Cortinarius iodes, a New Record from India

R.K. Verma*, Vimal Pandro, Diwyansh Raj and G.R. Rao

Tropical Forest Research Institute, Jabalpur - 482 021, Madhya Pradesh, India

*Corresponding author

A B S T R A C T

The present article reports one Cortinariaceae, Cortinarius iodes growing in the campus of Tropical Forest Research Institute, Jabalpur, Madhya Pradesh on leaf litter, under Bridelia retusa and Bauhinia varigata trees. This constitutes a new fungal record from India, earlier it was reported from ‘North America’. A list of 16 species of Cortinarius reported from India is also given along with their distribution and habits.

Introduction

Cortinarius is a member of Cortinariaceae, Agaricales was reported to be mycorrhizal with deciduous trees. Cortinarius iodes, commonly known as the spotted cort or the viscid violet cort. This mushroom has no distinctive taste or odor. Although it is edible but not recommended for consumption. The fruit bodies grow singly or in groups on litter.

Fifteen species of genus Cortinarius were reported from India, which mostly occurred from eastern Himalayan and Kerala (Berkeley, 1852; Bhavanidevi and Nair, 1983; Florence, 2004; Chona et al., 1958; Sathe and Daniel 1980; Sathe et al., 1980; Mohanan, 2011; Peintner et al., 2003; Sharma et al., 1978).

In the present article, Cortinarius iodes is reported as a new fungal record from India. Previously the species was reported from North American (Berkeley and Curtis, 1853).

Materials and Methods

The specimen was collected from campus of Tropical Forest Research Institute, Jabalpur, Madhya Pradesh during September, 2018 (Fig. 12). Identification of fungus was done with the help of literature (Berkeley, 1852; Bhavanidevi and Nair, 1983; Florence, 2004; Chona et al., 1958; Sathe and Daniel 1980; Sathe et al., 1980; Mohanan, 2011; Peintner et al., 2003; Sharma et al., 1978) and matter available on net. The specimen was deposited in the Mycology Herbarium, Tropical Forest Research Institute, Jabalpur. The slides were
preparing in lacto-phenol and cotton blue and observed under the advance Research Microscope, make Leica, Germany and photomicrographs were taken with a digital camera attached to the microscope.

**Results and Discussion**

**Taxonomic description**

*Cortinarius iodes* **berk. & M.A. curtis** (Figures 1-11)

(Cortinariaceae, Agaricales, Agaricomycetidae, Agaricomycetes, Agaricomycotina, Basidiomycota) ≡ *Gomphos iodes* (Berk. & M.A. Curtis) Kuntze, Revis. gen. pl. (Leipzig) 2: 854 (1891)

The cap is initially bell-shaped before becoming broadly convex and then flat on maturity, and attains a diameter of 5-6.5cm. The cap surface is slimy (in wet weather) and smooth, and has a lilac or purplish color. The flesh is white, firm, and thin. The color fades on maturity, and the cap develops irregular yellowish spots, or becomes yellowish in the center. Gills are attached to the stem and packed together closely. They are lilac to violet when young, but become rusty brown to grayish cinnamon when the spores mature. The stem measures 5–6cm long by 0.8–1cm thick, and is nearly equal in width throughout other than a somewhat bulbous base. It is solid slimy, smooth, and has violet or purplish colors that are usually lighter than the cap; sometimes, the stem base is more or less white. The cobweb-like, pale violet partial veil leaves a zone of thin, purple or rusty fibers on the upper stem. Basidia are four-spored, club-shaped, and measuring, 18.75–25 x 5–12.5μm. Basidiospores, rusty-brown, elliptical, with a finely roughened surface, measuring 2.5–6 x 2.5–5μm. Both cheliocystidia and pleurocystidia are absent from the hymenium; the gill edge is populated by basidia and their undeveloped equivalents, basidioles. The cap cuticle comprises a distinctive layer of 5–8μm wide hyphae. Clamp connections are present in hyphae throughout the fruit body.

**Collection examined**

On leaf litter growing under *Bridelia retusa* and *Bauhinia varigata* trees, near Scientists' hostel building, TFRI Campus, Jabalpur (MP), 31/09/2018; Specimen deposited in pathology museum at Tropical Forest Research Institute (TF 4150).

*Cortinarius iodes* forms mycorrhizal associations with deciduous trees, particularly oaks. The fruit bodies grow in humus and litter fall, sometimes singly, but more often scattered or in groups under hardwood trees (Mohanam, 2011; Peintner *et al.*, 2003; Roody, 2003). Typical habitats include bog edges, swampy areas, and hummocks. Fruiting usually occurs from July to November. In North America, it is common in eastern regions, and rare in the Pacific Northwest. Its distribution extends from eastern Canada south into Central America and northern regions of South America, northern Asia (Roody, 2003) and it also occurs in Central India.

*C. iodes* is very similar with *C. iodeoides* in appearance but can be distinguished from the former by its bitter-tasting cap cuticle (Roody, 2003). This species is not reported from India. A purple colored species, *C. purpurascens* was reported from Chambaghat, Solan, Himachal Pradesh (Sharma *et al.*, 1978). Another similar species reported includes, *C. traganus*, which has a dry, light purple cap and stem and a bad odor (Sundberg and Bessette, 1987). Two other widespread species with violet coloring and slimy caps are *C. salor* and *C. croceocaeruleus* (Table 1).
Table 1 *Cortinarius* species reported from India

| S.N. | Name of fungus | Host/Substrate | Distribution | Reference |
|------|----------------|----------------|--------------|-----------|
| 1.   | *Cortinarius cinnabarinus* Fr. | On ground | Thiruvananthapuram, Kerala | Bhavanidevi, Nair (1983); Florence (2004) |
| 2.   | *Cortinarius conopileus* K.A. Thomas, M.M. Moser, Peintner & Manim. | On ground | Wayanad, Kerala | Peintner *et al.*, (2003) |
| 3.   | *Cortinarius deceptivus* Kauffman | on ground | Delhi | Chona *et al.*, (1958) |
| 4.   | *Cortinarius emodensis* Berk. | on pine wood | Lachen, Sikkim, Himalayas | Berkeley (1852) |
| 5.   | *Cortinarius flammeus* Berk. | on pine wood | Sikkim, Himalayas | Berkeley (1852) |
| 6.   | *Cortinarius graminicola* Sathe & S.D. Deshp. | on ground | Maharashtra | in Sathe *et al.*, (1980) |
| 7.   | *Cortinarius iodes* Berk. & M.A. Curtis | Growing on litter under *Bridelia retusa* and *Bauhinia varigata* trees | Jabalpur, Madhya Pradesh | This article |
| 8.   | *Cortinarius keralensis* K.A. Thomas, M.M. Moser, Peintner & Manim. | on ground | Wayanad, Kerala | Peintner *et al.*, (2003) |
| 9.   | *Cortinarius palmicola* Sathe & J.T. Daniel (as *Cortinarius palmicolous*) | on ground | Kollam, Kerala | in Sathe and Daniel (1980); Florence (2004) |
| 10.  | *Cortinarius phlegmophorus* K.A. Thomas, M.M. Moser, Peintner & Manim. | on ground | Wayanad, Kerala | Peintner *et al.*, (2003) |
| 11.  | *Cortinarius pholideus* (Lilj.) Fr. | on ground | Muthanga and Wayanad, Kerala | Mohanan (2011) |
| 12.  | *Cortinarius purpurascens* Fr. | on soil | Chambaghat, Solan, Himachal Pradesh | Sharma *et al.*, (1978) |
| 13.  | *Cortinarius rufo-olivaceus* (Pers.) Fr. = *Cortinarius vinosus* Cooke | on pine wood | Sikkim, Himalayas | Berkeley (1852) |
| 14.  | *Cortinarius saniosus* (Fr.) Fr. = *Agaricus saniosus* Fr. | on pine wood, | Sikkim, Himalayas | Berkeley (1852) |
| 15.  | *Cortinarius vinosulus* Sacc. | on pine wood | Sikkim, Himalayas | Berkeley (1852) |
| 16.  | *Cortinarius violaceus* (L.) Gray = *Agaricus violaceus* L. | on wood | Myrong, Khasi hills, Meghalaya | Berkeley (1852) |
**Fig. 1-2** *Cortinarius iodes* fruit bodies in habit

**Fig. 3-4** *Cortinarius iodes* fruit bodies in habit showing pileus, gills and stipe

**Fig. 5-6** *Cortinarius iodes*, hyphae and section showing basidia
Fig. 7-8 *Cortinarius iodes* section showing basidia and a single basidium

Fig. 9-11 *Cortinarius iodes*, basidiospores in low power and enlarged basidiospores

Fig. 12 Map of India showing distribution of *Cortinarius* species

These mushrooms can be distinguished from *C. iodes* by the absence of yellowish spotting (Roberts and Evans, 2011). A North American species *C. oregonensis* has a paler lilac cap with a central region that is yellowish or brownish and with smaller spores (Smith, 1939). *Inocybe lilacina*, a non- *Cortinarius* species has a dry, silky cap with prominent umbo was also reported (Roody 2003).

In conclusion, *Cortinarius iodes* growing in litter under *Bridelia retusa* and *Bauhinia varigata* trees at Jabalpur, Madhya Pradesh is reported as new fungal record from India.
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