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NEW RECORD SPECIES OF TRICHOLOMATACEAE FROM PAKISTAN

Abdul Razaq[1], Saleem Shahzad[2] and Ali Noor[3]

[1]*Department of Biological Sciences, Karakoram International University, Gilgit-Baltistan.*
[2]*Department of Agriculture & Agribusiness Management, University of Karachi, Karachi-75270, Pakistan.*
[3]*Department of Botany, University of Karachi, Karachi-75270, Pakistan.*
Correspondence author e-mail Abdul_Razaq555@yahoo.com

ABSTRACT

The species *Clitocybe clavipes* and *C. inversa* are characterize by at first convex cap and then depressed, become funnel shaped, usually paler towards margin. Stem finely silky, club-shaped, tapering markedly upwards from swollen wooly base. Gills deeply decurant. Spore print white. Spore ellipsoid or sub spherical. While *Collybia succinea* has first convex then slightly flattened cap, becoming leathery when old. Stem equal, shiny and cylindrical. Gills fairly distant. Smell indistinct. Spores ellipsoid, smooth. As well as the *Lyophyllum connatum* has whitish, smooth, fleshy and convex cap. Gills subdecurrant. Fruit body grows in dense clusters, Stem cylindrical, equal. Spores ellipsoid, smooth, non-amyloid.

Key word: Ellipsoid, spores, cylindrical, fruit body and fleshy

INTRODUCTION

Phylum Basidiomycota is a common group of fungi that has worldwide distribution. It includes more than 22,244 species (Hawksworth *et al*., 1995). This phylum is large and divers, comprising of forms commonly known as mushrooms, boletus, puffballs, earthstars, stinkhorns, birds nest fungi, jelly fungi, bracket or shelf fungi, rust and smut fungi (Alexopoulos *et al*., 1996). Members of Basidiomycota are characterized primarily by the production of sexual spores (basidiospores) that are produced on the surface of a basidium. Many members have septal structures called a clamp connection. No other group of fungi has these.

Several members of Basidiomycota are well known plant pathogens, whereas others are important for their food value or because of scents, tastes, colours, and toxic properties of a wide variety of secondary products (Gallois *et al*., 1990). In contrast to more than 22,244 species reported from different parts of the world, only about 630 species have been reported from Pakistan (Ahmad *et al*., 1997). Gilgit-Baltistan area appears to be generally ignored by previous workers despite the climate is suitable for growth of Basidiomycota. The present report describes 5 new records of the member of the family Tricholomataceae from Gilgit-Baltistan including 3 new records for Pakistan.

MATERIAL AND METHODS

Samples of Basidiomycetous fungi were collected from different areas of Gilgit-Baltistan region. These fungi were photographed in their natural habitat and macroscopic details along with altitude and latitude (using a GPS) model Lowrance finder was recorded. Spore prints were also prepared by placing the cap overnight on a paper sheet. The samples were brought to Department of Biological Sciences, Karakoram International University and identified up to species level after reference to Ahmad *et al*., (1997), Demoulin and Merriott (1981), Surcek (1988), Buczacki (1989), Leelavathy and Ganesh (2000), Swann and Taylor (1993), Shibata (1992) and Sultana *et al*., (2011). The specimens were dried at room temperature to make a herbarium for future reference.

Microscopy: An Olympus B x51 microscope equipped with bright field and camera Olympus DP 12 was used to examine and photographs the fungi.

RESULTS AND DISCUSSION

During the present work, nine species viz., *Clitocybe clavipes, Clitocybe inversa, Collybia succinea* , *Lyophyllum connatum* , *Melanoleuca brevipes* , *Mycena inclinata, Omphalina postii* , *Ripartites metrodii* and *Ripartites tricholoma* were recorded for the first time from Pakistan.

Key to species of *Clitocybe*

1. Gills pale creamy, narrow, thin, deeply decurant---------- *C. clavipes*

- Gills whitish, then brown, crowded, deeply decurrent----------*C. inversa*

Clitocybe clavipes Pers. *Syn.* P. 353, Saccardo, *Syl. Fung,* Vol. 5, 1887, p. 143.

Distinguishng characters: Cap 4-8cm, at first convex and then depressed, becomes funnel shaped, usually paler towards margin. Stem 4-8cm, finely silky, club-shaped, and tapering markedly upwards from swollen wooly base. Gills pale creamy, narrow, thin, deeply decurant. Spore print white. Smell sweet. Flesh thick, watery, white tending to yellow in stem base. Spore subspherical, smooth, 4-5x3.5-4µm in size. Fig.1 A-B.
Season: June- July.
Occurrence: It was collected from Lashtang forest (Dashkin), District Astore, alt 2922m, N=35°66, E=74°56.
Ethnic uses/Importance: Inedible.
Habit/Habitat: Usually solitary, on leaf litter in broad-leaved woods.
Previous Report from Pakistan: None.

Clitocybe inversa (Scop.) Sowerb
SYNONYM: *Clitocybe flaccida* Sow. t. 185, Fr. S. M. I, p. 81, Saccardo, *Syl. Fung,* Vol. 5, 1887, p. 172.

Distinguishing characters: Cap 3-6cm, at first convex then funnel-shaped. Stem 3-6 cm long, equal, fairly stout, hollow, smooth at apex, wooly at base. Gills whitish, becoming brown, crowded, deeply decurrent. Smell indistinct. Flesh white. Spores ellipsoid, minutely spiny, 4-5x3-4µm in size, non-amyloid. Fig.1 C-D.
Season: September- October.
Occurance: Specimen were collected from Manimark, District Astore, alt 3822m, N=35°88,E=74°58.
Ethnic uses/Importance: Inedible.
Habit/Habitat: Usually in small groups, on leaf litter in conifers and broad-leaved woods.
Previous Report from Pakistan: None

Collybia succinea Fr. *Epicer*. P. 80, Monogr. I, p. 142, Saccardo, *Syl. Fung,* Vol.5, 1887, p. 227.

Distinguishing characters: Cap 2-8cm, at first convex then slightly flattened, becoming leathery when old. Stem 4cm long and 1.5cm thick, equal, shiny, cylindrical. Gills at first white then cream thick, fairly distant. Flesh reddish-brown. Smell indistinct. Spores ellipsoid, smooth 7-8x3-4µm in size, non-amyloid. Fig.1 E-F.
Season: September- October.
Occurrence: It was collected from Mushkin, District Astore, alt 2633m, N=35°42, E=74°57.
Ethnic uses/Importance: Inedible.
Habit/Habitat: Usually in small groups, on soil especially in burent places.
Previous Report from Pakistan: None.

Lyophyllum connatum (Schum. ex Fr.) Sing.1939

Distinguishing characters: *L. connatum* has a 3-14cm wide, fleshy, convex, entirely whitish, smooth cap. Gills subdecurrant, initially white, yellowish in age. Fruit body grows in dense clusters with their stipe bases mutually fusing to form a tuberiform structure. Stem 2-4cm long and 1-2cm thick, equal. Smell pleasent. Spores 6-8x3.5-4.5µm in size, ellipsoid, smooth. Fig.1 G-H.
Season: September- October.
Occurrence: It was collected from Lashtang forest (Dashkin), District Astore, alt 2505m, N= 35°28, E=74°46.
Ethnic uses/Importance: Edible.
Habit/Habitat: On ground of broad leaved trees forest, in small groups.
Previous Report from Pakistan: Dungagali (Shibata, 1992).

Melanoleuca brevipes (Bull. ex Fr.) Pat
Distinguishing characters: Cap 2-7cm, at first convex then slightly umbonate, margin in-rolled, at first smooth then lines appear on cap surface. Stem 2-6cm long and 2cm thick, stout, cylindrical, bulbous at base. Gills white,

crowded. Spore print white. Flesh brownish, especially when young. Smell pleasant. Spores ellipsoid, thick walled, amyloid, finely warty, 7-9x4-5µm in size. Fig.1 I-J.
Season: June- July.
Occurrence: It was collected from Menimark, District Astore, alt 3087m, N= 35°46, E=74°56.
Ethnic uses/Importance: Edible.
Habit/Habitat: Solitary or in small groups, on soil in the decaying woods.
Previous Report from Pakistan: None.

Mycena inclinata Fr. *Epicer.* P. 107, Hym. Eur. P. 139, Saccardo, *Syl. Fung*, Vol. 5, 1887, p. 270.

Distinguishing characters: Cap 2-3cm, at first conical, then convex, initially a whitish membrane covers the cap surface, but soon it is removed, reaveling a smooth cap, lines when wet, margin irregular when dry. Stem 2-4cm, equal, slender, fairly silky, densely downy, hairy at base. Gills first whitish then light brown, fairly broad and distant, adnate. Smell rancid. Flesh whitish. Spores ellipsoid, smooth, 8-10x6-7µm in size. Fig.1 K-L.
Season: August-September.
Occurrence: *M. inclinata* was collected from Jalalabad, District Gilgit, 2130m, N=36°70, E=74°40.
Ethnic uses/Importance: Inedible.
Habit/Habitat: On stump or wood of broad leaved trees. Widespread in rainy season.
Previous Report from Pakistan: None.

Omphalina postii (Fr. Sensus A. H. Smith) Singer in *Mycologia*, xxxix, p. 84, 1947.
Distinguishing characters: Cap 2-5cm, at first convex but soon becoming umbilicate, very finely lined at margin. Stem 2-5cm, equal, slender, often slightly curved at base. Gills yellowish, broad, fairly distant, decurant. Smell indistinct. Flesh thin, yellowish. Spore ellipsoid, smooth, 5-8x4.5-5µm in size, non-amyloid. Fig.1 M-N.
Season: September- October.
Occurrence: This species was collected from Rama forest, district Astore, alt 2622m, N=35°23, E=74°57.
Ethnic uses/Importance: Inedible.
Habit/Habitat: Grows solitary, on damp soil with mosses.
Previous Report from Pakistan: None.

Key to species of *Ripartites*

1. Cap flattened and depressed in center, cracked---------- *R. metrodii*

- Cap depressed, funnel shaped, smooth. ---------- *R. tricholoma*

Ripartites metrodii Huijsman in *Persoonia*, 1, 3, p. 337, 1960.
Distinguishing characters: Cap 4-9cm, at first convex, then flattened and depressed from center and then cracked. Stem 3-4cm, tapering upwards, fairly stout, scaly angular at apex. Gills at first pale buff, then becoming brownish buff, crowded, decurant. Smell indistinct. Flesh whitish buff. Spores sub-spherical, warty, 5-6 x 4-5µm in size. Fig.1 O-P.
Season: August- September.
Occurrence: Specimens were collected from Dichal nalla (Dashkin), District Astore, alt 3574, N=35o30, E=74°53.
Ethnic uses/Importance: Inedible.
Habit/Habitat: Usually in small groups on soil in coniferous woods.
Previous Report from Pakistan: None.

Ripartites tricholoma (Alb. & Schwein. ex Fr.) P. Karst. 1879.
Distinguishing characters: Cap 2-8cm, at first convex, then flattened, and depressed, funnel shaped, smooth. Stem 3-4cm equal or tapering slightly upward, smooth. Gills at first whitish, then brownish buff, crowded. Smell indistinct. Flesh white. Spores sub spherical, warty 4-5 x 3.5-4µm in size. Fig.1 Q-R.
Season: August- September.
Occurrence: It was collected from Hunza valley, District Gilgit, alt 1722m, N= 36 °19, E= 74°40.
Ethnic uses/importance: It is a poisonous species.
Habit/Habitat: Solitary or in group, on soil in broadleaved or coniferous forest.
Previous Report from Pakistan: None.

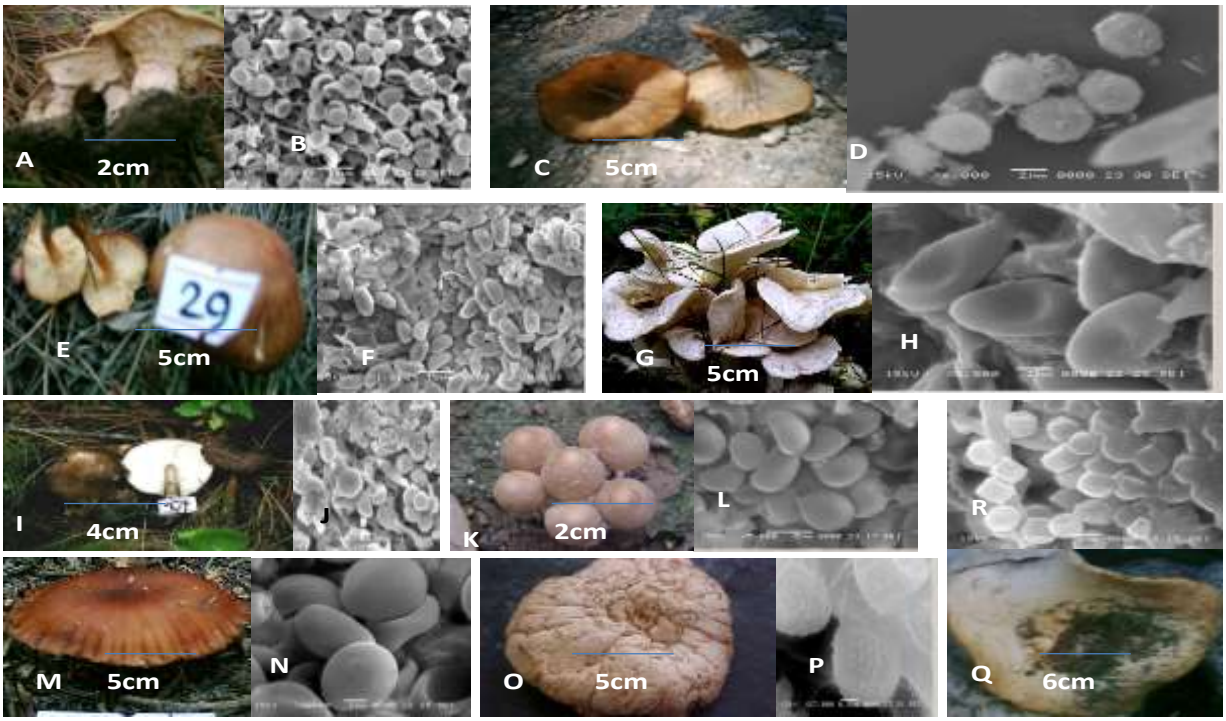

Fig.1 *Clitocybe clavipes*(A-B), *Clitocybe inversa* (C-D), *Collybia succinea* (E-F), *Lyophyllum connatum* (G-H), *Melanoleuca brevipes* (I-J), *Mycena inclinata* (K-L), *Omphalina postii* (M-N), *Ripartites metrodii* (0-P), *Ripartites tricholoma* (Q-R).

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