

Diversity and Characterization of Mushrooms from District Haripur, KPK, Pakistan

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ARTICLE INFO

Received:  May 23, 2019

Published:  May 31, 2019

Citation: Saira Bibi, Muhammad Fiaz khan, Aqsa Rehman. EDiversity and Characterization of Mushrooms from District Haripur, KPK, Pakistan. Biomed J Sci & Tech Res 18(3)-2019. BJSTR. MS.ID.003168.

Keywords: Mushrooms; Diversity; District Haripur

ABSTRACT

During the present study total of 19 families including 40 species were recorded enlisted in Table 1. The highest number of wild edible mushroom species recorded was of the Pleurotaceae family (*Pleurotus pulmonarius*, *P. giganteus*, *P. tuberregium*, *P. djamor var. djamor*, and *P. djamor var. roseus*). The second highest number of species recorded was from the Polyporaceae family (*Lentinus sajor-caju*, *L. squarrosulus*, and *Panus lecomtei*). All three species are white rot fungi with distant or crowded lamellae (as in Agaricales). Auriculariaceae family also comprises three species (*Auricularia polythrica*, *Auricularia auricular-judae* and *Auricularia sp. 1*) which are all edible. Among 40 wild edible mushrooms, only five were reported for medicinal uses. These mushrooms are *Pleurotus tuber-regium*, *Auricularia sp.*, *Xylaria sp.*, *Lignosus sp.* and *Schizophyllum commune*. The rare species of *Termitomyces eurhizae* (Lyophyllaceae) and *Hygrocybe miniata* (Hygrophoraceae) from lowland forests was found in this study. It is the first reported study from District Haripur. Local people were having very little knowledge on mushrooms. This will be helpful for the local community and researchers.

Introduction

For their value as nutritional Mushrooms are highly prized [1], and medicinal foods for their use in cosmetics [2], In every field including in agriculture, industry, medicine, food industry, textiles, and bioremediation Fungi play an important role [3]. Into three different forms yeast, moulds and macrofungi or mushrooms Fungi can be broadly classified or mushrooms. Large, conspicuous spore bearing structures and have fleshy, tough umbrella like sporophores that bear holobasidia on the surface of gills or lamellae that hang down from the cap belonging to basidiomycetes and ascomycetes are the Macrofungi [4]. Depending on the composition of tree species and other substrates Mushrooms are found in varied types of habitats. Due to favourable climate and abundance of flora during that time Mushrooms are abundant in spring to autumn while less distributed in dry and hot seasons [5]. By having the great economic importance they serve as the essential part of the human diet and are used as both medicine and food for centuries, mushrooms are rich in pharmacological properties, easy to cultivate, requires low resources and area, and can be grown all over the world [6]. most important organisms on Earth, both in terms of a high species richness and their functional roles in aquatic and terrestrial

ecosystems [7]. for species identification there is need of a wide taxonomical knowledge and a high field sampling effort [8].

The knowledge of the macrofungal component represents a useful tool for the establishment of priorities for sites of conservation and an indicator of forest worries [9]. In the ethology of acute exogenous intoxication Poisonings with mushrooms have an important position and are one of the main reasons for hospitalization [10]. Causing organ failure with potentially fatal outcome Death cap (*Amanita phalloides*) poisoning is a serious medical condition [11]. After mushrooms ingestion It is a toxic mushroom responsible for the majority of deaths occurring [12]. All deaths due to mushroom poisoning It is the cause of 90-95%. Rather rare Mushroom poisonings with fly agaric (*Amanita muscaria*) and panther cap (*Amanita pantherina*). Due to the short growing season and a high demand to wild mushrooms a large number of edible wild mushrooms are seasonally harvested, as an example up to 700 species of wild mushrooms are known to be edible and are utilized by local indigenous people as both a source of food and income in china. Due to the uniqueness to the area

many mushrooms are would drive up the market price of these species, and in turn encourage over harvesting. For the local people the importance and their availability is important there they think mushrooms priceless so in order to document the diversity of these mushrooms both in terms of edible and non-edibles this study is conducted in district Haripur.

Material and Methods

Methodology

Study Area: Study area was conducted in the district Haripur KPk Pakistan. Haripur is the main city of the Haripur District in Hazara, Khyber Pakhtunkhwa in Pakistan, with Swabi and Buner to the west, some 65 km north of Islamabad and 35 km south of

Abbottabad. It is in a hilly plain area at an altitude of 520 m. Having the 33.9946° N, 72.9106° E. With the pleasant weather and hilly areas with grasses and pine trees (Figure 1).

Sampling and Data Collection

Investigation of mushrooms were carried out during the whole year from January 2018 to December 2018 Sampling was performed by using 20 circular (4-m radius) plots (60 in total) selected in each study site along line-transects and for macrofungi following a standardized sampling method. Each plot was 20 m away from the next one. For each site total sample area was approximately 1,000 m². Species identification was performed by analyzing the macro- and microscopically characteristics of the collected specimens and the relevant literature.

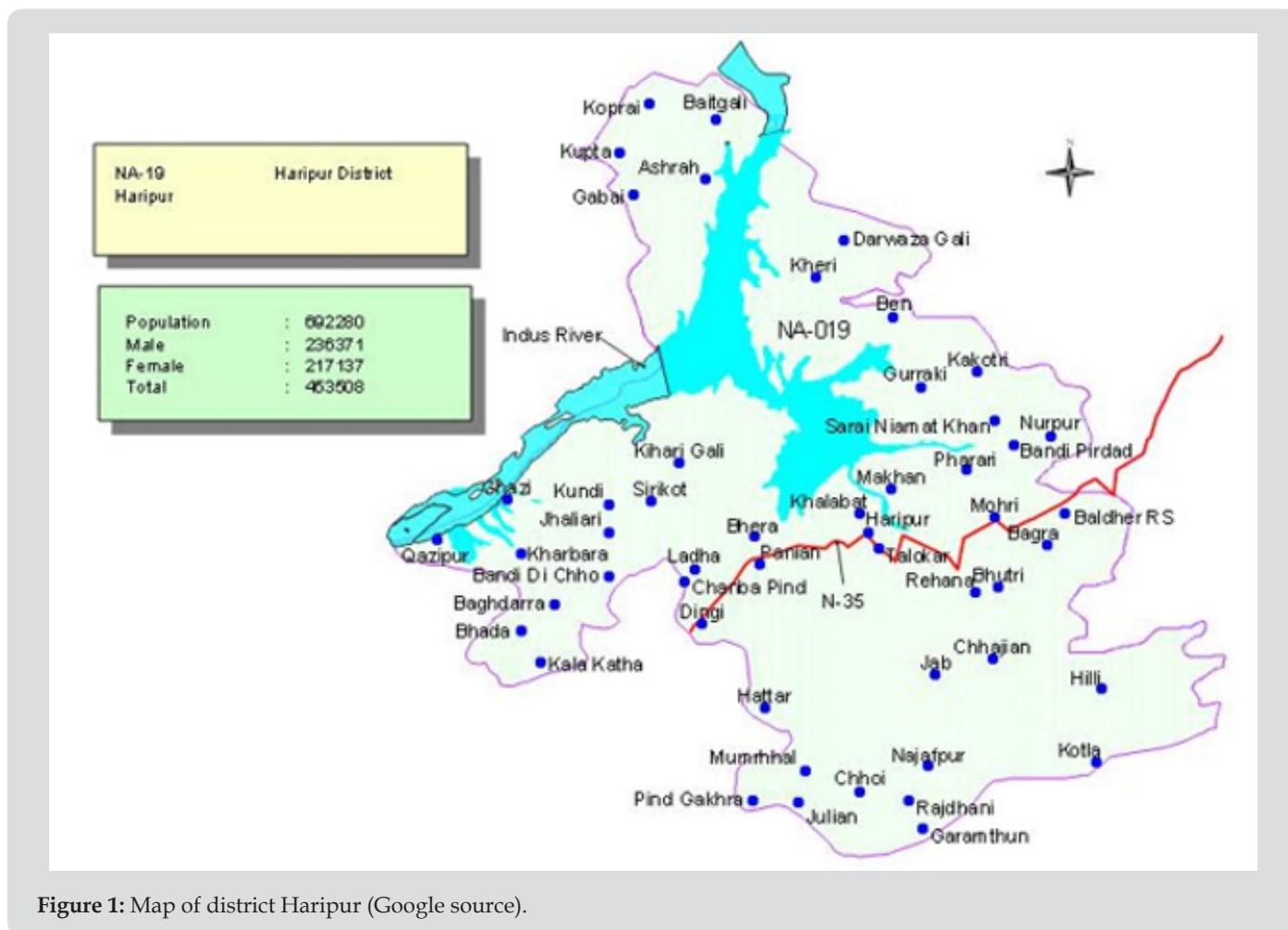


Figure 1: Map of district Haripur (Google source).

Results

During the present study total of 19 families including 40 species were recorded enlisted in Table 1. The highest number of wild edible mushroom species recorded was of the Pleurotaceae family (*Pleurotus pulmonarius*, *P. giganteus*, *P. tuberregium*, *P. djamor var. djamor*, and *P. djamor var. roseus*). The second highest number of species recorded was from the Polyporaceae family (*Lentinus sajor-caju*, *L. squarrosulus*, and *Panus lecomtei*). All three species are white rot fungi with distant or crowded lamellae (as in

Agaricales). Auriculariaceae family also comprises three species (*Auricularia polythrica*, *Auricularia auricular-judae* and *Auricularia sp. 1*) which are all edible. Among 40 wild edible mushrooms, only five were reported for medicinal uses. These mushrooms are *Pleurotus tuber-regium*, *Auricularia sp.*, *Xylaria sp.*, *Lignosus sp.* And *Schizophyllum commune*. The rare species of *Termitomyces eurhizae* (Lyophyllaceae) and *Hygrocybe miniata* (Hygrophoraceae) from lowland forests was found in this study. An edible, *Calostoma insignis* (Calostomataceae) and poisonous *Agaricus praelaresquamosus* were also recorded (Figure 2).

Table 1: Recorded species of mushrooms from district Haripur.

Family	Scientific name	Local name	Habitat	status of E/NE
Gomphaceae	Cantharellus floccus	shaggy scaly	shady areas	non edible
		califlower mushroom	shady	
Sparassidaceae	Conocyba crispa	places		edible
Morchellaceae	M. conica	guchhi	shady areas	edible
		chawara	shady areas	edible
	M. anqusticipt	mushroom		edible
Suillaceae	Boletus luteus	topa mushroom Round head	shady areas	edible
	M. vulgaris	morels		edible
	M. deliciosa	white morels	shady areas	edible
	M. crassipes	Giant morels	shady areas	edible
	Morchella esculenta		shady areas	edible
	Lentinus sajor-caju	Ring mushroom	shady areas	edible
	Lentinus		shady areas	edible
Polyporaceae	<i>squarrosulus</i>	Milky muahrooms	shady areas	edible
	Lignosus sp.		shady areas	edible
	Panus lecomtei	Curry Mushroom	shady areas	edible
Auriculariaceae	Auricularia polythrica	monkey ear	shady areas	edible
	Auricularia sp. 1	Elephant ear	shady areas	edible
	Auricularia auricular judae	Kulat Telinga	shady areas	edible
Agaricaceae	Agaricus subrutilescens	Agaricus subrutilescens	shady areas	Non edible
	<i>C.comatus</i>	Not known	shady areas	Non edible
	Agaricus sp. 1	Not known	shady areas	Non edible
Pleurotaceae	Pleurotus giganteus	Not known	shady areas	Non edible
	Pleurotus tuber regium	Not known	shady areas	Non edible
	Pleurotus djamor var. djamor	Not known	shady areas	Non edible
	Pleurotus ostreatus	Pata mushroom	shady areas	Non edible
Marasmiaceae	Marasmiellus sp.	Kulat sawit putih	shady areas	Non edible
	Lentinula edodes	wild shitake	shady areas	Non edible
Tremellaceae	<i>Tremella fuciformis</i>	white jelly	shady areas	Non edible
Hygrophoraceae	<i>Hygrocybe miniata</i>	Kulat Top	shady areas	Non edible
Pluteaceae	<i>Volvariella volvacea</i>	Paddy Straw mushroom	shady areas	Non edible
Schizophyllaceae	<i>Schizophyllum commune</i>	<i>Kulat Kodop</i>	shady areas	Non edible
Lyophyllaceae	<i>Termitomyces eurrhizus</i>	termite mushroom	shady areas	Non edible
Cantharellaceae	<i>Chanterellus cerinoalbus</i>	<i>Not known</i>	shady areas	Non edible
Calostomataceae	<i>Calostoma insignis</i>	Pig's eye mushroom	shady areas	Non edible



Figure 2: Some collected mushrooms from district Haripur.

Discussion

Knowledge on edible mushrooms is usually transferred from the older generation to the younger generation. Indigenous people living in the rural forest mainly use natural resources to sustain their subsistence [13]. Traditionally, older generations have vast knowledge on the uses of wild mushrooms. The younger generation only recognize the common edible wild mushrooms species. Currently, most of the younger generation have migrated to cities for job opportunities. Rural area have more forest coverage compared to urban areas. Previous studies have shown that depletion of ethno mycological knowledge may happen when people move to urban areas from rural villages [14]. Urbanization and land integration are two significant reasons that lead to the instant loss of their native knowledge from one generation to the next [15]. Similar results on these criteria in determining the edible mushrooms have been reported from other studies as well [16]. Several studies reported that *Pleurotus* species are valuable medicinal mushrooms [17]. In the Southeast Asia region, a diverse variety of wild mushroom have been found at local markets [18].

Conclusion

It is the first reported study from District Haripur. Local people were having very little knowledge on mushrooms. This will be helpful for the local community and researchers.

Acknowledgment

We would like to acknowledge the local community of villagers.

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ISSN: 2574-1241

DOI: 10.26717/BJSTR.2019.18.003168

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