

Revision of the Genus *Coltricia* Gray, from India

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ABSTRACT

This paper provides information about eleven species of genus *Coltricia* Gray (*Hymenochaetales*, *Hymenochaetales*, *Agaricomycetes*, *Basidiomycota*) from India. Of these, three species [*C. cinnamomea* (Jacq.) Murrill, *C. folicola* (Berk. and Curtis) Murrill and *C. perennis* (L.) Murrill], based on the collections made from Himachal Pradesh, are described and illustrated. It is pertinent to mention here that *C. folicola* is a new record for India.

Key words: *Coltricia*, *Basidiomycota*, basidiocarps, poroid hymenophore.

INTRODUCTION

The genus *Coltricia* Gray is characterized by annual, stipitate basidiocarps which are soft or leathery when fresh, hard, corky or brittle, light weight when dried. Pilear surface is usually central, yellowish to rust-brown to dark brown or greyish with age in few species, tomentose or velutinate, concentrically zonate or azonate, concolorous with the stipe. Hymenial surface poroid, pores circular to angular, cinnamon to deep rusty brown, context coriaceous. Hyphal system monomitic, generative hyphae simple septate, tissue darkening in 3% KOH solution. Basidiospores ellipsoid to subglobose, golden brown or rusty brown when mature,

slightly to distinctly thick-walled, smooth, inamyloid, cyanophilous or acyanophilous. The members are usually terricolous or lignicolous. Till date from India, ten species namely *C. albertinii* (Lloyd) Ryvardeen, *C. bambusicola* (Henn.) D.A. Reid, *C. cinnamomea* (Jacq.) Murrill, *C. montagnei* (Fr.) Murrill, *C. perennis* (L.) Murrill, *C. pusilla* Imazeki & Kobayasi, *C. pyrophila* (Wakef.) Ryvardeen, *C. spathulata* (Hook.) Murrill, *C. tomentosa* (Fr.) Murrill and *C. vallata* (Berk.) Teng have been documented (Table 1). Out of the reported species *C. albertinii*, *C. pusilla*, *C. spathulata*, *C. tomentosa* and *C. vallata* have been transferred to other genera (*Coltriciella*, *Phylloporia*, *Onnia* and *Inonotus*) leaving only five authentic representative species of *Coltricia* in India in comparison to 20 species of the genus known worldwide (Kirk *et al.*, 2008). In the present study three species are described in detail, of which *C. folicola* is a new record for India, *C. perennis* and *C. cinnamomea* are re-recorded from elsewhere.

Table 1: List of species of *Coltricia* reported by earlier workers with their current position and distribution in India.

Sr. No.	Earlier name of species	Current name of species as per MycoBank (2016)	Earlier reports from India
1.	<i>C. albertinii</i> (Lloyd) Ryvardeen	<i>Inonotus albertinii</i> (Lloyd) P.K. Buchanan & Ryvardeen	Singh (1987): Arunachal Pradesh
2.	<i>C. bambusicola</i> (Henn.) D.A. Reid	<i>C. bambusicola</i>	Dhanda (1977): Chandigarh Sharma (1995, 2012): Uttarakhand and Himachal Pradesh
3.	<i>C. cinnamomea</i> (Jacq.) Murrill	<i>C. cinnamomea</i>	Berkeley (1851, 1854): Sikkim Bose (1946): Meghalaya Banerjee (1947): West Bengal Bakshi (1971): Uttarakhand Dhanda (1977): Uttarakhand, Himachal Pradesh and Jammu and Kashmir Singh (1987): Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Tripura and West Bengal Sharma and Ghosh (1989): West Bengal Sharma (1995, 2012): Uttarakhand and Meghalaya
4.	<i>C. montagnei</i> (Fr.) Murrill	<i>C. montagnei</i>	Sharma (1997, 2012): Sikkim, Meghalaya and Uttarakhand
5.	<i>C. perennis</i> (L.) Murrill	<i>C. perennis</i>	Berkeley (1851): Sikkim Bose (1927): Meghalaya Mitter and Tondon (1932): Uttarakhand Banerjee (1947): West Bengal Thind <i>et al.</i> (1957): Uttarakhand Bakshi (1971): Meghalaya and Uttarakhand Dhanda (1977): Uttarakhand and Himachal Pradesh Singh (1987): Arunachal Pradesh, Meghalaya, Manipur, Nagaland and West Bengal Sharma (1995, 1997, 2012): Sikkim, Meghalaya and Uttarakhand
6.	<i>C. pusilla</i> Imazeki & Kobayasi	<i>Coltriciella pusilla</i> (Imazeki & Kobayasi) Corner	Sharma and Wright (1989): Meghalaya Sharma (2012): West Bengal, Meghalaya and Uttarakhand
7.	<i>C. pyrophila</i> (Wakef.) Ryvardeen	<i>C. pyrophila</i>	Sexena (1961): Madhya Pradesh Sharma (1989, 2012): Meghalaya
8.	<i>C. spathulata</i> (Hook.) Murrill	<i>Phylloporia spathulata</i> (Hook.) Ryvardeen	Thind and Rattan (1971): Himachal Pradesh Dhanda (1977): Himachal Pradesh Sharma (2012): Himachal Pradesh and Uttarakhand
9.	<i>C. tomentosa</i> (Fr.) Murrill	<i>Onnia tomentosa</i> (Fr.) P. Karst	Singh (1987): Arunachal Pradesh Bakshi (1971): Temperate Himalaya
10.	<i>C. vallata</i> (Berk.) Teng	<i>Inonotus vallatus</i> --- ---	Berkeley (1854) and Sehgal and Sharma (2007): Meghalaya Sharma and Ghosh (1989): West Bengal Sharma (1997): Sikkim Sharma (2012): Uttarakhand

* Earlier reported but not encountered during the present studies.

KEY TO THE SPECIES

- Basidiocarps in association with bamboos...*C. bambusicola**
- Basidiocarps in association with other host.....2
- Upper surface of pileus with radial ridges when dried.....*C. folicola*
- Abhymenial surface without radial ridges.....3
- Basidiocarps light yellow, turn dark brown on bruising/drying.....*C. pyrophila**
- Basidiocarps not as above.....4
- Basidiospores 10- 14 µm long.....*C. montagnei**
- Basidiospores less than 10 µm long.....5
- Abhymenial surface shiny.....*C. cinnamomea*
- Abhymenial surface dull.....*C. perennis*

OBSERVATIONS

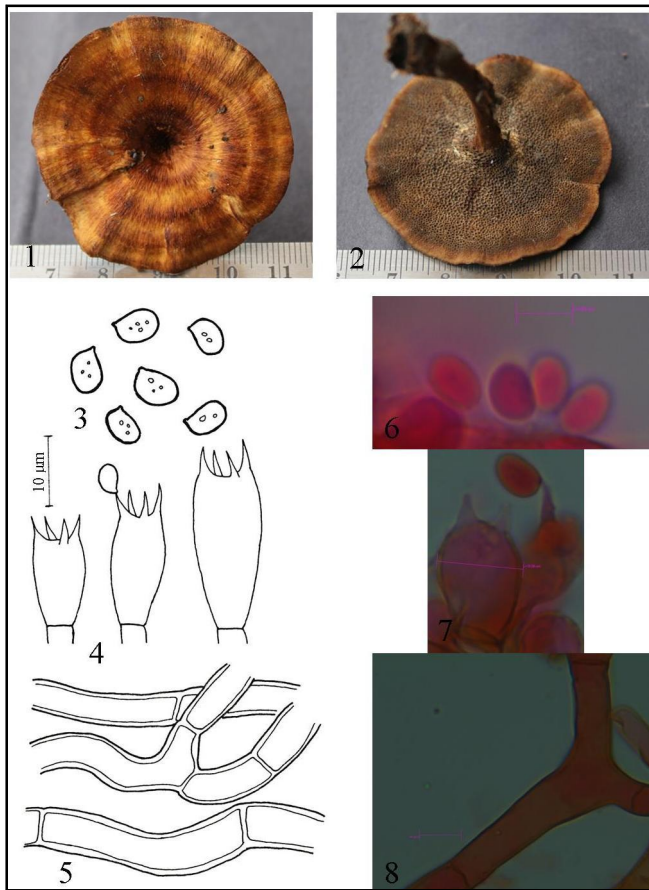
1. *Coltricia bambusicola* (Henn.) D.A. Reid, *Microscopy* **32**: 449, 1975.

Remarks: Earlier reported from India by Dhanda (1977) from Chandigarh and by Sharma (1995, 2012) from Uttarakhand and Himachal Pradesh.

2. *Coltricia cinnamomea* (Jacq.) Murrill, *Bulletin of the Torrey Botanical Club* **31**(6): 343, 1904.

Figs. 1-8

Basidiocarps annual, stipitate, solitary or in groups, fused laterally; pilei =5 cm in diameter, =3 mm thick in the centre, circular, infundibuliform, coriaceous when fresh, brittle on drying; abhymenial surface velutinate to silky fibrillose, shiny to glossy, with concentric zones, brown to reddish brown when fresh, not changing much on drying; hymenial surface poroid, brown to dark brown when fresh, not changing much on drying; pores circular to angular, 3-4/mm; dissepiments thin, entire to lacerate; context =1 mm thick, brown to dark brown; pore tubes =2 mm long, concolorous with hymenial surface; margins thin, entire to incised, fertile, concolorous with abhymenial surface; stipe centric to eccentric, cylindrical to flattened, expanded towards the base, finely velutinate, reddish brown, solid, =3 × 0.5 cm. Hyphal system monomitic. Generative hyphae =6.5 µm wide, highly branched, simple-septate, thin- to thick-walled, subhyaline to yellowish brown to reddish brown. Basidia 13.5-22.3 × 6.8-9.5 µm, clavate, subhyaline, simple-septate at the base, 4-sterigmate; sterigmata ?5.7 µm long. Basidiospores 4-7 × 3-5.3 µm, broadly ellipsoid, smooth, thin- to slightly thick-



Figs. 1-8: *Coltricia cinnamomea* :1. Basidiocarp showing abhymenial surface. 2. Basidiocarp showing hymenial surface. 3. Basidiospores. 4. Basidia. 5. Generative hyphae. (6-8) Microphotograph showing 6. Basidiospores. 7. Basidia. 8. Generative hyphae.

walled, yellowish brown, with oily contents, inamyloid, acyanophilous.

Collections examined: Himachal Pradesh: Shimla, Tara Devi, near PWD guest house, on soil in a mixed forest, Navpreet 7933 (PUN), August 1, 2013; Narkanda, about 4 km from Narkanda towards Hattu Peak, on soil in mixed forest, Avneet 7936 (PUN), September 2, 2014; Solan, about 8 km from Kufri towards Chail, on soil in a mixed forest, Dhingra 7935 (PUN), September 4, 2014; Mandi, 2 km from Jatingri towards Barot, on soil in a mixed forest, Navpreet 7934 (PUN), September 15, 2015.

Remarks: The species is characterised by shiny abhymenial surface in combination with broadly ellipsoid basidiospores. From India, it was earlier reported by Berkeley (1851, 1854) from Sikkim; Bose (1946) from Meghalaya; Banerjee (1947) from West Bengal; Bakshi (1971) from Uttarakhand; Dhanda (1977) from Himachal Pradesh (Chamba, Kullu and Shimla), Jammu and Kashmir and Uttarakhand; Singh (1987) from Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Tripura and West Bengal; Sharma and Ghosh (1989) from West Bengal and Sharma (1995, 2012) from Uttarakhand and Meghalaya. However, here it is being reported for the first time from districts Mandi and Solan of Himachal Pradesh.

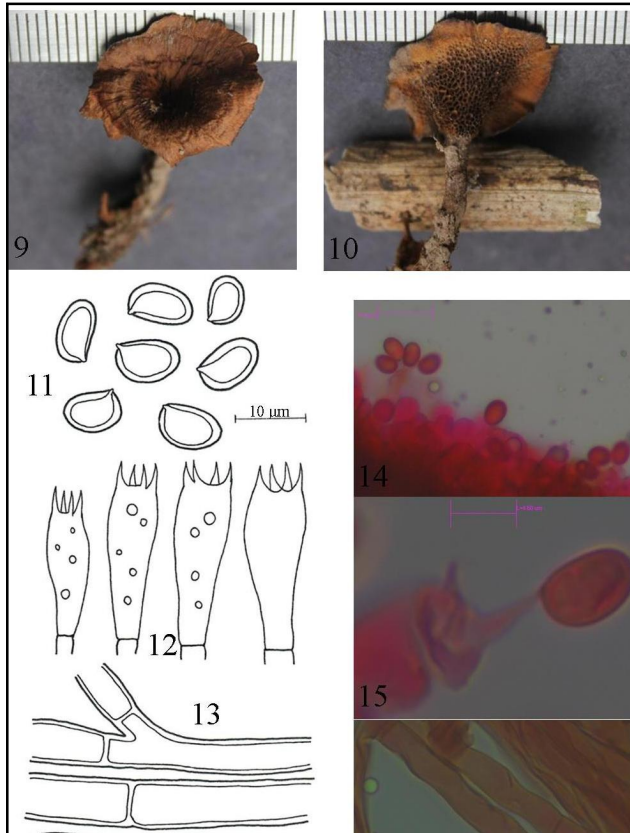
3. *Coltricia folicola* (Berk. & M.A. Curtis) Murrill, *N. Amer. Fl. (New York)* **9**(2): 92, 1908.

Figs. 9-16

Basidiocarps annual, stipitate, solitary; pilei =4 cm in diameter, =2 mm thick in the center, circular, often centrally depressed, coriaceous when fresh, brittle on drying; abhymenial surface velutinate to silky fibrillose, concentrically zonate, dull brown to brown to dark brown when fresh, radially wrinkled when dried; hymenial surface poroid, rust brown to dark brown; pores angular, 1-2/mm, regular; dissepiments thin, entire to lacerate; context =1.5 mm thick, concolorous with hymenial surface, pore tubes =0.5 mm long, concolorous with hymenial surface; margins thin, entire, sterile =1 mm, paler concolorous; stipe central, cylindrical, velutinate, cinnamon to rusty brown, =3 mm thick. **Hyphal system** monomitic. Generative hyphae =7.8 µm wide, branched, simple-septate, thin- to thick-walled, yellowish brown to dark brown. **Basidia** 17-24 × 6.3-9.3 µm, clavate, subhyaline, simple-septate at the base, 4-sterigmate; sterigmata =3.5 µm long. **Basidiospores** 6.8-9.5 × 4-5.3 µm, ellipsoid to subcylindrical, smooth, thick-walled, yellowish brown, inamyloid, acyanophilous.

Collection examined: Himachal Pradesh: Shimla, Narkanda, about 4 km from Narkanda towards Hattu Peak, on soil in coniferous forest, Navpreet 7937 (PUN), September 2, 2014.

Remarks: A new record for India, *C. folicola* differs from other species in the genus by radially wrinkled abhymenial surface in dried basidiocarps and slightly bigger pores. This species is wide spread in distribution and has been reported from Europe, China, Mongolia and Eastern North America (www.mycobank.org).



Figs. 9-16: *Coltricia focicola*: 9. Basidiocarp showing abhymenial surface. 10. Basidiocarp showing hymenial surface. 11. Basidiospores. 12. Basidia. 13. Generative hyphae. (14-16) Microphotograph showing 14 & 15. Basidiospores attached to Basidia. 16. Generative hyphae.

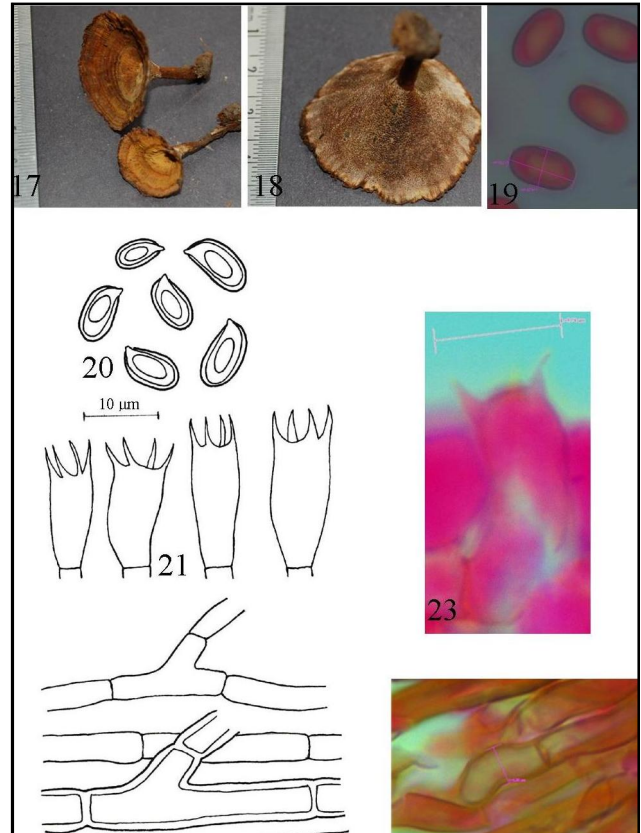
4. *Coltricia montagnei* (Fr.) Murrill, *Mycologia* **12**(1): 13, 1920.

Remarks: It has been reported by Sharma (1997, 2012) from Sikkim, Meghalaya and Uttarakhand.

5. *Coltricia perennis* (L.) Murrill, *Journal of Mycology* **9**(2): 91, 1903.

Figs. 17-24

Basidiocarp annual, pileate, stipitate, solitary; pileus circular, convex to depressed, coriaceous, =4 cm wide, =5 mm thick near the base; abhymenial surface apressed velutinate, dull, concentrically zonate, orange white to greyish orange to light brown to brown when fresh, not changing much on drying; hymenial surface poroid, brown when fresh, not changing much on drying; pores angular, 3-4/mm; dissepiments thin, entire to lacerate; context =2 mm thick, brownish orange; pore tubes =3 mm long, brown; margins acute, thin, entire, sterile =2 mm; stipe central, cylindrical, brownish orange to brown =1.6 × 0.5 cm. Hyphal system monomitic. Generative hyphae =4.7 μm wide, branched, simple-septate, thin- to thick-walled, yellowish brown to dark brown. Basidia 16-22 × 6.5-7.8 μm, clavate to subclavate, subhyaline, simple-septate at the base, 4-sterigmate; sterigmata =4 μm long. Basidiospores 8.5-9.8 × 4-4.3 μm, narrowly ellipsoid to cylindrical, smooth, thick-walled, guttulate, yellowish brown, inamyloid, acyanophilous.



Figs. 17-24: *Coltricia perennis*: 17. Basidiocarp showing abhymenial surface. 18. Basidiocarp showing hymenial surface. 19 & 20. Basidiospores. 21. Basidia. 22. Generative hyphae. (23 & 24) Microphotograph showing 23. Basidia. 24. Generative hyphae.

Collection examined: Himachal Pradesh: Solan, about 8 km from Kufri towards Chail, associated with roots of *Quercus*, in mixed forest, Navpreet 7938 (PUN), September 4, 2014.

Remarks: This species can be distinguished from *C. cinnamomea* by its dull, concentrically zonate abhymenial surface and ellipsoid to cylindrical basidiospores. It has earlier been reported from India by Berkeley (1851) from Sikkim; Bose (1927) from Shillong; Mitter and Tondon (1932) from Uttarakhand; Banerjee (1947) from Kolkata; Thind *et al.* (1957) from Uttarakhand; Bakshi (1971) from Meghalaya and Uttarakhand; Dhanda (1977) from Himachal Pradesh (Chamba, Kullu and Shimla) and Uttarakhand, Singh (1987) from Arunachal Pradesh, Meghalaya, Manipur, Nagaland and West Bengal and Sharma (1995, 1997, 2012) from Sikkim, Meghalaya and Uttarakhand. Here it is being reported for the first time from district Solan in Himachal Pradesh.

6. *Coltricia pyrophila* (Wakef.) Ryvarden, *Norwegian Journal of Botany* **19**: 231, 1972.

Remarks: Earlier report of this species is by Sexena (1961) from Madhya Pradesh and Sharma (2012) from Meghalaya.

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