic, generative hyphae with clamps; cystidia none; spores elliptic to ovoid or subglobose, smooth, thin walled and amyloid. On dead conifers and hardwoods, causing a white rot.
Type species: *Polyporus albolutescens* Romell.
Remarks. The characters of *Anomoloma* are similar to those of *Anomopori*a, but separated by the presence of rhizomorphs and a white rot.

Anomoloma albolutescens (Romell) Niemelä & K.H. Larsson,

Mycotaxon 100: 312, 2007. - *Polyporus albolutescens* Romell, Ark. Bot. 11: 11, 1911.
Basidiocarps resupinate, annual, small to widely effused, up to 3 mm thick, easily separable, soft and brittle, margin usually wide, fimbriate and with rhizomorphs; pore surface cream to pale chrome yellow, darkening to distinctly yellow, often with an orange, brown tint when dry, pores angular, 2-4 per mm, subiculum yellow; tube layer concolorous, up to 2 mm thick.
Hyphal system monomitic; generative hyphae with clamps, in the subiculum and margin smooth to finely encrusted, thin to slightly thick walled, 2.5-5 µm wide, sparingly branched; in the trama and subhymenium thin walled, smooth and 2-4 µm wide.
Basidiospores 3-5 x 2.5-3.5 µm, elliptic to subglobose, amyloid in Melzer's reagent.
Substrata. On dead coniferous wood, in Europe only known from *Picea*.
Distribution. Rare, but circumboreal in coniferous forests.
Remarks. *A. albolutescens* is separated from other yellow, resupinate polypores in the boreal conifer zone by its amyloid spores.

ANOMOPORIA Pouzar,

Ceska Mykol. 20:172, 1966.
Basidiocarps annual, resupinate, loosely attached, soft to brittle; margin often with rhizomorphs; pore surface cream to lavender or yellow; hyphal system monomitic; generative hyphae with clamps; cystidia absent; spores elliptic, smooth, thin-walled, amy-

loid in Melzer's reagent. Causing a brown rot in dead conifer wood. Circumglobal in the northern conifer zone.
Type species. *Polyporus bombycinus* Fr.
Remarks. The genus is restricted to brown rot species excluding the other white rot species previously placed in the genus and now placed in *Anomoloma*.

Anomoporia bombycina (Fr.) Pouzar,

Ceska Mykol. 20:172,1966. - *Polyporus bombycinus* Fr., Elench. Fung. 1:117, 1828. - *Poria fulvella* Bres., Mycologia 17:76, 1925. - *Poria coniferarum* D.V. Baxter, Pap. Michigan Acad. Sci. 23:300, 1939.
Basidiocarps annual, resupinate, in small patches to widely effused with age, up to 3 mm thick, soft when fresh, fragile when dry, easily separable; margin ochraceous to pale violet-brown, fimbriate to cottony, rarely with some scattered rhizomorphs; pore surface pale buff to lavender, the pores at first circular, but becoming angular and more irregular, 2-4 per mm, subiculum pale buff to pale brownish lavender, soft, up to 1 mm thick; tube layer concolorous with pore surface, up to 2 mm deep.
Hyphal system monomitic; generative hyphae with clamps, hyaline, but with a few scattered yellowish crystals, mostly 4-6 µm in diam.
Basidiospores 5-7 x 3-5 µm, broadly elliptic.
Substrata. On dead conifer wood, rarely on hard woods.
Distribution. Circumglobal in boreal conifer forest ecosystems.
Remarks. Basidiocarps of *A. bombycina* are often recognized in the field because of their distinctive pale brownish lavender colouration.

ANTRODIA P. Karst.,

Meddel. Soc. Fauna Fl. Fenn. 5:40, 1880.
Basidiocarps annual to perennial, resupinate to effused-reflexed, mostly light coloured and tough-fibrous to hard; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae hyaline or slightly tinted in a few species, variably amyloid in a few species; cystidia absent; small fusoid cystidioles often present among the basidia; spores cylindrical to oblong-elliptic, hyaline, thin-walled, smooth, negative in Melzer's reagent. Causing a brown rot, mostly in dead conifer wood. Large cosmopolitan genus with many species.
Type species: *Daedalea serpens* Fr. = *Antrodia serpens* (Fr.) P. Karsen.
Taxonomic synonyms:
Amyloporia Singer. (*Polyporus calceus* Fr. = *Polyporus xanthus* Fr.).
Cartilosoma Kotlaba & Pouzar (*Trametes subsinuosa* Bres.).
Fibroporia Parmasto (*Polyporus vaillantii* Fr.).
Anthoporia Karasiński & Niemelä (*Polyporus albobrunneus* Romell).
Remarks. The genus is here emended to include species with a dimitic hyphal system, clamped generative hyphae causing a brown rot in the attacked wood. The spores vary from allantoid to oblong-elliptic and all are negative in Melzer's reagent. True cystidia are not present in the genus.

Antrodia serpens (Fr.) P. Karst.,

Medd. Soc. Fauna Flora Fennica 5:40, 1879. - *Daedalea serpens* Fr.: Fr., Syst. Mycol. 1: 340, 1821.
Basidiocarps annual, resupinate to semipileate, tough when fresh, slightly harder when dry; pore surface white to cream, pores often variable, angular, 1.3-2 per mm, on sloping substrates often sinuous and elongated, context white and tough, rarely above 3 mm thick at the base; tube layer con colourous, up to 1.5 cm thick.
Hyphal system dimitic; generative hyphae with clamps, in the context and parts of the trama, thin to distinctly thick walled, 2-5 µm in diam, in the subhymenium thin walled, mostly 2-4 µm in diam; skeletal hyphae thick walled to almost solid, hyaline, unbranched to rarely dichotomously branched, 3-6 µm in diam.
Cystidia absent; but fusoid cystidiols often present, 25-45 x 6-7 µm.
Basidia 30-40 x 6-9 µm, clavate, di- or tetrasterigmatic
Basidiospores 8.5-12.5 x 3.6-4.6 µm, cylindrical, often rather variable within the same collection which presumably is due to a variable number of sterigmata on the basidia.
Substrata. Numerous genera of hardwoods, more rarely on conifers like *Abies* and *Pinus*.
Distribution. Circumpolar in the northern coniferous forests and into the temperate zone.
Remarks. The hymenophore is often confusing and may in one collection be purely poroid, in the next one almost purely lamellate, and in some cases both types are present with intermediate structures. The large spores will usually be sufficient to separate it from the other species of *Antrodia* on hardwoods.

ANTRODIELLA Ryvarden & I. Johansen,

Prelim. Polypore Flora East Africa, p. 256, 1980.
Basidiocarps annual to perennial, pileate to resupinate, soft to coriaceous when fresh, often dense and hard when dry with a semi-transparent appearance; pore surface pale ochraceous to straw-coloured, pores small; tubes in many species as if soaked with some resinous substance; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae hyaline, thick-walled; cystidia absent or present; spores globose to elliptic, rarely cylindrical, smooth, thin-walled, negative in Melzer's reagent, generally less than 5 µm in longest dimension. On dead wood of conifers and hardwoods, causing a white rot. Cosmopolitan genus.

Type species: *Antrodiella semisupina* (Berk. & M. A. Curtis) Ryvarden.
Taxonomic synonyms:
Metuloidea Miettinen (*Trametes fragrans* David & Tortic).
Franseika Spirin & Zimtr. (*Poria fissiliformis* Pilat).
Remarks. *Antrodiella* has the same general hyphal system as *Antrodia* and in many cases it may be difficult to distinguish the two genera even if *Antrodiella* species cause a white rot. Generally, the spores in the latter genus are shorter than those of *Antrodia*. In doubtful cases one may check both genera.
Many *Antrodiella* species occur on or close to dead basidiocarps of other polypores. Whether this is a case of parasitism or an adaptation to the type of decay caused by other poroid species, is unknown.

Antrodiella semisupina (Berk. & M.A. Curtis) Ryvarden,

Prelim. Polypore Fl. East Africa, p. 261, 1980. - *Polyporus semisupinus* Berk. & M.A. Curtis, Grevillea 1:50, 1872.
Basidiocarps annual, usually sessile to effused-reflexed, rarely resupinate, usually small, when pileate often imbricate with many narrow pilei and fused laterally, pilei most prominent along the upper edge of the basidiocarp, pore surface often decurrent or effused, individual pilei rarely above 2 cm wide, up to 4 mm thick at the base, resupinate specimens up to 5 mm thick, soft and waxy when fresh, dense and cartilaginous or resinous when dry, pileus at first white, azonate, adpressed velutinate, with age becoming glabrous, slightly zonate and darker in shades of ochraceous to pale straw coloured, sometimes with radial lines; pore surface cream to pale straw coloured, becoming deeper in colour and pale reddish brown to deep straw coloured with a shine when turned in incident light, the pores circular to angular, in resupinate and horizontal parts 5-7 per mm, almost invisible to the naked eye, on sloping substrata semi-irregular and up to 3 per mm, context white to cream, dense, 1-2 mm thick; tube layer concolorous with pore surface, dense, difficult to macerate in microscopical preparations, up to 3 mm thick; taste mild.
Basidiospores 2.5-4 x 2-2.5 µm, oblong elliptic.
Substrata. Primarily on dead hardwoods, rarely on conifers and on dead basidiocarps from genera such as *Fomes, Fomitopsis* and *Trichaptum*.
Distribution. Widespread in the North American northern hardwood forests. Replaced by similar species in Europe and Asia.
Remarks. Basidiocarps of *A. semisupina* are variable, but are well characterized by the dense semi translucent consistency, small pores, trimitic hyphal system, and small oblong elliptic spores.

AURANTIOPILEUS Ginns, D. L. Lindner & T. J. Baroni,

N. Amer. Fung. 5:4, 2010.
Basidiocarps orange, relatively small, fleshy to gelatinous when fresh, pores irregular, hyphal system monomitic with clamped generative hyphae, context and trama with thin walled cystidia embedded in the gelatinous trama, basidiospores small and broadly ellipsoid (4-6 x 2.8-4.6 mm) and non-amyloid. Causes a white rot. Monotypic American genus.
Type species: *Aurantiopileus mayanensis* Ginns, D. L. Lindner & T. J. Baroni.
Remarks. The dark orange gelatinous and soft basidiocarps may remind one of a *Phlebia* species, but the cystidia and the pores make the genus distinct.

Aurantiopileus mayanensis Ginns, D. L. Lindner & T. J. Baroni, Op.cit.
Basidiocarps orange when fresh, soft, jelly like, deeper orange over margin, effused reflexed or substipitate, 20-60 mm broad, circular when substipitate or dimidiate when lacking a stipe, single or imbricate, confluent and fused in larger basidiocarps, pileus deep orange, glabrous, rugulose, whitish near attachment, slightly zonate, when dry white to pale brown, radially striate, striae fine, slightly glossy pore surface orange; pores round or angular, 2-4 per mm, shallow and up to 1 mm deep or appearing somewhat rugulose pitted or fluted, dissepiments fimbriate to dentate, context orange- watery, gelatinous when fresh, drying hard and cartilaginous and then with pale brown, radiating striate, 1.0-2.5 mm thick.
Hyphal system monomitic, generative hyphae hyaline, 3-5 µm diameter with clamp connections, tramal and context hyphae with gelatinous walls that merge into structure less mucilage and the hyphae appear to be embedded in a gelatinous matrix.
Gloeopleurous hyphae scattered in trama and context, 3-6 µm wide, contents homogeneous, pale yellow in KOH, sparingly branched.
Cystidia 35-100 x 5-15 µm confined to tramal core, embedded, typically in vertically oriented fascicles, clavate, narrowly clavate or fusoid, thin walled, smooth, some with a thick, gelatinous coating, contents homogeneous, slightly refractive in KOH.
Basidia 18-26 x 6-7 µm, clavate with four sterigmata, each 5 µm long.
Basidiospores (4.6-) 5.0-6.0 x 3.6-4.5 µm, elliptic to broadly elliptic, smooth, thin walled, hyaline, negative in Melzer's reagent, mostly with a single large oil drop.
Distribution. Known only from the type locality in Belize.
Remarks. The genus is characterized by a fleshy to gelatinous deep orange texture, slightly irregular pores, a gelatinous context and trama and cystidia embedded in the trama. Superficially it may remind one of some *Phlebia* species, such as *P. tomentosa*, which however is paler and have a white tomentose pileus and a folded, merulioid hymenophore

APORPIUM Singer,

Mycologia 36: 67, 1944.
See *Protomerulius*.

AURIPORIA Ryvarden,

Norw. J. Bot. 20:3, 1973.
Basidiocarps resupinate to pileate, annual; pore surface yellow to orange when fresh; hyphal system mono-to dimitic; generative hyphae with scattered clamps; skeletal hyphae, when present, few, mostly confined to the context; cystidia ventricose, thick-walled and apically incrusted or smooth, basidiospores cylindrical to elliptic, smooth, thin-walled, negative in Melzer's reagent. On angiosperms and gymnosperms, causing a brown rot. North temperate genus.
Type species: *Auriporia aurea* (Peck) Ryvarden.
Remarks. The genus is characterized by its distinct cystidia and yellowish basidiocarps.

Auriporia aurea (Peck) Ryvarden,

Norw. J. Bot. 20:3, 1973. - *Poria aurea* Peck, N.Y. State Mus. Ann. Rep. 43:21, 1890.
Basidiocarps annual, resupinate; pore surface yellow when fresh, drying yellowish-buff to pale brownish, pores circular to angular, 2-4 per mm; margin con colourous, radiately fimbriate; subiculum drying pale buff with darker resinous streaks, soft, up to 1 mm thick; tube layer up to 3 mm thick, consistency soft and easily sectioned.
Cystidia 20-55 x 12-25 µm, frequent in hymenial layer, ventricose, thick-walled, usually with coarse apical incrustation, projecting to 15 µm, occasionally branched at the base and appearing rooted.
Basidiospores 5-8.5 x 3-4 µm, cylindrical to oblong elliptic.
Substrata. Dead conifers and hardwoods.
Distribution. Endemic in United States and recorded from the Northeast, Southwest and Pacific Northwest. It is apparently widely distributed, but seemingly rarely collected.
Remarks. The conspicuous, thick-walled, apically incrusted cystidia and the yellow colour of the basidiocarps, are a unique combination of characters among the polypores.

BJERKANDERA P. Karst.,

Meddel. Soc. Fauna Fl. Fenn. 5:38. 1879.

Basidiocarps annual, sessile, effused-reflexed, rarely resupinate; pilear surface light coloured, azonate, finely tomentose to glabrous; pore surface cinereous-grey or blackish to greyish brown; tube layer distinctly delimited from a white to pale cream context; hyphal system monomitic; hyphae with clamps, thin- to thick-walled; cystidia absent; spores oblong to short-cylindrical, smooth, negative in Melzer's reagent. Causes a white rot. Small genus with 2 widespread species throughout the boreal and temperate zones, rare in subtropical and tropical zones.
Type species: *Bjerkandera adusta* (Fr.) P. Karst.
Remarks. The blackish to cinereous-grey pore surface and tube layer, distinctly delineated from the whitish context, is the distinctive generic character.

Bjerkandera adusta (Willd.) P. Karst.,

Meddeland. Soc. Fauna Fl. Fenn. 5: 38, 1897. - *Polyporus adustus* (Willd.) Fr., Syst. Mycol. l: 363, 1821. - *Boletus adustus*_ Willd., Fl. Berol. Prodr. p. 392, 1787.
Basidiocarps annual, sessile, pileate, effused-reflexed, or occasionally resupinate under logs, often in imbricate clusters, tough, reflexed up to 3 cm; upper surface of pileus cream to buff, tomentose or strigose to glabrous with age, azonate or faintly zonate; pore surface grey to black, the pores angular, regular, 6-7 per mm, dissepiments thin, entire; context pale buff, azonate with distinct thin upper layer of tomentum, up to 6 mm thick; tube layer smoky grey, distinct from context, up to l mm thick.
Hyphal system monomitic; contextual hyphae thin- to moderately thick-walled, with abundant clamps, 3-5 µm in diam., with occasional branching; tramal hyphae similar but densely compacted and agglutinated.
Cystidia or other sterile hymenial elements lacking; dark brownish vascular hyphae sometimes present in subhymenium and in hymenial layer.
Basidia 10-14 x 4-5 µm, clavate.
Basidiospores 4.5-6 x 2.5-3.5 µm, short cylindrical.
Substrata. On all genera of hardwoods, rarely on conifers.
Distribution. Cosmopolitan and common.
Remarks. The smoky grey to black colour of the pore surface and the cream coloured pileus, often greyish along the margin, are distinctive field characters.

BOLETOPSIS Fayod,

Malpighia 3:72, 1889.
Basidiocarps stipitate, annual, fleshy, grey to pale sordid brown, darker when bruised; pilear surface smooth to finely scaly; stipe central to lateral; hyphal system monomitic; generative hyphae hyaline, delicately thin-walled, with clamps, variable in diameter

and up to 20 µm in diameter; cystidia absent, spores irregular and angular, coarsely tuberculate, hyaline to pale brownish. Terrestrial, and mycorrhizal with conifers.
Type species: *Polyporus subsquamosa* (L.) Fr.
Remarks. The genus belongs in *Thelephoraceae* (Russulales) evident from spore morphology and verified by DNA sequencing.

Boletopsis leucomelaena (Pers.) Fayod,

Malphigia 3:72, 1889. - *Boletus leucomelas* Pers., Syn. Meth. Fungorum 1: 515, 1801.
Basidiocarps annual, stipitate, fleshy, up to 10 cm in diam. and 4 cm thick in centre, about as tall as wide; stipe central or lateral; pileus often irregular in outline with undulating margin, fleshy when fresh and then brittle, easily breaking in all directions, soft to brittle when dry, taste initially mild, but developing to a slightly soapy, bitter after-taste, slightly bitter when dry; upper surface of pileus smooth, glabrous and matted, deep greyish to blackish, in young specimens paler along the margin, when old with fine scales or tufts, when dry dark brownish grey to greenish black and wrinkled, azonate, margin thin and wavy; stipe central to lateral, up to 7 cm high and 3 cm in diam., grey to pale sordid olivaceous brown, smooth to finely squamose with darkened scales, fleshy when fresh, wrinkled when dry, solid; pore surface at first cream, soon becoming pale lilac grey to olivaceous grey, drying grey to brown, pores thin-walled, angular, 1-3 per mm; context white when fresh, up to 3 cm thick, darkening to lilac grey when broken in the fresh condition, becoming greenish grey when dry, often somewhat darker just above the tubes and with a slight greenish tint close to the pileus surface; tube layer white to greenish white, usually distinctly paler than the context, up to 8 mm thick; entire basidiocarp sepia-black with KOH.
Hyphal system monomitic; generative hyphae delicately thin-walled or in the subhymenium slightly thick -walled, hyaline and of variable diameter, 3-20 µm, with irregular branching, with clamps at all septa, clamps sometimes small and inconspicuous, in other cases large and prominent.
Cystidia and other sterile hymenial elements absent.
Basidia 20-35 x 5.5-8.5 µm, clavate.
Basidiospores 5-6.5 x 4-5 µm, angular and irregularly tuberculate in outline, hyaline to pale brownish in mass, thin-walled, negative in Melzer's reagent.
Substrata. Terrestrial, in grassy and rich soil in coniferous forests, usually on calcareous soil.
Distribution. Due to confusion with other species, literature records are difficult to interpret. In Fennoscandia the species is continental with a southern inclination and known only from the southern parts of Scandinavia. Probably widespread in central Europe and recorded south to Portugal. Circumboreal in the conifer forest zone, but everywhere rare.
Remarks. Recognized by the blackish pileus and occurrence on rich soil in spruce forests, at least in Fennoscandia.

BONDARCEVOMYCES Parmasto,

Mycotaxon 70:222, 1999.
Basidiocarps pileate with greenish to brown tints and tomentose to strigose, pores angular, context pale greenish, hyphal system monomitic with clamped generative hyphae, basidiospores cylindrical to oblong ellipsoid, smooth and negative in Melzer´s reagent. Growing on coniferous wood and causing a white rot. Monotypic genus.
Type species: *Polyporus taxi* Bondartsev.
Remarks. The genus is above all characterized by the stipitate basidiocarps, almost always developing on the ground, the black, brownish greenish colours and the unpleasant scent.

Bondarcevomyces taxi (Bondartsev) Parmasto,

Mycotaxon 70: 222, 1999. - *Polyporus taxi* Bondartsev, Bot. Mater. Otd. Sporov. Rast. Inst. Akad. Nauk SSSR 5(1-3): 17, 1940.
Basidiocarps annual, sessile or laterally substipitate with a narrowed base, single, dimidiate, soft and spongy when fresh, drying brittle and very light in weight, up to 4 cm wide, 3 cm long, and 0.8 cm thick; upper surface of pileus pale yellowish brown to orange brown to darker rusty brown at the base, with greenish shades toward the margin, tomentose to strigose or scrupose in spots, on the narrowed rusty brown basal part more radially appressed-strigose, margin rounded, with greenish tints, narrowly sterile below; pore surface olivaceous green, the pores angular, mostly 2-3 per mm with occasional larger ones up to 1 mm wide, the dissepiments thin, entire; context pale greenish buff, azonate, soft-fibrous, up to 6 mm thick, instantly turning black where touched with KOH solution; tube layer concolorous with pore surface in lower part, pale greenish buff nearer the context, up to 2 mm thick; odour strong and unpleasant like decaying plant material or garbage, persistent in dried herbarium specimens for years.
Hyphal system monomitic; contextual generative hyphae hyaline to pale yellowish, thin walled, collapsing readily, with clamps, mostly 2-5 µm but some inflated up to 8-9 µm in diam.; tramal hyphae similar; hyphae in all tissues interwoven and collapsing readily, difficult to see clearly, gloeoplerous hyphae also present.
Cystidia absent, fusoid cystidiols present, 13-22 x 4-5 µm, with a basal clamp.
Basidiospores 4.5-5 x 2-2.5 µm, cylindrical to elliptic.
Substrate. Reported from *Taxus* and *Larix*.
Distribution. Known from the Black Sea coast of the Caucasus Mountains and in Novosibirsk in eastern Russia.
Remarks. Readily identified in the field by the greenish olivaceous colour of the pore surface and the strong, unpleasant odour.

BONDARZEWIA Singer,

Rev. Mycol. 5:4, 1940.
Basidiocarps annual, centrally to laterally stipitate or sessile, pilei single or densely imbricate; pilear surface ochraceous to purplish-brown, finely tomentose or strigose to glabrous; pore surface white to cream- coloured, pores 1-2 per mm; context white to buff, fleshy-tough, drying hard; hyphal system dimitic; generative hyphae simple-septate; skeletal hyphae with rare branching; cystidia absent; basidiospores globose to subglobose, hyaline, ornamented with short, irregular amyloid ridges.
Type species: *Bondarzewia montana* (Quél.) Singer.
Remarks. The large basidiocarps and the amyloid ornamented spores make the genus unique.

Bondarzewia mesenterica (Schaeff.) Kreisel,

Feddes Repert. 95: 699, 1984. - *Boletus mesentericus* Schaeff., Fung. Bavar. Palat. Nasc. 4: 91, 1774. - *Cerioporus montanus* Quél., Fl. Mycol. France, p. 408, 1888.
Basidiocarps annual, centrally to laterally stipitate, stipe terminating in an underground sclerotium, pilei solitary or several on a branched stipe, flabelliform, up to 11 cm wide and 1 cm thick; upper surface purplish brown, azonate, scurfy to finely tomentose, drying rugose, margin concolorous; pore surface cream coloured, the pores angular, 1-3 per mm, with thin dissepiments that become lacerate; context cream coloured, azonate, firm, fissile when dry, up to 1 cm thick; tube layer continuous and concolorous with context, up to 2 mm thick, often decurrent on stipe almost to ground level; odour very pleasant, nut-like.
Hyphal system dimitic; contextual generative hyphae thin-walled, simple septate, with rare branching, 4-8 µm in diam.; contextual skeletal hyphae thick-walled, aseptate, with infrequent branching, 3-8 µm in diam.; tramal hyphae thin-walled, simple septate, 2.5-4 µm in diam.
Cystidia or other sterile hymenial elements lacking.
Basidia 30-55 x 10-12 µm, broadly clavate, tetrasterigmatic.
Basidiospores 6-8 x 5-7 µm, globose to subglobose, hyaline in KOH, ornamented with irregularly arranged, short, strongly amyloid ridges.
Substrata. On stumps or near the base of living conifers, especially *Abies* ssp.
Distribution. Central Europe and through Siberia to north-western North America.
Remarks. The fleshy basidiocarps growing on stumps or from roots of living or dead conifers are a good field character. Microscopically, the amyloid, crested spores will immediately rule out any other stipitate polypore.

BYSSOPORIA M.J. Larsen & Zak,

Canad. J. Bot. 56:1123, 1978.
Basidiocarps resupinate, poroid, soft, with rhizomorphs, whitish to yellow, more rarely orange to bluish green; hyphal system monomitic; hyphae with both clamps and simple septa; cystidia absent; basidiospores ellipsoid to subglobose with slightly thickened wall, negative in Melzer's reagent; mycorrhizal with conifers and mostly fruiting on the ground, on organic debris, or very rotten wood. Monotypic and circumglobal.
Type species: *Byssoporia terrestris* (DC.: Fr.) M.J. Larsen & Zak.
Remarks. The genus is usually easy to recognize in the field due to the soft yellowish basidiocarps with slightly irregular pores and soft consistency.

Byssoporia terrestris (DC.: Fr.) M.J. Larsen & Zak,

Canad. J. Bot. 56:1123, 1978. - *Polyporus terrestris* DC.: Fr., Syst. Mycol. 1:383, 1821. - *Poria parksii* Murrill, Mycologia 13:175, 1921.
Basidiocarps annual, resupinate, soft, separable, effused up to several cm, up to 3 mm thick; margin usually rhizomorphic to fimbriate, cream coloured to pale yellowish, pore surface variable in colour, mostly cream to yellowish or straw coloured, but often orange to greenish or with bluish to purplish patches, when old more brownish, the pores angular, sometimes irregular and semi-daedaleoid, 2-3 per mm; subiculum less than 1 mm thick, soft-cottony, paler than tubes and pore surface; tube layer concolorous with pore surface, up to 3 mm thick.
Hyphal system monomitic; subicular hyphae hyaline, thin walled, 2-4.5 µm in diam, with both simple septa and clamps; hyphae of rhizomorphs up to 11 µm in diam, both types of hyphae variably encrusted with round to angular granules; tramal hyphae simple septate, 2-4.5 µm in diam.
Basidiospores 4-5 x 3-4 µm, broadly ellipsoid to subglobose, slightly thick-walled.
Substrata. On rotten plant debris on the ground or on rotted conifer wood, commonly brown rot residua, but also noted on hardwood genera including *Populus* and *Quercus*.
Distribution. Widely distributed in conifer forests of North America and Circumglobal in the warm and temperate regions of the Northern Hemisphere.
Remarks. Basidiocarps of *B. terrestris* are normally easy to recognize because of their soft texture and yellowish to bluish pore surface. The subglobose, slightly thick-walled spores and variable septation of the hyphae are also distinctive.

CERIPORIA Donk,

Med. Bot. Mus. Univ. Utrecht 9:170, 1933.

Basidiocarps annual, resupinate; pore surface white to tan or brightly coloured, purple, orange, pink or greenish; consistency soft; hyphal system monomitic; generative hyphae simple-septate or with rare single, double or multiple clamps; cystidia absent; basidia clavate, tetrasterigmatic, simple-septate at the base; basidiospores oblong to cylindrical or allantoid, hyaline, negative in Melzer's reagent. Causing a white rot in dead conifers and hardwoods.
Type species: *Ceriporia viridans* (Berk. & Broome) Donk.
Remarks. The genus is characterized by resupinate basidiocarps with simple septate hyphae and without any type of cystidia. It is by all probability of polyphyletic origin.

Ceriporia viridans (Berk. & Broome) Donk,
Med. Bot. Mus. Univ. Utrecht 9:171, 1933. - *Polyporus viridans* Berk. & Broome, Ann. Mag. Nat. Hist. 3,7:379, 1861.
Basidiocarps annual, resupinate, usually effused in small patches, up to 3 mm thick, soft when fresh, fragile when dried; margin narrow, white, pore surface variable in colour, mostly cream to cinnamon or sordid brown with a greenish tint, more rarely pinkish sordid white, the pores circular to sinuous, 3-5 per mm, in some specimens larger and more irregular; subiculum white to cinnamon in old specimens, up to 1 mm thick; tube layer concolorous with pore surface, up to 1 mm thick.
Basidiospores 4-6 x 1.5-2 µm, cylindrical to allantoid.
Substrata. Dead hardwoods of many genera, more rarely on conifers, mostly on rather rotten wood.
Distribution. Circumglobal to the boreal zone.
Remarks. This taxon is highly variable in colour of the basidiocarps. Numerous species have been described, based on colour variations of this species. *C. tarda* has normally a more uniform pale pinkish cream colour and consistently narrower hyphae. The spores of the two species are identical.

CERIPORIOPSIS Domanski,

Acta Soc. Bot. Poloniae 32:731. 1963.
Basidiocarps annual, resupinate, mostly light coloured; pores small to medium; context white to light coloured, thin; hyphal system monomitic; generative hyphae with clamps; cystidia none; spores smooth, thin-walled, hyaline, negative in Melzer's reagent except for one species. On dead wood, causing a white rot. Cosmopolitan genus.
Type species: *Ceriporiopsis gilvescens* (Bres.) Domanski.
Taxonomic synonyms:
Porpomyces Jülich (*Polyporus mucidus* Pers.:Fr.).
Gelatoporia Niemelä (*Poria subvermispora* Pilát).
Raduliporus Spirin & Zimtr. (*Polyporus aneirinus* Sommerf.).
Pouzaroporia Vampola (*Poria subrufa* Ellis & Dearn.).
Remarks. The genus comes close to *Oligoporus*, sharing most of its characters with the important difference that *Oligoporus* species cause a brown rot. *Tyromyces* is separated macroscopically by pileate basidiocarps and with occasional skeletal hyphae.

Ceriporiopsis gilvescens (Bres) Domanski,

Acta Soc. Bot. Poloniae. 32:731. 1963. - *Poria gilvescens* Bres., Ann. Mycol. 6:40. 1908.
Basidiocarps annual, resupinate, adnate, becoming widely effused, waxy and soft when fresh, hard and brittle when dry, up to 4 mm thick; pore surface at first whitish with shades of pink and orange, then darker when touched or wounded, when dry pale straw coloured to orange-brown, the pores angular to circular, 4-5 per mm; subiculum thin and dense, pale straw coloured; tubes concolorous with subiculum, often dense and resinous in consistency in dried specimens.
Hyphal system monomitic; generative hyphae with clamps, thin- to slightly thick-walled, 2-4 µm in diam, in the dissepiments often characteristically covered with small rod-like crystals.
Basidiospores 3.5-4.5(-5) x 1.5-2 µm, subcylindrical to oblong elliptic.
Substrata. Dead hard wood of many species.
Distribution. Widespread in the northern hemisphere.
Remarks. The slight colour change on bruising and the pale orange-brown colour are good field characteristics. Microscopically the sub cylindrical spores and the incrustation of the dissepimental hyphae are good aiding characteristics.

CERRENA S. F. Gray,

Nat. Arr. Brit. Plants 1:649, 1821.
Basidiocarps annual, sessile, effused-reflexed or resupinate; pileus hispid to hirsute, zonate; pore surface daedaloid, becoming split and finally semi hydnoid; context duplex; hyphal system trimitic; generative hyphae with clamps; cystidia absent; basidiospores smooth, cylindrical-elliptic, negative in Melzer's reagent. Causes a white rot of dead hardwoods. Widespread genus, two species in North America.
Type species: *Cerrena uni colour* (Bull.: Fr.) Murrill.
Remarks. The hydnoid or labyrinthine hymenophore, the hirsute, often greenish to grey pileus and a black line below the pileus tomentum, make the genus rather unmistakable.

Cerrena uni colour (Bull.: Fr.) Murrill,

J. Mycol. 9:91, 1903. - *Daedalea uni colour* Bull.: Fr., Syst. Mycol. 1:336, 1821.
Basidiocarps annual, sessile, effused-reflexed, or rarely resupinate; pilei often in imbricate clusters, dimidiate, up to 10 cm wide; pilear surface pale brownish to grey, hirsute to almost glabrous, often green due to algae, sulcate; pore surface ivory to pale buff on young specimens, becoming darker with age, the pores daedaleoid, variable, 3-4 per mm, in parts larger, context duplex, up to 3 mm thick, lower layer corky, pale brown, separated from soft, spongy, darker upper layer by a thin dark zone; tube layer up to 1 cm thick.
Basidiospores 5-7 x 2.5-4 µm, cylindrical-elliptic.
Substrata. Dead wood of many genera of hardwoods.
Distribution. Circumglobal in the Northern hemisphere. Also known from the high mountains in East Africa.
Remarks. *C. uni colour* is easy to recognize in the field because of the hirsute pileus, the black line in the context and the labyrinthine hymenophore.

CHAETOPORELLUS Bondartzev,

Polypor. Eur. USSR and Caucasia, p. 37, 1953.
Basidiocarps annual, resupinate; pore surface white to tan; hyphal system monomitic; generative hyphae with clamps; cystidia cylindrical, thick to thin-walled, incrusted or smooth; basidia clavate, 4-sterigmate; basidiospores cylindrical, hyaline, negative in Melzer's reagent. Causes white rot. Monotypic genus.
Type species: *Chaetoporellus latitans* (Bourdot & Galzin) Bondartzev & Singer.
Remarks. The genus is related to *Hyphodontia* in the Corticiaceae and represents an evolutionary line from hydnoid and smooth representatives of that genus. However, being poroid, it is included in this manual.

Chaetoporellus latitans (Bourdot & Galzin) Bondartzev & Singer,

Ann. Mycol. 39: 50, 1941. - *Poria latitans* Bourdot & Galzin, Bull. Soc. Mycol. France 41: 226, 1925.
Basidiocarps annual, resupinate, becoming widely effused, usually fertile to the margin; pore surface tan, the pores angular, 1-3 per mm, with thin, entire dissepiments that split deeply and become lacerate; context less than 1 mm thick, tan to pale buff, soft-fibrous, azonate; tube layer concolorousand continuous with context, up to 2 mm thick, tubes cream-buff within.
Hyphal system monomitic, generative hyphae with clamps at all septa, with occasional branching, 2-4 µm in diam.
Cystidia 25-35 x 3-4.5 µm, cylindrical with refractive contents, thin-walled, smooth, mostly imbedded, some projecting to 10 µm.
Basidiospores 3.5-5 x 0.5-0.8 µm, narrowly allantoid.
Substrata. Dead wood of conifers, common on *Pinus* through the southern U.S., also on hardwoods.
Distribution. Widely distributed in the Northern hemisphere, but rare in Asia and Europe.
Remarks. *C. latitans* is similar to *Ceriporia alachuana* macroscopically, but the latter species lacks clamps and has oblong spores.

CINEREOMYCES Jülich,

Bibl. Mycol. 85:396, 1981.
Basidiocarps resupinate, adnate, effused, annual, pore surface whitish to distinct greyish, hyphal system dimitic, generative hyphae with clamps, skeletal hyphae dissolving in KOH, weakly amyloid, cystidia absent, basidia with 4 sterigmata, basidiospores cylindrical to sub allantoid, thin walled, smooth, non-amyloid. Causing white rot both in hardwoods and coniferous wood.
Monotypic genus with one north temperate species.
Type species: *Polyporus lindbladii* Fr.
Remarks. The species has the same hyphal system as seen in *Diplomitoporus*, but in this genus the skeletal hyphae do not dissolve in KOH nor are they weakly amyloid. DNA studies have also shown that it is not related to *Diplomitoporus* in spite of their similarity.

Cineromyces lindbladii (Berk.) Jülich,

Bibl. Mycol. 85:400, 1981. - *Polyporus lindbladii* Berk., Grevillea 1:54, 1872. - *Poria subavellanea* Murrill, Mycologia 12:88, 1920.
Basidiocarps annual, resupinate, becoming widely effused, soft-fibrous to tough, up to 6 mm thick, separable; pore surface creamy white to greyish, the pores circular to angular, 3-5(-6) per mm, subiculum white to cream, soft-fibrous, up to 3 mm thick; tube layer greyish towards the pore surface, whiter to cream towards the subiculum, up to 5 mm thick.
Hyphal system di-trimitic; generative hyphae with clamps, 3-5.5 µm in diam; subicular skeletal hyphae straight to sinuous, thick-walled to solid, 3-8 µm in diam, gelatinized in KOH and disappearing, weakly amyloid in Melzer's reagent, this reaction most easily seen in hyphal masses; binding-type hyphae rare and inconspicuous, observed in the context only, 2-4 µm in diam.
Basidiospores 5-7.5 x 1.5-2 µm, cylindrical to allantoid.
Substrata. Most commonly on dead conifers, but also recorded from a number of hardwoods.
Distribution. Throughout the Northern hemisphere.
Remarks. The resupinate, soft-fibrous basidiocarps with the cinereous or greyish pore surface and small pores are usually distinctive in the field. Microscopically, the moderately large spores and the conspicuous gelatinizing (in KOH) of the skeletal hyphae will be sufficient for a determination. The amyloid reaction of the skeletal hyphae is rather variable.

CLIMACOCYSTIS Kotl. & Pouzar,

Ceska Mykol. 12:95, 1958.
Basidiocarps annual, pileate; pilear surface hirsute to smooth with agglutinated tufts of hyphae, white to light cream; pore surface white, the pores angular and moderately large; context white to cream, duplex; hyphal system monomitic; generative hyphae with clamps; cystidia acute, slightly ventricose, thick-walled towards the apex, embedded or only slightly projecting; spores broadly elliptic, hyaline, smooth, negative in Melzer's reagent. Causing a white rot of living and dead conifers. Monotypic genus.
Type species: *Climacocystis borealis* (Fr.) Kotl. & Pouzar.
Remarks. *Climacocystis* is characterized by its often imbricate clusters of whitish basidiocarps and microscopically by the ventricose, slightly thick-walled cystidia.

Climacocystis borealis (Fr.) Kotl. & Pouzar,

Ceská Mykol. 12:96, 1958. - *Polyporus borealis* Fr., Syst. Mycol. 1:366, 1821.
Basidiocarps annual, pileate, developing late in the season; pilei applanate, fan-shaped to broadly sessile, usually dimidiate, up to 15 cm long, 8 cm wide and 4 cm thick towards the base, often imbricate, soft and watery when fresh, light and brittle when dry; pileus flat to slightly convex, tomentose to hirsute when fresh, drying partly glabrous, and often with radial striae, white to light cream or straw coloured; pore surface as pileus, pores angular, in parts more irregular and split, about 1-2 per mm, context white to cream, duplex with a lower dense layer, up to 2 cm thick; tube layer concolorous with pore surface, up to 5 mm thick; taste mild.
Cystidia usually numerous, ventricose and tapering, either acute or slightly rounded at the tip, mostly smooth, but sometimes with a few grainy crystals at the apex, thin-walled in the lower part, distinctly thickened towards the apex, up to 50 µm long from the basal clamp, 5-12 µm in diam, embedded in the hymenium or slightly projecting.
Basidiospores 4.5-6.5 x 3-4.5 µm, broadly elliptic.
Substrata. Known almost exclusively from conifers, especially spruce in boreal or alpine ecosystems, rarely on hardwoods.
Distribution. Circumglobal in boreal conifer forest ecosystems.
Remarks. Basidiocarps of *C. borealis* are readily recognized in the field because of their soggy or watery consistency. They often develop in large imbricate clusters, and the whitish to pale ochraceous colour, the coarsely hirsute to scrupose pilear surface and the cystidia, are diagnostic.

COLTRICIA S.F. Gray,

Nat. Arr. Brit. Plants 1:644, 1821.
Basidiocarps annual, stipitate, soft and tough when fresh, hard and brittle when dry; pileus surface yellowish to deep rusty brown, in some species grayish with age, tomentose to silky with appressed hairs; pore surface cinnamon to rusty brown, pores angular, medium to large; stipe usually central, concolorous with the pileus; context cinnamon to deep rusty brown; all parts of basidiocarp black with KOH; hyphal system monomitic; generative hyphae with simple septa, hyaline to pale rusty brown, narrow to wide, thin- to thick-walled; setae absent in all temperate species or present in some tropical representatives; spores cylindrical to elliptic, at maturity golden yellow to rusty brown, thin- to slightly thick-walled, slightly dextrinoid in Melzer's reagent. On the ground or on well decayed wood. Cosmopolitan genus.
Type species: *Polyporus perennis* L.:Fr.
Remarks. The genus as circumscribed here seems to be a rather natural one. *Coltricia* species in North America are generally terrestrial and *C. perennis* has been demonstrated to be able to produce basidiocarps both as a wood-destroying agent and as a facultative mycorrhizal partner.

Coltricia perennis (L.:Fr.) Murrill,

J. Mycol. 9:91, 1903. - *Boletus perennis* L., Sp. Plant. p. 1177, 1753. - *Polyporus perennis* L.:Fr., Syst. Mycol. 1:350, 1821. - *Polyporus proliferus* Lloyd, Mycol, Notes 1:8, 1908. - *Polyporus decurrens* Lloyd, Mycol. Notes 1:12, 1908.
Basidiocarps annual, stipitate, pileus more or less circular, often confluent with adjacent specimens when growing in groups, up to 10 mm in diam, 2-5 mm thick at centre, tough and coriaceous when fresh, brittle and hard when dry; pilear surface pale cinnamon to deep brown and velvety-tomentose at first, becoming dull greyish and glabrous with age, usually zonate, pore surface golden brown, becoming cinnamon to darker brown, the pores angular, 2-4 per mm, tubes often slightly decurrent on the stipe; context rusty brown, densely fibrous, paler towards the upper surface, 1-2 mm thick; tube layer cinnamon to rusty brown, up to 3 mm thick.
Hyphal system monomitic; generative hyphae simple-septate; rusty brown, 3-8 µm in diam., hyphae on pilear surface thick-walled, erect, with distinctive dichotomous antler-like branching, pale yellowish brown, 3-8 µm in diam.
Basidiospores 6-9(-10) x 3.5-5(-5.5) µm, elliptic to oblong cylindrical, pale yellowish brown.
Substrata. On the ground in conifer forests, more rarely in mixed or hardwood forests, often on exposed soil in places such as paths, roadsides, clearings, in vicinity of fireplaces, etc.
Distribution. Circumglobal and common in the conifer zone.
Remarks. *C. perennis* can only be confused with *C. focicola,* but the latter has usually larger pores and lacks the dichotomously branched cuticular hyphae so typical of *C. perennis*.

COLTRICIELLA Murrill,

Bull. Torrey Bot. Club 31:348, 1904.
Basidiocarps pendent or stipitate with a thin stipe or elongated tapering base, usually small, 4-20 mm wide, soft and fragile; pilear surface rusty-brown, adpressed-velutinate; pore surface brown, pores 2-3 per mm; context rusty-brown; hyphal system monomitic; generative hyphae simple-septate; setae absent; spores elliptical to slightly pipshaped, pale yellowish and finely verrucose. On well decayed hardwood and coniferous wood, associated with a white rot.
Type species: *Coltriciella dependens* (Berk. & M.A. Curtis) Murrill.
Remarks. The genus is similar to *Coltricia*, but distinguished by the finely verrucose spores.

Coltriciella dependens (Berk. & M.A. Curtis) Murrill,

Bull. Torrey Bot. Club. 31: 348, 1904. - *Polyporus dependens* Berk. & M.A. Curtis, Ann. Mag. Nat. Hist. 2, 12: 431, 1853. - *Polyporus deceptivus* Lloyd, Lloyd Mycol. Writ. 7: 1316, 1924.
Basidiocarps annual, pileate, pendent from a distinct stipe or more contracted vertex; stipe up to 1 cm long and 1-3 mm wide; pileus usually circular, 3-20 mm wide, 2-8 mm thick, soft, brittle or fragile when dry, light in weight; pilear surface rusty brown in variable shades, at first finely velutinate, with age the adpressed tomentum becomes agglutinated and the pileus glabrous with some faint radial striae; pore surface rusty-brown, the pores angular, 2-3 per mm; context rusty-brown, soft, 2-5 mm thick; tube layer up to 6 mm deep.
Basidiospores 7.5-10 x 4.5-5.5 µm, oblong-elliptic, some almost navicular, pale golden brown, finely verrucose.
Substrata. Rotten hardwoods and gymnosperms like *Juniperus* and *Pinus*. Often inside hollows in rotten logs and inconspicuous.
Distribution. Eastern United States, South-east Asia, Africa and Australia, but everywhere rare although probably overlooked because of the brown colour and small size.
Remarks. The species is distinctive by the consistently pendent basidiocarps, and this, and the soft basidiocarps are sufficient for a field determination. Microscopically the verrucose and coloured spores are distinctive.

CRYPTOPORUS (Peck) Shear,

Bull. Torrey Bot. Club 29:450, 1902.

Basidiocarps annual, sessile, ungulate; margin of pileus extending over the pore surface as a volva with a small basal opening; pore surface pale to dark brown; context ivory white, fibrous, azonate; hyphal system trimitic; generative hyphae with clamps; cystidioles fusoid, imbedded or barely projecting; basidia clavate, tetrasterigmatic with a basal clamp; basidiospores cylindrical, negative in Melzer's reagent. On recently dead standing conifers, causing a white rot. Monotypic genus.
Type species: *Cryptoporus volvatus* (Peck) Shear.
Remarks: The volva enclosing the pore surface is the distinctive character on which the genus is based. This is a unique characteristic in polypores.

Cryptoporus volvatus (Peck) Shear,

Bull. Torrey Bot. Club 29:450, 1902. - *Polyporus volvatus* Peck, New York State Mus. Bull. 27:98, 1877.
Basidiocarps annual, pileate, sessile, ungulate, solitary or in groups of two to many, up to 4 x 4 x 5 cm; pilear surface cream coloured to yellowish buff or tan, azonate, glabrous, often coated with a clear, lacquer-like layer, smooth or rugose; margin concolorous, rounded, continuous with a volva-like structure which completely encloses the pore surface except for a small hole at the base; pore surface pale to dark chocolate brown, the pores circular, 4-5 per mm, context ivory white, up to 3 cm thick; tube layer pinkish buff, up to 1 cm thick, taste slightly bitter.
Hyphal system trimitic; generative hyphae thin-walled, with clamps mostly 3-7 µm in diam but with inflated portions at branches up to 15 µm in diam; skeletal hyphae thick-walled, hyaline with occasional branching, 2.5-8 µm in diam; binding hyphae thick-walled, hyaline, much branched, 1.5-2.5 µm in diam.
Basidiospores 12-16.5 x 4-5.5 µm, cylindrical.
Substrata. Recently killed conifers with bark still attached, commonly appearing a year after trees are killed by fire, bark beetles, or other factors, and then displaced by other saprophytic wood-rotting fungi. Species of *Pinus* are the most common substrata, but found also on *Abies* and *Pseudotsuga*.
Distribution. Transcontinental in North American conifer forest ecosystems but apparently absent in the southern pine region and perhaps the far north. Also, in eastern Asia.
Remarks. The volva makes this species unmistakable and has been interpreted as an adaptation to retain moisture and high relative humidity for sporulation during dry periods.

CYCLOMYCES Fr.,

Linnaea 5:512, 1830.
Basidiocarps annual, pileate, solitary or imbricate, semi-circular to flabelliform or sometimes dimidiate with a contracted base; pilear surface finely pubescent in warm brown colours; pores variable or concentrically lamellate; context distinctly duplex, lower part dense, separated from the pileus tomentum by thin black zones; hyphal system monomitic; generative hyphae hyaline to brownish, simple-septate; setae present, dark brown, acute, thick-walled; spores hyaline to very pale yellowish, cylindrical to oblong-elliptic. Causes a white rot of dead hardwoods. Pantropical genus with 4 species out of which one occurs in North America.
Type species: *Cyclomyces fuscus* Fr.

Remarks. The genus is related to *Inonotus*, but separated by its thin, flexible basidiocarps with a distinctly duplex context and cylindrical spores.

Cyclomyces fuscus Fr.

Linnaea 5:512, 1830.
Basidiocarps annual to perennial, solitary or imbricate, in clusters, flabelliform with an almost stipitate attachment to more broadly attached to sessile, consistency coriaceous when dry, pileus up to 5 cm wide and long and 1-3 mm thick, ferruginous, fuscous to sepia, concentrically zoned in different shades of brown, tomentose to velvety in touch and slightly furrowed, margin acute, entire or lobed, pore surface bay, ferruginous or dark brown, plane, margin sterile, hymenophore concentrically lamellate, 4-5 per mm radially, when older 2-3 per mm, edges acute, toothed, finely velutinate, up to 1 mm deep. Near the periphery they may anastomose to form angular, shallow pores, context up to 2 mm thick, duplex, lower part dense, chestnut to dark fuscous, separated with a black zone from the looser tomentum.
Hyphal system monomitic, generative hyphae yellowish to pale ferruginous, with simple septa, thick-walled, 4-8 µm in diameter.
Hymenial setae 25-40 x 5-10 µm, dark brown, thick-walled and acute, projecting, often bent at the base.
Basidiospores 3.5-4 x 1.5-2 µm, narrowly elliptical.
Substrata. On dead wood.
Distribution. Pantropical, but rare.
Remarks. *C fuscus* differs from the other species in the genus in having concentric lamellae, which near the margin may anastomose to form angular, shallow pores.

DAEDALEA Fr,

Syst. Mycol. 1:331, 1821.
Basidiocarps perennial, pileate, broadly sessile; pilear surface glabrous to velutinate, often concentrically sulcate; hymenophore irregular, partly poroid, labyrinthine to daedaleoid, or strictly lamellate, ochraceous; context light to deep brown, tough-corky; hyphal system trimitic; generative hyphae with clamps; binding and skeletal hyphae present the latter bending from the trama into the hymenium and developing a catahymenium; basidiospores oblong-ellipsoid to cylindrical, smooth, hyaline, chlamydospores present in some tropical species. On hardwoods causing a brown rot.
Type species: *Daedalea quercina* Fr.
Remarks. The genus is characterized by perennial basidiocarps mostly with an irregular hymenophore and causing brown rot in different hardwoods.

Daedalea quercina Fr.,

Syst. Mycol. 1:333, 1821.
Basidiocarps perennial, single or a few pilei fused laterally, broadly sessile to dimidiate, up to 20 cm wide, 15 cm broad and 8 cm thick, strongly attached to the substrate, corky to woody; pilear surface flat to slightly convex, glabrous to finely velutinate, margin acute, ochraceous at first, becoming deeper brownish to grayish in old specimens, sometimes with pads or smaller areas with fresh outgrowth of light ochraceous mycelium; pore surface ochraceous, elongate pores occur along the margin, in the older parts with sinuous, daedaleoid to labyrinthine mostly 1-4 mm in diam measured tangentially, sometimes almost lamellate, dissepiments 1-3 mm thick, deeply split on oblique surfaces; context up to 1 cm thick, ochraceous to tobacco brown, tube layer up to 4 cm thick.
Cystidia absent, but thick-walled skeletal hyphae bend into the hymenium as a dense catahymenium, often with a fine granular exudate, their similarity to true hymenial cystidia is striking.
Basidiospores 5.5-6 x 2.5-3.5 µm, cylindrical.
Substrata. On different hardwood genera, especially common on *Quercus*, where it often develops on very hard wood, but also noted on other hardwoods.
Distribution. Circumglobal in forest ecosystems with oaks.
Remarks. The species is usually easy to recognize because of the evenly pale ochraceous colour, hard, tough consistency, and irregular daedaleoid hymenophore.

DAEDALEOPSIS Schröt.,

Krypt. Fl. Schles. 3:492, 1888.
Basidiocarps annual, sessile to effused-reflexed; pileus pale brown, zonate, glabrous; hymenophore lamellate to tubular; context pale brown, tough-fibrous; hyphal system trimitic; generative hyphae with clamps; skeletal and binding hyphae pale brown; dendrohyphidia present; basidiospores cylindrical, slightly curved, hyaline, smooth, negative in Melzer's reagent; Causing a white rot of dead hardwoods, rarely on conifers.
Type species: *Daedaleopsis confragosa* (Fr.) Schröt.
Remarks. Usually, the species of the genus are rather easy to identify because of the variable hymenophore and the microscopcially by the dendrohyphidia.

Daedaleopsis confragosa (Bolton: Fr.) Schröt.,

Krypt. Fl. Schles. 3:493, 1888. - *Daedalea confragosa* Bolton: Fr., Syst. Mycol. 1:336, 1821.
Basidiocarps annual, sessile or effused-reflexed, dimidiate, tough-corky, up to 12 cm wide and 3 cm thick; pilear surface

matted-strigose to glabrous, buff to light brown, usually zonate and shallowly sulcate; pore surface light buff to darker brown with age, the pores variable, circular or radially elongated and up to 1 mm in diam, daedaleoid, or with dissepiments splitting to form a radially lamellate hymenophore; context pale buff to brown, up to 2 cm thick; tube layer concolorousand continuous with context, up to 1 cm thick.
Dendrohyphidia present, thin-walled, smooth and apically branched, 2-3 µm in diam.
Basidiospores 9-11 x 2-2.5 µm, cylindrical, slightly curved.
Substrata. On dead hardwoods, rarely reported on conifer wood.
Distribution. Common throughout eastern hardwood forests less so in western North America but known from the Northwest and Southwest. In the Southwest it is rare and occurs mainly on conifers, particularly *Pinus* and *Pseudotsuga*. Circumglobal in the temperate zone.
Remarks. *Daedaleopsis confragosa* is one of the most variable of polypores in its pore surface configuration. The morphology of the pileus is quite uniform, and basidiocarps can usually be identified in the field from the top view alone.

DATRONIA Donk,

Persoonia 4:337, 1966.
Basidiocarps annual, resupinate to effused-reflexed; pilear surface brown to black, tomentose to glabrous; pore surface whitish to pale brown, pores large to small, circular to daedaloid; context pale brown, tough-fibrous; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae hyaline to pale brown; hyphae on dissepiment edges dendritically branched in some species; fusoid cystidioles present or absent; basidia clavate, 4-sterigmate; basidiospores cylindrical, hyaline, smooth, negative in Melzer's reagent; causing a white rot.
Type species: *Datronia mollis* (Sommerf.: Fr.) Donk.

Datronia mollis (Sommerf.: Fr.) Donk,

Persoonia 4:338, 1966. - *Daedalea mollis* Sommerf.: Fr., Elench. Fung., p. 71, 1828.
Basidiocarps annual, usually effused-reflexed, occasionally resupinate or sessile, reflexed up to 2 cm; pilear surface dark brown to black, strigose to glabrous, concentrically zonate and sulcate; pore surface buff to umber brown, the pores angular to daedaleoid, 1-2 per mm, some over 1 mm wide, lower context pale buff, up to 1 mm thick, separated from dark brown upper layer of tomentum by a thin, black layer; tube layer concolorous with lower context, up to 3 mm thick.
Basidiospores 10-12 x 3-4.5 µm, cylindrical.
Substrata. Dead wood of numerous hardwood genera.
Distribution. Eastern and western North America, not known from the southern U.S. Circumglobal in the temperate and boreal zones
Remarks. The large irregular pores and the black layer separating the upper tomentum from the lower context, are distinctive field characters for *D. mollis*.

DIACANTHODES Singer,

Lloydia 8:141, 1945.
Basidiocarps stipitate, partly infundibuliform with circular pileus; pilear surface tomentose to strigose, whitish to dirty brown; pore surface wood- coloured, darkening with age; context duplex, upper part soft and cottony, lower part dense and ochraceous, the two parts mostly separated by a darker resinous zone; tube layer ochraceous when fresh, pale-brown and agglutinated when dry; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae thick-walled to solid, weakly dextrinoid in Melzer's reagent; cystidia clavate to fusoid, slightly thick-walled; spores broadly ellipsoid, ornamented, dextrinoid. Terrestrial in tropical and subtropical forests. Monotypic genus.
Type species: *Diacanthodes novo-guineensis* (Henn.) O. Fidalgo.
Remarks. The genus seems to be rather isolated in the family. The closest relative is probably *Bondarzewia* which, however, has simple-septate generative hyphae, no cystidia, and amyloid spores. However, both genera have ornamented spores, a dimitic hyphal system, and a terrestrial habit.

Diacanthodes novo-guineensis (Henn.) O. Fidalgo,

Rickia 1:149, 1962. - *Polyporus novo-guineensis* Henn. in Schumach. & Hollrung, Beiheft Nachr. Kaiser Wilhelm's Land Bism. Archip., p. 6, 1889. - *Abortiporus subabortivus* Murrill, Bull. Torrey Bot. Club 65:655, 1938.
Basidiocarps annual, centrally stipitate, pilei circular, flat or with a slight central depression and a thin deflexed margin, up to 12 cm in diam and 1 cm thick, sappy and fleshy when fresh, when dried partly shrunken, dense and brittle; pilear surface tomentose to strongly strigose with numerous tufts of erect hyphae, uneven and weakly undulating, ochraceous when fresh, unevenly dirty brown when dry; stipe more or less cylindrical, stout, up to 3 cm in diam and 6 cm long, ochraceous, glabrous or scrupose to weakly strigose with tufts of erect hyphae,; pore surface ochraceous when fresh, dirty-brown when dry, pores, circular to angular, shrunken when dry, 3-4 per mm, context distinctly duplex, lower part white when fresh, pale ochraceous when dry, upper part loose and cottony, tube layer ochraceous when fresh, soft, when resinous dry, dirty-brown, agglutinated, fragile, up to 8 mm thick.
Hyphal system dimitic; generative hyphae with clamps, in dry basidiocarps up to 8 µm in diam, some with strongly thickened walls to almost solid and with very large prominent clamps, frequently double at the septa, the clamps up to 15 µm in diam, skeletal hyphae weakly dextrinoid, 3-8 µm in diam.
Cystidia 15-25 x 5-8.5 µm, variable in occurrence, in some specimens rather abundant, in other specimens very difficult to find, clavate to ventricose and fusoid, with a somewhat rounded to obtuse apex, smooth, slightly thick-walled.

Basidiospores 5-7.5 x 5-6 µm, broadly elliptic, slightly thick-walled, ornamented with small angular plates, distinctly dextrinoid.
Conidia 5-7 x 3.5-5 µm, produced from hyphal ends in the upper context, but in some specimens apparently absent, coarsely ornamented, ellipsoid to subglobose, brownish.
Substrata. On the ground or on buried wood or roots colonized by the asexual stage. In the tropics frequently reported on *Coffea*.
Distribution. Pantropical, in United States known only from one Florida collection.
Remarks. Basidiocarps of *D. novo-guineensis* are rather easily recognized by the stipitate, terrestrial habit and the ornamented, dextrinoid spores.

DICHOMITUS D.A. Reid,

Rev. Biol. 5:149, 1965.
Basidiocarps annual to perennial, resupinate to pileate and broadly sessile; pilear surface white to blackish; pore surface white to cream or pale greyish, the pores small to large; margin in one species becoming blackish; context white to ochraceous; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae dendritically branched, dextrinoid or non-dextrinoid, cystidia absent; spores cylindrical to oblong-ellipsoid, hyaline, thin-walled, negative in Melzer's reagent. Causing a white rot of living and dead conifers and hardwoods.
Type species: *Trametes squalens* P. Karst.
Taxonomic synonym: *Megasporoporia* Ryvarden & Wright (*Poria setulosa* Henn.).
Remarks. The microscopical characters of *Dichomitus* are similar to those of *Polyporus* s. str., and the two genera are related. The main characters separating them are the stipitate to dimidiate or fan shaped basidiocarps of *Polyporus* and the resupinate to broadly sessile ones of *Dichomitus*.

Dichomitus squalens (P. Karst.) D.A. Reid,

Rev. Biol. 5:149, 1965. - *Trametes squalens* P. Karst., in Rabenh. & G. Winter, Fungi Eur., no. 3528. 1886. - *Polyporus anceps* Peck, Bull. Torrey Bot. Club 22:207, 1895.
Basidiocarps annual to reviving a second year, resupinate, effused-reflexed, or sessile, when resupinate becoming widely effused, when pileate single to imbricate, individual pilei usually triquetrous, up to 3 cm wide, 1-7 cm long, 3-15 mm thick at the base, tough and corky when fresh, hard when dry; pileus white to cream, with age dis coloured and ultimately bay to almost blackish from the base, at first finely tomentose, later glabrous, azonate or slightly concentrically zonate, in dried specimens often slightly wrinkled radially; margin white, narrow to glabrous, dis coloured with age; pore surface white to cream, with age more yellowish or dis coloured in light brown and grey shades, often unevenly, the pores circular to angular, 4-5 per mm, context white to cream, tough-fibrous to corky, 1-4 mm thick; tube layer concolorous with pore surface or paler, up to 10 mm thick; odor none; taste slightly bitter.
Hyphal system dimitic; generative hyphae with clamps, 1.5-4 µm in diam; skeleto-binding hyphae dichotomously branched, thick-walled to solid, up to 7 µm in diam.
Basidiospores 7-11 x 2.5-3.5 µm, cylindrical to oblong elliptic.
Substrata. On conifers.
Distribution. Widely distributed in North American conifer forest ecosystems and circumglobal through Asia to Europe.
Remarks. Macroscopically the basidiocarps may be taken for a *Tyromyces* or *Trametes* species, especially when young and whitish. However, microscopically the arboriform skeleto-binding hyphae are diagnostic. It may also be mistaken for an *Antrodia* species, particularly *A. serialis*, but the latter differs in causing a brown rot and having unbranched skeletal hyphae.

DIPLOMITOPORUS Domanski,

Acta Soc. Bot. Poloniae 39:191, 1970.
Basidiocarps annual, resupinate to effused reflexed, white to light coloured; pores round to angular, medium to small; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae hyaline, thick-walled, non-amyloid to weakly amyloid; cystidia absent or present; spores allantoid to elliptic, thin-walled, smooth, negative in Melzer's reagent. On dead wood of conifers and hardwoods, causing a white rot.
Type species: *Trametes flavescens* Bres.
Taxonomic synonym: *Cyanotrama* Ghob. Nel. & Dai (*Poria rimosa* Murrill).
Remarks. The genus is similar to *Antrodia* and is separated mainly because all *Antrodia* species cause a brown rot. The borderline towards *Antrodiella* is vague as both genera include species with the same hyphal system, type of spores, and rot. However, the spores of *Antrodiella* are generally small and mostly elliptic.

Diplomitoporus flavescens (Bres.) Domański,

Acta Soc. Bot. Poloniae 39:191, 1970. - *Trametes flavescens* Bres., Ann. Mycol. 1: 81, 1903.
Basidiocarps annual, adnate, resupinate to effused-reflexed with a narrow pileus, up to 3 cm wide and 2 cm thick at the base, tough; upper surface (when present) finely tomentose, azonate, at first whitish, but soon cream to pale straw coloured; pore surface cream to straw coloured, pores angular, 2-4 per mm, often with a shine when fresh, with thin dissepiments; margin white and finely floccose; context white to cream coloured, 1-3 mm thick; tube layer concolorous with pore surface, up to 5 mm thick.

Hyphal system dimitic; generative hyphae with clamps, thin- to slightly thick walled, hyaline, 2-4 µm in diam; skeletal hyphae common only in the trama, thick walled to solid, hyaline, nonseptate, 2.5-6 µm in diam.
Cystidia not present, but hyaline pointed cystidioles often present in the hymenium, 16-23 x 4-5 µm.
Basidia 15-22 x 5-6 µm, clavate.
Basidiospores 5-7 x 2-3 µm, allantoid to cylindrical.
Substrata. Known only from *Pinus* species.
Distribution. A rare European species, known from the interior of Fennoscandia, scattered in Central Europe and single localities in England and Spain. Circumpolar to Eastern Canada.
Remarks. The fairly large allantoid spores, the pale straw-coloured basidiocarp, and the restriction to *Pinus* are diagnostic characteristics for identification of this species. *Antrodia primaeva* is rather similar macroscopically, but causes brown rot, its spores are larger and its subiculum is almost monomitic.

DONKIOPORIA Kotl. & Pouzar,

Persoonia 7: 214, 1973.
Basidiocarps perennial, resupinate, woody, dark brown; pores small; subiculum brown, separated from the substrate by a black line; hyphal system trimitic; generative hyphae with clamps; skeletal hyphae pale brown; binding hyphae hyaline; cystidia absent; basidiospores cylindrical-elliptic, thin-walled, hyaline, negative in Melzer's reagent. White rot in dead hardwoods, preferably *Quercus* spp. Monotypic genus in North America and Europe.
Type species: *Donkioporia expansa* (Desm.) Kotl. & Pouzar.
Remarks. Superficially the type species resembles a resupinate *Phellinus*, but the clamps on the generative hyphae immediately exclude this genus. The brown tissue and clamped generative hyphae are characters also found in *Gloeophyllum*. However, *Gloeophyllum* species cause a brown rot and have larger cylindrical spores and, in most species, also cystidia.

Donkioporia expansa (Desm.) Kotl. & Pouzar,

Persoonia 7:214, 1973. - *Boletus expansus* Desm., Cat. Pl. Omis., pl. 18, 1823. - *Fomitiporia ohiensis* Murrill, North Am. Fl. 9:11, 1907.
Basidiocarps perennial, resupinate, becoming widely effused, tough when fresh, hard and brittle when dry, up to 2 cm thick; margin often abrupt, pale brown; pore surface dark sienna to umber brown, the pores circular to angular, 4-5 per mm, subiculum rusty to golden brown, 1-3 mm thick, often separated from the substrate by a distinct black layer, tube layers long and regular, especially on sloping substrates, up to 2 cm thick, umber brown.
Hyphal system trimitic; generative hyphae with clamps, 3-6 µm in diam; skeletal hyphae yellowish golden brown, 3-7 µm in diam; binding type hyphae at interface of substrate, in the subiculum and in pits in the decayed wood.
Basidiospores 4.5-6(-7) x 3-3.5 µm, cylindrical to elliptic.
Substrata. Preferably *Quercus* used as structural timber, also reported from *Castanea*. In Europe also reported from *Fraxinus, Picea, Pinus, Populus*, and *Prunus*.
Distribution. Rare in the southern temperate zone.
Remarks. The clamped generative hyphae should easily separate this species from *Phellinus* species with resupinate basidiocarps. In many places almost exclusively confined to structural timber and as oak is less and less used in buildings, the species is becoming rarer.

EARLIELLA Murrill,

Bull. Torrey Bot. Club 32:478, 1905.
Basidiocarps annual to perennial, resupinate, effused-reflexed to pileate, tough; pilear surface glabrous, at first white to cream, then with a reddish cuticle spreading from the base; pore surface white to cork- coloured, the pores circular to sinuous; context white to wood- coloured; hyphal system trimitic; generative hyphae with clamps; skeletal hyphae and binding hyphae hyaline; cystidia absent; basidiospores cylindrical, hyaline, negative in Melzer's reagent. Causes a white rot in dead hardwoods. Monotypic tropical genus.
Type species: *Earliella cubensis* (Pers.) Murrill (a synonym of *Polyporus scabrosus* Pers.).
Remarks. The genus is undoubtedly related to *Trametes*, sharing the same type of hyphal system and spores. The basidiocarp, however, is deviating as it frequently is resupinate to effused-reflexed and develops a reddish cuticle on the pileus.

Earliella scabrosa (Pers.) Gilb. & Ryvarden,

Mycotaxon 22:364, 1985. - *Polyporus scabrosus* Pers. in Gaudich., Voy. Aut. Monde, p. 172, 1827. - *Earliella cubensis* Murrill, Bull. Torrey Bot. Club 32:478, 1905.
Basidiocarps annual or perennial, resupinate, effused-reflexed or more rarely sessile, often shelf-like and widely effused along fallen logs, tough and coriaceous, individual pilei up to 1 cm thick at the base and rarely more than 4 cm wide; pileus glabrous, zonate, at first white to cream, soon covered by a reddish cuticle starting from the base to the almost the whole surface in old specimens, pore surface white to cork coloured, pores angular to sinuous or semi-daedaleoid, especially on sloping parts of the pore surface, 2-3 per mm, context white to cream, tough-corky, up to 3 mm thick; tube layers concolorous with pore surface, up to 5 mm thick.
Basidiospores 7-10.5 x 3-4 µm, cylindrical, straight to slightly curved.
Substrata. Dead wood of numerous hardwood genera.
Distribution. Widely distributed and common in dry subtropical and tropical areas of the world.

Remarks. Usually the tough reflexed basidiocarps with a reddish cuticle and somewhat irregular elongated and sinuous pores will be sufficient for a field determination. It is often seen on poles, structural timber and felled logs and is one of the most common polypores in the tropics.

ECHINODONTIUM Ellis & Everh.,

Bull. Torrey Bot. Club. 27:49, 1900.
Basidiocarps perennial, sessile to effused-reflexed; pilear surface becoming black and rimose; lower surface poroid to daedaleoid at the margin, dissepiments splitting soon after differentiation to form a distinctly hydnoid hymenophore; context hard, woody, brick-red; hyphal system dimitic; generative hyphae with clamps; cystidia thick-walled, apically incrusted; basidia clavate, tetrasterigmatic; basidiospores elliptic, minutely echinulate, amyloid; causing white heart rots of living conifers.
Type species: *Echinodontium tinctorium* (Ellis & Everh.) Ellis & Everh.
Remarks. The reddish context and the echinulate amyloid spores make this a distinct genus.

Echinodontium tinctorium (Ellis & Everh.) Ellis & Everh.,

Bull. Torrey Bot. Club 27:49, 1900. - *Fomes tinctorius* Ellis & Everh., Bull. Torrey Bot. Club 22:362, 1895.
Basidiocarps perennial, sessile, ungulate to applanate, up to 40 cm wide, 30 cm deep, and 20 cm thick; pilear surface dark dull brown and hispid to matted-hirsute at first, quickly becoming blackened, crustose, and rimose, cracking radially and concentrically into rectangular blocks, sulcate; lower surface irregularly poroid to daedaleoid at the margin, the dissepiments quickly splitting to form a hydnoid hymenophore with flattened to cylindrical teeth, these thin and brittle at first but becoming thick, rigid, teeth pale buff to pinkish buff in sporulating condition, inner tissue becoming brick red, up to 2.5 mm thick and 15 mm long; context brick red, with radially arranged fibers but hard and woody, with a distinct, blackish crustose layer up to 2 mm thick.
Cystidia 25-65 x 8-17 µm, abundant, thick-walled, ventricose to pointed, dark reddish brown in KOH and Melzer's reagent, fusoid to mammillate, apically incrusted, but incrustation disappear readily in KOH and Melzer's reagent.
Basidiospores 6-8 x 4.5-6 µm, elliptic.
Substrata. Primarily on *Abies* and *Tsuga*, rarely on other conifers.
Distribution. Throughout the range of true firs and hemlock in western coniferous forests from Alaska to Mexico, not known from eastern North America or elsewhere in the world.
Remarks. *Echinodontium tinctorium* is commonly known as the Indian paint fungus, and is the main cause of heart rot and volume loss in true firs throughout their wide range in western coniferous forests.

ECHINOPORIA Ryvarden,

Prelim. Polypore Fl. East. Africa., p. 325, 1980.
Basidiocarps resupinate to pileate, at the margin or on the pileus with hydnoid conidiogenous processes, either singly or as villose to hispid tufts; pore surface white to cream; pores irregular, 2-3 per mm; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae thick-walled, often with a bulbous swelling at the tip; apically encrusted cystidia present; basidia clavate, tetrasterigmatic, basidiospores hyaline, elliptic to ovoid, smooth, negative in Melzer's reagent; conidia elliptic to fusiform, slightly thick-walled, produced from ends of clamped generative hyphae. Small tropical genus with one species in North America. Causing a white rot in dead hardwoods.
Type species: *Polyporus hydnophorus* Berk. & Broome.
Remarks. The genus is highly distinctive with hydnoid processes or strigose hairs composed of generative hyphae from which conidia develop. This initial stage is often found without a poroid basidiocarp. The hyphal system is dimitic with bulbous swellings at the ends of many skeletal hyphae, an unusual character in the Polyporaceae.

Echinoporia aculeifera (Berk. & M. A. Curtis) Ryvarden,

Mycotaxon 19:330, 1984. - *Trametes aculeifera* Berk. & M. A. Curtis., J. Linn. Soc. Bot. 10:319, 1868.
Basidiocarps annual, resupinate, or semi-resupinate to pileate, nodulose. 1-2 cm wide, up to 5 cm long in fused specimens, 1-4 mm thick, soft when fresh, flexible and tough when dry, pileus white to ochraceous or pale yellowish orange to -brown, radially fimbriate or crested and normally densely covered with hairs or hydnoid processes, often in entangled masses, 1-3 mm long, margin commonly deeply incised in narrow fimbriate lobes covered with projecting hairs, in a preliminary stage the whole basidiocarp primordium may be covered by these processes, pore surface white to cork-coloured, pores irregular, angular and 2-3 per mm, along the margin often developed without a context as the fimbriate lobes start to grow vertically and develop into irregular, sinuous to angular poroid structures, tubes up to 3 mm deep, context white to pale ochraceous, 1-2 mm thick.
Cystidia or bulbous to oblong hyphal endings present, but scattered and only in the dissepiments, arising from generative hyphae, up to 25 µm long and 5-7 µm wide, smooth or with a crystal crown, their occurrence is erratic and they are often difficult to find.
Basidiospores 4-5 x 3-3.5 µm, broadly elliptic.
Conidia 12-15 x 4-6 µm, arise from generative hyphae in the hairs on the pileus, oblong with a pointed end, slightly thick-walled, often with a small lateral "hook" from the clamp where the spore was attached to the apical end of a generative hypha.
Distribution. Tropical America from Brazil to Florida, the latter is the only state in United States from which it is known.
Remarks. In the field rather easily recognized because of the dense pileus cover with long white to ochraceous hairs or hydnoid processes and the white and irregular pores. Microscopically the conidia are diagnostic, and no other polypore in the region is known with such conidia.

ERASTIA Niemelä &Kinnunen,

Karstenia 45:76, 2005.
Basidiocarps annual, resupinate, soft when fresh, hard and brittle when dry, whole basidiocarp reddish to salmon coloured, without or only slightly cherry red in contact with KOH; pores round to angular, small to medium; hyphal system monomitic with clamped generative hyphae, weakly amyloid in the trama; cystidia none; spores ellipsoid to cylindrical, smooth, hyaline, thin-walled, negative in Melzer's reagent; on conifers, causing white rots. Monotypic genus.
Type species: *Polyporus salmoni colour* Berk. & M. A. Curtis.
Remarks. The type species is similar to some resupinate reddish species in *Hapalopilus*, but DNA sequencing has shown this to be an example of biological convergence.

Erastia salmoni colour (Berk. & A. M. Curtis.) Niemelä & Kinnunen,

Karstenia, 45:76, 2005. - *Polyporus salmoni colour* Berk. & M. A. Curtis., Hooker's J. Bot. 1:104, 1849. - *Ceriporiopsis. pseudoplacenta* Vlasak & Ryvarden, Mycotaxon 119: 222, 2012.
Basidiocarps annual, resupinate, moderately large to small, rarely above 10 cm in diameter, up to 8 mm thick, soft when fresh, resinous and hard when dry, mostly adnate, margin wide to narrow, light orange and byssoid; pore surface bright orange to pink when fresh, drying darker to orange brown, pores entire, mostly angular, 3-5 per mm, with thin dissepiments, often partly split in basidiocarps growing on oblique substrates; subiculum thin, light orange to pink; tube layer up to 7 mm thick, orange when fresh, reddish brown to purplish and soaked with resinous substances when dry, azonate or with a few narrow zones in section.
Basidiospores 4-5.5 x 2.5-3 µm, oblong to short-cylindrical.
Substrata. Dead conifers, especially *Pinus sylvestris* and *P. pinea*, but also known from other *Pinus* spp. and more rarely on *Picea abies* and *Abies*.
Distribution. Southern United States and Cuba, but probably widespread in the conifer zone. **Remarks.** The species is usually easy to recognize when fresh because of the yellowish orange to salmon coloured basidiocarp and the substrate. When dry it becomes dark reddish or wine-coloured, dense and rigid, and the whole structure is full of abundant brown granular to crystalline matter, making it difficult to observe the hyphal septation.

FAVOLASCHIA (Pat.) Pat.,

Bull. Soc. Mycol. France 8:116, 1892. - *Laschia* sect. *Favolaschia* Pat., J. Bot. (Morot) 1:231, 1887.
Basidiocarps small, brightly coloured, sessile, dorsally laterally stipitate, pileus glabrous reticulate with rounded depressions reflecting the pores, stipe eccentric, lateral or absent, concolorous with pileus, pore surface concolorous with pileus, pores large, spores large, subglobose to broadly ellipsoid, smooth, hyaline and amyloid, gloeocystidia and acanthophyses mostly present. Wood inhabiting, large pantropical genus with a white rot.
Type species: *Favolaschia gaillardii* (Pat.) Pat.
Remarks. The genus belongs in the Mycenaceae with its distinct acanthophyses and may be looked upon as a poroid *Mycena.* Most species are easy to recognize in the field because of striking colours and large pores. The genus is widespread in the tropical zones with a single or very few species in the temperate zones.

Favolaschia calocera R. Heim,

Rev. Mycol. (Paris) 31: 154, 1966.
Basidiocarps mostly in clusters or groups, pileus more or less round, up to 3.5 cm in diameter, orange to reddish yellow, somewhat darker when dry, smooth to slightly undulate in a reticulate pattern reflecting the pores below, faintly pruinose, pore surface concolorous with pileus, pores angular to ellipsoid, 0.3-2.5 mm in diam., larger towards the stipe, stipe lateral, up to 2 cm long and 5 mm wide, cylindrical, widening towards the base.
Hyphal system monomitic, generative hyphae with simple septa.
Basidia 28-35 x 6-10 µm, clavate, tapered slightly towards the base, mostly 2-spored, sterigmata 8.5-14 µm long.
Basidiospores 9-12.5 x 6.5-8.5 µm, broadly ellipsoid, smooth, hyaline, faintly amyloid.
Gloeocystidia present on edges of pores, in the hymenium and in the pileus cuticle, smooth, cylindrical to clavate, walls slightly thickened, contents dense and yellow orange; those amongst the basidia cylindrical, 8.5-12.5 µm, those on the pore edges and in the pileus cuticle broad-clavate, 11-25 µm long.
Acanthophyses 35-52 x 8.5-14 µm, present on pore edges and in pileus cuticle, hyaline, cylindrical to subclavate, apically round with numerous pointed projections.
Substrate. On a wide range of both hard woods and coniferous hosts.
Distribution. Spain, Italy, France, Switzerland, Portugal and southern England, originally described from Madagascar. Recently introduced to New Zealand, St. Helena, Australia, and is also present in Africa.
Remarks. The laterally stipitate small basidiocarps, mostly in clusters, with a striking orange to reddish colour and large pores, will be sufficient for a field determination. *F. thwaitsii* (Berk. & Broome) Kuntze (described from Sri Lanka) is macroscopically almost identical with *F. calocera* and microscopically separated only by hyphae with clamps and slightly smaller spores. It may be that the latter is only a haploid two-spored form of the former, which is widespread and very common in eastern and southern part of Africa, India and Sri Lanka.

FISTULINA Fr.,

Syst. Mycol. 1:396, 1821.
Basidiocarps annual, sessile to laterally stipitate; pilear surface reddish to brown, scurfy to tomentose; context reddish and fleshy with a red sap or white to ochraceous and firm-fibrous; tubes separate but closely packed, 4-6 per mm; hyphal system monomitic; clamps present or absent; cystidia absent in hymenium; trichocysts present or absent; basidia clavate, tetrasterigmatic; basidiospores ovoid, hyaline, negative in Melzer's reagent. Causing a brown rot in dead hardwoods. Cosmopolitan genus following *Quercus* spp.
Type species: *Fistulina hepatica* Schaeff.: Fr.
Taxonomic synonym: *Pseudofistulina* (*Polyporus radicata* Schwein.).
Remarks. The genus is unique by having a hymenophore of tubes in which the spores are developed. The genus belongs in Cyphellaceae and is included here because its basidiocarps can easily be taken for a true polypore.

Fistulina hepatica (Schaeff.: Fr.) With.,

Bot. Arr. Br. Pl., ed. 2, 3(2):405, 1792. - *Fistulina hepatica* (Schaeff.: Fr.) Fr., Syst. Mycol. 1:396, 1821. – *Boletus hepaticus* Schaeff., Fung. Bavar. Palat. Nasc. 4:82, 1774.
Basidiocarps annual, sessile or laterally stipitate, single or several from a branched base or stipe; pileus dimidiate to reniform or semicircular, up to 20 cm in diam and 6 cm thick, at first soft and fleshy and readily exuding a reddish blood like sap when squeezed or bruised, eventually more fibrous and tough in older specimens; pileus surface pinkish brown to more reddish or purplish brown, finely hispid to scurfy with hyphae aggregating in crowded papillate tufts, these wearing away to expose a relatively smooth, slimy, reddish to pale purplish brown cuticle with minute darker scales or radial striations; margin rounded to rather acute, con colourous; pore surface white at first, bruising darker on handling and becoming dull brown with age and drying, the individual tubes crowded, about 4-6 per mm; context reddish, fleshy and juicy when fresh, with a blood like exudate where cut or broken, mottled or irregularly zonate with alternating pale and darker areas, in older specimens or on drying becoming soft-fibrous, pale wood brown, up to 5 cm thick; tube layer consisting of individual, crowded but easily separable tubes, white to pale buff, bruising dark reddish brown, drying pale brown, up to 1 cm thick; stipe lateral, scurfy with papillate tufts, these merging with tubes on the decurrent tube layer, reddish at first, darkening to blackish brown on the basal portion, up to 5 cm long and 3 cm wide or on some sub sessile specimens simply a broad, tapering base up to 8 cm wide.
Hyphal system monomitic; contextual generative hyphae thin-walled, with simple septa and clamps, rarely branched, mostly 4-10 µm in diam., but with inflated portions up to 20 µm in diam.; gloeopleurous hyphae also present in context; tramal hyphae hyaline, thin-walled, agglutinated and difficult to separate in sections from dried specimens, with rare branching, but with abundant clamps, 2-5 µm in diam.
Cystidia absent from hymenium, but cylindrical, thin-walled cystidial elements present in dissepiment edges, 6-7 µm in diam. and up to 75 µm long.
Basidia 15-20 x 5-6 µm, clavate.
Basidiospores 3.5-4.5 x 2.5-3 µm, ovoid to tear shaped.
Substrata. In northern Europe almost exclusively on heartwood of living or dead *Quercus*, in central and southern Europe also common on *Castanea.* Rarely on other hardwood genera.
Distribution. Following the genus *Quercus* to its northern limit of distribution, Circumglobal in temperate hardwood forest ecosystems and in the mountains of the Indian subtropics.
Remarks. *Fistulina hepatica* is together with *Laetiporus sulphureus* the main cause for the inner decay of large oak trees, eventually making them hollow. It seems to need a long period of decay before basidiocarps are produced, and thus, these are invariably seen only on large and old oak trees.

FOMES Fr.,

Summa Veg. Scand. 2:319, 1847.
Basidiocarps perennial, sessile, ungulate, pileus surface grey to blackish with a hard smooth crust; pore surface pale brown, pores small, regular; tube layers brown, stratified; context pale brown, tough-fibrous; hyphal system trimitic; generative hyphae with clamps; binding and skeletal hyphae pale brown; sclerids present; basidiospores cylindrical, large, hyaline, negative in Melzer's reagent. Causes a white rot of living or dead hardwoods.
Type species: *Polyporus fomentarius* L.: Fr.
Remarks. The genus is similar to *Hexagonia* with the same hyphal system and smooth, thin walled large spores However, being perennial with a mycelial core in the pileus, it is accepted as a separate genus.

Fomes fomentarius (L.:Fr.) Fr.,

Summa Veg. Scand. 2:321, 1849. - *Polyporus fomentarius* L.: Fr., Syst. Mycol. 1:374, 1821. - *Boletus fomentarius* L., Sp. Pl. p.1176, 1753.
Basidiocarps perennial, sessile, ungulate, up to 20 cm wide, tough, woody; upper surface of pileus quickly developing a hard glabrous crust, older part grey, zonate and shallowly sulcate, marginal part light brown, also zonate, minutely tomentose; pore surface concave, pale brown, the pores circular, 4-5 per mm, with thick tomentose dissepiments; context yellowish brown, tough fibrous, azonate, up to 1 cm thick, granular core of varying size developing at upper part of the context next to the substrate, mottled with a mixture of pale and darker areas; tube layers indistinctly stratified, comprising most of the interior tissue of the basidiocarp, light brown and becoming stuffed with white mycelium; context tissue usually a relatively thin

layer between the surface crust and the old tube layers.
Hyphal system trimitic; contextual generative hyphae thin-walled, hyaline with clamps, 2-4 µm in diam., inconspicuous; contextual skeletal hyphae thick-walled, nonseptate, pale yellowish brown in KOH, 3-8 µm in diam.; contextual binding hyphae thick-walled, much-branched, nonseptate, 1.5-3 µm in diam.; granular core a mixture of binding hyphae, narrow skeletal hyphae, and irregularly shaped, thick-walled sclerids that are brown in KOH; tramal hyphae similar, except for sclerids.
Cystidia none, but cystidiols often present in the hymenium, thin-walled, fusoid, 24-37 x 3.5-7.5 µm, with a basal clamp, also hyphoid like elements near dissepiments edges, these up to 120 µm long and 3-5 µm in diam., projecting to 55 µm, some lightly encrusted.
Basidia 23-25 x 7-9 µm, with a swollen base.
Basidiospores 12-18(-20) x 4-7 µm, cylindrical, hyaline, smooth, negative in Melzer's reagent. They are produced almost exclusively early in the spring, often in enormous numbers, and covering the vicinity of the basidiocarps with a white powder.
Substrata. Living and dead trees in numerous genera of hardwoods, rarely on conifers like *Larix* and *Taxus*.
Distribution. Very common, especially in the Fennoscandian temperate to subalpine birch forests, circumboreal and south to North Africa, through Asia to East North America.
Remarks. Easily recognized in the field by its ungulate, usually greyish basidiocarps with a hard glabrous, sulcate crust on the pileus. The granular core at the base of the context will immediately separate it from *Ganoderma* species. The sclerids in the granular core are very distinctive microscopically. Unless collected in the spring, basidiocarps are almost invariably sterile. The reason for this rather consistent seasonal sporulation is unknown.

FOMITELLA Murrill,

Bull. Torrey Bot. Club 32:365, 1905.
Basidiocarps annual or perennial, sessile or effused-reflexed; pilei dimidiate, applanate; pilear surface becoming crustose or reddish and laccate; pore surface purplish brown to smoky grey, the pores circular, 5-7 per mm; context pale brown, zonate; hyphal system trimitic; generative hyphae with clamps; cystidia absent; basidiospores cylindrical, negative in Melzer's reagent. Causing a white rot of dead hardwoods. Monotypic subtropical American genus.
Type species: *Fomitella supina* (Sw.:Fr.) Murrill.
Remarks. The genus comes close to *Fomes,* but is separated by lack of mycelial cores and shorter spores.

Fomitella supina (Sw.:Fr.) Murrill,

Bull. Torrey Bot. Club 32:365, 1905. - *Boletus supinus* Sw., Flora Ind. Occid. III, p. 1926, 1806. - *Polyporus supinus* Sw.: Fr., Syst. Mycol. 1:376, 1821.
Basidiocarps annual or perennial, sessile or effused-reflexed, single or imbricate, dimidiate, or occasionally circular on the top of logs, applanate, up to 15 x 7 x 4 cm; pilear surface highly variable, pale ochraceous, minutely tomentose, azonate, smooth in early stages of development, often with a basal portion or most of pilear surface becoming darker and eventually reddish-brown to black and crustose or laccate, in other specimens weathering to almost white and becoming rough, frequently greenish from algae in older specimens; pore surface purplish brown to cinerous or smoky, the pores circular, 5-7 per mm, with thick, entire dissepiments; context ochraceous to pale brown, zonate, firm-fibrous, up to 2 cm thick, in laccate specimens with a hard, horny dark layer at the surface; tube layers becoming indistinctly stratified with older tubes filled with mycelium, purplish tan on younger specimens, distinct from context, single layers up to 5 mm thick.
Basidiospores 7-9 x 3-3.5 µm, cylindrical.
Substrata. Dead wood of numerous genera of hardwoods.
Distribution. Southeastern U.S., especially in bottomland hardwood forests of the Gulf Coast region and further into the tropical zone.
Remarks. Basidiocarps of *Fomitella supina* are morphologically like those of several species of *Fomitopsis,* but the latter are brown rot fungi. They are also similar to those of *Earliella scabrosa,* see remarks under that genus.

FOMITIPORIA Murrill,

North American Flora 9: 7, 1907.

Basidiocarps pileate to resupinate, perennial, rarely annual, pileus hirsute to glabrous, pores variable, but mostly small, context thin and dense; hyphal system dimitic, generative hyphae usually hyaline, thin-walled and narrow, pale golden brown, tramal setae or hymenial setae absent or present, spores hyaline to rusty brown, thin- to thick-walled and dextrinoid. All species on dead wood with a white rot. Cosmopolitan genus.
Type species *Fomitiporia langloisii* Murrill.
Remarks. The genus is related to *Phellinus* with many common characters, but distinguished by the dextrinoid basidiospores. The species macroscopical concepts in this genus are narrow and in many cases based on host specificity since the microscopic characters often are close to identical.

Fomitiporia langloisii Murrill,

North Amer. Flora 9:13, 1907. - *Fomitiporella floridana* Murrill, North Amer. Flora 9:14, 1907.
Basidiocarps perennial, resupinate, adnate, becoming widely effused, in the type about 5 mm thick along the tubes, woody; pore surface fulvous to dark cinnamon or greyish-brown, the pores circular, 6-8 per mm, dissepiments entire; tube layers concolorous with pore surface, the older ones stuffed with white mycelium, up to 4 mm thick; subiculum more or less absent in the type, in other specimens very thin, dense, less than 1 mm thick.

Hymenial setae absent.
Basidiospores 4-5 x 3-3.5 µm, elliptic to subglobose, pale rusty brown.
Substrata. Most commonly on *Quercus* in the southern U.S., on dead hardwoods of many tree genera in subtropical and tropical regions.
Distribution. Endemic in Southern part of United States.
Remarks. *F. langloisii* is recognized by its resupinate basidiocarp, small pores, lack of setae, and pale rusty brown spores.

FOMITOPSIS P. Karst.,

Meddel. Soc. Fauna Fl. Fenn. 6:9, 1881.
Basidiocarps perennial or rarely annual, sessile to effused-reflexed, tough to woody; pore surface and context white to tan or pinkish; pores mostly small, regular; hyphal system dimitic or trimitic; generative hyphae with clamps; cystidia present or absent; basidia clavate, 4-sterigmate, with a basal clamp; basidiospores subglobose to cylindrical, hyaline, smooth, negative in Melzer's reagent. Causing a brown cubical rot of living or dead conifers and hardwoods.
Type species: *Fomitopsis pinicola* (Sw.: Fr.) P. Karst.
Taxonomic synonyms:
Laricifomes Kotl. & Pouzar (*Polyporus officinalis* Fr.).
Rhodofomitopsis Cui et al. (*Polyporus feeii* Fr.).
Rhodofomes Kotl. & Pouzar (*Polyporus cajanderi* P. Karst.).
Remarks. *Fomitopsis* includes species with a perennial or rarely annual basidiocarp and a dull to laccate, glabrous pileus. The brown rot and the perennial basidiocarps are the main characters separating it from *Trametes* which has the same type of spores and hyphal system.

Fomitopsis pinicola (Sw.: Fr.) P. Karst.,

Krit. Finl. Basidsv., p. 306, 1889. - *Polyporus pinicola* Sw.: Fr., Syst. Mycol. 1:372, 1821.
Basidiocarps perennial, usually sessile, rarely effused-reflexed or resupinate, woody, applanate to ungulate, up to 38 x 20 x 15 cm; pilear surface at first with a sticky reddish brown resinous layer, this often persisting over the younger marginal areas, becoming glabrous, sometimes laccate, greyish to brown or blackish, smooth to sulcate; pore surface cream coloured, the pores circular, 5-6 per mm, with thick, entire dissepiments; context cream coloured to buff, corky to woody, azonate to zonate, up to 12 cm thick; tube layers indistinctly stratified, concolorous with the context, up to 6 cm thick.
Basidiospores 6-9 x 3.5-4.5 µm, cylindrical-elliptic.
Substrata. Common on dead conifers and causing heart rot of living conifers and numerous hard woods, especially on *Alnus* spp.
Distribution. Throughout the conifer forest regions of North America but absent or rare in the southern pine region. Circumglobal in the Northern Hemisphere.
Remarks. *Fomitopsis pinicola* is one of the most conspicuous and widely distributed polypores in conifer forest regions of the Northern Hemisphere. It is a major factor in the production of brown rot residua that are a stable soil component in coniferous forest ecosystems.

FUSCOCERRENA Ryvarden,

Trans. Brit. Mycol. Soc. 79:279, 1982.
Basidiocarps effused-reflexed to resupinate; pileus dark brown, finely tomentose; hymenophore poroid, semi daedaleoid or hydnoid, often yellowish-green and farinose when fresh, later dark brown; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae unbranched, light brown; dendrohyphidia in hymenium and occasionally along the dissepiment edges; cystidia absent; spores hyaline, cylindrical, thin-walled, smooth, negative in Melzer's reagent. Causing a white rot in dead hardwoods. Monotypic American genus.
Type species: *Fuscocerrena portoricensis* (Fr.) Ryvarden.
Remarks. The presence of dendrohyphidia, the dark basidiocarps with a dimitic hyphal system, and cylindrical, thin-walled, non-amyloid spores, indicate a close relationship to *Datronia*. However, the variable greenish farinose colour of the hymenophore is unknown in that genus which further has distinctly duplex context with a dark layer between the tomentum and the context proper.

Fuscocerrena portoricensis (Fr.) Ryvarden,

Trans. Brit. Mycol. Soc. 79:280, 1982. - *Polyporus portoricensis* Fr., Elench. Fung. 1:115, 1828. - *Irpex farinaceus* Fr., Linnaea 5:523, 1830. - *Irpex coriaceus* Berk. & Ravenel, Grevillea 1:101, 1872. - *Cerrenella subcoriacea* Murrill, North Am. Fl. 9:72, 1908. For further synonyms, see Ryvarden, op. cit.
Basidiocarps annual to perennial, effused-reflexed or resupinate, tough, coriaceous, adnate, up to 1 cm wide, 1-5 cm long, 1-2 mm thick, often laterally fused, pileus umber to dark vinaceous brown, tomentose, sulcate, zonate; pore surface yellowish green to darker brownish, irregular, at first poroid and then 1-2 pores per mm, angular, later the dissepiments split and the hymenophore becomes daedaleoid with sinuous pores or hydnoid with flattened teeth, actively growing specimens with greenish-white tube walls with a brown tint while the dissepiments remain brown due to projecting skeletal hyphae, tube walls in old specimens dark brown as the whitish, fine grainy layer disintegrates and the brown colour emerges; context dark brown, azonate, up to 1 mm thick; tube layer with dark brown tramal tissue, up to 2 mm thick.
Basidiospores 5-7 x 2-2.5 µm, cylindrical.

Substrata. On dead hardwoods of several genera.
Distribution. Eastern U.S. from Iowa, Minnesota and New York south to Texas and Florida. In Central and South America to southern Brazil.
Remarks. This species is easily recognized in the field by the dark brown pileus and the greenish irregular hymenophore becoming brown and hydnoid with age.

GANODERMA P. Karst,

Rev. Mycol.3:17, 1881.
Basidiocarps annual or perennial, stipitate to sessile; pileus with a thick, dull crust or shiny and laccate with a thin hymenoderm of clavate end cells; pore surface cream coloured, bruising brown, the pores regular, 4-7 per mm; context cream coloured to dark purplish brown, soft and spongy to firm-fibrous; tube layers single or stratified, pale to purplish brown; stipe when present central or lateral; hyphal system trimitic; generative hyphae with clamps; skeletal hyphae hyaline to brown, no septate, often with long, tapering branches; basidia broadly elliptic, tapering abruptly at the base; cystidia absent; basidiospores broadly to narrowly elliptic with a truncate apex and apical germ pore, wall two layered, the endosporium brown and separated from the hyaline exosporium by inter-wall pillars, negative in Melzer's reagent, 7-20 µm long. Causing uniform or mottled white rots of dead and living hardwoods and conifers. Large, cosmopolitan genus.
Type species *Ganoderma lucidum* (Curtis: Fr.) P. Karst.
Taxonomic synonyms:
Elfvingia Karsten (*Polyporus applanatus* S. F. Gray).
Tomophagus Murrill, (*Polyporus colossus* Fr.).
Remarks. The double walled basidiospores make the family distinct. The great variability in macroscopic characters of the basidiocarps has resulted in a large number of synonyms and confusion in the taxonomy of the genus. Those interested are referred to Synopsis Fung. Volume 12 with a list and short descriptions of all species described in the genus. It can be downloaded for free from the home page of Fungiflora.no.

Ganoderma lucidum (Curtis: Fr.) P. Karst.,

Rev. Mycol. (Toulouse) 3(9):17, 1881. - *Boletus lucidus* Curtis, F1. Londin. no. 224, 1781. - *Polyporus lucidus* Curtis: Fr., Syst. Mycol. 1: 353, 1821.
Basidiocarps annual, centrally to laterally stipitate, applanate, fan shaped to dimidiate, 15 cm or more broad; upper surface with thin varnished crust at maturity, yellow at the margin in actively growing specimens, then orange red to dark reddish brown and finally deep bay, typically covered with a powdery layer of basidiospores deposited by air currents, margin acute, narrowly sterile below; pore surface creamy white at first, becoming light buff, staining dark purple-brown on bruising; pores circular to angular, 4-5 per mm, with thick dissepiments; context at first creamy white, becoming dark purple brown in older portions, zonate, up to 3 cm thick at base; tube layer purple-brown, sharply distinct from context, up to 1 cm thick.
Hyphal system dimitic; contextual generative hyphae 2-2.5 µm in diam, hyaline, thin-walled, with clamps; contextual skeletal hyphae hyaline to pale golden brown, thick-walled, nonseptate, with frequent dendritic branching, branch tips tapering to less than 1 µm diam, main hyphae up to 7 um diam; laccate crust on pileus surface 40-70 µm thick, with a dense palisade of clavate, reddish-brown, thick-walled, amyloid hyphal end cells up to 7-11 µm in diam; tramal skeletal hyphae pale brown, thick-walled, nonseptate, 2-3.5 µm in diam, also some slender, thick-walled, branching, hyaline, nonseptate hyphae 1-1.5 µm in diam; tramal generative hyphae 2-2.5 µm in diam, hyaline, thin-walled and with clamps.
Cystidia or other sterile hymenial elements absent.
Basidia 12-23 x 10-11 µm, broadly elliptic to barrel-shaped, tetrasterigmatic.
Basidiospores 7-11 x 6-8 µm, often variable in length within the same collection, ellipsoid, truncate at apex, pale brown in KOH, wall two-layered with thick, brown endosporium separated by interwall pillars from thin, hyaline exosporium with shallow depressions, negative in Melzer's reagent.
Substrata. Numerous hardwood genera, occasionally on gymnosperms such as *Picea*.
Distribution. Circumpolar and probably a cosmopolitan species, but numerous confusingly similar species of dubious or unclear taxonomic status are known from the tropics, making distributional statements from this area rather ambiguous.
Remarks. The laccate and stipitate basidiocarps make this a distinct species as such, although, especially in the tropics there are many confusingly similar species.

GLOBIFOMES Murrill,

Bull. Torrey Bot. Club 31:424, 1904.
Basidiocarps annual but persisting or perennial, sessile, with large numbers of small petaloid pilei developing on a mass of core tissue; pileus becoming grey, glabrous, crustose; context brown, tough-fibrous in small pilei, granular in central core; hyphal system trimitic; generative hyphae with clamps; thick-walled sclerids abundant in core tissue; cystidioles fusoid, thin-walled; basidia clavate, 4-sterigmate; basidiospores cylindrical, hyaline, negative in Melzer's reagent. Causes a white heart rot of living hardwoods. Monotypic American genus.
Type species: *Globifomes graveolens* (Schwein.) Murrill.

Globifomes graveolens (Schwein.) Murrill,

Bull. Torrey Bot. Club 31:424, 1904.- *Boletus graveolens* Schwein., Schr. Nat. Ges. Leipzig 1:97, 1822.
Basidiocarps sessile, ungulate to columnar, with large numbers of small, imbricate petaloid pilei developing over the surface

of a mass of core tissue, up to 15 cm wide, 20 cm long and 15 cm thick; pileus at first dull brown, minutely tomentose, radially rugose, eventually becoming grey to grayish-black, glabrous and hard and crustose; pore surface at first purplish gray, becoming dark grayish brown, the pores circular, 5-7 per mm, context in individual small pilei yellowish brown, fibrous, up to 5 mm thick, azonate, with a distinct, dark, crustose upper layer; context of central core with a granular or mottled appearance from interspersed areas of light and dark mycelium, this central core making up most of the basidiocarp, up to 18 x 15 cm; tube layers pale purplish brown, up to 2.5 mm thick.
Hyphal system trimitic with abundant sclerids in the granular core, irregular in size and shape, walls up to 10 um thick.
Basidiospores 10-14 x 3-4 µm, cylindrical.
Substrata. Known only on hardwoods with most records from *Quercus*.
Distribution. Endemic through most of the eastern U.S. to east Texas.
Remarks. *Globifomes graveolens* is macroscopically unique among North American polypores. However, its microscopic characters are similar to those of *Fomes fomentarius* and *F. fasciatus* as all three have a similar hyphal system, large cylindrical spores, and the distinctive sclerids in their granular context. They are also alike in having a hard, grey crustose layer on the pileus surface.

GLOEOPHYLLUM P. Karst.,

Bidrag Känned. Finlands Natur Folk 37:79, 1882.
Basidiocarps annual to perennial, resupinate to pileate, dimidiate to broadly attached or rosette-shaped, tough to woody; pileus deep brown to greyish with age, glabrous to hispid, often zonate; hymenophore poroid, daedaleoid, or lamellate, rusty to deep umber brown; trama and context dark rusty to umber brown; hyphal system di- to trimitic; generative hyphae with clamps; skeletal hyphae yellowish brown and dominant in the basidiocarps; binding hyphae rare and scattered in context; cystidia present or absent, smooth or with an apical crown of crystals; spores smooth, cylindrical, thin-walled, negative in Melzer's reagent, generally longer than 7 µm. On dead wood, in the Northern hemisphere mostly on conifers, but in the tropics on numerous hardwood genera. Causes a brown rot and all basidiocarps contain trametin or closely related chemical compounds.
Type species: *Gloeophyllum sepiarium* (Fr.) P. Karst.
Taxonomic synonyms:
Osmoporus Singer, 1944 (*Polyporus odoratus* Wulfen:Fr.).
Phaeocoriolellus Kotl. & Pouzar, 1957 (*Daedalea trabea* Pers.:Fr.).
Griseoporia Ginns, 1984 (*Hexagonia carbonaria* Berk. & M.A. Curtis).
Remarks. The generic concept used here is based on the brown colour of the basidiocarps, the di- to trimitic hyphal system, the cylindrical, hyaline, non-amyloid spores, the presence of trametin, and the brown rot.

Gloeophyllum sepiarium (Wulfen: Fr.) P. Karst.,

Finl. Hattsv. 2: 80, 1879. - *Daedalea sepiaria* Wulfen: Fr., Syst. Mycol. 1: 333, 1821. - *Agaricus sepiarius* Wulfen, Pl. Rar. Carinth. in Collectanea [Jacquin] 1: 347, 1786.
Basidiocarps annual to perennial, pileate, broadly sessile, dimidiate or rosette shaped, often imbricate in clusters from a common base, or fused laterally to compound basidiocarps, up to 7 cm wide, 12 cm long and 6-8 mm thick at the base of the pileus, tough and flexible, margin sharp and slightly wavy; upper surface at first bright yellowish brown, then darker reddish brown and finally greyish to black, when young and along the margin finely tomentose, in age the hyphae agglutinate and the surface becomes tufted, hirsute to hispid or scrupose with coarse protuberances, finally more or less smooth in zones mixed with narrow, more persistent hispid bands, narrowly to broadly zonate reflecting different stages of growth and thus, the zones from the margin to base in old specimens are often differently coloured; hymenophore lamellate with anastomosing, dense lamellae, 15-20 per cm behind the margin, more rarely mixed with poroid areas with rounded to irregular, sinuous, radially elongated pores, about 1-2 per mm, edges of lamellae light golden brown in active growth, later umber brown, side surface of lamellae ochraceous to pale brown, usually distinctly lighter than the context and trama, lamellae up to 7 mm deep; context dark brown, denser next to the lamellae than towards the upper surface, up to 5 mm thick, black in KOH.
Hyphal system trimitic; generative hyphae thin to thick walled, hyaline, with clamps, 2.5-4 µm in diam; skeletal hyphae dominating in the basidiocarp, especially in the upper context and trama, golden brown, straight, thick-walled, nonseptate, up to 6 µm in diam; binding hyphae few, tortuous and with relatively short branches, seen only in older parts of the context, pale golden brown, up to 4.5 µm in diam at the base.
Cystidia 25-95 x 3-7 µm, abundant in the hymenium, subulate to obtuse, thin to thick-walled in age, some extremely elongated, not or only slightly projecting, usually smooth, more rarely with a small crown of crystals.
Basidia 18-40 x 4.5-7 µm, narrowly clavate, tetrasterigmatic.
Basidiospores 8-11(-12) x 3-5 µm, cylindrical.
Substrata. Most common on dead conifers, especially *Picea* more rarely on angiosperms. It often occurs on exposed places like the top of stumps and partly fallen logs, etc. It is a highly heat-tolerant species and thus a serious decaying agent in wooden roofs and windowsills.
Distribution. Widespread in the whole of Europe and known north to Porsanger, Norway at 70°N and seemingly present wherever there are coniferous or mixed forests. Circumboreal through Russia to North America and common everywhere.
Remarks. Normally this is an easy species to recognize because of the yellowish to rusty colour and the lamellate hymenophore. *G. sepiarium* is a major factor in the decay of dead coniferous wood and formation of brown rot residues.

GLOEOPORUS Mont,

Ann. Sci. Nat. Bot., Ser. 2, 17: l26, 1842.
Basidiocarps annual, resupinate to pileate, pilear surface, when present, white to greyish, tomentose; pore surface pinkish white, orange to deep bay, or reddish, pores small, shallow, circular to angular, with a continuous layer of basidia over the dissepiments; tube layer gelatinous in fresh condition, resinous and dense to cartilaginous when dry, darker and denser than the white, cottony subiculum or context; hyphal system monomitic; generative hyphae with clamps or simple septa; cystidia absent; spores allantoid to cylindrical, thin-walled, smooth, negative in Melzer's reagent. On both hardwoods and conifers, causing a white rot. Cosmopolitan genus.
Type species: *Gloeoporus thelephoroides* (Hook.) G. Cunn.
Taxonomic synonym.
Remarks. The genus belongs in the Corticiaceae (s.lato) or Meruliaceae because of the continuous layer of basidia over the dissepiments, a common feature in *Merulius, Byssomerulius* and other genera with a merulioid or folded hymenophore. The genus is included here because its species have a distinct poroid hymenophore.

Gloeoporus thelephoroides (Hook.) G. Cunn.

Polyporaceae of New Zealand, p. 111. 1965.- *Boletus thelephoroides* Hook. in Kunth, Syn. Pl. 1:10. 1822. - *Gloeoporus conchoides* Mont., Ann. Sci. Nat., Ser. 2, 17:126. 1842.
Basidiocarps annual, pileate, sessile, solitary to imbricate, up to 6 cm wide, pileus 2-4 mm thick near the base, thinning towards the margin, consistency tough and soft when fresh, coriaceous or flexible when dry, pilei broadly sessile to slightly spathulate, applanate; margin acute, thin, often lobed, partly wavy, bent downwards; pilear surface evenly to radially tomentose, white to ochraceous or light yellowish, later more pale yellowish-brown, in older specimens the tomentum often becomes radially striate; pore surface light ochraceous to pinkish in young specimens, resinous pinkish brown in very old ones, the pores circular in fresh specimens, angular and with thin dissepiments with age or drying, 5-7(-8) per mm; context white to ochraceous, 0.2-1.0 mm thick, separated from the tube layer by a darker gelatinized zone; tube layer often decurrent on the substratum, up to l mm thick and thinning out towards the margin which is often sterile, in dried specimens the tubes are partly filled with a resinous substance.
Hyphal system monomitic; generative hyphae with simple septa, in the tomentum and the context of variable width and wall thickness, 2-6 µm in diam, septa often difficult to find in some segments of the most thick-walled ones; tramal hyphae thin-walled, simple-septate, 2-4 µm in diam, with frequent branching, often slightly yellowish.
Cystidia and other sterile hymenial elements absent.
Basidia 15-21 x 4-6 µm, clavate, tetrasterigmatic.
Basidiospores cylindric to allantoid, hyaline, smooth, thin-walled, negative in Melzer's reagent, 4-5.5 x 0.7-1 µm.
Substrata. On dead hardwoods of many tropical genera.
Distribution. Pantropical species.
Remarks. Basidiocarps of *G. thelephoroides* are usually easy to recognize because of the gelatinous hymenophore with a pinkish colour that darkens with age. Very young specimens are almost whitish. Specimens with a darker pore surface may be separated from *G. dichrous* by their simple-septate hyphae.

GRIFOLA Gray,

Nat. Arr. Brit. Plants 1:643, 1821.
Basidiocarps annual, stipitate, stipe usually branched to give rise to large numbers of petaloid pilei; pileus grey to brownish, finely tomentose to glabrous; pore surface white to cream coloured, the pores angular, 2-4 per mm; context white to pale buff; tube layer decurrent on stipe; hyphal system dimitic; generative hyphae with clamps; cystidia absent; basidia broadly clavate, 4-spored; basidiospores ovoid to elliptic, negative in Melzer's reagent. Causing a white butt rot of hardwoods, rarely conifers. Monotypic genus.
Type species: *Grifola frondosa* (Dicks.:Fr.) Gray.
Remarks. The genus is characterized by its large compound basidiocarps growing on the ground at the base of trees or stumps. It may be related to *Meripilus*, which however has simple-septate generative hyphae and sclerified generative hyphae instead of skeletal hyphae proper. Their spores are almost identical, and both cause a white rot. This and the compound basidiocarps point to a close relationship.

Grifola frondosa (Dicks.:Fr.) Gray,

Nat. Arr. Brit. Plants 1:643, 1821. - *Polyporus frondosus* Dicks.:Fr., Syst. Mycol. 1:355, 1821.
Basidiocarps annual, stipitate, stipe much branched from a thick base, cream coloured, up to 10 cm or more in diam at the base, giving rise to large numbers of imbricate, petaloid or flabelliform and often confluent pilei up to 8 cm wide and 8 mm thick, entire structure up to 40 cm wide; pileuspale lavender-grey at first, becoming darker and finally a dull dark brown on older specimens, azonate, very finely tomentose to glabrous, smooth or radiately rugose; pore surface ivory white, the pores angular, 2-4 per mm, context ivory white, up to 2 mm thick in individual pilei, up to several cm thick at base and in main branches of stipe; tube layer decurrent on the stipe, pale tan on older dried specimens, brittle and shattering easily when dried, up to 5 mm thick; odour pleasant, nutlike.
Basidiospores 6-7 x 4-4.5 µm, ovoid to elliptic.
Substrata. Growing on the ground from roots at the base of living hardwoods and conifers. Particularly common on oaks but also on *Nyssa, Ulmus*, and *Acer*; also reported on *Pinus, Pseudotsuga*, and *Larix*.

Distribution. Circumpolar in the temperate zone.
Remarks. *Polyporus umbellatus* Pers.: Fr. has similar basidiocarps but has cylindrical basidiospores and branched skeleto-binding hyphae. *Meripilus giganteus* differs in having larger individual pilei, simple-septate generative hyphae, a more fibrous consistency and a pale brown pileus from the very beginning.

GRAMMOTHELE Berk. & M. A. Curtis,

J. Linn. Soc. Bot. 10:327, 1868.
Basidiocarps annual, resupinate, adnate, effused, up to 2 mm thick, but usually thinner, hymenial surface irregularly irpicoid to poroid and then partly labyrinthine to sinuous, pore surface variable white, pinkish, whitish grey to pale greyish blue, in some species the skeletal hyphae agglutinated as bundles, hymenium restricted to the horizontal basal parts of the pores and slightly down the vertical walls, context light and thin. Hyphal system dimitic, generative hyphae with clamps, skeletal hyphae thick walled to solid, dextrinoid at least in the outer parts, in some species more or less hyaline throughout the life span of the basidiocarps, in other species first hyaline and then darker with age and in some species coloured from the very beginning. Dendrohyphidia absent or present, spores elliptic to cylindrical, thin walled, smooth and nonamyloid. On hard woods. Tropical genus.
Type species: *Grammothele lineata* Berk. & M. A. Curtis.
Remarks. The genus is similar and seemingly related to *Porogramme* which is separated by having a monomitic hyphal system.

Grammothele lineata Berk. & M. A. Curtis,

Jour. Linn. Soc. 10:327, 1868.
Basidiocarps adnate, effused, up to 1 mm thick, but frequently only 200-400 µm thick, margin white to pale pinkish, pore surface first white to greyish, later pinkish, pale cocoa or sordid grey, the colour change occurs as the skeletal hyphae become tinted or coloured especially those in hyphal pegs and then the pore surface becomes dotted with dark spots with age, especially along the dissepiments, more scattered on the vertical, sterile tube walls where these bundles often project as hyphal pegs, tubes shallow, angular (1)2-4 per mm, often irregular and the walls first occur as irregular plates or teeth which later merge to a more or less poroid pattern where, however, there usually are numerous pores which are incomplete as there are narrow passages from one pore to another, hymenium whitish and restricted to the base of the pores, subiculum very thin, whitish to pinkish, with age becoming dark and resinous.
Hyphal system trimitic, generative hyphae thin walled and with clamps, 1.5-2.5 µm wide, skeletal hyphae thick walled to solid, 1.0-2.5 µm wide, first hyaline, with age becoming tinted in shades of brown, darkening in KOH and with a distinct dextrinoid reaction.
Dendrohyphidia richly present, hyaline and irregularly apically branched, difficult to observe in old specimens, in the hymenium up to 3-15 µm long, in the dissepiments and on the vertical walls apparently arising at the end of branched generative hyphae.
Basidiospores 4.5-6 x 1.5-2.5 µm, elliptic.
Distribution. Pantropical.
Remarks. The partly hydnoid surface with dots of numerous dark bundles of skeletal hyphae is distinct in this species.

GRAMMOTHELOPSIS Jülich,

Bibl. Mycol. 85: 400, 1982. Basidiocarps resupinate, adnate, shallowly poroid with hymenium restricted the inner bottom of the pores, hymenial system dimitic, generative hyphae with clamps, skeletal hyphae non-dextrinoid to dextrinoid, basidia tetrasterigmatic, cystidia absent, basidiospores large, thick-walled, smooth, hyaline dextrinoid or non dextrinoid, on hard woods, tropical genus.
Type species: *Grammothele macrospora* Ryvarden.
Remarks. The genus is characterized by the shallow pores, reminding as such about *Grammothele*, but easily separated from the latter by the far larger and thick-walled spores.

Grammothelopsis macrospora (Ryvarden) Jülich,

Bibl. Mycol 85:400, 1982. – *Grammothele macrospora* Ryvarden, Prelimin. Fl. Polyp. East Africa p. 43, 1980.
Basidiocarps resupinate, effused, in type about 6 x 8 cm, adnate, up to 400 µm thick, ore surface pale brown, margin white to pale ochraceous, narrow to wide, pores angular to elongated, on average 12 per mm, some pores up to 3 mm long, finely dentate, pore mouths and tube walls dotted with white hyphal pegs, partly as conical studs, partly as elongated short ridges, tubes pale brown, context thin, pale brown.
Hyphal system dimitic, generative hyphae hyaline and with clamps, 13 µm wide, trama and subhymenium dominated by skeletal hyphae, thick walled to solid, pale yellowish, straight to slightly sinuous, mostly unbranched, but in the pore mouths distinctly arboriform, apical parts strongly to weakly dextrinoid, lower straight parts nondextrinoid.
Dendrohyphidia richly present, both in the hymenium and along the sterile pore mouths, up to 30 µm long.
Basidiospores 15-20 x 7.5-11 µm, broadly elliptic, thick walled and strongly dextrinoid.
Distribution. Known only from the type locality in Kenya.
Remarks. The large, thick walled dextrinoid spores and the dendrohyphidia make this a distinct species.

HADDOWIA Steyaert,

Persoonia 7:108, 1972.
Basidiocarps stipitate, pileus shiny laccate, reddish to blackish-brown, stipe laccate and shiny, pore surface wood coloured, context white to pale straw coloured, pores 2-3 per mm, hyphal system trimitic with clamped generative hyphae, binding hyphae and skeletal hyphae, basidiospores with longitudinal double crests connected by small transverse membranes. On the ground. Tropical genus with two species out of which one occurs in Africa.
Type species: *Polyporus longipes* Lev.
Remarks. The genus is well-characterized by its laccate basidiocarps and distinctive and unique spores. It belongs in Ganodermataceae.

Haddowia longipes (Lev.) Steyaert, op.cit. p. 109.

Polyporus longipes Lev., Ann. Sci. Nat. Bot. ser III, 5:124, 1846.
Basidiocarps annual, single, stipitate, pileate, centrally to more commonly laterally stipitate, pileus up to 10 cm wide and 3 cm thick, mostly flat with almost vertical edge or margin, rather soft when dry, fresh, light of weight when dry, pileus shiny, laccate, yellowish-brown in young parts, chestnut to blackish-brown in older parts, with a very thin, easily-dented crust, concentrically zonate in sulcate bands, more prominent on the vertical edge of the pileus than on the top, slightly wrinkled in radial direction when dry, pore surface whitish to ochraceous, pores angular, thin-walled, 2-3 per mm, tubes wood-coloured, up to 3 cm deep, context up to 5 mm thick, but mostly thinner, white to cork coloured, cottony and tough, upper crust 20-40 µm thick.
Stipe 8-18 cm long, 4-6 mm in diameter, shiny and laccate, chestnut to deep blackish brown, with a thin crust, central core homogeneous, white to pale straw-coloured.
Hyphal system trimitic, generative hyphae hyaline and with clamps, 2-5 µm wide, in a layer below the crust wider and densely intertwined, skeletal hyphae in trama densely intertwined and randomly oriented, dominantly unbranched, slightly tortuous, thick-walled to solid, hyaline, 2-5 µm wide, cuticle of club-shaped ends of generative hyphae, 20-60 µm long from the clamp, 6-10 µm wide in the upper part, thick-walled, in the upper part brownish and filled with a brown resinous content. **Basidiospores** 12-17(19) x 10-14(15) µm, elliptic, longitudinally striate with double crests, partly connected with short transverse walls, yellowish to brownish.
Substrate. On the ground from buried roots.
Distribution. Pantropical, but rare.
Remarks. Microscopically the species is easy to recognize because of the unique, crested spores.

HAPALOPILUS P. Karst.

Rev. Mycol 3:18, 1881.

Basidiocarps annual, resupinate to pileate, then broadly sessile to dimidiate, soft when fresh, brittle when dry, whole basidiocarp reddish brown to orange, turning cherry red in contact with KOH; pores circular to angular, small to medium; hyphal system monomitic; hyphae with clamps; cystidia absent; spores elliptic to cylindrical, smooth, hyaline, thin-walled, negative in Melzer's reagent. On dead hardwoods and conifers, causing a white rot.
Type species: *Hapalopilus nidulans* (Fr.) P. Karst.
Remarks. The genus as circumscribed here may include species with different phylogenetic back ground. However, the reddish coloration with KOH and the monomitic hyphal system with clamped generative hyphae make the genus rather distinct. The reaction to KOH in the type species is pink to violet while it is distinctly more reddish changing to darker colours in the other species.

Hapalopilus rutilans (Pers.:Fr.) Murrill,

Bull. Torrey bot. Club 31:416, 1904. - *Polyporus rutilans* Pers.: Fr., Syst. Mycol. 1:363, 1821. – Observ. Mycol. (Havniae) 2:260, 1818. - *Boletus rutilans* Pers., Icon. Descr. Fung. Min. Cognit. (Leipzig), p. 18, 1798. - *Polyporus nidulans* Fr., Syst. Mycol. 1: 362, 1821.
Basidiocarps annual, pileate, broadly sessile to effused-reflexed, mostly convex, often almost triangular in section, up to 10 cm wide and long, but usually smaller, up to 4 cm thick at the base, soft and watery when fresh, light and somewhat brittle when dry, all parts of the basidiocarp light violet to purplish-red with KOH; upper surface cinnamon to ochraceous, at first finely tomentose to scrupose with small adpressed tufts of hyphae, soon completely smooth, azonate or with a few broad, weakly sulcate zones, the inner ones usually smoother than the distal ones, margin acute and entire; pore surface ochraceous to cinnamon brown, usually with a distinct sterile edge towards the substrate and margin, pores thin-walled, angular, 2-4 per mm, the pore surface often with a few large cracks in larger basidiocarps; context light cinnamon, mostly distinctly paler in colour towards the pileus, soft and fibrous and quite brittle when dried, up to 4 cm thick at the base; tube layer up to 10 mm thick, ochraceous or whitish due to cottony sterile hyphae.
Hyphal system monomitic; generative hyphae hyaline, with clamps, in the context large, up to 10 µm in diam. and with conspicuous clamps, distinctly thick-walled and richly branched, mostly smooth, but also covered partly with amorphous substances mixed with polygonal, light pinkish to brownish crystals; tramal and subhymenial hyphae straighter and narrower, up to 6 µm in diam.
Cystidia none; fusoid cystidiols variably present, 18-22 x 4-5 µm, with a basal clamp.
Basidia 18-22 x 5-6.5 µm, clavate.
Basidiospores 3.5-5 x 2-2.5(-3) µm, ellipsoid to cylindrical.

Substrata. Dead hardwoods, rarely on conifers like *Abies, Picea* and *Pinus*. In north Europe especially common on *Corylus* and *Sorbus*, in central Europe most common on *Quercus* spp.
Distribution. Circumboreal in the north temperate zone. Also known from the mountains in tropical Africa.
Remarks. Easily recognised due to the cinnamon coloured, sappy basidiocarp with a vivid violet (polyporic acid) reaction in KOH.

HAPLOPORUS Singer,

Mycologia 35:66, 1944.
Basidiocarps perennial, pileate, sessile, ungulate, with a strong scent of anise; hyphal system trimitic; generative hyphae with clamps; cystidia absent; spores ovoid to elliptic, hyaline, minutely nodulose or ridged, causing a white heart rot. Circumboreal.
Type species: *Haploporus odorus* (Sommerf.: Fr.) Singer.
Taxonomic synonym: *Pachykytospora* Kotl. & Pouzar (*Polyporus tuberculosus* Fr.).
Remarks. The genus is well characterized by its trimitic hyphal system and the ornamented basidiospores. The dextrinoid spores in some species suggest a relationship to *Perenniporia*, which, however has smooth, usually truncate, thick-walled spores.

Haploporus odorus (Sommerf.: Fr.) Singer,

Mycologia 36:68, 1944. - *Polyporus odorus* Sommerf., Suppl. Fl. Lapp., p. 275, 1826. - *Polyporus odorus* Sommerf.: Fr. Elench. Fung., p. 90, 1828.
Basidiocarps perennial, usually sessile, ungulate, rarely effused-reflexed, up to 6 x 15 x 8 cm; pilear surface pale buff to darker grayish or dingy brown, azonate, smooth, finely tomentose at first, becoming glabrous and encrusted on older, larger specimens; pore surface pale buff, smooth, the pores circular, 4-5 per mm, with thick, entire dissepiments; context light buff, corky, faintly zonate or layered in appearance, up to 7 cm thick; tube layers distinctly stratified, concolorous with context, up to 1.5 cm thick; fresh basidiocarps with a strong, pleasant, anise odor.
Hyphal system trimitic; generative hyphae, 2-3.5 µm in diam, skeletal hyphae thick-walled, 3-5 µm in diam; binding hyphae thick-walled, 1.5-2.5 µm in diam.
Basidiospores 5-6.5 x 3-4.5 µm, ovoid to elliptic, minutely, but distinctly ornamented.
Substrata. Most commonly on living *Salix* ssp, rarely on *Populus* spp.
Distribution. A rare species, but circumboreal in ecosystems with willows.
Remarks. Fresh basidiocarps have a strong pleasantly fragrant odor of anise and can be detected often at long distance by this character. Microscopically, the minutely ornamented and dextrinoid spores are distinctive.

HETEROBASIDION Bref,,

Unters. Gesamtg. Mykol. 8:154, 1888.
Basidiocarps perennial, resupinate to pileate, widely effused, tough; pilear surface at first light brown, finely tomentose, soon darker, smooth, with a distinct thin black cuticle; pore surface light cream, glancing, pores regular, circular to angular, mostly small; context white to light cream, dark reddish brown with Melzer's reagent; hyphal system dimitic; generative hyphae delicately thin-walled, simple-septate; skeletal hyphae dominating in the basidiocarp, dextrinoid, unbranched or sparsely branched; cystidia absent; basidiospores broadly elliptic to globose, hyaline, thin to slightly thick-walled, finely asperulate, non-amyloid. Causing a white root and butt rot of living trees, predominantly conifers. Temperate to boreal genus with two species in North America.
Type species: *Heterobasidion annosum* (Fr.) Bref.
Remarks. The dextrinoid skeletal hyphae, the cuticle on the pileus and above all the asperulate spores make *Heterobasidion* a distinctive genus. The type species is a major root-rot pathogen in conifer-forests. Previously it was assumed that the type species was transcontinental in the boreal conifer zone. However recent DNA investigations have shown that the North American populations belong to two different species.

Heterobasidion annosum (Fr.) Bref.,

Op. cit. - *Polyporus annosus* Fr., Syst. Mycol. 1:373, 1821.
Basidiocarps annual to perennial, sessile, effused reflexed, or often resupinate, pilei dimidiate to long, narrow and shelf like, irregular in shape, imbricate or single, up to 9 x 15 x 5 cm; surface of the pileus tomentose to glabrous, becoming incrusted, brown, blackish with age, very rough and irregular, indistinctly concentrically zonate and sulcate, margin concolorous, often undulating, rounded, sterile below; pore surface ivory white to pinkish cream, glancing, smooth, pores circular to angular, 4-5 per mm, dissepiments at first thick, entire, becoming thin and lacerate with age; context ivory, corky, azonate, up to 1 cm thick, upper encrusted layer showing as a thin black line in section; tube layers concolorous and continuous with context, indistinctly stratified, up to 3 mm long each year.
Hyphal system dimitic; contextual generative hyphae hyaline, thin-walled, simple septate, with occasional branching, 2.5-5 µm in diam.; contextual skeletal hyphae hyaline, thick-walled, nonseptate, dextrinoid, with occasional branching, 3-5.5 µm in diam.; tramal hyphae similar.
Cystidia or other sterile hymenial elements lacking.
Basidia 16-22 x 5-7 µm, clavate, tetrasterigmatic and simple-septate at the base.
Basidiospores 4.5-6.2 x 4-5.2 µm, subglobose to ovoid, hyaline, minutely echinulate and may appear smooth under the light microscope, negative in Melzer's reagent.
Substrata. On living and dead conifers, especially *Pinus*, less common on other coniferous hosts. More rarely on hardwoods

Distribution. Throughout the coniferous forests of Europe although rare in the northernmost parts of the Fennoscandian peninsula. Common. In East Asia and in North America replaced by *Heterobasidion insulare* (Murrill) Ryvarden.
Remarks. *H. annosum* is usually easy to recognize by the brown and often sulcate or irregular pileus and the cream pore surface reacting strongly with Melzer's reagent. The margin is often very distinct and slightly raised in resupinate basidiocarps. Microscopically the dextrinoid skeletal hyphae are distinctive. The spores are often difficult to observe and the ornamentation is not easily seen. The septation of the generative hyphae may also be difficult to discern.
Heterobasidion annosum is one of the major root rot pathogens on European conifers and is particularly damaging in plantations or second growth stands which have been thinned.

HEXAGONIA Fr.,

Fl. Scand., p. 339, 1835.
Basidiocarps annual to perennial, pileate, sessile, dimidiate to flabelliform, consistency coriaceous to corky; pilear surface smooth, tomentose or densely hirsute with long dark hairs; pores angular and mostly large, dissepiments entire; context usually thin, dark brown, blackening in KOH; hyphal system trimitic; generative hyphae with clamps, thin-walled, hyaline; binding and skeletal hyphae thick-walled to almost solid, yellow to golden-brown, endings of both types often project into the hymenium which then partly becomes a catahymenium; true cystidia absent; spores hyaline, cylindrical, longer than 12 µm, negative in Melzer's reagent. On dead hardwoods, causing a white rot. Pantropical genus.
Type species: *Hexagonia crinigera* Fr.
Remarks. The genus is characterized by a trimitic hyphal system with coloured skeletal hyphae and large cylindrical spores and most species also have large hexagonal pores, which, however, is not the case with the two species treated here. There are difficulties in drawing a sharp borderline with some *Trametes* spp. in subgenus *Coriolopsis*, but normally they are of a lighter colour and have shorter spores.

Hexagonia hydnoides (Sw.: Fr.) M. Fidalgo,

Mem. New York Bot. Gard. 17:35-108, 1968. - *Polyporus hydnoides* Sw.: Fr., Syst. Mycol. 1:362, 1821.
Basidiocarps annual, rarely perennial, pileate, sessile, solitary to imbricate, dimidiate to flabelliform, convex or flat, 3-19 cm broad, 2.5-10 (-14) cm wide, and 0.2-1 (-2) cm thick, but usually thin, consistency flexible and coriaceous when fresh, rigid on drying; pilear surface dark brown to almost black, at first densely covered with dark branched hairs up to 6 mm long, erect or prostrate, these soon falling off completely or in concentric zones, rarely glabrous, but often shiny; pore surface fulvous to dark brown with a distinct grayish tint, the pores circular to somewhat irregular, 3-4 (-5) per mm, context cinnamon-brown to dark brown, 1-2 mm thick; tube layer brown to grayish brown, 1-10 mm thick.
Hyphal pegs 30-70 µm long, common and consisting of skeletal hyphae.
Basidiospores 11-14.5 x 3-4 µm, cylindrical.
Substrata. Reported from numerous hardwood species.
Distribution. Pantropical, often in semidry areas and savannas.
Remarks. Basidiocarps of *H. hydnoides* are easy to recognize because of the dense mass of black erect hairs on the pileus, often in distinct zones. In the tropics there are other species with the same type of pileus cover but distinguished by far larger pores.

HYDNOPOLYPORUS D.A. Reid,

Persoonia 2:151, 1962.
Basidiocarps annual, pileate, single or caespitose, usually composed of numerous flabelliform irregular pilei, often erect and multiplex; pilear surface finely velutinate to glabrous, striate, azonate to zonate, white to isabelline, becoming darker when dried; pore surface almost smooth, papillate, hydnoid or irregularly poroid with angular pores; context white, thin; hyphal system monomitic; generative hyphae with simple septa, hyaline and narrow to wide; cystidia absent; basidia clavate; basidiospores broadly elliptic to ovoid; conidia similar, but produced from hyphae in the upper tomentum. Causes a white rot in dead hardwoods. American monotypic genus.
Type species: *Hydnopolyporus fimbriatus* (Fr.) D.A. Reid.
Remarks. The irregular basidiocarps with a variable hymenophore make this a distinct genus.

Hydopolyporus fimbriatus (Fr.) D.A. Reid,

Persoonia 2:151, 1962. - *Polyporus fimbriatus* Fr., Linnaea 5:520, 1830.
Basidiocarps annual, pileate, irregular, often as small rosettes with fimbriate to incised fan shaped pilei and a rudimentary, sterile contracted base or stipe, in clusters, more rarely single, in clusters 2-12 cm in diameter, individual pilei up to 2.5 cm wide and 1-3 mm thick, flexible and tough; pilear surface velutinate, becoming glabrous, azonate to concentrically zonate, smooth to radially striate, white to pale tan becoming darker when dried; margin very thin, incised, fimbriate to irregularly split, often darker than the basal parts of pileus as if soaked with resinous substances; pore surface variable, almost smooth, warted, irpicoid, hydnoid or poroid, in the latter case with angular to sinuous pores, 3-5 per mm close to the margin, larger and 2-3 per mm towards the base; context thin, duplex, upper layer soft, the lower one more dense, but duplex consistency often not clearly developed; tube layer concolorous with pore surface, without hyphal pegs.
Hyphal system monomitic; generative hyphae with simple septa, thin to distinctly thick-walled, 3-8 µm in diam.
Basidiospores 4.5-5.5 x 3.5-4.5 µm, broadly elliptic to subglobose.
Conidiospores 2.5-4 x 2-3 µm, subglobose, smooth, present in the context, may be absent.

Substrata. On dead hardwoods, often from buried wood.
Distribution. Tropical American species, in United States known only from Alabama, Florida, and Louisiana. Southwards to Northern Argentina.
Remarks. The irregular, often deeply split and incised basidiocarps with an irregular hymenophore are distinctive in the field. Microscopically the simple-septate hyphae and the broadly elliptic to subglobose spores will be diagnostic.

INONOTUS P. Karst.,

Meddel. Soc. Fauna Fl. Fenn. 5:39, 1880.

Basidiocarps annual, resupinate, effused-reflexed, sessile, or stipitate; tissue yellowish brown to reddish brown, darkening in KOH; pilear surface hirsute, hispid, tomentose, or glabrous, yellowish brown to reddish brown, often darkened and rimose in age; context brown, soft-fibrous to tough-corky; hyphal system monomitic to dimitic; generative hyphae simple-septate, hyaline to thick-walled and brown in KOH; thick-walled, nonseptate, dark brown skeletal hyphae present in some species; binding hyphae present in some species; setal hyphae present in context or trama of some species; hymenial setae present in most species, straight to hooked, becoming thick-walled, dark brown in KOH; basidiospores narrowly elliptic to ovoid or subglobose, hyaline or golden to reddish brown, negative in Melzer's reagent. Large cosmopolitan genus with 26 species in North America, causing white rots in living and dead hardwoods and conifers.
Type species. *Polyporus cuticularis* Bull.:Fr.
Remarks. The genus is usually easy to recognize by the brown, annual basidiocarps with a fibrous to soft or fragile consistency. The hyphae are generally wider than those seen in *Phellinus* which is characterized by woody, perennial basidiocarps with a dimitic hyphal system.
Taxonomic synonyms.
The following genera (with type species in parenthesis) are based on species included in the present wide and traditional concept of *Inonotus*, thus, being available for those who prefer more restricted circumscriptions of genera. Necessary combinations are available in Mycobank or Index Fungorum
Inocutis Fiasson & Niemelä (*Polyporus rheades* Pers.).
Inoderma P. Karst. (*Polyporus radiatus* Sowerby:Fr).
Inonotopsis Parmasto *(Polyporus subiculosus* Peck).
Mensularia Lazaro-Ibiza (*Polyporus radiatus* Fr.).
Onnia P. Karst. (*Polyporus circinatus* Fr.).
Phaeoporus Schröt. (*Polyporus obliquus* Pers.:Fr.).
Xanthoporia Murrill, (*Mucronoporus andersonii* Ellis & Everh.).

Inonotus cuticularis (Bull.:Fr.) P. Karst.,

Meddel.. Soc. Fauna Fl. Fenn. 5:37, 1879. - *Polyporus cuticularis* Bull.:Fr., Syst. Mycol. l:363, 1821.
Basidiocarps annual, sessile, solitary or in imbricate clusters, dimidiate, applanate, up to 5 x 11 x l.5 cm; pileus surface yellowish brown, tomentose or radially fibrillose, becoming glabrous and finally blackened and rimose with age, azonate or faintly zonate, smooth or shallowly sulcate; pore surface pale brown, glancing, the pores angular, 4-5 per mm, context bright yellowish brown to reddish brown, firm-fibrous, azonate, up to l cm thick, upper tomentum often delimited by a darker, compact layer that forms the upper surface on weathered pilei; tube layer pale brownish, up to 8 mm thick, tubes often whitish within; spore print bright yellowish brown.
Setal hyphae abundant on pileus surface, branched, firm- to thick-walled, branches often curved, tapering to a point, setal elements similar to the hymenial setae also present on hymenial surface.
Hymenial setae 16-30 x 6-11 µm, abundant to rare, subulate to ventricose, frequently hooked, firm- to thick-walled.
Basidiospores 6-8 x 4.5-6 µm, elliptic to ovate, pale to dark brown.
Substrate. Hardwoods of different kinds.
Distribution. Circumpolar in the temperate zone.
Remarks. The species is characterized by its hooked setae on the pileus. There are similar species in North America, see (Ryvarden 2024).

IRPEX Fr.,

Elench. Fung. 1:142, 1828.
Basidiocarps annual, sessile, effused-reflexed, or resupinate; hymenophore becoming strongly hydnoid; pilear surface tomentose to hirsute, white to pale buff; hyphal system dimitic; generative hyphae simple-septate; cystidia thick-walled, encrusted; basidiospores cylindrical, hyaline. Causing a white rot of dead hardwoods and conifers
Type species: *Irpex lacteus* (Fr.:Fr.) Fr.
Remarks. The genus is included in this book even if the basidiocarps usually are hydnoid, but young specimens could easily be taken for a poroid species.

Irpex lacteus (Fr.:Fr.) Fr,

Elench. Fung., p. 145, 1828. - *Sistotrema lacteum* Fr., Obs. Mycol. 2:226, 1818. - *Hydnum lacteum* Fr.:Fr., Syst. Mycol. 1:412, 1821. - *Polyporus tulipiferae* (Schwein.) Overh., Wash. Univ. Studies 3, 1:29, 1915.
Basidiocarps annual, usually effused-reflexed or resupinate at first, occasionally sessile; pilei usually imbricate, dimidiate or laterally fused, up to 1 x 7 x .5 cm; pilear surface white to cream coloured or pale buff, densely tomentose to hirsute, azonate

to faintly zonate, smooth or shallowly sulcate; margin concolorous; pore surface white to cream, the pores angular, 2-3 per mm near the margin with thin dissepiments that split deeply at an early stage to form an hydnoid hymenophore; context white to pale tan, up to 2 mm thick; tube layer concolorous and continuous with the context, up to 3 mm thick.
Cystidia 50-110 x 5-l0 µm, abundant, thick-walled, heavily apically encrusted, projecting up to 40 µm, originating in the subhymenium from skeletal hyphae.
Basidiospores 5-7 x 2-3 µm, oblong to cylindrical, straight to slightly curved, hyaline.
Substrata. Dead wood of numerous hardwood genera.
Distribution. Cosmopolitan species.
Remarks. The strongly hydnoid hymenophore, conspicuous incrusted cystidia and simple-septate hyphae, are the diagnostic characters of *I. lacteus*.

ISCHNODERMA P. Karst.,

Med. Soc. Fauna Fl. Fenn. 3:38, 1879.
Basidiocarps annual, sessile, applanate, dimidiate to almost circular; pilear surface tomentose to smooth, dark brown to almost black, becoming rugose; pore surface white, darkening when touched or dried, the pores small, dissepiments entire; tubes concolorous with pore surface; context ochraceous to light brown, separated from the tomentum by a distinct thin black zone, becoming a crust on the pileus when the tomentum wears away; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae hyaline to light yellowish, thick-walled; cystidia absent; spores cylindrical, thin-walled, smooth, negative in Melzer's reagent. On conifers and hardwoods, causing a white rot.
Type species: *Ischnoderma resinosum* (Fr.) P. Karst.
Remarks. The genus is fairly well recognized by its dark brown, tomentose pileus, becoming black and glabrous with age, usually wrinkled radially.

Ischnoderma resinosum Fr.) P. Karst.,

Meddel. Soc. Fauna Fl. Fenn. 5:38, 1879. - *Polyporus resinosus* Fr., Syst. Mycol. 1:361, 1821. - *Polyporus benzoinus* Wahlb.: Fr., Elench. Fung. 1:100, 1828.
Basidiocarps annual, single or rarely imbricate, usually dimidiate with a tapering base or broadly attached, fairly large, up to 12 cm wide, 15 cm long and up to 3 cm thick at the base, at first fleshy and sappy, becoming hard and brittle; pileus at first finely tomentose, dark brown, when fresh more or less even, later the tomentum disappears in concentric zones, exposing a slightly glossy black resinous crust that shrinks when dried and has numerous radial furrows and some broad sulcate bands; pore surface at first whitish, darker when touched, later pale brown, pores angular to circular, 4-6 per mm; context at first soft, whitish, with drying and age ochraceous to light cinnamon and quite hard, up to 10 mm thick at the base; tube layer concolorous with pore surface, up to 10 mm thick.
Basidiospores 5-7 x 1.5-2 µm, cylindrical.
Substrata. Dead wood of numerous genera of hardwoods, also on conifers.
Distribution. Widespread in the temperate zone, and Circumglobal through Northern Asia to Europe.
Remarks. Usually the species is easy to recognize because of the annual sappy basidiocarps with a dark brown to blackish brown, finely tomentose pileus, often zoned and wrinkled. The pore surface stains brown very rapidly when touched in fresh condition.

JAHNOPORUS Nuss,

Hoppea 39:176, 1980.
Basidiocarps annual, stipitate; pileus grey to pale purplish brown, hispid to tomentose becoming glabrous; pore surface white to cream, pores angular; context white; hyphal system monomitic; generative hyphae with clamps; cystidia absent, spores spindle shaped, l2.5-17 µm long; occurs on the ground from buried wood. Monotypic genus.
Type species: *Jahnoporus hirtus* (Quél.) Nuss.
Remarks. The genus is characterized by its large spindle shaped spores, very different from those of *Albatrellus*, with which it shares a monomitic hyphal system.

Jahnoporus hirtus (Cooke) Nuss,

Hoppea 39:176, 1980. - *Fomes hirtus* Cooke, Grevillea 13:118, 1885. - *Polyporus hispidellus* Peck, N.Y. State Mus. Bull. 25:649, 1899.
Basidiocarps annual, centrally to laterally stipitate; stipe simple or branched, tan to pale purplish-brown, tomentose to glabrous, up to 10 cm long and 4 cm in diam; pilei circular, solitary or several from a branched base, up to 15 cm in diam; pileus grayish to pale purplish-brown, azonate, hispid or scurfy to tomentose or becoming glabrous, rugose or smooth; pore surface white to cream coloured, the pores angular, 1-2 per mm, with thin, entire or lacerate dissepiments; context whitish, azonate, corky, up to 1 cm thick; tube layer concolorous and continuous with the context, decurrent on the stipe, up to 8 mm thick; odor pleasantly fragrant, nutlike.
Basidiospores 12.5-17 x 4.5-5.5 µm, fusiform or spindle shaped.
Substrata. Usually growing on the ground under conifers, apparently from roots or buried wood.
Distribution. Widespread but rare in the warmer parts of the temperate zone.
Remarks. The large pores, a hispid or scurfy, pale purplish brown pileus and the large fusiform spores, are the distinctive features of *J. hirtus.*

JUNGHUHNIA Corda emend. Ryvarden,

Annal. Stud. Mycol., p. 195, 1842; - Persoonia 7:18, 1972.
Basidiocarps annual, resupinate, rarely effused reflexed; pore surface cream- coloured to pinkish buff or cinnamon; pores mostly small, with thin, lacerate dissepiments; hyphal system dimitic; generative hyphae with clamps; thick-walled skeletocystidia rare to abundant, heavily incrusted, imbedded or projecting; basidiospores ovoid to cylindrical, curved in some species. Causing a white rot in dead hardwoods and conifers.
Type species: *Junghuhnia crustacea* (Jungh.) Ryvarden.
Remarks. The genus is characterized by the dimitic hyphal system and the heavily encrusted cystidia.

Junghuhnia crustacea (Jungh.) Ryvarden,

Persoonia 7:18, 1972. - *Laschia crustacea* Jungh., Verh. Batav. Genootsch. Kunst. Weten.17: 75, 1838.
Basidiocarps annual, resupinate, mostly small, but effused specimens have been seen from Africa, up to 2 mm thick, probably soft when fresh, rather brittle when dry, pore surface white to cream, later more ochraceous, margin thin and narrow to absent, hymenophore first irregularly hydnoid as the tubes arise from separate plates which grow laterally and then develop into a poroid surface, usually with rather dentate dissepiments, pores angular, 4-6 per mm, along the pore edges dotted with numerous projecting cystidia (strong lens), tubes concolorous with the pore surface, subiculum very thin and whitish.
Hyphal system dimitic, generative hyphae hyaline, thin-walled, 1-3 µm wide and with clamps, often very difficult to find in dry and old specimen, skeletal hyphae totally dominating in the basidiocarps, frequently mixed with crystalline and semi-crystalline material which make it difficult to tease them apart, thick-walled to solid, 1.5 – 3 µm wide.
Basidia 12-18 µm, clavate, tetrasterigmatic.
Cystidia numerous, strongly apically encrusted, encrustation 20-40 µm long and in the upper part thick-walled and widened, 6-12 µm wide with encrustation,
Basidiospores 4-5 x 2.5 µm oblong elliptic.
Substrate. On deciduous wood.
Distribution. Paleotropical species.
Remarks. The basidiocarps remind one somewhat of the hymenial configuration seen in *Grammothele* and *Theleporus*. However, as the hymenium distinctly also covers the tubes walls we prefer to place it in the Polyporaceae.

LAETIPORUS Murrill,

Bull. Torrey Bot. Club 31:607, 1904.
Basidiocarps annual, sessile to stipitate, soft and fleshy, friable and light in weight on drying; pilear surface yellow-orange to pinkish brown, becoming glabrous; pore surface yellow to pinkish cream, the pores regular, 3-4 per mm; context white to pinkish buff, soft, zonate to azonate; hyphal system dimitic; generative hyphae simple-septate; binding hyphae thick-walled, nonseptate, much branched and interlocked; cystidia absent; basidiospores ovoid to broadly ellipsoid, negative in Melzer's reagent; causing a brown cubical rot of living hardwoods and conifers.
Type species: *Laetiporus sulphureus* (Bull.: Fr.) Murrill.
Remarks. The yellow to orange species of *Laetiporus* are closely related, and rather few representative specimens exist of the individual and newly described species. Thus, reports in previous literature cannot be trusted as to distribution and choice of hosts.

Laetiporus sulphureus (Bull.:Fr.) Murrill,

Mycologia 12:11, 1920. - *Polyporus sulphureus* Bull.:Fr., Syst. Mycol. 1:357, 1821.
Basidiocarps annual, laterally substipitate to sessile, pilei single to occurring in large imbricate clusters up to a square meter or more in extent, dimidiate to flabelliform, up to 40 cm wide; pilear surface lemon yellow to orange when fresh, fading to pale brownish with age or drying and bleaching to white in old, deteriorating specimens, minutely tomentose to glabrous, azonate to faintly zonate, radiately furrowed; margin concolorous, often undulate, rounded, sterile or fertile below; pore surface sulphureus yellow when fresh, fading to pale tan on drying, the pores angular, 3-4 per mm, with thin dissepiments that quickly become lacerate; context white, azonate, brittle and sappy or succulent when fresh, drying crumbly or chalky, up to 2 cm thick; tube layer sulphureus yellow when fresh, drying pale buff, distinct, up to 4 mm thick; taste and odor nutlike, pleasant.
Basidiospores 5-8 x 4-5 µm, ovoid to elliptic, hyaline, smooth, thin walled.
Anamorph. *Sporotrichum versisporum* (Lloyd) Stalpers.
Substrata. Hardwoods and is particularly common on *Quercus* spp., rarely on coniferous hosts.
Distribution. Widely distributed and throughout the temperate zones, rare in subtropical and tropical zones.
Remarks. *Laetiporus sulphureus* is the most commonly eaten polypore and can often be collected in quantity from a single fruiting for this purpose. The bright orange colour and the stipitate to sessile basidiocarp make this a distinct species.

LENTINUS Fr.,

Syst. Orb. Veget. p. 77, 1825.
Basidiocarps stipitate, funnel shaped to vase shaped, or centrally depressed, pileus usually circular, hirsute, squamose to glabrous, margin often involute upon ageing and in some species with cilia, hymenophore lamellate, lamellae usually moderate

to deeply decurrent, even to lacerate or denticulate, hyphal pegs usually present on the lamellae, stipe central to eccentric and of variable length. Hyphal system dimitic, consisting of non-inflated generative hyphae with clamp connections, and frequently branched arboriform skeletal hyphae in subgenus *Lentinus*, or unbranched skeletal hyphae in subgenus *Panus*, basidiospores cylindrical to elliptic, hyaline, non-amyloid, non-dextrinoid, thin walled, smooth; basidia typically narrow and cylindrical to clavate snd tetrasterigmatic. Cystidia present or absent. All species (except *L. lepideus*) with a white rot. **Type species**: *Agaricus crinitus* L: Fr.
Remarks. The genus is usually easy to recognize in the field due to the stipitate basidiocarps with lamellae and a tough consistency, quite different from macroscopically similar agarics which have a much softer consistency. Almost all species grow on wood, and the genus is related to *Polyporus* s. str., and in principle separated only by its gills instead of pores. *Pleurotus* is a rather similar genus growing on wood, but is separated by having a monomitic hyphal system.

Lentinus crinitus (L.: Fr.) Fr.,

Syst. Orb. Veg. p. 77, 1825. – *Agaricus crinitus* L., Spec. Plant. 2: 1644, 1763.
Basidiocarp 1-4 cm wide, thin and coriaceous, deeply umbilicate to infundibuliform, pileus pale yellowish brown becoming dark reddish-brown , distinctly strigose tot striate, becoming glabrous by age, margin thin an d ciliate, lamellae decurrent; whitish to ochraceous, up 1,5 mm wide, moderately crowded, context , thin up to 1 mm thick, white to wood coloured.
Stipe 1-4 cm, central or slightly eccentric, slender; cylindrical, often somewhat swollen at the base, concolorous with pileus.
Hyphal system dimitic, generative hyphae, not inflated; 1-4 µm wide; frequently branched, skeletal hyphae 2-5 µm wide, thick walled but with a narrow continuous lumen.
Cheilocystidia 14-37 x 2.5-5 µm, sinuous to nodulose, hyaline, thin walled,
Hyphal pegs 40-90 x 15-30 µm, abundant usually in fascicles, often with crystalline deposits.
Basidiospores 5-7 x 2-2.7 µm, cylindrical.
Substrate. On hard woods.
Distribution. American species from southern United States to Argentina.
Remarks. The rather small infundibuliform basidiocarps with brown striate lines, are distinctive features for this species.

LEPTOPORUS Quél.,

Enrich. Fung., p. 175, 1886.
Basidiocarps annual, sessile to effused-reflexed; upper surface of pileus white to pale reddish at first, becoming dark reddish purple to purplish brown with age or drying; pore surface becoming purplish brown, pores regular; hyphal system monomitic; generative hyphae simple-septate; cystidia absent; basidia clavate, tetrasterigmatic, simple-septate at the base; basidiospores allantoid, hyaline, negative in Melzer's reagent. Causes a brown cubical rot of dead conifers. Monotypic genus.
Type species: *Leptoporus mollis* (Pers.: Fr.) Pilàt.
Remarks. Basidiocarps of *Leptoporus* are similar to those of *Oligoporus* but is easily separated by its striking reddish to purplish colour and the simple septate generative hyphae.

Leptoporus mollis (Pers.: Fr.) Pilàt,

Atl. Champ. Eur. 3:174, 1936. - *Polyporus mollis* Pers.: Fr., Syst. Mycol. 1:360, 1821.
Basidiocarps annual, sessile, effused-reflexed, or rarely resupinate; pilei solitary, dimidiate to elongate, up to 1 x 3 x 2 cm; pilear surface pinkish white to pale reddish purple at first, becoming purplish brown with age or drying, faintly tomentose to glabrous, azonate, becoming rugose with age; pore surface white to pale reddish purple, becoming dark purplish-brown, the pores circular to angular, 3-4 per mm, with thick, context cream coloured to pinkish buff, becoming pale pinkish brown, soft and felty, up to 7 mm thick; tube layer drying dark purplish-brown, up to 1 cm thick.
Basidiospores 5-6 x 1.5-2 µm, allantoid.
Substrata. Dead coniferous wood.
Distribution. Widespread in through the northern conifer forest ecosystems.
Remarks. Segments of the thick-walled hyphae may resemble skeletal hyphae, but some septa are always present. Except for the simple septate hyphae, this species has clear affinities to *Oligoporus.*

LEUCOPHELLINUS Bondartsev & Singer,

Mycologia 36: 68, 1944.
Basidiocarps pileate, hyphal system monomitic with simple septate generative hyphae, cystidia present, thin to thick walled and cylindrical to tubular, usually smooth, basidiospores elliptic to oval, smooth, hyaline, thick-walled and non-dextrinoid, on hard woods, paleotropical genus.
Type species *Leucophellinus irpicoides* (Bondartsev ex Pilát) Bondartsev & Singer.
Remarks. The genus is seemingly isolated in the family with its smooth tubular cystidia and fairly large thick-walled spores. Monotypic genus.

Leucophellinus hobsonii (Berk.) Ryvarden,

Mycotaxon 31: 51, 1988. - *Polyporus hobsonii* Berk., Grevillea 15: 20 1886. - *Polyporus mollissimus* Pat., J. Bot. Paris 1 :340, 1897. - *Spongipellis stramineus* Pat., Bull. Soc. Mycol. Fr. 23:52, 1917.
Basidiocarps effused or effused-reflexed, sessile to imbricate, variable in size and thickness, up to 15 cm long, 5-10 cm in width and 1-9 cm thick at base, in effused specimens the margin can be about 1 cm wide, light of weight, consistency soft

and watery when fresh, fibrous and loose in texture when dry, pileus white to cream when fresh, straw-coloured, yellow-brown to ochraceous buff when dry, greyish to greenish at base, upper surface densely tomentose to hispid or tufted in old specimens, azonate, cortex absent, pore surface concolorous with the pileus or somewhat paler, pores angular, irregular to labyrinthine, 0.5-3 per mm, often varying in size within the same basidiocarp, dissepiments thin and papery, tubes up to 7 cm long, context thin, concolorous with the pileus, concentrically zoned, up to 3-4 cm thick.
Hyphal system monomitic, generative hyphae in the dissepiments mostly golden and thick-walled, more seldom hyaline and thin-walled, simple-septate, mostly 4-5 µm in diameter, when old the hyphae become heavily encrusted, and the whole basidiocarp then turns more brownish, hyphae sparingly branched at acute angles, hyphae in the context of the same kind, but slightly more agglutinated in strands.
Cystidia a) oblong to cylindrical, projecting up to 30 µm above the hymenium, thin to thick-walled, often with a swollen top and with one to three simple septa, up to 110 µm long and 15 µm wide. Occasionally apically covered with a resinous matter. b) pointed and mixed with basidia.
Basidiospores 8-10.5 (11) x (5.5) 6-7 µm, broadly elliptic to oval, thick-walled, appearing yellow and refractive in KOH.
Distribution. Paleotropical species, in Africa known from Zambia and Dem. Rep. Congo.
Remarks. The species is characterized by thick-walled spores and the multiseptated cystidia.

LIGNOSUS Torrend,

Broteria (Ser. Bot) 18:121, 1920.
Basidiocarps annual, centrally stipitate, pileus brown to white, smooth to very finely tomentose, pore small to large, stipe white to brown, arising from a sclerotium in the ground, context white. Hyphal system di- or trimitic, generative hyphae with clamps, hyaline binding and skeletal hyphae in context, sclerotium and stipe, cystidia none, spores smooth, elliptic, hyaline and non-amyloid. On the ground from roots. Paleotropical genus.
Type species: *Polyporus sacer* Fr.
Remarks. The genus is characteristic by its stipitate basidiocarps arising from a sclerotium and is recognizable in the field.

Lignosus sacer (Fr.) Ryvarden,

Norw. J. Bot. 19:232, 1972. - *Polyporus sacer* Fr., Epicr. Syst. mycol. p. 436, 1838.
Basidiocarps annual, solitary or in small groups, centrally stipitate with a more or less circular pileus, up to 10 cm in diameter, up to 4 mm thick in the centre, tough to coriaceous, pileus hazel to snuff brown or even dark sepia brown in old specimens, first very finely tomentose in narrow concentric zones, sometimes distinctly sulcate, but soon more or less glabrous in narrow bands, dry specimens usually wrinkled radially, in large specimens the margin may become strongly radially folded with narrow furrows, margin thin and sharp, pileus with a distinct dark cuticle in section, contrasting the white context, pore surface white to light cream, pore variable, angular, slightly radially elongated or irregular and split, 1-3 per mm, up to 1 mm deep, 1-3 with few to numerous hyphal pegs or cylindrical protuberances, up to 200 µm high, context pure white, 1-2 mm thick.
Stipe more or less central, single or a few from the same sclerotium, rarely forked in the upper part, light brown and velvety tomentose, becoming smoother and finally glabrous with age, and with a distinct thin and light brown cuticle, context pure white, stipe, first solid, but soon hollow.
Sclerotium irregular, round to somewhat elongated, up to 5 cm wide, usually dirty and soiled, finely tomentose, smooth to slightly folded when fresh, wrinkled and partly collapsed and bony hard in dry and old specimens, rhizomorphs or cords of mycelium richly to scarcely present, 1-3 mm in diameter, up to 7 cm long, usually growing radially out from where the stipe is attached, which is 1-2 cm below ground, the rhizomorphs are white to light ochraceous, finely velvety, hollow, brittle and easily broken if the basidiocarp is carelessly dug out of the ground. The sclerotium is frequently used for medical purposes.
Hyphal system trimitic, generative hyphae with clamps, in the hymenium thin-walled and hyaline, 2-3 µm in diameter, the tomentum both on the pileus and the stipe consists of such hyphae, up to 10 µm in diameter and with slightly thickened to semisolid light yellowish, moderately branched and with numerous clamps, skeletal hyphae straight to flexuous, hyaline and thick-walled to solid, 1.5-6 µm wide, in the lower part of context and in the trama mixed with strongly branched, tortuous binding hyphae, thick-walled to solid, 2-6 µm wide.
Basidiospores 5-7 x 3-4.5 µm, broadly elliptic.
Substrate. On the ground in rain forests.
Distribution. Tropical Africa from Sierra Leone to Kenya and south to South Africa. Not common.
Remarks. The stipitate basidiocarps arising from a sclerotium make this a distinct species.

LINDTNERIA Pilát,

Stud. Bot. Czech. 1:72, 1938.
Basidiocarps annual, resupinate, merulioid to poroid, thin, with irregular pores; hyphal system monomitic with simple septa or clamps; cystidia absent or present; basidia clavate with granular content; spores strongly ornamented, globose to elliptic. On dead wood, causing a white rot. Widely distributed genus, but little known.
Type species: *Lindtneria trachyspora* (Bourdot & Galzin) Pilát.
Remarks. The genus belongs in Corticiaceae s. lato with its irregular poroid hymenophore and strongly ornamented spores. The latter makes the genus distinct and easy to recognize microscopically.

Lindtneria trachyspora (Bourdot & Galzin) Pilát,

Stud. Bot. Cech. 1:72, 1938. - *Poria trachyspora* Bourdot & Galzin, Hym. de France, p. 659, 1928.
Basidiocarps annual, resupinate, effused but mostly rather small, loosely attached, thin, soft, almost cottony especially when young and in the living state, brittle when dried, when alive yellow, darkening with age and on drying to dull ochraceous, reddish, violaceous or brownish; hymenophore at first reticulate, then poroid, pores 0.5-1 mm wide, with thin, low dissepiments; subiculum very thin, soft, less than 1 mm.
Hyphal system monomitic; hyphae thin-walled, mostly 3-5 µm in diam, at branches often inflated up to 10 µm or more, mostly simple-septate but scattered clamps occur.
Basidiospores spherical 6-8 µm in diam, at first smooth, thin-walled, when mature with thickened walls and spiny.
Substrata. On strongly degraded hardwoods and occasionally on conifers.
Distribution. Cosmopolitan in the temperate zones, but rather rare.
Remarks. The spiny globose to subglobose spores and the yellow basidiocarps drying brownish with pinkish shades, are diagnostic characteristics for this species.

MACROHYPORIA Johan. & Ryvarden,

Trans. Br. Mycol. Soc. 72:192, 1979.
Basidiocarps annual to perennial, resupinate, in small patches to widely effused, brittle to hard when dry, pore surface cream to ochraceous or pale brown, dull, pores 15 per mm or larger, context thin. Hyphal system monomitic dimitic, generative hyphae thin walled and simple septate, in the trama and context up to 20 µm wide, binding hyphae or strongly branched thick walled generative hyphae dominating in the trama and context, non-amyloid to weakly amyloid, also of large diameter, spores hyaline to pale yellow, thin to weakly thick walled, subglobose to ellipsoid, non-amyloid, growing on wood, one species with a sclerotium.
Type species: *Polyporus dictyoporus* Cooke.
Remarks. The characteristic feature of the genus is the very wide and simple septate generative hyphae and the binding like hyphae with lateral swellings and short side branches with a variable amyloid reaction. The hyphal system is somewhat similar to that of *Laetiporus* which, however, includes pileate species with true binding hyphae.

Macrohyporia dictyopora (Cooke) Johan. & Ryvarden,

Op. cit. - *Polyporus dictyoporus* Cooke, Grevillea 12:17, 1883.
Basidiocarp annual to perennial, resupinate, adnate, widely effused, up to 10 mm thick, coriaceous when fresh, woody hard when dry, pore surface first white, then ochraceous to cork or wood coloured, even or slightly nodulose, pores round or elongated on sloping substrates, 3-4 per mm, tubes concolorous with the pore surface, up to 8 mm thick.
Hyphal system dimitic, generative hyphae thin to thick walled, moderately branched, mostly 8-12 µm wide in the trama and context, narrower in the subhymenium, binding hyphae of the Bovista type present or often as very thick-walled hyphae with lateral swellings or short side branches with somewhat swollen apices, 7-15 µm wide, nonamyloid or weakly amyloid, especially when seen in quantities.
Basidiospores globose to subglobose, 4.5-6 µm in diameter, slightly thick walled.
Distribution. Australia and Malawi.
Remarks. The species is recognized by the wide hyphae with simple septa and richly branched binding hyphae. The latter are more prominent in the type from Australia than in the African collection.

MELANOPORIA Murrill,

North Amer. Flora 9:14, 1907.
Basidiocarps resupinate, perennial, purplish black to fuliginous; pores small; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae pale to dark brown; cystidia absent; spores elliptic, smooth, negative in Melzer's reagent. On dead hardwoods, causing a brown rot. Monotypic American genus.
Type species: *Melanoporia nigra* (Berk.) Murrill.
Remarks. There is no other resupinate polypore treated in this manual with a similar dark- coloured basidiocarp. In tropical America it can be confused with *Melanoporiella carbonacea* (Berk. & M.A. Curtis) Murrill, which differs in having simple-septate generative hyphae and cylindrical spores.

Melanoporia nigra (Berk.) Murrill,

North Amer. Flora 9:14, 1907. - *Polyporus niger* Berk., London J. Bot. 4:304, 1845.
Basidiocarps perennial, resupinate, becoming widely effused, woody, up to 2.5 cm thick; pore surface dark umber to purplish brown or fuliginous, the pores circular, 5-6(-8) per mm, with thick, entire dissepiments; margin dark purplish brown, narrow; subiculum dark purplish black, tough-fibrous, up to 2 mm thick, with a black layer next to the substratum at least in the central parts of the basidiocarp; tube layers concolorous with pore surface but in actively growing specimens the hymenial surface lining the tubes paler than the trama, tough-fibrous to corky, normally distinctly stratified, each layer up to 8 mm thick in narrow zones.
Basidiospores 3-4.5 x 2-3 µm, cylindrical to elliptic.
Substrata. On living and dead hardwoods, especially oak and chestnut.
Distribution. Central and eastern U.S, south to Florida.
Remarks. The resupinate, perennial, purplish brown basidiocarp will usually be diagnostic for a field determination.

MELANOPORELLA Murrill,

North Am. Fl. 9:14, 1907.
Basidiocarps resupinate, perennial, purplish black to fuliginous, pores small, hyphal system dimitic, generative hyphae simple septate, skeletal hyphae pale to dark brown, cystidia none, spores cylindrical, smooth and IKI-negative, causing white rot. Monotypic tropical genus.
Type species: *Polyporus carbonaceus* Berk. & M. A. Curtis.
Remarks. It may be confused with *Nigroporus* which however has clamped hyphae and cylindrical spores.

Melanoporella carbonacea (Berk. & M. A. Curtis) Murrill,

op. cit. - *Polyporus carbonaceus* Berk. & M. A. Curtis, Lond. J. Bot. 10:317, 1868.
Basidiocarps resupinate, perennial, effused, purplish brown to dark fuliginous brown, woody, up to 10 mm thick; margin dark brown, narrow; pore surface dark umber to purplish brown, often with a slight whitish pruina when in active growth, pores irregular, 1-2 mm wide, up to 2-3 mm long on sloping substrates, tubes concolorous with pore surface but in actively growing specimens, the hymenium along the tubes paler than the trama, the tubes normally not stratified, context purplish black, up to 5 mm thick.
Hyphal system dimitic; subicular generative hyphae with simple septa, hyaline, thin walled, 14 µm wide, often difficult to observe; skeletal hyphae dominating, thick-walled to solid, pale to dark brown, 3-7 µm wide.
Basidiospores 5.5-7.5 x 2.5-3.5 µm cylindrical.
Distribution. West African species seen from Nigeria and Sierra Leone. Widespread in tropical America.
Remarks. The resupinate, perennial, purplish brown basidiocarp with fairly large irregular pores will be diagnostic. *Nigrofomes melanoporus* which occasionally may be resupinate, has almost invisible pores.

MERIPILUS P. Karst.,

Bidrag Känned. Finlands Natur Folk 37:33, 1882.
Basidiocarps annual, large, pileate and composed of numerous imbricate fan-shaped to spatulate pilei from a common short stipe or base; pilear surface brown with radial lines, smooth, usually with concentric zones; pore surface white, darkening when touched or dried, pores small, tube layer white, thin; context white, fibrous; hyphal system monomitic; generative hyphae thin- to thick-walled, hyaline, simple-septate; cystidia absent; spores subglobose, hyaline, smooth, negative in Melzer's reagent. On hardwoods, rarely conifers, often from buried roots or close to stumps, causing a white rot. Cosmopolitan genus.
Type species: *Meripilus giganteus* (Fr.) P. Karst.
Remarks. This is a characteristic genus and easily recognized in the field by the large size and the numerous fan-shaped to spatulate brownish pilei arising from a common base or short stipe. The monomitic hyphal system and simple-septate hyphae are distinctive microscopic characters.

Meripilus giganteus (Pers.: Fr.) P. Karsten,

Bidrag Kännedom Finlands Natur Folk 37: 33, 1882. - *Polyporus giganteus* Pers.: Fr., Syst. Mycol. 1: 356, 1821. - Observ. Mycol. (Havniae) 1:124, 1815. - *Boletus giganteus* Pers., Syn. Fungorum p. 521, 1821.
Basidiocarps annual, large and pileate with numerous imbricate, fan shaped to spatulate pilei from a common base or stem, single pilei 5-20 cm wide and long with tapering base, up to 2 cm thick, the basidiocarp as a whole up to 30 cm wide and long, fleshy when fresh, pilei hard and brittle when dry; pilei glabrous, smooth, ochraceous to brown when old, often somewhat concentrically zonate, when dry the thinner parts of the pileus often become radially wrinkled, margin thin, entire to lobed and wavy, often deflexed when dry; stipe almost absent or short and stout, ochraceous and smooth, distinctly fibrous; pore surface white to wood-coloured, darkening when touched in fresh condition, pores small, 3-5 per mm, dissepiments entire; tube layer up to 8 mm thick, concolorous with the pore surface; context whitish to cork-coloured, paler than the tubes, distinctly fibrous and up to 1.5 cm thick near the bases of the individual pilei.
Hyphal system monomitic; generative hyphae with simple septa, in the trama more or less parallel, thin-walled and with numerous septa, 3-5 µm wide, these hyphae make the trama distinctly more brittle than the context, in the context and stipe generative hyphae unbranched or sparingly branched, strongly thick-walled to almost solid, with scattered to almost no septa, 6-14 µm wide, to an untrained observer, these hyphae may resemble skeletal hyphae, they are arranged more or less parallel, but are mixed with more twisted and branched hyphae, some very thick-walled and swollen, others more thin-walled and of even diameter, transitions occurring between all these types of hyphae, diameter variable from 3-10 µm, in swollen parts and around points of branching up to 15 µm wide.
Cystidia absent, fusoid cystidiols present, 18-40 x 5-8 µm, simple-septate at the base.
Basidia 22-40 x 7-8 µm, clavate, tetrasterigmatic.
Basidiospores 6-7 x 4.5-6 µm, broadly elliptic to subglobose.
Substrata. On hardwoods, especially *Quercus* and *Fagus*, usually on the ground close to stumps, rarely on conifers.
Distribution. Widespread in temperate Europe and Asia and seemingly follows *Quercus* to its northern limit in southern Scandinavia. Replaced by similar species in North America.
Remarks. Easily recognised in the field because of the large multi-pileate basidiocarp and pore surface that becomes rapidly blackish when bruised or cut. Basidiocarps of *Grifola frondosa* are more greyish on the pileus, have larger pores besides clamps on the generative hyphae.

MERULIPORIA Murrill,

Mycologia 34:596, 1942.
Basidiocarps annual, resupinate, associated with extensive mycelial mats and thick rhizomorphs; pore surface pale buff to grey when fresh, darkening to brown or nearly black on drying, merulioid, the pores 2-3 per mm; subiculum thick, soft, pale tan; tube layer darkening on drying; hyphal system monomitic; clamp connections present; cystidia absent; basidiospores broadly elliptic, smooth, brown at maturity, dextrinoid in Melzer's reagent. Causing a brown rot in structural timbers. Monotypic genus endemic to North America.
Type species: *Meruliporia incrassata* (Berk. & M.A. Curtis) Murrill.
Remarks. There is no doubt that *M. incrassata* belongs in the Coniophoraceae with its brown basidiocarps, the brown, thick-walled, large, dextrinoid spores, and the destructive brown rot, all characters found in other genera of the family like *Coniophora* and *Serpula*. In many aspects it can be looked upon as the poroid counterpart to *Serpula lacrymans*.

Meruliporia incrassata (Berk. & M.A. Curtis) Murrill,

Mycologia 34:596, 1942. - *Merulius incrassatus* Berk. & M.A. Curtis, Hooker's J. Bot. 1:234, 1849.
Basidiocarps annual, resupinate, becoming effused over a wide area, easily separable, soft when fresh; margin fertile or narrowly sterile, then whitish or buff; pore surface appearing merulioid, whitish to buff or ochraceous-grey when fresh, becoming grayish-brown to black on drying, the pores circular to angular or slightly sinuous, 2-3 per mm, with thick, entire dissepiments that appear cartilaginous on dried specimens; subiculum buff, azonate, soft-fibrous, up to 7 mm thick; tube layer drying dark brownish or blackish, distinct from the subiculum, drying hard and brittle, up to 6 mm thick; spore print rusty brown.
Basidiospores 10-16 x 5-8 µm, broadly elliptic, dextrinoid, hyaline to brown.
Substrata. Primarily on conifer structural timbers or stored lumber, but also occasionally on hardwood structural timbers. Rarely reported on wood in forests.
Distribution. Widely distributed in North America, mainly in areas with high relative humidity.
Remarks. *Meruliporia incrassata* is one of the most important causes of decay in houses and other wooden structures in the United States, particularly in the southern states. The large spores and the dark basidiocarps make it a distinct species.

MICROPORELLUS Murrill,

Bull. Torrey Bot. Club 32:483, 1905.

Basidiocarps annual, centrally to laterally stipitate; pilei circular, single or confluent; pilear surface tomentose to glabrous, grey to pale buff, concentrically zonate; pore surface pinkish buff to pale ochraceous, the pores small, 8-10 per mm; context white to ochraceous, azonate; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae present in trama, present or absent in context, dextrinoid or negative in Melzer's reagent, walls swelling or unchanged in KOH; ventricose cystidia absent or rare; basidiospores small, subglobose to tear-drop shaped, hyaline, thin-walled, negative in Melzer's reagent. On dead hardwoods, causing a white rot. Pantropical genus.
Type species: *Microporellus dealbatus* (Berk. & M.A. Curtis) Murrill.
Remarks. *Microporellus* is most closely related to *Polyporus* and is differentiated by its small, subglobose to tear drop-shaped spores and the absence of dendritically branched skeleto-binding hyphae.

Microporellus dealbatus (Berk. & M.A. Curtis) Murrill,

Bull. Torrey Bot. Club 32:483, 1905. - *Polyporus dealbatus* Berk. & M.A. Curtis, Ann. Mag. Nat. Hist., ser. 2, 12:432, 1853.
Basidiocarps annual, centrally, more rarely laterally stipitate, tough when fresh, hard when dry; pilei circular to reniform, 2-10 cm broad, often somewhat depressed in the center; pilear surface velutinate to unevenly tomentose, becoming glabrous with age, often strongly zonate, isabelline, grey to pale brown with age; stipe 3-7 cm long, 3-10 mm in diam, concolorous with the pileus surface; pore surface at first white, then cream to ochraceous, often wrinkled when dry, the pores minute, 8-10 per mm; context white, dense in both pileus and stipe, up to 2 mm thick in pileus; tube layer concolorous with pore surface, up to 3 mm thick.
Cystidia rare, mostly on the dissepiment edges, ventricose with slightly thickened walls, apically incrusted, easy to overlook and difficult to observe in some specimens.
Basidiospores 4.5-6 x 3.5-4.5 µm, elliptic to drop-shaped with a distinct apiculus.
Substrata. Terrestrial from buried roots of hardwoods.
Distribution. Endemic species to America, from the Gulf Coast and lower Atlantic Coast to Brazil.
Remarks. The centrally stipitate basidiocarp, minute pores, dimitic hyphal system with dextrinoid skeletal hyphae and the drop-shaped spores, are diagnostic characteristics for *M. dealbatus*.

MICROPORUS Beauv. ex Kuntze,

Rev. gen. pl. 3:494, 1898.
Basidiocarps annual, centrally or laterally stipitate, pileus circular, flabelliform to spatulate, smooth to hirsute, often zoned, stipe lateral or central, round and usually with expanded foot at the base, white to black, smooth or hirsute, pore surface white to cream, pores round and entire, very small, 5-10 mm, context in pileus and stipe white and tough. Hyphal system trimitic, generative hyphae with clamps, binding and skeletal hyphae hyaline and thick-walled, hymenial cystidia absent, coralloid dichophytic elements present along the dissepiments, spores allantoid to elliptical, smooth, thin-walled, hyaline and

non-amyloid. On hard woods. Paleotropical genus.
Type species: *Microporus xanthopus* (Fr.) Kunt.
Remarks. Most species in the genus can be recognized in the field by their stipitate basidiocarps, the minute pores and the tough consistency. The coralloid elements are often difficult to observe as they collapse in dry specimens.

Microporus xanthopus (Fr.) Kunt.,

Rev. gen. Pl. 3:494, 1898. - *Polyporus xanthopus* Fr., Syst. mycol. 1:350, 1821.
Basidiocarps annual, solitary or in small groups, centrally or laterally stipitate and usually infundibuliform, margin wavy and lobed, often deeply incised, often radially furrowed, pileus up to 10 cm in diameter and 1-3 mm thick, glabrous and shiny when fresh, dull when dry, yellowish-brown to chestnut in numerous narrow concentric zones, often with alternating dark and light colours, pore surface cream to pale buff, almost pure white towards the margin, pores minute, almost invisible to the naked eye 8-10 per mm, tubes up to 0.1 mm deep, context pure white, thin and covered with a distinct cuticle. Stipe round, glabrous, light yellowish to light brown, up to 6 cm high and 3-9 mm in diameter, at the base finely adpressed tomentose, later glabrous, context of stipe pure white, dense in the periphery, somewhat looser in the core.
Hyphal system trimitic, generative hyphae thin-walled and with clamps, 2,3,5 µm in diameter, moderately branched, skeletal hyphae dominating, hyaline and thick-walled, up to 6 µm in diameter, binding hyphae tortuous, thick-walled to solid, up to 1-3 µm in diameter, strongly coralloid dichophytic elements present along the dissepiments, finely branched and often partly covered with crystalline deposits.
Basidiospores 6-7.5 x 2-2.5 µm, cylindrical.
Distribution. Common from Western Africa through Asia to the Pacific Area.
Remarks. Usually easy to recognize in the field because of the infundibuliform basidiocarps with a glossy and shin

NAVISPORUS Ryvarden,

Prelim. Polypore Fl. East Afr. p. 443, 1980.
Basidiocarp pileate, sessile, dimidiate, substipitate, effused reflexed; pileus smooth to finely tomentose in shades of brown; pore surface white to pale cinnamon, pores small to medium, context wood-coloured to pale cinnamon, thick to thin, punky to coriaceous; hyphal system dimitic, generative hyphae with clamps, skeletal hyphae thick-walled and dextrinoid, cystidia absent, basidiospores navicular to oblong fusiform or amygdaliform, hyaline with slightly thickened walls, non-amyloid, and slightly dextrinoid to non-dextrinoid. On hardwoods, causing a white rot. Tropical genus.
Type species: *Trametes floccosa* Bres.
Remarks. This is a characteristic genus because of its dextrinoid skeletal hyphae and medium to large, cylindrical, navicular to amygdaliform basidiospores.

Navisporus floccosus (Bres.) Ryvarden,

Prelim. flora of East Africa p. 443, 1980. - *Trametes floccosa* Bres., Ann. Roy. Inst. Bot. Roma 6:179, 1896. – *Ganoderma areolatum* Murrill, N.Y. Bot. Garden 8:149, 1912.
Basidiocarps annual, sessile, ungulate to dimidiate, up to 35 cm in diameter, and 7 cm thick at the base, coriaceous and punky, pileus glabrous, smooth to slightly scrupose at the base and with age with a papery thin cuticle, first whitish, stains when bruised, ochraceous to pale brown, becoming patch wise deep brown to almost black with age, azonate, but somewhat sulcate in parts and then more irregular in outline, pore surface white when fresh, brownish when bruised, isabelline to pale brown, pores round to angular, 2-3 per mm, tubes isabelline to straw coloured, up to 15 mm deep, context concolorous with tubes or pale orange, slightly punky and homogenous, up to 7 cm thick at the base.
Basidiospores 12-15 x 5-7 µm, navicular to amygdaliform, yellowish to golden when mature, weakly dextrinoid in masses.
Distribution. Widespread in the tropical zones, but rather rare.
Remarks. This species is characteristic by its large basidiocarps and large, navicular basidiospores.

NIGROFOMES Murrill,

Bull. Torrey Bot. Club. 31:425, 1904.
Basidiocarps perennial, pileate, applanate, very hard when dry; pilear surface glabrous, sulcate in concentric zones, dark violaceous black, with a distinct black cuticle; pore surface black to dark violaceous purplish, pores very small; tubes concolorous with pore surface; context dense, purplish-black; hyphal system dimitic; generative hyphae simple-septate, hyaline to dark brownish, densely agglutinated; cystidia ventricose, scattered to very rare, umber brown; spores broadly ellipsoid, hyaline, negative in Melzer's reagent. On dead hardwoods, causing a white rot. Monotypic tropical genus.
Type species: *Nigrofomes melanoporus* (Mont.) Murr.
Remarks. The species is easy to recognize in the field because of the blackish to dark purplish basidiocarps with minute pores and a black cuticle on the pileus.

Nigrofomes melanoporus (Mont.) Murrill,

Bull. Torrey Bot. Club 31:425, 1904. - *Polyporus melanoporus* Mont., Ann. Sci. Nat., Ser. 2, 17:127, 1842.
Basidiocarps perennial, pileate, applanate, sessile, mostly dimidiate, applanate, up to 20 cm wide and long and 5 cm thick, very hard; pilear surface first finely velutinate and dark brown, becoming glabrous and purplish black, often with sulcate zones, becoming tuberculate and slightly cracked with age and then with a distinct dense, thick cuticle; margin thin, acute, commonly bent down in dry specimens; pore surface dark brown, becoming purplish black on drying, the pores small, isodi-

ametric, 6-9 per mm, almost invisible to the naked eye; context dark chestnut to purplish black, often shiny, hard, intergrading with the cuticle, up to 2 cm thick; tube layers concolorous with pore surface, often stratified, up to 4 cm thick.
Cystidia 10-30 x 5-12 µm, rare, ventricose, thick-walled, acute and dark fuscous brown.
Basidiospores 4-5 x 3-3.5 µm, broadly elliptic.
Substrata. Dead hardwoods.
Distribution. Widely distributed in the tropical zones.
Remarks. The species is easy to recognize because of the hard, purplish to black pileate basidiocarps. *Nigroporus vinosus* has more violaceous coloured smaller basidiocarps and is microscopically different with cylindrical spores and clamps.

NIGROPORUS Murrill,

Bull. Torrey Bot. Club 32:361, 1905.
Basidiocarps annual to perennial, pileate, sessile or effused-refaxed, or resupinate; pilear surface scrupose to glabrous, azonate to concentrically zonate, grayish-blue, vinaceous brown, pink, or violet; pore surface of same colours as pileus, the pores usually small, circular to angular, dissepiments entire; context vinaceous brown to pink or purplish; hyphal system dimitic; contextual generative hyphae with clamps; skeletal hyphae fuliginous brown, thick-walled; cystidia absent; spores mostly small, longest dimension usually less than 5 µm, allantoid to broadly ellipsoid, hyaline, smooth, thin-walled, negative in Melzer's reagent. On dead hardwoods, causing a white rot. Pantropical genus.
Type species: *Polyporus vinosus* Berk.
Remarks. The dimitic hyphal system and the fuliginous skeletal hyphae, which give the basidiocarps the pinkish, violet to dark bluish-grey colours, are the diagnostic characteristics.

Nigroporus vinosus (Berk.) Murrill,

Bull. Torrey Bot. Club 32:361, 1905. - *Polyporus vinosus* Berk., Ann. Mag. Nat. Hist., ser. 2, 11:195, 1852.
Basidiocarps annual, pileate, broadly attached and narrow to dimidiate, up to 5 cm wide, 2-10 cm long in reflexed specimens, up to 8 mm thick, rigid and brittle when dry, coriaceous when fresh; pilear surface at first felty to velutinate, pale violaceous to vinaceous brown, becoming glabrous and purplish brown to dark violet, azonate or with distinct narrow sulcate zones; pore surface purplish brown to dark violet, pores angular, 7-9 per mm, context pale vinaceous brown, slightly darker just above the tubes, up to 5 mm thick at the base; tube layer paler than context, up to 3 mm thick.
Basidiospores 4-5 x 1-1.5 µm, allantoid to cylindrical.
Substrata. On dead hardwoods and rarely on conifers.
Distribution. Pantropical.
Remarks. The small purplish to violet basidiocarps with tiny pores make *N. vinosus* distinctive in the field.

OBBA Miettinen & Rajchenberg,

Mycol. Progress 11:141, 2012.
Basidiocarps resupinate, annual to biennial, white when fresh drying cream to ochraceous, soft when fresh, drying hard to brittle, hyphal system monomitic, generative hyphae with clamps, coarse crystal rosettes in trama and tube mouths, cystidia none, basidia clavate and tetrasterigmatic, basidiospores subglobose to globose, smooth, thin- to slightly thick-walled, often with a large hyaline oil drop, negative in Melzer's reagent. Produces a white rot. One poroid species in North America.
Type species: *Obba valdiviana* (Rajchenb.) Miettinen & Rajchenb.
Remarks. *Obba* is similar to *Physisporinus* with globose spores and monomitic hyphal system, but separated by having clamped generative hyphae, these being simple septate in the latter.

Obba rivulosa (Berk. & M. A. Curtis) Miettinen & Rajchenb.,

Mycol. Progress 11:142, 2012. - *Polyporus rivulosus* Berk. & M.A. Curtis, J. Linn. Soc. Bot. 10:318, 1868.
Basidiocarps annual, resupinate, usually effused in small patches, up to 3 mm thick, soft and crisp when fresh, rigid and brittle when dry, taste slightly bitter; margin white; pore surface white, drying cream to pale ochraceous brown, pores angular, 5-7 per mm; tube layer becoming resinous, dense and partly translucent, up to 3 mm thick, subiculum up to 1 mm thick, white when fresh, drying ochraceous to brown.
Basidiospores 4.5-5.5 x 3.7-4.5 µm, subglobose to oval.
Substrata. Reported from *Abies, Pinus, Sequoia, Tsuga* and *Thuja* besides hard wood trees like *Alnus, Castanea, Populus* and *Quercus*. A high proportion of the collections are from charred wood, but the species is not restricted to this substrate.
Distribution. A rare species and widespread in the tropical areas.
Remarks. The species is characterized by subglobose spores and generative hyphae with clamps.

OLIGOPORUS Bref,

Untersuch. Gesamtgebiet. Mykol. 8:114, 1888.
Basidiocarps annual, resupinate to pileate, fleshy when fresh, brittle to hard when dry, mostly white to light coloured, sometimes becoming darker on drying; hyphal system monomitic; generative hyphae with clamps, thin- to thick-walled; cystidia mostly absent, present in a few species; basidia tetrasterigmatic; spores allantoid to elliptic, thin-walled, hyaline, negative in Melzer's reagent; chlamydospores absent or present. On living or dead conifers, more rarely hardwoods, causing a brown rot.
Type species: *Oligoporus farinosus* Bref., a synonym of *Polyporus rennyii* Berk. & Broome.

Taxonomic synonyms:
Rhodonia Niemelä (*Polyporus placentus* Fr.).
Osteina Donk (*Polyporus obductus* Berk.).
Postia P. Karst. 1881, nomen illegit., non *Postia* Boiss. & Blond. 1875, non *Postia* Fr. 1874, nomen illegit., no typification.
Remarks. Previously most of the species included in the genus were placed in *Tyromyces*. However, the type species of *Tyromyces* causes a white rot and the genus is restricted to species causing this type of rot. *Oligoporus* is the oldest generic name for the species causing a brown rot and having a monomitic hyphal system with clamped generative hyphae.
When Karsten (1881) took up *Postia*, it was illegitimate because of *Postia* Boiss & Blanch. (Saxifragacaeae, 1875).

Oligoporus rennyi (Berk. & Broome) Donk,

Persoonia 6:214, 1971. - *Polyporus rennyi* Berk. & Broome, Ann. Mag. Nat. Hist. ser. 4, 15:31, 1871. - Anamorph: *Ptychogaster citrinus* Boud., J. Bot. 3:8, 1887.
Basidiocarps annual, resupinate, effused in small patches up to 1 cm wide, soft, easily removed from substratum; pore surface white, the pores angular, 2-3 per mm, sterile margin up to 5 mm wide, floccose, white; subiculum white, soft-cottony, azonate, up to 2 mm thick; tube layer white, soft, up to 3 mm thick.
Basidiospores 4-5 x 2-2.5 µm, oblong to short-cylindrical.
Anamorph blending into basidiocarps, appearing as a powdery mass in a matrix of filaments of hyaline hyphae with clamps, 2.5-4 µm in diam; chlamydospores in masses, subglobose to elliptic, thick-walled, 5-7.5 x 3.5-5 µm.
Substrata. Dead conifer wood. In North America known from *Picea*, in Europe reported from other conifers including *Juniperus, Larix*, and *Pinus*.
Distribution. In North America known from a single collection from Maine. Widely distributed in Europe and also known from China.
Remarks. Distinctive features of *O. rennyi* are the soft, cottony, resupinate basidiocarps with fragile tubes and the powdery ptychogastric stage.

OXYPORUS Donk,

Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 9:202, 1933.
Basidiocarps annual to perennial, resupinate to pileate, in the latter case broadly attached and fibrous to woody; Pileus white to deep cream, velutinate and often covered with mosses; pore surface white to light yellowish, pores mostly small and isodiametric, rarely large and angular; tube layer single or distinctly stratified, then with layers of context between the tube layers; context white to cream; hyphal system monomitic; generative hyphae thin- to thick-walled, sparingly branched, simple-septate; apically incrusted hymenial cystidia abundantly present in most species, difficult to demonstrate in others; spores globose to broadly elliptic, thin- to thick-walled, smooth, hyaline, negative in Melzer's reagent. On living or dead hardwoods or conifers, causing a white rot. Cosmopolitan genus.
Type species: *Oxyporus populinus* (Fr.) Donk.
Taxonomic synonyms:
Bridgeoporus Volk, Burds. & Amarati (*Oxyporus noblissimus* W. B. Cooke).
Emmia Zimitr., Spirin & Malys. (*Polyporus laetimarginatus* Dur. & Mont.).
Remarks. The genus is characterized by its simple septate generative hyphae and present of cystidia.

Oxyporus populinus (Schum.: Fr.) Donk,

Meded. Bot. Mus. Herb. Rijks Univ. Utrecht 9: 204, 1933. - *Polyporus populinus* Schum.: Fr., Syst. Mycol. 1: 367, 1821.
Basidiocarps perennial, pileate, sessile or effused-reflexed; pilei often imbricate and laterally fused, up to 5 x 12 x 5 cm; pileus cream coloured to buff or darkening with age, finely tomentose to glabrous, often covered with mosses at the base; pore surface cream coloured to buff, the pores circular to angular, 5-7 per mm; context cream coloured to tawny, corky, faintly zonate to azonate, up to 2 cm thick; tube layers concolorous with context, distinctly stratified, separated by a thin layer of context tissue, up to 5 cm thick.
Cystidia 20-35 x 3-5.5 µm, abundant, thin-walled, cylindrical to narrowly clavate, apically to entirely incrusted, incrustation dissolving rapidly in KOH.
Basidiospores 3.5-4.5 x 2.5-4 µm, subglobose to globose.
Substrata. Living hardwoods, especially common on *Acer* spp.
Distribution. Throughout the temperate zones, occasionally in the tropical zones.
Remarks. *Oxyporus populinus* is well differentiated from the other species in the genus by its perennial, sessile basidiocarp with the tube layers separated by thin layers of context.

PANELLUS P. Karst.,

Bidrag til Känned. Finlands Natur och Folk 32:96, 1879.
Basidiocarps annual, pileate, hymenophore lamellate to poroid, hyphal system monomitic, cystidia present, achantocystidia present along the dissepiments, basidiospores smooth and amyloid. On hard woods. Widespread genus.
Type species: *Agaricus stipticus* Bull.: Fr.
Synonym: *Dictyopanus* Pat., Essai tax. p. 137, 1900.
Remarks. The genus is characterized by pileate basidiocarps with achantocystidia along the dissepiments or pore mouths like in the agaric genus *Mycena*. One pantropical poroid species.

Panellus pusillus (Pers. ex Lév.) Burdsall and Miller,

Beiheft Nova Hedwigia. 51:85, 1975. - *Gloeoporus pusillus* Pers. ex Lév., Ann. Sci. Nat. Ser.3, 2: 195. 1844. - *Polyporus rhipidium* Berk., Hook., London J. Bot., 6: 319. 1847. - *Polyporus subpulverulentus* Berk. & M. A. Curtis, J. Linn. Soc. Bot., 10; 306. 1869. - *Polyporus diminutus* Mass., J. Bot., 34: 153. 1896.
Basidiocarps reniform to semicircular with short contracted stipe, convex to flat, nearly white to pale tan when fresh, slightly darker when dry, up to 3 cm wide and long, pileus smooth, pubescent to velvety, azonate, margin concolorous, nearly smooth, pores concolorous with pileus, pore surface irregular with some elongated radially pores, 4-5/ mm tangentially 2-3 / mm radially, sometimes becoming sub lamellate, luminescent when fresh, context white, pale cream when dry.
Cystidia 20-35 × 3-4 µm, usually present only near the pore edge, cylindrical to lanceolate, hyaline, thin-walled, smooth, clamped at base, protruding up to 1/2 of total length, also present in the cuticle.
Acanthocystidia present along the dissepiments, some with reddish-brown crusted granules.
Basidiospores 4-5.5 × 2-3 µm, ovoid to broadly ovoid, adaxially flattened, hyaline, thin- walled, smooth, amyloid.
Substrate. Hardwoods of all kinds.
Distribution. Pantropical and locally common.
Remarks. The small basidiocarps with elongated pores with granular dissepiments (lens), amyloid spores and achantocystidia, characterize this species. In the tropics there are many lamellate representatives of the genus.

PERENNIPORIA Murrill,

Mycologia 34:595, 1942.
Basidiocarps mostly perennial, rarely annual, resupinate to pileate; pileus smooth, ochraceous to blackish with age; pore surface white to cream, pores small, isodiametric; context white to light ochraceous and tough-fibrous to woody; hyphal system di- trimitic; generative hyphae thin-walled, with clamps, often difficult to observe; skeletal hyphae dominating in the basidiocarps, solid to thick-walled, unbranched to moderately branched, non-dextrinoid to strongly dextrinoid in Melzer's reagent; narrow much-branched binding hyphae present or absent; cystidia none; basidia broadly clavate; basidiospores thin- to thick-walled, hyaline, smooth, globose to elliptic, drop-shaped to truncate, non-dextrinoid to strongly dextrinoid in Melzer's reagent, often variable within the same basidiocarp. On dead and living hardwoods and conifers, causing white rots. Large cosmopolitan genus.
Type species: *Polyporus medulla-panis* Pers.: Fr.
Taxonomic synonym: *Truncospora* Pilat *(Polyporus ochroleuca* Berk.).
Remarks. The genus is above all characterized by the elliptic to distinctly truncate spores, usually thick-walled and with a variable dextrinoid reaction combined with a di- to trimitic hyphal system where the vegetative hyphae are dextrinoid in a variable degree.

Perenniporia medulla-panis (Jacq.: Fr.) Donk,

Persoonia 5: 76, 1967. - *Boletus medulla-panis* Jacq., Misc. Austri. 1: 141, 1778. - *Polyporus medulla-panis* Jacq.: Fr., Syst. Mycol. 1: 380, 1821.
Basidiocarps annual to perennial, becoming widely effused, usually resupinate but sometimes narrowly reflexed on vertical surfaces, tough-corky; pore surface highly variable in colour, cinereous, cream colour to cream-buff or bright yellow, the pores circular, 4-7 per mm, with thick dissepiments; subiculum thin, cream coloured to yellowish; tube layers concolorous with subiculum, distinctly stratified, each layer up to 1 mm thick.
Hyphal system trimitic; subicular generative hyphae thin-walled, nodose-septate, 2-4 µm in diam; subicular skeletal hyphae thick-walled, nonseptate, 1-3 µm in diam; binding hyphae thick-walled, nonseptate, much-branched, 1.5-2 µm in diam; skeletal and binding hyphae variably dextrinoid in Melzer's reagent; tramal hyphae similar.
Cystidia none; fusoid cystidioles present, not projecting, 15-22 x 5-7 µm; hyphal pegs present.
Basidia 16-27 x 7-11 µm, broadly clavate.
Basidiospores 5-6 x 3.5-4.5 µm, broadly elliptic to ovoid, usually truncate, thick-walled, weakly to strongly dextrinoid.
Substrata. On dead hardwoods from numerous genera.
Distribution. Widely distributed north to the limit of the *Quercus* species.
Remarks. *Perenniporia medulla-panis* is characterized by the thick walled, variably dextrinoid spores and variably dextrinoid, rather thin and flexuous skeletal and binding hyphae. Macroscopically, the tough, perennial or persistent basidiocarps with the highly variable, but normally isabelline to cork coloured pore surface are distinctive. Reflexed basidiocarps are occasionally found on vertical surfaces such as the sides of stumps.
The taxonomy of this species has been much discussed and *P. medulla-panis* s. stricto. Is probably present only in European and Asia and is replaced with confusingly similar species in America and Australia.

PHAEOLUS (Pat.) Pat.,

Essai Taxon. Hym., p. 86, 1900.
Basidiocarps annual, sessile to stipitate; pileus orange at first, becoming brown, strigose to fibrillose; pore surface orange to greenish brown, pores daedaleoid to circular, up to 2 mm in diam; context orange to brown, fibrous to spongy; hyphal system monomitic; hyphae simple-septate, thin- to thick-walled; cystidia cylindrical, thin-walled, not incrusted; gloeoplerous hyphae also present in hymenium; basidia clavate, simple-septate at the base; basidiospores elliptic to ovoid, hyaline, smooth, negative in Melzer's reagent. Primarily on living conifers, causing a brown cubical butt rot. Cosmopolitan monotypic genus.

Type species: *Phaeolus schweinitzii* (Fr.) Pat.
Remarks. Externally the genus looks like *Phellinus*, but the cystidia immediately exclude all genera in Hymenochaetaceae.

Phaeolus schweinitzii (Fr.) Pat.,

Essai Taxon. Hym., p. 86, 1900. - *Polyporus schweinitzii* Fr., Syst. Mycol. 1:351, 1821.
Basidiocarps annual, stipitate, occasionally effused-reflexed or sessile on the base of living trees, stumps or logs; stipe central or lateral, short and stout, simple or branched, up to 5 cm in diam; pilei solitary or imbricate, circular or irregularly lobed, up to 25 cm in diam; pileus orange at first, becoming yellowish brown at maturity, drying to dark reddish brown, tomentose to hirsute, faintly zonate; pore surface orange at first, becoming greenish brown, then yellowish brown to rusty brown with age, the pores daedaleoid or angular to circular, 1-2 per mm, context yellowish-brown, becoming dark rusty brown with age, soft-fibrous, azonate, up to 1.5 cm thick; tube layer decurrent, distinct from context, greenish to rusty brown, up to 1.5 cm thick.
Hyphal system monomitic generative hyphae with simple septate, , light to dark brown in KOH, 3-15 mm wide.
Cystidia 20-90 x 7-13 µm, frequent, yellowish, cylindrical to fusoid, smooth, projecting up to 75 µm.
Basidiospores 6-9 x 2.5-5 µm, elliptic to ovoid.
Substrata. Living conifers, but also on dead trees, stumps, and logs; rarely on hardwoods.
Distribution. Throughout the conifer forest ecosystems and Circumglobal, but rare in the tropical zones.
Remarks. Macroscopically the basidiocarps of *Phaeolus schweinitzii* is similar to those of a *Phellinus* species, but easily separated by presence of smooth cystidia. It is similar to species of *Pycnoporellus*, also brown rot fungi on conifers, which have orange basidiocarps and a microscopic structure similar to that of *P. schweinitzii*.

PHELLINUS Quél,

Enrich. Fung., p. 172, 1886.
Basidiocarps perennial, resupinate to pileate, single or imbricate with decurrent tube layer; pileus yellowish brown, rusty brown, greyish to blackening, tomentose, hispid, glabrous or deeply cracked; pore surface yellowish brown to reddish or purplish brown, the pores isodiametric, circular or more rarely irregular, angular with dissepiments slightly split; context dark reddish brown, umber or yellowish brown, mostly woody, more rarely tough-fibrous; hyphal system dimitic or more typically with transitions between thin-walled and very thick-walled hyphae, generative hyphae hyaline to pale yellowish, simple-septate, skeletal hyphae brown and thick walled, occasionally simple septate; hymenial setae and tramal setae present or absent; setal hyphae present or absent in margin, context or trama; spores globose to cylindrical, smooth, hyaline to rusty brown, thin- to thick-walled, negative in Melzer's reagent. On dead or living hardwoods and conifers, causing a white rot. Large, cosmopolitan genus.
Type species: *Polyporus igniarius* L.:Fr.
Taxonomic synonyms (range according to year of description):
Ochroporus J. Schröet. 1888 (*Polyporus contiguus* Fr.).
Pyropolyporus Murrill 1903 (*Boletus torulosus* Pers.).
Porodaedalea Murrill 1905 (*Polyporus pini* Fr.).
Fuscoporia Murrill 1907 (*Polyporus ferruginosus* Schrad.: Fr.).
Fomitiporella Murrill 1907 (*Poria umbrinella* Bres.).
Fomitiporia Murrill 1907 (*Fomitiporia langloisii* Murrill).
Fuscoporella Murrill 1907 (*Fuscoporella corruscans* Murrill).
Fulvifomes Murrill 1914 (*Pyropolyporus robinae* Murrill).
Scalaria Lázaro Ibiza 1916 (*Scalaria fusca* Lázaro Ibiza).
Pseudofomes Lázaro Ibiza 1916 (*Polyporus nigricans* Fr.).
Phellidinium Fiasson & Niemelä 1984 (*Poria ferrugineofusca* P. Karst.).
*Tropi*coporus Zhou, Dai & Wu 2015 (*Tropicoporus excentrodendri* Zhou & Dai).
Sanghuangporus Sheng H. et al. 2015 (*Inonotus sanghuang* Sheng H. et al.).
Remarks. The closest relative seems to be *Inonotus*, which in principle is separated only by having annual basidiocarps and a monomitic hyphal system dominated by thin- to thick-walled, simple-septate hyphae. *Phellinus* is here kept as a single large genus until more data are available and a final phylogenetic classification can be achieved.

Phellinus igniarius (L.: Fr.) Quél.,

Enric. Fung., p. 172, 1886. - *Boletus igniarius* L. Sp. Pl. p. 1176, 1753. - *Polyporus igniarius* L.: Fr., Syst. Mycol. 1: 375, 1821. - *Fomes trivialis* Bres., Icon. Mycol. 20: 995, 1931. - *P. igniarius* var. *cinereus* Niemelä, Ann. Bot. Fenn. 12: 110, 1975. - *Ochroporus cinereus* (Niemelä) Fischer, Biblioth. Mycol. 105: 159, 1986. - *Ochroporus ossatus* Fischer, Biblioth. Mycol. 105: 159, 1986. - *Phellinus alni* (Bondartsev) Parmasto, Eesti NSV Tead. Akad. Toim. Biol. 25:318. 1976.
Basidiocarps perennial, sessile or rarely effused-reflexed, ungulate or sometimes applanate, up to 11 x 20 x 8 cm; upper surface grey or blackish, glabrous, sulcate, becoming deeply rimose, encrusted; margin concolorous and glabrous or yellowish brown; pore surface pale cinnamon brown to dark purplish brown, the pores circular, 5-6 per mm, with thick, entire dissepiments; context dark reddish brown, zonate, woody, up to 2 cm thick; core absent or present next to substratum, with white tissue intermixed; tube layers concolorous with context, the tubes white-stuffed, in distinct layers, each up to 4 mm thick.

Hyphal system dimitic; contextual hyphae of two types, some brown in KOH, thick-walled, distinct, with rare branching, aseptate, 2-5 µm in diam, some hyaline, thin-walled with occasional simple septa, very indistinct; tramal hyphae similar, 2-3 µm in diam.
Hymenial setae ventricose to subulate, abundant to rare, 14-17 x 4-6 µm; core setae present in some specimens, irregularly lobed and branched; thick-walled, up to 15 µm in diam.
Basidia 9-13 x 6-7 µm, broadly clavate, tetrasterigmatic.
Basidiospores 5-6.5 x 4.5-6 µm, broadly ovoid to subglobose.
Substrata. Living and dead hardwoods of many genera, most common on *Betula* then *Salix* and *Alnus*.
Distribution. Throughout Europe to the North Cape area in Norway. In a wide sense circumpolar in the boreal-temperate zone.
Remarks. The *Phellinus igniarius* complex is probably the most difficult complex of the whole genus. Many species have been described on basis of host specificity. The microscopical characters used to separate these species are in the best of cases marginal and are in general difficult to use. Studies have shown that there is partial incompatibility between these "species", but as long as there are no distinct morphological differences between them, we have adopted a wide circumscription here

PHYLLOPORIA Murrill,

Torreya 4:141, 1904.
Basidiocarps annual, resupinate to pileate; pileus cinnamon to dark brown, tomentum soft and thick over a distinct thin dark zone, mostly with narrow to wide concentric zones; pore surface brown; pores, circular to angular; dissepiments entire; tubes concolorous with pore surface; context pale to dark brown, thin and separated from the pileus tomentum by a black zone; hyphal system monomitic; generative hyphae hyaline to light rusty brown, simple-septate; setae absent; spores elliptic, less than 5 µm in greatest dimension, slightly thick-walled, light yellowish in maturity. On living or dead hardwoods, often on remarkably thin dead branches on living trees, causing white rots. Mainly a tropical genus.
Type species: *Phylloporia parasitica* Murrill
Remarks. *Phylloporia* belongs in the Hymenochaetaceae and its closest relatives are *Inonotus* and *Cyclomyces*. From the former it differs in having a thick persistent tomentum separated from the context by a thin dark zone, besides having small yellowish spores. Basidiocarps of *Cyclomyces*, are much thinner with an adpressed tomentum and microscopically distinct by presence of hymenial setae.

PHYSISPORINUS P. Karst.,

Finl. Basidsv., p. 324, 1889.
Basidiocarps resupinate, annual, soft to ceraceous, often changing colour on bruising or drying; hyphal system monomitic; generative hyphae simple-septate or with clamps; cystidia absent; fusoid cystidioles present; spores globose to ovoid, hyaline, thin-walled, negative in Melzer's reagent. On dead hardwoods and conifers, causing a white rot.
Type species: *Physisporinus vitreus* (Pers.: Fr.) P. Karst.
Remarks. The genus comes close to *Rigidoporus* because of the similar hyphal system and spores. However, *P. sanguinolentus* and *P. vitreus* are resupinate with soft to waxy basidiocarps that often change colour when they are bruised or dried. In *Rigidoporus* the basidiocarps are hard and the hyphae are thick-walled and can be easily taken as skeletal hyphae. Furthermore, the basidiocarps of *Rigidoporus* are mostly bright reddish orange when fresh, fading to pale brown when dry.

Physisporinus vitreus (Pers.: Fr.) P. Karst.,

Bidrag Kännedom. Finlands Natur Folk p. 324, 1889. - *Polyporus vitreus* Pers.: Fr., Syst. Mycol. 1: 381, 1821. - *Poria vitrea* Pers., Ann. Bot. (Usteri) 15:14, 1795.
Basidiocarps resupinate, annual, becoming widely effused, up to 5 mm thick, waxy and soft when fresh, hard and cartilaginous when dry, often curled and partly shrunken; pore surface white to bluish white and translucent when fresh, ochraceous to pale pinkish brown when dry, slightly staining when touched or bruised, but reaction slow and variable, pores circular to angular, 4-6 per mm, somewhat smaller in dried specimens, tube layer up to 5 mm thick, concolorous with pore surface; context 2-5 mm thick, dense, pale brown when dry.
Hyphal system monomitic; subicular hyphae hyaline in KOH, agglutinated and difficult to separate in dried specimens, thick- to thin-walled, sparingly branched, simple-septate, 3-6 µm in diam; tramal hyphae similar, 2-4 µm in diam.
Hymenial cystidia absent; fusoid cystidioles present among the basidia, 15-20 x 5-6 µm, simple-septate at the base, in many specimens also hyphoid, thin-walled tramal cystidia, usually in the bottom of the pores and with an apical encrustation. In other specimens they are apparently absent.
Basidia 15-20 x 6-8 µm, broadly clavate.
Basidiospores 5-6 x 4-5 µm ovoid to globose.
Substrata. Several genera of hardwoods and conifers, seemingly most common on *Fagus*.
Distribution. Widely distributed in the boreal and temperate zones.
Remarks. This species is related to *P. sanguinolentus*, which however, has basidiocarps with a more normal whitish colour when fresh which rapidly become reddish and then black when bruised. *P. vitreus* has a distinct bluish, semitranslucent colour in actively growing basidiocarps which does not or only slightly change colour when bruised.

PILOPORIA Niemelä,

Karstenia 22: 13, 1982.
Basidiocarps pileate, effused-reflexed to resupinate; upper surface tomentose, dark brown; pore surface whitish to cork-coloured; tubes concolorous; context duplex with a black line separating the lower cork-coloured part from the upper rusty brown part; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae hyaline to brown in upper part of context, finely encrusted in the dissepiments; cystidia none; basidiospores allantoid, hyaline, thin-walled and IKI; causing a white rot in conifers and hardwoods, small genus with two species one of which is a rare boreal species known from Europe.
Type species: *Antrodia sajanensis* Parmasto.
Remarks. The genus has characters from *Datronia* by its typical duplex consistency with a black line in the subiculum or context, but has far smaller spores than seen in this genus. *Skeletocutis* is probably the closest relative sharing the same small allantoid spores and the encrusted skeletal hyphae. The duplex consistency described above is, however, unknown in this genus.

Piloporia sajanensis (Parmasto) Niemelä,

op cit. - *Antrodia sajanensis* Parmasto, Bot. Mater. Otd. Sporov. Rast. Bot. Inst. Akad. Nauk SSSR 15: 134, 1962. - *Datronia sajanensis* (Parmasto) Domański, Mala Fl. Grzybow 1: 196, 1974.
Basidiocarps annual, pileate, effused-reflexed to resupinate, soft and pliable, pileus up to 2.5 cm wide and to 10 cm long in large effused basidiocarps, 2-5 mm thick; upper surface dark brown, velutinate, soft and xanthocroic, separated from the context proper by a black line; pore surface at first white to cream, becoming cork coloured to greyish pale brown; pores at first circular and regular, 4-5 per mm, with age the dissepiments splitting and fusing to form irregular pores , often slightly split on sloping substrates, dissepiments finely pruinose and often lacerate in mature specimens; lower context concolorous with tubes, up to 1 mm thick, separated by a black line from the rusty deep brown upper context or pilear adpressed tomentum; tube layer up to 3 mm thick, cork-coloured.
Hyphal system dimitic; generative hyphae with clamps, hyaline in trama and lower context, yellowish brown and thick-walled in the brown part of context, branched, 2-4 µm in diam; skeletal hyphae thick-walled, hyaline to pale yellowish, non-septate, sinuous, 2-3 µm in diam; hyphae of the dissepiments edges covered with minute crystals over a considerable length.
Cystidia absent, fusoid cystidioles present, 13-17 x 4-5 µm.
Basidia 15-17 x 4-5 µm, clavate, tetrasterigmatic.
Basidiospores 3.5-4 x 0.8-1 µm, allantoid.
Substrata. In Europe most common on *Picea*, but also found on *Pinus*, in Asia also recorded on *Abies* and *Larix*.
Distribution. Central and northern parts of Sweden and Finland and an isolated locality at Sardinia in Italy. Further known from Ural Mts. Through Siberia to Eastern Russia.
Remarks. In the field *P. sajanensis* will easily be mistaken for *Datronia stereoides* because of the duplex context and the dark brown, adpressed velutinate pileus. However, the latter species has never been found on conifers in Europe. Microscopically the small allantoid spores and the encrusted hyphal ends are diagnostic. Resupinate specimens can easily be mistaken for a *Skeletocutis* growing on a dead *Phellinus* since the brown part of the context is xanthocroic. The black line will help to clarify the situation and if observed, the clamps on the hyphae in this part of the context will of course rule out this possibility.

PIPTOPORUS P. Karst.,

Meddel. Soc. Fauna Fl. Fenn. 6:9, 1881.
Basidiocarps annual, pileate, dimidiate to broadly attached, often substipitate, light in weight when dry; pilei applanate, dimidiate or reniform; pileus white to ochraceous salmon or pale brownish, azonate; pore surface white to pale buff, pores regular, 3-6 per mm; context white to pinkish buff, azonate, soft-fibrous, spongy to corky when dry; hyphal system di-trimitic; generative hyphae with clamps; skeletal hyphae sinuous or straight, persistent or dissolving in KOH; basidiospores cylindrical or elliptic, hyaline, smooth, negative in Melzer's reagent. On dead hardwoods, causing brown rots. The three North American species are rather host specific.
Type species: *Piptoporus betulinus* (Bull.: Fr.) P. Karst.
Remarks. The annual and tough pileate basidiocarps characterize the genus together with the dimitic hyphal system and brown rot.

Piptoporus betulinus (Bull.: Fr.) P. Karst. ,

Rev. Mycol. (Toulouse) 3(9): 17, 1881. - *Boletus betulinus* Bull., Herb. France, Pl. 312, 1787. - *Polyporus betulinus* Bull.: Fr., Syst. Mycol. 1: 358, 1821.
Basidiocarps dimidiate to substipitate; stipe short, stout, glabrous, often resinous, whitish to brown, up to 6 cm long and 5 cm thick; pilei often pendent, usually dimidiate or reniform, solitary, up to 15 x 25 x 6 cm; upper surface whitish to mouse-coloured or brownish, usually with a pellicle that breaks up to give a pitted or scaly appearance, glabrous, azonate; margin concolorous, usually extending down below the pore surface; pore surface white at first, becoming pale brownish with age, the pores circular to angular, 3-5 per mm, with thick, entire dissepiments that split and clump together with age to give a hydnoid appearance; context white, tough when fresh, drying soft-corky, azonate, up to 5 cm thick; tube layer easily separated from the context when fresh, up to 1 cm thick.
Hyphal system di-tri-mitic; contextual generative hyphae thin-walled, hyaline, with clamps, rarely branched, 2.5-4 µm in diam; contextual skeletal hyphae hyaline in KOH, thick-walled, nonseptate, some much branched, others with rare or occasional branching, 2.5-6 µm in diam; also some large thick-walled hyphae with a wide lumen, up to 11 µm in diam, tramal

hyphae similar.
Basidia 12-15 x 5-6 µm, clavate, tetrasterigmatic.
Basidiospores 5-6 x 1.5-1.7 µm, cylindrical, slightly allantoid.
Substrata. Restricted to *Betula* spp. and follows this genus everywhere.
Distribution. A true boreal fungus and found north to North Cape in Norway at 71°N; a circumboreal species.
Remarks. This species is scarcely comparable to any other considered here. The restriction to birch, the smooth, usually pelliculose upper surface, the easily separated tube layer, and the margin extending below the pore surface are reliable field characters.

PODOFOMES Pouzar,

Česká Mykol. 20: 174, 1966.
Basidiocarps annual, centrally to laterally stipitate; pileus dark brown with a fine tomentum, often in concentric zones, with age disappearing exposing a black crust; stipe round to flattened, often irregularly and with an uneven surface, dark brown and as the pileus with a crust under a fine tomentum; pore surface whitish when fresh, becoming brown on drying; pores small; tubes concolorous with pore surface; context of pileus fibrillose, that of stem more compact, wood coloured; hyphal system di- to trimitic; generative hyphae with clamps; skeletal hyphae present in context, trama and stipe, unbranched to sparingly branched in context and trama, pale yellowish brown, in the stipe the vegetative hyphae are more branched being similar to the binding hyphae of the Bovista type; cystidia none; basidia 4-sterigmate with a basal clamp; basidiospores hyaline, thin-walled, IKI. Causes a white rot. On calcareous ground from roots or on stumps of *Abies*. Monotypic genus with one Central European and West Asian species.
Type species: *Polyporus corrugis* Fr. = *P. trogii* Fr.
Remarks: Superficially, basidiocarps of *Podofomes trogii* are similar to those of *Ischnoderma* spp., as already pointed out by Pouzar (1971), Jahn (1973) and David et al. (1983). The brown zoned tomentose pileus with an underlying blackish crust is found in both genera. Typically, in both genera the pileus shrinks by drying and becomes characteristically radially folded or wrinkled. The context is wood brown in both species and they both have clamped generative hyphae. As to hyphal system there are differences (see below) and the same goes for the spores.

Podofomes trogii (Fr.) Pouzar,

Česká Mykol. 25: 19, 1971. - *Polyporus trogii* Fr., Nova Acta Regiae Soc. Sci. Uppsal. Ser. 3, 1: 50, 1851. - *Polyporus corrugis* Fr., Hymenomyc. Europ. p. 536, 1874. - *Podofomes pyrenaicus* Rath, Rivista Micol. 31: 76, 1988. See remarks below.
Basidiocarps laterally to centrally stipitate, annual, but old dead basidiocarps often remain intact through the winter; pileus 3-12 cm in diam, semicircular to reniform, rather soft when fresh, woody when dried, up to 1.5 cm thick; upper surface dark brown, finely pubescent to tomentose, zonate, undulating and often wrinkled radially, with age the tomentum wears away and exposes a black cuticle in concentric zones; margin thin and wavy; pore surface whitish when fresh, staining rapidly when touched, with age becoming pale brown; pores circular, 2-4 per mm, with thick, entire dissepiments; tube layer 2-4 mm thick, whitish to ochraceous when dry; context wood- to cork-coloured or pale ochraceous when dry, up to 1 cm thick, coriaceous and dense and partly shrunken when dry, in the stipe of the same colour but with some longitudinal darker zones, towards the surface tomentum limited by a black dense zone 30-60 µm thick; stipe up to 12 cm long, 0.8-1.5 cm in diameter, vertical or oblique, irregular in diam, often tuberculate and with an undulating surface, dark brown, finely tomentose over an underlying black cuticle.
Hyphal system di-trimitic; generative hyphae with clamps, thin-walled, hyaline, 2-3 µm in diam; skeletal hyphae pale brown, thick-walled, nonseptate, 3-4.5 µm in diam, a few with dichotomous branching, skeletal hyphae in trama narrower, 1.5-2.5 µm and parallel to the tubes; subhymenium of tortuous, thin-walled, much branched generative hyphae; in the context both branched and unbranched hyphae are present, the former are clearly skeletal hyphae, the latter of the Bovista type and could be classified as binding hyphae (as in *Polyporus* s. str.) but with all types of transitions to the unbranched ones, 3-4.5 µm in diam.
Cystidia absent, but a few hyaline cystidioles present among the basidia, thin walled, fusoid, 20-25 x 4-6 µm.
Basidia 25-35 x 5-7 µm, clavate, tetrasterigmatic.
Basidiospores 4.5-6 x 2.5-3.5 µm, elliptic with a few oil drops.
Substrata. Seemingly restricted to roots and stumps of *Abies alba*. Domański et al. (1973) also reports *Picea* as a host, but we have seen no specimen with an indication of this host, and all other authors (see above) report *A. alba* as the only host.
Distribution. Restricted to Central Europe and West Asia, following its host from Spain and France through Central Europe to Caucasus and Turkey and further to Uzbekistan.
Remarks. This species is easy to recognize in the field due to the dark-coloured stipitate basidiocarp growing on or close to *Abies*. It seems to prefer calcareous soil.

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POLYPOROLETUS Snell,

Mycologia 28:467, 1936.

Basidiocarps annual, terrestrial, centrally to laterally stipitate; pileus circular to reniform or lobate; pileus tomentose-fibrillose to glabrous, purplish grey to pale buff, darkening on drying; pore surface yellowish tan to pinkish buff, becoming pale olivaceous on dried specimens, pores circular to angular, 1 -2 per mm; tubes decurrent on stipe; context pale pinkish buff, azonate; hyphal system monomitic; hyphae with clamps and simple septa; basidia clavate, tetrasterigmatic; cystidia absent; basidiospores globose to subglobose, with a double wall separated by interwall partitions, hyaline, appearing slightly rough, negative in Melzer's reagent.

Monotypic genus restricted to North America. Type of rot unknown, possibly mycorrhizal.
Type species: *Polyporoletus sublividus* Snell.
Remarks. *Polyporoletus* is probably phylogenetically related to *Albatrellus,* but is distinguished by its unique basidiospores, quite unlike those of any other polypore.

Polyporoletus sublividus Snell,

Mycologia 28:467, 1936.
Basidiocarps annual, laterally to centrally stipitate, terrestrial; pilei solitary, circular to reniform or lobed, up to 18 cm in diam and 2.5 cm thick; pileus tomentose to fibrillose, in some specimens with fibrils becoming appressed in a reticulate pattern, in others becoming glabrous, dark purplish-grey, fading to cinnamon buff to olivaceous tawny, azonate, in some specimens almost black after drying; pore surface purplish grey to pale brown or olivaceous with age, pores circular to angular, 1-2 per mm, stipe up to 10 cm long and 4 cm wide, cylindrical, with a bulbous base up to 5.5 cm wide, reticulate, tomentose to finely hispid, wood-brown to olivaceous; context pinkish buff to ochraceous salmon, soft and friable, azonate, up to 1.5 cm thick; tube layer sharply distinct from context, not separable, decurrent on stipe, up to 1 cm thick.
Basidiospores 10-12 x 8-10 µm, subglobose to broadly elliptic, hyaline, appearing slightly rough, with a double wall separated by inter wall pillars or partitions.
Substrata. On the ground under hardwood trees.
Distribution. Known only from the Pacific Northwest and the Great Smoky Mountains in Tennessee and North Carolina.
Remarks. *P. sublividus* is morphologically similar to species of *Albatrellus,* but easily separated by its unique spores.

POLYPORUS Fr.,

Syst. Mycol. 1:134. 1821.
Basidiocarps annual or biannual, centrally to laterally stipitate or substipitate, pileus circular to dimidiate, convex to infundibuliform, smooth to scaly, glabrous to finely tomentose, white to deep brown or black, tough when fresh, leathery or brittle when dry, pore surface white to cream, or dark brown when dry, pores entire, round to angular, small to large, context white to light brown, stipe cream to black, glabrous to finely tomentose, in some species arising from a sclerotium, hyphal system dimitic, generative hyphae hyaline, mainly with clamps, two species with simple septa, arboriform binding hyphae hyaline to brown, solid or with a lumen, cystidia absent, basidiospores cylindrical to elliptic, smooth, hyaline and negative in Melzer's reagent. On living and dead hardwoods, rarely on conifers, or developing from sclerotia buried and with a white rot. Cosmopolitan genus.
Type species: *Polyporus tuberaster* Jaq.:Fr.
Taxonomic synonyms with type species:
Favolus Fr. (*Cantharellus alveolaris DC.:Fr.).* 1828.
Polyporellus P. Karst. (*Polyporus brumalis* Fr.). 1879.
Cladomeris Quel. (*Polyporus umbellatus* (Pers.) Fr.). 1886.
Leucoporus Quel. (*Polyporus ciliatus* Fr.). 1886.
Melanopus Pat. (*Polyporus melanopus* Fr.). 1887.
Lentus Torrend (*Polyporus brumalis* Pers.: Fr.). 1920
Dendropolyporus (Kotl.) Jülich (*Polyporus umbellatus* Pers.: Fr.). 1982.
*Neofavolu*s Sotome & Hatt. (*Merulius alveolaris* DC). 2012.
Picipes Zimitr. & Kovalenko (*Polyporus badius* Pers.: Fr.). 2016.
Remarks. The genus is circumscribed here in a wide sense, and those who prefer a narrower generic concept have a wide choice in their selection as indicated above. The genus is quite well defined by the centrally to laterally stipitate basidiocarps and the dimitic hyphal system with arboriform binding hyphae. *Dichomitus* is related, separated in principle only by its sessile to resupinate basidiocarps and slightly different vegetative hyphae.

Polyporus tuberaster Jacq.: Fr.,

Syst. Mycol. 1: 347, 1821. - *Boletus tuberaster* Jacq., Collectanea [Jacquin] 5, pls. 8-9, 1796.
Basidiocarps annual, stipitate, simple when growing on wood, often more compound when growing on the ground; pileus fleshy when fresh, circular to semicircular or even fanshaped in compound basidiocarps, depressed in centre, up to 15 cm wide, 0.5 to 1.5 cm thick; upper surface whitish, ochraceous to pale yellowish brown and covered with small tan to dark brown scales with a broad base and especially towards the margin, split and fibrillose, in pale specimens the scales are pale and thus not especially distinct, with age becoming more glabrous from the centre as the scales partly wear away, partly are glued to the surface; margin thin, mostly finely ciliate or lacerate, flat in fresh specimens, curved in dried specimens; stipe central to lateral, straight or curved at the base, 0.5-6 cm long, 0.5-1.5 cm in diam with decurrent pores, at the base with white hairs under which there is a thin black cuticle which may extend a short distance above the tomentum, above that, the stipe is white to ochraceous; pore surface white to pale tan, pores angular, often somewhat radially elongated, 1-2 mm long and 0.5-1 mm wide, dissepiments often lacerate or dentate; context white, up to 10 mm thick, fleshy-tough when fresh, drying rigid and brittle; tube layer concolorous with pore surface, up to 5 mm thick.
Sclerotium normally present in the ground, round to oval or irregular, heavy, up to 15 kilos, but normally far less than that, fleshy and tough when fresh, shrinking considerably on drying and becoming hard and brittle, surface ochraceous to dark dirty brown, densely mixed with sand, stones and roots, often in considerable quantities so it looks like ground material that has been penetrated by mycelial strands and white aggregations of hyphae.
Hyphal system dimitic; generative hyphae with clamps, hyaline, thin-walled, 3-9 µm in diam; hairs at the base of stipe and

the scales consist mostly of wide generative hyphae; skeleto-binding hyphae of the Bovista type with tapering side branches, hyaline, thick-walled to solid, sparingly branched, up to 12 µm wide in the main stem; sclerotium mainly with skeleto-binding hyphae, in parts very finely branched and very thin, in most parts sparingly branched, thick-walled and variable in diameter, 3-10 µm wide, in some cases with apical swellings.
Cystidia absent; fusoid cystidioles present, 20-30 x 5-6 µm.
Basidia 25-40 x 6-10 µm, clavate, 4-sterigmate, with a basal clamp.
Basidiospores 10-16 x 4.5-6 µm, cylindrical to oblong ellipsoid.
Substrata. On hardwoods or on the ground from a large blackish sclerotium. When growing on wood, there is often a connection through the wood to an underground sclerotium.
Distribution. Widespread in the Northern boreal zone.
Remarks. The species can be confused with *P. squamosus* which has similar scales on the pileus, but has no sclerotium and normally has thicker and more robust basidiocarps. The scales of *P. squamosus* are normally rounded and more agglutinated and not raised and tufted as in *P. tuberaster*. The original drawing of Jaquin shows a stipitate fungus growing from a sclerotium and with a scaly pileus. Thus, there can be no doubt about the identity of the species.

PORODISCULUS Murrill,

North Amer. Flora 9:47, 1907.
Basidiocarps pileate, pendent from a stalk-like base, pileus and dissepiments farinaceous, ashy white to pale brown; pore surface concave, hyphal system monomitic, hyphae simple-septate; branched trichocyst present on pileus and dissepiments; cystidia absent; basidiospores allantoid. Associated with a white rot of dead hardwoods. Monotypic, cosmopolitan genus.
Type species: *Porodisculus pendulus* (Schwein.) Murrill.
Remarks. The small pendent basidiocarps and the distinctive coralloid trichocyst hyphae suggest relationships with pleurotoid agarics such as *Mycena* or perhaps cyphellaceous fungi.

Porodisculus pendulus (Schwein.) Murrill,

North Amer. Flora 9:47, 1907. - *Peziza pendula* Schwein., Schr. Nat. Ges. Leipzig 1:92, 1822. - *Polyporus cupulaeformis* Berk. & M.A. Curtis, Grevillea 1:38, 1872. - *Polyporus pocula* (Schwein.) Berk. & M.A. Curtis, Amer. Acad. Arts Sci. Proc. 4:122, 1860.
Basidiocarps annual, pileate, single but usually fruiting in large numbers, usually pendent from a dorsal or lateral narrowed stalk-like base, 1-3 mm in diam; pileus ashy-white, farinaceous, azonate; pore surface convex, pores 8-10 per mm, almost obscured by thick, farinaceous and sugary looking dissepiments; context cream coloured with a pale brown upper layer composed of the surface tomentum, azonate, up to 1.5 mm thick, firm-corky; tube layer distinct, pinkish buff, up to 1 mm thick; dorsal or lateral stalk-like part present with colour as pileus.
Hyphal system monomitic; hyphae hyaline, thin-walled, simple-septate, 2-3 µm in diam, pileus and dissepiments with much branched trichocyst hyphae, branching heads covered with minute dichotomously branched projections and often with coarse crystalline material, those on the pileus strongly amyloid so that the entire layer turns blue-black in Melzer's reagent.
Chlamydospore like structures present in trama, elliptic to spherical, moderately thick-walled, 15-20 x 12-15 µm.
Basidiospores 3.5-4.5 x 1 µm, allantoid.
Substrata. Dead hardwood branches, most common on oak and chestnut.
Distribution. Hardwood forests of the eastern U. S. from New York to Florida, not known from western North America, but widely distributed in the Southern Hemisphere.
Remarks. This species has the smallest basidiocarps of any of the polypores described in this book. They commonly develop in large numbers on recently killed branches or logging slash.

POROGRAMME Pat.,

Essai Tax. p. 63, 1900.
Basidiocarps resupinate, adnate, bluish grey, reddish to almost blackish, pores angular and irregular, in parts labyrinthine or consisting of irregular plates, hymenium whitish and restricted to the base of the pores, context dark and resinous hard, old tubes filled with white mycelium, substrate usually reddened in zones, hyphal system monomitic, generative hyphae with clamps, first hyaline, later thick walled and tinted brownish, dextrinoid, dark brown in KOH, densely intertwined and agglutinated, clamps often difficult to observe, cystidia and dendrohyphidia absent or present, spores elliptic, smooth, thin walled and nonamyloid.
Type species: *Porogramme dussii* (Pat.) Pat.
Remarks. The genus is usually easy to recognize because of the extremely tiny pores. The hyphal system may be mistaken to be dimitic, but an examination of the thick-walled hyphae will demonstrate clamps, thus, they must be interpreted as sklerified generative hyphae. Their reaction in Melzer and in KOH is quite unique.

Porogramme albocincta (Cooke. & Massee) Lowe,

Lloydia 21:102, 1958. - *Poria albocincta* Cooke & Massee, Grevillea 20:106, 1892.
Basidiocarp resupinate, widely effused, adnate and hard, up to 2 mm thick in mature specimens, smooth in young specimens, with deep polygonal cracks in older specimens, substratum distinctly reddened by the fungus, often in several zones or bands, pore surface dark bluish grey to brownish grey when older, pores very small, 8-20 per mm and variable, mostly

angular and thin walled, entire or sinuous to labyrinthine or even consisting of isolated, sinuous vertical plates, under a lens the walls appear as being almost black, while the bottom of the pores is filled to variable heights with a white mycelium, in sections the basidiocarp appears dark coloured with white spots where old pores have been filled with these mycelial masses.
Hyphal system monomitic, generative hyphae with clamps, developing thicker walls and scattered clamps in the dissepiments, in the sterile parts of the basidiocarp olivaceous brown in KOH and water, dextrinoid, strongly agglutinated and the clamps are difficult to observe, moderately thick walled, hymenium restricted to bases of the pores, in fresh, actively growing specimens there is a distinct subhymenium, up to 3-5 µm deep with vertical and highly branched hyphae.
Basidiospores 4-6 (6.5) x 3-3.5 µm, broadly elliptic.
Distribution. A pantropical species and quite common.
Remarks. The species is easy to recognize in the field because of its dark bluish blackish surface when old, ashier blue when young and then white at the bottoms of the pores. Further, red irregular zones or bands are developed below the basidiocarps. The only other species with the same type of zones, is *Tinctoporellus epimiltinus*, which, however, is a true polypore with a more reddish buff pore surface

PROTOMERULIUS A. Møller,

Mycologia 36:67, 1944.
Basidiocarps resupinate, annual; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae dominant in the basidiocarp; basidia longitudinally septate, 4-celled; basidiospores hyaline, allantoid, negative in Melzer's reagent. Causes a white rot in dead hardwoods. Cosmopolitan genus, but rare.
Type species: *Protomerulius brasiliensis* A. Møller.
Synonym: *Aporpium* Singer (*Poria canescens* P. Karst. = *Polyporus caryae* Schwein.).
Remarks. The genus is unique with its septate basidia and belongs in the Tremellaceae. The generative hyphae are often difficult to observe, and basidia seem to collapse rather rapidly after spore discharge.

Protomerulius caryae (Schwein.) Ryvarden,

Synopsis Fung. 5:212, 1991. - *Polyporus caryae* Schwein., Trans. Am. Phil. Soc. II, 4:159, 1832. **Basidiocarps** annual, resupinate; pore surface pale pinkish brown, often spotted, turning light reddish brown when bruised, pores regular, circular, 3-5 per mm; subiculum less than 0.5 mm thick, pale buff; tube layer concolorous with context, up to 3 mm thick.
Basidia 8-9 x 5-7.5 µm, longitudinally septate, broadly clavate when immature.
Basidiospores 5.5-6 x 2-2.5 µm, allantoid.
Substrata. Dead hardwood.
Distribution. Transcontinental in North America from Yukon Territory to Florida. Circumglobal in the Northern Hemisphere.
Remarks. *Protomerulius caryae* is rather common in the hardwood forest regions of eastern North America, rarer in the West.

PSEUDOFAVOLUS Pat.,

Essai Tax. Hymen., p. 80, 1900.
Basidiocarps annual, solitary or imbricate, flabelliform to spatulate, narrowing to a stipe-like base; pileus glabrous, smooth or tessulated, sometimes radially striate; context thin; pores large to rather small, angular to hexagonal, tubes short; hyphal system dimitic; generative hyphae with clamps; skeleto-binding hyphae arboriform with a variable dextrinoid reaction, cystidia absent; dendrohyphidia may be present among the basidia, spores cylindrical, large, smooth, negative in Melzer's reagent; On dead hardwoods, causing a white rot. Mainly a tropical genus with one species known from the southern U.S.
Type species: *Polyporus miquelii* Mont.
Remarks. The genus is undoubtedly related to *Polyporus* s. str. by its large cylindrical spores and strongly arboriform skeleto-binding hyphae, characters also seen in the type species of *Polyporus*.

Pseudofavolus cucullatus (Mont.) Pat.,

Essai Tax. p. 81, 1900. - *Favolus cucullatus* Mont., Ann. Sci. Nat. Ser. Vol. 2, 17:125, 1842. - *Favolus curtipes* Berk. & M.A. Curtis, Hooker's J. Bot. 1:234, 1849. - *Hexagonia taxodii* Murrill, Bull. Torrey Bot. Club 31:332, 1904.
Basidiocarps annual, pileate, up to 8 cm wide and 3-4 mm thick, laterally attached with a small disc or a diminutive stipe, dimidiate to flabelliform, pileus glabrous, smooth, sometimes finely radiate-striate, whitish to ochraceous or pale dirty umber, often with a dark reddish tint along the margin, stipe reduced, a few mm long, pore surface dark ochraceous to umber or dirty fuscous, pores angular to hexagonal, regular to irregular, (1-)2-3 per mm, context straw-coloured to pale ochraceous, 1-2 mm thick; tube layer up to 2 mm thick, concolorous with the pore surface.
Basidiospores (11.5-)13-16 x 4-6 µm, cylindrical.
Substrata. Dead hardwoods in many genera.
Distribution. In the U.S. known from Louisiana, Georgia, and Florida. Pantropical.
Remarks. Superficially the basidiocarps resemble small ones of some *Polyporus* species, but are separated by the shallow, large, hexagonal pores and thin pilei. There is no other poroid species with such a small and dimidiate to almost substipitate basidiocarp.

PSEDUOPIPTOPORUS Ryvarden,

Preliminary Polyp. Fl. East Africa p. 524, 1980.
Basidiocarps, pileate, sessile, dimidiate, smooth, glabrous, whitish, ochraceous to dirty lurid-brown, pores wood coloured to dirty straw-coloured, tubes agglutinated and fragile, context pale, crumbly and fragile. Hyphal system dimitic, tubes monomitic, context dimitic, generative hyphae with clamps, skeletal hyphae unbranched to distinctly arboriform, thick-walled and amyloid, spores elliptic to ovate, thick-walled, pale yellowish, dextrinoid. Monotypic genus.
Type species*: Polyporus devians* Bres.
Remarks. The genus is unique by its large whitish basidiocarps, partly resembling those of *Piptoporus betulinus*, and the combination of amyloid skeletal hyphae, gloeopleurous hyphae and dextrinoid spores.

Pseudopiptoporus devians (Bres.) Ryvarden,

op. cit. - *Polyporus devians* Bres., Ann. Mycol. 18:32-33, 1920.
Basidiocarps annual, solitary, pileate, dimidiate to substipitate with a contracted base, semicircular in outline, up to 30 cm wide and long and 1-8 cm thick at the base, punky and soft when fresh, soft and fragile when dry, pileus smooth, azonate, glabrous and with a thin cuticle, easily dented with a nail, white when fresh, when old and weathered dark brown to lurid yellow-brown, ochraceous to greyish-isabelline and acute, pore surface white to cream, pores round to slightly elongated, 3-4 per mm, tubes fragile, resinous pale brown to straw-coloured and distinctly darker than the context, up to 10 mm deep, context pale ochraceous to cork-coloured, , up to 6 cm thick at the base, becoming bluish-black in Melzer's reagent.
Hyphal system dimitic, generative hyphae with clamps, in the context thin walled, up to 8 µm wide, usually collapsed, giving the context the rather loose structure, skeletal hyphae, arboriform, amyloid, 2-5 µm wide. Gloeopleurous hyphae present in the context, up to 12 µm wide, thin-walled and filled with a grainy to fluid brown material.
Basidiospores 5.0-6.5 x 4-5 µm, elliptic, thick- walled, pale straw-coloured and dextrinoid. **Distribution**. Known only from two localities in Mozambique.
Remarks. The whitish basidiocarps with amyloid skeletal hyphae and dextrinoid spores, make this a distinct species.

PYCNOPORUS P. Karst.,

Rev. Mycol. 3:18, 1881. See *Trametes*.

PYCNOPORELLUS Murrill, emend Kotl. & Pouzar,

Bull. Torrey Bot. Club 32:489, 1905. - Ceska Mykol. 17:176, 1963.
Basidiocarps annual, pileate or resupinate, when pileate, broadly attached and dimidiate or somewhat elongated; pileus tomentose, zonate, bright orange to rust coloured; pore surface orange, the pores medium to large, angular; tube layer concolorous with pore surface; context orange to orange-buff, soft-fibrous; all tissues deep red in KOH; hyphal system monomitic; generative hyphae, mostly incrusted, simple-septate; cystidia present, tubular and projecting; spores cylindrical to oblong- elliptic, thin-walled, smooth, hyaline, non-amyloid. On dead conifers and hardwoods causing a brown rot. Small genus with two species.
Type species: *Pycnoporellus fibrillosus* (P. Karst.) Murrill (= *P. fulgens* (Fr.) Donk).
Remarks. The colour and the cystidia are characteristic for the genus. It is undoubtedly related to *Phaeolus.*

Pycnoporellus fulgens (Fr.) Donk,

Persoonia 6: 216, 1971. - *Hydnum fulgens* Fr., Öfvers. Kung. Vetensk. Akad. Förh. 9: 130, 1852. - *Polyporus fibrillosus* P. Karst., Syd. Finl. Polyp., p. 30, 1859.
Basidiocarps annual, sessile or effused-reflexed; pilei solitary or imbricate, dimidiate to long and narrow, up to 6 x 9 x 2.5 cm; upper surface pale orange to reddish orange or rust-coloured, tomentose or glabrous on young specimens to hispid or radially fibrillose with age, often zonate, pore surface pale orange, the pores circular to angular, 2-3 per mm, dissepiments thin, becoming lacerate with age; context light orange, up to 5 mm thick, sometimes duplex; lower layer firm, corky, upper layer soft, fibrous; tube layer concolorous with the context or sometimes paler orange, up to 6 mm thick; tissue of context and tubes red in KOH solution.
Hyphal system monomitic; contextual hyphae pale reddish to brownish in KOH, thin- to thick-walled, with occasional branching, simple-septate, 4-11 µm in diam, some with a very narrow, sinuous lumen; others thin- to moderately thick-walled, hyaline in KOH, with frequent branching, simple-septate, 2.5-4 µm in diam.
Cystidia frequent, narrowly cylindrical, thin walled, 45-60 x 4-6 µm, projecting up to 35 µm, simple-septate at the base.
Basidia 20-30 x 5-5.5 µm, clavate, tetrasterigmatic, simple-septate at the base.
Basidiospores 6-9(-11) x 2.5-4 µm, cylindrical-elliptic to elliptic.
Substrata. In Europe most common on *Picea* but also found on *Abies* and *Pinus*, far rarer on hardwoods like *Alnus, Betula, Fagus, Populus* and *Tilia*.
Distribution. A rare species Central Europe and eastwards to northern U.S. and Canada.
Remarks. *P. fulgens* differs from *P. alboluteus* the other species in the genus, in having smaller pores, spores and cystidia, and in being commonly sessile or effused-reflexed.

PYROFOMES Kotl. & Pouzar,

Feddes Rep. 69:140, 1964.
Basidiocarps perennial to annual, pileate to resupinate; pileus smooth to pubescent, ochraceous pink to brick red; pore surface orange pink to reddish; context concolorous, woody; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae slightly tinted, thick-walled to solid, rarely branched; spores smooth, thick-walled, truncate, slightly dextrinoid to negative in Melzer's reagent. On living and dead conifers and hardwoods, causing a white rot. Cosmopolitan genus with one species in North America.
Type species: *Pyrofomes demidoffii* (Lév.) Kotl. & Pouzar.
Remarks. The genus is easy to recognize by its coloured basidiocarps and truncate spores. It is undoubtedly closely related to *Perenniporia*, separated mainly by its reddish basidiocarps.

Pyrofomes demidoffii (Lev.) Kotl. & Pouzar,

Feddes Rep. 69: 140,1964. – *Polyporus demidoffii* Lev. in Demidoff, Voyage Ruiss. Meriod. 2: 92, 1842. - *Polyporus juniperinus* Schrenk, Bull. US Dep. Agriculture, 21: 9, 1900. - *Pyropolyporus earlei* Murrill, Bull. Torrey Bot. Cl. 30: 116, 1903.
Basidiocarps perennial, sessile, solitary, ungulate, often becoming columnar, up to 15 cm wide, 7 cm thick and 10 cm high; pileus brownish, tomentose in young specimens, becoming blackened and rimose with age, concentrically sulcate, pore surface light ochraceous buff to ochraceous buff, pores circular, 2-3 per mm, context brick red to orange cinnamon, woody, azonate, up to 5 cm thick; tube layers ochraceous buff to yellowish, indistinctly stratified, each layer up to 7 mm thick.
Basidiospores 6-8 x 4-7 µm, ovoid to broadly elliptic or more elongated and angular.
Substrata. Known only on *Juniperus* species.
Distribution. Common throughout the western U.S and follows the host genus in East Europe, Central Asia and East Africa.
Remarks. *Pyrofomes juniperinus* is readily distinguished by the bright rusty red colour of context tissue and its restriction to junipers.

RESUPINATUS S. F. Gray,

Natural Arr. Br. Plants. 1:617, 1821.
Basidiocarps annual, resupinate, consisting of scattered to crowded cupules on a common subiculum, superficially poroid; hyphal system monomitic; generative hyphae with clamps; cystidia absent; spores hyaline, thin-walled, negative in Melzer's reagent; on dead hardwoods and conifers. causing a white rot.
Type species: *Resupinatus applicatus* (Batsch) S. F. Gray.
Taxonomic synonym: *Stigmatolemma* Kalchbr.
Remarks. The genus is included here since one representative with a basidiocarp consisting of individual tiny cupules grouped so closely that together they resemble a true polypore. The genus belongs in Pleurotaceae.

Resupinatus poriaeformis (Pers.: Fr.) Thorn, Moncalvo & Redhead,

Mycologia 97: 1148, 2006. - *Peziza poriaeformis* Pers.: Fr., Syst. Mycol. 2:106, 1821.
Basidiocarps annual, resupinate, consisting of a grey subiculum with scattered to crowded grey cupules 200-300 µm in diam, apical pore conspicuous, outer surface of cupules appearing granular under 30 x magnification, subiculum tomentose to cottony or very thin and arachnoid, sometimes white at the margin.
Basidiospores 4.5-6 µm in diam, globose to subglobose.
Substrata. Dead hardwoods.
Distribution. Widely distributed in forest regions of North America and circumpolar in the temperate zone.
Remarks. The species is included here because of its superficial resemblance to a polypore although an examination with a hand lens will reveal that it is not related to the true polypores.

RIGIDOPORUS Murrill,

Bull. Torrey Bot. Club 32:478, 1905.
Basidiocarps annual to perennial, resupinate to pileate, reddish orange to pinkish, isabelline or ochraceous, coriaceous to rigid and bony when dry; pileus tomentose to glabrous, usually zonate; pore surface con colourous, in some species becoming grey to almost black on drying; context dense, fibrous to woody; hyphal system monomitic to apparently dimitic; generative hyphae with simple septa, variable in width and wall thickness, in some species skeletal or strongly sclerified nonseptate hyphae also present; incrusted cystidia present or absent; smooth cystidioles present among basidia in most species; spores ovoid to globose, thin-walled, negative in Melzer's reagent. On living or dead hardwoods, rarely conifers, causing a white rot. Cosmopolitan genus.
Type species: *Polyporus micromegas* Mont. (a synonym of *R. microporus* (Fr.) Overeem).
Remarks. Microscopically the genus comes close to *Oxyporus* Donk which has the same type of generative hyphae and cystidia in most species. However, all species in *Oxyporus* are light coloured, and the cystidia are hymenial and not tramal as in *Rigidoporus*.

Rigidiporus microporus (Fr.) Overeem,

Icon. Fung. Malayen. 5:1, 1924. - *Polyporus microporus* Fr., Syst. Mycol. 1:376, 1821. - *Polyporus lignosus* Klotzsch, Linnaea 8:485, 1833.
Basidiocarps annual, 22 cm long, 10 cm wide and up to 1.5 cm thick, rarely persisting, sessile or effused-reflexed, often im-

bricate in clusters, consistency brittle and hard when dry, pilei dimidiate to flabelliform; pileus first orange to reddish brown, slightly velutinate, becoming glabrous and fading to pale brownish, concentrically zonate, sulcate, dull to slightly shining; pore surface at first bright orange to reddish-brown, fading to ochraceous, pale brown or gray, pores circular to angular, 6-9 per mm, context cream to pale brownish, radially fibrous, up to 1 cm thick; up to 1 cm thick, cream to pale brownish but reddish-brown near the pore surface.
Basidiospores 4.5-6 x 4-5 µm, subglobose to globose.
Substrata. Numerous genera of hardwoods.
Distribution. Pantropical.
Remarks. In fresh condition the reddish colour and the minute pores will be rather diagnostic, when dry it becomes paler and ochraceous. A microscopical examination is necessary to separate it from the cystidiate, but otherwise similar, *R. lineatus*.

SARCOPORIA P. Karst.,

Hedwigia 33:15, 1894.
Basidiocarps annual, resupinate to effused-reflexed or sessile, white to light brown, soft when fresh, fragile when dry; pores angular; context duplex, with a dense dark gelatinous layer next to the tubes and a white, soft-fibrous layer next to the substrate; hyphal system monomitic; generative hyphae with clamps; cystidia none; basidiospores cylindrical, smooth, hyaline, slightly thick-walled, dextrinoid in Melzer's reagent; on conifers and hardwoods, causing a brown rot.
Type species: *Sarcoporia polyspora* P. Karst.
Taxonomic synonym: *Parmastomyces* Kotl. & Pouzar, Feddes Repert. 69:138, 1964.
Remarks. The dextrinoid reaction of the thick-walled spores is a diagnostic character for the genus and sequencing has shown it to be related to *Amylocystis* and *Auriporia*.

Sarcoporia polyspora P. Karst.,

op.cit. - *Polyporus transmutans* Overh., Mycologia 44:226, 1952
Basidiocarps annual, resupinate, effused-reflexed or sessile, soft and fleshy, drying brittle; taste slightly acid; pileus white to cream, bruising or drying reddish brown, matted-strigose, azonate; pore surface white to cream, also turning reddish brown on bruising or drying, the pores circular, 2-3(-4) per mm, context duplex, gelatinous next to the tubes, otherwise white, soft-fibrous, in most specimens on conifers up to 5 mm thick but in some specimens on hardwoods up to 1 cm thick, gelatinous layer darker and resinous on drying or on thicker basidiocarps darker resinous streaks scattered in context; tube layer fragile, brittle and shattering easily when dry, 1-3 mm thick.
Basidiospores (4-)5-7 x 2.5-4 µm, narrowly elliptic to short-cylindrical, dextrinoid.
Substrata. Causes a brown rot in conifers and hardwoods.
Distribution. Conifer forest ecosystems through the boreal conifer zone, but a rare species.
Remarks. The dextrinoid spores make this a distinct species.

SCHIZOPORA Velen.,

Ceské Houby, p. 638, 1922.
Basidiocarps annual, resupinate or rarely with narrow, imbricate pilei over a decurrent tube layer; pore surface and subiculum cream to pale buff; the pores angular to daedaleoid or irregularly hydnoid from splitting of dissepiments; hyphal system di- or monomitic; generative hyphae moderately thick-walled, with clamps; skeletal hyphae thick-walled, cystidia or fusoid or capitate hyphal ends present; hyphae at dissepiment edges incrusted; basidiospores elliptic to subglobose, hyaline, negative in Melzer's reagent. On dead hardwoods, rarely conifers. Small cosmopolitan genus with four species.
Type species: *Polyporus laciniatus* Velen. (= *Hydnum paradoxum* Schrad.: Fr.).
Remarks. Normally the typical narrow hyphae with thickened walls and large clamps will be sufficient to recognize the genus microscopically. The bulbous swollen cystidia or hyphal ends are also diagnostic for the genus. Its representatives are some of the most common polypores and they seem very well adapted to invade exposed substrates such as attached dead branches, dead trunks etc., thus, usually easy to observe.

Schizopora paradoxa (Schrad: Fr.) Donk,

Persoonia 5:76, 1967. - *Hydnum paradoxum* Schrad.: Fr., Syst. Mycol. 1:424, 1821.
Basidiocarps resupinate, often large, on vertical substrata often with small nodules with fertile underside but no real pilei, tough, white to cream- coloured or darkening with age (grayish-ochraceous-brownish), 1-5 mm thick; hymenophore usually split and irregularly hydnoid with flattened teeth, or labyrinthine to lacerate-denticulate if poroid, pores of varying sizes, on sloping substrata more or less prolonged, near the margin the pores are shallow or net-like, subiculum cream to pale buff, fibrous, up to 2 mm thick; tube layer concolouros and continuous with context, up to 3 mm thick.
Cystidia are present in variable numbers, usually with a rounded head, often covered with a crystalline or resinous substance.
Basidiospores 5.5-6.5 x 3.5-4.5 µm, elliptic.
Substrata. On numerous dead hardwoods. It has also been collected on various conifers.
Distribution. Widely distributed and cosmopolitan.
Remarks. *S. paradoxa* is usually easy to recognize because of the irregular pore surface.

SERPULA (Pers.) S. F. Gray,

A nat. arr. British plants 1: 637, 1821.
Basidiocarp effused reflexed pileate imbricate, membranaceous, soft fleshy, thin rather thick; hymenium meruloid poroid, brownish, when fully developed dark brown; rhizomorphs present; hyphal system dimitic, polymorphic; generative hyphae with clamps, skeletal hyphae present; cystidia absent; basidia clavate, with 4 sterigmata; spores broadly elliptic ovoid, smooth, yellowish brownish.
Type species: *Merulius destruens* Pers. (syn.: *S. lacrymans* (Wulf.:Fr.) Schroet.).
Remarks. The genus is characterized by the folded semiporoid brown surface on soft to tough basidiocarps restricted to mostly coniferous wood, while the spores are thick-walled and rusty brown. Cosmopolitan genus.

Serpula similis (Berk. & Broome) Ginns

Mycologia 63: 231, 1971. - *Merulius similis* Berk. & Broome, Jour. Linn. Soc. Bot. 14: 58, 1875. **Basidiocarps** annual, 8 to 4 cm long and wide, 1-1.5 mm thick when fresh, resupinate to distinctly pileate, imbricate, sessile, fleshy and more or less watery when fresh, becoming corky, brittle and light in weight on drying, pileus flabelliform to semicircular, cream to light lemon yellow, azonate, uneven, smooth, tomentose, shiny, hymenophore meruloid to reticulated to folded, more so towards the centre, lemon yellow to yellowish brown, poroid, pores 1-2/ mm, irregular to daedaloid, context, pale cream colour, soft corky to spongy, up to 14 mm thick.
Hyphal system, dimitic, generative hyphae with clamps, hyaline, 2.5-6.0 µm wide, skeletal hyphae hyaline and with wide lumen, thick walled, 1.5-3.0 µm wide.
Basidiospores 4.5 5.5 x 3.5-4.5µm, subglobose, bright yellow, thick walled and smooth.
Substrate: Dead hard woods causing a brown rot.
Distribution: Paleotropical species, widespread, but not common.
Remarks. The brown folded hymenium and coloured spores are distinctive characters for this striking species.

SIDERA Miettinen & K. H. Larsson,

Mycol. Progress. 10: 136, 2010.

Basidiocarps annual, resupinate, becoming widely effused, soft to tough, hyphal system dimitic; generative hyphae with clamps, hyaline, thin-walled, skeletal hyphae straight to sinuous, thick-walled to solid, nonseptate, rarely branched, cystidia present as smooth thin walled cystidioles, in the poroid species hyphidia present as hyphal ends out of which many have a crystal crown, basidia clavate, 4-sterigmate, basidiospores in the poroid species allantoid to lunate, hyaline, thin-walled, negative in Melzer's reagent. Both on hard woods and coniferous hosts causing a white rot.
Type species: *Physisporinus lenis* P. Karst.
Remarks. The genus includes in addition to the poroid species described here, also a poroid species from South America and a grandinoid corticoid species.
The type species and its sibling *Sidera vulgaris* are both characterized by lunate spores, dimitic hyphal system and hyphidia or hyphal ends with a small crystalline crown. DNA sequencing has demonstrated that the genus also includes some corticoid species.

Sidera lenis (P. Karst.) Miettinen,

Mycol. Progress 10: 136, 2011. - *Physisporinus lenis* P. Karst. in Rabenhorst & Winter, Fungi Eur. et extra-Eur. exsicc. no. 3527, 1886. - *Poria earlei* Murrill, Mycologia 12:86, 1920. - *Poria tenuipora* Murrill, Mycologia 12:85. - *Poria montana* Murrill, Mycologia 12:307, 1920.
Basidiocarps perennial, resupinate, becoming widely effused, 5-20 x 2-5 x 0.1-1 cm, soft, separable and light in consistency, pore surface white to cream coloured or pale buff, pores small, 4-6 per mm, usually intermixed with some larger ones, tube layer white, up to 3 mm thick, context white, cottony to fibrous, soft, 1-3 mm thick.
Basidiospores 4-5 x 1.5-2 µm, lunate to allantoid.
Substrata. Usually on *Pinus*, more rarely on *Abies, Cupressus, Picea*, and *Taxus*.
Distribution. Circumglobal in conifer ecosystems of the Northern Hemisphere.
Remarks. The relatively short, lunate to allantoid spores and the soft fibrous basidiocarps distinguishes *S. lenis* from smooth specimens of *Antrodia xantha* which are chalkier and crumbly and usually more yellowish. Some young and faded specimens of *A. xantha* are difficult to distinguish, but the skeletal hyphae of *A. xantha* usually have a weak amyloid reaction in Melzer's reagent.

SISTOTREMA Fr,

Syst. Mycol. 1:246, 1821.
Basidiocarps resupinate, reflexed or in one species stipitate, arachnoid, pelliculose, or waxy; hyphal system monomitic; generative hyphae with clamps, often ampullate; basidia urniform, 6-8 sterigmata in most species; basidiospores small, smooth, hyaline, negative in Melzer's reagent. On dead hardwoods and conifers with a white rot. Cosmopolitan genus with numerous species.
Type species: *Sistotrema confluens* Pers.: Fr.
Remarks. *Sistotrema* is a large genus in Corticiaceae where most species have basidiocarps with a smooth to hydnoid hymenophore.

Sistotrema confluens Pers.: Fr,

Syst. Mycol. 1:426, 1821.
Basidiocarps annual, laterally to eccentrically stipitate, effused-reflexed or occasionally resupinate; pilei up to 2 cm in diam, spatulate to infundibuliform; pileus pale buff on dried specimens, finely tomentose to glabrous; hymenophore poroid to hydnoid, decurrent; stipe glabrous, pale buff, up to 1 cm long and 3 mm in diam.
Basidiospores 4-5.5 x 2-2.5 µm, short-cylindrical to oblong.
Substrata. Dead wood of hardwoods and conifers or in some cases terrestrial on buried wood or leaf litter.
Distribution. Circumglobal in in forest regions of the temperate zone.
Remarks. *Sistotrema confluens* has hydnoid pileate basidiocarps, an unusual character in the genus.

SKELETOCUTIS Kotl. & Pouzar,

Ceska Mykol. 12:103, 1958. -
Basidiocarps annual to perennial, resupinate to pileate, white, pinkish cream, to lilac, often slightly dis coloured when dry; pores usually small; many species with a dense cartilaginous zone above the tube layer; hyphal system di- to trimitic; generative hyphae with clamps, often encrusted, especially in the dissepiments; skeletal hyphae hyaline; cystidia absent, cystidioles present in most species; spores hyaline, cylindrical to elliptic, negative in Melzer's reagent. On dead conifers and hardwoods, sometimes on dead basidiocarps of other species, causing a white rot.
Type species: *Skeletocutis amorpha* (Fr.) Kotl. & Pouzar.
Taxonomic synonym. *Incrustoporia* Domaniski. Acta Soc. Bot. Poloniae 32:737, 1963.
Remarks. The important generic character is the incrustation of the hyphae, especially the generative ones.

Skeletocutis amorpha (Fr.) Kotl. & Pouzar,

Ceska Mykol. 12:103, 1958. - *Polyporus amorphus* Fr., Syst. Mycol. 1:364, 1821.
Basidiocarps annual, effused-reflexed to resupinate; pilei solitary or imbricate, dimidiate to elongated, often laterally fused, up to 2 x 4 x 0.3 cm, thin and coriaceous, upper surface whitish to grey or pale buff, tomentose to adpressed-hirsute, smooth to deeply sulcate; pore surface cartilaginous and dense, pinkish buff to reddish-orange, pores circular to angular, 6-8 per mm, with thin, entire dissepiments; context consisting of a soft, fibrous upper layer and a firm, cartilaginous lower layer, the whole up to 1 mm thick; tube layer concolorousand continuous with the lower layer of the context, up to 1 mm thick; sections pale yellowish or reddish in KOH; taste slightly bitter.
Basidiospores 3-4.5 x 1.3-1.8 µm, allantoid.
Substrata. Dead wood of gymnosperms.
Distribution. Circumglobal species in North temperate coniferous zone.
Remarks. The cartilaginous consistency, pinkish to orange pore surface and tube layer are distinctive characters. *S. carneogrisea* is similar but has a beige to grayish pore surface and more strongly curved, lunate spores.

SPONGIPELLIS Pat.,

Hym. Europ., p. 140, 1887.
Basidiocarps annual, pileate, broadly attached, dimidiate, sessile to effused-reflexed, rarely resupinate; pileus tomentose to smooth, white to ochraceous; hymenophore poroid to hydnoid; pores circular to sinuous; tubes concolorous with pore surface; context white to cream, mostly duplex, lower part fibrous and dense, upper part looser and more cottony; hyphal system monomitic; generative hyphae with clamps; cystidia or other sterile elements absent; spores elliptic to globose, smooth, hyaline, thick-walled, negative in Melzer's reagent,. On living and dead hardwoods, causing a white rot.
Type species: *Spongipellis spumea* (Fr.) Pat.
Taxonomic synonyms:
Fibropellis Vlasák & Spirin (*Polyporus delectans* Peck).
Irpiciporus Murrill (*Irpex mollis* Berk. & M. A. Curtis = *Hydnum pachydon* Pers.).
Remarks. The genus is close to *Tyromyces,* but is distinguished by the distinct duplex consistency, and especially the thick-walled, subglobose to elliptic spores.

Spongipellis spumea (Sow.: Fr.) Pat.,

Essai Tax. p. 84, 1900. - *Polyporus spumeus* Sow.: Fr., Syst. Mycol. 1:358, 1821.
Basidiocarps annual, pileate, sessile, applanate, broadly attached or dimidiate with a contracted base, small to large, up to 10 cm wide, 20 cm long and 2-6 cm thick at the base, fleshy and soft when fresh, hard and brittle when dry; pileus whitish to cream when fresh, pale straw coloured to ochraceous when dry, finely hirsute to tomentose, azonate; pore surface white to cream when fresh, straw coloured to ochraceous when dry, the pores circular, 1-2(-3) per mm, context white to pale cream, duplex, the lower denser, firm part up to 5 cm thick, upper part 3-10 mm thick, softer and looser; tube layer concolorous with pore surface, up to 15 mm thick.
Basidiospores 6-7 x 5-6 µm, broadly elliptic to subglobose.
Substrata. Living and dead hardwoods.
Distribution. Circumglobal in the North Temperate zone.
Remarks. *S. spumea* be confused with *S. delectans,* which, however, have lacerate and dentate dissepiments and often somewhat irregular pores, while those of the former are regular and the smooth pore surface.

STROMATOSCYPHA Donk,

Reinwardtia 1:218, 1951.
Basidiocarps resupinate, margin rhizomorphic; hymenium lining crowded to confluent papillae which open by an apical pore to form a poroid hymenophore; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae present; cystidia or other sterile elements absent; spores oblong to elliptic. On dead hardwoods and conifers, causing a white rot. Monotypic cosmopolitan genus.
Type species: *Polyporus fimbriatus* Pers.: Fr.
Remarks. The true relationship of this genus is unclear as its development of a hymenophore from crowded papillae opening up to pores is unique. The genus is included here since it is easily mistaken for a polypore and has repeatedly been described as a species of *Poria*, especially since it is dimitic with skeletal hyphae. An examination with a hand lens will easily reveal the strange pore development, where all stages from young papillae to fully open tubes can be found on the same basidiocarp.

Stromatoscypha fimbriata (Pers.: Fr.) Donk,

Reinwardtia 1:219, 1951. - *Porothelium fimbriatum* Pers.: Fr., Syst. Mycol. 1:506, 1821.
Basidiocarps annual, resupinate, becoming widely effused, soft, readily separable; margin conspicuously rhizomorphic, often up to 2 or 3 cm wide, white to cream- coloured; pore surface ivory or cinereous, the pores developing by the development of an apical pore in isolated papillae which later become crowded or confluent to form a typical tube layer, circular to angular, 3-5 per mm in mature specimens, subiculum white to cream coloured, soft-fibrous, azonate, up to 1 mm thick, tube layer ivory to pale tan, distinct from the subiculum, up to 0.5 mm thick; taste mild.
Hyphal system dimitic; generative hyphae with clamps, 2.5-3.5 µm in diam; skeletal hyphae thick-walled, 2-4 µm in diam.
Basidiospores 4.5-5 x 2-3 µm, short-cylindrical to elliptic.
Substrata. Dead conifers and hardwoods in numerous genera.
Distribution. Circumglobal species.
Remarks. The development of the tubes from papillae which rupture at the apex, is a unique feature of this species and readily separates it from other resupinate poroid fungi. The conspicuous rhizomorphs are also very characteristic.

THELEPORUS Fr.,

Kongl. Svenska Vetensk. Akad. Handl. 11:138, 1848.
Basidiocarps annual, resupinate, white to ochraceous, adnate, soft-fibrous to floccose; tubes developing from isolated shallow cupules or rupturing of papillae; pores circular to irregular, hymenium restricted to the basal portion of the tubes; hyphal system di-trimitic; generative hyphae with clamps; skeletal hyphae rarely branched or with arboriform terminal branching; cystidia absent; dendrohyphidia present or absent; basidiospores elliptic, hyaline, smooth, negative in Melzer's reagent. On dead hardwoods, causing a white rot.
Type species: *Theleporus cretaceus* Fr.
Remarks. The shallow cupulate tubes with hymenium restricted to the base, the di-trimitic hyphal system, and the clamped generative hyphae, are distinctive characters.

Theleporus ajovalliensis Gilb. & M. Blackwell,

Mycotaxon 15:249-253, 1982.
Basidiocarps annual, resupinate, originating as a loose, floccose, white mycelial primordium in which isolated circular cupules develop, these becoming deeper, more numerous, and crowded; basidiocarps eventually assuming a poroid aspect, mostly in small, scattered patches but some effused up to 3 cm in diam; pore surface white, the pores in mature specimens circular to angular, highly variable in size, mostly 2-3 per mm, but some up to 1 mm in diam; subiculum and tubes soft, easily sectioned, white.
Basidiospores 9-11.5 x 5-7 µm, elliptic.
Substrata. Known only on dead ocotillo (*Fouquieria splendens*).
Distribution. Known only from southern Arizona.
Remarks. Although mature specimens of *T. ajovalliensis* have the macroscopic aspect of a resupinate polypore, development of the tubes and the microscopic structure are typical of species of the genus *Theleporus*. It belongs in Corticiaceae as the hymenium is restricted to the basal portion of the tubes or cupules.

TINCTOPORELLUS Ryvarden,

Trans. Brit. Mycol. Soc. 73:18, 1979.
Basidiocarps resupinate; pore surface bluish grey to pink, hyphal system dimitic; generative hyphae with clamps; skeletal hyphae thick-walled, weakly dextrinoid in Melzer's reagent, spores elliptic to sub-globose, smooth, hyaline, negative in Melzer's reagent. On dead hardwoods, causing a white rot with reddish dis colouration. Monotypic genus.
Type species: *Tinctoporellus epimiltinus* (Berk. & Broome) Ryvarden.
Remarks. The isabelline to pale pink pore surface and the reddish zones in the substrate, are distinct characters for the genus.

Tinctoporellus epimiltinus (Berk. & Broome) Ryvarden,

Trans. Brit. Mycol. Soc. 73:18, 1979. - *Polyporus epimiltinus* Berk. & Broome, J. Linn. Soc., Bot. 14:54, 1873. - *Poria borbonica* Pat., J. Bot. 4:198, 1890.
Basidiocarps annual to persisting, resupinate, adnate, becoming widely effused, woody, up to 3 mm thick, distinctly delimited towards the wood with irregular red lines; pore surface purplish gray, glaucous to light beige or violaceous brown, the pores circular to angular, (5) 7-9 per mm, almost invisible to the naked eye, subiculum extremely thin to apparently absent with the tubes arising directly from the substratum; tube layer up to 3 mm thick, old tubes soften with white mycelium.
Basidiospores 4.5-5.5 x 2.5-3 µm, broadly elliptic to subglobose.
Substrata. On numerous tropical hard woods.
Distribution. Pantropical.
Remarks. This species is usually easy to identify because it is the only true polypore described in this book that reddens the substratum.

TRAMETES Fr.,

Fl. Scand., p.339. 1835.
Basidiocarps annual to perennial, pileate, sessile or effused-reflexed, pilei dimidiate to fan shaped, single or imbricate, flexible to rigid; pileus hispid to glabrous, often zonate; pore surface white to cream or cinereous; context white to isabelline, homogeneous or duplex, hyphal system trimitic; generative hyphae hyaline with clamps; skeletal hyphae straight, thick-walled to solid, hyaline; binding hyphae much branched, thick-walled to solid, hyaline; cystidia absent; spores cylindrical to elliptic, hyaline, smooth, thin-walled, negative in Melzer's reagent. On dead hardwoods, rarely conifers, causing a uniform white rot. Cosmopolitan genus with many common and widely distributed species.
Type species: *Trametes suaveolens* (Fr.) Fr.
Taxonomic synonyms with type species:
Lenzites Fr. 1835, *Daedalea betulina* Fr.
Pycnoporus P. Karst. 1881, *Polyporus cinnabarinus* Fr.
Coriolus Quél.1886, *Polyporus hirsuta* Wulf.: Fr.
Funalia Pat. 1900, *Polyporus monsveneris* Jungh. (= *Polyporus leoninus* Kl.).
Coriolopsis Murrill 1905, *Polyporus occidentalis* Kl. (= *Polyporus polyzona* Pers.).
Artolenzites Falck 1909, *Deadalea repanda* Pers. (= *Lenzites elegans* Fr.).
Leiotrametes Welti & Courtec. 2012, *Polyporus lactinea* Berk.
Remarks. The generic concept used here is a wide one, based on pileate basidiocarps, a trimitic hyphal system and smooth, thin-walled spores being negative in Melzers reagent. *Hexagonia* is mainly separated by having a dark brown pore surface, tubes and context and generally larger spores.

Trametes suaveolens L.:Fr.,

Epicr. Syst. Mycol. p. 491, 1838. - *Boletus suaveolens* L., Sp. Plant., p. 1177, 1753.
Basidiocarps annual, sessile, with a pleasant anise odor when fresh, usually solitary, dimidiate or elongate, up to 14 cm wide and long; pileus cream coloured to buff, finely tomentose to glabrous, azonate, smooth, pore surface cream coloured to pale buff, pores circular to angular, 2-3 per mm, context white to cream coloured, soft-corky, zonate, up to 3.5 mm thick; tube layer concolorous with or slightly darker than the context, up to 1 cm thick.
Basidiospores 9-12 x 4-4.5 µm, cylindrical.
Substrata. Most common on *Salix* and *Populus*, but also reported on *Betula* and *Abies*.
Distribution. Cosmopolitan temperate species.
Remarks. The pleasant anise odor of fresh basidiocarps is very characteristic for this species. The relatively large spores also provide a reliable character for identification.

TRECHISPORA P. Karst,

Taxon 15: 318, 1966.

Basidiocarps annual, resupinate, mostly soft and fragile, loosely attached; hymenophore smooth to hydnoid or poroid; hyphal system monomitic in most species; generative hyphae with clamps, commonly ampullate at some septa; cystidia present or absent; basidiospores globose to short-cylindrical, smooth or ornamented with spines or warts, negative in Melzer's reagent. On dead hardwoods and conifers with a white rot.
Type species: *Trechispora onusta* P. Karst.
Remarks. *Trechispora* is a large genus in Corticiaceae where most species have a smooth to hydnoid hymenophore.

Trechispora mollusca (Pers.: Fr.) Liberta,

Can. J. Bot. 51:1878, 1973. - *Polyporus molluscus* Pers.: Fr., Syst. Mycol. 1:384, 1821. - *Polyporus candidissimus* Schw. Trans. Amer. Philos. Soc. New Series 2:159, 1832.
Basidiocarp annual, resupinate, effused up to 6 cm, very soft and fragile, readily separable; margin white, often very thin, arachnoid, rhizomorphic; pore surface white to cream coloured, the pores angular, 2-4 per mm, with thin, pubescent dissepiments that become lacerate with age; context white, azonate, soft, less than 0.5 mm thick; tube layer continuous and concolorous with the context, soft and fragile, up to 2 mm thick; taste mild.

Basidiospores 3.5-4.5 x 2.5-3.5 µm, echinulate, ovoid to subglobose.
Substrata. Dead wood of hardwoods and conifers in numerous genera, occasionally on dead basidiocarps of poroid genera such as *Fomes fomentarius* and *Phellinus* spp.
Distribution. Circumglobal in forest regions.
Remarks. *Trechispora mollusca* is recognized mainly by its small spores

TRICHAPTUM Murrill,

Bull. Torrey Bot. Club 31:608, 1904.
Basidiocarps annual, resupinate, effused-reflexed or pileate; pileus hispid to adpressed tomentose, grey or dirty white to blackish; hymenophore irpicoid, lamellate or poroid, mostly pale brownish to purplish when actively growing; tube layer purplish brown; context distinctly duplex, lower part dense and dark, upper part paler and soft-fibrous; hyphal system di- to trimitic; generative hyphae with clamps; skeletal hyphae dominating and conspicuous; binding hyphae rarely present, hymenial cystidia abundant, thin- to thick-walled, subulate to clavate, smooth or apically incrusted; spores cylindrical, often slightly curved, smooth, hyaline, thin-walled, negative in Melzer's reagent. On dead conifers and hardwoods, causing a white rot. Cosmopolitan genus.
Type species: *Polyporus trichomallus* Berk. & Mont. (a synonym of *Trichaptum perrottetii* (Lév.) Ryvarden, based on the same type specimen).
Synonym: *Hirschioporus* Donk (*Polyporus abietinus* Fr.).
Remarks. The genus is characterized by the purplish to violet pore surface in actively growing specimens, fading to buff or pale brown in age and on drying. Microscopically the dimitic hyphal system, cylindrical spores and cystidia are diagnostic.

Trichaptum perrottetii (Lév.) Ryvarden,

Norw. J. Bot. 19:237, 1972. - *Polyporus perrottetii* Lév., Ann. Sci. Nat. Bot. Ser. 3, 2:167-221, 1844. - *Polyporus trichomallus* Berk. & Mont., Ann. Sci. Nat. Bot. Ser. 3, 11:238, 1849.
Basidiocarps annual, sessile, applanate to ungulate, 5-15 cm long, 3-7 cm wide and up to 8 mm thick. dimidiate to elongated, shelf-like, mostly broadly-attached, tough and flexible; pileus strigose or hirsute with a dense layer of forked hairs, dark brown, becoming darker towards the base and more grayish towards the margin, up to 10 mm thick at the base; pore surface at first purplish to violaceous, on drying fading to snuff brown, pores angular to circular, 2-3 per mm, pores sometimes coalescing and in parts sinuous to daedaleoid, in the latter case up to 2 mm wide and several mm long; context thin, 0.1-0.4 mm, dark ochraceous to brown; tube layer deep brown, 2-5 mm thick.
Cystidia 18-30 x 5-7 µm abundant, narrowly fusoid to ventricose, mostly apically incrusted.
Basidiospores 5-6 x 2.5-3(-3.5) µm, short-cylindrical to oblong-elliptic.
Substrata. Dead hardwoods of many genera.
Distribution. Neotropical species from Florida and south wards to Argentina.
Remarks. This species is easy to recognize in the field due to the dense dark mat of stiff hairs on the pileus and the violet to brown pore surface. *T. byssogenus* has a grey pileus with a thinner tomentum and is normally effused-reflexed. Microscopically the two species differ in the more narrowly cylindrical spores and non-ventricose cystidia of *T. byssogenum*.

TYROMYCES P. Karsten,

Rev. Mycol. 3, 9:17, 1881.
Basidiocarps annual, pileate to resupinate, short-lived and sappy when fresh, usually rigid and fragile when dry, often shrinking greatly on drying; taste mild to bitter; pileus mostly white to cream, drying darker; pore surface white to cream, drying darker; hyphal system monomitic or dimitic; generative hyphae with clamps; gloeopleurous hyphae present in some species; cystidia absent, but cystidioles sometimes present; spores hyaline, thin-walled, allantoid to ovoid, negative in Melzer's reagent, on hardwoods or conifers, causing a white rot. Cosmopolitan genus.
Type species: *Tyromyces chioneus* (Fr.) P. Karst.
Remarks. The genus is restricted to species with generally white, pileate, and short-lived basidiocarps with clamped generative hyphae and a white rot. Some species have a restricted number of skeletal hyphae in the trama.

Tyromyces chioneus (Fr.) P. Karsten,

Rev. Mycol. 3, 9:17, 1881. - *Polyporus chioneus* Fr., Syst. Mycol. 1:359, 1821. - *Polyporus albellus* Peck, New York State Mus. Ann. Rep. 30: 45, 1876.
Basidiocarps annual, pileate, usually sessile, applanate to slightly convex, rarely effused-reflexed, broadly attached to dimidiate, more rarely spatulate, single or a few pilei together, up to 8 cm broad, 10 cm wide, 0.5-2 cm thick, soft and fleshy when fresh, drying rather hard and brittle; pileus azonate, at first whitish, finely tomentose, soon becoming glabrous as the hyphae agglutinate, then finely scrupose and warted, cream, light yellowish, or pale grayish to straw- coloured, as the agglutination proceeds there develops a smooth pellicle which on drying becomes radially to irregularly wrinkled, in age dirty yellowish to pale sordid gray; pore surface white to pale cream, slightly shiny, the pores circular to angular, 3-4(-5) per mm, context white to cream, dense in dry condition, usually distinctly thicker than the tube layer, up to 1.5-2 cm thick at the base; tube layer concolorous with pore surface, up to 8 mm deep; taste mild; with a slight aromatic odor when fresh.
Hyphal system dimitic, skeletal hyphae few, 2-4 µm wide, hyaline and thick walled.
Basidiospores 4-5 x 1.5-2 µm, cylindrical and often slightly curved.
Substrata. Numerous hardwoods, especially common on *Betula* spp.

Distribution. Rather common throughout the boreal and temperate hardwood forests.
Remarks. The slightly applanate, short-lived basidiocarps, frequently with a thin yellowish pellicle, are distinctive macroscopic characters for field determination. Microscopically the dimitic trama, and the slightly wider spores will separate it from the often confusingly similar brown rot fungus *Oligoporus tephroleucus*.

WOLFIPORIA Ryvarden & Gilb.,

Mycotaxon 19:141, 1984.
Basidiocarps annual, resupinate; pore surface white to ochraceous, the pores circular to angular, 1-5 per mm; subiculum white to pale buff, firm-fibrous; tube layer con colourous, up to 2 mm thick; hyphal system dimitic; generative hyphae thin- to thick-walled, simple-septate, some inflated up to 20 µm; skeletal hyphae thick-walled, fusoid cystidioles present or absent; basidiospores elliptic to cylindrical, hyaline, negative in Melzer's reagent. On living or dead hardwoods and conifers causing a brown cubical rot. North American genus with two species.
Type species: *Wolfiporia cocos* (Schwein.) Ryvarden & Gilb.
Remarks; *Wolfiporia* is a distinctive genus characterized by simple septate hyphae, a dimitic hyphal system with greatly inflated hyphae and a brown cubical rot.

Wolfiporia cocos Ryvarden & Gilb.,

Mycotaxon 19:141, 1984. - *Sclerotium cocos* Schwein., Naturf. Ges. Leipzig Schrift. 1:56, 1822.
Basidiocarps annual, at first in small rounded patches, these becoming confluent and widely effused; pore surface light ochraceous buff to pinkish buff, pores angular, variable, 1-2 per mm, dissepiments thin, entire, minutely fimbriate; margin abrupt, fertile or sterile, often wide, tomentose, cartridge buff; subiculum cream to pale pinkish buff, azonate, fibrous to corky, 1-2 mm thick; tube layer pale buff, continuous with subiculum, often very shallow, up to 2 mm thick.
Basidiospores 8-11 x 3-4 µm, cylindrical.
Substrata. Living and dead conifers and hardwoods, especially oaks. In the Lake States and Northeast most common on *Populus*. In western North America mainly on conifers.
Distribution. Throughout the eastern U.S. and into southeastern Canada, also in the Pacific Northwest, California, and the Northern Rocky Mountain region into western Canada.
Remarks. *Wolfiporia cocos* forms large hypogeous sclerotia known as tuckahoes, apparently from mycelium in roots.

WRIGHTOPORIA Pouzar,

Ceská Mykol. 20:173, 1966.
Basidiocarps resupinate to pileate, annual to perennial; pore surface cream, ochraceous to fulvous, pores circular to angular or irregular, 2-6 per mm, dissepiments thin to rather thick; hyphal system dimitic; generative hyphae with clamps; skeletal hyphae dominating, thick-walled, dextrinoid in some species, cystidia absent; spores broadly elliptic, less than 6 µm in largest dimension, smooth to ornamented, distinctly amyloid in Melzer's reagent. On dead hardwoods and conifers, associated with brown or white rots.
Type species: *Poria lenta* (Overh. & J. Lowe) Pouzar.
Remarks. The genus is unique in its combination of amyloid spores and dextrinoid skeletal hyphae. The genus includes both white and brown rot fungi and is not monophyletic.

Wrightoporia lenta (Overh. & Lowe) Pouzar,

Ceská Mycol. 20:173, 1966. - *Poria lenta* Overh. & Lowe, Mycologia 38: 210, 1946.
Basidiocarp resupinate, effused, up to 3 mm thick, separable to slightly adnate, tough when dry; pore surface white to cream, margin white, pores round to angular, often slightly sinuous on oblique substrates, on average 2-3 mm, thin-walled, tubes concolorous with pore surface, up to 2 mm deep; context thin and white.
Hyphal system dimitic; generative hyphae with clamps, 1-3 µm wide; skeletal hyphae thick-walled to solid, 1.5-3 µm wide, strongly dextrinoid; gloeopleurous hyphae rare and scattered, irregular and often with blunt side-branches, 3-6 µm, in parts up to 15 µm wide.
Basidiospores 5-6 x 4.5-5.5 µm, globose, finely asperulate, amyloid.
Substrata. On hardwood and palms in subtropical and tropical areas.
Distribution. Cosmopolitan in the tropical and subtropical zones.
Remarks. The species is recognized by its large spores.

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