

Wood-inhabiting fungi in southern China. 4. Polypores from Hainan Province

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Extensive surveys on wood-rotting fungi were recently carried out in Hainan Province, southern China. Around 2500 specimens of poroid wood-inhabiting fungi were collected during ten field trips, and 235 polypores were identified. Four species, *Grammothelopsis asiatica* Y.C. Dai & B.K. Cui, *Inonotus latemarginatus* Y.C. Dai, *Pereniporia hattorii* Y.C. Dai & B.K. Cui and *Wrightoporia austrosinensis* Y.C. Dai, are described and illustrated as new. Of the 235 species, 99 were found from the province for the first time.

Introduction

Hainan Province, located between 18°10'–20°10'N and 108°37'–111°05'E, is an island in southern China. It has both lowland area in the northeast and mountainous terrain in the central and southwestern regions, and the highest altitude is 1867 m a.s.l. in the central area. The annual mean temperature is 19.7 °C, and the annual precipitation is 2650 mm. Most parts of the island have a subtropical to tropical vegetation. The plant flora is well known, and 3324 seed plants, belonging to 1237 genera and 206 families, are reported (Wu 1994). However, the fungal flora is poorly known; 305 agarics were recorded previously from the province (Bi *et al.* 1997), and 136 polypores were found mostly during more or less recent inventories (Zhao 1989, Zhao &

Zhang 1992, Dai *et al.* 2004, 2009a, 2009b, Yuan & Dai 2008, Xiong & Dai 2008, Yu & Dai 2009, Zhou *et al.* 2009, Cui *et al.* 2010, 2011a, 2011b, Dai 2010). Considering the abundance of woody species in the study area, the polypore flora is far from completely known.

Several mycological investigations dealing with many new species from Hainan were published recently (Zhang *et al.* 2008a, 2008b, 2009, Ma *et al.* 2008a, 2008b). The present paper belongs to a series of studies devoted to the fungal diversity of the Hainan Province. By support from the National Natural Science Foundation of China and the Ministry Science and Technology of China, ten field investigations on wood-decaying fungi were made in the Hainan Province during 2002–2009, and around 2500 specimens of poroid wood-inhabiting fungi

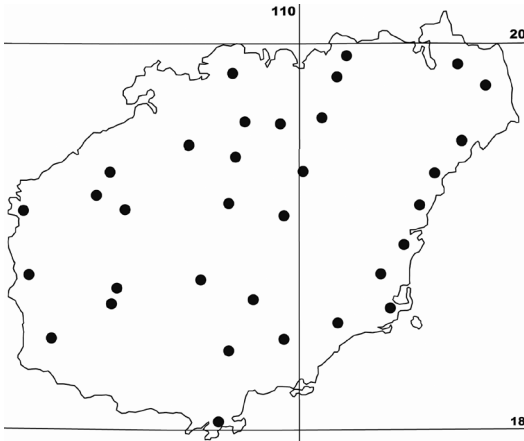


Fig. 1. Locations (black dots) of the investigated areas in Hainan Province.

were collected from 25 localities (Fig. 1). 235 polypores were identified after laboratory analysis, including four new species, and the present paper is a summary of these inventories.

Material and methods

The present study is based mostly on materials collected by the authors, and the studied specimens are deposited in the herbaria of the Beijing Forestry University (BJFC) and the Institute of Applied Ecology of the Chinese Academy of Sciences (IFP). A few specimens previously collected from the province and deposited in the herbarium of the Institute of Microbiology, the Chinese Academy of Sciences (HMAS), were also studied. All the materials were examined under the microscope Nikon 80i. The drawings were made with the aid of a drawing tube. Microscopic features, measurements, and drawings were made from slide preparations stained with Cotton Blue and Melzer's reagent. Spores were measured from sections cut from the tubes; in presenting spore size data 5% of the measurements were excluded from each end of the range, and these are shown in parentheses. The abbreviations include IKI (Melzer's reagent, with IKI- = inamyloid), KOH (5% potassium hydroxide), and CB (Cotton Blue; CB+ = cyanophilous; CB(+) = weakly cyanophilous; CB- = acyanophilous). Additional abbreviations include *L* (mean spore length; arithmetic aver-

age of all spores), *W* (mean spore width; arithmetic average of all spores), *Q* (variation in the *L/W* ratios between the specimens studied), and *n* (number of spores measured from a given number of specimens). The special color terms follow Petersen (1996).

New taxa

Grammothelopsis asiatica Y.C. Dai & B.K. Cui, *sp. nova* (Fig. 2)

Mycobank no.: MB 518961.

Carpophorum, resupinatum. Facies pororum cremea; pori angulati vel rotundi, 3–4 per mm. Systema hypharum dimiticum, hyphae generativae fibulatae, hyphae skeletales IKI–, hyphae skeletales subiculi 2–4.5 μm in diam. Sporae ellipsoideae, IKI–, CB– vel CB(+), 10.5–13 × 5.4–6 μm.

TYPE: China. Yunnan Province, Mengla County, Xishuangbanna Botanical Garden, on fallen bamboo, 31.X.2009 Cui 8336 (holotype BJFC; isotype IFP).

ETYMOLOGY: *asiatica* (Lat.), referring to Asia.

FRUITBODY. Basidiocarps annual, resupinate, adnate, corky, without odour or taste when fresh, becoming corky upon drying, up to 9 cm long, 1 cm wide, and 0.6 mm thick at centre. Sterile margin narrow, cream, less than 1 mm wide. Pore surface cream; pores round to angular, 3–4 per mm; dissepiments thin, entire to slightly lacerate. Subiculum very thin, cream, corky, azonate, less than 0.1 mm thick. Tubes concolorous with the pore surface, corky, less than 0.5 mm long.

HYPHAL STRUCTURE. Hyphal system dimitic; generative hyphae with clamp connections; skeletal hyphae IKI–, CB– to CB(+), tissue unchanged in KOH.

SUBICULUM. Generative hyphae infrequent, hyaline, thin-walled, rarely branched, 1.6–3.2 μm in diam; skeletal hyphae dominant, hyaline, thick-walled with a narrow lumen, unbranched, interwoven, 2–4.5 μm in diam.

TUBES. Generative hyphae infrequent, hyaline, thin-walled, rarely branched, 1.4–3 μm in diam; skeletal hyphae dominant, hyaline, thick-

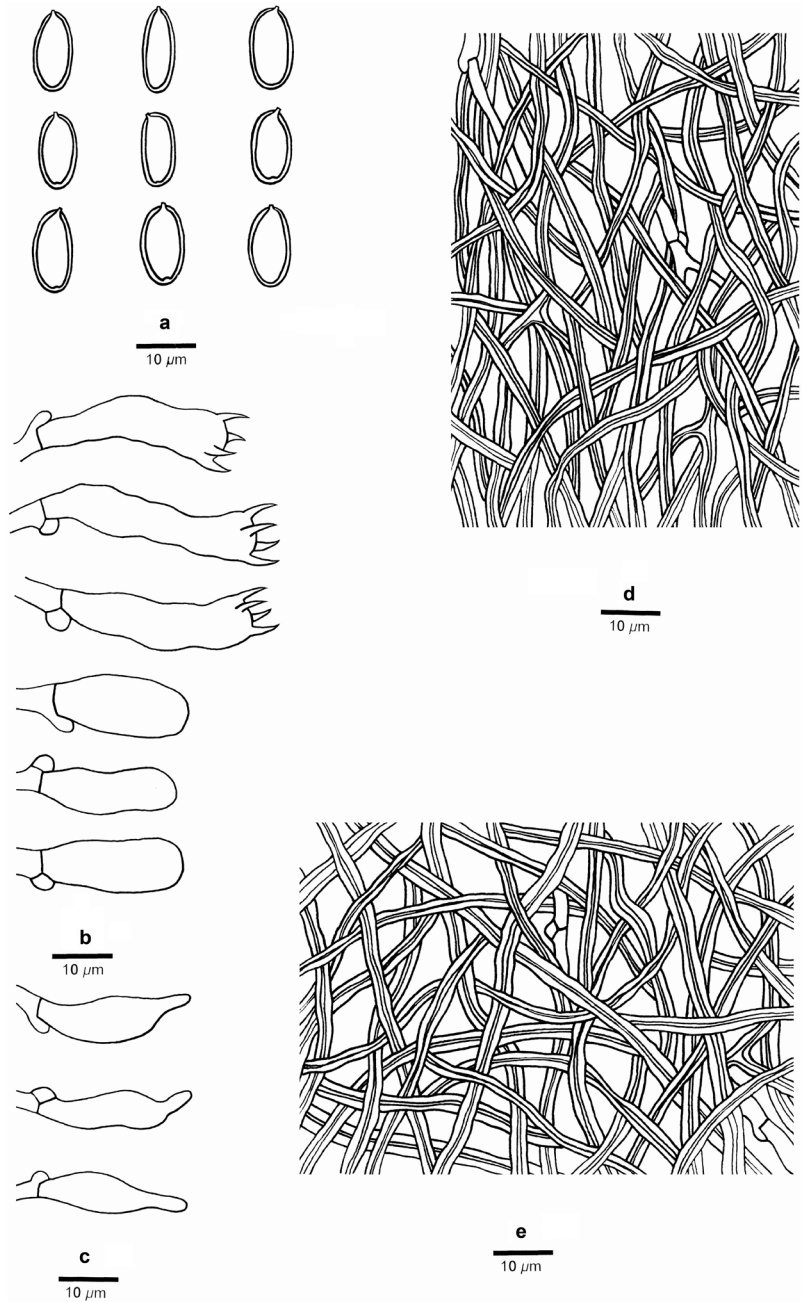


Fig. 2. Microscopic structures of *Grammothelopsis asiatica* (drawn from the holotype). — **a**: Basidiospores. — **b**: Basidia and basidioles. — **c**: cystidioles. — **d**: Hyphae from trama. — **e**: Hyphae from subiculum.

walled with a narrow lumen to subsolid, rarely branched, interwoven, 1.8–4.2 μm in diam. Cystidia absent, cystidioles present, fusoid to subulate, 18–25 \times 6–9 μm ; basidia clavate, with four sterigmata and a basal clamp connection at the base, 22–34 \times 6–10 μm ; basidioles in shape similar to basidia, but distinctly smaller.

SPORES. Basidiospores ellipsoid to oblong ellipsoid, hyaline, thick-walled, smooth, IKI–, CB(+), (9–)10.5–13(–15) \times (5–)5.4–6(–6.7) μm , $L = 12.14 \mu\text{m}$, $W = 5.72 \mu\text{m}$, $Q = 2.1–2.2$ ($n = 60/2$).

ADDITIONAL SPECIMENS EXAMINED (paratypes). **China.**

Hainan Province, Lingshui County, Diaoluoshan Forest Park, on fallen bamboo, 30.V.2008 *Dai* 9881 (BJFC & IFP). Changjiang County, Bawangling Nat. Res., on fallen bamboo, 9.XI.2009 *Dai* 11588 (BJFC, IFP & H).

A total of five species in *Grammothelopsis* have been reported, four of them, *G. bambusicola*, *G. incrustata*, *G. neotropica* and *G. puiggarii*, were found in Central and South America (David & Rajchenberg 1985, Rajchenberg & Wright 1987, Ryvarden & de Meijer 2002, Robledo & Ryvarden 2007), and *G. macrospora* was recorded in tropical Africa (Ryvarden & Johansen 1980). *Grammothelopsis asiatica* represents the first record of the genus in Asia.

Grammothelopsis asiatica is similar to *G. bambusicola*, which also was found on bamboo (Ryvarden & de Meijer 2002). The type material of *G. bambusicola* was studied, its skeletal hyphae and spores are strongly dextrinoid, and it has dendrohyphidia at dissepiment edge. In addition, its basidiospores are broadly ellipsoid, strongly cyanophilous, (11–)11–13.5(–15) × (7–)7.8–9(–10) μm, *L* = 12.56 μm, *W* = 8.32 μm, *Q* = 1.51 (*n* = 30/1). In contrast, *G. asiatica* has indextrinoid skeletal and spores, dendrohyphidia are absent at dissepiment edges, and the spores are ellipsoid to oblong ellipsoid, weakly cyanophilous.

Grammothelopsis incrustata and *G. neotropica* have indextrinoid basidiospores, but both have distinctly larger basidiospores (16–22 × 6–8 μm and 18–20 × 7–8 μm, Robledo & Ryvarden 2007). *Grammothelopsis macrospora* differs from *G. asiatica* by having large pores (1–2 per mm), abundant dendrohyphidia, broadly ellipsoid and strongly dextrinoid basidiospores (15–20 × 7.5–11 μm; Robledo & Ryvarden 2007). *Grammothelopsis puiggarii* is distinguished from *G. asiatica* by larger pores (1–2 per mm), broadly ellipsoid and strongly dextrinoid basidiospores (17–20 × 10–12 μm; Robledo & Ryvarden 2007).

OTHER SPECIMEN STUDIED. *Grammothelopsis bambusicola*. **Brazil**. Parana State, Colombo, on rotten bamboo (O 70521).

Inonotus latemarginatus Y.C. Dai, sp. nova (Fig. 3)

Mycobank no.: MB 518962.

Carpophorum annuum, *applanatum*, *solitarium*. *Facies pororum electrinum vel luteolum*; *pori rotundi*, 4–6 per mm. *Systema hypharum monomiticum*, *hyphae septatae sine fibulis*, *hyphae contexti* 4–8 μm in diam. *Hyphae setoidae crassitunicatae, acutae*, 8–15 μm in diam. *Sporae subglobosae*, IKI–, CB(+), 7.1–8.7 × 6.2–7.8 μm.

TYPE: China. Hainan Province, Baoting County, Qixianling National Park, on rotten angiosperm wood, 28.V.2008 *Dai* 9758 (IFP).

ETYMOLOGY: *latemarginatus* (Lat.), referring to the wide sterile margin.

FRUITBODY. Basidiocarps annual, pileate, single, soft corky and without odour or taste when fresh, becoming corky to brittle and very light when dry. Pileus applanate, semicircular, projecting up to 8 cm long, 10 cm wide, and 1 cm thick at base; margin obtuse. Pileal surface matted-tomentose to velutinate, indistinctly concentrically zonate, fuscous to brick from base toward to margin when fresh, becoming fuscous and shrunken when dry; margin curry-yellow when fresh, becoming date-brown when dry. Pore surface curry-yellow to buff-yellowish from base towards margin when fresh, becoming snuff-brown when bruised, cinnamon-buff when dry, sterile margin distinct, up to 5 mm wide; pores round, 4–6 per mm; dissepiments thin, matted, slightly lacerate. Context soft and spongy when fresh, becoming brittle to fibrous, shrunken and yellowish brown when dry, up to 5 mm thick, upper layer with a distinct fuscous crust; tube layer concolorous to context, tubes hard corky to brittle, up to 5 mm long.

HYPHAL STRUCTURE. Hyphal system monomitic; all septa without clamp connections, IKI–, CB–; tissue darkening but otherwise unchanged in KOH.

CONTEXT. Generative hyphae hyaline to yellowish brown, thin- to slightly thick-walled with a wide lumen, more or less straight, occasionally branched, 4–8 μm in diam, hyphae at upper crust reddish brown, thick-walled, strongly agglutinated, 4–6 μm in diam. Hyphoid setae absent.

TUBES. Generative hyphae hyaline to yellowish, thin- to fairly thick-walled with a wide lumen, straight, rarely branched, more or less subparallel along the tubes, 3–5 μm in diam.

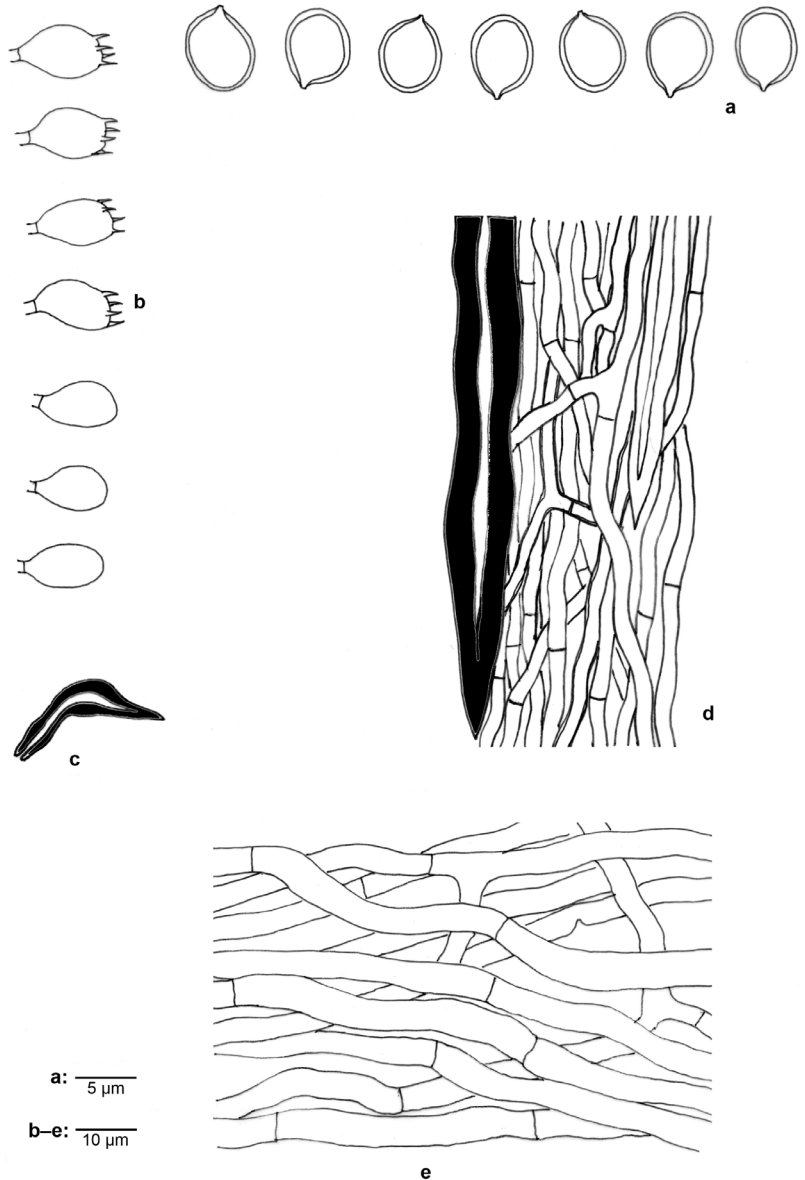


Fig. 3. Microscopic structures of *Inonotus latemarginatus* (drawn from the holotype). — **a:** Basidiospores. — **b:** Basidia and basidioles. — **c:** Hymenial setae. — **d:** Hyphae from trama. — **e:** Hyphae from context.

Hyphoid setae occasionally present, conspicuous, thick-walled with a wide to narrow lumen, nonseptate, tapering to a point, more or less parallel along the tubes, up to 200 μm long, 8–15 μm in diam in widest part ($n = 10/1$). Hymenial setae very rarely present, ventricose to hooked, 16–18 \times 6–9 μm . Cystidia and cystidiolae absent; basidia barrel-shaped, 10–12 \times 7–9 μm , and basidioles similar to basidia.

Spores. Basidiospores subglobose, pale yellowish, fairly thick-walled, smooth, IKI–, CB(+),

(7–)7.1–8.7(–9.3) \times (5.9–)6.2–7.8(–8.8) μm , $L = 7.85 \mu\text{m}$, $W = 7.05 \mu\text{m}$, $Q = 1.11$ ($n = 32/1$).

Inonotus latemarginatus is similar to *I. quercustris*, which was originally described from Louisiana (Blackwell & Gilbertson 1985), and later found in Argentina (Urcelay & Rajchenberg 1999). However, *I. quercustris* differs from *I. latemarginatus* by unguulate basidiocarps (20 \times 16 \times 10 cm), larger pores (3–5 per mm in USA, 2 per mm in Argentina), abundant hyphoid setae in trama, distinctly longer basidia (18–23 \times

9–11 μm), and especially ellipsoid basidiospores (9–10 \times 6–8 μm in USA, 8–10 \times 6–7 μm in Argentina).

Inonotus hemmesii, *I. ochroporus* and *I. rodwayi* are pileate species with broadly ellipsoid to subglobose basidiospores and presence of hyphoid setae in tube trama, so they may be confused with *I. latemarginatus*. However, *I. hemmesii* has unguulate basidiocarps (30 \times 20 \times 15 cm), its hyphoid setae are narrower (7–10 μm wide), and its basidiospores are ellipsoid to ovoid (7–9 \times 5.5–7 μm ; Gilbertson & Ryvarden 2002). *Inonotus ochroporus* has unguulate basidiocarps (40 \times 30 \times 30 cm) with duplex context, and its basidiospores are smaller (5.8–7 \times 4.9–6.2 μm ; Cui et al. 2007). *Inonotus rodwayi* has larger pores (2–4 per mm), its basidiospores are ellipsoid and narrower (7–8.5 \times 5.2–6.5 μm ; Dai & Wu 2002), and its hyphoid setae project into tubes.

Perenniporia hattorii Y.C. Dai & B.K. Cui,
sp. nova (Fig. 4)

Mycobank no.: MB 518963.

Carpophorum annuum, *resupinatum* vel *effuso-reflexum*. *Facies pororum cremea vel bubalina*; *pori rotundi vel angulati*, 3–5 per mm. *Systema hypharum dimiticum*, *hyphae generatoriae fibulatae*, *hyphae skeletales subiculi* 2.5–4.8 μm in diam. *Sporae hyalinae*, *ellipsoideae vel truncatae*, *amyloideae*, CB+, 9.8–12.7 \times 5.8–7.2 μm .

TYPE: China. Hainan Province, Ledong County, Jianfengling Nature Reserve, on fallen angiosperm branch, 3.IX.2008 Dai 10285 (holotype BJFC; isotype IFP).

ETYMOLOGY: *Hattorii* (Lat.), in honor of the Japanese mycologist Dr. Tsutomu Hattori.

FRUITBODY. Basidiocarps annual, resupinate to effused-reflexed, adnate, soft corky to corky, without odour or taste when fresh, becoming corky to fragile upon drying, up to 15 cm long, 4 cm wide, and 1.2 mm thick at centre. Sterile margin cream to cream buff, up to 1 mm wide. Pore surface cream to buff when fresh, becoming cinnamon-buff when bruised, pale yellowish brown upon drying; pores round to angular, 3–5 per mm; dissepiments thin, entire. Subiculum thin, cream to buff, corky, azonate, up to 0.2 mm

thick. Tubes concolorous with the pore surface, corky to fragile, up to 1 mm long.

HYPHAL STRUCTURE. Hyphal system dimitic; generative hyphae with clamp connections; skeletal hyphae weakly amyloid, CB+, tissue unchanged in KOH.

SUBICULUM. Generative hyphae infrequent, hyaline, thin-walled, rarely branched, 1.5–3.4 μm in diam; skeletal hyphae dominant, hyaline, thick-walled with a narrow lumen to subsolid, occasionally branched, interwoven, 2.5–4.8 μm in diam.

TUBES. Generative hyphae infrequent, hyaline, thin-walled, rarely branched, 1.4–3.2 μm in diam; skeletal hyphae dominant, hyaline, thick-walled with a narrow lumen to subsolid, occasionally branched, interwoven, 2.2–4.5 μm in diam. Cystidia absent; fusoid cystidioles present, 18–25 \times 6–9 μm ; basidia barrel-shaped, with four sterigmata and a basal clamp connection at the base, 20–32 \times 10–15 μm ; basidioles pyriform, distinctly smaller than basidia.

SPORES. Basidiospores ellipsoid, truncate, hyaline, thick-walled, smooth, weakly amyloid, CB+, (9–)9.8–12.7(–14) \times (4.5–)5.8–7.2(–8) μm , $L = 11.3 \mu\text{m}$, $W = 6.48 \mu\text{m}$, $Q = 1.74–1.75$ ($n = 90/3$).

ADDITIONAL SPECIMENS EXAMINED (paratypes). **China.** Hainan Province, Ledong County, Jianfengling Nature Reserve, on fallen angiosperm trunk, 4.IX.2008 Dai 10315 & 10318 (BJFC & IFP).

Perenniporia hattorii is characterized by an annual growth habit, amyloid and cyanophilous skeletal hyphae, ellipsoid, truncate and amyloid basidiospores.

Perenniporia narymica is a common species in the northern hemisphere (Gilbertson & Ryvarden 1987, Ryvarden & Gilbertson 1994, Núñez & Ryvarden 2001). It also has an annual growth habit, cream to pale yellowish pores, amyloid skeletal hyphae, so it may be confused with *P. hattorii*. However, *P. narymica* has acyanophilous skeletal hyphae, smaller and non truncate, inamyloid basidiospores (4.3–5.5 \times 3–3.6 μm ; Dai et al. 2002), and the hyphae dissolve in KOH.

Perenniporia amyloextrinoidea resembles *P. hattorii* by the resupinate basidiocarps, cream to buff pore surface with pores 3–5 per mm, amyloid skeletal hyphae. However, its basid-

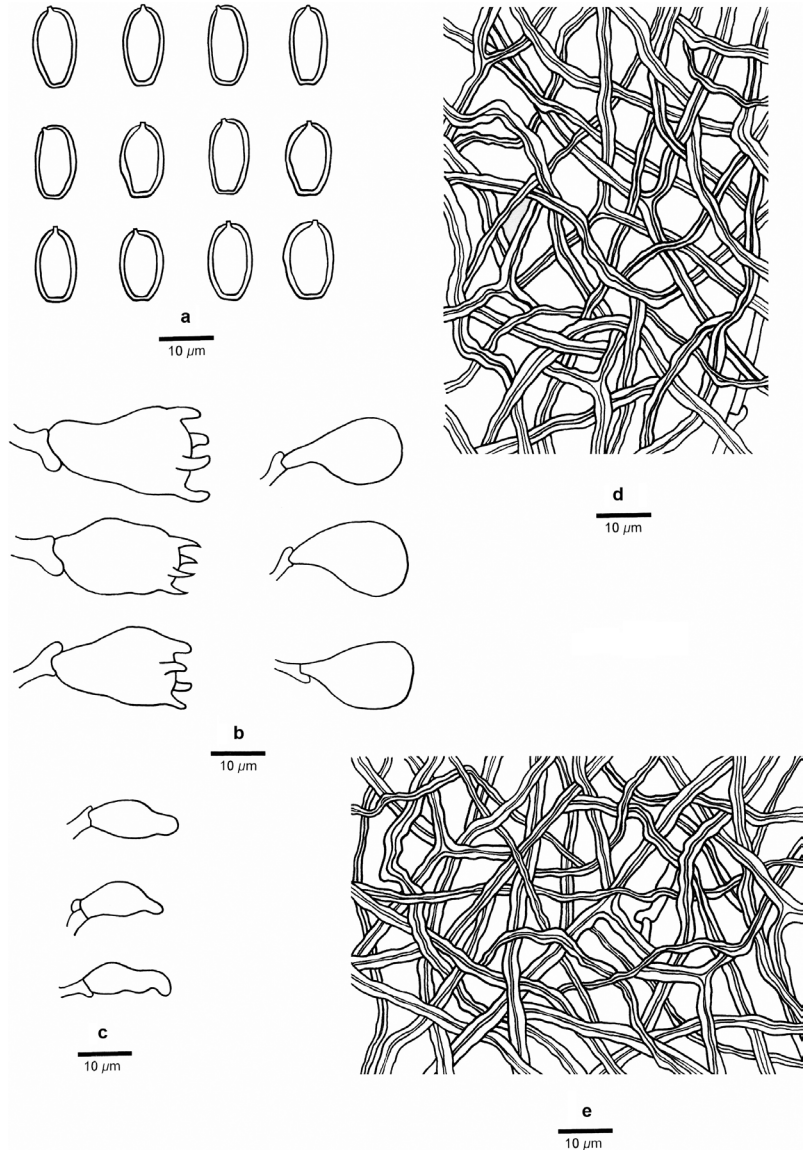


Fig. 4. Microscopic structures of *Perenniporia hattonii* (drawn from the holotype). — **a:** Basidiospores. — **b:** Basidia and basidioles. — **c:** Cystidioles. — **d:** Hyphae from trama. — **e:** Hyphae from context.

iospores are dextrinoid and distinctly smaller ($4.5\text{--}5.5 \times 3\text{--}3.5 \mu\text{m}$; Gilbertson & Ryvarden 1987).

Wrightoporia austrosinensis Y.C. Dai, *sp. nova* (Fig. 5)

Mycobank no.: MB 518964.

Carpophorum, resupinatum, contextum cremeum. Facies pororum alba vel cremea; pori

angulati vel rotundi, 1–3 per mm. Systema hypharum dimiticum, hyphae generatoriae fibulatae, hyphae skeletales non dextrinoideae, hyphae skeletales subiculi 1.7–2 μm in diam. Cystidia hymenii abundantia. Sporae ellipsoideae, hyalinae, asperae, amyloideae, $3\text{--}3.2 \times 2\text{--}2.4 \mu\text{m}$.

TYPE: China. Hainan Prov., Changjiang County, Bawangling Nat. Res., on rotten wood of *Pinus*, 8.XI.2009 Dai 11579 (holotype IFP; isotype BJFC).

ETYMOLOGY: *austrosinensis* (Lat.), referring to southern China.

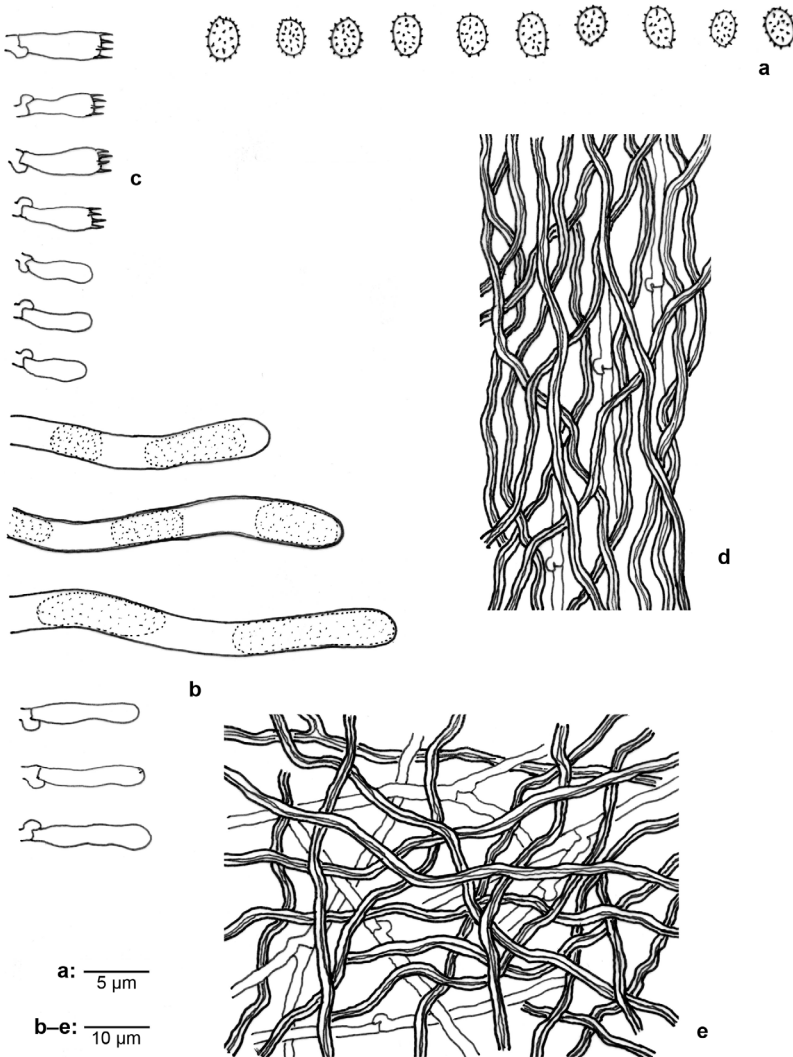


Fig. 5. Microscopic structures of *Wrightoporia austrosinensis* (drawn from the holotype). — **a:** Basidiospores. — **b:** Cystidia and gloeocystidia. — **c:** Basidia and basidioles. — **d:** Hyphae from trama. — **e:** Hyphae from context.

FRUITBODY. Basidiocarps annual, resupinate, soft and cottony when fresh, very difficult to separate from substrate, without odour or taste, cottony when dry, up to 30 cm long, 10 cm wide, 2 mm thick at centre. Pore surface white to cream when fresh, becoming cream to pale brownish upon drying; sterile margin distinct, white, cottony, up to 4 mm wide; pores round to angular, 1–3 per mm, dissepiments thin, entire to slightly lacerate. Context white, very thin. Tubes cream, cottony, up to 2 mm long.

HYPHAL STRUCTURE. Hyphal system dimitic; generative hyphae with clamp connections; skeletal hyphae IKI–, CB–, tissue unchanged in KOH.

CONTEXT. Generative hyphae hyaline, thin-walled, frequently branched, 1.9–2 μm in diam; skeletal hyphae dominant, hyaline, thick-walled with a narrow lumen to subsolid, rarely branched, interwoven, 1.7–2 μm in diam.

TUBES. Generative hyphae frequent, hyaline, thin-walled, rarely branched, 1.8–2.6 μm in diam; skeletal hyphae dominant, hyaline, thick-walled with a narrow lumen to subsolid, rarely branched, flexuous, loosely interwoven, 1.8–2.1 μm in diam. Cystidia clavate to tubular, thin- to slightly thick-walled, originated from trama, embedded or projecting into hymenium, 35–90 \times 4–11 μm ; gloeocystidia clavate, thin-walled, 17–27 \times 5–8 μm ; basidia subclavate, with a

basal clamp connection and four sterigmata, $8.5\text{--}10 \times 2.9\text{--}3.5 \mu\text{m}$; basidioles in shape similar to basidia, but slightly smaller.

SPORES. Basidiospores ellipsoid, hyaline, thin-walled, echinulate, amyloid, CB–, $(2.9\text{--})3\text{--}3.2(3.7) \times 2\text{--}2.4(2.5) \mu\text{m}$, $L = 3.11 \mu\text{m}$, $W = 2.2 \mu\text{m}$, $Q = 1.41$ ($n = 35/1$).

Wrightoporia subrutilans and *W. austrosinensis* have similar basidiospores, but the former has smaller pores (4–5 per mm), strongly dextrinoid skeletal, and lack of cystidia (Gilbertson & Ryvarden 1987). In the macro-morphology, *W. austrosinensis* resembles *W. lenta* because of the white and tough basidiocarps. However, *W. lenta* has distinctly larger basidiospores ($5.3\text{--}7 \times 4.8\text{--}5.8 \mu\text{m}$, measured from *Dai 1506*) and strongly dextrinoid skeletal.

Wrightoporia straminea and *W. tropicalis* both have thick-walled cystidia. The former species is distinguished from *W. austrosinensis* by resupinate to effused-reflexed basidiocarps with grayish orange pore surface, smaller pores (6–8 per mm), and lack of gloeocystidia (Hattori 2008). *Wrightoporia tropicalis* differs from *W. austrosinensis* by perennial and woody hard basidiocarps, smaller pores (6–8 per mm), and dextrinoid skeletal (Cui & Dai 2006).

Checklist

In the following an alphabetical list (according to genera) of the polypores is given, and the authors of the scientific names are according to the Authors of Fungal Names (<http://www.indexfungorum.org/AuthorsOfFungalNames.htm>). Substrates are omitted because most species were collected on unnamed angiosperm wood. The concept of polypores circumscribed here is in a wide sense, including poroid wood-decaying fungi in Basidiomycota.

Abortiporus biennis (Bull.) Singer, *Dai 10026*.

Abundisporus roseoalbus (Jungh.) Ryvarden, *Dai 9334*, *9534*, *9624*, *10834*.

Amauroderma elmerianum Murrill, *Dai 4345*.

Amauroderma perplexum Corner, *Dai 10811*.

Amauroderma preussii (Henn.) Steyaert, *Dai 9552*, *9553*, *9554*, *9557*, *9566*, *9571*.

Amauroderma rude (Berk.) Torrend, *Dai 7896*.

Amauroderma rugosum (Blume & T. Nees) Torrend, *Cui*

5275, *6185*, *Dai 7862*, *7872*, *7972*.

Amauroderma subresinosum (Murrill) Corner, *Cui 6189*, *Dai 7801*, *9522*, *10307*.

Amyloporus campbellii (Berk.) Ryvarden, *Dai 7802*, *7803*.

Antrodia sordida Ryvarden & Gilb., *Dai 10827*, *10830*.

Antrodiella duracina (Pat.) I. Lindblad & Ryvarden, *Cui 5158*, *6391*, *Dai 9693*.

Antrodiella liebmannii (Fr.) Ryvarden, *Cui 5166*, *Dai 9270A*, *9821*.

Antrodiella zonata (Berk.) Ryvarden, *Dai 4360*, *4481*, *7821*, *9939*.

Aurificaria indica (Masse) D.A. Reid, *Cui 6473*.

Bjerkandera adusta (Willd.) P. Karst., *Cui 5198*, *5376*, *Dai 10328*.

Bondarzewia podocarpi Y.C. Dai & B.K. Cui, *Dai 9261*, *10660*, *10662*, *10669*.

Ceriporia crassitunicata Y.C. Dai & Sheng H. Wu, *Cui 5243*.

Ceriporia lacerata N. Maek., Suhara & R. Kondo, *Dai 9501*, *9613*.

Ceriporia mellita (Bourdot) Bondartsev & Singer, *Dai 9667*.

Ceriporia reticulata (Hoffm.) Domański, *Dai 9453*.

Ceriporia spissa (Schwein. ex Fr.) Rajchenb., *Dai 2913*, *6984*, *7000*, *7878*.

Ceriporia viridans (Berk. & Broome) Donk, *Cui 5230*, *5231*, *Dai 9995*, *10833*.

Ceriporiopsis mucida (Pers.) Gilb. & Ryvarden, *Cui 5183*.

Ceriporiopsis resinascens (Romell) Domański, *Cui 6589*, *6594*, *Dai 9264*.

Cinereomyces vulgaris (Fr.) Spirin, *Dai 4497*, *7830*, *7831*, *9376*, *9650*, *9658*, *9677*, *9797*, *9807*, *9888*, *9985*.

Coltricia sideroides (Lév.) Teng, *Dai 9238*, *9239*, *9240*.

Coltriciella dependens (Berk. & M.A. Curtis) Murrill, *Cui 6526*, *Dai 4440*, *7938*.

Coltriciella subglobosa Y.C. Dai, *Wei 5020*.

Coltriciella tasmanica (Cleland & Rodway) D.A. Reid, *Dai 11589*.

Corioloopsis aspera (Jungh.) Teng, *Cui 6256*, *Dai 9333*, *9448*, *9472*, *9496*, *9515*, *9516*, *9541*, *9575*, *9669*, *10737*, *10786*, *10789*, *10799*.

Corioloopsis byrsina (Mont.) Ryvarden, *Dai 10788*.

Corioloopsis caperata (Berk.) Murrill, *Dai 9575*, *9500*.

Corioloopsis glabro-rigens (Lloyd) Núñez & Ryvarden, *Dai 7894*.

Corioloopsis polyzona (Pers.) Ryvarden, *Cui 6231*, *Dai 7798*, *9468*, *9486*, *9495*, *9514*, *9573*, *10816*.

Corioloopsis retropicta (Lloyd) Teng, *Dai 9870*.

Corioloopsis sanguinaria (Klotzsch) Teng, *Dai 4590*, *7954*, *9314*, *9350*, *9362*, *9943*, *9980*, *9990*, *10303*.

Corioloopsis strumosa (Fr.) Ryvarden, *Dai 4582*.

Corioloopsis telfarii (Klotzsch) Ryvarden, *HMAS 30136*.

Cyclomyces fuscus Fr., *Dai 9975*, *10016*.

Cyclomyces setiporus (Berk.) Pat., *Cui 6243*, *6249*, *Dai 9252*, *9355*, *9865*.

Cyclomyces tabacinus (Mont.) Pat., *Dai 4365*, *4455*, *4460*, *4480*, *4509*, *9837*, *9845*, *9958*, *9963*, *10309*, *10317*.

Daedalea incana (P. Karst.) Sacc. & D. Sacc., *Cui 6422*, *Dai 9343*.

Daedaleopsis purpurea (Cooke) Imazeki & Aoshima, *Cui 6481*, *6514*, *Dai 9872*.

Datronia mollis (Sommerf.) Donk, *Dai 10772*.

- Dictyopanus pusillus* (Pers. ex Lév.) Singer, *Dai* 4479.
Earliella scabrosa (Pers.) Gilb. & Ryvarden, *Cui* 6236, *Dai* 4565, 4571, 4615, 9469, 9488, 9510, 9549, 9574, 9620, 9803, 9869, 10329, 10344, 10797.
Echinoporia hydnophora (Berk. & Broome) Ryvarden, *Dai* 7962, 9600, 9744, 9809, 9960.
Elmerina cladophora (Berk.) Bres., *Cui* 5194, 5461.
Erastia salmonicolor (Berk. & M.A. Curtis) Niemelä & Kinnunen, *Cui* 6673, *Dai* 7892.
Favolaschia pustulosa (Jungh.) Kuntze, *Cui* 5417, 5423, 5427.
Favolaschia volkensii (Bres.) Henn., *Dai* 4489.
Fistulina hepatica (Schaeff.) With., *Dai* 7814, 9703.
Flabellophora superposita (Berk.) G. Cunn., *Dai* 10284.
Flavodon flavus (Klotzsch) Ryvarden, *Cui* 6188, 6195, 6281, *Dai* 4575, 9452, 9547, 9551, 9621.
Fomitiporia bannaensis Y.C. Dai, *Cui* 5300, *Dai* 7978, 9911.
Fomitiporia ellipsoidea B.K. Cui & Y.C. Dai, *Dai* 4019, 9251, 9278, 9293, 9967, 10311.
Fomitiporia pusilla (Lloyd) Y.C. Dai, *Cui* 5211.
Fomitiporia robusta (P. Karst.) Fiasson & Niemelä, *Dai* 10881.
Fomitiporia texana (Murrill) Nuss, *HMAS* 30866.
Fomitopsis carnea (Blume & T. Nees) Imazeki, *HMAS* 7518.
Fomitopsis feei (Fr.) Kreisel, *Cui* 5178, *Dai* 7822, 7838, 7947, 9268, 9838.
Fomitopsis pinicola (Sw.) P. Karst., *Dai* 11583.
Fomitopsis rhodophaea (Lév.) Imazeki, *Dai* 9306.
Fomitopsis spraguei (Berk. & M.A. Curtis) Gilb. & Ryvarden, *Dai* 9260.
Funalia gallica (Fr.) Bondartsev & Singer, *Dai* 9718, 9720, 10356, 10741, 10814.
Ganoderma australe (Fr.) Pat., *Cui* 6245, *Dai* 4347, 9465, 9519, 9715, 10041.
Ganoderma boninense Pat., *Dai* 9564.
Ganoderma calidophilum J.D. Zhao et al., *Cui* 6393.
Ganoderma gibbosum (Nees) Pat., *Dai* 10795.
Ganoderma multipileum Ding Hou, *Cui* 5445, 5445, 6186.
Ganoderma nigrolucidum (Lloyd) D.A. Reid, *Dai* 10774.
Ganoderma shangsiense J.D. Zhao, *Cui* 6434, *Dai* 10326.
Ganoderma sinense J.D. Zhao et al., *Dai* 4559, 9271.
Ganoderma tropicum (Jungh.) Bres., *Dai* 4346, 4581, 4585, 7805, 9447, 9521, 9523, 9524, 10042.
Gloeophyllum imponens (Ces.) Teng, *Dai* 4383, 9593, 9862, 9988.
Gloeophyllum striatum (Swartz) Murrill, *Dai* 1191a.
Gloeophyllum trabeum (Pers.) Murrill, *Cui* 6234, *Dai* 4466, 9694.
Gloeoporus dichrous (Fr.) Bres., *Dai* 9276, 9512, 9652, 9657, 9685, 9916.
Gloeoporus theleporoides (Hook.) G. Cunn., *Dai* 9266, 9482, 9622.
Grammothele fulgio (Berk. & Broome) Ryvarden, *Cui* 6655, *Dai* 4419, 4520, 4600.
Grammothele lineata Berk. & M.A. Curtis, *Cui* 6668, *Dai* 9646, 9716, 9723, 9670, 9716, 9723.
Grammothelopsis asiatica Y.C. Dai & B.K. Cui, *Dai* 9881, 11588.
Haddowia longipes (Lév.) Steyaert, *HMAS* 29743.
Haploporus flavus B.K. Cui & Y.C. Dai, *Cui* 6414.
Haploporus alabamiae (Berk. & Cooke) Y.C. Dai & Niemelä, *Dai* 4363, 9324, 9746, 10778.
Haploporus papyraceus (Schwein.) Y.C. Dai & Niemelä, *Dai* 9962.
Heterobasidion ecrustosum Tokuda, T. Hatt. & Y.C. Dai, *Dai* 9358, 9731, 9804, 9840.
Hexagonia apiaria (Pers.) Fr., *Cui* 6447, 6467; *Dai* 9714, 9732, 10364, 10784.
Hexagonia glabra (P. Beauv.) Ryvarden, *Dai* 10991.
Hexagonia tenuis (Hook) Fr., *Cui* 6200, 6248, 6258, *Dai* 4567, 7843, 7879, 9513, 9540, 9618, 9952, 10350, 10801.
Humphreya coffeata (Berk.) Steyaert, *HMAS* 37912.
Hyphodontia flavipora (Cooke) Sheng H. Wu, *Dai* 4448, 4522, 4523, 4545, 4611, 7880, 7886, 7891, 7911, 9637, 9651, 10002, 10762.
Hyphodontia latitans (Bourdout & Galzin) Ginns & M.N.L. Lefebvre, *Dai* 9499, 9499, 9647, 9662, 9648, 9649, 9655, 9659, 9661, 9662, 9663, 9664, 10743, 10749.
Hyphodontia taiwaniana Sheng H. Wu, *Wu* 0809-172.
Hyphodontia tropica Sheng H. Wu, *Dai* 7942, 9279, 9449, 9704, 9705, 9712, 9844, 9849, 10802.
Inonotus acutus B.K. Cui & Y.C. Dai, *Cui* 5400.
Inonotus chrysomarginatus B.K. Cui & Y.C. Dai, *Cui* 6689.
Inonotus hainanensis H.X. Xiong & Y.C. Dai, *Dai* 9259.
Inonotus latemarginatus Y.C. Dai, *Dai* 9758.
Inonotus patouillardii (Rick) Imazeki, *Dai* 4608.
Inonotus perchocolatus Corner, *Dai* 7939.
Inonotus rickii (Pat.) D.A. Reid, *Dai* 10359.
Irpex lacteus (Fr.) Fr. s. lato, *Cui* 6436, *Dai* 4504, 9684.
Irpex vellereus Berk. & Broome, *Dai* 7832, 9833.
Junghuhnia nitida (Pers.) Ryvarden, *Cui* 5443.
Junghuhnia pseudominuta H.S. Yuan & Y.C. Dai, *Dai* 9360, Yuan 4105.
Laccocephalum hartmannii (Cooke) Núñez & Ryvarden, *HMAS* 54101.
Laetiporus sulphureus (Bull.) Murrill, *Cui* 5442, 5448, 5488.
Lenzites acuta Berk., *Dai* 10358, 10832.
Lenzites vespacea (Pers.) Pat., *Cui* 5447, *Dai* 7916, 9839, 9874, 10287.
Leucophellinus hobsonii (Cooke) Ryvarden, *Dai* 10733, 10790.
Lignosus hainanensis B.K. Cui & Y.C. Dai, *Dai* 10670.
Lignosus rhinocerotis (Cooke) Ryvarden, *HMAS* 30036.
Lindtneria flava Parmasto, *Dai* 10800.
Lindtneria trachyspora (Bourdout & Galzin) Pilát, *Dai* 7819.
Megasporoporia cystidiolophora B.K. Cui & Y.C. Dai, *Dai* 9906.
Megasporoporia hexagonoides (Speg.) J.E. Wright & Rajchenb., *Cui* 5179, *Dai* 7834, 9281.
Megasporoporia major (G.Y. Zheng & Z.S. Bi) Y.C. Dai, *Cui* 6592, *Dai* 9915, 9933, 10779.
Megasporoporia minuta Y.C. Dai & X.S. Zhou, *Cui* 6425, *Dai* 10863.
Megasporoporia setulosa (Henn.) Rajchenb., *Dai* 4373, 9783, 9785.
Microporus affinis (Blume & Nees) Kuntze, *Dai* 4350, 4371, 7826, 7858, 9603, 9751, 9829.
Microporus vernicipes (Berk.) Kuntze, *Dai* 4374, 4410.
Microporus xanthopus (F.) Pat., *Cui* 5488, *Dai* 7833, 7897, 9283.
Nigrofomes melanoporus (Mont.) Murrill, *Dai* 4396, 4403,

- 7899, 9602, 9674, 9802, 9802, 10839.
Nigroporus vinosus (Berk.) Murrill, *Dai* 4396, 4461, 7920, 9301, 9681, 9880, 10763, 10775.
Oligoporus sericeomollis (Romell) Bondartseva, *Dai* 9337.
Oxyporus corticola (Fr.) Ryvardeen, *Dai* 7871.
Oxyporus ginkgonis Y.C. Dai, *Cui* 6476, *Dai* 9707, 10794.
Oxyporus subulatus Ryvardeen, *Cui* 6477.
Parmastomyces mollissimus (Maire) Pouzar, *Dai* 9263, 9325.
Perenniporia corticola (Corner) Decock, *Dai* 4592.
Perenniporia hattorii Y.C. Dai & B.K. Cui, *Dai* 10285, 10315, 10318.
Perenniporia latissima (Bres.) Ryvardeen, *Cui* 6595, *Dai* 9255, 9368, 9926.
Perenniporia medulla-panis (Jacq.) Donk, *Dai* 9326, 9328, 9363, 9739, 10780, 10781.
Perenniporia narymica (Pilát) Pouzar, *Cui* 5425, *Dai* 9267.
Perenniporia ochroleuca (Berk.) Ryvardeen, *Dai* 9588, 9597.
Perenniporia subacida (Peck) Donk, *Dai* 7816.
Perenniporia subadusta (Z.S. Bi & G.Y. Zheng) Y.C. Dai, *Dai* 10661.
Perenniporia tephropora (Mont.) Ryvardeen, *Cui* 6283, 6290, *Dai* 4613, 4618, 7796, 7827, 9462, 9483, 9506, 9518, 9675, 9728, 9986, 10751, 10760.
Phaeolus schweinitzii (Fr.) Pat., *Cui* 6566.
Phellinidium lamaense (Murrill) Y.C. Dai, *Dai* 4468, 4546, 7872, 9250, 9353, 9368, 9374.
Phellinidium noxium (Corner) Bondartseva & S. Herrera, *Cui* 6308, *Dai* 9299, 9528, 9530, 10009, 10292.
Phellinus baumii Pilát, *Cui* 6631, *Dai* 10841.
Phellinus cesatii (Bres.) Ryvardeen, *Cui* 5405.
Phellinus chryseus (Lév.) Ryvardeen, *Dai* 10842.
Phellinus collinus Y.C. Dai & Niemelä, *Dai* 7866.
Phellinus contiguus (Pers.) Pat., *Dai* 9747, 9861.
Phellinus discipes (Berk.) Ryvardeen, *Cui* 5416, *Dai* 4381, 4429, 7867, 10286, 10313.
Phellinus durissimus (Lloyd) Roy, *Cui* 5235.
Phellinus fastuosus (Lév.) Ryvardeen, *Cui* 5342, 5494, *Dai* 9241.
Phellinus ferreus (Pers.) Bourdot & Galzin, *Dai* 7870, 7922, 7924, 9332, 9349, 9856, 9860, 10769, 10874.
Phellinus ferruginosus (Schröd.) Pat., *Cui* 6648.
Phellinus gilvus (Schwein.) Pat., *Cui* 6253, *Dai* 4355, 4364, 4432, 7836, 7841, 7863, 7901, 7941, 9572, 9660, 9666, 10813.
Phellinus glaucescens (Petch) Ryvardeen, *Dai* 7860, 9371.
Phellinus inermis (Ellis & Everhart) G. Cunn., *Cui* 6474, *Dai* 9527, 9531, 9805, 10000.
Phellinus kanehirae (Yasuda) Ryvardeen, *Cui* 5155, 5336, *Dai* 9262, 9370.
Phellinus lloydii (Cleland) G. Cunn., *Dai* 9243, 9316, 9625, 9766, 10805, 10809, 10838.
Phellinus merrillii (Murrill) Ryvardeen, *Cui* 5192, *Dai* 9642.
Phellinus minisporus B.K. Cui & Y.C. Dai, *Dai* 9632.
Phellinus pachyphloeus (Pat.) Pat., *Dai* 9248, 10341.
Phellinus pullus (Berk. & Mont.) Ryvardeen, *Dai* 4436, 7955, 9313, 9627.
Phellinus rhabarbarinus (Berk.) G. Cunn., *Dai* 4389, 4423, 4606, 7873, 10876.
Phellinus rimosus (Berk.) Pilát, *Dai* 4384, 9247, 9310.
Phellinus senex (Nees & Mont.) Imazeki, *Cui* 5486, *Dai* 7979.
Phellinus torulosus (Pers.) Bourdot & Galzin, *Cui* 5167, 5441, *Dai* 4430.
Phellinus tricolor (Bres.) Kotl., *Dai* 4399, 9819, 10858.
Phellinus umbrinellus (Bres.) Ryvardeen, *Cui* 5247, *Dai* 9319, 9373.
Phellinus wahlbergii (Fr.) A.D. Reid, *Dai* 9339, 9340.
Phylloporia hainaniana Y.C. Dai & B.K. Cui, *Cui* 5160, *Dai* 9460.
Phylloporia pectinata (Klotsch) Ryvardeen, *Dai* 7958, 9245, 9246, 9249, 9253, 9257, 9536, 9823.
Phylloporia ribis (Schumach.) Ryvardeen, *Cui* 6497, *Dai* 10831.
Phylloporia weberiana (Bres. & Henn. ex Sacc.) Ryvardeen, *Dai* 9242.
Phylosporinus xylostromatoides (Bres.) Y.C. Dai, *Dai* 4601.
Polyporus arcularius (Batsch) Fr., *Cui* 6450, 9507, 9636, 9721.
Polyporus dictyopus Mont., *Cui* 5269, 5452, 6456, 6484, 6497.
Polyporus grammocephalus Berk., *Dai* 7799, 7849, 7869, 7893, 7898, 7905, 7915, 9576, 9695, 9754, 10029, 10749b.
Polyporus jiangenglingensis (G.Y. Zheng) H.D. Zheng & P.G. Liu, *HMIGD* 14403.
Polyporus leprieurii Mont., *Dai* 10791.
Polyporus mikawai Lloyd, *Cui* 5387, 6247, *Dai* 10770.
Polyporus minor Z.S. Bi & G.Y. Zheng, *Dai* 7847.
Polyporus moluccensis (Mont.) Ryvardeen, *Cui* 5267, *Dai* 4352, 4511, 4540, 9384.
Polyporus mori (Pollini) Fr., *Dai* 7842, 7946.
Polyporus philippinensis Berk., *Dai* 7959, 7961, 9354, 10301, 10849.
Polyporus pumilus Y.C. Dai & Niemelä, *Cui* 5464.
Polyporus squamosus (Huds.) Fr., *Yang* 740.
Polyporus tenuiculus (Beauv.) Fr., *Cui* 6390, *Dai* 4540, 9755.
Polyporus virgatus Berk. & M.A. Curtis, *HMAS* 7622.
Postia alni Niemelä & Vampola, *Dai* 9601, 10840, 10854.
Postia fragilis (Fr.) Jülich, *Dai* 9708, 9710.
Pouzarporia subrufa (Ellis & Dearn.) Vampola, *Dai* 9743.
Protomerulius caryae (Schwein.) Ryvardeen, *Dai* 4549, 9582, 9846.
Protomerulius efibulatus Y.C. Dai & Y.L. Wei, *Dai* 9322, 9378, 9851.
Pseudofavolus cucullatus (Mont.) Pat., *Dai* 10325, 10771.
Pycnoporus sanguineus (L.) Murrill, *Cui* 6242, *Dai* 7795, 7835, 9459, 9471, 9476, 9479, 9494, 9497, 9505, 9623, 9679, 9683, 9722.
Pyrofomes albomarginatus (Lév.) Ryvardeen, *Dai* 9369, 9828.
Pyrrhoderma sendaiense (Yasuda) Imazeki, *Dai* 7957, 10340.
Rigidoporus adnatus Corner, *Cui* 5485.
Rigidoporus crocatus (Pat.) Ryvardeen, *Cui* 5431.
Rigidoporus hypobrunneus (Petch) Corner, *Cui* 6678, *Dai* 7811, 7824, 9480, 9619.
Rigidoporus lineatus (Pers.) Ryvardeen, *Dai* 9806.
Rigidoporus microporus (Sw.) Overeem, *Dai* 4541, 9580, 9617, 9640, 9835, 9858, 10316.
Rigidoporus minutus B.K. Cui & Y.C. Dai, *Cui* 5193, 6549, *Dai* 9798, 9847.
Rigidoporus ulmarius (Sowerby) Imazeki, *Cui* 5244, 5438, 5449, *Dai* 9315.
Rigidoporus vinctus (Berk.) Ryvardeen, *Dai* 4612, 7817, 7926, 7927, 9280, 9286, 9331, 9638, 9676, 9765, 9792,

9801, 9850, 9860, 9955, 9994, 10848.
Skeletocutis alutacea (J. Lowe) Jean Keller, *Dai* 9285, 9307, 9884.
Skeletocutis luteolus B.K. Cui & Y.C. Dai, *Dai* 9529, 9542, 10322, 10742.
Skeletocutis nivea (Jungh.) Jean Keller, *Dai* 7829, 7858, 7881, 7932, 9598, 9822, 9825, 9977.
Skeletocutis stellae (Pilát) Jean Keller, *Dai* 10822, 10825.
Skeletocutis subvulgaris Y.C. Dai, *Dai* 11590.
Sparsitubus nelumbiformis L.W. Xu & J.D. Zhao, *Cui* 5182, 5217, *Dai* 4417, 9244.
Theleporus calcicolor (Sacc. & P. Syd.) Ryvarden, *Cui* 5226, *Dai* 7921, 7969.
Tinctoporellus epimiltinus (Berk. & Broome) Ryvarden, *Dai* 4457, 9347, 9993, 10305.
Trametes elegans (Spreng.) Fr., *Cui* 6217, *Dai* 4576, 9457, 9546, 9555, 9558, 9559, 9569, 9730, 9788, 10745, 10748, 10812, 10855.
Trametes hirsuta (Wulfen) Pilát, *Cui* 6239, 6241, *Dai* 4566, 4593, 7908, 9477, 9533, 9550, 9561, 9578, 9581.
Trametes manilaensis (Lloyd) Teng, *Cui* 6212, 6240, *Dai* 10747.
Trametes membranacea (Sw.) Kreisel, *Dai* 10983.
Trametes modesta (Kunze ex Fr.) Ryvarden, *Cui* 6229, *Dai* 4350, 4351, 4450, 7815, 9290, 9492, 10844, 10873.
Trametes orientalis (Yasuda) Imazeki, *Cui* 6184, *Dai* 4570, 7882, 9445, 9454, 9458, 9461, 9467, 9475, 9478, 9481, 9713, 10735, 10736.
Trametes pocas (Berk.) Ryvarden, *Dai* 11577.
Trametes pubescens (Schumach.) Pilát, *Dai* 7846.
Trametes versicolor (L.) Lloyd, *Cui* 6440, *Dai* 9485.
Trichaptum abietinum (Pers.) Ryvarden, *Cui* 5415, 6561, *Dai* 7903.
Trichaptum brastagii (Corner) T. Hatt., *Dai* 4376, 4515, 4552, 10773.
Trichaptum byssogenum (Jungh.) Ryvarden, *Dai* 4587, 4595, 9537, 9594, 9668, 9689, 9692, 10752.
Trichaptum durum (Jungh.) Corner, *Dai* 4400, 4470, 4514, 7875, 9843, 10320.
Trichaptum imbricatum Y.C. Dai & B.K. Cui, *Cui* 5175, *Dai* 9254.
Trichaptum perenne Y.C. Dai & H.S. Yuan, *Yang* 885.
Trichaptum podocarpi Y.C. Dai, *Dai* 4529, 9356, 9853.
Tyromyces chioneus (Fr.) P. Karst., *Dai* 9302.
Whitfordia scopulosa (Berk.) Núñez & Ryvarden, *Cui* 6209, *Dai* 10739.
Wrightoporia aurantipora T. Hatt., *Dai* 9671.
Wrightoporia austrosinensis Y.C. Dai, *Dai* 11579.
Wrightoporia avellanea (Bres.) Pouzar, *Dai* 10826.
Wrightoporia luteola B.K. Cui & Y.C. Dai, *Cui* 5200, 5229, *Dai* 9297.
Wrightoporia tropicalis (Cooke) Ryvarden, *Dai* 4382, 4409, 4490.

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