

NEW RECORD SPECIES OF *PHOLIOTA* (Fr.) FROM PAKISTAN

Abdul Razaq¹, Saleem Shahzad² and Ali Noor³

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.

Corresponding author e-mail Abdul_Razaq555@yahoo.com

ABSTRACT

The genus *Pholiota* (Fr.) belong to family Strophariaceae and order Agaricales. There are four different species of *Pholiota* viz., *Pholiota carbonaria*, *P. squamosa*, *P. aurivella* and *P. lenta* that are distinguished by scales, appearance of cracks on surface and flesh. The present paper describes 5 new record species of *Pholiota* viz., *Pholiota carbonaria*, *p. aurivella*, *P. lenta*, *P. squamosa* and *P. squarrosa* from Gilgit-Baltistan. Of these *Pholiota carbonaria*, *p. aurivella* and *P. lenta* are reported for the first time from Pakistan.

Keywords: Spore, ellipsoid, gills, convex, scales

INTRODUCTION

Phylum Basidiomycota is a common group of fungi that has worldwide distribution. It includes more than 22,244 species (Hawksworth, 1995). This phylum is large and diver, 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, 1996). Member of Basidiomycota are characterized primarily by production of sexual spores (basidiospores) that are produced on the surface of basidium. Many members have septal structure 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 scent, tastes, colors and toxic properties of a wide variety of secondary products (Galllois *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 record species of genus *Pholiota* from Gilgit-Baltistan including 3 new records for Pakistan.

MATERIAL AND METHODS

Samples of Basidiomycetous fungi were collected from Hunza and Naltar, District Gilgit. The fungi were photographed in their natural habitat and macroscopic details along with altitude and latitude (using a GPS) model Lowrance ifinder 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), Murakami, Y. (1993) and Sultana *et al.* (2011), Razaq *et al.* (2012) and Sarwar *et al.* (2012). The specimens were dried at room temperature to make a herbarium for future reference.

RESULTS

During the present work, five species viz., *Pholiota carbonaria*, *P. aurivella* and *P. lenta* were recorded for the first time from Pakistan while the *P. squamosa* and *P. squarrosa* are first time from Gilgit-Baltistan region.

Key to species of *Pholiota*

1. Scales on cap absent or disappear quickly-----2
- Scales on cap persistent-----3
2. Scales absent-----*P. carbonaria*
- Scales present but disappear quickly-----*P. squamosa*
3. Cracks appear on cap when dry-----*p. aurivella*

-Cracks not present on cap when dry-----4
 4. Flesh brown, spore print brown-----*P. lenta*
 - Flesh yellow, spore print reddish brown-----*P. squarrosa*

DISCUSSION

Pholiota carbonaria can be distinguished from *P. spumosa* by absence of scales; *P. spumosa* has scales which disappear quickly. *P. aurivella* can be distinguished from *P. lenta* by appearance of cracks on the cap when dry, while *P. lenta* has no cracks on cap when dry. *P. squarrosa* can also be differentiated by its yellowish flesh.

Pholiota aurivella Batsch f. 115 nec differt f. 114 (Agar.), Fr. Obs. 2, p. 17, Hym. Eur. P. 220.

SYNONYM : *Pholiota cerifera* (Karst.) Karst.

Distinguishing characters: Cap 5-11cm, at first convex then flattened, covered with large flattened scales and some cracks appear on the surface when the fruit body becomes dry. Stem long, covered with large scales and becomes hard. Gills at first yellowish then become brown, crowded. Spore print brown. Smell faint, indistinct. Flesh at first yellowish then reddish brown. Spores ellipsoid, smooth, 6-8x4-5µm in size (Fig.1A-B).

Season: July and August.

Occurrence: It is collected from Dichal nalla, District Astore, alt 3228m, N=35°24, E=74°53.

Ethnic uses/Importance: Inedible.

Habit/Habitat: It grows on woods, especially on old tree trunks.

Previous Report from Pakistan: None.

Pholiota carbonaria (Fr.) Sing

SYNONYM: *Flammula carbonaria* (Fr.) Quel.

Distinguishing characters: Cap 2-5cm, at first convex, then flattened, smooth, sticky. Stem 3-6cm long and 1cm thick, equal, slender, fibrous-scaly below indefinite ring zone. Gills at first buff then brown, crowded, adnate. Spore print brown. Smell indistinct. Flesh yellowish white. Spores ellipsoid, smooth, 6-8x4-5µm in size (Fig.1 C-D).

Season: June-July.

Occurrence: It was collected from Dichal nalla, District Astore alt 3155m, N=35°28, E= 74°22.

Ethnic uses/Importance: Inedible.

Habit/Habitat: Usually in large groups on soil on the fire sites, especially in woods.

Previous Report from Pakistan: None.

Pholiota lenta (Pers. ex Fr.) Singer

SYNONYM: *Flammula lenta* (Pers. Ex Fr.) Gill.

Distinguishing characters: Cap 5-9cm, at first convex, then flattened, covered with scales, no cracks on the surface. Stem 7-9cm long, tapering slightly upwards and covered with scales below that quickly disappear near the ring zone and its stem becomes smooth at apex, dry. Gills at first yellowish then reddish brown, crowded. Spore print brown. Smell pleasant, fruity. Flesh brown. Spores ellipsoid, smooth, 6-8x4-5µm in size (Fig.1E-F).

Season: June- July.

Occurrence: It is collected from Dichal nalla, District Astore, alt 3322m, N= 35°24 E=74°53.

Ethnic uses/Importance: Inedible.

Habit/Habitat: Usually in small groups. Grows on wood of broad -leaved trees and old trunks.

Previous Report from Pakistan: None.

Pholiota squarrosa (Pers. Ex Fr.) Quel. Forma annulosa Wichansky in C.C. H. mykol. Sborn., 41, p. 46, 1964.

SYNONYM : *Dryophila squarrosa* (Müll. : Fr.) Qué.

Distinguishing characters: Cap 4-10cm, at first convex, then flattened, densely covered with concentric rings of coarse upturned scales. Stem 5-14cm, tapering slightly downwards, fairly slender, covered with upturned scales below superior apical ring. Gills at first yellowish, then radish ocher, crowded, adnate. Spore print radish brown. Smell unpleasant. Flesh yellowish, radish brown in stem base. Densely tufted. Spores ellipsoid, smooth 6-9x 4-5µm in size (Fig.1G-H).

Season: July and August.

Occurrence: Specimens were collected from Dichal nalla, (Dashkin), District Astore, alt 3578m, N=35°30, E=74°53.

Ethnic uses/Importance: Inedible causing to damage the tree trunk.

Habit/Habitat: On woods trunk base of broad- leaved trees.

Previous Report from Pakistan: Dungagali, Nathiagali (Khalid and Iqbal, 1996).

Pholiota spumosa (Fr.) Singer, 1969.

SYNONYM: *Flammula spumosa* (Fr.) Karst.

Distinguishing characters: Cap 2-8cm, at first convex then flattened, slightly depressed, at first covered with small scales, then smooth. Stem 3-7cm, tapering slightly downwards, slender, and scaly with ring that disappear quickly. Gills at first yellowish, then brown, crowded, adnate. Spore print brown. Smell indistinct. Flesh yellowish. Spores ellipsoid, smooth 7-8x3-4µm in size (Fig.1I-J).

Season: September and October.

Occurrence: It was collected from Dichal nalla (Dashkin), District Astore, alt 3573m, N=35°30, E=74°53.

Ethnic uses/Importance: Inedible.

Habit/Habitat: Usually in small groups on soil with coniferous trees.

Previous Report from Pakistan: On ground in coniferous forest. Khanspur, Dungagali (Khalid and Iqbal, 1996).



Fig.1. *Pholiota aurivella*(A-B), *Pholiota carbonaria* (C-D), *Pholiota lenta*(E-F), *Pholiota squarrosa* (G-H), *Pholiota spumosa* (I-L).

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