NEW RECORD SPECIES OF STROPHARIACEAE FROM PAKISTAN

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Abstract

The species viz., *Panaeolus papilionaceus* (Fr.) Quel, *Panaeolus sphinctrinus* (Fr.) Staude and *Stropharia hornimannii* (Fr.) Lund belonging to family Strophariaceae and order Agaricales are described. The *Panaeolus papilionaceus* and *P. sphinctrinus* are characterized by at first bell shaped are describe cap, convex then flattened, slightly umbonate. Stem smooth, radially vained, tapering slightly upwards or equal, slender. Gills fairly crowded and adenate. Spore print black. Smell indistinct. Spores ellipsoid, smooth. While the *Stropharia hornimannii* have at first convex then flattened, sticky and, smooth cap. Stem tapering slightly downwards, rather stout, ring present near the cap. Gills fairly crowded, adnate. Spore print brown. Smell unpleasant. Spores ellipsoid, smooth.

Introduction

Phylum Basidiomycota is a common group of fungi found all over the world that includes at least 22,244 species (Hawkworth *et al*., 1995). The group 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 (Alexopolus *et al*., 1996). Basidiomycetes are characterized primarily by the sexual spores (basidiospores) being produced on a cell called a basidium, usually in four. Many but not all have septal structures called a clamp connection during most of the life cycle. No other group of fungi has these. Basidiomycetes are well known for their ability to cause disease, their food value and production of a wide variety of interesting secondary products noted for their scents, tastes, colours, and toxic properties (Gallois *et al*., 1990).Rust and smut fungi cause plant diseases that destroy many millions of dollars worth of crops annually. Many others attack a large variety of food and ornamental plants. Several Basidiomycetes are significant in causing disease of forest and shade trees e.g. Armillaria species. Many other Basidiomycetes are directly responsible for the destruction of a wide variety of wood products. Basidiomycetes that attack dead woody plants are the principal agents that decay cellulose and lignin and are essential components of forest ecosystems. Some species of basidiomycetes are human pathogens, particularly in aids patient, like Filobasidiella neoformans (Alexopoulos *et al.*, 1996). Several Basidiomycetes are sought eagerly by mushrooms lovers the world over. The cultivation of mushrooms for food has developed into an industry of considerable proportions in the United State, Europe and Asia growing continuously. Besides the edible members, several mushrooms are toxic or hallucinogenic. A review of literature regarding the diversity of fungi in Pakistan shows that there is need to explore the Basidiomycetes in Pakistan since out of more than 22,244 species, only about 630 species have been reported from various parts of Pakistan (Ahmad *et al*., 1997). Gilgit valley appears to be totally ignored by pervious workers since no report on fungi from Gilgit is available.

Materials and Methods

Samples of Basidiomycetous fungi were collected from Hunza and Nultar, 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 & Mirriott (1981), Surcek (1988), Buczacki (1989), Leelavathy & Ganesh (2000), Swann & 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

During the present work, two species viz., *Panaeolus papilionaceus P.sphinctrinus* and *Stropharia hornimannii* were recorded for the first time from Pakistan.

Key to species of *Panaeolus* (Fr.) Quel. (1872)

1. Cap first convex, smooth then flattened, cracked ----------*P. papilionaceus*
- Cap first bell shaped, slightly umbonate, without cracks----------*P. sphinctrinus*

Panaeolus papilionaceus Fr. Epicr. P. 236, Saccardo, *Syl. Fung.*,Vol. 5, 1887, p. 1122.

Distinguishing characters: Cap 2-6cm, at first convex, smooth, then flattened and cracked, margin irregular. Stem 5-8cm, tapering slightly upwards, base swollen, slender. Gills at first grayish, then with black spots, finally becoming black, fairly crowded, adenate. Spore print black. Smell indistinct. Flesh brown. Spores ellipsoid, smooth, 12-14x7-8µm in size (Fig.1A-C).

Season: August- September.

Occurrence: Specimens were collected from Dichal nalla, District Astore, alt 3572m, N=35 ^{o}30, E=74 ^{o}53.

Ethnic Uses/ Importance: Inedible.

Habit/Habitat: On pasture, solitary or in-group.

Previous Report from Pakistan: None

Panaeolus sphinctrinus Fr. Epicer. P. 235, Hym. Eur. P. 311, Saccardo, *Syl. Fung*, Vol. 5, 1887, p. 1121.

Distinguishing characters: Cap 2-4cm, first bell shaped, slightly umbonate, paler when dry, smooth-radially vained, and spots appear at maturity. Stem 4-7cm, equal, smooth, white in colour, slender. Gills at first grayish, then black, fairly crowded, adnate. Spore print black. Smell indistinct. Flesh buff- brown. Spores lemon-shaped, smooth, 12-14x8-10µm in size (Fig.1D-F).

Season: May- June.

Occurrence: *P. sphinctrinus* was collected from Gilgit airport, District Gilgit, alt 2036m, N=36 ^{o}78, E=74 ^{o}45.

Ethnic uses/Importance: Inedible.

Habit/Habitat: Usually in small groups, trooping, on well-manured soil.

Previous Report from Pakistan: None.

Remarks: *Panaeolus sphinctrinus* can be easily distinguished from *P. papilionaceus* by slightly umbonate cap without any cracks whereas *P. papilionaceus* has convex than flattened cap with cracks.

Stropharia hornimannii (Fr.: Fr.) Lund. et Nannf.

Distinguishing characters: Cap 5-12, at first convex then flattened, sticky, smooth, reddish in colour. Stem 8-12cm long and 2-3cm thick, tapering slightly downwards, rather stout, ring present near the cap. Gills at first grayish, then becoming dark-brown, fairly crowded, adnate. Spore print brown. Smell unpleasant. Flesh grayish white. Spores ellipsoid, smooth, 7-8 x 5.5µm in size.

Season: September- October.

Occurrence: Specimen were collected from Muashkin forest, District Astore, alt 3078m, N=35 ^{o}78, E=74 ^{o}45.
Ethnic uses/Importance: Inedible.

Habit/Habitat: Solitary or in small groups on soil under the coniferous trees.

Previous Report from Pakistan: None.

Fig.1. ***Panaeolus papilionaceus*** **(A-C),** ***Panaeolus sphinctrinus*** **(D-F),** ***Stropharia hornimannii*** **(G-H).**

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