



# Short communication Coltricia raigadensis (Hymenochaetaceae, Basidiomycota), a new species from India

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### ABSTRACT

A new species of Coltricia, C. raigadensis is described from tropical region of Maharashtra, India. The species is recognized on the basis of morphological characteristics and phylogenetic analyses using rDNA ITS1-5.8S-ITS2, partial 28S rDNA and partial 18S rDNA sequences. Coltricia raigadensis is characterized by centrally stipitate basidiocarps, adpressed velutinate to tomentose pileal surface, small pores (2-4 per mm), globose to subglobose, thick walled basidiospores measuring  $5.6-7 \times 5-6.64 \mu m$ .

Keywords: morphology, phylogeny, polypore, taxonomy

Article history: Received 7 June 2023, Revised 30 January 2024, Accepted 2 February 2024, Available online 2 May 2024.

Coltricia Gray is a worldwide genus of Hymenochaetales (Larsson et al., 2006), typified by C. perennis (L.) Murrill. The majority of species are terrestrial and some have been associated with plant roots, where they are likely to be mycorrhizal (Tedersoo et al., 2007), while others have been discovered on wood. The genus Coltriciella Murrill is closely related to Coltricia by sharing similar morphological characteristics and growth habits, but they differ mainly in having either ornamented or smooth basidiospores (Ryvarden, 1991). The phylogenetic studies by Bian et al. (2022) revealed the placement of Coltriciella within the clade of Coltricia and hence Coltriciella was considered as a synonym under Coltricia. Further, based on the above conclusions, Wu et al. (2022) grouped all Coltriciella species under the genus Coltricia. So, the generic concept is broadened by basidiocarps varying from resupinate, effuse-reflexed, pendent or stipitate with a monomitic hyphal system devoid of clamp connections, poroid or lamellate hymenial surfaces, and usually pigmented, smooth or ornamented basidiospores (Corner, 1991; Dai, 2010; Ryvarden, 2004).

Coltricia has been substantially investigated worldwide and about 31 new taxa (adding nine new species of the originally described Coltriciella) were newly described in the last decade (Baltazar et al., 2010; Baltazar & Silveira, 2012; Bian & Dai, 2015, 2017, 2020; Bian et al., 2016, 2022; Dai, 2010; Dai et al., 2010; Dai & Li, 2012; Decock, 2013; Jayawardena et al., 2022; Ryvarden & Melo, 2014; Susan et al., 2018; Valenzuela et al., 2012, 2020; Vasco-Palacios, 2016; Vlasák et al., 2020; Wu et al., 2022; Zhou & Tedersoo, 2012). In India, Coltricia is poorly studied, so far nine species of the

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genus are reported from the country (Adarsh et al., 2018; Baltazar & Silveira, 2012; Kaur et al., 2016; Kour et al., 2015; Pongen et al., 2018).

During the macrofungal surveys conducted from 2015 to 2020 in the Matheran Hills region of Maharashtra, India, amidst the monsoon periods, several new taxa of mushrooms have been collected. The region is characterized by a mixed dry deciduous forest dominated by Memecylon umbellatum Burm.f. In the present study, a new Coltricia species is described pursuant to morphological characters and molecular phylogenetic analyses.

Materials were collected after taking field photographs. Detailed macroscopic characters were studied from the fresh materials. Color notations were followed according to Kornerup and Wanscher (1978). The specimens were air dried or dried at 45-50 °C temperature in oven for 1 or 2 d. All micromorphological features were studied with assistance of a compound microscope MLX-B (Olympus, Tokyo, Japan) connected with Magnus Magcam DC-5 camera (Magnus Opto Systems India Pvt. Ltd., New Delhi, India). The thin handmade sections of dried specimens were revived in 5% (w/v) KOH, stained with 1% (w/v) phloxin in distilled water, cotton blue and Melzer's reagent. The following abbreviations were used in the text to describe the basidiospores: L for arithmetic mean of basidiospores length, W for arithmetic mean of basidiospores width and Q for quotient of length and width between samples studied, Qm for mean values of  $Q \pm$  standard deviation and n for number of basidiospores measured from given number of specimens. The studied samples were deposited at Ajrekar Mycological Herbarium (AMH), Pune, India and the paratypes were maintained at 'Matheran Mushroom Herbarium' collection (MMH) of the department of Botany, Smt. Chandibai Himathmal Mansukhani College, Thane, India.



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The specimens and sequences obtained from this study and other fungal taxa used in previous studies were enlisted in Table 1. The genomic DNA was extracted using CTAB method (Doyle & Doyle, 1987), and PCR reactions and PCR purification were carried out by Genematrix LLP (Pune, India), further the Sanger sequencing was conducted by Apical Scientific Sdn Bhd (Seri Kembangan, Selangor, Malaysia). The DNA markers ITS1-5.8S-ITS2 (nrITS), partial 28S rDNA (nrLSU) and partial 18S rDNA (nrSSU) were amplified and sequenced using the primers: ITS1/ITS4 (White et al., 1990), LR0R/ LR5 (Moncalvo et al., 2000; Vilgalys & Hester, 1990), NS1/NS4 (White et al., 1990). All the sequences generated in this study were deposited to NCBI database under accession numbers OR072877, OR072932, OR053821, and OR053822. The NCBI database sequences were retrieved and used to construct the phylogenetic trees following earlier studies (Bian & Dai, 2017, 2020; Bian et al., 2016, 2022; Wu et al., 2022). The combined dataset consists of 73 nrITS, 73 nrLSU and 54 nrSSU sequences (including four new sequences of present study), representing 40 species of Coltricia. Based on the morphological similarities and previous molecular studies (Bian & Dai, 2020; Bian et al., 2022; Larsson et al., 2006; Wagner & Fischer, 2002), the closely allied genera Fomitiporella chinensis (Pilát) Y.C. Dai, X.H. Ji & Vlasák and Inonotus griseus L.W. Zhou were selected as outgroups. All the sequences were aligned using MUSCLE programme in the MEGA v 7.0 software (Kumar et al., 2016). Initially, the individual marker based trees were constructed and then all three markers were analysed for their combining efficacy by performing the partition homogeneity test (ILD) in PAUP v 4.0b10 (Swofford & Sullivan, 2009) to generate the combined tree. The sequences were concatenated by using TaxonDNA (Sequence Matrix) v 1.7.8 (Vaidya et al., 2010). The combined aligned data matrix of all three markers was also deposited to the treeBASE, which can be accessed using the URL: http://purl.org/phylo/treebase/phylows/ study/TB2:S30807. Phylogenetic analyses were performed with Maximum likelihood (ML) and Bayesian inference (BI) criteria. The ML phylogram was generated by using IQTree v 1.6.8 (Nguyen et al., 2014) and the best-fit nucleotide substitution model was selected as GTR+F+I+G4 for combined dataset, according to the ModelFinder (an inbuilt tool of IQTree, Kalyaanamoorthy et al., 2017). Further, the Bayesian analysis was performed using Metropolis Coupled MCMC method in MrBayes v 3.2.6 (Ronquist et al., 2012). Two parallel chains were run for 4 million generations and standard deviation of split frequency was obtained less than 0.01 for the combined dataset. The nucleotide substitution model (GTR+I+G) was selected using jModeltest (Darriba et al., 2012). ML and Bayesian phylogenetic trees were visualized in FigTree v 1.4.2 (Rambaut, 2014). Statistical supports for the phylogram were determined in terms of bootstrap values (BS) and posterior probabilities (PP).

### Taxonomy

*Coltricia raigadensis* P.B. Patil, S.A. Vaidya, S. Maurya & L.S. Yadav sp. nov. Figs. 1, 2.

MycoBank no.: MB 849006.

Diagnosis: this species is characterized by centrally stipitate basidiocarps, adpressed velutinate to tomentose pileal surface, 2–4 pores per mm, 5.3–7.6  $\mu$ m wide contextual hyphae, 4.8–5.4  $\mu$ m wide tramal hyphae, globose to subglobose, thick walled basidiospores measuring 5.6–7 × 5–6.64  $\mu$ m.

Type: INDIA, Maharashtra, Raigad District, Matheran Hills (18°58'48.00"N, 73°16'12.00"E, 800 m a.s.l.), collected by P. B. Patil on 25 Jul 2017. (**AMH 10511**, Holotype).

DNA sequence ex-Holotype: OR072877 (nrITS).

Etymology: The species epithet "raigadensis" refers to the place

Basidiomes annual, centrally stipitate, solitary, soft or leathery when fresh, hard, corky or brittle, light weight when dried. Pilei more or less circular, flat to infundibuliform, up to 35 mm diam, 3 mm thick at centre. Pileal surface shiny, chocolate brown (6F4) to chestnut brown (6F7) to burnt umber (6F6) when fresh, brownish black (6F8) to burnt umber (6F6) upon drying, azonate to concentrically zonate, adpressed velutinate to tomentose, hairs erected in the centre, margin entire to incised, straight to deflexed when dry, with tuft of hairs, sterile up to 3 mm. Pore surface brownish black (6F8) when fresh yellowish brown (5E8) upon drying. Pores round to angular, 2-4 per mm, dissepiments thin to fairly thick, entire to lacerate. Context dark brown, coriaceous, up to 2 mm thick. Tubes concolorous with the pore surface, brittle when dry, up to 1-2 mm long. Stipe concolorous with the upper surface of the pileus, cylindrical, rigid to pliable, velutinous to tomentose, often branched near apex, corky to leathery when dry, up to 25 to 40 mm long, 3 to 5 mm diam, mostly swollen tip up to 8 mm diam.

Hyphal system monomitic, generative hyphae with simple septa, contextual hyphae golden brown, branched at broad angles, fairly thick walled with broad lumen, 5.3–7.6  $\mu$ m wide. Stipe hyphae golden brown, thick walled with a narrow lumen, distinctly narrower than those in context, parallel along the stipe, unbranched, 4–5.3  $\mu$ m wide. Tramal hyphae pale yellow to buff yellow, slightly thick walled with a wide lumen, moderately branched, loosely interwoven to subparallel along the tubes, 4.8–5.4  $\mu$ m diam. Cystidia and cystidioles absent. Basidia broadly clavate, 4–spored, with the basal septum, 18.5–24.5 × 5.4–7.8  $\mu$ m; basidioles slightly smaller, 12.6–20.4 × 4–6.6  $\mu$ m, similar in shape to basidia. Basidio-spores globose to subglobose, golden brown, smooth, thick-walled, cyanophilic, inamyloid, nondextrinoid, (4.6) 5.6–7 (7.2) × (4.3) 5–6.6  $\mu$ m, L = 6.3  $\mu$ m, W = 5.7  $\mu$ m, Q = 1.03–1.18, Qm = 1.11 $\pm$  0.06 (n = 60/3).

Habitat and distribution: On soil, solitary to scattered in mixed dry deciduous forest. So far known only from Matheran Hills, Maharashtra, India.

Additional specimens (paratypes) examined: INDIA, Maharashtra, Raigad District, Matheran Hills (18°58'48.00"N, 73°16'12.00"E), 15 Aug 2019 (MMH 1211, OR072932 for nrITS, OR053821 for nrLSU, and OR053822 for nrSSU), 8 Sep 2019 (MMH 1212), 22 Aug 2021 (MMH 1213), Prashant B. Patil.

Coltricia raigadensis is characterized by its centrally stipitate basidiocarps, adpressed velutinate to tomentose pileal surface, globose to subglobose, and thick walled basidiospores; these features are common with C. albidipes Corner ex Y.C. Dai & Hai J. Li, C. barbata Ryvarden & de Meijer, C. globispora Gomes-Silva, Ryvarden & Gibertoni, C. hamata (Romell) Ryvarden, C. rigida L.S. Bian & Y.C. Dai, and C. velutina Baltazar & Gibertoni. However, C. albidipes has pale yellowish, glabrous pileal surface and slightly smaller basidiospores  $(5-6 \times 4.7-5.2 \,\mu\text{m})$  (Dai & Li, 2012). Coltricia barbata is distinguishable from C. raigadensis by its smaller basidiomes (up to 18 mm diam) and glabrous pileal surface (Ryvarden & de Meijer, 2002). Coltricia globispora distinctly differs from C. raigadensis in having larger basidiomes (pileus up to 55 mm diam), glabrous, snuff brown pileal surface and smaller pores (7-8 per mm) (Gomes-Silva et al., 2009). Coltricia hamata is differs markedly by its conspicuous, dark brown setal hyphae and larger basidiospores (7.5–10 × 5.5–7 µm) (Ryvarden & Johansen, 1980). Coltricia velutina has smaller basidiomes (pileus up to 15.5 mm diam), smaller pores (5–7 per mm), basidia ( $12-15 \times 7-8 \mu m$ ) and basidiospores  $(5.5-6.5 \times 4.5-5.5 \mu m)$  (Baltazar et al., 2010). Coltricia rigida is also having subglobose to globose basidiospores but differs from C. raigadensis by having laterally stipitate larger basidiocarps (up to

 Table 1. Fungal taxa, voucher specimen numbers, substrate, localities and GenBank accession numbers for nrITS, nrLSU, and nrSSU sequences used for the present phylogenetic analyses. "-" means information not available from GenBank database. Sequences newly generated in the present study were shown in bold.

Instance         Int State         Int State         Int State         Int State         Int State           Caling additional         Cuilson 201         Caling additional         KU380473         KU380474         KU	Taxon	Specimen Voucher	Substrate	Locality	Gen	GenBank accession numbers		
Caloriscie         Caloriscie         KU186673         KU18673		· · · · · · · · · · · · · · · · · · ·			nrITS	nrLSU	nrSSU	
C ableriola Cui 1312 Ground China KUS6973 KU69753 KV69757 C autoritories Du 13064 Ground China KUS6975 KU56975 KV69757 C autoritories Du 13076 Ground China KU56975 KU56975 KV69757 C autoritories Du 13075 Ground China KU56972 KU569672 KV69757 C autoritories Du 13075 Botto Control China KU56972 KV69777 C abritories Du 13075 Botto Control China KU56972 KV69777 C autoritories Du 13075 Botto Control China KU56987 C autoritories Du 13075 Botto Control China KU56987 C autoritories Du 13075 Botto Control China KV61793 KV69777 C confirms T A 18144 Ground C China KV99778 KV69777 C confirms T A 18144 Ground C China KV99778 KV69777 C confirms C 13599 Ground C China KV99778 KV69777 KV69777 KV698737 C confirms D 13074 Botto Control China KV99778 KV69777 KV69777 KV698737 C confirms D 13074 Botto V000 China KV79478 KV697778 KV69777 KV698737 KV698737 C confirms D 141074 Botto V000 China KV79478 KV697778 KV69777 KV698737 KV698315 C dependent D 141074 Botto V000 China KV79478 KV697778 KV698737 C dependent D 141074 Botto V000 China KV79478 KV697778 KV698737 C dependent D 141074 Botto V000 China KV79478 KV697778 KV698737 C dependent D 141070 Ground C China KV79478 KV69778 KV69778 VF99815 C dependent D 141070 Ground C China KV74478 KV79478 KV69778 VF99818 C dependent D 141070 Ground C China KV74478 KV79478 KV69778 VF99818 C dependent D 141070 Ground C China KV74478 KV79478 KV69878 C V699778 C dependent D 141070 Ground C China KV74478 KV79478 KV69878 C V699778 C dependent D 141070 Ground C China KV74478 KV79478 KV69878 C V699778 C dependent D 14177 Ground C China KV74478 KV74478 KV74978 VV69788 C dependent D 14178 Ground C China KV74478 KV74478 KV74478 VV69788 C dependent D 14178 Ground C China KV74478 KV74478 KV74978 VV69787 C dependent D	Coltricia abieticola	Cui 12276	Ground	China	KU360673	KU360643	KY693762	
L administration Control (Control) (	C. abieticola	Cui 12312	Ground	China	KU360674	KU360644	KY693763	
C autoritational Data 1998 Ground China Lautorita Carbon AM1223 Lautorita Carbon China C 1996 Ground China C 1996 Ground C C	C. abieticola	Cui 10265 Cui 10321	Ground	China	KX364785	KX364803 KX364804	KY693760 KY693761	
C austraminensis Dal 13993 Ground China KU36070 KU36040 KY98753 C atternaminensis Dal 13973 Ground Colombia KT724137 KU69754 C hardware AMV 1866 Ground Colombia KT724137 KU70474 C hardware AMV 1866 Ground Colombia KT724137 KU70474 C hardware Colombia KT724137 KU704778 C hardware Colombia KT724178 KU704778 C hardware Colombia KT724142 KT74140 C hardware Colombia KT704787 C hardware Colombia KT70478 C hardware Colombia KT70478 C hardware Colombia KT74412 KT74140 C hardware Colombia KT74412 KT74140 C hardware Colombia KT74412 KT74140 C hardware Colombia KT74478 C hardware Colombia KT74478 C hardware Colombia KT74478 C hardware Colombia KT704787 C hardware Colombia KT704787 C hardware Colombia KT74478 C hardware Colombia KT94787 C hardware C	C. australica	TU 103694	Ground	Australia	-	AM412243	-	
C austromenteris Dal 1999; Grund China KL95671	C. austrosinensis	Dai 13093	Ground	China	KU360670	KU360640	KY693764	
C. during and the set of the set	C. austrosinensis	Dai 13098	Ground	China	KU360671	-	KY693765	
C. Indexina         MAY 1923         Ground         Columbia         KT24190         FT24190         FT24190           C. Boodnenstati         Dail 19075         Rotter wood of Catarappits         Chan         KX264810         KX36480         KX364797         KX369776         KY997373         KX36470         KY997373         KX364707         KY997373         KX364707         KX364707         KX364707         KX364707 <td>C. austrosinensis C. barbata</td> <td>Dai 13823 AMV 1866</td> <td>Ground</td> <td>Colombia</td> <td>KU360672 KT724137</td> <td>KU360642</td> <td>KY693766</td>	C. austrosinensis C. barbata	Dai 13823 AMV 1866	Ground	Colombia	KU360672 KT724137	KU360642	KY693766	
C. bashanemsite         Cui II AT         Rottes wood of Catanoparia         China         KX54-860         ·         ·           C. bashanemsite         Dail 1993         Rottes wood of Catanoparia         China         KX54-860         KX54-860         KY09370           C. oringines         TA A Ji Akabo         Granuad         China         KX54-860         KY09370         KY09370           C. oringines         TA A Ji Akabo         Granuad         USA         MM122108         KY093773         KY093734         KY093773         KY093734         KY093773         KY093734         KY093773         KY093734         KY09374         KY09374         KY09374         KY093734         KY093734         KY09374<	C. barbata	AMV 1925	Ground	Colombia	KT724136	KT724149	-	
C. housenerstic         Doi 13075         Refers wood of Cutrangenia         China         KX 64370         KX 64373         KX 64373           C. ordinamis         TH 702373         Ground         Distaine         AM412241            C. ordinamis         TH 702373         Ground         Distaine         AM412341            C. ordinamis         C. ordinamis         C. Ordinamis         KM412341            C. ordinamis         C. ordinamis         KM 64300         KW 643743         KW 64374           C. ordinamis         C. ordinamis         KM 644074         KW 643743         KW 64374           C. ordinamis         Disi 10444         Rottes wood         China         KY 693737         KY 693757           C. dipondramis         Disi 16450         Ground         China         KY 693737         KY 693738         KY 693737           C. dipondramis         Disi 16450         Ground         China         KY 693737         KY 693743         KY 693743           C. dipondramis         Disi 16450         Ground         Disi 1647         Ground         China         KY 693743         KY 69374           C. dipondramis         Disi 1647         Ground         Disi 1647         Ground         Disi 1647	C. baoshanensis	Cui 8147	Rotten wood of Castanopsis	China	KX364799	KX364819	-	
C. dbminnome         Clin Laber         Contral         China         K. 1092-20         K. 1092-21         K. 1092-21           C. confiltens         TA A. 114640         Ground         Extonia         A. M. 121008         -         -           C. confiltens         TH 7072287         Ground         U.N.A         M. 121008         -         -           C. constant         Duil 1024         Ground         China         K. 1096078         K. 1096074         K. 1096077           C. constant         Duil 1024         Ground         China         K. 10960773         K. 1096074         K. 10980777           C. dipenders         Duil 1004         Ground         China         K. 10960773         K. 10980777         K. 10980777           C. finciola         Duil 10040         Ground         China         K. 10960778         K. 1098078         K. 10980777           C. finciola         Duil 10040         Ground         China         K. 10980778         K. 1098078         K. 10980777         K. 10980777         K. 10980777         K. 10980778         K. 10980777         K. 10980778         K. 10980777         K. 10980777 <t< td=""><td>C. baoshanensis</td><td>Dai 13075</td><td>Rotten wood of <i>Castanopsis</i></td><td>China</td><td>KX364800</td><td>KX364820</td><td>KY693812</td></t<>	C. baoshanensis	Dai 13075	Rotten wood of <i>Castanopsis</i>	China	KX364800	KX364820	KY693812	
Configuration         TAA 1814600         Cround         Example         AM412241         N. 1.1.         N. 1.1.           C. configuration         TF 07257         Ground         USA         M112108         -         -           C. crissar         Duil 1516         Ground         China         KU360678         KU360674         KV993778           C. crissar         Duil 1516         Ground         China         KV993788         KV993758           C. dipontation         Duil 2520         Ground         China         KV993778         KV993758           C. dipontation         Duil 2520         Ground         China         KV993758         KV993758           C. forbotation         Duil 2600         Ground         China         KX564766         KV993758           C. forbotation         Duil 2620         Ground         Brazili         MZ444545         KV993751           C. forbotation         AVV 1897         Ground         Brazili         MZ444545         -         -           C. homata         AVV 1897         Ground         Thailand         -         KV243702         -           C. homata         AVV 1897         Ground         Thailand         KX244743         KY74131         -	C. cinnamomea	Cui 12549 Cui 12584	Ground	China	KY693728 KV693729	KY693742 KV693743	KY693769 KY693770	
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C. orasam         Cuil 1025         Ground         China         KU360678         KU360678         KU360674         KV93775           C. artsam         Duil 1514         Ground Not         China         KV397758         KV937753           C. artsam         Duil 2200         Forond         China         KV937758         KV937753           C. artsam         Duil 2200         Ground         China         KV937768         KV937753           C. artsam         Duil 10900         Ground         China         KV84776         KV93753           C. artsam         Duil 10900         Ground         China         KV84776         KV93815           C. artsam         Aut 27074         Ground         Bazil         MZ449454         -           C. homata         AVX 3776         Ground         Colombia         KT724144         KT734151         -           C. homata         AuV 1987         Ground         Thailand         KX34978         KX34980         KY93751           C. homata         AuV 1987         Ground         Thailand         KX34788         KX34980         KY93781         -           C. homata         AuV 23762         Ground         Thailand         KX34787         KX346808         KY93781	C. confluens	TF 072287	Ground	USA	MN121008	-	-	
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C deformations (Cul 9217) Rotten wood China KY993738 KY993738 KY993738 KY993736 CY993736 CY99373 CY93376 CY993736 CY99373 CY93376 CY993736 CY99373 CY93376 CY99373 CY93376 CY99373 CY93376 CY99373 CY93376 CY99378 CY3356 CY3357 CY33576 CY33	C. crassa C. dapandans	Dai 15163	Ground Potton wood	China	KU360679	KU360648	KY693778	
C, Jubraham         Dial 22300         Ground         China         Dial 2300         Dial 2300         Choral         China         KX54986         KX54805         I.           C, globoa         Cuil 7545         Ground         China         KX54986         KX54805         I.           C, globoa         Cuil 7545         Ground         Phraid         MT47443         MT12428         MT12428         I.           C, hormata         AMY 2005         Ground         Phraid         MT247446         KT724151         I.           C, hormata         AMY 2076         Ground         Colombia         KT724146         KT724151         I.           C, hintipes         Dai 16611         Ground         Thailand         K-49774         KY69370         I.           C, hintipes         Dai 16611         Ground         Thailand         K-49775         KX548007         KY693781           C, labraham         Dai 12545         Ground         China         KX54789         KX54807         KY693781           C, labraham         Dai 12367         Ground         China         China         KX54789         KX54807         KY693781           C, labraham         Dai 12373         Ground         China         KX154789	C. dependens C. dependens	Cui 9210	Rotten wood	China	KY693738	KY693758	KY693814	
C. fociola         Dai 16090         Ground         China         KX364786         KX364805	C. fimbriata	Dai 22300	Ground	China	OL691607	OL691616	OL691612	
C. globos         Cur 745         Ground         Chana         K149039         K100022         K100022 <thk10022< th=""> <thk100022< th=""> <thk10< td=""><td>C. focicola</td><td>Dai 16090</td><td>Ground</td><td>China</td><td>KX364786</td><td>KX364805</td><td>-</td></thk10<></thk100022<></thk10022<>	C. focicola	Dai 16090	Ground	China	KX364786	KX364805	-	
	C. globosa	Cui 7545	Ground	China	KJ540930	KJ000226	KY693815	
Chamata         4024         Ground         Bazall         M289454         Market         Market           C. hamata         AMV 2076         Ground         Colombia         KT724146         KT724150         -           C. hamata         AMV 2076         Ground         Thalland         KT724142         KT724150         -           C. httriges         Dai 1661         Ground         Thalland         KX54777         KX54800         KY693730           C. krandalaursis         Dai 1525         Fallen wood         Thalland         KX54779         KX54800         KY693781           C. krandalaursis         Dai 15264         Ground         China         KX54790         KX54800         KY693781           C. leris         Dai 22373         Ground         China         OL691618         OL691615         OL691615         OL691615         OL691615         C         KY693784         KY693784         KY693784         KY693787           C. macropora         Cui 9019         Ground         China         KU366680         KU306649         KY693787           C. markinger         Dai 1282         Ground         China         KU366684         KU306645         KY693789           C. markingora         Cui 9209         Ground </td <td>C. hamata</td> <td>3947</td> <td>Ground</td> <td>Brazil</td> <td>M7484545</td> <td>M7437402</td> <td>-</td>	C. hamata	3947	Ground	Brazil	M7484545	M7437402	-	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	C. hamata	4054	Ground	Brazil	MZ484546	-	-	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	C. hamata	AMV 1897	Ground	Colombia	KT724146	KT724150	-	
	C. hamata	AMV 2076	Ground	Colombia	KT724142	KT724151	-	
C. Kinzbelunsis         Dail 1997         Fallen wood         Thailand         KX364806         KY693780           C. Kinzbelunsis         Dail 1958         Follen wood         Thailand         KX364789         KX364807         KY693781           C. laterallis         Dail 13564         Ground         China         KX364789         KX364809         -           C. letris         Dai 22367         Ground         China         OL591617         OL691617         OL6916161           C. letris         Dai 22373         Ground         China         OL306080         LK364789         KX364809         -           C. letris         Dai 22373         Ground         China         KU30682         KU30220         KY693783           C. macropora         Cui 9019         Ground         China         KU30682         KU30205         KY693783           C. marcopora         Cui 9019         Ground         China         KU30684         KU360651         KY693788           C. minira         Dai 12237         Ground         China         KU36085         KU360651         KY693788           C. minirane         Cui 30168         Rotten wood         Giuyana         KT354890         -         -         -         -         -	C. hirtipes	Dai 16647	Ground	Thailand	KY693734	KY693750	-	
C. kinzbaltenisis         Dai 13958         Fallen wood         Thailand         KX364807         KX364807         KY364807           C. laterallis         Dai 13564         Ground         China         KX364790         KX364808         KY693782           C. lenis         Dai 22373         Ground         China         VL364790         KX364809         L-601613           C. lenis         Dai 22373         Ground         China         VL3608680         K1000220         KY693781           C. lenis         Dai 22373         Ground         China         KU360868         K1000220         KY693781           C. macropora         Cui 9019         Ground         China         KU360868         KU300651         KY693781           C. mintom         Dai 1826         Ground         China         KU360883         KU300651         KY693781           C. mintom         Dai 18247         Ground         China         KU360684         KU360651         KY693787           C. montagnet         Dai 1237         Ground         China         KU360685         KU360652         KY693780           C. navispora         MCA 3221         Fallen wood         Guyana         KC15387         KC15386         -           C. navispora	C. kinabaluensis	Dai 13957	Fallen wood	Thailand	- KX364787	KX364806	- KY693780	
C. lateralis         Cui 12563         Ground         China         KX364789         KX364808         KY693782           C. letris         Dai 22373         Ground         China         OL691618         OL691617         OL691616         OL691616         OL691616         OL691616         OL691616         OL691616         OL691616         OL691617         OL691616         OL691617         OL691618         Chi07167         OL691618         Chi07177         Ground         China         KU360681         KU360651         KY693783         Cmintaginet         Oui 10169         Ground         China         KU360684         KU360651         KY693783         Cmoitaginet         Su 12127         Ground         China         KU360684         KU360651         KY693780         Cmintaginet         Su 364810         KY693780         Cmintaginet         Su 364810         KY693780         Cmintaginet         Su 364810         KY693780         C	C. kinabaluensis	Dai 13958	Fallen wood	Thailand	KX364788	KX364807	KY693781	
C. lateratis         Dati 13564         Ground         China         KX364790         KX364809	C. lateralis	Cui 12563	Ground	China	KX364789	KX364808	KY693782	
L jens         Dil 22373         Ground         China         OL97103         OL97101         OL97101         OL97101         OL97101           C. lenis         Dil 2373         Ground         China         OL971060         OL97111         OL97101         OL9710	C. lateralis	Dai 13564	Ground	China	KX364790	KX364809	-	
C. leris         Diz 2257         Ground         China         OL691609         OL691615           C. macropora         Cui 9039         Ground         China         KU360681         K1000220         KY693784           C. matrima         Dai 15206         Ground         China         KU360683         KU360649         KY693784           C. minima         Dai 15206         Ground         China         KU360683         KU360649         KY693786           C. minior         Dai 16028         Roten wood         China         KU360651         KY693786           C. montagnei         Dai 10698         Rotten wood         Guyana         KC153857         KC155386         -           C. navispora         ME 3221         Fallen wood         Guyana         KC153857         -         -         -           C. oblectabilis         TH 9187         Ground         Colombia         KT33260         - <td>C. lenis C. lenis</td> <td>Dai 22307</td> <td>Ground</td> <td>China</td> <td>0L091008</td> <td>OL 691617</td> <td>OL 691613</td>	C. lenis C. lenis	Dai 22307	Ground	China	0L091008	OL 691617	OL 691613	
C macropora         Cui 9019         Ground         China         KU360680         KU000221         KY693783           C macropora         Cui 9039         Ground         China         KU360681         KU360649         KY693784           C minima         Dai 15222         Ground         China         KU360683         KU360651         KY693785           C miniran         Dai 1688         Roten wood         China         KU360685         KU360651         KY693786           C montagnei         Dai 12137         Ground         China         KU360685         KU360651         KY693789           C montagnei         Dai 12137         Ground         Guyana         KC155387         -         -           C navispora         TH 9529         Fallen wood         Guyana         KU360685         KU300224         KY693790           C notectabilis         TH 9137         Ground         China         KU360686         KU300653         KY693791           C perennis         Cui 10319         Ground         China         KJ540931         KU360651         KY693782           C perennis         Cui 10318         Roten wood         China         KJ360686         KU30067         KY693784           C perennis         Cui 10	C. lenis	Dai 22373	Ground	China	OL691609	OL691619	OL691615	
C. macropora         Cui 9039         Ground         China         KU360681         KU360681         KU360648         KV993785           C. minima         Dai 15222         Ground         China         KU360682         KV936050         KY693785           C. minor         Dai 16222         Ground         China         KU360683         KU360651         KY693787           C. montagnei         Dai 12137         Ground         China         KU360684         KU360652         KY693787           C. notiksport         TH 9529         Fallen wood         Guyana         KC155387         KC155386         -           C. notiksport         TH 9529         Fallen wood         Guyana         KC155387         -         -         -           C. oblectabilis         TH 19529         Ground         Cluma         KU360686         KU000224         KY693791           C. perennis         Cui 10318         Ground         USA         KX564791         KX364811         KY693785           C. preunis         JV 0809/66         Ground         USA         KX564901         KX364821         KY693781           C. preunis         JV 0809/66         Ground         USA         KX564901         KX364811         KY693785	C. macropora	Cui 9019	Ground	China	KU360680	KJ000220	KY693783	
C minima Dai 15206 Ground China KU360682 KU360699 KY993785 C minor Dai 16088 Rotten wood China KU360683 KU360651 KY993786 C minor Dai 16088 Rotten wood China KU360685 KU360652 KY993786 C montagnei Cui 10169 Ground China KU360685 KU360652 KY993786 C montagnei Dai 12137 Ground China KU360685 KU360652 KY993788 C montagnei Dai 12137 Ground China KU360685 KU360623 KY993789 C navispora MCA 3921 Fallen wood Guyana KC15387 C oblectabilis AMV 2255 Ground Colombia KT334640 C oblectabilis TH 9187 Ground China KU360866 KJ000224 KY993790 C perennis Cui 10318 Ground China KU360866 KJ000224 KY993790 C perennis Cui 10319 Ground China KU360867 KU360653 KY993791 C perennis Cui 10319 Ground China KU360867 KU360653 KY993790 C perennis Cui 10319 Ground China KU360867 KU360653 KY993790 C perennis Cui 12582 Rotten wood China KU360867 KU360653 KY993790 C perennis Cui 12582 Rotten wood China KU360867 KU360653 KY993790 C perennis Cui 12582 Rotten wood China KU364801 KX364821 KY993817 C pusuldoependens Cui 12582 Rotten wood China KU364791 KX364811 KY993817 C pusuldoependens Cui 12582 Rotten wood China KU364791 KX364813 KY993817 C raigadensis AMH 1211 Ground India OR07297	C. macropora	Cui 9039	Ground	China	KU360681	KJ000221	KY693784	
C minimaDail LozzDoubleChinaK U360624K U360625K V052709C minimaCui 10169GroundChinaK U360684K U360652K Y693788C montagnelDail 12137GroundChinaK U360684K V360652K Y693789C navisporaMCA 3921Fallen woodGuyanaK T339262C navisporaTH 9529Fallen woodGuyanaK T339262C anvisporaK V255GroundColombiaK T354690C oblectabilisAMV 2255GroundChinaK U360686K W00224K Y693790C perennisCui 10318GroundChinaK U360686K W00227K Y693791C perennisCui 10319GroundUSAK X364811K Y693791C perennisJ V 0809/66GroundUSAK X364801K X364811K Y693791C pesudodependensCui 8138Rotten woodChinaK U360667K Y693816C pissillaDai 15168Rotten woodChinaK X364801K X364811K Y693793C raigadensisMMH 105111GroundIndiaOR072972OR05321OR05321C raigadensisMMH 105112GroundChinaK X364793K X364811K Y693796C rigidaDai 13622aGroundChinaK X364793K X364813K Y693796C rigidaDai 13622aGroundChinaK X364793K Y693755K Y693756C sinoperennisD	C. minima	Dai 15206	Ground	China	KU360682 KU360683	KU360649 KU360650	KY693785 KY693786	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	C. minor	Dai 16088	Rotten wood	China	KU360684	KU360651	KY693787	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	C. montagnei	Cui 10169	Ground	China	KU360685	KU360652	KY693788	
C navisporaMCA 3921Fallen woodGuyanaKC155387KC155386-C navisporaTH 9529Fallen woodGuyanaKC1353262C oblectabilisAMV 2255GroundGuyanaKC155387C oblectabilisTH 9187GroundChinaKU360686KJ000224KY693790C perennisCui 10319GroundChinaKU360686KJ000224KY693791C perennisJV 0809/66GroundUSAKX364791KX364811KY693792C perennisJV 0809/66GroundChinaKI340931KJ000227KY693816C pseudodependensCui 12582Rotten woodChinaKU360661KY693817C pusuliaDai 15168Rotten woodJapan-AY059060-C raigudensisAMH 10511TGroundIndiaOR072877C raigudensisAMH 10511TGroundChinaKX364793KX364813KY693796C rigidaDai 16322GroundChinaKX364793KX364813KY693797C sinoperennisDai 1625GroundChinaKX364793KX364814KY693797C sinoperennisDai 1305GroundChinaKY693735KY693753KY693805C sinoperennisDai 13546GroundChinaKY693736KY693758KY693805C sinoperennisDai 1598Rotten woodChinaKV693756KY693798C sinoperennis <tdd< td=""><td>C. montagnei</td><td>Dai 12137</td><td>Ground</td><td>China</td><td>-</td><td>KX364810</td><td>KY693789</td></tdd<>	C. montagnei	Dai 12137	Ground	China	-	KX364810	KY693789	
C ndugabalis AHV 2255 Ground Colombia K135409	C. navispora	MCA 3921	Fallen wood	Guyana	KC155387	KC155386	-	
C. oblectabilitsTH 9187GroundGuyanaKC155387C. perennisCui 10319GroundChinaKU360666K1000224KY693790C. perennisLU 10319GroundChinaKU360687KU360653KY693791C. perennisJV 0809/66GroundUSAKX364791KX364811KY693792C. pesudodependensCui 12382Rotten woodChinaKX364801KX364821KY693816C. pusuidodependensCui 12382Rotten woodChinaKU360671KY693817C. pusuillaDai 15168Rotten woodJapan-AY059060-C. raigadensisMMH 10511TGroundIndiaOR072932OR053821OR053821C. raigidaDai 13622GroundChinaKX364793KX364813KY693796C. raigadensisMMH 1211GroundChinaKX364793KX364814KY693796C. raigadensisDai 11625GroundChinaKY693735KY693753KY693806C. sinoperennisDai 11625GroundChinaKY693736KY693754KY693797C. sinoperennisDai 11025GroundChinaKY693730KY693755KY693798C. sinoperennisDai 1528GroundChinaKY364815KY693798C. subglobosaDai 1586GroundChinaKY693730KY693755KY693810C. subglobosaDai 1516GroundChina-KY693755KY693810C. subglobosa<	C. ohlectabilis	AMV 2255	Ground	Colombia	KT354690	-	-	
C. perennisCui 10318GroundChinaKU360686KU0300224KY693790C. perennisJV 0809/66GroundUSAKX364791KX364811KY693792C. perennisJV 0809/66GroundChinaKJ540931KJ000227KY693791C. perennisCui 12582Rotten woodChinaKJ344801KX364811KY693792C. pseudodependensCui 12582Rotten woodChinaKJ346801KX364821KY693816C. pusillaDai 15168Rotten woodChinaKJ360701KU360667KY693818C. pusillaMN 26.7.95Rotten woodJapanAY059060-C. raigadensisAMH 10511TGroundChinaKX364793KX364813KY693796C. raigadensisAMH 10512GroundChinaKX364794KX364814KY693797C. raigadensisDai 1622GroundChinaKY369375KY693754KY693805C. sinoperennisDai 11625GroundChinaKY69375KY693754KY693798C. sinoperennisDai 15145GroundChinaKX364795KX364815KY693798C. subcinnamomeaDai 17016GroundChinaKX364795KX364815KY693798C. subcinnamomeaDai 17016GroundChinaKY693706KY693781KY693781C. subcinnamomeaDai 17016GroundChinaKY693706KY693781KY693781C. subcinnamomeaDai 17016GroundChina <td< td=""><td>C. oblectabilis</td><td>TH 9187</td><td>Ground</td><td>Guyana</td><td>KC155387</td><td>-</td><td>-</td></td<>	C. oblectabilis	TH 9187	Ground	Guyana	KC155387	-	-	
C. perennisCui 10319GroundChinaKU360687KU360653KY693791C. perennisJV 0809/66GroundUSAKX364791KX364811KY693791C. pseudodependensCui 12582Rotten woodChinaKL340931KU00027KY693816C. pseudodependensCui 12582Rotten woodChinaKU360701KU360667KY693817C. pusillaDai 15168Rotten woodChinaKU360701KU360667KY693817C. raigadensisMMH 105117GroundIndiaOR072877C. raigadensisMMH 1211GroundChinaKX364793KX364813KY693797C. raigadensisDai 13622GroundChinaKX364793KX364814KY693797C. raigadaDai 13622GroundChinaKY693735KY693754KY693797C. sinoperennisDai 13095GroundChinaKY693735KY693754KY693794C. sinoperennisDai 13095GroundChinaKY694795KX364815KY693798C. strigosipesDai 1586GroundChinaKY694795KX364815KY693798C. subcinnanomeaDai 17016GroundChinaKY693740KY693755KY693810C. subciohosaDai 15158Rotten woodChinaKU360692KU360658KY693799C. subciohosaDai 15158Rotten woodChinaKU360702KU360658KY693796C. subglobosaDai 15158Rotten woodChinaMT	C. perennis	Cui 10318	Ground	China	KU360686	KJ000224	KY693790	
C. pretrintsJ. V 0809/00GroundO.S.A.K.X.504/91K	C. perennis	Cui 10319	Ground	China	KU360687	KU360653	KY693791	
CpseudodependensCui 12582Rotten woodChinaKX364801KX364821KY693817CpusillaDai 15168Rotten woodChinaKU3600701KU360667KY693818CpusillaDai 15168Rotten woodJapan-AY059060-CraigadensisAMH 10511TGroundIndiaOR072932OR053821OR053821C. raigadensisMMH 1211GroundChinaKX364793KX364813KY693796C. rigidaDai 16322GroundChinaKX364793KX364813KY693796C. sinoperennisDai 11625GroundChinaKY693735KY693753KY693754C. sinoperennisDai 13095GroundChinaKY693736KY693754KY693798C. sinoperennisDai 11525GroundChinaKY693736KY693799-C. strigosipesDai 1545GroundChinaKY693744KY693798C. strigosipesDai 1586GroundChinaKY693764KY693755C. subcinnamomeaDai 1702GroundChinaKU360692KU360668KY693810C. subcinnamomeaDai 1518Rotten woodChina-KX364821KY693756KY693812C. subcinnamomeaDai 1518Rotten woodChina-KX364822KY693812C. subcinnamomeaDai 1500GroundChinaMT174242MT174235MT174234C. subcinnamomeaDai 12098Deatten woodChina- <td>C. perennis C. pseudodenendens</td> <td>Cui 8138</td> <td>Rotten wood</td> <td>China</td> <td>KI540931</td> <td>KI000227</td> <td>KY693816</td>	C. perennis C. pseudodenendens	Cui 8138	Rotten wood	China	KI540931	KI000227	KY693816	
C. pusillaDai 15168Rotten woodChinaKU360701KU360667KY693818C. pusillaMN 26.7.95Rotten woodJapan-AY059060-C. raigadensisAMH 10511TGroundIndiaOR072932OR053821OR053822C. rigidaDai 16322GroundChinaKX364793KX364814KY693796C. rigidaDai 16322GroundChinaKY693735KY693793KY693793C. sinoperennisDai 1035GroundChinaKY693736KY693735KY693793C. sinoperennisDai 1515GroundChinaKY693736KY693793KY693798C. strigosipesDai 15386GroundChinaKX364795KX364815KY693798C. strigosipesDai 15586GroundChinaKU360692KU360658KY693798C. subcinnamomeaDai 17016GroundChinaKU360702KU360658KY693810C. subcinnamomeaDai 1702GroundChinaKU360702KU36069KY693821C. subglobosaYuan 6253Rotten woodChinaMT174243MT174236MT174234C. subglobosaDai 1500GroundChinaMT174243MT174236MT174234C. subglobosaDai 1500GroundChinaMT44511MZ437407-C. subglobosaDai 12690GroundChinaMT174243MT174236MT174234C. subglobosaDai 12690GroundChinaMT174243MT174236MT17	C. pseudodependens	Cui 12582	Rotten wood	China	KX364801	KX364821	KY693817	
C. pusillaMN 26.7.95Rotten woodJapan-AV059060-C. raigadensisAMH 10511TGroundIndiaOR072877C. raigadensisMMH 1211GroundChinaKX364793KX364813KY693796C. rigidaDai 16322GroundChinaKX364794KX364814KY693797C. sinoperennisDai 16322GroundChinaKX364794KX364814KY693797C. sinoperennisDai 1625GroundChinaKY693735KY693753KY693804C. sinoperennisDai 1525GroundChinaKY364795KX364815KY693798C. sinoperennisDai 15145GroundChinaKU360692KU360658KY693798C. sinopieseDai 15145GroundChinaKU360702KU360658KY693798C. subcinnamomeaDai 17016GroundChinaKU360702KU360666KY693811C. subglobosaDai 15158Rotten woodChinaKU360702KU360666KY693821C. subglobosaDai 15190GroundChinaMT174243MT174235MT174234C. subglobosaDai 12919GroundChinaMZ36451MZ37407-C. subglobosaDai 12000GroundChinaMT174243MT174235MT174235C. subglobosaDai 1208Dead tree of PiceaChinaMZ364795KV364812K7693801C. subglobosaDai 1208Dead tree of PiceaChinaMZ464551	C. pusilla	Dai 15168	Rotten wood	China	KU360701	KU360667	KY693818	
C. TragadensisAVIII 105111GroundInitialOR072877 $1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -$	C. pusilla	MN 26.7.95	Rotten wood	Japan	- OD072977	AY059060	-	
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# **Mycoscience**



**Fig. 1**. – Macromorphologies of *Coltricia raigadensis* (AMH 10511, holotype). A, B: Basidiomata in the natural habitat. C: Basidiomata with scale bar. D: Basidiomata showing abhymenial surface with close-up view in inset image.

70 mm wide and 23 mm thick at base), smaller pores (7–8 per mm) and basidia (11–14 × 6–8  $\mu$ m; Bian & Dai, 2017). Another species *C. lateralis*, phylogenetically close to *C. raigadensis* but primarily differs in its laterally stipitate smaller basidiocarps (pileus up to 15 mm diam), larger basidia (23–29 × 7–8  $\mu$ m) and broadly ellipsoid larger basidiospores (7–8 × 5–6  $\mu$ m) (Bian & Dai, 2017).

The combined dataset alignment contained 3459 characters, which includes the aligned sequence dataset composed of 1094 bp from nrITS, 1357 bp from nrLSU, and 1008 bp from nrSSU for the analyses. The exhaustive ILD test analysis with 1000 bootstrap showed congruence with the p value 0.85 at the significance level of 0.05. So, the dataset was combined for the further analysis. Based on combined analysis using ML and Bayesian methods we obtained similar tree topologies. The above morphological results were strongly supported by the molecular data and our phylogenetic study revealed monophyletic origin of C. raigadensis and appeared as sister to C. hamata (Romell) Ryvarden with moderate bootstrap and posterior probability supports (0.86/85) (Fig. 3). Moreover, it falls in the clade shared by C. lateralis L.S. Bian & Y.C. Dai, C. velutina and C. rigida (Fig. 3). Based on the above morphological and molecular dataset, here we propose the new species C. raigadensis, under the genus Coltricia.

## Disclosure

The authors declare no conflicts of interest.

#### Acknowledgements

We greatly acknowledge the Principal, Smt. C.H.M. College, Ulhasnagar, Maharashtra, India for providing the laboratory facili-



**Fig. 2.** – Microscopic characters of *Coltricia raigadensis* (AMH 10511, holotype). A: Basidiospores. B, C: Basidia. D, E: Basidioles. F: Hyphae from trama. G: Hyphae from context. H: Hyphae from stipe. *Bars*: A–E 10 μm; F–H 20 μm.



Fig. 3. – Maximum likelihood phylogram of *Coltricia* generated from the combined dataset of nrITS, nrLSU, and nrSSU sequences. Bootstrap values (BS) > 70 and Bayesian posterior probability (PP) > 0.8 are given at the internodes. *Fomitiporella chinensis* and *Inonotus griseus* are selected as outgroups. Scale bar represents a phylogenetic distance of 0.08 nucleotide substitutions per site.

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## References

Adarsh, C. K., Vidyasagran K., & Ganesh, P. N. (2018). A checklist of polypores of

Kerala state, India. *Studies in Fungi*, *3*, 202–226. https://doi. org/10.5943/sif/3/ 1/21.

- Baltazar, J. M., Ryvarden, L., & Gibertoni, T. B. (2010). The genus Coltricia in Brazil: new records and two new species. Mycologia, 102, 1253–1262. https://doi.org/ 10.3852/09-227
- Baltazar, J. M., & Silveira, R. M. B. (2012). A new name for a *Coltricia (Basidiomyco-ta)* from India. *Mycotaxon*, 119, 385–389. https://doi.org/10.5248/119.385
- Bian, L-S., & Dai, Y-C. (2015). Coltricia globosa and C. pseudodependens spp. nov. (Hymenochaetales) from southern China based on morphological and molecular characters. Mycoscience, 56, 190–197. https://doi.org/10.1016/j.myc.2014. 06.001
- Bian, L-S., & Dai, Y-C. (2017). Morphological and molecular evidence for three new species of *Coltricia* (Hymenochaetaceae, Basidiomycota) from southern China. *Mycologia*, 109, 64–74. https://doi.org/10.1080/00275514.2017.1286571
- Bian, L-S., & Dai, Y-C. (2020). Molecular phylogeny and morphology reveal two new species of *Coltricia* (Hymenochaetaceae Basidiomycota) from China. *Mycological Progress*, 19, 657–666. https://doi.org/10.1007/s11557-020-01583-7
- Bian, L-S., Wu, F., & Dai, Y-C. (2016). Two new species of *Coltricia* (Hymenochaetaceae, Basidiomycota) from southern China based on the evidence from morphology and DNA sequence data. *Mycological Progress*, 15, 27. https://doi.org/ 10.1007/s11557-016-1173-0
- Bian, L-S., Zhou, M., & Yu, J. (2022). Three new Coltricia (Hymenochaetaceae, Basidiomycota) species from China based on morphological characters and molecular evidence. Mycological Progress, 21, 45. https://doi.org/10.1007/s11557-022-01792-2
- Corner, E. J. H. (1991). Ad Polyporaceas VII. The xanthochroic polypores. Nova Hedwigia, 101, 1–175.
- Dai, Y-C., (2010) Hymenochaetaceae (Basidiomycota) in China. Fungal Diversity, 45, 131–343. https://doi.org/10.1007/s13225-010-0066-9
- Dai, Y-C., & Li, H-J. (2012). Type studies on *Coltricia* and *Coltriciella* described by E. J H Corner from Southeast Asia. *Mycoscience*, 53, 337–346. https://doi.org/10. 1007/s10267-011-0174-8
- Dai, Y-C., Yuan, H-S., & Cui, B-K. (2010). Coltricia (Basidiomycota, Hymenochaetaceae) in China. Sydowia, 62, 11–21.
- Darriba, D., Taboada, G. L., Doallo, R., & Posada, D. (2012). jModelTest 2: more models, new heuristics and parallel computing. *Nature Methods*, 9, 772.
- Decock, C. (2013). Coltricia oboensis sp. nov. from the high elevation cloud forest of São Tomé. Cryptogamie Mycologie, 34, 175–181. https://doi.org/10.7872/crym. v34.iss2.2013.175
- Doyle, J. J., & Doyle, J. L. (1987). A rapid DNA isolation procedure for small quantities of fresh leaf tissue. *Phytochemical Bulletin*, 19, 11–15.
- Gomes-Silva, A. C., Ryvarden, L., & Gibertoni, T. B. (2009). New and interesting species of *Hymenochaetaceae* from the Brazilian Amazonia. *Mycological Prog*ress, 8, 273–279. https://doi.org/10.1007/s11557-009-0606-4
- Jayawardena, R. S., Hyde, K. D., Wang, S., Sun, YR., Suwannarach, N., Sysouphanthong, P., AbdelWahab, M. A., AbdelAziz, F. A., Abeywickrama, P. D., Abreu, V. P., Armand, A., Aptroot, A., Bao, D-F., Begerow, D., Bellanger, J-M., Bezerra, J. D. P., Bundhun, D., Calabon, M. S., Cao, T.,... Wang, Y. (2022). Fungal diversity notes 1512–1610: taxonomic and phylogenetic contributions on genera and species of fungal taxa. *Fungal Diversity*, *1610*, 1–272. https://doi.org/10.1007/ s13225-022-00513-0
- Kalyaanamoorthy, S., Minh, B. Q., Wong, T. K. F., Von Haeseler, A., & Jermiin, L. S. (2017). ModelFinder: fast model selection for accurate phylogenetic estimates. *Nature Methods*, 14, 587–589. https://doi.org/10.1038/nmeth.4285
- Kaur, N., Singh, A. P., & Dhingra, G. S. (2016). Revision of the Genus Coltricia Gray, from India. Kavaka, 47, 134–137.
- Kornerup, A., & Wanscher, J. H. (1978). *Methuen handbook of colour*. Third Edition. London: Eyre Methuen.
- Kour, H., Kumar, S., & Sharma, Y. P. (2015). Coltricia permollis Gray, a new record from India. Indian Journal of Forestry, 38, 219–222. https://doi.org/10.54207/ bsmps1000-2015-ZJ0Y1W
- Kumar, S., Stecher, G., & Tamura, K. (2016). MEGA 7: Molecular Evolutionary Genetics Analysis Version 7.0 for Bigger Datasets. *Molecular Biology and Evolution*, 33, 1870–1874. https://doi.org/10.1093/molbev/msw054
- Larsson, K-H., Parmasto, E., Fischer, M., Langer, E., Nakasone, K. K., & Redhead, S. A. (2006). Hymenochaetales: a molecular phylogeny for the hymenochaetoid clade. *Mycologia*, 98, 926–936. https://doi.org/10.1080/15572536.2006.11832622
- Moncalvo, J-M., Lutzoni, F. M., Rehner, S. A., Johnson, J. & Vilgalys, R. (2000). Phylogenetic relationship of agaric fungi based on nuclear large subunit ribosomal DNA sequences. *Systematic Biology*, *49*, 278–305.
- Nguyen, L. T., Schmidt, H. A., Von Haeseler, A. & Minh, B. Q. (2014). IQ-TREE: a fast and effective stochastic algorithm for estimating maximum-likelihood phylogenies. *Molecular Biology and Evolution*, 32, 268–274. https://doi.org/ 10.1093/molbev/msu300

- Pongen, A. S., Chuzho, K., Harsh, N. S. K., Dkhar, M. S., & Kumar, M. (2018). Coltriciella dependens (Berk. & M.A. Curtis) Murill, a new addition to wood-rotting fungi of India. Journal of Threatened Taxa, 10, 12140–12143. https://doi.org/10. 11609/jott.4123.10.8.12140-12143
- Rambaut, A. (2014). FigTree version 1.4.2, A graphical viewer of phylogenetic trees. http://tree.bioed.ac.uk/software/figtree
- Ronquist, F., Teslenko, M, Van Der Mark, P., Ayers, D. L., Darling, A., Hohna, S., Largent, B., Liu, L., Suchard, M. & Huelsenbeck, J. P. (2012). Mrbayes 3.2: efficient Bayesian phylogenetic inference and model choice across a large model space. *Systematic Biology*, *61*, 539–542. https://doi.org/10.1093/sysbio/sys029
- Ryvarden, L. (1991). Genera of polypores. Nomenclature and taxonomy (Synopsis Fungorum, Vol. 5). Fungiflora.
- Ryvarden, L. (2004). Neotropical polypores 1: Introduction, Ganodermataceae and Hymenochaetaceae (Synopsis Fungorum, Vol. 19). Fungiflora.
- Ryvarden, L., & de Meijer, A. A. R. (2002). Studies in Neotropical polypores 14: new species from the state of Paraná, Brazil. In: L. Ryvarden (Ed.), Some neotropical wood-inhabiting fungi (Synopsis Fungorum, Vol. 15) (pp. 34–69). Fungiflora.
- Ryvarden, L., & Johansen, I. (1980). A preliminary Polypore flora of East Africa. Fungiflora.
- Ryvarden, L., & Melo, I. (2014). Poroid fungi of Europe (1st ed., Synopsis Fungorum, Vol. 31). Fungiflora.
- Susan, D., Retnowati, A., & Sukarno, N. (2018). Coltriciella minuscula sp. nov., a new species of poroid fungus on Pinus merkusii from an Indonesian tropical forest. Mycoscience, 59, 49–53. https://doi.org/ 10.1016/j.myc.2017.08.005
- Swofford, D. L., & Sullivan, J. (2009). Phylogeny inference based on parsimony and other methods using PAUP. In: P., Lemey, M., Salemi, & A-M. Vandamme (Eds.), The Phylogenetic Handbook. A Practical Approach to Phylogenetic Analysis and Hypothesis Testing (2nd ed., pp. 267–312). Cambridge University Press.
- Tedersoo, L., Suvi, T., Beaver, K., & Saar, I. (2007). Ectomycorrhizas of *Coltricia* and *Coltriciella* (Hymenochaetales, Basidiomycota) on Caesalpiniaceae, Dipterocarpaceae and Myrtaceae in Seychelles. *Mycological Progress*, 6, 101–107. https://doi.org/10.1007/s11557-007-0530-4
- Vaidya, G., Lohman, D. J., & Meier, R. (2010). SequenceMatrix: concatenation software for the assembly of multi-gene datasets with character set and codon information. *Cladistics*, 27, 171–180. https://doi.org/10.1111/j.1096-0031.2010. 00329.x
- Valenzuela, R., Raymundo, T., Cifuentes, J., Esqueda, M., Amalfi, M., & Decock, C. (2012) Coltriciella sonorensis sp. nov. (Basidiomycota, Hymenochaetales) from Mexico: evidence from morphology and DNA sequence data. Mycological Progress, 11, 181–189. https://doi.org/10.1007/s11557-011-0740-7
- Valenzuela, R., Raymundo, T., Decock, C., Lara-Díaz, B. N., Luna-Vega, I., & García-Sandoval, R. (2020). *Coltriciella multipileata* (Agaricomycetes, Hymenochaetaceae), a new species from Mexico, related to ectomycorrhizal lineages. *Phytotaxa*, 475, 79–90. https://doi.org/10.11646/phytotaxa.475.2.2
- Vasco-Palacios, A. M. (2016). Ectomycorrhizal fungi in Amazonian tropical forests in Colombia. [Doctoral dissertation, Utrecht University].
- Vilgalys, R. & Hester, M. (1990). Rapid genetic identification and mapping of enzymatically amplified ribosomal DNA from several *Cryptococcus* species. *Journal* of Bacteriology, 172, 4238–4246. https://doi.org/10.1128/jb.172.8.4238-4246.1990
- Vlasák, J., Vlasák, J.Jr., & Ryvarden, L. (2020). Studies in Neotropical polypores 46, Some new and noteworthy polypores from Costa Rica. In: L. Ryvarden (Ed.), Synopsis Fungorum (Vol. 42) (pp. 30–33). Fungiflora.
- Wagner, T., & Fischer, M. (2002). Proceedings toward a natural classification of the worldwide taxa *Phellinus* s.l. and *Inonotus* s.l., and phylogenetic relationships of allied genera. *Mycologia*, 94, 998–1016. https:// doi.org/10.2307/3761866
- White, T. J., Bruns, T., Lee, S., & Taylor, J. (1990). Amplification and direct sequencing of fungal ribosomal RNA genes for phylogenetics. In: M. A. Innis, D. H. Gelfand, J. J. Sninsky, & T. J. White (Eds.), *PCR Protocols: a guide to methods* and applications. (pp. 315–322). Academic Press.
- Wu, F., Zhou, L-W., Vlasák, J., & Dai, Y-C. (2022). Global diversity and systematics of *Hymenochaetaceae* with poroid hymenophore. *Fungal Diversity*, 113, 1–192. https://doi.org/10.1007/s13225-021-00496-4
- Zhou, L-W., & Tedersoo, L. (2012). Coltricia australica sp. nov. (Hymenochaetales, Basidiomycota) from Australia. Mycotaxon, 122, 123–128. https://doi.org/10. 5248/122.123