Taxonomy and multi-gene phylogeny of Datronia (Polyporales, Basidiomycota)

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Key words
ITS
nLSU
Polyoporaceae
RPB2
wood-inhabiting fungi

Abstract  Taxonomic and phylogenetic studies on Datronia were carried out. Phylogeny based on ITS, nLSU and RPB2 regions revealed that Datronia in current sense includes species belonging to three distantly related clades in polypores. The Datronia in a restricted sense is proposed for the clade including the type species D. mollis and D. stereotypes. Neodatronia gen. nov. was proposed for two new resupinate species, N. gaoligongensis and N. sinensis. Species of Neodatronia differ from Datronia s.s. by their resupinate basidiomes, moderately to frequently branched skeletal hyphae in subiculum. Datroniella gen. nov., typified by D. scutellata was proposed for species in the other clade. Four new species of Datroniella, D. melanocarpa, D. subtropica, D. tibetica and D. tropica, were identified. Species of Datroniella differ from Datronia s.s. by their moderately to frequently branched skeletal hyphae in context and absence of dendrohyphidia. While, differentiate from Neodatronia by their small pileate, effused-reflexed or rarely resupinate basidiomes and absence of dendrohyphidia. Illustrated descriptions of the new species and two new genera are provided. The main morphological differences between Datronia, Datroniella, Neodatronia and related genera are discussed, identification keys to related genera and species in each genus are provided.

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INTRODUCTION

Datronia Donk was established by Donk (1966) on D. mollis (Sommerf.) Donk. The genus is characterized by effused-reflexed basidiocarps, brown to black pileal surface which is tomentose or glabrous, more or less brownish context usually with a black line upwards, a dimitic hyphal system with clamped generative hyphae, hyaline, thin-walled and smooth basidiospores which are negative in Melzer’s reagent, and an ecology causing a white rot mainly on angiosperm wood (Gilbertson & Ryvarden 1986, Ryvarden 1991, Ryvarden & Gilbertson 1993, Nűhez & Ryvarden 2001). At present, eight species are accepted in the genus, D. decipiens (Bres.) Ryvarden, D. glabra Ryvarden, D. mollis, D. orcomanta Robledo & Rajchenb., D. perstrata (Corner) T. Hatt. & Sotome, D. scutellata (Schwein.) Gilb. & Ryvarden, D. sepiicolor (Corner) T. Hatt. & Sotome and D. stereotypes (Fr.) Ryvarden (Ryvarden 1987, 1988, Nűhez & Ryvarden 2001, Robledo et al. 2006, Hattori & Sotome 2013).

Phylogenetic studies showed that Datronia nested within the core polyporoid clade and was closely related to some species of Polyporus P. Micheli ex Adans, (Binder et al. 2005, Sotome et al. 2008, Ghobad-Nejhad & Dai 2010, Justo & Hibbett 2011, Sotome et al. 2013). However, only D. mollis and D. scutellata were sampled in the previous studies, and they were never clustered together as a monophyletic lineage (Sotome et al. 2008, Justo & Hibbett 2011). So, further phylogenetic analyses sampling more species are needed to clarify the relationships of Datronia and its related genera.

In the last two decades, extensive taxonomic studies of wood-inhabiting fungi in China have been carried out, and many new species were described based on morphological characters (Dai 1995, Dai & Niemelä 1997, Langer & Dai 1998, Dai et al. 2002, 2003, 2004, 2009, 2010, 2011, Cui & Dai 2006, Cui et al. 2011a, Dai 2010, Li & Cui 2010, He & Li 2011). Recently, molecular data along with morphology were used to certify the taxonomy and phylogeny of wood-inhabiting fungi in China (Cui et al. 2008, 2011b, Cui 2013, Cui & Decock 2013, Li & Cui 2013, Tian et al. 2013, Yuan 2013, Zhao & Cui 2013, Zhao et al. 2013). During investigations of wood-inhabiting fungi in China, nearly 200 specimens were preliminarily identified as Datronia spp., but their taxonomic affinities and phylogenetic relationships remain uncertain. The aim of this work is to clarify the taxonomy and phylogeny of Datronia species in China based on both morphological study and phylogenetic analysis using three genes (ITS, nLSU and RPB2).

MATERIAL AND METHODS

Morphological studies

For the studied specimens, most are deposited at the herbarium of the Institute of Microbiology, Beijing Forestry University (BJFC), while a few samples from Canada and Finland were provided by the Botanical Museum of the University of Helsinki (H). The microscopic procedure followed Cui & Zhao (2012). In presenting the variation in the size of the spores, 5% of measurements were excluded from each end of the range and were given in parentheses. In the text the following abbreviations are used: IKI = Melzer’s reagent, IKI− = both inamyloid and indetrinoid, KOH = 5% potassium hydroxide, CB = Cotton Blue, CB− = acyanophilous, CB+= cyanophilous, 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, n = number of spores measured/number of specimens. Special colour codes followed Petersen (1996).

DNA extraction, PCR amplification and sequencing

CTAB rapid plant genome extraction kit-DN14 (Aidlab Biotechnologies Co., Ltd., Beijing) was used to obtain PCR products
Phylogenetic analysis

Beside the sequences generated from this study, reference taxa for our phylogenetic analysis were selected based on Binder et al. (2005), Sotome et al. (2008, 2013), Justo & Hibbett (2011) and through searches in GenBank (Table 1). The phylogeny was inferred from combined ITS, nLSU and RP2B sequences. Sequences of each gene was initially aligned using ClustalX.93 (Chenna et al. 2003) and manually edited in BioEdit 7.0.5.3 (Hall 1999). Their combinability was evaluated with the incongruence length difference (ILD) test (Farris et al. 1994) implemented in PAUP* 4.0.b10 (Swofford 2002). Heuristic search and 1,000 homogeneity replicates were performed. A P-value of < 0.05 was considered as statistically significant for combinability. Our ILD test found a P-value of 0.32, indicating no significant discrepancy between ITS, nLSU and RP2B sequences in reconstructing phylogenetic trees. The alignment of combined ITS, nLSU and RP2B sequences was deposited at TreeBase (submission ID 13816). Maximum parsimony (MP) analysis and Bayesian inference (BI) of ITS, nLSU and RP2B were performed with PAUP* 4.0.b10 and MrBayes 3.1.2 (Ronquist & Huelsenbeck 2003), respectively. Phylogenetic trees were visualized using Treeview (Page 1996).

For MP analysis, gaps were treated as missing data. Trees were generated using 100 replicates of random stepwise addition of sequence and tree-bisection-reconnection (TBR) branch-swapping. The species used for our analysis were selected based on Binder et al. (2005), Sotome et al. (2008, 2013), Justo & Hibbett (2011) and through searches in GenBank (Table 1). The phylogeny was inferred from combined ITS, nLSU and RP2B sequences. Sequences of each gene was initially aligned using ClustalX.93 (Chenna et al. 2003) and manually edited in BioEdit 7.0.5.3 (Hall 1999). Their combinability was evaluated with the incongruence length difference (ILD) test (Farris et al. 1994) implemented in PAUP* 4.0.b10 (Swofford 2002). Heuristic search and 1,000 homogeneity replicates were performed. A P-value of < 0.05 was considered as statistically significant for combinability. Our ILD test found a P-value of 0.32, indicating no significant discrepancy between ITS, nLSU and RP2B sequences in reconstructing phylogenetic trees. The alignment of combined ITS, nLSU and RP2B sequences was deposited at TreeBase (submission ID 13816). Maximum parsimony (MP) analysis and Bayesian inference (BI) of ITS, nLSU and RP2B were performed with PAUP* 4.0.b10 and MrBayes 3.1.2 (Ronquist & Huelsenbeck 2003), respectively. Phylogenetic trees were visualized using Treeview (Page 1996).
swapping algorithm, with all characters given equal weight. The consistency indices (CI, Kluge & Farris 1969), retention indices (RI, Farris 1989) and rescaled consistency indices (RC, Farris 1998) were calculated for each tree generated. Branch support for all parsimony analysis was estimated by performing 1 000 bootstrap replicates (Felsenstein 1985) with a heuristic search of 10 random-addition replicates for each bootstrap replicate. The best-fit models of nucleotide substitution, selected by the hierarchical likelihood ratio tests (HLRT; Huelsenbeck & Crandall 1997, Posada & Crandall 2001) implemented in MrModelTest 2.2 (Posada & Crandall 1998, Nylander 2004), were used for estimating BI. Eight Markov chains were run with a random starting tree for 1 000 000 generations of combined dataset of ITS, nLSU and RPB2, and trees were sampled every 100 generations. The first one-fourth of the sampled trees, which represented the burn-in phase of the analysis, were discarded, while the last three-fourth trees were used for calculating posterior probabilities in the consensus tree. Confident branch support is defined as Bayesian posterior probabilities (BPPs) equal or more than 0.95.

RESULTS

A total of 44 ITS, 45 nLSU and 40 RPB2 sequences were included in the combined dataset (Table 1), of which 21 ITS and nLSU, and 19 RPB2 were newly generated in this study. The resulted alignment had 3 097 base pairs with 908 parsimony-informative characters. Twelve equally parsimonious trees were yielded (tree length = 4.061, CI = 0.450, RI = 0.695, RC = 0.313) and one of them was shown in Fig. 1. In the parsimony analysis, the current Datronia includes species belonging to three distinct clades, namely one clade of D. mollis and D. stereoides, the clade clustered by two Chinese resupinate species and the clade of D. scutellata and related species (Fig. 1). We propose to restrict Datronia to D. mollis and D. stereoides. The clade including two Chinese resupinate species was proposed as a new genus, Neodatronia gen. nov., and two new species, N. gaoligongensis and N. sinensis were identified (Fig. 1). Datronia scutellata and related species was proposed as member of another new genus, Datroniella gen. nov., typified by D. scutellata. Four new species, D. melanocarpa, D. subtropa, D. bettica and D. tropica, were identified from China (Fig. 1). In the Bayesian analysis, no conflicts between topologies from the MP tree were discovered, the separation of Datroniella and Neodatronia from Datronia was also supported. Three clades identified as Datronia s.s., Datroniella and Neodatronia were strongly supported (BPP = 1.00, Fig. 1), and sequences of the six new species appear as distinct lineages with high support. Best model estimated and applied in the BI was ‘GTR+I+G’ with equal frequency of nucleotides.

TAXONOMY

**Datroniella** B.K. Cui, Hai J. Li & Y.C. Dai, gen. nov. — Mycobank MB803225

Type species. *Datroniella scutellata* (Schwein.) B.K. Cui, Hai J. Li & Y.C. Dai.

**Etymology.** Datroniella: referring to the genus morphologically similar to Datronia.

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**Fig. 1** One of the MP tree inferred from combined dataset of ITS, nLSU and RPB2. Parsimony bootstrap proportions (before the slash markers) higher than 50% and Bayesian posterior probabilities (after the slash markers) more than 0.95 are indicated along branches.
Basidiocarps annual, pileate, effused-reflexed or rarely resupinate, when pileate, pileus usually projecting less than 3 cm. Pileal surface brown to black, glabrous, often wrinkled and distinctly brown when dry; pores round, 2–3 per mm; dissepiments thin, pink when fresh, become brown when bruised, cream to pale brown;

**Datroniella melanocarpa** B.K. Cui, Hai J. Li & Y.C. Dai, sp. nov. — MycoBank MB803226; Fig. 2, 3a

*Holotype. China, Sichuan Province, Jiuzhaigou County, Jiuzhaigou Nature Reserve, on living angiosperm tree, 12 Oct. 2012, B.K. Cui, Cui 10646 (BJFC).*

**Etymology. melanocarpa** (Lat.): referring to the black pileal surface.

**Basidiome** 3–4 µm. smooth, IKI–, CB–, 8.8–11 × 8–9 µm. **Tubes** concolorous with pore surface, corky, up to 2.5 mm long. **Hyphal system** dimitic; generative hyphae bearing clamp connections; skeletal hyphae IKI−, slightly CB+; tissues turn to black in KOH and fading when dry. Generative hyphae in context infrequent, hyaline, thin-walled, moderately branched, 1.8–5 µm diam; skeletal hyphae dominant, pale brown to pale yellowish brown, thick-walled with a narrow lumen to subsolid, interwoven, moderately to frequently branched, straight to sinuous, with an unbranched, thick-walled basal stalk, 3.5–6 µm wide, up to 70–150 µm long, the branches 2.4–4.5 µm wide, 170–300 µm long. Generative hyphae in trama infrequent, hyaline, thin-walled, moderately branched, 1.8–2.5 µm diam; skeletal hyphae dominant, pale brown to pale yellowish brown, thick-walled with a narrow lumen to subsolid, interwoven, frequently branched, straight to sinuous, then occasionally with lateral aborted processes, 3.3–4 µm wide in the main part, up to 20–80 µm long, the branches 2–3.5 µm wide, 50–250 µm long. **Dendrohyphidia** absent. **Cystidia** absent; cystidioles present, more or less ventricose, thin-walled, smooth, 23–30 × 6–9 µm. **Basidia** clavate to uniform, with four sterigmata and a basal clamp connection, 25–30 × 8–9 µm; basidioles clavate or pyriform, smaller than basidia. **Basidiospores** cylindrical, hyaline, thin-walled, smooth, IKI–, CB–, (7.6–)7.8–9.2(–9.8) × (2.9–)3–4 µm, L = 9.69 µm, W = 3.46 µm, Q = 2.8 (n = 40/1).

Notes — **Datroniella melanocarpa** is characterized by its small black basidiocarps, large and round pores (2–3 per mm). **Datronia mollis** (Fig. 3b) is similar to the new species in producing large basidiospores (10–12 × 4 µm). Núñez & Ryvarden 2001), however, the former usually has larger effused-reflexed basidioles with tomentose surface and larger pores (1–2 per mm, Núñez & Ryvarden 2001).

**Datroniella scutellata** (Schwein.) B.K. Cui, Hai J. Li & Y.C. Dai, comb. nov. — Mycobank MB803227; Fig. 3b, 4

*Basionym. Polyporus scutellatus* Schwein., Trans. Amer. Philos. Soc., 4, 2: 157. 1832. = **Datronia scutellata** (Schwein.) Gilb. & Ryvarden, Mycotaxon 22: 364. 1985.

**Basidiome** annual, effused-reflexed or pileate, without odour or taste when fresh, becoming corky upon drying; pilei projecting up to 8 mm, 2 cm wide and 3 mm thick at base. Sterile margin indistinct. Pileal surface fuscous to black, glabrous, often wrinkled and distinctly sulcate with zones. Pore surface white or cream to slightly pink when fresh, become brown when bruised, cream to pale brown when dry; pores round, 2–3 per mm; dissepiments thin, entire. Context pale yellowish brown, corky, up to 0.5 mm thick. Tubes concolorous with pore surface, corky, up to 2.5 mm long. **Hyphal system** dimitic; generative hyphae bearing clamp connections; skeletal hyphae IKI−, slightly CB+; tissues turn to black in KOH and fading when dry. Generative hyphae in context infrequent, hyaline, thin-walled, moderately branched, 2–2.5 µm diam; skeletal hyphae dominant, pale brown to pale yellowish brown, thick-walled with a narrow lumen to subsolid, interwoven, moderately to frequently branched, straight to sinuous, then occasionally with lateral aborted processes, 3–5 µm wide in the main part, up to 30–150 µm long, the branches 2–3.5 µm wide, 120–370 µm long. **Dendrohyphidia** absent. **Cystidia** and **cystidioles** absent. **Basidia** clavate, with four sterigmata and a basal clamp connection, 20–27 × 6–8 µm; basidioles in shape similar to basidia, but smaller. **Basidiospores** cylindrical, hyaline, thin-walled, smooth, usually with 1–3 moderate guttules, IKI−, CB−, (7.6–)7.8–9.2(–9.8) × 3–3.6(–3.8) µm, L = 8.53 µm, W = 3.13 µm, Q = 2.69–2.76 (n = 60/2).

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**Fig. 2** Microscopic structures of Datroniella melanocarpa. a. Basidiospores; b. basidia and basidioles; c. cystidioles; d. skeletal hyphae from trama; e. skeletal hyphae from context (all: holotype). — Scale bars: a–c = 10 µm; d, e = 20 µm.
Fig. 3 Basidiocarps of Datronia, Datroniella and Neodatronia species. a. Datroniella melanocarpa; b. D. scutellata; c, d. D. subtropica; e. D. tibetica; f. D. tropica; g. Datronia mollis; h. Neodatronia gaoligongensis; i. N. sinensis. — Scale bars = 1 cm.
Datroniella subtropica B.K. Cui, Hai J. Li & Y.C. Dai, sp. nov. — MycoBank MB803228; Fig. 3c, d, 5

Holotype. CHNA, Sichuan Province, Xichang, on fallen angiosperm branch, 16 Sept. 2012; Y.C. Dai, Dai 12881 (BJFC).

Etymology. subtropica (Lat.): referring to the locality (Tibet) of the species.

Additional specimens (paratypes) examined. CHNA, Fujian Province, Wuyishan Nature Reserve, on fallen angiosperm branch, 18 Oct. 2005, Y.C. Dai, Dai 7186 (BJFC); Sichuan Province, Xichang, on fallen angiosperm branch, 16 Sept. 2012; Y.C. Dai, Dai 12883, 12885 (BJFC).

Notes — Datroniella subtropica is characterized by its effused-reflexed or pileate basidiocarps, pileal surface glabrous, narrowly sulcate, buff or yellowish brown to black from margin towards the base, small and round pores (7–8 per mm) and distribution within subtropical areas. Datronia glabra also has small pores (7–8 per mm) and similar basidiospores (7–9 × 2–3 μm, Ryvarden 1987), but its dextrinoid skeletal hyphae are different from those of D. subtropica.

Datroniella tibetica B.K. Cui, Hai J. Li & Y.C. Dai, sp. nov. — MycoBank MB803229; Fig. 3e, 6

Holotype. CHNA, Xizang Autonomous Region (Tibet), Bomi County, on fallen angiosperm branch, 19 Sept. 2010; B.K. Cui, Cui 9486 (BJFC).

Etymology. tibetica (Lat.): referring to the locality (Tibet) of the species.

Basidiocarps annual, resupinate to effused-reflexed or pileate. Pileal surface buff or yellowish brown to black from margin towards the base, glabrous and distinctly sulcate with zones. Pore ash-grey when dry; pores round to angular, 4–6 mm. Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal hyphae IKI–, CB+; tissues turn to black in KOH and fading when dry. Basidiospores cylindrical, hyaline, thin-walled, smooth, usually with one to three small guttules, IKI–, CB–, 6.8–10.2 × 2.5–3 μm.

Fig. 5 Microscopic structures of Datroniella subtropica. a. Basidiospores; b. basidia and basidioles; c. cystidioles; d. skeletal hyphae from trama; e. skeletal hyphae from context (all: holotype). — Scale bars: a–c = 10 μm; d, e = 20 μm.

infrequent, hyaline, thin-walled, usually incrusted with fine crystals at dissepimental ends, moderately branched, 1.5–3 μm diam; skeletal hyphae dominant, pale yellowish brown, thick-walled with a narrow lumen to subsolid, interwoven, frequently branched, straight to sinuous, 3–6 μm wide in the main part, up to 30–80 μm long, the branches 2–3.5 μm wide, 50–170 μm long. Dendrohyphidia absent. Cystidia absent; cystidioles present, more or less fusoid, thin-walled, smooth, 13–23 × 4–5 μm. Basidia more or less barrel-shaped, with four sterigmata and a basal clamp connection, 15–18 × 6–8 μm; basidiospores in shape similar to basidia, but smaller. Basidiospores cylindrical, slightly tapering at apiculus, hyaline, thin-walled, smooth, usually with one to several small guttules, IKI–, CB–, (6.5–)6.8–8 × 2–2.7(–3) μm, L = 7.27 μm, W = 2.31 μm, Q = 3.13–3.16 (n = 80/2).

Notes — Datroniella scutellata is characterized by its effused-reflexed or pileate basidiocarps, small and round pores (3.5–5 per mm) and white or cream to pale brown pore surface. Datronia glabra are different from those of D. subtropica.
Basidiome annual, resupinate to effused-reflexed or pileate, without odour or taste when fresh, becoming corky upon drying; pilei projecting up to 7 mm, 1.5 cm wide and 3 mm thick at base. Sterile margin indistinct. Pileal surface buff, yellowish brown or cinnamon to black from margin towards the base, glabrous and distinctly sulcate with zones. Pore surface greyish white when fresh, ash-grey when dry; pores round to angular, 4–6 per mm; disseipiments thin to thick, entire. Context pale yellowish brown, corky, up to 0.3 mm thick. Tubes concolorous with pore surface, corky, up to 2.7 mm long. Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal hyphae IKI−, CB+; tissues turn to black in KOH and fading when dry. Generative hyphae in context infrequent, hyaline, thin-walled, sometimes incrusted with fine crystals, moderately branched, 2–4 μm diam; skeletal hyphae dominant, pale yellow brown to golden yellow, thick-walled with a narrow lumen to subsolid, interwoven, moderately to frequently branched, straight to sinuous, with an unbranched, little differentiated, thick-walled basal stalk, 3–5 μm wide, over 90 μm long, the branches 2.8–4 μm wide, 200–400 μm long. Generative hyphae in trama infrequent, hyaline, thin-walled, usually incrusted with fine crystals at disseipimental ends, moderately branched, 1.8–2.8 μm diam; skeletal hyphae dominant, pale yellow brown to golden yellowish, thick-walled with a narrow lumen to subsolid, interwoven, frequently branched, straight to sinuous, then occasionally with lateral aborted processes, 3.5–5.2 μm wide in the main part, up to 30–60 μm long, the branches 2.2–3.6 μm wide, 110–160 μm long. Dendrohyphidia, cystidia and cystidiolles absent. Basidia more or less barrel-shaped, with four sterigmata and a basal clamp connection, 16–25 × 6–8 μm; basidia in shape similar to basidia, but smaller. Basidiospores cylindrical, slightly tapering at apiculus, hyaline, thin-walled, smooth, usually with one to three small guttules, IKI−, CB−, (7.8–)8–10.2(–10.8) × 2.5–3(–3.1) μm, L = 9.13 μm, W = 2.88 μm, Q = 3.01–3.33 (n = 80/2).

Additional specimen (paratype) examined. China, Xizang Autonomous Region (Tibet), Bomi County, on fallen angiosperm branch, 19 Sept. 2010, B.K. Cui, Cui 9510 (BJFC).

Notes — Tibet is located in the Qinghai-Tibet Plateau, which is known as ‘the roof of the world’. This area is characterized by extremely complex topography and is considered as one of the most important hotspots of biodiversity. Datroniella scutellata is characterized by its small basidiocarps with buff to yellowish brown or cinnamon pileal surface, small, round to angular pores (4–6 per mm), generative hyphae sometimes encrusted with fine crystals. Datroniella scutellata also has effused-reflexed or pileate basidiocarps, similar pores (3.5–5 per mm), but its basidiospores (7.8–9.2 × 3–3.6 μm) are distinctly wider than those in D. tibetica.

Datroniella tropica B.K. Cui, Hai J. Li & Y.C. Dai, sp. nov. — MycoBank MB803230; Fig. 3f, 7

Holotype. China, Yunnan Province, Longchuan County, Tongbiguan Nature Reserve, on fallen angiosperm branch, 31 Oct. 2012, Y.C. Dai, Dai 13147 (BJFC).

Etymology. tropica (Lat.): referring to the species being distributed in the tropics.

Basidiocarps annual, effused-reflexed. Pileal surface yellowish brown to reddish brown or almost black from margin towards the base, glabrous, azonate to slightly sulcate. Pore white to cream pale grey when dry; pores round, 5–7 per mm. Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal hyphae IKI−, CB+; tissues turn to black in KOH and leave a black stain when dry. Basidiospores cylindrical, hyaline, thin-walled, smooth, usually with 1–3 small to moderate guttules, IKI−, CB−, 8–9.8 × 2.5–3.5 μm.

Datroniella tropica annual, effused-reflexed, without odour or taste when fresh, becoming corky upon drying; pilei projecting up to 2 cm, 2 cm wide and 2.5 mm thick at base. Sterile margin buff to cinnamon-buff or brown, up to 1 mm wide. Pileal surface yellowish brown to reddish brown or almost black from margin towards the base, glabrous, azonate to slightly sulcate. Pore surface white to cream when fresh, become brown when bruised, pale grey when dry; pores round, 5–7 per mm; disseipiments thin to thick, entire. Context yellowish brown to brown, corky, up to 2.2 mm thick. Tubes concolorous with pore surface, corky, up to 0.3 mm long. Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal hyphae IKI−, CB−; tissues turn to black in KOH and leave a black stain when dry. Generative hyphae in context infrequent, hyaline, thin- to slightly thick-walled, moderately branched, 1.8–3.5 μm diam; skeletal hyphae dominant, pale yellowish brown, thick-walled with a narrow lumen to subsolid, interwoven, moderately to frequently branched, straight to sinuous, with an unbranched, little differentiated, thick-walled basal stalk, 3–8 μm wide, up to 70–120 μm long, the branches 2–4 μm wide, 200–380 μm long.
Generative hyphae in trama infrequent, hyaline, thin-walled, moderately branched, 1.3–2.3 µm diam; skeletal hyphae dominant, pale yellowish brown, thick-walled with a narrow lumen to subsolid, interwoven, frequently branched, straight to sinuous, then occasionally with lateral aborted processes, 3.7–4.8 µm wide in the main part, up to 20–70 µm long, branches well differentiated from the main part, 1.8–3 µm wide, 20–160 µm long. Dendrohyphidia absent. Cystidia absent; cystidioles present, fusoid, thin-walled, smooth, 13–22 × 4–6 µm. Basidia more or less barrel-shaped, with four sterigmata and a basal clamp connection, 16–25 × 6–8 µm; basidioles mostly pyriform, smaller than basidia. Basidisporous cylindrical, hyaline, thin-walled, smooth, usually with one to three guttules, IKI–, CB–, (7.4–)8–9.8(–10) × (2.1–)2.5–3.5(–3.9) µm, L = 8.54 µm, W = 2.93 µm, Q = 2.66–3.1 (n = 101/4).

Additional specimens (paratypes) examined. CHINA, Hainan Province, Ledong County, Jianfengling Nature Reserve, on fallen angiosperm trunk, 18 Nov. 2007, B.K. Cui, Cui 5201 (BJFC); on fallen angiosperm trunk, 18 Nov. 2007, Y.C. Dai, Dai 9291 (BJFC); Yunnan Province, Manhai County, Mangao Nature Reserve, on fallen angiosperm trunk, 8 June 2011, Y.C. Dai, Dai 12336 (BJFC); Longchuan County, Tongbigan Nature Reserve, on fallen angiosperm branch, 31 Oct. 2012, Y.C. Dai, Dai 13192 (BJFC).

Notes — Datronia subtropica is characterized by its effused-reflexed basidiocarps, yellowish brown to reddish brown or almost black pileal surface, small and round pores (5–7 per mm) and distribution in tropical China. D. subtrópica also has small pores (6–8 per mm), but its basidisporous are distinctly smaller (6.8–8 × 2–2.7 µm) than those of D. tropica.

Neodatronia B.K. Cui, Hai J. Li & Y.C. Dai, gen. nov. — Mycobank MB804548

Type species. Neodatronia sinensis B.K. Cui, Hai J. Li & Y.C. Dai.

Etymology: Neodatronia: referring to the resemblance of the genus to Datronia.

Basidiocarps annual, resupinate. Pore surface white, cream to pale brown; pores moderate to small, round to angular; pores surface fragile when dry. Subiculum yellowish brown to cinnamon, corky. Hyphal system dimitic, generative hyphae with clamp connections, skeletal hyphae usually dominating, pale brown to brown, moderately to frequently branched in subicum and trama, branches of tramal skeletal hyphae usually well differentiated from the main part, IKI–, CB+, tissues darkening in KOH. Dendrohyphidia present in the hymenium and dissepiment edges, cystidia absent, but thin-walled cystidioles usually present. Basidisporous cylindrical, hyaline, thin-walled, smooth, IKI–, CB+. Usually growth on angiosperm wood and causing a white rot.

Neodatronia gaoligongensis B.K. Cui, Hai J. Li & Y.C. Dai, sp. nov. — Mycobank MB804549; Fig. 3h, 8

Holotype. CHINA, Yunnan Province, Baoshan County, Gaoligong Nature Reserve, on fallen angiosperm branch, 24 Oct. 2009, B.K. Cui, Cui 8055 (BJFC).

Etymology: gaoligongensis (Lat.): referring to its locality, Yunnan Province, Gaoligong Nature Reserve.

Basidiocarps annual, resupinate. Pore surface cream to pale grey; pores angular, 5–8 per mm. Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal-binding hyphae IKI–, CB+; tissues in subicum turn to black in KOH and leave a black stain when dry, tissues in subicum unchanged and pore surface turned to olivaceous and paler when dry. Dendrohyphidia abundant in the hymenium and dissepiment edges. Cystidia absent; cystidioles present, fusoid, thin-walled, smooth, 16–25 × 5–7 µm. Basidia clavate, with four sterigmata and a basal clamp connection, 17–21 × 6.5–9 µm; basidioles in shape similar to basidia but smaller. Basidisporous cylindrical, hyaline, thin-walled, smooth, with one to two large guttules, IKI–, CB–, (6.8–)7–9.8(–10.2) × (2.7–)3–3.8(–4) µm, L = 8.1 µm, W = 3.2 µm, Q = 2.31–2.74 (n = 90/3).

Additional specimens (paratypes) examined. CHINA, Yunnan Province, Baoshan County, Gaoligong Nature Reserve, on fallen angiosperm branch, 25 Oct. 2009, B.K. Cui, Cui 8132 (BJFC), 26 Oct. 2009, B.K. Cui, Cui 8186 (BJFC).

Notes — Neodatronia gaoligongensis is characterized by its cream to pale grey pore surface, small pores (5–8 per mm) and presence of dendrohyphidia in the hymenium and dissepiment edges. Neodatronia gaoligongensis is similar to N. sinensis by having resupinate basidiocarps, but the latter species has larger pores (4–6 per mm) and smaller basidisporous (6.8–8 × 2–2.6 µm).
**Neodatronia sinensis** B.K. Cui, Hai J. Li & Y.C. Dai, sp. nov.
--- MycoBank MB804550; Fig. 3i, 9

**Holotype.** CHINA, Anhui Province, Huangshan, on dead tree of *Cyclobalanopsis*, 22 Oct 2010, Y.C. Dai, Dai 11921 (BJFC).

**Etymology.** *sinensis* (Lat.): referring to the country where this new species was found.

Basidiocarps annual, resupinate. Pore surface cream to buff to pale grey, 4–6 mm. Hyphal system dimitic; generative hyphae bearing clamp connections; skeletal-binding hyphae IKI–, CB+; tissues in subiculum turn to black in KOH and leave a black stain when dry, tissues in subiculum unchanged and pore surface turned to olivaceous and paler when dry. Dendrohyphidia abundant in the hymenium and dissepiment edges. Basidiospores cylindrical, usually slightly curved, hyaline, thin-walled, smooth, with 1–3 small to large guttules, IKI–, CB–, 6.8–8 × 2–2.6 µm.

Basidioles annual, resupinate, corky, without odour or taste when fresh, becoming hard corky upon drying, up to 20 cm long, 7 cm wide and 1 mm thick at centre. Sterile margin distinct, pale yellowish brown to cinnamon, up to 1 mm wide. Pore surface cream to buff to pale grey; pores angular, 4–6 mm; dissepiments thin, usually entire and lacerate on sloping parts. Subiculum yellowish brown to cinnamon, hard corky, up to 0.8 mm thick. Tubes concolorous with pore surface, fragile, up to 0.2 mm long. *Hyphal system trimitic; generative hyphae bearing clamp connections; skeletal-binding hyphae IKI–, CB+; tissues in subiculum turn to black in KOH and leave a black stain when dry, tissues in subiculum unchanged and pore surface turned to olivaceous and paler when dry. Generative hyphae in subiculum infrequent, hyaline, thin-walled, occasionally branched, 2–3.8 µm diam; skeletal hyphae dominant, pale brown, thick-walled with a wide to narrow lumen, interwoven, moderately to frequently branched, straight to sinuous, with an unbranched, little differentiated, thick-walled basal stalk, 2.8–5 µm wide, up to 50–150 µm long, the branches 2–3 µm wide, 60–240 µm long. Generative hyphae in trama infrequent, hyaline, thin-walled, moderately branched, 1.2–2.2 µm diam; skeletal hyphae dominant, pale brown, thick-walled with a wide to narrow lumen, interwoven, frequently branched, straight to sinuous, then occasionally with lateral aborted processes, 2.8–4 µm wide in the main part, up to 10–30 µm long, branches well differentiated from the main part, 1.3–2.6 µm wide, 15–220 µm long. *Dendrohyphidia* abundant in the hymenium and dissepiment edges. *Cystidia* absent; *cystidioles* present, fusoid, thin-walled, smooth, 12–18 × 3.5–5 µm. *Basidia* clavate, with four sterigmata and a basal clamp connection, 18–24 × 4.5–6.5 µm; *basidioles* in shape similar to *basidia*, but smaller. *Basidiospores* cylindrical, usually slightly curved, hyaline, thin-walled, smooth, with one to three small to large guttules, IKI–, CB–, (6.2–)6.8–(8–8.8) × 2.6–(2.7) µm, L = 7.29 µm, W = 2.28 µm, Q = 3.06–3.35 (n = 60/2).

**Additional specimens (paratypes) examined.** CHINA, Fujian Province, Wuyishan Nature Reserve, on fallen angiosperm branch, 22 Oct 2005, Y.C. Dai, Dai 7374 (BJFC); Jilin Province, Antu County, Changbaishan Nature Reserve, on fallen trunk of Acer, 7 Aug 2011, B.K. Cui, Cui 9949 (BJFC); on fallen angiosperm branch, 8 Aug 2011, B.K. Cui, Cui 9876 (BJFC); Sichuan Province, Baoxing County, Fengtongzhai Nature Reserve, on fallen angiosperm branch, 18 Oct 2012, B.K. Cui, Cui 10768, 10764, 10769 (BJFC); Xizang Autonomous Region, Linzi County, on fallen angiosperm branch, 18 Sept 2010, B.K. Cui, Cui 9434 (BJFC); Yunnan Province, Baoshan County, Gaoligong Nature Reserve, on fallen angiosperm branch, 25 Oct 2009, B.K. Cui, Cui 8181 (BJFC); 28 Oct 2012, Y.C. Dai, Dai 13096 (BJFC).

Notes — *Neodatronia sinensis* is characterized by its cream to buff to pale grey pore surface, small pores (4–6 per mm) and presence of dendrohyphidia in the hymenium and dissepiment edges. *Datronia stereoides* is similar to *N. sinensis* by having small angular pores (4–5 per mm), cystidioles and dendrohyphidia in the hymenium, but the former species has distinct larger basidiospores (8–12 × 3.5–4.5 µm, Núñez & Ryvarden 2001).

**Notes on other species recorded of *Datronia* without molecular data**

**Datronia decipiens** (Bres.) Ryvarden, Mycotaxon 33: 308. 1988

Basionym. *Trametes decipiens* Bres., Ann. Mycol. 18, 1–3: 40. 1920.

Notes — This species is characterized by effused-reflexed, dark brown, tomentose basidiomes, a dimitic hyphal system, large ellipsoid to subcylindrical basidiospores and lacking dendrohyphidia (Ryvarden 1988, Table 2). Its effused-reflexed basidiomes, lacking dendrohyphidia indicates it may be a *Datroniella* species.

**Datronia glabra** Ryvarden, Mycotaxon 28, 2: 527. 1987

Notes — This species is characterized by pileate, glabrous basidiomes with pale brown to corky colour pileal surface which becoming bay from the base, a trimitic hyphal system and dextrinoid skeletal and binding hyphae (Ryvarden 1987, Table 2). All these characters indicate this species may belong to *Corioliopsis* Murrill.

**Datronia orcomanta** Robledo & Rajchenb., Canad. J. Bot. 84, 10: 1566. 2006

Notes — This species is characterized by its effused-reflexed to pileate to triquetrous or ungulate and pendant basidiomes, with chocolate brown pileal surface, pale brown context, a dimitic hyphal system with frequently branched skeletal hyphae, lacking dendrohyphidia (Robledo et al. 2006, Table 2). Morphological characters of this species indicate it may belong to *Datroniella*.

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**Fig. 9** Microscopic structures of *Neodatronia sinensis*. a. Basidiospores; b. basidia and basidioles; c. cystidioles; d. dendrohyphidia; e. skeletal hyphae from trama; f. skeletal hyphae from subiculum (all: holotype). --- Scale bars: a = 5 µm; b–d = 10 µm; e, f = 20 µm.
Table 2  Main morphological characters of Datronia s.s., Datroniella, Neodatronia and other Datronia species.

| Species          | Pores (µm) | Basidicarps | Basidiomers (µm) | Skeleto-binding hyphae | Dendrohyphidia | Cystidioles | Crystals on generative hyphae |
|------------------|------------|-------------|------------------|-------------------------|----------------|------------|-------------------------------|
|                   |            |             |                  | Context / subiculum     | Trama          |            | Context / subiculum           |
|                   |            |             |                  |                         |                |            | Dissepimental ends            |
| **Datronia s.s.** |            |             |                  |                         |                |            |                               |
| D. mollis         | 1–3        | R / E / P   | 10–12 × 3–4      | r / m                   | f              | +          | +                             |
| D. stercoides     | 4–7        | E           | 9–11.5 × 3.7–4.6 | r                       | f              | +          | –                             |
| **Datroniella**   |            |             |                  |                         |                |            |                               |
| D. melanocarpa    | 2–3        | P           | 8.8–11 × 3–4     | m / f                   | f              | –          | +                             |
| D. subtropica     | 6–8        | E / P       | 6.8–8 × 2–2.7    | m / f                   | f              | +          | +                             |
| D. tibetica       | 4–6        | E / P       | 8–10.2 × 2.5–3   | m / f                   | r              | –          | +                             |
| D. tropica        | 5–7        | E           | 8–9.8 × 2.5–3.5  | m / f                   | f              | +          | –                             |
| D. scutellata     | 3.5–5      | E / P       | 7.8–9.2 × 3–3.6  | m / f                   | f              | –          | –                             |
| **Neodatronia**   |            |             |                  |                         |                |            |                               |
| N. gaoligongensis | 5–8        | R           | 7–9.8 × 3–3.8    | m / f                   | f              | +          | +                             |
| N. sinensis       | 4–6        | R           | 6.8–8 × 2–2.6    | m / f                   | f              | +          | –                             |
| **Other Datronia species** |      |             |                  |                         |                |            |                               |
| D. decipiens     | About 1    | E           | 14–16 × 6–8      | unknown                 | unknown        | –          | –                             |
| D. glabra         | 7–8        | P           | 7–9 × 2–3        | Trimitic / dextrinoid   | Trimitic / dextrinoid | –          | –                             |
| D. orcomanta      | 3–4        | P           | 13–15 × 4–5.5    | f                       | f              | +          | +                             |
| D. perstrata      | 7–8        | P           | 5.5–6 × 2–2.5    | f                       | f              | –          | –                             |
| D. sepicolor      | 1–2 or 2–3 | E / P       | 6.5–9 × 2.5–3.5  | f                       | –              | +          | –                             |

Abbreviations used: E = Effused-reflexed; P = Pileate; R = Resupinate; f = frequently branched; m = moderately branched; r = rarely branched; + = present; – = absent.

**Datronia perstrata** (Corner) T. Hatt. & Sotome, Mycoscience 54, 4: 301. 2013

_Basionym_. Trametes perstrata Corner, Beih. Nova Hedwiga 97: 133. 1989.

Notes — This species is characterized by its pileate basidiomes, with narrowly sulcate, matt to glabrous pileal surface, light brown context, a dimitic hyphal system with frequently branched skeletal hyphae and small cylindrical basidiospores, lacking dendrohyphidia (Corner 1989, Hattori & Sotome 2013, Table 2). All these characters indicate it may be a _Datroniella_ species.

**Datronia sepicolor** (Corner) T. Hatt. & Sotome, Mycoscience 54, 4: 304. 2013

_Basionym_. Trametes perstrata Corner, Beih. Nova Hedwiga 97: 160. 1989.

Notes — This species is characterized by its sessile to effused-reflexed basidiomes, dark brown, multi-sulcate pileal surface with distinctly tomentose zones, light brown to brown context, a dimitic hyphal system with frequently branched skeletal hyphae and lacking dendrohyphidia (Corner 1989, Hattori & Sotome 2013, Table 2). All these characters indicate it may be a _Datroniella_ species.

DISCUSSION

Our three-gene phylogeny on extensive samples showed that _Datronia_ in current sense includes species for three distantly related clades, which confirms _Datronia_ was not monophyletic (Sotome et al. 2008, Justo & Hibbett 2011).

One clade included the type species _D. mollis_ and _D. stercoides_. This clade was strongly supported by both MP and BI analysis (MP = 100 %, BPP = 1.00, Fig. 1). Four samples of _D. mollis_ from China, Japan and USA, two samples of _D. stercoides_ from Canada and Finland formed two highly supported lineages (Fig. 1). Both species produce effused-reflexed basidiocarps, dendrohyphidia, rarely to moderately branched skeletal hyphae in context, and have been reported with wide distributions in the world (Gilbertson & Ryvarden 1986, Ryvarden & Gilbertson 1993, Núñez & Ryvarden 2001, Table 2).

_Neodatronia_ was formed by two resupinate species: _N. gaoligongensis_ and _N. sinensis_ with strong support (MP = 100 %, BPP = 1.00, Fig. 1), then it clustered with _Datronia_ s.s. Species in both genera share a dimitic hyphal system with clamped generative hyphae, thin-walled basidiospores and presence of dendrohyphidia (Núñez & Ryvarden 2001, Table 2). But _Neodatronia_ differs from _Datronia_ s.s. by producing distinct resupinate basidiospores, moderately to frequently branched skeletal hyphae in subiculum (Fig. 3, 8–11, Table 2, 3). The three-loci phylogeny strongly supported the segregation of _D. scutellata_ and related species from _D. mollis_ clade (Fig. 1).

Therefore, a new genus, _Datroniella_, is proposed to accommo-

Table 3  Skeletal hyphae characterization of Datronia s.s., Datroniella and Neodatronia.

| Species          | Context / subiculum | Trama  |
|------------------|---------------------|--------|
|                  | Stem (µm)           | Branches (µm) | Stem (µm) | Branches (µm) |
|                  | diameter length     | diameter length | diameter length | diameter length |
| **Datronia s.s.**|                     |                 |             |             |
| D. mollis        | 2.8–4               | 80–500         | 2–3.5       | 280–500     |
| D. stercoides    | 4–5.8               | 300–600        | 3.8–5       | > 250       |
| **Datroniella**  |                     |                 |             |             |
| D. scutellata    | 3.8–4.5             | 120–200        | 1.7–3.8     | 200–360     |
| D. melanocharpa  | 3.5–6               | 70–150         | 2.4–4.5     | 170–300     |
| D. subtropica    | 2.8–4               | 100–400        | 1.8–3       | > 200       |
| D. tibetica      | 3–5                 | > 90           | 2.8–4       | 200–400     |
| D. tropica       | 3–8                 | 70–120         | 2–4         | 200–380     |
| **Neodatronia**  |                     |                 |             |             |
| N. sinensis      | 2.8–5               | 50–150         | 2–3         | 60–240      |
| N. goligongensis | 3–5                 | 10–180         | 1.8–3.4     | 80–320      |
date species in this clade. *Datronia scutellata* was transferred to the new genus as *Datroniella scutellata* and serves as the generic type. Two samples of *D. scutellata* from China and USA formed a monophyletic lineage (bootstrap value = 99 %, BPP = 1.00, Fig. 1), which grouped with *Datroniella melano-carpa* (bootstrap value = 78 %, BPP = 1.00, Fig. 1). *Datroniella scutellata* produces small effused-reflexed or pileate basidiocarps and has a wide distribution in Asia (Núñez & Ryvarden 2001, Dai 2012), Europe (Ryvarden & Gilbertson 1993) and North America (Gilbertson & Ryvarden 1986). *Datroniella melanocarpa*, identified from Sichuan Province, southwestern China, produces small black basidiocarps and large pores (2–3 per mm). *Datroniella subtropica*, originating from southern China, has effused-reflexed or pileate basidiocarps (Fig. 3c, d). *Datroniella tibetica* was described from Xizang Autonomous Region (Tibet) and produces resupinate to effused-reflexed or pileate basidiocarps (Fig. 3e). *Datroniella tropica* was found in tropical China and has effused-reflexed or pileate basidiocarps (Fig. 3f).

The vegetative hyphae characterization (ramification pattern, stem and branches size), and the hyphal structure (variation of the vegetative morphology) were successfully used to corroborate phylogenetic hypothesis in *Perenniporia* s.l. (Robledo et al. 2009). Skeletal hyphae in *D. mollis* and *D. stereoides* are rarely to moderately branched, 80–500 µm and 300–600 µm long, respectively (Fig. 10, 11, Table 2, 3). Skeletal hyphae in *Neodatronia* moderately to frequently branched in subiculum and trama, branches of trama skeletal hyphae usually well differentiated from the main part (Fig. 8, 9, Table 2, 3). Skeletal hyphae in *Datroniella* are moderately to frequently branched in context (Fig. 2, 4–7, Table 2, 3), which can easily differentiate from *Datronia*.

Dendrohyphidia were recorded in *D. mollis* (Núñez & Ryvarden 2001) and abundantly present at the disseipmental edges of *D. stereoides* (Núñez & Ryvarden 2001). Dendrohyphidia were also abundant at the disseipmental edges of *Neodatronia gaoligongensis* and *N. sinensis* (Fig. 8, 9, Table 2). But, all five species of *Datroniella* lack dendrohyphidia. The presence or absence of dendrohyphidia showed certain consistency in *Datronia* s.s., *Datroniella* and *Neodatronia* clades.

Morphologically, *Neodatronia* is similar to *Megasporoporia* Ryvarden & J.E. Wright by sharing resupinate basidiomes, dimitic hyphal system with clamped generative hyphae, cylindrical, hyaline, thin-walled basidiospores (Ryvarden et al. 1982, Dai & Wu 2004, Li & Cui 2013). But *Megasporoporia* differs in having dextrinoid skeletal hyphae. Phylogenetically, *Megasporoporia* s.l. is polyphyletic nested within the core polyporoid clade, and two genera, *Megasporia* B.K. Cui, Y.C. Dai & H.J. Li and *Megaspororiella* B.K. Cui, Y.C. Dai & H.J. Li were segregated from *Megasporoporia* (Li & Cui 2013). While *D. mollis* and *D. scutellata* were clustered with some *Polyporus* species and were distant from *Megasporoporia* s.1. (Justo & Hibbett 2011, Li & Cui 2013).

*Neodatronia* may resemble the resupinate species of *Dichomitus* D.A. Reid by sharing resupinate basidiomes, dimitic hyphal system and thin-walled basidiospores (Núñez & Ryvarden 2001, Li & Cui 2013). *Dichomitus ecuadoriensis* Ryvarden has similar pores (4–5 per mm) to *N. sinensis* (4–6 per mm), but differs in having white to pale ochraceous context, dextrinoid skeletal hyphae and large basidiospores (10–11 × 5–5.5 µm, Læssøe & Ryvarden 2010). *Dichomitus albidofuscus* (Domarški) Domarski shares similar small pores (5–7 per mm) to *N. gaoligongensis* (5–8 per mm), but *D. albidofuscus* has thicker basidio-
mes (up to 1.5 cm) and distinct smaller basidiospores (4–6 × 2.5–3 µm, Ryvarden & Gilbertson 1993). *Dichomitus pendulus* Læssøe & Ryvarden also has smaller pores (6–7 per mm), but its small pendant basidiomes can easily differentiate from *N. gaoligongensis* (Læssøe & Ryvarden 2010).

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**Fig. 10** Microscopic structures of *Datronia mollis*. a. Skeletal hyphae from trama; b. skeletal hyphae from context (all: Dai 11456). — Scale bars = 20 µm.

**Fig. 11** Microscopic structures of *Datronia stereoides*. a. Skeletal hyphae from trama; b. skeletal hyphae from context (all: Niemelä 3020). — Scale bars = 20 µm.
Melanoderma B.K. Cui & Y.C. Dai is a recently proposed genus (Cui et al. 2011b). It is similar to Datronia in black basidiocarps, a dimitic hyphal system with clamped generative hyphae, thin-walled basidiospores that are negative in Melzer’s reagent. However, Melanoderma differs from Datronia in having dextrinoid skeletal hyphae, encrusted cystidia and rhomboid crystals in trama and hymenium.

Previous studies showed that Datronia was closely related to some Polyporus (Sotome et al. 2008, 2013, Justo & Hibbett 2011). Our phylogenetic analysis also confirmed the conclusion (Fig. 1). Both groups share a dimitic hyphal system with cyanophilous skeletal hyphae, cylindrical basidiospores and causes of a white rot of woods (Nüñez & Ryvarden 1995, 2001, Sotome et al. 2008). However, Polyporus usually has a distinct stipe, cream-coloured context, tissues unchanged in KOH and hyaline skeletal hyphae, while Datronia, Datroniella and Neodatronia produce resupinate to sessile basidiocarps, brown context, tissues becoming black in KOH and brownish skeletal hyphae. Polyporus was demonstrated as polyphyletic and closely related with several other polypore genera, including Datronia [Krüger et al. 2006, Sotome et al. 2008, 2013]. No sequences of Datronia decipiens, D. glabra, D. orcomanta, D. perstrata and D. setipila are available at present, but morphological characters indicate D. glabra may be a Coriolopsis species and the other four species may belong to Datroniella (Ryvarden 1987, 1988, Robledo et al. 2006, Hattori & Sotome 2013). Further molecular studies are needed to resolve their taxonomic and phylogenetic position.

Key to Megasperoporia s.l., Dichomitus, Datronia s.s. and Datroniella

1. Basidiome resupinate .......................... 2
2. Basidiome effused-reflexed to pleateate  ... 4
3. Skeletal hyphae dextrinoid ........................ Megasperoporia s.l. / Dichomitus
4. Skeletal hyphae IKI ............................ 3
5. Subiculum white to cream .......................... Dicomitus
6. Subiculum yellowish brown to cinnamon  Neodatronia
7. Context white to cream on conifers  Dicomitus squalens
8. Context brown on hardwoods .................. 5
9. Skeletal hyphae in context rarely branched, dendrophidia present .......................... Datronia s.s.
10. Skeletal hyphae in context frequently branched, dendrophidia absent .......................... Datroniella

Key to species of Datronia s.s.

1. Pores 1–3 mm, basidiospores 10–12 × 3–4 μm  ........................................ D. mollis
2. Pores 4–7 mm, basidiospores 9–11.5 × 3.7–4.6 μm  ........................................ D. stereoides

Key to species of Datroniella

1. Pores 2–3 mm  ........................................ D. melanocarpa
2. Pores 3–8 mm  ........................................ D. subtropica
3. Basidiospores 6–8 μm long  ........................................ D. subtricha
4. Basidiospores > 8 μm long  ........................................ 3
5. Cystidioles absent  ........................................ D. tibetica
6. Cystidioles present  ........................................ 4
7. Pores 3.5–5 mm  ........................................ D. scutellata
8. Pores 5–7 mm  ........................................ D. tropica

Key to species of Neodatronia

1. Basidiospores 2–2.6 μm wide  ................. N. sinensis
2. Basidiospores 3–3.8 μm wide  ................. N. gaoligongensis

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