

Hymenochaetopsis nom. nov. proposed to replace *Pseudochaete* (Hymenochaetales, Basidiomycota) with descriptions of *H. laricicola* sp. nov and *H. gigasetosa* new to China

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Abstract A new fungal generic name *Hymenochaetopsis* is proposed to replace *Pseudochaete*, which is a nomen illegitimum according to Art. 53.1 in the International Code of Nomenclature for algae, fungi, and plants. Twelve new combinations are proposed for species in genera *Hymenochaete* and *Pseudochaete*. *Hymenochaetopsis laricicola* is described and illustrated as a new species from Northeast China based on morphological and molecular evidence. It is characterized by effused-reflexed to pileate basidiocarps, presence of a cortex and hyphal layer, relative small hymenial setae, short cylindrical basidiospores, and exclusive growth on *Larix*. *Hymenochaetopsis gigasetosa*, which was previously reported from its type locality only, is newly recorded in China. An identification key is provided for the 13 known species of *Hymenochaetopsis*.

Keywords *Hymenochaete* · Hymenochaetaceae · nomen illegitimum · wood-inhabiting fungi

Introduction

Pseudochaete T. Wagner & M. Fisch. was segregated from *Hymenochaete* Lév. as a monotypic genus with *Auricularia tabacina* as the type species (Wagner & Fischer 2002). Recently, ten species, either newly described or combined from *Hymenochaete*, *Cyclomyces* Kunze ex Fr., and

Hydnochaete Bres. were added to the genus (He & Dai 2012; He & Li 2013; Parmasto et al. 2014) based on morphological and molecular data. However, *Pseudochaete* has already been used as a generic name for algae since 1903 (West & West 1903; Guiry & Guiry 2015), which makes it a nom. illegit. for fungi according to Art. 53.1 in the International Code of Nomenclature for algae, fungi, and plants (ICN, IAPT: <http://www.iapt-taxon.org>). Therefore, a new fungal generic name is needed to accommodate the fungal species under the name of *Pseudochaete*.

Several specimens collected on *Larix* from Northeastern China were identified by the senior author as *Hymenochaete lenta*, which was reported from Costa Rica in South America (He & Li 2011). Those specimens were recently restudied and compared with a *H. lenta* specimen collected from Venezuela. The results show that the Chinese species is not *H. lenta*, but represents an undescribed taxon. In addition, two specimens collected from Yunnan Province, southwestern China, are identified as *Hymenochaete gigasetosa*, which was previously reported from its type locality in India only.

In this paper: (1) a new generic name *Hymenochaetopsis* and twelve new combinations are proposed; (2) *Hymenochaetopsis laricicola* sp. nov. and *H. gigasetosa* new to China are illustrated and described; and (3) an emended description of *Hymenochaetopsis* and an identification key to all the 13 known species are provided.

Materials and methods

Morphological studies.—Voucher specimens are deposited in the herbarium of Beijing Forestry University (BJFC). Microscopic procedures follow Dai (2010). In the text the following abbreviations are used: L = mean spore length, W = mean spore width, Q = variation in the L/W ratios between

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the specimens studied, n = the number of spores measured from given number of specimens, KOH = potassium hydroxide, IKI = inamyloid and nondextrinoid, CB = acyanophilous. Color designations are from Korerup and Wanscher (1978). Herbarium codes follow Index Herbariorum (Thiers 2015).

DNA extraction and sequencing.—A CTAB plant genome rapid extraction kit-DN14 (Aidlab Biotechnologies Co., Ltd) was employed for DNA extraction and PCR amplification from dried specimens according to the manufacturer's instructions. Approximately 600 base pairs of the ITS rDNA were amplified with primers ITS5 and ITS4 (White et al. 1990), using the following procedure: initial denaturation at 95 °C for 3 min, followed by 34 cycles of 94 °C for 40 s, 58 °C for 45 s and 72 °C for 1 min, and a final extension of 72 °C for 10 min. DNA sequencing was performed at Beijing Genomics Institute, and the newly generated sequences were deposited in the GenBank database.

Phylogenetic analysis.—The molecular phylogeny of *Hymenochaetopsis* was inferred from the analysis of 15 ITS sequences of 12 species (Table 1). The generic type of *Hymenochaete*, *H. rubiginosa* (Dicks.) Lév. was selected as the outgroup. The sequences were aligned using the ClustalX 1.83 (Chenna et al. 2003). Alignments were optimized manually in BioEdit 7.0.5.3 (Hall 1999).

Maximum parsimony analysis was performed using PAUP* 4.0b10 (Swofford 2002). Gaps in the alignments were treated as missing data. Trees were generated using 100 replicates of random stepwise addition of sequence and tree-bisection reconnection (TBR) branch-swapping algorithm, with all characters given equal weight. Branch supports for

all parsimony analysis were estimated by performing 1000 bootstrap replicates (Felsenstein 1985) with a heuristic search of ten random-addition replicates for each bootstrap replicate. The tree length (TL), consistency indices (CI), retention indices (RI), rescaled consistency indices (RC), and homoplasy index (HI) were calculated for each tree generated. Trees were figured in Treeview 1.6.6 (Page 1996).

Phylogeny results

The ITS dataset includes 16 sequences representing 12 ingroup and one outgroup species. Five sequences were newly obtained (Table 1). The dataset has an aligned length of 667 characters with 104 of them parsimony informative. One parsimony tree is a yield from the analysis (TL = 388, CI = 0.804, RI = 0.757, RC = 0.609, HI = 0.196, Fig. 1). The analyses show that species of *Hymenochaetopsis* are well separated from the outgroup, and *H. laricicola* appears as a distinct lineage with strong support (bootstrap value = 100 %). *Hymenochaetopsis gigasetosa* is closely related to *H. latesetosa*.

Taxonomy

Hymenochaetopsis S.H. He & Jiao Yang, nom. nov.

Mycobank: MB 814943

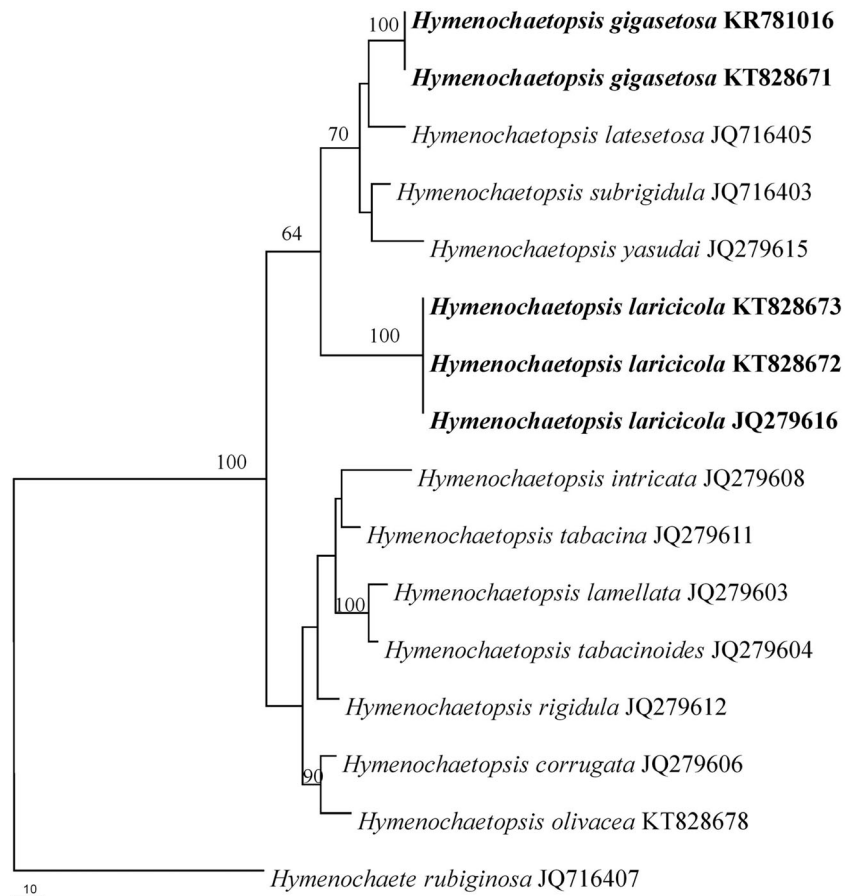
Typus: *Auricularia tabacina* Sowerby, Brit. Fung., pl. 25, 1797.

Table 1 A list of taxa, voucher specimens, and their accession numbers of ITS sequences used in the phylogenetic analysis

Species	Voucher specimens	Locality	ITS accession numbers
<i>Hymenochaetopsis</i>			
<i>H. corrugata</i>	S.H. He 761	China	JQ279606
<i>H. gigasetosa</i>	S.H. He 1442	China	KR781016*
	S.H. He 1461	China	KT828671*
<i>H. intricata</i>	S.H. He 412	China	JQ279608
<i>H. lamellata</i>	B.K. Cui 7629	China	JQ279603
<i>H. laricicola</i>	Y.C. Dai 11046	China	JQ279616
	Y.C. Dai 13458	China	KT828672*
	S.H. Wu 1207-122	China	KT828673*
<i>H. latesetosa</i>	S.H. He 502	China	JQ716405
<i>H. olivacea</i>	Y.C. Dai 12789	USA	KT828678*
<i>H. rigidula</i>	S.H. He 343	China	JQ279612
<i>H. subrigidula</i>	S.H. He 1157	China	JQ716403
<i>H. tabacina</i>	S.H. He 810	China	JQ279611
<i>H. tabacinoides</i>	B.K. Cui 10428	China	JQ279604
<i>H. yasudae</i>	S.H. He 375	China	JQ279615
Outgroup			
<i>Hymenochaete rubiginosa</i>	S.H. He 1049	China	JQ716407

* Sequences newly obtained in this study

Fig. 1 Strict consensus tree obtained from Maximum Parsimony analysis of ITS sequences of *Hymenochaetopsis* taxa. Parsimony bootstrap values (>50 %) are shown



Synonym: *Pseudochaete* T. Wagner & M. Fisch., Mycol. Progr. 1: 100, 2002 (nom. illegit.); non *Pseudochaete* W. West & G.S. West, Journal of Botany, London 41: 37, 1903 (Algae).

Etymology: *Hymenochaetopsis* (Lat.) refers to the morphological resemblance to *Hymenochaete*.

Basidiocarps annual, resupinate, effused-reflexed or pileate, thin, membranous, coriaceous or corky. Hymenophore smooth, hydroid, semi-lamellate or lamellate, more or less cracked with age, usually brown colored, turning black in KOH. Hyphal system monomitic or subdimitic; generative hyphae simple-septate; setal hyphae present in some species. Setae usually abundant, reddish-brown, subulate, more or less encrusted. Basidia clavate to subcylindrical, with four sterigmata, simple-septate at the base. Basidiospores narrowly cylindrical to allantoid, hyaline, thin-walled, smooth, IKI-, CB-. Causing a white rot on angiospermous or gymnospermous wood.

Hymenochaetopsis laricicola S.H. He & Jiao Yang, sp. nov. (Figs. 2c and 3)

Mycobank: MB 814944

Type.—CHINA. Heilongjiang Prov., Ning'an County, Jingbohu Forestry Park, on fallen branch of *Larix* sp., 5.IX.2013, Y.C. Dai 13458 (holotype, BJFC!).

Etymology.—*laricicola* (Lat.) refers to the growth on *Larix*.

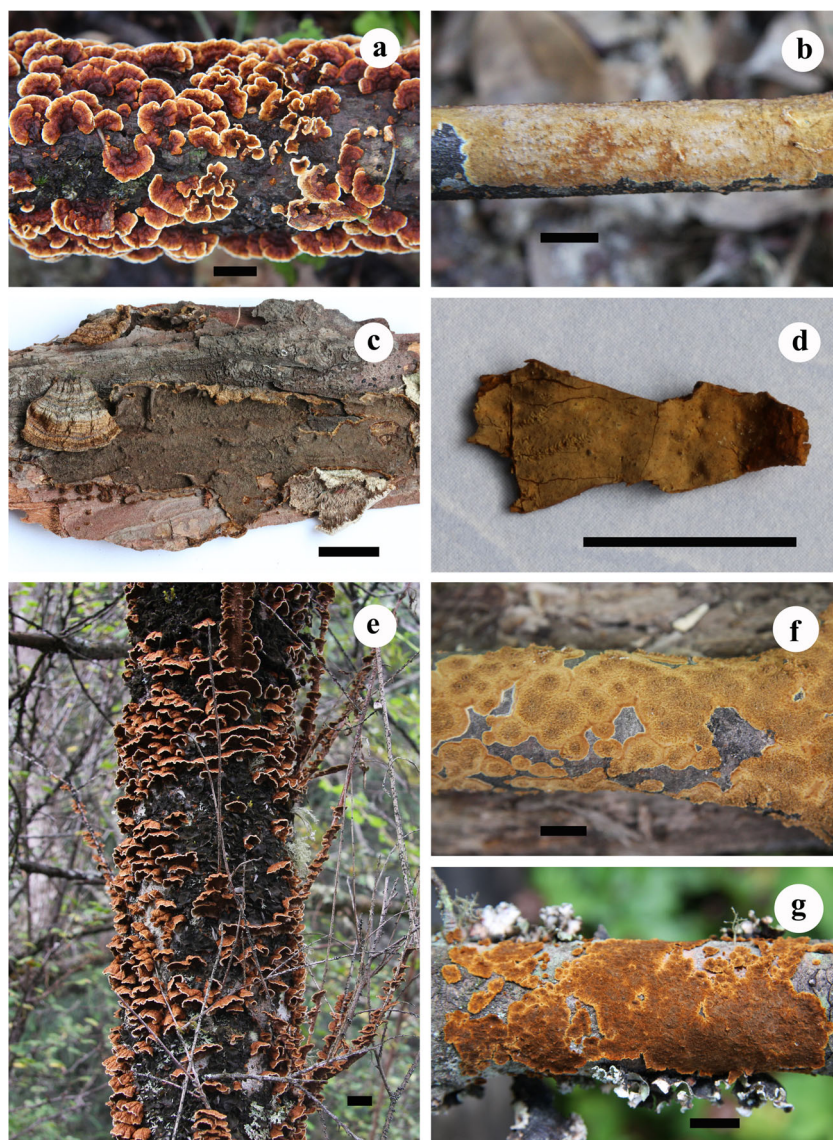
Fruitbody.—Basidiocarps annual, broadly effused-reflexed or pileate, closely adnate, coriaceous or corky, more or less brittle when dry. Pilei confluent, imbricate, dimidiate, semicircular or fan-shaped, projecting up to 1.5 cm, up to 0.5 mm at the base; pileal surface radiately fibrillose, silky, becoming glabrous with age, concentrically zonate and sulcate, light brown (6D6–8), brown (7E4–5), grey (6E1) or brownish grey (6E2); margin thin, entire, curving down when dry, concolorous with the pileal surface. Hymenophore smooth, usually densely cracked with age, with numerous crevices, brown (7E5–8), brownish grey (7 F2), reddish brown (8E4–6) or dark brown (7 F5–8); margin thinning out, fimbriate, lighter colored or concolorous with hymenophore surface.

Hyphal structure.—Hyphal system monomitic; generative hyphae without clamp connections; tissue darkening but otherwise unchanged in KOH.

Subiculum.—Tomentum, cortex and hyphal layer present. Cortex composed of strongly agglutinated hyphae, 30–40 μm thick. Generative hyphae in hyphal layer hyaline or yellowish-brown, regularly arranged or more or less interwoven, thin- to thick-walled with a wide lumen, rarely branched, 2–4.5 μm in diam.

Stratified hymenium.—Hyphae in this layer similar to those in subiculum, yellowish-brown, agglutinated, interwoven, 2–

Fig. 2 Basidiocarps of *Hymenochaetopsis* spp. (photos by Shuang-Hui He, scale bars = 1 cm). **a** *H. intricata* (S.H. He 1900); **b** *H. gigasetosa* (S.H. He 1442); **c** *H. laricicola* (Y.C. Dai 13458); **d** *H. lenta* (L. Ryvardeen 37887); **e** *H. tabacina* (S.H. He 318); **f** *H. olivacea* (S.H. He 2079); **g** *H. yasudae* (S.H. He 340)



4 μm in diam. Hymenium composed of setae, basidia, and basidioles. Hymenial setae abundant, subulate, reddish-brown, thick-walled, sometimes slightly encrusted with crystals in the tips, with bluntly acute or obtuse tip, (20) 25–50 (60) \times (6) 7–10 (15) μm , projecting up to 30 μm above the hymenium. Setae in subhymenium (setal hyphae) frequent, more or less parallel along the substrate with tips bending into the hymenium, up to 120 \times 12 μm . Cystidia and hyphidia absent. Basidia clavate to subcylindrical, hyaline, with 4-stigmata, and simple-septate at the base, 12–25 \times 3–5 μm ; walls thickening toward the base; basidioles numerous, similar to basidia but shorter.

Spores.—Basidiospores narrowly and shortly cylindrical, hyaline, thin-walled, smooth, IKI–, CB–, 4–6 (7) \times 1.5–2 μm , L = 5 μm , W = 1.7 μm , Q = 2.8–3.2 (n = 90/3).

Habitat.—Growing on the bark of dead or fallen trees of *Larix*.

Additional specimens examined.—*Hymenochaetopsis laricicola*: CHINA. Heilongjiang Prov., Huma County, Nanwenghe Nat. Res., on fallen trunk of *Larix gmelinii*, 27.VIII.2014, Y.C. Dai 14607; Jilin Prov., Antu County, Changbaishan Nat. Res., on bark of *Larix*, VII.2012, S.H. Wu 1207–122; Neimenggu Autonomous Region, Genhe County, Greater Hinggan Mountains Nat. Res., on dead tree of *Larix gmelinii*, 28.VIII.2009, Y.C. Dai 11046 (ITS: JQ279616); Arxan County, Arxan National Forest Park, on fallen trunk of *Larix gmelinii*, 20.X.2015, S.H. He 3109.

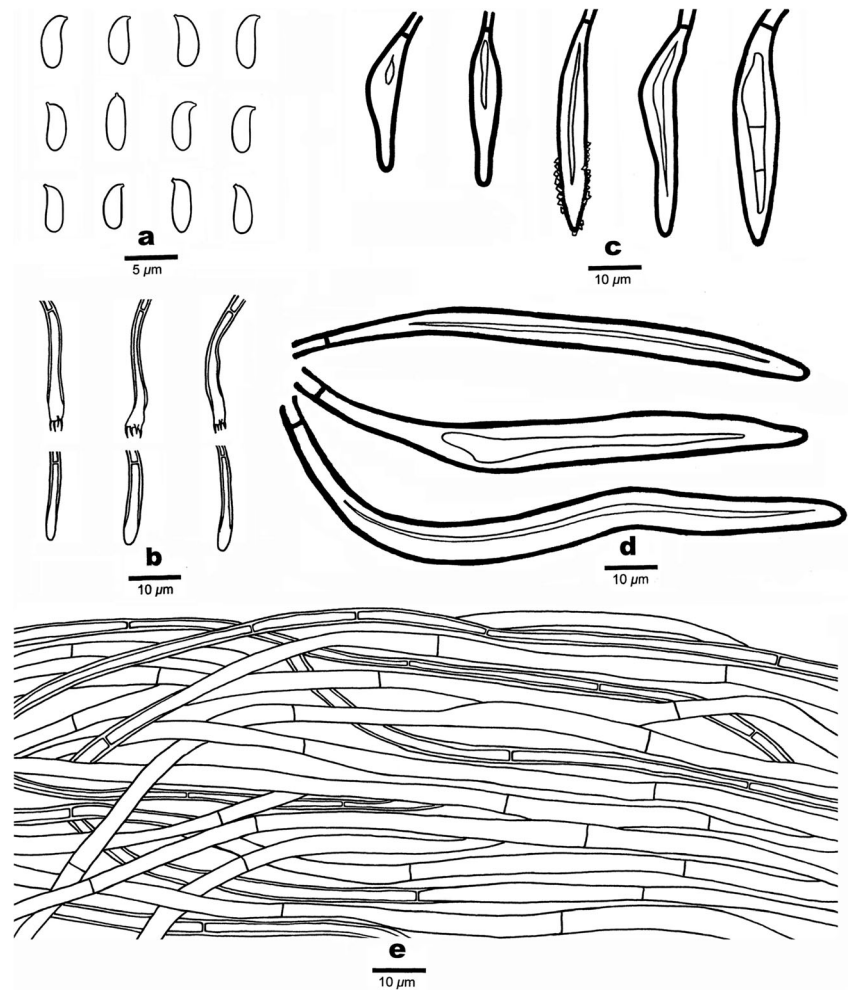
Hymenochaetopsis lenta: Venezuela: Estado Bolivar, Las Nieves, on dead hardwood, 12.VI.1995, L. Ryvardeen 37887 (O!).

Hymenochaetopsis corrugata (Fr.) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814946

Basionym: *Thelephora corrugata* Fr., Observ. Mycol. 1: 154, 1815

Fig. 3 Microscopic structures of *Hymenochaetopsis laricicola* (drawn from Y.C. Dai 13458 by Jiao Yang). **a** Basidiospores; **b** Basidia and basidioles; **c** Hymenial setae; **d** Setae originate from subiculum; **e** Hyphae from subiculum



Synonyms: *Hymenochaete corrugata* (Fr.) Lév., Ann. Sci. Nat., Bot., III 5: 152, 1846; *Pseudochaete corrugata* (Fr.) S.H. He & Y.C. Dai, Fungal Diversity 56: 89, 2012

Hymenochaetopsis gigasetosa (Parmasto) S.H. He & Jiao Yang, comb. nov. (Figs. 2b and 4)

Mycobank: MB 814947

Basionym: *Hymenochaete gigasetosa* Parmasto, Folia Cryptog. Estonica, Fasc. 40: 41, 2003

Fruitbody.—Basidiocarps annual, resupinate, closely adnate, coriaceous, first as small patches, later confluent up to 20 cm, 100–300 µm thick in cross-section. Hymenophore smooth, brownish orange (6C5–8) or light brown (6D5–8), not cracked with age; margin thinning out, distinct, fimbriate, white (6D1) when juvenile, becoming indistinct, concolorous with hymenophore surface with age.

Hyphal structure.—Hyphal system monomitic; generative hyphae without clamp connections; tissue darkening but otherwise unchanged in KOH.

Subiculum.—Tomentum absent. Cortex absent or sometimes a thin dark line present, 5–20 µm in diam., composed of strongly agglutinated hyphae. Hyphal layer present, usually

indistinct with thickening setal layer. Generative hyphae hyaline to yellowish brown, thin- to thick-walled with a wide lumen, moderately septate and branched, loosely interwoven, 2–5 µm in diam. Setal hyphae (embedded setae) frequently present when juvenile, more or less parallel along substrate, longer and narrower than hymenial setae, usually bending downwards and penetrating out of the hymenium to represent setae.

Stratified hymenium.—Hyphae in this layer similar to those in subiculum, yellowish brown, thick-walled, agglutinated. Setal layer composed of 1–3 rows of overlapping setae. Setae scattered or rare, originating from hymenium or subiculum, setae from hymenium broadly subulate, vertical to hymenium, usually swollen at the base, shorter and wider than those from subiculum; setae from subiculum usually with a setal hyphae-like base, bent downwards and penetrating out of the hymenium; both types of setae reddish brown, with blunt or acute tips, slightly encrusted with crystals in the upper part, projecting up to 100 µm above the hymenium, (70) 80–190 (200) × (8) 9–24 (26) µm. Cystidia absent. Hyphidia present, numerous or sometimes scattered, yellowish brown, usually

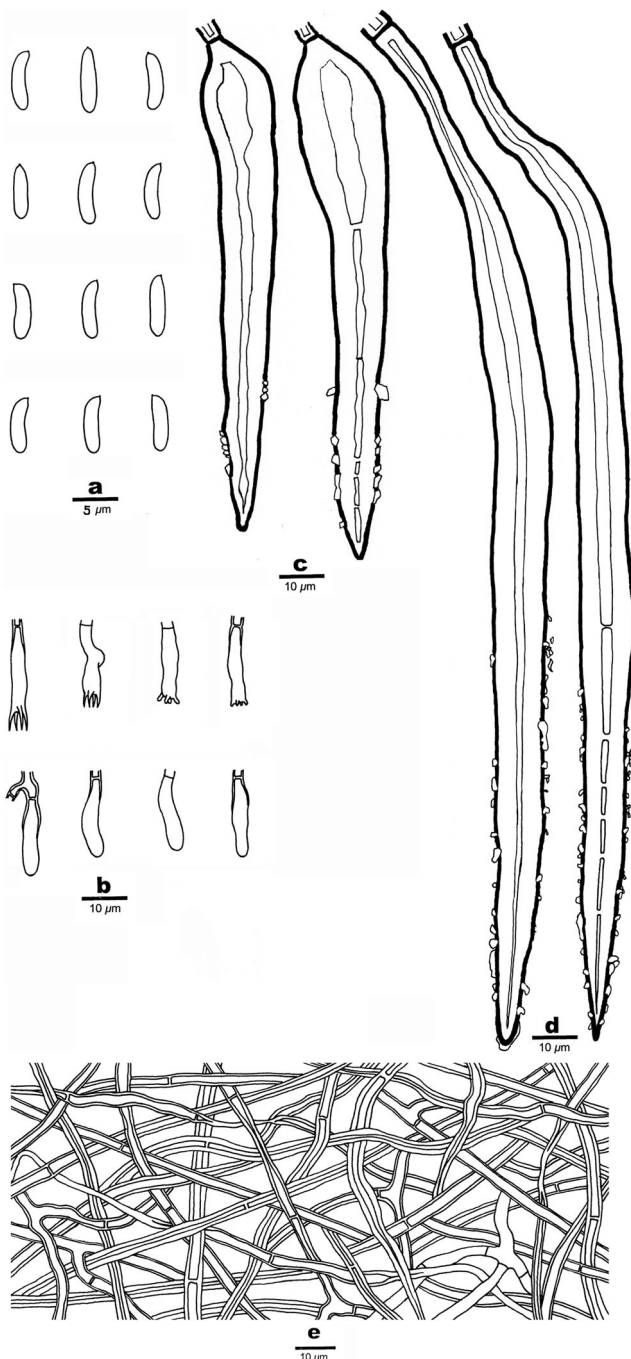


Fig. 4 Microscopic structures of *Hymenochaetopsis gigasetosa* (drawn from S.H. He 1461 by Hai-Jiao Li). **a** Basidiospores; **b** Basidia and basidioles; **c** Hymenial setae; **d** Setae originate from subiculum; **e** Hyphae from subiculum

sinuous, not bifurcated or branched, thick-walled, with round or acute tip, sometimes curved or coiled at the tips. Basidia clavate, with four sterigmata, and simple-septate at the base, $16\text{--}20 \times 3\text{--}4 \mu\text{m}$; walls usually thickening at basal part; basidioles similar to basidia but slightly smaller.

Spores.—Basidiospores narrowly cylindrical to slightly allantoid, hyaline, thin-walled, smooth, IKI–, CB–, $6\text{--}8 \times 1.5\text{--}2 \mu\text{m}$, $L = 6.9 \mu\text{m}$, $W = 1.9 \mu\text{m}$, $Q = 3.6\text{--}3.8$ ($n = 60/2$).

Type of rot.—Causing a white fibrose rot of wood.

Specimens examined.—CHINA. Yunnan Prov.: Baoshan, Gaoligongshan Nat. Res., Baihualing, elevation ca. 1600 m, on fallen angiosperm twig, 28.X.2012, S.H. He 1442 & 1461. INDIA. Uttar Pradesh, Mundali, Chakrata Forest Division, on dead twigs of *Picea morinda*, 8.XI.1957, P.S. Rehill (isotype in TAA!); on fallen angiosperm branch, 5.XI.1953, P.S. Rehill (paratype in TAA!).

Hymenochaetopsis intricata (Lloyd) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814948

Basionym: *Stereum intricatum* Lloyd, Mycol. Writ. 7: 1157, 1922

Synonyms: *Hymenochaete intricata* (Lloyd) S. Ito, Bot. Mag., Tokyo 44: 156, 1930; *Pseudochaete intricata* (Lloyd) S.H. He & Y.C. Dai, Fungal Diversity 56: 89, 2012

Hymenochaetopsis lamellata (Y.C. Dai & Niemelä) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814949

Basionym: *Cyclomyces lamellatus* Y.C. Dai & Niemelä, in Dai, Härkönen & Niemelä, Ann. Bot. Fenn. 40: 384, 2003

Synonym: *Pseudochaete lamellata* (Y.C. Dai & Niemelä) S.H. He & Y.C. Dai, Fungal Diversity 56: 89, 2012

Hymenochaetopsis latesetosa (S.H. He & Hai J. Li) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814989

Basionym: *Pseudochaete latesetosa* S.H. He & Hai J. Li, Mycol. Progr. 12: 333, 2013

Hymenochaetopsis lenta (G.A. Escobar ex J.C. Léger) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814952

Basionym: *Hymenochaete lenta* G.A. Escobar ex J.C. Léger, Cryptog. Mycol. 11: 302, 1990

Synonym: *Pseudochaete lenta* (G.A. Escobar ex J.C. Léger) S.H. He & Y.C. Dai, Fungal Diversity 56: 89, 2012

Hymenochaetopsis olivacea (Schwein.) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814953

Basionym: *Sistotrema olivaceum* Schwein., Schr. Naturf. Ges. Leipzig 1: 101, 1822

Synonyms: *Hydnum olivaceum* (Schwein.) Fr., Elench. Fung. 1: 134, 1828; *Hydnochaete olivacea* (Schwein.) Banker, Mycologia 6: 234, 1914; *Pseudochaete olivacea* (Schwein.) Parmasto, in Parmasto, Saar, Larsson & Rummo, Mycol. Progr. 13: 61, 2014

Hymenochaetopsis rigidula (Berk. & M.A. Curtis) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814954

Basionym: *Hymenochaete rigidula* Berk. & M.A. Curtis, J. Linn. Soc., Bot. 10: 334, 1868 [1869]

Synonym: *Pseudochaete rigidula* (Berk. & M.A. Curtis) S.H. He & Y.C. Dai, Fungal Diversity 56: 89, 2012

Hymenochaetopsis subrigidula (S.H. He & Hai J. Li) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814990

Basionym: *Pseudochaete subrigidula* S.H. He & Hai J. Li, Mycol. Progr. 12: 335, 2013

Hymenochaetopsis tabacina (Sowerby) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814955

Basionym: *Auricularia tabacina* Sowerby, Col. Fig. Engl. Fung. 1: 14, 1797

Synonyms: *Thelephora tabacina* (Sowerby) Fr., Syst. Myc. 1: 437, 1821; *Stereum tabacinum* (Sowerby) Fr., Epicr. Syst. Mycol.: 550, 1838; *Hymenochaete tabacina* (Sowerby) Lév., Ann. Soc. Nat., Bot III, 5: 152, 1846

Hymenochaetopsis tabacinoides (Yasuda) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814956

Basionym: *Irpex tabacinoides* Yasuda, Bot. Mag., Tokyo 33: 189, 1919

Synonym: *Pseudochaete tabacinoides* (Yasuda) S.H. He & Y.C. Dai, Fungal Diversity 56: 89, 2012

Hymenochaetopsis yasudae (Imazeki) S.H. He & Jiao Yang, comb. nov.

Mycobank: MB 814960

Basionym: *Hymenochaete yasudae* Imazeki [as 'yasudai'], Bull. Tokyo Sci. Mus. 2: 6, 1940

Synonym: *Pseudochaete yasudae* (Imazeki) S.H. He & Y.C. Dai, Fungal Diversity 56: 89, 2012

Key to species of *Hymenochaetopsis*

1. Hymenophore hydroid or lamellate ————— 2
1. Hymenophore smooth ————— 4
2. Hymenophore effused or effused-reflexed, hydroid, American species ————— *H. olivacea*
2. Hymenophore effused-reflexed or pileate, lamellate or hydroid, Asian species ————— 3
3. Hymenophore lamellate ————— *H. lamellata*
3. Hymenophore hydroid or semi-lamellate ————— *H. tabacinoides*
4. Growth exclusively on gymnospermous wood ————— 5
4. Growth on angiospermous wood, or occasionally on gymnospermous wood ————— 6
5. On *Pinus* or *Abies*, submoniliform hyphidia numerous ————— *H. yasudae*
5. On *Larix*, submoniliform hyphidia absent ————— *H. laricicola*
6. Basidiocarps strictly resupinate or slightly effused-reflexed ————— 7
6. Basidiocarps effused-reflexed or pileate ————— 11
7. Hyphal layer absent ————— *H. corrugata*
7. Hyphal layer present ————— 8
8. Setae up to 14 μm wide ————— 9

8. Setae up to 24 μm wide ————— 10

9. Setae 40–60 \times 7–12 μm , basidiospores 3.7–5 \times 1.5–2.3 μm ————— *H. rigidula*

9. Setae 35–135 \times 7–14 μm , basidiospores 5–7 \times 1.5–2 μm ————— *H. subrigidula*

10. Setae 50–150 \times 11–23, tropical species ————— *H. latesetosa*

10. Setae 80–190 \times 9–24, temperate species ————— *H. gigasetosa*

11. Subicular hyphae hyaline ————— *H. intricata*

11. Subicular hyphae yellowish brown ————— 12

12. Setal hyphae present, setae 60–120 \times 7–15 μm , cosmopolitan species ————— *H. tabacina*

12. Setal hyphae absent, setae 40–55 \times 9–15 μm , South America species ————— *H. lenta*

Discussion

Like those of *Hymenochaete*, species of *Hymenochaetopsis* have usually brown colored basidiocarps turning black in KOH, smooth, lamellate or hydroid hymenophores, simple-septate generative hyphae, a monomitic or subdimitic hyphal system, characteristic subulate setae, smooth and thin-walled basidiospores negative in cotton blue and Melzer's solution. They cause white rots on both angiospermous and gymnospermous wood from boreal to tropical areas.

Hymenochaetopsis laricicola is characterized by inhabiting gymnospermous trees, effused-reflexed to pileate basidiocarps, presence of a cortex and hyphal layer, relatively small hymenial setae, and short cylindrical basidiospores. Three species, *Hymenochaetopsis intricata* (Fig. 2a), *H. lenta* (Fig. 2d), and *H. tabacina* (Fig. 2e) with effused-reflexed to pileate basidiocarps and smooth hymenophores that are most similar to *H. laricicola*. However, *H. intricata* differs from *H. laricicola* in having a hyaline hyphal layer, more scattered and wider setae, and growth on angiospermous wood; *H. lenta* differs in having larger basidiocarps with yellowish hymenophores, no setal hyphae, and a distribution in South America; and *H. tabacina* differs in having larger setae and growth mainly on angiospermous wood. Parmasto (2001) mentioned that *Larix* is a common host for *H. tabacina* in North and East Asia. However, according to our investigations in northeast China, *H. tabacina* was found on several angiosperm trees, e.g., *Acer*, *Betula*, *Quercus*, etc., but never on *Larix*. Previously, only *Hymenochaetopsis yasudae* (Fig. 2g) has been reported to grow strictly on conifer trees such as *Pinus* and *Abies*, but this species differs from *H. laricicola* by having larger hymenial setae and submoniliform hyphidia.

Hymenochaetopsis gigasetosa has been previously reported from India only (Parmasto 2003). It is characterized by large setae, presence of setal hyphae and narrowly cylindrical basidiospores. Parmasto did not find basidiospores when he described this species, but gave the data measured by the collector ($6.1\text{--}8.4 \times 1.75\text{--}2.1 \mu\text{m}$ or $5.25\text{--}8.75 \times 1.75\text{--}2.2 \mu\text{m}$, Parmasto 2003). The Chinese specimens fit very well with the characters of the Indian materials, except that Chinese specimens have thinner basidiocarps. However, this might be due to the juvenile stage of Chinese specimens. So far, except for the two species, *H. lenta* (Fig. 2d) and *H. olivacea* (Fig. 2f) from America, all the other 11 species of *Hymenochaetopsis* have been recorded in China (Dai & Li 2010; He & Dai 2012; He & Li 2013).

Although ecologically and morphologically *Hymenochaetopsis* is very similar to *Hymenochaete*, it always formed a distinct sister clade with *Hymenochaete* in the phylogenetic trees of Hymenochaetaceae (Wagner & Fischer 2002; Larsson et al. 2006; He & Dai 2012; Parmasto et al. 2014). He & Dai (2012) found that all the species of *Hymenochaetopsis* have narrowly and shortly cylindrical to allantoid basidiospores with a maximum length of 7 μm and width of 2.5 μm , which might be a useful character to distinguish it from *Hymenochaete* (basidiospores cylindrical, ellipsoid to subglobose). However, in order to delimit well these two sibling genera, more species in *Hymenochaete* s.l. need to be sequenced.

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