

MUSHROOMS OF THE ORDER POLYPORALES FROM DISTRICT POONCH OF AZAD JAMMU AND KASHMIR

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ABSTRACT

Mushrooms of order polyporales from local myco-flora of district Poonch AJK were explored on the basis of micro and macroscopic characteristics followed by identification among edible and poisonous specimens. Three different species of mushrooms of order polyporales viz: *Polyporus versicolor*, *Laetiporus sulphurens* and *Phaeolus schweintzii* were collected from different tehsils of Poonch district Azad Jammu and Kashmir. Temperature during specimen collection was recorded 18-25° C. It is assumed that this study would be beneficial to existing knowledge about local mycoflora of Poonch AJK. In consequence, most of the forest worth is wasted and not even local community is aware by mushrooms knowledge. Mushroom farming, mushroom products and mushroom bioremediation is of prime importance to boost the revenue income and healthy living.

Keywords; *Polyporus versicolor*, *Laetiporus sulphurens* and *Phaeolus schweintzii*

INTRODUCTION

There are around 3.8 million species of mushrooms throughout the world that have been collected from the natural vegetation and used for various conventional and medicinal purposes (Hawksworth, 2017; Fakhar-ud-Din and Mukhtar, 2019). Although mushrooms can be found anytime in the year but generally appear in two distinctive seasons. First season occurs between March-May and the second between September-October, with some ephemeral species surviving for only 24 hours (laala *et al.*, 2016). The economic value of medicinal mushrooms and imitative dietary supplement throughout the world was nearly about US\$9.0 billion in 2001 (Miles and Chang, 2004).

The shorter, milder summers in the Poonch area are perfect for the development of large mushrooms (GOAJK, 2020). In a location where the vast majority of the macroflora has not yet been investigated, reports on the region's macro-fungi are few. AJK may be found in the southern Karakoram foothills, around 80 kilometers north-east of the capital, Islamabad. It's worth noting that AJK locals, who depend only on traditional knowledge of wild mushrooms for sustenance, are unaware of the potential economic and medical benefits of these fungi.

The basidium or basidiocarp is the macroscopic fruiting structure of mushrooms in the class Basidiomycetes, and it may be found both above and below ground. There are over 10,000 different kinds of basidiomycetes, spread among 550 different genera and 80 different families

(Dudka and Wasser, 1987). Mycologists continue to uncover the unknown and hidden mushrooms as species go extinct through habitat loss and climate changes, but only a small proportion of the world's total fungal riches has been studied by scientists. To best develop mushrooms from the indigenous myco-flora of Poonch Azad Kashmir, it would be crucial to collect a representative sample of the region's environment from a variety of different ecological and geographical contexts. The proposed study aimed to collect local myco-flora of Poonch AJK for differentiation among edible and poisonous specimens.

MATERIAL AND METHODS

Rawalakot, Hajira, and Abbaspur are only three of the tehsils in the district of Poonch from whence the wild mushrooms were gathered. Mushroom samples were taken to the PMAS-Arid Agriculture University in Rawalpindi and the University of Poonch's department of plant pathology in AJK for further analysis. Specimens were gathered at random from a variety of locations in the Poonch region of AJK, with a focus on wetland areas. Additionally, mushroom harvesting occurred just after rainstorms. Because of their delicate nature, mushrooms required careful collection using a trowel and shovel. Tissue paper, plastic bag, flat basket, and little boxes were utilized to prevent breakage. The specimen was unearthed with the stem, and notably the base, still attached. Specimens with deep roots were pulled out using a trowel and shovel, while those with more superficial roots were hand-picked from the ground (Pala, 2012).

We scratched the substrate with a sharp knife to gather specimens that had developed on the branches and trunks. However, in most cases, the whole section had to be cut off to protect

the specimen. Surface features, odors, and color shifts were documented, as were development behaviors including soil depth, form, and softness, among others. Temperature, habitat, and substrate were also identified as three of the most often observed features. The obtained samples were taken to the lab for analysis. Every collection has its own unique number.

Field images were shot using a Huawei camera, showcasing as many of the species' substrates as possible.

Macroscopic and microscopic analyses were used for identification (Atri et al., 2003). Macroscopic identification included determining the specimen's dimensions, colors, textures, pilei, lamellae, and stipe before moving on to microscopic identification (Atri et al., 2003). Various textual and descriptive mushroom keys were used to classify mushroom specimens (Arora, 1986). On the other hand, spore dust from a fresh specimen was placed on a slide with a drop of water or lactophenol to make a microscopic slide. In addition, 3% KOH, cotton blue, and Mezler's reagent were used in conjunction with (Pala, 2012). Using a Nikon Eclipse E200 microscope and an ocular micrometer, we also quantified the spore size. In addition, we followed Kuo's instructions for capturing spore prints (2001). We got spore prints by slicing up a pileus and leaving it overnight on white paper. For a further 24 hours, the chopped pileus was kept on white paper in case any spore prints had not been released (Arora, 1986). Samples of wild mushrooms were collected and stored for use in scientific research. Both moist and dry methods of preservation were used.

Careful identification according to existing taxonomic literature of wild mushrooms was performed so that locals would be informed of which species were edible and which were harmful (Arora, 1986).

RESULTS AND DISCUSSION

Order: Polyporales

During wild mushroom collection from poonch area of ajk, 3 species belonging to same order of same family and 3 different genus were collected. morphological features of all these specimens are elaborated in table 1. Moreover, there were several possible places for fungus in every location, and in the tropics specifically, roughly 32 ecological niches meriting inquiry were found, each of which required unique methods and specialists to investigate. Some environments are especially underexplored, even though no place on Earth can be regarded to have a comprehensive inventory of the fungus present (hawksworth et al., 1997).

Polyporus versicolor

It was seen on trunks (dead and living both), also seen on coniferous trees, and most commonly found on fruit trees from Shamsabad village of Tehsil Rawalakot, during month of September, 2015 and temperature noted was 25°C. Corphophores were present with a size measurement of 3-8cm in width and were flattened. Specimen was joined together forming a rosette structure and texture was very smooth with a velvety appearance. It was seen in brown, pale and purple colors (Fig a). Tubes were present and were very short having white and dark brown appearance. Spore print was brown. Spore size measured was $4-7 \times 13-3 \mu\text{m}$ and spores were round to elliptical in scattered form (Fig a).

Laetiporus sulphurens

Specimen was found on dead stumps and logs and buried woods in Chatra village of Tehsil Abaspur during month of April, 2015. Temperature was 18° C.

Fruiting body was about 9-13 cm broad having fleshy texture. Appearance of fruiting body was finger like, shelf like and knob like. Specimen was in yellow, white and orange colours and fruiting structure was wrinkled (Fig a). Stipe was totally absent as wood serves function of stipe. Spore print was white and spores were smooth having size, 5-5.5×7-3 μm (Fig b).

Phaeolus schweinitzii

Specimen was seen on dead logs of trees mostly in groups but was also seen in scattered form during rainy season. It was found from Chatra village of Abaspur Tehsil during month of September, 2015 and temperature during collection was 24°C.

Pileus was absent. Appearance of fruiting body was shelf like. Fruiting body was about 4-6.6 cm broad and of white colour with very smooth texture (Fig c). As wood was habitat therefore it serves purpose of stipe, but a very small stipe was also present only about 0.5 cm in thickness and was tapered downwards having white colour. Lamellae was totally absent. Spore print was white. Spores were smooth having size, 4.5-6×5-8 μm (Fig c).



Figure a: *Polyporus versicolor*

Figure b: *Laetiporus sulphurens*

Figure c: *Phaeolus schweinitzii*

Table 1- Morphological characterization of mushrooms from order Polyporales collected from Poonch area of AJK

Sr #	Scientific Name	Common Name	Order	Edibility	Pileus	Stipe	Spore print	Spore size
1-	<i>Polyporus versicolor</i>	Turkey tail	Polyporales	Edible	3-8cm	Absent	Brown	4-7 × 13-3 μm
2-	<i>Laetiporus sulphurens</i>	Chicken of woods	Polyporales	Edible	9-13 cm	Absent	White	7-3 × 5-5.5 μm
3-	<i>Phaeolus</i>	Velvety top	Polyporales	Poisonous	4-4.6	0.5 cm	White	5-8 × 4.5-6

	<i>schweintzii</i>	fungus			cm			μm
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DISCUSSION

The majority of the Poonch District AJK's wild mushroom samples were gathered between February and October, making this period the prime time for mushroom cultivation. Similar findings were found by Lakhanpal (2010), who undertook a similar study for collecting wild mushrooms in the North Western Himalayas and documented 300 species belonging to 59 genera and 15 families of the order Agaricales during the same season.

Mushrooms from the phylum Basidiomycetes have critical nutritional value. Mushrooms of the Pleurotaceae and Agaricaceae families are naturally gluten-free, high in vitamin D and vitamin B, protein, and carbs, and low in fat and calories. The edible mushrooms in the phylum Basidiomycetes are not only important for their culinary worth, but also for their medicinal significance. Various ailments, including cancer, diabetes, and heart disease, are reportedly treated with these edible mushrooms (2019). In conclusion, mushrooms serve several purposes in both the medical and culinary fields (Alice and Kustudia, 2004).

CONCLUSION

After exploring local myco-flora of Poonch AJK our study revealed presence of rich macro-fungi in at every hook and corner of research area. Many of these hold great medicinal and nutritional importance. If this natural wealth properly collected, managed and marketed, local inhabitants can get handsome money and country can earn good amount of foreign exchange by exporting them.

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