

Two new polypores from tropical China, and renaming two species of *Polyporus* and *Phellinus*

Yu-Cheng Dai

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Abstract Two new polypores, *Inonotus canaricola* sp. nov. and *Skeletocutis substellae* sp. nov., are described. Both of them were found in Hainan, tropical China. *I. canaricola* is distinct from other species in the genus by bearing a black cuticle at the upper surface, presence of hyphoid setae in the trama and hooked hymenial setae, and having yellowish brown and subglobose to globose basidiospores. *S. substellae* is very similar to *S. stellae* but differs from the latter by swollen skeletal hyphae in potassium hydrochloride (KOH) and smaller basidiospores. In addition, *Polyporus rhododendri* is renamed as *P. tai-baiensis*, because the previous name was illegitimate. A new combination, *Phellinus yunnanensis*, is proposed.

Keywords Hymenochaetaceae · Polyporaceae · Taxonomy · Wood-rotting fungi

Surveys on wood-rotting fungi in Hainan, southern China, were carried out during 2002–2009, and 232 poroid wood-decaying species were recorded from the island (Du and Cui 2009; Dai et al. 2011). During an additional field trip in Hainan on November 2010, I collected two noteworthy polypores in *Inonotus* P. Karst. and *Skeletocutis* Kotl. & Pouzar. After detailed studies on them, these species are described below as *I. canaricola* sp. nov. and *S. substellae*

sp. nov. Microscopic features, measurements and drawings were made from slide preparations stained with Cotton Blue (CB) 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 are shown in parentheses. Abbreviations include IKI (iodine and potassium chloride) (Melzer's reagent, with IKI– = inamyloid), KOH (potassium hydrochloride) [5% (w/v) KOH solution], and CB (with CB– = acyanophilous). Additional abbreviations include *L* (mean spore length; arithmetic average 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* = *a/b* [number (*a*) of spores measured from given number (*b*) of specimens]. Special colour terms follow Petersen (1996).

Inonotus canaricola Y.C. Dai, sp. nov.
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Fig. 1

Basidiocarpium annuum, pileatum, solitarium. Facies pororum cinereo-brunnea; pori rotundi, 3–4 per millimetre. Systema hypharum monomiticum, hyphae contexti 3–6 µm in diametro; hyphae setales presentia, 106–160 × 7–11 µm; setae praesentes, hamatae, 25–50 × 6–10 µm. Sporae subglobosae vel globosae, flavidae, crassitunicatae, IKI–, CB–, 7–8.9 × 6.2–8 µm.

Holotypus: China. Hainan Province, Changjiang County, Bawangling Nat. Res., on dead tree of *Canarium pimela*, 27.XI.2010 Dai 12106 (holotype in BJFC, isotype in IFP). Etymology: *Canaricola* (Lat.), referring to inhabiting *Canarium*.

Basidiocarps annual, pileate, solitary, corky and without odour or taste when fresh. Pilei applanate, projecting up to 23-cm, 25-cm wide and 33-mm thick at base. Pileal surface dark brown to almost black, with a black cuticle, glabrous,

Y.-C. Dai (✉)
State Key Laboratory of Forest and Soil Ecology,
Institute of Applied Ecology, Chinese Academy of Sciences,
Shenyang 110016, China
e-mail: yuchengd@yahoo.com

Y.-C. Dai
Institute of Microbiology, Beijing Forestry University,
Beijing 100083, China

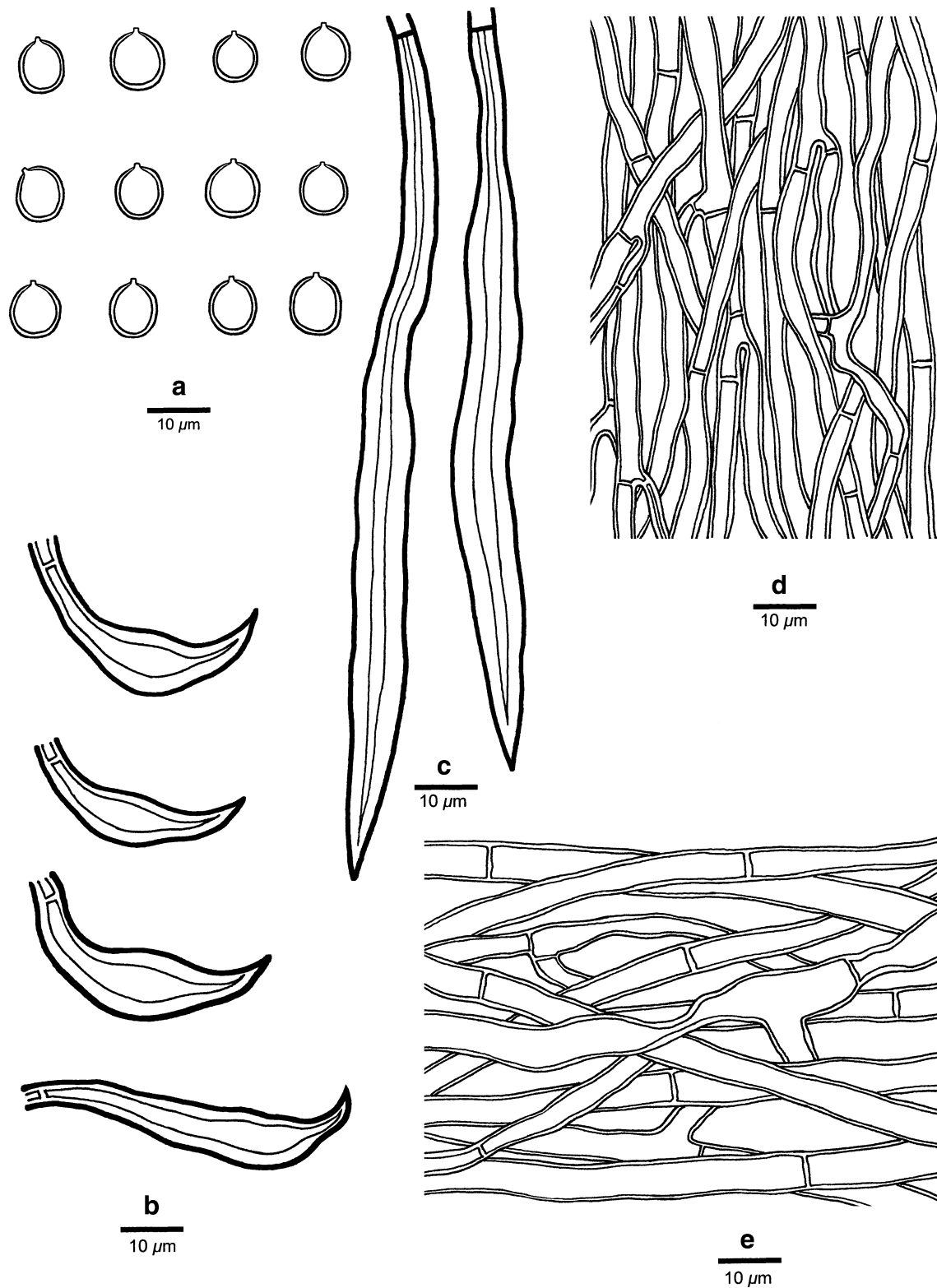


Fig. 1 Microscopic structures of *Inonotus canaricola* (drawn from the holotype). **a** Basidiospores. **b** Hymenial setae. **c** Hyphoid setae from trama. **d** Hyphae from trama. **e** Hyphae from context

uneven, azonate, slightly cracked when dry; margin blunt. Pore surface yellowish brown to dark brown, cracked when dry; pores circular, 3–4 per millimetre; dissepiments thin to moderately thick, entire. Context yellowish brown to dark brown, corky, up to 19-mm thick, tissues darkening but otherwise unchanged in KOH. Tubes yellowish brown, corky when dry, up to 14-mm long. Hyphal system monomitic; generative hyphae simple septate; Contextual hyphae yellowish brown, fairly thick-walled with a wide lumen, moderately branched, frequently septate, sometimes collapsed, loosely interwoven, 3- to 6- μm in diameter. Tramal hyphae yellowish to yellowish brown, slightly thick-walled with a wide lumen, frequently branched and septate, subparallel along the tubes, 2.5- to 5- μm in diameter. Hyphoid setae present in trama, not dominant, dark brown, distinctly thick-walled with a narrow to wide lumen, terminally pointed, more or less parallel along the tubes, $106\text{--}160 \times 7\text{--}11 \mu\text{m}$. Hymenial setae subulate and hooked, dark brown, distinctly thick-walled, $25\text{--}50 \times 6\text{--}10 \mu\text{m}$; hymenium collapsed, basidia and basidioles not seen. Basidiospores subglobose to globose, yellowish brown, thick-walled, IKI–, CB–, $7\text{--}8.9(-9.2) \times (6\text{--})6.2\text{--}8(-8.5) \mu\text{m}$, $L = 7.98 \mu\text{m}$, $W = 7.23 \mu\text{m}$, $Q = 1.1$ ($n = 30/1$).

I. canaricola is characterized by its large pileate basidiocarp with a black cuticle, presence of hyphoid setae in trama and hooked hymenial setae, and yellowish brown and subglobose to globose basidiospores.

I. hemmesii Gilb. & Ryvar den resembles *I. canaricola* by pileate basidiocarps with a black upper surface, similar pores as 3–4 per millimetre and presence of both hyphoid setae and hymenial setae, but it differs from the latter by ventricose hymenial setae (not hooked), and ellipsoid to ovoid basidiospores ($7\text{--}9 \times 5.5\text{--}7 \mu\text{m}$, Ryvar den 2005).

The following species also has distinctly pileate basidiocarps, hyphoid setae and hymenial setae: *I. albertinii* (Lloyd) P.K. Buchanan & Ryvar den, *I. ochroporus* (Van der Byl) Pegler and *I. rodwayi* D.A. Reid. However, *I. albertinii* has a semistipitate basidiocarp, bigger pores (1–3 per millimetre), ventricose hymenial setae and narrowly ellipsoid spores ($7\text{--}9 \times 4.5\text{--}5.5 \mu\text{m}$, Ryvar den 2005); *I. ochroporus* has smaller pores (5–7 per millimetre), ventricose hymenial setae and smaller spores ($5.8\text{--}7 \times 4.9\text{--}6.2 \mu\text{m}$, Dai 2010); *I. rodwayi* has golden brown to greyish brown pileus surface, ventricose hymenial setae and ellipsoid spores ($7\text{--}8.5 \times 5.2\text{--}6.5 \mu\text{m}$, Dai 2010).

Skeletocutis substellae Y.C. Dai, sp. nov. Fig. 2
Mycobank no.: MB 561218

Basidiocarpium annuum, resupinatum, contextum cremeum. Facies pororum crenea vel bubalina; pori rotundi vel angulati, 8–9 per millimetre. Systema hypharum dimiticum, hyphae generatoriae fibulatae, hyphae

skeletales subiculi 2.8–4.5 μm in diametro; hyphae in trama et in orificio pororum incrustatae. Sporae hyalinae, allantoidae, IKI–, CB–, $2.8\text{--}3.5 \times 0.7\text{--}1 \mu\text{m}$.

Holotypus: China. Hainan Province, Changjiang County, Bawangling Nat. Res., on rotten wood of *Dacrydium pierrei*, 25.XI.2010 Dai 12041 (holotype in BJFC, isotype in IFP).

Etymology: Substellae (Lat.), referring to reminding *S. stellae* (Pilát) Jean Keller.

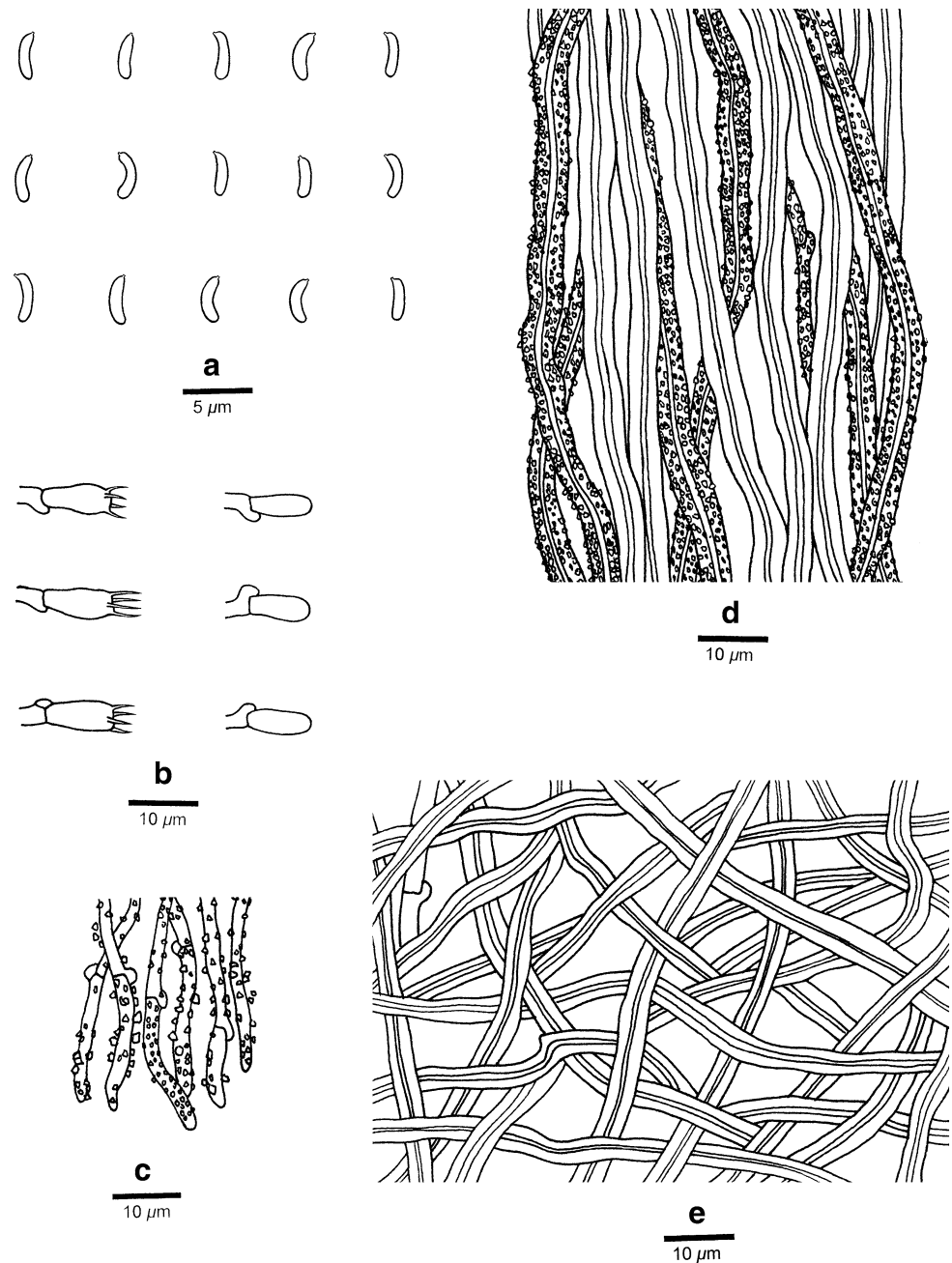
Basidiocarps annual, resupinate, inseparable, soft when fresh, becoming corky upon drying, up to 3-cm long, 2.5-cm wide, and 4-mm thick at centre. Pore surface cream when fresh, cream to buff when dry; pores round to angular, 8–9 per millimetre; dissepiments thin, entire to slightly lacerate. Subiculum cream and soft corky when dry, up to 1-mm thick; tubes cream, paler than pore surface, up to 3-mm long; tubes stratified into two layers, a thin white context layer present between them.

Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal hyphae dominant and swollen in KOH. Generative hyphae in subiculum scanty, hyaline, thin-walled, occasionally branched, 2- to 3- μm in diameter; subicular skeletal hyphae dominant, thick-walled to sub-solid, unbranched, interwoven, 2.8- to 4.5- μm in diameter, up to 10- μm in diameter in KOH. Tramal generative hyphae hyaline, thin-walled, commonly encrusted by fine crystals, 1.8- to 2.5- μm in diameter; skeletal hyphae in trama dominant, thick-walled to subsolid, unbranched, subparallel along the tubes, commonly encrusted by fine crystals, 3- to 4.5- μm in diameter. Hyphae at dissepiment edges very thin-walled, fairly straight, often richly encrusted. Basidia clavate, with four sterigmata and a basal clamp connection, $9.5\text{--}12 \times 3\text{--}4 \mu\text{m}$; basidioles in shape similar to basidia, but slightly smaller. Basidiospores allantoid, hyaline, thin-walled, smooth, IKI–, CB–, $(2.6\text{--})2.8\text{--}3.5(-3.7) \times (0.6\text{--})0.7\text{--}1 \mu\text{m}$, $L = 3.08 \mu\text{m}$, $W = 0.84 \mu\text{m}$, $Q = 3.61\text{--}3.77$ ($n = 60/2$).

S. substellae is characterised by its small pores (8–9 per millimetre), swollen skeletal hyphae in KOH and small basidiospores ($2.8\text{--}3.5 \times 0.7\text{--}1 \mu\text{m}$).

S. substellae can be taken for *S. stellae* in the field because of the similar macromorphology and substrates. However, *S. stellae* has longer spores ($3.2\text{--}4 \times 0.8\text{--}1 \mu\text{m}$, Niemelä 1998) and abundant cystidioles, and its skeletals are not swollen in KOH (Niemelä 1998). Another species with narrow spores and dimitic trama is *S. hymeniicola* (Murrill) Niemelä, and it differs from *S. substellae* by smaller pores (8–11 per millimetre), narrower skeletal hyphae (1.9- to 2.5- μm in diameter) not swollen in KOH and longer basidiospores ($3.4\text{--}3.9 \times 0.8\text{--}0.9 \mu\text{m}$, Niemelä 1998).

Fig. 2 Microscopic structures of *Skeletocutis substellae* (drawn from the holotype). **a** Basidiospores. **b** Basidia and basidioles. **c** Hyphae from dissepiment edge. **d** Hyphae from trama. **e** Hyphae from subiculum



Additional specimen (paratype) examined: China. Hainan Province, Changjiang County, Bawangling Nat. Res., on rotten wood of *Castanopsis hystrix*, 25.XI.2010 Dai 12046 (BJFC).

A note on other species

Polyporus rhododendri Y.C. Dai & H.S. Yuan was described by Dai et al. (2009), but it is a later homonym of *P. rhododendri* Schwein. (Trans. Am. Phil. Soc., New Series 7:158, 1832; Overholts 1923). Here, I propose

P. taibaiensis to replace the former. *P. taibaiensis* Y.C. Dai, nom. nov. (replaced synonym: *P. rhododendri* Y.C. Dai & H.S. Yuan, Ann. Bot. Fenn. 46:58, 2009). The etymology of the new name refers to its locality, Taibai Mts.

Fuscoporia yunnanensis Y.C. Dai was recently described from China (Dai 2010). Because *Phellinus* Quél. s. l. (including *Fulvifomes* Murrill, *Fuscoporia* Murrill, *Phellinopsis* Y.C. Dai, *Phellopilus* Niemelä, T. Wagner & M. Fisch. and *Porodaedalea* Murrill) is widely used in most publications, the following combination is proposed. *Phellinus yunnanensis* (Y.C. Dai) Y.C. Dai, comb. nov.

(basionym: *F. yunnanensis* Y.C. Dai, Fungal Diversity 45:221, 2010).

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