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Wild edible mushrooms traded by ethnic communities of Senapati and Kangpokpi district of Manipur, India

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Abstract

Wild Edible Mushrooms (WEMs) are one of the important food sources of rural people. Mushroom collection is a means of generating additional income and improving nutritional security for many ethnic communities that are collected and consumed by the ethnic communities of Manipur since ages. Although information is available for mushrooms of north east India yet very sporadic information on WEMs of Manipur is available. The present study is an attempt to document the WEMs collected, consumed and commercially traded by Naga & Kuki tribes of Manipur through extensive field and market surveys. Although a large number of WEMs are being consumed, only 8 edible fungi belonging to 7 families were recorded to be traded in the town markets of hill districts of Manipur. The study indicates the prospects of socio-economic development of dependent communities through scientific interventions.

Keywords: wild edible mushrooms, ethnic communities, manipur, livelihoods, trade

Introduction

The dependence of human, particularly the ethnic communities, on wild edible mushrooms (WEMs) is as old as the evolutionary history of *Homo sapiens*. Wild mushrooms have been consumed by man for various purposes including their medicinal properties [1-9] since ages. Many cultures have knowledge to find out suitability of edible nature of wild mushrooms [4]. Wild edible mushrooms and their nutritional value have been reported from Assam, Arunachal Pradesh, Tripura, Meghalaya and Nagaland in Northeast India [7, 9, 10-17] but only few reports are available from the state of Manipur [18-21]. The hill districts of the Manipur are very rich in floristic including mushrooms. Mushroom gathering is an income-generating activity for rural tribes and is one of the important food sources for them. The tribes are well familiar with mushroom and have their own means and ways to identify the edible mushrooms. The tribal collect these naturally growing mushrooms from the forests and sell them in local markets besides self consuming for meeting their nutritional requirements. The purpose of this paper is to document the diversity of wild edible mushrooms being consumed and commercially traded by the ethnic communities of Kangpokpi and Senapati districts of Manipur, India.

Materials and Methods

Study Area

The present study was conducted in Kangpokpi and Senapati districts of Manipur. The districts are located in the northern part of the state at an altitude of 1,056 above the mean sea level. The state is rich in flora and fauna and falls in the Indo-Burma Global Biodiversity Hotspots with tropical to sub-tropical and temperate forests [22]. The Kuki's are one of the major inhabiting tribe of Kangpokpi district while the Senapati district is dominated by Naga's.

Market surveys

Extensive market surveys were conducted during 2016 -2017 at six market locations in both the districts viz. Mao Gate, Senapati (district HQ), Kangpokpi (district HQ), Kalapahar, Motbung and Kanglatombi (Table 1).

Table 1: Markets surveyed

S. No	Name of market	GPS Coordinate N Latitude	Altitude (masl)
Kangpokpi District			
1.	Kanglatombi Market	N24°58.366' E 93°53.242	848
2.	Motbung Market	N24°59.971' E 93°54.247	892

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3	Kalapahar Market	N25°06.733' E 93°57.328	977
4	Kangpokpi Market	N25°09.065' E 93°58.329	1081
Senapati District			
5	Senapati Market	N25°16.375' E 94°01.573	1043
6	Mao Market	N 25°30.906' E 94° 08.102	1733

The desired information was collected through a semi-structured questionnaire involving interviewing both the primary collectors, permanent vendors and the street vendors who are engaged in trading wild edible mushrooms. Majority of the primary collectors and vendors were women (Figure 1). They were interviewed about the local names of WEMs, source/ place of collection / procurement, market price and

seasonal availability. Only traders selling WEMs were targeted for the interview. The interview was followed by specimens and samples collection for proper identification. All the WEMs were collected and identified with the help of various relevant published papers [19, 20, 23, 24, 25] for accurate nomenclature and family delimitation.



Fig 1: Women Vendors selling Wild Edible mushrooms in the local markets

Results and Discussions

Market survey revealed that WEMs are one among the most preferred and valuable diet for the tribes in the area. The local tribe use mushrooms in preparing soups, chutney, salads and various other dishes. A total of 8 edible macrofungi species namely *Auricularia delicate* (Fr.) P. Henn, *Cantharellus*

cibarius (Fr.), *Lactarius volemus* (Fr.), *Lentinula edodes* (Berk.) Pegler, *Pleurotus citrinopileatus* Singer, *Pleurotus ostreatus* (Jacquin ex. Fr) Kummer, *Schizophillum commune* Fr, *Termitomyces eurhizus* (Berk.) R. Heim, belonging to 7 families was found to be traded in the markets of the districts (Table2; Figure 2).

Table 2: Average retail cost traded in the local markets

S. No	Scientific Name	Vernacular Name Kuki/Naga	Family	Retail price/kg in INR	Season of Collection
1.	<i>Auricularia delicata</i> (Fr.) P. Henn.	Pachop/Sonabi, Koshani, Yanaupa	Auriculariaceae	Fresh: 100-150 Dry: 600-700	April-November
2.	<i>Cantharellus cibarius</i> (Fr.)	Paa/Nil	Cantharellaceae	Fresh: 100-150	June – October
3.	<i>Lactarius volemus</i> (Fr.)	Panai/Pati	Russulaceae	Fresh: 100-150	June – October
4.	<i>Lentinula edodes</i> (Berk.) Pegler	Sipa, Papal/Papine	Polyporaceae	Fresh: 150-200 Dry: 300-350	April- July
5.	<i>Pleurotus citrinopileatus</i> Singer	Nil/Hudziimotupa, Panei	Pleurotaceae	Fresh: 150-200	June-July
6.	<i>Pleurotus ostreatus</i> (Jacquin ex. Fr) Kummer.	Pachang, Pache/Pachu	Pleurotaceae	Fresh: 100-130 Dry: 300-350	April-August
7.	<i>Schizophyllum commune</i> Fr.	Pashi/Makhrieme, Movupa	Schizophyllaceae	Fresh: 120-150 Dry: 600-700	April-Oct
8.	<i>Termitomyces eurhizus</i> (Berk.) R. Heim	Palhung, Papah/Epriapa, Piiirapa	Lyophyllaceae	Fresh: 120-150	May-July

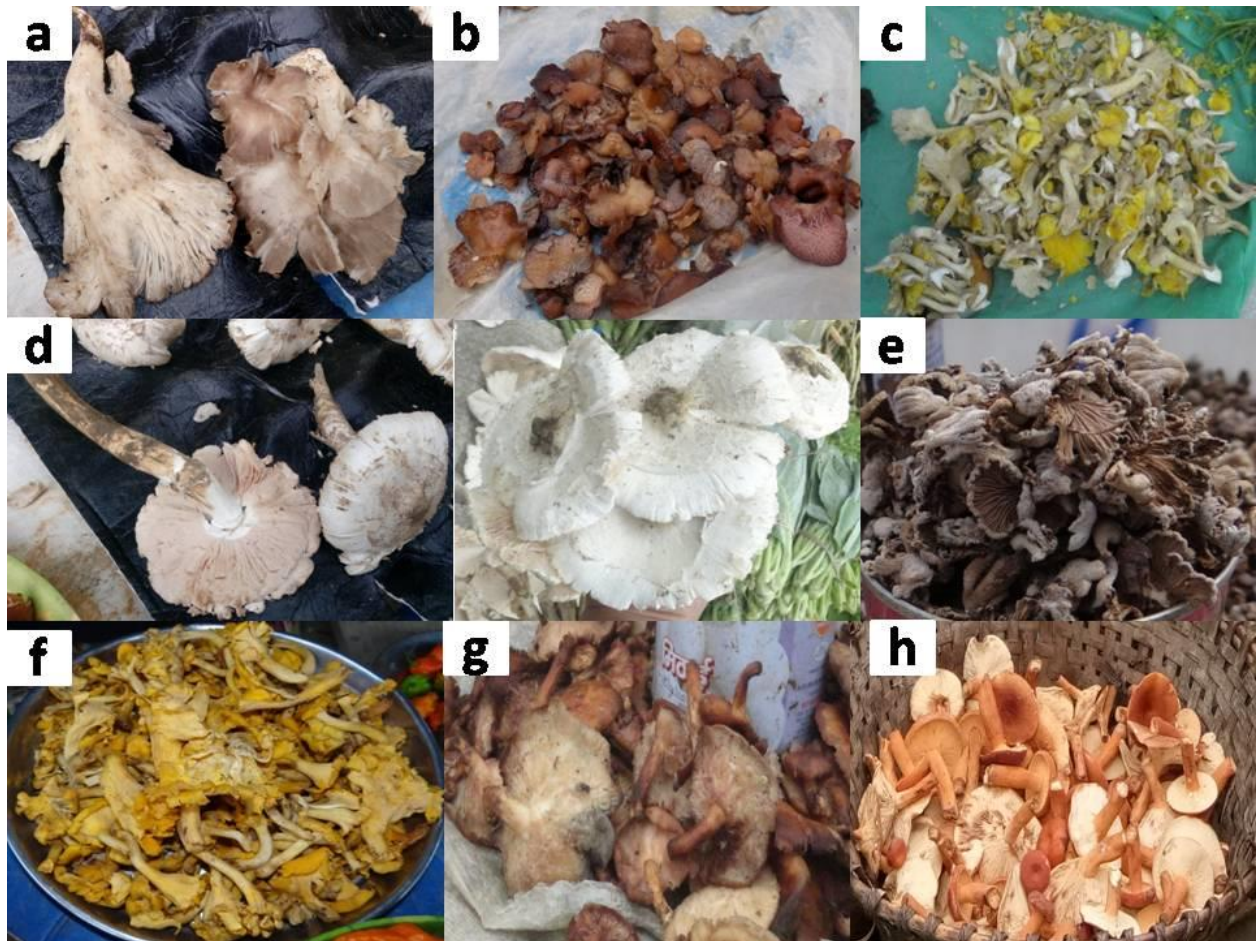


Fig 2: (a) *Pleurotus ostreatus* (Jacquin ex. Fr) Kummer (b) *Auricularia delicata* (Fr.) P. Henn. (c) *Pleurotus citrinopileatus* Singer (d) *Termitomyces eurhizus* (Berk.) R. Heim (e) *Schizophyllum commune* Fr. (f) *Cantharellus cibarius* (Fr.) (g) *Lentinula edodes* (Berk.) Pegler (h) *Lactarius volemus* (Fr.)

Auricularia delicata (Fr.) P. Henn., *Lentinula edodes* (Berk.) Pegler, *Pleurotus ostreatus* (Jacquin ex. Fr) Kummer, *Schizophyllum commune* Fr. and *Termitomyces eurhizus* (Berk.) R. Heim was observed to be widely traded in the area indicating that these species are available plenty in nature.

Termitomyces eurhizus (Berk.) R. Heim and *Lentinula edodes* (Berk.) Pegler is the most popular and highly demanded due to their unique and subtle flavor and is available only during the rainy season (May-July). *Termitomyces eurhizus* (Berk.) R. Heim is used as fresh, while other WEMs are used both in fresh and dried form. The WEMs are dried in traditional ways such as smoking on chulas or sun dried on the roof-tops of houses or in open and is stored for off season sales and consumption. The favorable time for collection of wild edible mushrooms in the study area begins with the onset of rains,

the period when the conditions are conducive for the mushroom growth and are available in abundant quantity. During this season, there is a high demand of WEMs as they are abundantly available and cheaper in price. The market price of the mushrooms species varies from season to season according to their availability. *Auricularia delicata* (Fr.) P. Henn and *Schizophyllum commune* Fr fetch a lucrative price in dry form as compared to other species (Table 2). *Auricularia delicata* (Fr.) P. Henn., *Schizophyllum commune* Fr. and *Lentinula edodes* (Berk.) Pegler is sold in the market during the off-season and fetches good price in the market and hence were available throughout the year.

WEMs collected are acknowledged to play a valuable nutritional supplement role. There are several reports of nutritional evaluation of mushrooms, however very few

reports on nutritional value of mushrooms of Northeast- India are available^[7, 13, 19]. Of all the species recorded in the present study, *L. edodes* and *S. commune* of Manipur origin have been reported to have significant nutritional value^[19]. Therefore, there is a strong need to undertake nutritional evaluation of commercially traded WEMs reported in this study. Further such an endeavor would open avenues for their national consumption and trade to provide local collectors better marketing network and to improve the livelihoods and reduce the poverty of the local communities by providing employment opportunity.

Competing Interests

The authors declare that they have no competing interests.

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