

Wood-rotting fungi in eastern China. 5. Polypore diversity in Jiangxi Province

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Received 28 Dec. 2009, revised version received 26 Apr. 2010, accepted 27 Apr. 2010

Wang, B., Cui, B. K., Li, H. J., Du, P. & Jia, B. S. 2011: Wood-rotting fungi in eastern China. 5. Polypore diversity in Jiangxi Province. — *Ann. Bot. Fennici* 48: 237–246.

Field investigations on wood-rotting fungi in Jiangxi Province, eastern China, were made in 2005–2009, and nearly 600 specimens were collected by the authors. Based on the collected materials 149 poroid wood-rotting fungi were identified, and this paper provides a checklist of our results. Substrates and collecting data are provided for each species. *Phellinus tenuiculus* B.K. Cui *sp. nova* is described and illustrated. It is characterized by an annual growth habit, resupinate and very thin basidiocarps, lack of setae, and by ellipsoid, yellowish brown and fairly thick-walled basidiospores, which are usually collapsed when mature.

Introduction

Jiangxi Province is located in the eastern part of China, between 24°29'–30°04'N and 113°34'–118°28'E (Fig. 1), and belongs to the warm-temperate–subtropical zone. The main vegetation types are broadleaf evergreen forests, broadleaf deciduous forests, mixed coniferous and broadleaf forests, and coniferous forests. More than 5000 plant species including 2000 woody plants have been reported in the province.

Wood-rotting fungi are an important component of forest ecosystems, decomposing not only coarse woody debris, but they also are critical for maintaining the species diversity of those ecosystems. Studies on the diversity and ecology of wood-rotting fungi in eastern China have recently been carried out in different forest ecosystems (Hattori & Zang 1995, Dai & Cui

2005, Cui & Dai 2006, Wei & Dai 2006, Cui & Dai 2007, Cui *et al.* 2007, Cui & Dai 2008a). This paper is a continuation of a series of studies on wood-rotting fungi from eastern China (Cui & Dai 2008b, Cui *et al.* 2008, Du *et al.* 2009, Wang *et al.* 2009). For a closer description of the area and the ongoing project, see Cui *et al.* (2008). Studies on poroid wood-rotting fungi in the Jiangxi Province were rather casual and mostly found in general fungal books or reports (Teng 1963, Zhao 1998, Núñez & Ryvarden 2000, Zhao & Zhang 2000, Núñez & Ryvarden 2001, Zhang & Dai 2005). Eighty-six polypores were recently recorded from the Dagang Mountains in the province (Wang *et al.* 2009), but our knowledge of the fungal flora in the province is still incomplete. Field trips were made in Jiangxi during 2005 to 2009, and around 600 specimens were collected from its forest areas. One hundred

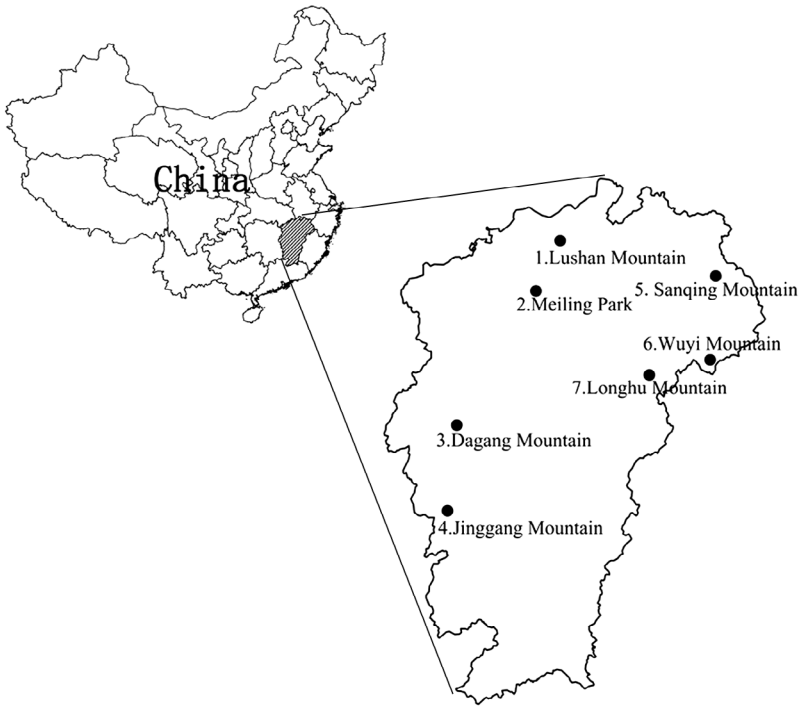


Fig. 1. Location of the Jiangxi Province (shaded area) in China, and investigated areas in the Jiangxi Province (black dots).

and forty nine polypores were identified, among them one new species. In this paper we publish a critical checklist, including host data for each species.

Material and methods

The present study is based on specimens collected by the authors or our fellow researchers from seven localities in the Jiangxi Province (*see* Fig. 1). The studied specimens are deposited at the herbarium of Beijing Forestry University (BJFC). Some duplicates are preserved at the herbarium of the Institute of Applied Ecology, Chinese Academy of Sciences (IFP).

All the materials were examined under the microscope. The microscopic routine used in the study is as presented by Dai *et al.* (2002a). In the text the following abbreviations are used: L = mean spore length (arithmetical average of all spores); W = mean spore width (arithmetical average of all spores); Q = variation in the L/W ratios between the specimens studied (quotient of the mean spore length and the mean spore width of each specimen); n = number of spores

measured from a given number of specimens; IKI = Melzer's reagent; IKI- = both inamyloid and indextrinoid; KOH = 5% potassium hydroxide; CB = Cotton Blue; CB+ = cyanophilous; CB- = acyanophilous. In presenting the variation in the size of the spores, 5% of the measurements were excluded from each end of the range, and are given in parentheses. The width of a basidium was measured at the thickest part, and the length was measured from the apex (sterigmata excluded) to the basal septum. Sections were studied at magnification up to $\times 1000$ by using a Nikon Eclipse 80i microscope and phase contrast illumination. Drawings were made with the aid of a drawing tube. Special colour terms are from Petersen (1996) and Anonymous (1969).

Results

Checklist

In the following, an alphabetical list (according to genera) of the polypores is given; the authors of scientific names follow the second edition of Authors of Fungal Names (<http://www.indexfun->

gorum.org/AuthorsOfFungalNames.htm). Substrate and collecting data are provided after the name of each species. The hosts are listed alphabetically, and within the same host tree, they are arranged by the order: living tree, dead tree, fallen branch, fallen trunk, rotten wood, stump, and root. The “polypores” are circumscribed here in a wide sense, including the aphyllorphoid fungi with a poroid fruiting body.

Abortiporus biennis (Bull.) Singer, fallen angiosperm trunk, *Dai 10379*.

Antrodia albida (Fr.) Donk, fallen angiosperm branch, *Cui 6080*; fallen angiosperm trunk, *Cui 7887*.

Antrodia oleracea (R.W. Davidson & Lombard) Ryvar den, rotten angiosperm wood, *Dai 10630*.

Antrodia cf. *sitchensis* (Baxter) Gilb. & Ryvar den, fallen trunk of *Cunninghamia*, *Cui 7861*.

Antrodia vaillantii (DC.) Ryvar den, rotten stump of *Pinus*, *Dai 10595*.

Antrodiella albocinnamomea Y.C. Dai & Niemelä, fallen angiosperm trunk, *Cui 7803 & 7906*; rotten angiosperm wood, *Dai 19423*; angiosperm stump, *Dai 10560*; root of *Castanopsis*, *Dai 10504*.

Antrodiella americana Ryvar den & Gilb., fallen trunk of *Castanopsis*, *Cui 7807*.

Antrodiella aurantilaeta (Corner) T. Hatt. & Ryvar den, fallen angiosperm branch, *Cui 6069*.

Antrodiella brunneimontana (Corner) T. Hatt., fallen angiosperm branch, *Cui 6074*; fallen angiosperm trunk, *Cui 7886*; angiosperm stump, *Cui 7844*; fallen branch of *Castanopsis*, *Cui 7787*; fallen trunk of *Castanopsis*, *Cui 7838*; fallen branch of *Elaeocarpus*, *Dai 10521*; dead *Machilus* tree, *Cui 7919*.

Antrodiella duracina (Pat.) I. Lindblad & Ryvar den, fallen angiosperm trunk, *Cui 7855*; fallen trunk of *Schima*, *Dai 10429*.

Antrodiella gypsea (Yasuda) T. Hatt. & Ryvar den, fallen gymnosperm trunk, *Cui 5973*; fallen trunk of *Cunninghamia*, *Cui 6026, 7741 & 7834, Dai 10391 & 10438*; fallen branch of *Fokienia*, *Dai 10563*; dead *Metasequoia* tree, *Cui 7907*; fallen trunk of *Metasequoia*, *Dai 10572*; fallen trunk of *Pinus*, *Cui 5986, 5987 & 7820*.

Antrodiella perennis B.K. Cui & Y.C. Dai, rotten wood of *Liquidambar*, *Dai 10403*; living *Machilus* tree, *Cui 7872*; fallen trunk of *Machilus*, *Cui 7877*; fallen branch of *Phoebe*, *Dai 10511*.

Antrodiella romellii (Donk) Niemelä, fallen angiosperm branch, *Cui 6082*.

Antrodiella semisupina (Berk. & M.A. Curtis) Ryvar den s.l., fallen trunk of *Rhododendron*, *Dai 10415*.

Antrodiella zonata (Berk.) Ryvar den, living angiosperm tree, *Cui 6051 & 6094*; dead angiosperm tree, *Dai 10607*; fallen angiosperm branch, *Cui 6028*; fallen angiosperm trunk, *Cui 5913, 5928, 5984, 6103 & 7731*; dead *Idesia* tree, *Cui 7912*; fallen trunk of *Platanus*, *Dai 10368*.

Aurantiporus fissilis (Berk. & M.A. Curtis) H. Jahn, dead *Platycarya* tree, *Cui 7878 & 7895, Dai 10502*; dead

Quercus tree, *Cui 7801*.

Auriporia aurulenta David, Tortić & Jelić, fallen angiosperm trunk, *Cui 6003*.

Bjerkandera adusta (Willd.) P. Karst., fallen trunk of *Alnus*, *Cui 7719 & 7752*; stump of *Alnus*, *Cui 7725*; living angiosperm tree, *Cui 6036*; dead angiosperm tree, *Cui 5915*; fallen angiosperm branch, *Cui 7908, Dai 10578*; fallen trunk of *Cyclobalanopsis*, *Cui 7785*; fallen trunk of *Liquidambar*, *Dai 10372*.

Castanoporus castaneus (Lloyd) Ryvar den, fallen trunk of *Pinus*, *Dai 10454*.

Ceriporia alachuana (Murrill) Hallenb., fallen trunk of *Albizia*, *Dai 10522*.

Ceriporia crassitunicata Y.C. Dai & Sheng H. Wu, fallen trunk of *Alnus*, *Dai 10376*.

Ceriporia lacerata N. Maek., Suhara & R. Kondo, fallen angiosperm trunk, *Cui 7712*.

Ceriporia viridans (Berk. & Broome) Donk, fallen angiosperm trunk, *Cui 7743*; rotten angiosperm wood, *Dai 10477*.

Ceriporiopsis mucida (Pers.) Gilb. & Ryvar den, rotten wood of *Cunninghamia*, *Dai 10404*; rotten stump of *Cunninghamia*, *Dai 10597*.

Cerrena meyenii (Klotzsch) L. Hansen, living angiosperm tree, *Cui 5906 & 5971*; dead angiosperm tree, *Dai 10610*.

Cerrena unicolor (Bull.) Murrill, dead *Alnus* tree, *Dai 10377*.

Cinereomyces vulgaris (Fr.) Spirin, fallen angiosperm trunk, *Cui 6096 & 6106*; rotten wood of *Pinus*, *Dai 10605*.

Coltricia cinnamomea (Jacq.) Murrill, on ground in forest with angiosperm trees, *Dai 10464, 10591, 10606, 10609 & 10612*.

Coltricia focicola (Berk. & M.A. Curtis) Murrill, on ground in forest with angiosperm trees, *Dai 10599*.

Coltricia montagnei (Fr.) Murrill, on ground in forest with angiosperm trees, *Cui 5901*.

Coltricia tsugicola Y.C. Dai & B.K. Cui, rotten wood of *Tsuga*, *Dai 7303*; rotten root of living *Tsuga* tree, *Dai 7336*.

Coltricia verrucata Aime, T.W. Henkel & Ryvar den, on ground under angiosperm trees, *Cui 5916 & 5920, Dai 10587*.

Coltriciella dependens (Berk. & M.A. Curtis) Murrill, on ground in forest with angiosperm trees, *Cui 6032 & 6034*; rotten bamboo, *Dai 10406*.

Coltriciella subpicta (Lloyd) Corner, on ground under angiosperm trees, *Cui 5919*.

Corioloopsis aspera (Jungh.) Teng, fallen angiosperm trunk, *Cui 7819*; fallen branch of *Sapium*, *Cui 7901*.

Corioloopsis polyzona (Pers.) Ryvar den, fallen trunk of *Cyclobalanopsis*, *Dai 10419 & 10420*.

Cyclomyces lamellatus Y.C. Dai & Niemelä, dead angiosperm tree, *Dai 10527*; fallen angiosperm branch, *Cui 5911*; fallen angiosperm trunk, *Cui 6039 & 6064, Dai 10589*.

Cyclomyces tabacinus (Mont.) Pat., living angiosperm tree, *Cui 5925 & 5926*.

Cyclomyces xeranticus (Berk.) Y.C. Dai & Niemelä, dead angiosperm tree, *Dai 10593*; fallen trunk of *Castanopsis*, *Cui 6005, 6038 & 6045*; rotten wood of *Castanopsis*, *Dai 10459*.

Daedalea dickinsii Yasuda, fallen trunk of *Castanopsis*, *Cui 7881*.

- Daedaleopsis confragosa* (Bolton) J. Schröt., living *Liquidambar* tree, Cui 7888; living *Salix* tree, Cui 6104 & 6108.
- Daedaleopsis tricolor* (Bull.) Bondartsev & Singer, fallen branch of *Alnus*, Cui 7733, Dai 10398; fallen angiosperm branch, Cui 6018; fallen angiosperm trunk, Cui 5909, Dai 10439, 10574, 10575 & 10614; fallen trunk of *Schima*, Cui 7836.
- Datronia mollis* (Sommerf.) Donk, fallen angiosperm branch, Cui 7830; fallen angiosperm trunk, Cui 7899 & 7917; fallen trunk of *Phoebe*, Dai 10500; fallen trunk of *Quercus*, Dai 10443; fallen trunk of *Sapindus*, Cui 7813.
- Datronia stereoides* (Fr.) Ryvar den, fallen angiosperm branch, Dai 10559.
- Earliella scabrosa* (Pers.) Gilb. & Ryvar den, fallen angiosperm trunk, Cui 7757.
- Echinochaete russiceps* (Berk. & Broome) D.A. Reid, fallen angiosperm trunk, Dai 10455; living *Rhododendron* tree, Cui 7799.
- Fistulina hepatica* (Schaeff.) With., living angiosperm tree, Cui 5902; living *Broussonetia* tree, Dai 10604.
- Fomitiporia bannaensis* Y.C. Dai, dead *Camellia* tree, Dai 10538; dead *Castanopsis* tree, Dai 10417; stump of *Clerodendrum*, Dai 10495; living *Nerium* tree, Cui 5960; living *Rhododendron* tree, Cui 7789; dead *Rhododendron* tree, Dai 10407.
- Fomitopsis feei* (Fr.) Kreisel, rotten wood of *Cunninghamia*, Dai 10430; stump of *Cunninghamia*, Dai 10370 & 10570.
- Fomitopsis rosea* (Alb. & Schwein.) P. Karst., fallen trunk of *Cunninghamia*, Cui 7824; stump of *Cunninghamia*, Cui 7737, 7746 & 7873.
- Fomitopsis spraguei* (Berk. & M.A. Curtis) Gilb. & Ryvar den, living *Castanopsis* tree, Dai 10428.
- Funalia cervina* (Schwein.) Y.C. Dai, fallen trunk of *Elaeocarpus*, Cui 7780; fallen trunk of *Liquidambar*, Cui 7841.
- Funalia trogii* (Berk.) Bondartsev & Singer, dead *Populus* tree, Dai 10540; living *Salix* tree, Cui 6095.
- Ganoderma australe* (Fr.) Pat., fallen trunk of *Alnus*, Cui 7715; stump of *Alnus*, Cui 7756; living angiosperm tree, Cui 5900 & 6100, Dai 10556; dead angiosperm tree, Dai 10551; fallen angiosperm trunk, Cui 7723; angiosperm stump, Cui 6090, 6114 & 7795, Dai 10624 & 10626; fallen trunk of *Castanopsis*, Dai 10433; fallen trunk of *Cunninghamia*, Cui 7780; stump of *Machilus*, Cui 7923; stump of *Platycarya*, Dai 10508; living *Populus* tree, Cui 5962; living *Sapindus* tree, Cui 7808; stump of *Schima*, Cui 7806.
- Ganoderma gibbosum* (Nees) Pat., angiosperm stump, Cui 6091.
- Ganoderma lucidum* (Curtis.) P. Karst., on ground in forest with angiosperm trees, Cui 6019; living *Castanopsis* tree, Cui 7848 & 7849; root of *Castanopsis*, Dai 10457.
- Ganoderma resinaceum* Boud., angiosperm stump, Cui 6109.
- Gloeoporus dichrous* (Fr.) Bres., living angiosperm tree, Cui 5902; fallen angiosperm trunk, Cui 6070, Dai 10541 & 10629; fallen trunk of *Castanopsis*, Dai 10471; fallen trunk of *Pinus*, Cui 6031.
- Grammothele fulgio* (Berk. & Broome) Ryvar den, bamboo stump, Dai 10447.
- Hapalopilus flavus* B.K. Cui & Y.C. Dai, fallen angiosperm trunk, Cui 7793.
- Haploporus alabamae* (Berk. & Cooke) Y.C. Dai & Niemelä, fallen angiosperm branch, Cui 7761, Dai 10480.
- Haploporus latisporus* Juan Li & Y.C. Dai, fallen branch of *Abies*, Cui 6075; living *Metasequoia* tree, Cui 6079; fallen branch of *Metasequoia*, Dai 10562.
- Heterobasidium ecrustosum* Tokuda, T. Hatt. & Y.C. Dai, living *Pinus* tree, Cui 6000.
- Heterobasidium australe* Y.C. Dai & Korhonen, stump of *Tsuga*, Dai 7296 & 7298.
- Hyphodontia flavipora* (Cooke) Sheng H. Wu, fallen trunk of *Alnus*, Cui 7759, Dai 10402; fallen angiosperm branch, Cui 5921, 5945, 5998, 6076 & 6112; rotten wood of *Castanea*, Cui 5957; fallen angiosperm trunk, Cui 7745, 7750, 7753 & 7755; fallen trunk of *Castanopsis*, Cui 7786; fallen trunk of *Cunninghamia*, Cui 7732 & 7760; bark of *Metasequoia*, Dai 10557; living *Nerium* tree, Cui 5967; fallen trunk of *Pinus*, Cui 5974, 5978, 5980 & 6060; living *Prunus* tree, Cui 6068.
- Hyphodontia laitians* (Bourdot & Galzin) Ginns & M.N.L. Lefebvre, fallen angiosperm branch, Dai 10390; fallen angiosperm trunk, Cui 7894; rotten wood of *Cunninghamia*, Dai 10543.
- Hyphodontia paradoxa* (Schrad.) Langer & Vesterh., fallen angiosperm branch, Dai 7355.
- Hyphodontia syringae* E. Langer, fallen angiosperm trunk, Cui 5903.
- Hyphodontia tropica* Sheng H. Wu, fallen angiosperm trunk, Cui 7827.
- Inonotus cuticularis* (Bull.) P. Karst., dead *Cyclobalanopsis* tree, Dai 10496.
- Inonotus cf. truncatisporus* Corner, fallen trunk of *Platycarya*, Dai 10512.
- Irpex lacteus* (Fr.) Fr., fallen angiosperm branch, Cui 5910, 5924, 5979, 5988, 5990, 5999, 7811 & 7835, Dai 10467; fallen angiosperm trunk, Cui 5992, 6058 & 6062, Dai 10580.
- Ischnoderma benzoinum* (Wahlenb.) P. Karst., stump of *Tsuga*, Dai 7328.
- Junghuhnia collabens* (Fr.) Ryvar den, rotten wood of *Tsuga*, Dai 7319.
- Junghuhnia japonica* Núñez & Ryvar den, fallen trunk of *Castanopsis*, Dai 10487.
- Junghuhnia luteoalba* (P. Karst.) Ryvar den, living *Castanopsis* tree, Dai 10452.
- Junghuhnia nitida* (Pers.) Ryvar den, fallen branch of *Idesia*, Cui 7920.
- Laetiporus sulphureus* (Bull.) Murrill s.l., living angiosperm tree, Cui 7882; fallen angiosperm trunk, Cui 7928; living *Castanea* tree, Cui 5929, 5934, 5941 & 5952; living *Castanopsis* tree, Dai 10600; fallen trunk of *Castanopsis*, Dai 10448.
- Laetiporus versiporus* (Lloyd) Imazeki, living angiosperm tree, Cui 6007 & 6014.
- Lenzites betulinus* (L.) Fr., fallen angiosperm branch, Dai 7357.
- Lenzites vespacea* (Pers.) Pat., fallen angiosperm branch, Cui 5918; fallen angiosperm trunk, Cui 5958, 5981, 6061 & 7740, Dai 10395 & 10564.

- Megasporoporia setulosa* (Henn.) Rajchenb., fallen angiosperm branch, *Cui* 6077.
- Megasporoporia subcavernulosa* Y.C. Dai & Sheng H. Wu, fallen angiosperm branch, *Dai* 7304.
- Microporus affinis* (Blume & Nees) O. Kuntze, fallen angiosperm trunk, *Cui* 7714, 7727 & 7744, *Dai* 10566 & 10602; living *Castanopsis* tree, *Cui* 7840; dead *Lithocarpus* tree, *Dai* 10432.
- Nigroporus vinosus* (Berk.) Murrill, rotten angiosperm wood, *Dai* 10453; rotten wood of *Castanopsis*, *Cui* 7777; fallen trunk of *Cunninghamia*, *Cui* 7773; dead *Elaeocarpus* tree, *Dai* 10414; rotten wood of *Schima*, *Cui* 7790, 7800 & 7832; stump of *Schima*, *Cui* 7854.
- Oxyporus corticola* (Fr.) Ryvardeen, fallen branch of *Vernicia*, *Cui* 7914.
- Oxyporus cuneatus* (Murrill) Aoshima, fallen branch of *Alnus*, *Cui* 7898; fallen trunk of *Cunninghamia*, *Cui* 6022 & 7893, *Dai* 10579; fallen trunk of *Metasequoia*, *Dai* 10506.
- Oxyporus obducens* (Pers.) Donk, fallen trunk of *Idesia*, *Cui* 7810 & 7842; living *Schima* tree, *Cui* 7805.
- Oxyporus populinus* (Schumach.) Donk, living *Acer* tree, *Cui* 6048; stump of *Castanopsis*, *Cui* 6054; dead *Liquidambar* tree, *Dai* 10476; living *Machilus* tree, *Cui* 7903; living *Michelia* tree, *Dai* 10555; living *Platanus* tree, *Cui* 6002.
- Perenniporia* cf. *corticola* (Corner) C. Decock, rotten wood of *Pinus*, *Dai* 7330.
- Perenniporia fraxinea* (Bull.) Ryvardeen, stump of *Cinnamomum*, *Cui* 5937; dead *Sorbus* tree, *Dai* 10440.
- Perenniporia medulla-panis* (Jacq.) Donk, fallen trunk of *Alnus*, *Dai* 10393; living angiosperm tree, *Dai* 10592.
- Perenniporia minutissima* (Yasuda) T. Hatt. & Ryvardeen, dead angiosperm tree, *Cui* 6053.
- Perenniporia narymica* (Pilát) Pouzar, dead angiosperm tree, *Dai* 10510.
- Perenniporia ochroleuca* (Berk.) Ryvardeen, fallen angiosperm trunk, *Cui* 7828; fallen trunk of *Lithocarpus*, *Dai* 10437; fallen trunk of *Rhododendron*, *Cui* 7826; fallen branch of *Sassafras*, *Dai* 10547.
- Perenniporia subacida* (Peck) Donk, angiosperm stump, *Cui* 6004 & 6006; fallen trunk of *Pinus*, *Dai* 10596.
- Perenniporia tephropora* (Mont.) Ryvardeen, fallen angiosperm trunk, *Dai* 10594; fallen branch of *Betula*, *Dai* 10545; living *Castanea* tree, *Cui* 5930, 5931, 5932 & 5949; fallen trunk of *Castanea*, *Cui* 5946; fallen branch of *Sassafras*, *Dai* 10542.
- Phellinus baumii* Pilát, living *Lonicera* tree, *Cui* 6001, 6010 & 6012.
- Phellinus collinus* Y.C. Dai & Niemelä, fallen angiosperm trunk, *Cui* 7758; living *Liquidambar* tree, *Cui* 7909; stump of *Quercus*, *Cui* 7825.
- Phellinus contiguus* (Pers.) Pat., fallen angiosperm trunk, *Cui* 6024, *Dai* 10483; fallen trunk of *Rhododendron*, *Cui* 7837.
- Phellinus ferreus* (Pers.) Bourdot & Galzin, dead angiosperm tree, *Dai* 10621; fallen angiosperm branch, *Cui* 6033 & 7812; fallen angiosperm trunk, *Dai* 10590 & 10603; fallen trunk of *Machilus*, *Dai* 10514.
- Phellinus gilvus* (Schwein.) Pat., dead angiosperm tree, *Cui* 5908, 5966, 6041 & 6089; fallen angiosperm trunk, *Cui* 7729 & 7735; dead *Broussonetia* tree, *Dai* 10611; fallen branch of *Castanopsis*, *Dai* 10456; fallen trunk of *Castanopsis*, *Cui* 7843; fallen trunk of *Idesia*, *Cui* 7863; living *Nerium* tree, *Cui* 5961; fallen trunk of *Prunus*, *Cui* 7869; fallen trunk of *Schima*, *Cui* 7816.
- Phellinus inermis* (Ellis & Everhart) G. Cunn., fallen trunk of *Albizia*, *Dai* 10411; fallen trunk of *Alnus*, *Cui* 7775; living angiosperm tree, *Cui* 6016; fallen angiosperm trunk, *Cui* 5975 & 6098; living *Betula* tree, *Dai* 10546; living *Castanea* tree, *Cui* 5936; fallen trunk of *Castanopsis*, *Dai* 10409; fallen trunk of *Cyclobalanopsis*, *Dai* 10520; dead *Elaeocarpus* tree, *Dai* 10515; fallen trunk of *Hovenia*, *Dai* 10468; fallen trunk of *Lithocarpus*, *Dai* 10445; living *Melia* tree, *Dai* 10550; living *Photinia* tree, *Dai* 10554; dead *Quercus* tree, *Dai* 10472; dead *Rhododendron* tree, *Dai* 10435; living *Toona* tree, *Dai* 10544 & 10548.
- Phellinus kanehirae* (Yasuda) Ryvardeen, fallen trunk of *Schima*, *Dai* 10418.
- Phellinus rhabarbarinus* (Berk.) G. Cunn., living angiosperm tree, *Cui* 5944; dead angiosperm tree, *Cui* 5962, *Dai* 10568; angiosperm stump, *Cui* 7839; dead *Castanea* tree, *Dai* 10498; living *Cunninghamia* tree, *Dai* 10369; stump of *Dalbergia*, *Cui* 7880, *Dai* 10516; dead *Pyrus* tree, *Cui* 5933 & 5935.
- Phellinus setifer* T. Hatt., fallen trunk of *Liquidambar*, *Cui* 7859.
- Phellinus tenuiculus* B.K. Cui, fallen angiosperm branch, *Cui* 7929; fallen angiosperm trunk, *Cui* 7866; fallen trunk of *Castanopsis*, *Cui* 7782.
- Phylloporia ribis* (Schumach.) Ryvardeen, living *Nandina* tree, *Dai* 10588 & 10625.
- Piptoporus soloniensis* (Dubois) Pilát, stump of *Castanea*, *Cui* 5947; fallen trunk of *Castanopsis*, *Cui* 7900.
- Polyporus badius* (Pers.) Schwein., fallen angiosperm trunk, *Dai* 7297.
- Polyporus mikawai* Lloyd, fallen angiosperm branch, *Cui* 5927.
- Polyporus mori* (Pollini) Fr., fallen branch of *Castanopsis*, *Cui* 7814.
- Polyporus varius* (Pers.) Fr., living angiosperm tree, *Dai* 7335.
- Postia alni* Niemelä & Vampola, fallen trunk of *Alnus*, *Dai* 10463; fallen angiosperm trunk, *Cui* 6066; fallen branch of *Osmanthus*, *Dai* 10549.
- Postia caesia* (Schrad.) P. Karst., fallen branch of *Abies*, *Cui* 6017; fallen trunk of *Abies*, *Cui* 6050.
- Postia fragilis* (Fr.) Jülich, fallen angiosperm trunk, *Cui* 6065.
- Postia gloeocystidiata* Y.L. Wei & Y.C. Dai, fallen branch of *Abies*, *Cui* 6009; fallen branch of *Pinus*, *Cui* 6023.
- Postia hibernica* (Berk. & Broome) Jülich, fallen angiosperm trunk, *Cui* 6067.
- Postia lactea* (Fr.) P. Karst., living *Hovenia* tree, *Cui* 7890.
- Postia leucomallella* (Murrill) Jülich, fallen branch of *Abies*, *Cui* 6011.
- Postia* cf. *subcaesia* (A. David) Jülich, fallen angiosperm trunk, *Dai* 7314 & 7325.
- Postia tephroleuca* (Fr.) Jülich, fallen branch of *Abies*, *Cui* 6020.

- Protomerulius caryae* (Schwein.) Ryvar den, fallen angiosperm trunk, *Cui* 7885; stump of *Prunus*, *Dai* 10412.
- Pseudofavolus cucullatus* (Mont.) Pat., dead *Dalbergia* tree, *Cui* 7871; fallen trunk of *Machilus*, *Cui* 7913.
- Pycnoporus sanguineus* (L.) Murrill, fallen trunk of *Alnus*, *Dai* 10374; fallen angiosperm branch, *Cui* 5983 & 6013; fallen angiosperm trunk, *Cui* 5993, 6047 & 6101, *Dai* 10389 & 10567; fallen branch of *Castanea*, *Cui* 5942; fallen trunk of *Cunninghamia*, *Cui* 7724.
- Pyrrhoderma adamantinum* (Berk.) Imazeki, angiosperm root, *Dai* 10553.
- Pyrrhoderma sendaiense* (Yasuda) Imazeki, dead angiosperm tree, *Cui* 6088, 6093 & 6105.
- Rigidoporus crocatus* (Pat.) Ryvar den, rotten wood of *Tsuga*, *Dai* 7348.
- Rigidoporus eminens* Y.C. Dai, fallen branch of *Dalbergia*, *Cui* 7918.
- Rigidoporus minutus* B.K. Cui & Y.C. Dai, fallen angiosperm trunk, *Cui* 7774 & 7876; angiosperm stump, *Cui* 7831; fallen trunk of *Castanopsis*, *Cui* 7814, *Dai* 10507; rotten wood of *Castanopsis*, *Dai* 10427.
- Rigidoporus vinctus* (Berk.) Ryvar den, dead angiosperm tree, *Dai* 10569; fallen angiosperm trunk, *Dai* 10394; dead *Castanopsis* tree, *Dai* 10466; fallen trunk of *Ilex*, *Dai* 10503; living tree of *Pinus*, *Cui* 6057.
- Skeletocutis alutacea* (J. Lowe) Jean Keller, fallen branch of *Pinus*, *Cui* 6049; rotten wood of *Pinus*, *Cui* 6071 & 6073.
- Skeletocutis amorpha* (Fr.) Kotl. & Pouzar, dead tree of *Pinus*, *Dai* 7310.
- Skeletocutis nivea* (Jungh.) Jean Keller, fallen angiosperm branch, *Cui* 7833, *Dai* 10449; fallen angiosperm trunk, *Cui* 7829.
- Tinctoporellus epimiltinus* (Berk. & Broome) Ryvar den, living angiosperm tree, *Cui* 7711 & 7905; fallen angiosperm trunk, *Cui* 7864; angiosperm stump, *Cui* 7809; dead *Bothrocaryum* tree, *Dai* 10505; stump of *Castanopsis*, *Dai* 10518; dead *Cerasus* tree, *Dai* 10501; dead *Rhus* tree, *Cui* 7892.
- Trametes elegans* (Spreng.) Fr., fallen trunk of *Alnus*, *Cui* 7716, 7718, 7730 & 7738; fallen angiosperm trunk, *Cui* 7776 & 7870; fallen trunk of *Cyclobalanopsis*, *Cui* 7783; fallen trunk of *Phoebe*, *Cui* 7817; fallen trunk of *Sapium*, *Cui* 7856.
- Trametes gibbosa* (Pers.) Fr., dead *Acer* tree, *Dai* 10558; dead angiosperm tree, *Cui* 7910; fallen trunk of *Alnus*, *Cui* 7713, 7736, 7742, 7748 & 7847; fallen angiosperm trunk, *Cui* 7860, 7865 & 7875; angiosperm stump, *Dai* 10565; stump of *Liquidambar*, *Dai* 10371; fallen trunk of *Machilus*, *Cui* 7891; dead *Sapium* tree, *Cui* 7879.
- Trametes hirsuta* (Wulfen) Pilát, fallen trunk of *Alnus*, *Cui* 7720, *Dai* 10392 & 10494; fallen angiosperm branch, *Cui* 6027 & 6086; fallen angiosperm trunk, *Cui* 5904, 5953, 5991, 7749 & 7889, *Dai* 10613; fallen trunk of *Elaeocarpus*, *Cui* 7784; fallen trunk of *Phoebe*, *Cui* 7858 & 7862; fallen trunk of *Quercus*, *Cui* 7868.
- Trametes lactinea* (Berk.) Sacc., fallen angiosperm trunk, *Cui* 6097.
- Trametes orientalis* (Yasuda) Imazeki, living *Platanus* tree, *Cui* 6037; fallen trunk of *Quercus*, *Cui* 7781 & 7788.
- Trametes pubescens* (Schumach.) Pilát, fallen trunk of *Alnus*, *Dai* 10375; fallen angiosperm branch, *Cui* 5905; fallen angiosperm trunk, *Cui* 5951, *Dai* 10571; fallen trunk of *Castanopsis*, *Dai* 10513; fallen branch of *Machilus*, *Cui* 7897; fallen branch of *Abies*, *Cui* 6015.
- Trametes suaveolens* (L.) Fr., fallen angiosperm branch, *Dai* 10460; fallen angiosperm trunk, *Cui* 6092, *Dai* 10436.
- Trametes versicolor* (L.) Pilát, fallen trunk of *Alnus*, *Dai* 10400 & 10442; fallen angiosperm branch, *Cui* 5922, 5982, 6025 & 6059; fallen angiosperm trunk, *Cui* 5954, 5976, 5996, 6046 & 7717, *Dai* 10577 & 10628; dead *Camellia* tree, *Dai* 10539; fallen trunk of *Castanea*, *Cui* 5939; living *Nerium* tree, *Cui* 5967; living *Rohdea* tree, *Cui* 5964.
- Trichaptum abietinum* (Pers.) Ryvar den, fallen trunk of *Pinus*, *Cui* 6085; fallen trunk of *Pinus*, *Dai* 10396.
- Trichaptum fuscoviolaceum* (Ehrenb.) Ryvar den, fallen gymnosperm trunk, *Cui* 5985; fallen trunk of *Cunninghamia*, *Dai* 10576; fallen trunk of *Pinus*, *Cui* 6055 & 7846.
- Trichaptum laricinum* (P. Karst.) Ryvar den, fallen trunk of *Cunninghamia*, *Cui* 7857.
- Trichaptum pargamenum* (Fr.) G. Cunn., fallen angiosperm trunk, *Dai* 10598.
- Tyromyces chioneus* (Fr.) P. Karst., fallen trunk of *Cyclobalanopsis*, *Dai* 10426 & 10441.
- Wrightoporia lenta* (Oveh. & J. Lowe) Pouzar, rotten wood of *Cunninghamia*, *Dai* 10462 & 10473; stump of *Cunninghamia*, *Cui* 7804 & 7922.

***Phellinus tenuiculus* B.K. Cui, sp. nova**
(Fig. 2)

Mycobank no.: MB 516033

Carpophorum annuum, resupinatum. Facies pororum fulva vel hinnulea; pori rotundi, 5–8 per mm. Systema hypharum dimiticum, hyphae generatoriae septatae, efibulatae. Sporae ellipsoideae, crassitunicatae, IKI–, CB(+), 4–5.1 × 2.3–4.3 μm.

TYPE: China. Jiangxi Province, Fenyi County, Dagang Mountains, on fallen trunk of *Castanopsis*, 22.IX.2009 *Cui* 7782 (holotype BJFC; isotype IFP). — PARATYPES: China. Jiangxi Prov., Fenyi County, Dagang Mountains, on fallen angiosperm trunk, 23.IX.2009 *Cui* 7866 (BJFC & IFP); on fallen angiosperm branch, 23.IX.2009 *Cui* 7929 (BJFC & IFP).

ETYMOLOGY. Epithet *tenuiculus* (Lat.), referring to the very thin basidiocarps.

FRUITBODY. Basidiocarps annual, resupinate, firmly attached to the substrate, not readily separable, with no odour or taste when fresh, woody hard when dry, up to 15 cm long in longest dimension, 4 cm wide, and 2 mm thick at centre;

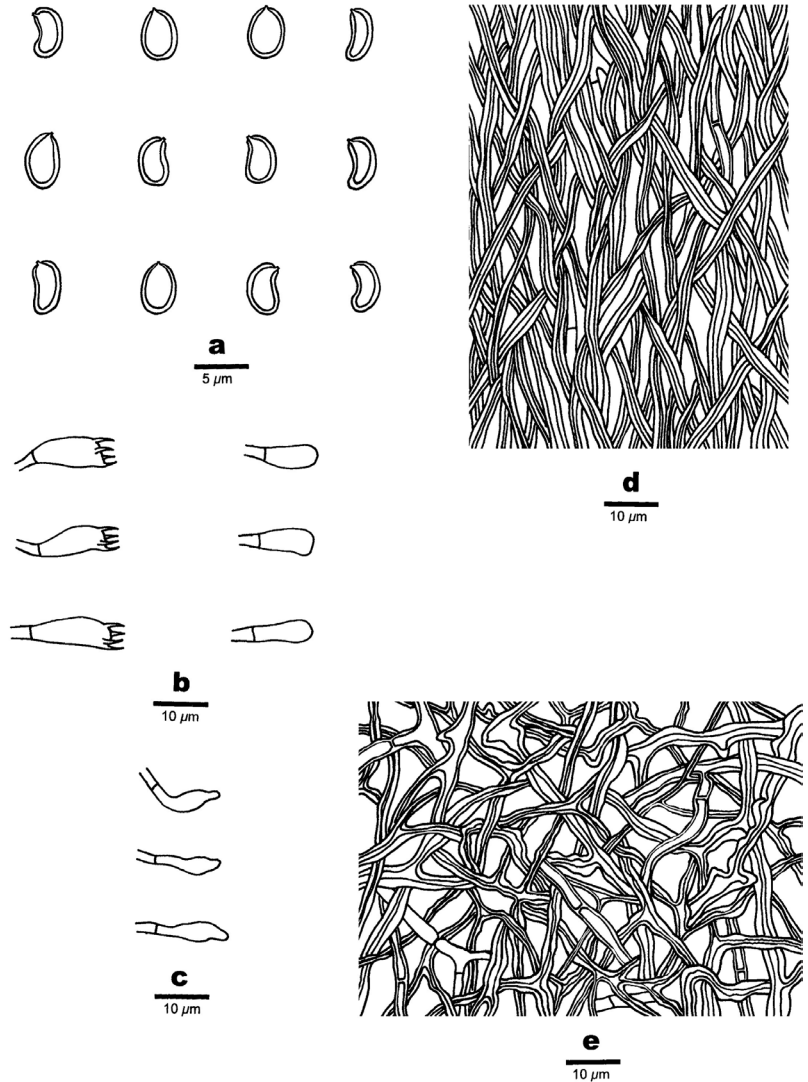


Fig. 2. Microscopic structures of *Phellinus tenuiculus* (from the holotype). — **a:** Basidiospores. — **b:** Basidia and basidioles. — **c:** Cystidioles. — **d:** Hyphae from trama. — **e:** Hyphae from subiculum.

sterile margin narrow to almost lacking, pale buff to pale yellowish brown, less than 1 mm wide. Pore surface yellowish brown to fawn-brown, with slight silky sheen; pores round, 5–8 per mm; dissepiments thin, entire. Subiculum cinnamon-brown to fawn-brown, hard corky, about 0.1 mm thick. Tubes concolorous with pores, woody hard, up to 2 mm long. **HYPHAL STRUCTURE.** Hyphal system dimittic; all septa without clamp connections; skeletal hyphae IKI–, CB–; tissue darkening but otherwise unchanged in KOH. **SUBICULUM.** Generative hyphae hyaline to pale yellowish, thin- to fairly thick-walled, occasionally branched and with frequent simple

septa, 1.5–3.5 μm in diam; skeletal hyphae yellowish brown to reddish brown, thick-walled to almost solid, occasionally branched, interwoven, 2–4.5 μm in diam. **TUBES.** Generative hyphae hyaline to pale yellowish, thin- to slightly thick-walled, occasionally branched, 1.2–3 μm in diam; skeletal hyphae yellowish brown to reddish brown, thick-walled with a wide to narrow lumen, agglutinated, 2–4 μm in diam. Hymenial setae absent. Cystidia absent, fusoid to subulate cystidioles occasionally present, 10–16 \times 3–4 μm ; basidia clavate, with four sterigmata and a simple septum at the base, 9–13 \times 4.5–6 μm ; basidioles in shape similar to basidia,

but slightly smaller. Rhomboid crystals frequent in trama and hymenium.

SPORES. Basidiospores ellipsoid, yellowish brown, fairly thick-walled, smooth, IKI–, weakly to moderately CB+ when juvenile, usually collapsed when mature, $(3.8-4-5.1(-5.4) \times (2-2.3-4.3(-4.5) \mu\text{m}, L = 4.56 \mu\text{m}, W = 3.4 \mu\text{m}, Q = 1.3-1.37 (n = 120/3).$

TYPE OF ROT. White rot.

Phellinus tenuiculus is characterized by an annual growth habit, resupinate and very thin basidiocarps, complete lack of setae, and by ellipsoid, yellowish brown and fairly thick-walled basidiospores, which usually are collapsed in dry herbarium specimens. These characters distinguish it from the other species in the genus. Macroscopically, *P. tenuiculus* may be confused with *P. ferreus* by having resupinate basidiocarps and similar pores. However, *P. ferreus* has hymenial setae, and its spores are cylindrical and hyaline (Dai 1999).

Five species in *Phellinus*, *P. adhaerens*, *P. inermis*, *P. melanoporus*, *P. membranaceus*, and *P. umbrinellus*, have resupinate basidiocarps, coloured basidiospores, and lack hymenial setae (Larsen & Cobb-Pouille 1990). *Phellinus adhaerens* differs from *P. tenuiculus* by its larger pores (3–4 per mm), ellipsoid and perfectly shaped, brown and thin-walled basidiospores ($4.1-4.6 \times 2.6-3.6 \mu\text{m}$; Wright & Blumenfeld 1984, Larsen & Cobb-Pouille 1990). *Phellinus inermis* is perennial, and it has thick basidiocarps, ovoid to broadly ellipsoid and regular, reddish brown to golden brown basidiospores ($5-6 \times 4-4.5 \mu\text{m}$; Larsen & Cobb-Pouille 1990). *Phellinus melanoporus* differs from *P. tenuiculus* in being perennial and in having bright yellowish brown basidiocarps with yellow and radially fimbriate margins, and ovoid to ellipsoid basidiospores ($4-5 \times 3-3.5 \mu\text{m}$; Larsen & Cobb-Pouille 1990). *Phellinus membranaceus* can be distinguished from *P. tenuiculus* by its smaller basidiospores ($3.1-4.2 \times 2.6-3.1 \mu\text{m}$; Wright & Blumenfeld 1984). The pores of *P. umbrinellus* are smaller (8–9 per mm) than in *P. tenuiculus* and the basidiospores are subglobose, rust brown ($3.3-4.2 \times 2.8-3.3 \mu\text{m}$; Larsen & Cobb-Pouille 1990).

Phellinus collinus was described from China (Dai et al. 2003). It is a setaeless species; also it has collapsed, golden yellow basidiospores

($4.1-5 \times 3-3.5 \mu\text{m}$), but its basidiospores are perennial and pileate (Dai et al. 2003).

Discussion

Heterobasidion insulare has been reported many times from eastern China (Zhao 1998, Núñez & Ryvarden 2001), but recent studies have shown it to be in fact a species complex (Dai et al. 2002b, Ota et al. 2006, Dai et al. 2007b). According to mating tests and morphological studies, two recently described taxa, *Heterobasidion ecrustum* and *H. australe*, are present in the province (Dai & Korhonen 2009, Tokud et al. 2009).

Laetiporus sulphureus has been considered a rather common species in the northern hemisphere (Gilbertson & Ryvarden 1986, Ryvarden & Gilbertson 1993, Núñez & Ryvarden 2001), and it was recorded as a forest pathogen in China (Dai et al. 2007a). Recent studies showed that more taxa are involved in this complex (Banik & Burdsall 2000, Ota et al. 2009), and two species, *Laetiporus cremeiporus* and *L. montanus*, are also found in NE China (Ota et al. 2009). We did not make molecular studies with Chinese materials, and therefore we keep the old collective name *Laetiporus sulphureus* s. lato for our Jiangxi specimens.

Phellinus setifer is new to the Chinese fungal flora; it was described from Japan by Hattori (1999), characterized by large pores (2–4 per mm), a very thin context, abundant setae, and thin-walled, cylindrical basidiospores ($5.5-7.5 \times 1.5-2.5 \mu\text{m}$). The present collection is the second record of the species after its original description.

Eighty-six species of polypores were recently recorded from the Dagang Mountains in the Jiangxi Province (Wang et al. 2009), and 63 more species were found in different areas of Jiangxi in our study. Now 149 polypores are known from the province. Of them, *Antrodiella zonata*, *Bjerkandera adusta*, *Daedaleopsis tricolor*, *Ganoderma australe*, *Hyphodontia flavipora*, *Irpex lacteus*, *Phellinus gilvus*, *Trametes hirsute*, *T. pubescens* and *T. versicolor* are the most common species, and they can be found in almost every studied location. *Antrodiella gypsea* is common in the gymnosperm forests, *Pycnoporus sanguineus* is common in exposed dry sites, and

Antrodiella brunneimontana, *Fomitiporia bannaensis*, *Lenzites vespacea*, *Microporus affinis*, *Nigroporus vinosus*, *Perenniporia tephropora*, *Phellinus inermis*, *Phellinus rhabarbarinus*, *Trametes elegans* and *T. gibbosa* are common in the forests. *Abortiporus biennis*, *Antrodia oleracea*, *A. vaillantii*, *Aurantiporus fissilis*, *Ceriporia alachuana*, *C. crassitunicata*, *Echinochaete russiceps*, *Fistulina hepatica*, *Fomitopsis spraguei*, *Inonotus cuticularis*, *I. cf. truncatioporus*, *Jung-huhnia collabens*, *J. japonica*, *Perenniporia narymica*, *Phellinus setifer*, *Skeletocutis amorphia* are rare in the studied areas.

Among the 149 polypores, four species (2.7% of the total) in the genus *Coltricia* are mycorrhizal fungi, 22 species (14.8% of the total) in the genus *Antrodia*, *Auriporia*, *Daedalea*, *Fistulina*, *Fomitopsis*, *Laetiporus*, *Piptoporus* and *Postia* cause a brown rot, and the remaining 123 species (82.5% of the total) cause a white rot.

According to earlier studies, 102 polypores are known from the Hunan Province, southern China (Dai *et al.* 2003), 144 polypores were recorded in the east Chinese Zhejiang Province (Cui & Dai 2007), and 155 polypores were found in the Fujian Province, eastern China (Cui *et al.* 2008). The vegetation in the Jiangxi Province includes warm temperate to subtropical forests which are similar to those in Hunan, Fujian and Zhejiang provinces, and the polypore flora is also fairly similar in all these provinces.

Acknowledgements

The research is financed by the Beijing Forestry University (Project no. BLYX200912), the Ministry of Science and Technology of China (Project no. 2008BADB0B03), and the National Natural Science Foundation of China (Project no. 30870013).

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