

Type studies on polypores described by J. D. Zhao

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Type materials of 15 polypores described from China by Ji-Ding Zhao and other mycologists were re-examined. Nine of the 15 names are synonymized, two species are accepted, and one name is a *nomen dubium*; two species belong to other genera according to modern taxonomy, and one name is illegitimate. One new combination, *Funalia thujae* (J.D. Zhao) Y.C. Dai & H.S. Yuan, is proposed, and an illustrated description of it is given.

Key words: Aphyllophorales, Basidiomycota, fungi, morphology, nomenclature, taxonomy, type specimens

The Chinese mycologist Ji-Ding Zhao and his colleagues described around 50 apyllophoroid fungi during the 1980s and 1990s. Most of these taxa belong to the Ganodermataceae, but 15 of them were other polypores (Xu & Zhao 1980, Zhao *et al.* 1981, 1982, Zhao & Zhang 1983, Zhang & Zhao 1986, Zhao 1986, 1991a, 1991b). The types of these 15 polypores were studied, and the results are presented here. All types are preserved in the herbarium of the Institute of Microbiology, the Chinese Academy of Sciences (HMAS).

The taxa are alphabetically treated according to the original names. A name is followed by the protologue, information on the type and reference to current classification. The microscopic routine used in the study is as presented by Dai and Niemelä (1997), and special colour terms are from Petersen (1996) and Anonymous (1969).

Albatrellus henanensis J.D. Zhao & X.Q. Zhang

Acta Mycol. Sinica 10: 266. 1991. — TYPE: China. Hennan Prov., Lushi County, Shiziping, ground, VIII.1968 *Ying* 157 (HMAS 53936, holotype). = *Albatrellus tianschanicus* (Bondartsev) Pouzar.

The classification accepted here was earlier proposed by Núñez and Ryvarden (2001). Basidiospores in *A. henanensis* are slightly larger than those in *A. tianschanicus*, but all other characters fit *A. tianschanicus* well. For a detailed description of the species, see Ryvarden and Gilbertson (1993).

Fomitopsis hainaniana J.D. Zhao & X.Q. Zhang

Acta Mycol. Sinica 10: 114. 1991. — TYPE: China. Hainan

Prov., Limu Mts., 7.IV.1977 *Han 450* (HMAS 58978, holotype). = *Perenniporia martia* (Berk.) Ryvarden.

Núñez and Ryvarden (2001) came to the same conclusion, and the reader is referred to Decock and Figueroa (2000) for a good description.

***Fomitopsis sanmingensis* J.D. Zhao & X.Q. Zhang**

Acta Mycol. Sinica 10: 113. 1991. — TYPE: China. Fujian Prov., Sanming, rotten wood, 26.VI.1976 *Zhang 60* (HMAS 54083, holotype). = *Fomitopsis pseudopetchii* (Lloyd) Ryvarden.

The type is sterile, but some basidiospores were found on its upper surface; they are ellipsoid, slightly thick-walled, slightly cyanophilous, and $4\text{--}5 \times 2.5\text{--}3.8 \mu\text{m}$ larger than $3.5\text{--}4.5 \times 2 \mu\text{m}$ reported for *Fomitopsis pseudopetchii* by Núñez and Ryvarden (2001). For a detailed description of the species, see Núñez and Ryvarden (2001).

***Fuscoporia quercina* J.D. Zhao**

Acta Mycol. Sinica 5: 156. 1986. — TYPE: China. Beijing, Tanzhe Temple, fallen trunk of *Quercus*, XI.1956 *Zhao 2468* (HMAS 19110, holotype); VI.1950 *Zhao 66* (HMAS 16544, paratype), *Zhao 48* (HMAS 15481, paratype), *Zhao 537* (HMAS 15480, paratype).

The holotype and paratypes are totally sterile, and all the types are black materials similar to the sterile conks in *Inonotus obliquus* (Pers.: Fr.) Pilát, and the name is a *nomen dubium*.

***Polyporus rosulatus* J.D. Zhao & L.W. Xu**

Acta Microbiol. Sinica 21: 431. 1981, *nom. illeg.* — *Polyporus pekingensis* J.D. Zhao & L.W. Xu, Acta Microbiol. Sinica 22: 232. 1982. — TYPE: China. Beijing, Tong County, Matou, 14.IX.1979 *Xu 1137* (HMAS 39416, holotype). = *Jahnporus pekingensis* (J.D. Zhao & L.W. Xu) Y.C. Dai.

The first name was illegitimate, being a homonym of *Polyporus rosulatus* G. Cunn. (*Bull. N.Z. Dept. Sci. Industr. Res., Pl. Dis. Div.* 74: 36.

1948). Zhao *et al.* (1982) proposed as *nom. nov.* *Polyporus pekingensis*. Dai (2003) provided an illustrated description of the species.

***Polyporus sublignosus* J.D. Zhao & X.Q. Zhang**

Acta Mycol. Sinica 10: 269. 1991. — TYPE: China. Hainan Prov., Bawangling, alt. 800 m, ground, 18.IV.1977 *Han 803* (HMAS 54101, holotype). = *Laccocephalum hartmannii* (Cooke) Núñez & Ryvarden.

The holotype is a juvenile specimen, and its context is dominated by generative hyphae, but branched skeleto-binding hyphae are occasionally present. Basidiospores are distinctly fusiform, slightly smaller than those in *Laccocephalum hartmannii* ($6.5\text{--}7.5 \times 2.5\text{--}3.5 \mu\text{m}$ vs. $7\text{--}9 \times 2.5\text{--}3.5 \mu\text{m}$, Núñez & Ryvarden 1996). For a detailed description see Núñez and Ryvarden (2001).

***Polyporus xinjiangensis* J.D. Zhao & X.Q. Zhang**

Acta Microbiol. Sinica 21: 430. 1981. — TYPE: China. Xinjiang Auto., Reg., Tie Mts., alt. 3200, 29.VI.1977 *Mao 39* (HMAS 39487, holotype).

The type material is composed of large and imbricate basidiocarps, but is totally sterile, the hyphal structure is close to *Polyporus*, but the skeleto-binding hyphae are acyanophilous. Another specimen was collected on *Populus* from Xinjiang by the present authors, and it is fertile. It is a typical species of *Polyporus*, and its illustrated description was provided by Dai *et al.* (2007a).

***Polyporus yuananensis* X.Q. Zhang & J.D. Zhao**

Acta Mycol. Sinica, Supplement 1: 275. 1986. — TYPE: China. Hubei Prov., Yuan'an County, 27.VI.1984 *Yao 202* (HMAS 47826, holotype). = *Abortiporus biennis* (Bull.) Singer.

The type is in full accordance with *Abor-*

tiporus biennis. For a detailed description of the species, see Ryvarden and Gilbertson (1993).

***Rigidoporus hainanicus* J.D. Zhao & X.Q. Zhang**

Acta Mycol. Sinica 10: 267. 1991. — TYPE: China. Hainan Prov., Limushan, 10.IV.1977 *Han 619* (HMAS 59469, holotype). = *Rigidoporus ulmarius* (Sow. : Fr.) Imazeki.

The type material is a typical specimen of *R. ulmarius*, and the reader is referred to Ryvarden and Gilbertson (1994) for a good description.

***Sparsitubus nelumbiformis* L.W. Hsu & J.D. Zhao**

Acta Microbiol. Sinica 20: 237. 1980. — TYPE: China. Yunnan Prov., Simao County, on fallen angiosperm trunk, 13.IV.1957 *Xu 623* (HMAS 41035, holotype).

It is an accepted species, and an illustrated description was provided by Dai *et al.* (2007b).

***Trametes thujae* J.D. Zhao**

Acta Mycol. Sinica 10: 270. 1991. — *Funalia thujae* (J.D. Zhao) Y.C. Dai & H.S. Yuan, *comb. nova* (Fig. 1, MB 504751). — TYPE: China. Xizang, Changdu County, Xiangda, alt. 3600 m, on branch of *Thuja*, 8.VI.1976 *Zang 239* (HMAS 58278, holotype).

FRUITBODY. Basidiocarps annual to biennial, pileate, sometimes effused-reflexed, rarely resupinate, mostly solitary, rarely imbricate, coriaceous when fresh, corky and light in weight when dry, without odour or taste. Pileus dimidiate, projecting up to 3 cm long, 5 cm wide, 1 cm thick at the base; pileal surface honey yellow to ash grey or grayish brown with age, zonate or concentrically sulcate, pubescent or almost glabrous with age; margin obtuse. Pore surface cream when fresh, becoming grayish cream, olivaceous buff, or cinnamon brown when dry; pores angular, radically aligned or elongated, 0.5–1 per mm tangentially; dissepiments thin, slightly lacerate. Context white when fresh, becoming cream or clay buff when dry, homoge-

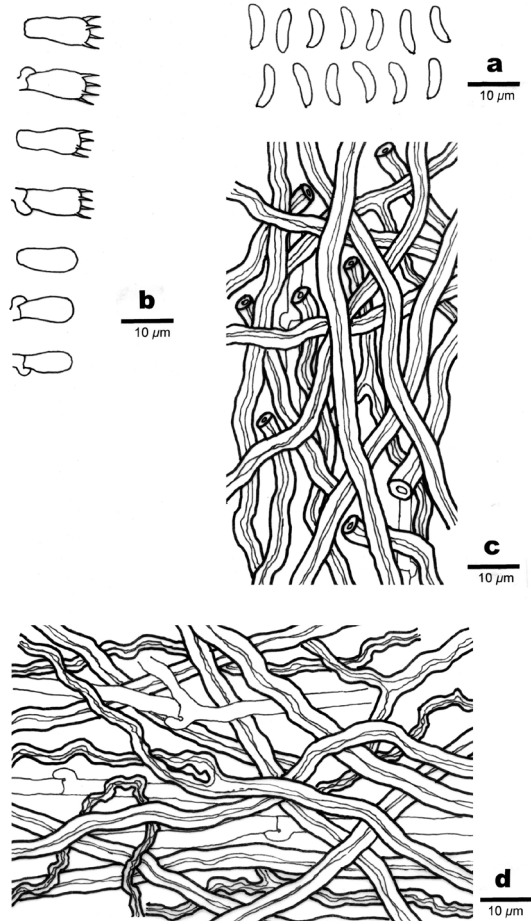


Fig. 1. Microscopic structures of *Funalia thujae* (drawn from the holotype). — a: Basidiospores. — b: Basidia and basidioles. — c: Hyphae from trama. — d: Hyphae from context.

neous, corky, azonate, up to 1 mm thick. Tubes concolorous with pore surface, leathery, up to 9 mm long; tube layers indistinct. *Hyphal structure.* Hyphal system dimitic; generative hyphae with clamp connections; skeletal hyphae dominant, negative in Melzer's reagent, cyanophilous in Cotton Blue, tissue unchanged in KOH.

CONTEXT. Generative hyphae frequent, hyaline, thin-walled, frequently branched, 2.5–4.5 µm in diam; skeletal hyphae fairly straight, thick-walled with a wide lumen, occasionally branched, some collapsed, interwoven, 4.5–6.5 µm in diam. *Tubes.* Generative hyphae infrequent, hyaline, thin-walled, occasionally branched, 2–3.5 µm in diam; skeletal hyphae fairly straight, thick-walled

with a wide lumen, occasionally branched, loosely interwoven, 2.5–5.5 μm , some skeletal elements encrusted by fine crystals. Cystidia and cystidioles absent; basidia clavate, with four sterigmata and a basal clamp connection, 11–15 \times 4.5–6 μm ; basidioles in shape similar to basidia, but slightly smaller. *Spores*. Basidiospores allantoid, hyaline, thin-walled, smooth, IKI–, CB–, (7–)7.2–8.8(–9.2) \times 2–2.5 μm , $L = 7.94 \mu\text{m}$, $W = 2.19 \mu\text{m}$, $Q = 3.63$ ($n = 31/1$).

TYPE OF ROT. White rot.

The basidiospores were reported as 3.5–6 \times 1.5–2.5 μm (Zhao & Zhang 1991), but after studying the holotype, we found that the basidiospores are rather bigger. The macro-characters of *Funalia thujae* are similar to *Trametes*, because its skeletal elements are cyanophilous in Cotton Blue, and it is therefore closer to *Funalia*.

Trametes junipericola Manjon, Moreno & Ryvarden described from central Spain (Ryvarden & Gilbertson 1994) may be related to *Funalia thujae*. However, it differs in having smaller pores (2–3 per mm) and bigger basidiospores (8–10 \times 3–4 μm).

Funalia cervina may also be closely related to *F. thujae*, both species having allantoid basidiospores, and the generative hyphae are frequent in context. However, *F. cervina* is an annual species with thinner basidiocarps, acute margin and smaller pores (2–3 per mm). Although *F. cervina* has similar spores as *F. thujae*, its contextual skeletal elements are distinctly thinner than those in the latter (2.5–4.5 μm vs. 4.5–6.5 μm).

ADDITIONAL SPECIMEN EXAMINED. **China**. Gansu Prov., Zhangye, Qilianshan Nat. Res., Sidalong Forest Farm, on fallen trunk of *Thuja*, 20.VIII.2005 Cui 2130 & 2134 (IFP).

***Tyromyces armeniacus* J.D. Zhao & X.Q. Zhang**

Acta Mycol. Sinica 2: 19. 1983. — TYPE: China. Fujian Prov., Sanming, rotten wood, 7.VII.1974 Jiang 459 (HMAS 40576, holotype). = *Piptoporus soloniensis* (Dubois : Fr.) Pilát.

The type material is sterile, but typical of *Piptoporus soloniensis*. For a detailed description of the species, see Ryvarden and Gilbertson (1994).

***Tyromyces imbricatus* J.D. Zhao & X.Q. Zhang**

Acta Mycol. Sinica 2: 21. 1983. — TYPE: China. Yunnan Prov., Simao County, dead angiosperm branch, 6.IV.1957 Xu 481 (HMAS 41929, holotype). = *Piptoporus soloniensis*.

The reader is referred to Ryvarden and Gilbertson (1994) for a description of the species.

***Tyromyces tibeticus* J.D. Zhao & X.Q. Zhang**

Acta Mycol. Sinica 2: 22. 1983. — TYPE: China. Xizang Auto., Reg., Bomi County, 6.VIII.1976 Zong 466 (HMAS 41227, holotype). = *Heterobasidion insulare* (Murrill) Ryvarden *sensu lato*.

For a detailed description of the species, see Ryvarden and Gilbertson (1993).

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