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MUSHROOM DIVERSITY OF AMRITE COMMUNITY FOREST, KAPILVASTU, NEPAL

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ABSTRACT

A total of 38 wild mushroom specimens were collected for the period of 3 months (from June to September, 2016) from Amrite community forest of Bhalwad, Banganga municipality. Out of 38 species collected, 34 species were identified up to generic level belonging to 16 families. The most dominant family was Coprinaceae belonging to 5 species followed by Amanitaceae consisting of 4 species. 80% of the Tharu people were found to use mushroom as food, 12.5% as medicine and 7.5% of Tharu people don't have any idea of food and medicinal value. On the other hand, 57.5% of the non-Tharu community in the study area use mushroom as food, 7.5 % use as medicine and 35% of non-Tharu community do not use mushroom as food and medicine.

Key words: community forest, mushrooms, nutrients, specimens, Tharu community,.

INTRODUCTION

Mushrooms are seasonal fungi which occupy diverse niche in nature in forest ecosystem. They predominantly occur during the rainy season. They are macromycetes forming macroscopic fruiting bodies such as *Agaricus*, *Boletus*, Jelly fungi, coral fungi, stinkhorns, bracket fungi, puffballs and bird's nest fungi. They are fleshy, sub-fleshy, or sometimes leathery and woody and bear their fertile surface either on lamellae or lining the tubes, opening out by means of pores. Mushrooms can be classified into three categories by their trophic pattern; saprophytes, parasites or mycorrhizae. The most commonly grown mushrooms are saprophytes, decomposers in an ecosystem growing on organic matters like wood, leaves and straw in nature. These varied elements have enriched Nepal with economically important mycoflora (Adhikari, 1988). Mushrooms may be edible, inedible, medicinal and poisonous. Many kinds of macro-fungi are not edible, but also possess tonic and medicinal properties (Chang and Miles, 2004). Till now 608 genera and 2025 species have been reported under 60 order and 80 families. To date about 1021 species (874 species-Basidiomycotina and 147 species-Ascomycotina) of mushrooms are recorded from Nepal (Adhikari, 2012). Out of these, 228 species have food value (Christensen et al. 2008), while 73 species are medicinal and 65 species poisonous (Adhikari 2009). Wild edible mushrooms (WEMs) are important commodity to rural and tribal livelihood (Christensen et al., 2008). Mushrooms are low in calories, high in fiber, and contain many important vitamins and minerals. Some also have medicinal properties such as complex carbohydrates that strengthen the immune system Mushrooms have been recognized as delicious food of good quality protein. These are rich in vitamins particularly in vitamin C and vitamin B-complex and minerals. These are the food of low calorie with little fat, where sugar content is very less, starch and cholesterol are absent and ergosterol is present.

Major mineral constituents in mushrooms are K, P, Na, Ca, Mg and elements like Cu, Zn, Fe, Mo, Cd form minor constituents (Bano et al.,1982, Li and Chang,1982). K, P, Na and Mg constitute about 56 to 70% of total ash content of the mushrooms (Li and Chang, 1982).

MATERIALS AND METHODS

Study Area

The study was conducted in Amrite community forest and its vicinity that lies in Kapilbastu district in the western development region, south of the Chure hills of Argakhanchi district. Amrite community forest lies 2741' N and $83^0$6'38" E to $27^0$44'46.5" N and $83^0$05'48" E. It lies between the elevations of 106 to 140 m from mean sea level in the Kapilbastu district. Amrite community forest was established in 2066 B.S. which is conserved by more than 1200 people that includes 261 residence residing towards its southern vicinity. It is surrounded by Amrite Khola towards East, Dhire Khola towards west and south and way to Amrite cattle pasture land towards North. The forest is tropical forest which consists of *Shorea robusta, Adina cordifolia, Acacia catechu, Bombax ceiba, Aegle marmelos, Anthocephalus chinensis, Terminalia alata, Terminalia chebula, Terminalia bellarica, Acorus calamus, Syzygium cuminis, Cassia fistula,* etc.

Data collection

The field work was conducted five times (June to September 2016) in the "Amrite Community Forest" of the Banganga Municipality, Kapilbastu. While conducting field trips local people were also accompanied. Indigenous knowledge survey was conducted. The Participatory Rural Appraisal (PRA) technique was adopted with the local people aimed at getting information largely on nutritional aspects. Data were obtained using combined semi-structured questionnaire, participatory discussions and field observations. The mushrooms were photographed in their natural habitat before they were collected. The basidiocarps were picked up by digging them out carefully with the help of a sharp knife. Specific collection numbers were given for each species. The mushrooms were preserved by dry preserve and liquid preserve by using 95% alcohol. The specimens were studied at Central Department of Botany, TU Kirtipur. The specimens that were collected and preserved were identified with the help of relevant literatures (Pacioni, 1985; Singer, 1986; Adhikari, 2000; Pandey, 2004; Jha *et al*, 2011; Jha and Tripathi, 2012; Aryal *et al*., 2012; Aryal and Budhathoki, 2013a, b, c, d; 2014).

RESULTS AND DISCUSSION

A total of 38 wild mushroom species were collected. Out of these 34 species were identified up to generic level belonging to 16 families. The most dominant family was Coprinaceae belonging to five species followed by Amanitaceae consisting of four species. Russulaceae, Polyporaceae, Tricholomataceae and Sclerodermataceae were represented by three species each while Agaricaceae, Boletaceae, Cantheralleceae were represented by two species each. Family Auriculariaceae, Dacrymycetaceae, Hydnangiaceae, Pannariaceae, Phallaceae, and Xylariaceae were represented by 1 species each where as four species were unidentified (Table 1).

On the basis of the information collected from 40 respondent of Tharu and 40 respondent of Non-Tharu community, 80% of the Tharu people were found to use mushroom as food, 12.5% as medicine and 7.5% of Tharu people don't have any idea of food and medicinal value. On the other hand, 57.5% of the non-Tharu community in the study area use mushroom as food, 7.5 % use as medicine and 35% of non-

Tharu community do not use mushroom as food and medicine. Thus, the above data reveals that 68.75% of the people use mushroom as food, 10% use it as medicine and 21.25% of people have no idea about the use and importance of mushroom.

According to perception of local people, it was reported that the mushrooms with following features are edible or poisonous:

- Mushrooms having annulus nearby the cap are poisonous.
- Mushroom species with curved pileus with annulus are also poisonous.
- Mushrooms found on fodder plants are generally edible.
- Mushrooms that have warts on their pileus and bad odour are poisonous.
- Mushrooms that glow at night are poisonous.
- Mushrooms that are peeled off easily are edible.
- Mushrooms that are eaten by insects and rodents are generally edible.

The edible species *Auricuaria auricula* reported from the present study has been already reported from Manichur (Adhikari, 1976). *Pycnoporus cinnabarinus* commonly known as kanya chyau has been reported from the study area but has been already reported from Ghorepani (Bhandary, 1985). The species *Russula delica* found on the study area has been reported from Royal Botanical Garden, Godavary (1515m) (Adhikari and Durrieu, 1996). The species *Coprinus comatus* reported from the study area has been reported from Chima goan.

Table 1: List of mushrooms collected from the Amrite community forest, Banganga-16, Kapilvastu.

Host/ substrate	Lat./Long.	Alt. (m)	Scientific name	Local name	Order	Family	Application
soil	27°41'01.5"/ 83°06'38"	114	*Macrolapiota procera* (Scop.) Singer	Gobre chyau	Agaricales	Agaricaceae	Non-edible
soil	27°41'11.5"/ 83°05'36"	112	*Tricholar* sp.		Agaricales	Tricholomataceae	Medicinal
soil	27°41'12.5"/ 83°06'28"	122	Russula spp.	Raktey	Russulales	Russulaceae	Edible
soil	27°41'21"/ 83°06'48"	121	*Russula emetica* (Schaeff.) Pers.	Kali Chyau	Russulales	Russulaceae	Edible
soil	27°42'22"/ 83°08'38"	136	*Pycnoporus cinnabarinus* (Jacq.) P. Karst.	Kane Chyau	Polyporales	Polyporaceae	Medicinal
soil	27°41'25"/ 83°06'14"	127	*Scleroderma texense* Berk.	Bhutki	Bolatales	Sclerodermataceae	Edible
soil	27°42'17"/ 83°06'36"	110	*Coprinus Commatus* (O.F.Müll.) Pers.	Gobre	Agaricales	Coprinaceae	Unknown
Soil	27°41'03"/ 83°05'44"	122	*Amanita chepangiana* Tulloss and Bhandary	Salle Chyau	Agaricales	Amanitaceae	Edible
Soil	27°41'50"/ 83°05'22"	112	*Buwaldo boletus* spp.	Dhabre chyau	Bolatales	Boletaceae	Poisonous
soil	27°43'19"/ 83°05'07"	112	*Scleroderma cepa* Pers.	Bhutki	Bolatales	Sclerodermataceae	Edible
soil	27°44'01"/ 83°05'20"	114	*Amanita* sp.	Besera Cheyu	Agaricales	Amanitaceae	Edible
Soil	27°42'05"/ 83°05'20"	118	*Russula* spp.	Ratteuo Chyau	Russulales	Russulaceae	Edible
Soil	27°42'44"/ 83°05'16"	140	*Boletus* spp.	Bhude Chyau	Bolatales	Boletaceae	Medicinal
wood	27°41'01.5"/ 83°06'38"	114	*Sparissis crispa* (Wolfen) Fr.	Cauli Chyau	Polyporale	Sparassidaceae	
wood	27°42'15"/ 83°06'31"	123	*Guepinia spathularia* (Schwein.) Fr.	Putali Chyau	Tramellales	Dacrymycetacea	
wood	27°41'11.5"/ 83°05'36"	112	*Nebularia* sp.		Peltigerales	Pannariaceae	

dung	27°42'22"/ 83°05'06"	132	*Coprinus plicalitis* Fr. ex Curtis	Gobre Chyau	Agaricales	Coprinaceae	Inedible
soil	27°42'44"/ 83°05'16	140	*Termitomyces aurantiacus* (R Heim) R. Heim	Dhamire Chyau	Agaricales	Tricholomataceae	
soil	27°42'05"/ 83°05'20"	118	*Lacaria laccata* (Scop.) Cooke	Dudhe Chyau	Agaricales	Hydnangiaceae	
animal dung	27°42'15"/ 83°06'31"	123	*Coprinus disseminates* (Pers.) J.E.Lange	Gobre chyeu	Agaricales	Coprinaceae	
tree trunk	27°42'05"/ 83°05'20"	118	*Polyprous durus*	Kathe chyeu	Polyporales	Polyporaceae	Edible
tree trunk	27°42'44"/ 83°05'16	140	*Auricularia auricula-jude* (Bull.) J. Schröt.	Todke	Agaricales	Auriculariaceae	Medicinal
wood	27°42'05"/ 83°05'20"	118	unidentified				Inedible
soil	27°41'11.5"/ 83°05'36"	112	unidentified				
Wood	27°42'22"/ 83°05'06"	132	*Microporous xanthpus*	Kathe chyau	Polyporales	Polyporaceae	Medicinal
wood	27°42'05"/ 83°05'20"	118	*Daldenia* sp.	Dalley	Polyporales	Xylariaceae	
Soil	27°41'01.5"/ 83°06'38"	114	*Amanita hemibapha* (Berk. and Broome) Sacc.	Salle chyau	Agaricales	Amanitaceae	Edible
Wood	27°44'02"/ 83°06'33"	129	*Cantharellus* sp.	Chamre Chyaue	Cantharellales	Cantharellacae	Edible
Soil	27°42'15"/ 83°06'31"	123	*Amanita* sp.	Salle	Agaricales	Amanitaceae	Poisonous
Rock	27°44'02"/ 83°06'33"	129	Unidentified				
Soil	27°42'15"/ 83°06'31"	123	*Coprinus* sp.	Gobre	Agaricales	Coprinaceae	
Soil	27°42'44"/ 83°05'16	140	*Marasmius perforans* (Hoffm.) Fr.	Bulaki Chyau	Agaricales	Tricholomataceae	
soil	27°44'02"/ 83°06'33"	129	Unidentified	Kukurmuta			Inedible
animal dung	27°42'22"/ 83°05'06"	138	*Coprinus atramentarius* (Bull.) Re	Gobre Chyau	Agaricales	Coprinaceae	
animal dung	27°41'11.5"/ 83°05'36"	112	*Agaricus* sp.	Gobre chyau	Agaricales	Agaricaceae	Edible
Soil	27°42'22"/ 83°05'06"	132	*Scleroderma bovista* Fr.	Dalle chyau	Boletales	Sclerodermataceae	Medicinal
Soil	27°41'01.5"/ 83°06'38"	114	*Cantharellus cibarius* Fr.	Besare chyau	Cantharellales	Cantherallaceae	Edible
Soil	27°44'02"/ 83°06'33"	129	*Dictyophora indusiata (*Vent.) Desv.	Jali Chyau	Phallales	Phallaceae	Poisonous

C.date = Collection date, Lat. = Latitude, Long. = Longitude, Alt. = Altitude

Photo plates

Pycnoporous cinnabarinus (Jacq.:Fr)Karst.

Sparassis crispa (Wolfen) Fr.

Guepinia spathularia (Schwein.) Fr.

Macrolapiota (Scop.) Singer

Russula emitica (Sch.:Fr)Pers.

Coprinus plicalitis Fr. ex Curtis

Lacaria laccata (Scop.) Cooke

Coprinus disseminates (Pers.) J.E.Lange

Amanita chapengiana Tulloss and Bhandary

Scleroderma taxiens Berk.

Buwaldo boletus spp.

Auricularia auricula-jude (Bull.) J.Schröt.

Polyporus durus (Timm.)Kreisel.

Microporus xanthopus (Fr.) Kuntze

Coprinus comatus (Mull.:Fr)Pers.

*Dictophora indusiata (*Vent.) Desv.

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