

Some wild edible mushrooms growing in Yinmabin village, Thazi Township

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ABSTRACT

This investigation was conducted in Yinmabin village, Thazi Township, Mandalay Region, located at 20° 45' N Latitude 96° 19' E Longitude. The present survey was conducted to record the morphological characterization of some wild edible mushrooms in Yinmabin village, during the rainy season of July to October, 2018. The total of 10 edible species belonging to three orders, four families, and four genera were identified and other phenotypic parameters were noted in fresh form. The fruiting structures like, stalk, gills, volva and annulus were observed as present/ absent during collection. The shape and color of fruiting bodies were also recorded. The order Agaricales was found with eight species, Auriculariales and Cantharellales with one species each were identified. In this investigation, the identified species possesses three color of spore print. The families Auriculariaceae, Lyophyllaceae, and Cantharellaceae were the white color spore print, and the family Lyophyllaceae was pink color spore print. The present investigation emphasized the edible mushrooms growing in Yinmabin village, Thazi Township. The edibility test of collected mushrooms was also ascertained by obtaining information from local people and according to the references.

Key Words: Wild edible mushroom, Yinmabin village

INTRODUCTION

The Basidiomycetes (phylum Basidiomycota), has about 22,000 named species. These are the most familiar fungi. Basidiomycetes are not only the mushrooms, toadstools, puffballs, jelly fungi, and shelf fungi, but also many important plant pathogens including rusts and smuts. Many mushrooms are used as food, but others are deadly poisonous (Alexopoulos 1962).

Mushroom is a general term used mainly for the fruiting body of macrofungi (Ascomycota and Basidiomycota) and represents only a short reproductive stage in their life cycle (Das, 2010). Mushroom can be epigeous or hypogeous, large enough to be seen with the naked eyes and can be picked by hand. From the taxonomic point of view, mainly basidiomycetes but also some species of ascomycetes are mushroom forming fungi. Total mushrooms on the earth (Webster and Weber, 2007).

Many of them have been used in folk medicine for thousands of years. Some of them are nutraceuticals (natural food having potential value in maintaining good health and boosting immune system of the human body) while others can produce potent nutraceuticals (compounds that have medicinal and nutritional attributes and are consumed as medicines in the form of capsules or tablets but not as food) (Wasse 2010)

Mushrooms are known to be rich sources of various bioactive substances like antibacterial, antifungal, antiviral, antiparasitic, antioxidant, anti-inflammatory, antiproliferative, anticancer, antitumour, cytotoxic, anti-HIV, hypo-cholesterolemic, antidiabetic, anticoagulant, hepato-protective compounds, among . Out of approximately 14,000 known species, 2,000 are safe for human consumption and about 650 of these possess medicinal properties (Chaung 2004).

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Agaricales comprises the so-called mushrooms and toadstools, and is the largest clade of mushroom-forming fungi. More than 9000 species in more than 300 genera, and 26 families had been described. Mostly they are terrestrial, lignicolous and saprobic, and many are mycorrhizal (Kirk *et al.* 2001).

All species within the Auriculariales are thought to be saprotrophs, most of them are wood-rotters. They are typically found on dead attached or fallen wood, though a few are normally found on the ground. As a group, their distribution is cosmopolitan. According to a 2008 estimate, the Auriculariales contain 32 genera and around 200 species. The order cantharellales includes not only the charellaceae, but also some of the tooth fungi (Hydnaceae), clavarioid fungi and corticioid fungi ([http:// en.m.wikipedia.org](http://en.m.wikipedia.org))

The present research investigation was described the brief morphological description, macro and microscopic details, and edibility of the 10 species belonged to the three orders namely Agricales, Auriculariles and Cantharellales. Among these orders, the order Agricales was abundantly found in the study area.

The purpose of the present survey was to identify the edible mushrooms up to genus and species level, to provide valuable information as practical field guide on this area to researchers who are interested in mushrooms and to partially fulfill the requirement of the mushroom flora.

MATERIALS AND METHODS

Collection site

The samples were collected from Yinmabin village, Thazi Township, Mandalay Region, located between 20° 45' N Latitude 96° 19' E. Minimum and maximum temperature was 29.9°C and 36.0°C and average rainfall 126.4 mm. The average annual relative humidity was 70-84%, during the survey.

Mushroom Identification

The collected specimens were brought to the laboratory. The measurements of various parts of mushrooms were recorded and morphological features were observed. The taxonomy had been done on the basis of macro and microscopic characteristic according to the literatures such as Thomas (1948), Alexopoulos (1962), Krieger (1967), Pacioni (1981), Keizer (1998), Phillips (2006) and Weber (2007). The collection, preservation and the spores print technique were followed to Krieger (1967), Pacioni (1981).

RESULTS

The total of 10 edible mushrooms species belonging to genus *Auricularia*, *Termitomyces*, *Pleurotus* and *Cantharellus* were collected and identified in the Yinmabin village, Thazi Township. According to the morphological and spores characters, these specimens were classified and identified. The list of collected species was shown in Table 1 and morphological characters shown in Table 2.

Table 1. List of edible mushrooms in Yinmabin village, Thazi Township

Orders	Family	N0.	Scientific Name
Auriculariales	Auriculariaceae	1.	<i>Auricularia auricularis</i> (Gray) G.W. Martin.
Agaricales	Lyophyllaceae	2.	<i>Termitomyces badius</i> Otieno
		3.	<i>Termitomyces bulborhizus</i> T. Z. Wei
		4.	<i>Termitomyces clypeatus</i> R. Heim
		5.	<i>Termitomyces eurhizus</i> (Berk.) R. Heim
		6.	<i>Termitomyces heimii</i> Natarajan
	Pleurotaceae	7.	<i>Pleurotus ostreatus</i> (Jacq.) P. Kumm.
		8.	<i>Pleurotus petaloides</i> (Bull.) Quèl
		9.	<i>Pleurotus pulmonarius</i> (Fr) Quèl.
Cantharellales	Cantharellaceae	10.	<i>Cantharellus cibarius</i> Fr.

Table 2. Morphology characters of collected mushrooms in study areas

No	Scientific Name	cap color	stipe	gill	umbo	spore color	spore shape
1.	<i>Auricularia auricularis</i> (Gray) G.W. Martin.	brown	-	-	-	White	+
2.	<i>Termitomyces badius</i> Otieno	brown	+	+	+	Pink	+
3.	<i>Termitomyces bulborhizus</i> T. Z. Wei	brown	+	+	+	Pink	+
4.	<i>Termitomyces clypeatus</i> R. Heim	Reddish-brown	+	+	+	White	+
5.	<i>Termitomyces eurhizus</i> (Berk.) R. Heim	Brown	+	+	+	pink	+
6.	<i>Termitomyces heimii</i> Natarajan	white	+	+	+	White	+
7.	<i>Pleurotus ostreatus</i> (Jacq.) P. Kumm.	white	+	+	-	White	-
8.	<i>Pleurotus petaloides</i> (Bull.) Quèl	yellow	+	+	-	White	-
9.	<i>Pleurotus pulmonarius</i> (Fr) Quèl.	white	+	+	-	White	-
10.	<i>Cantharellus cibarius</i> Fr.	yellow	+	-	-	White	-

+ For present, oblong and - for absent, ellipsoid



Fig. 1 *Auricularia auricularis* (Gray) G.W. Martin.



Fig. 2. *Termitomyces bulborhizus* T. Z. Wei

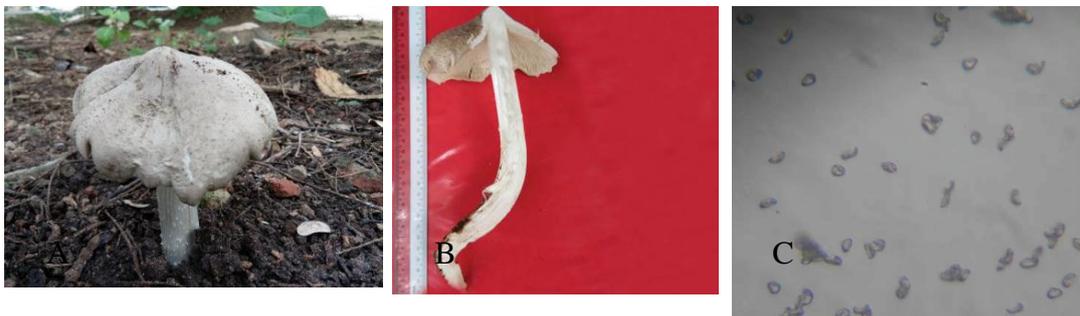


Fig.3 *Termitomyces badius* Otieno



Fig.4. *Termitomyces eurhizus* (Berk.) R. Heim



Fig.5 *Termitomyces clypeatus* R. Heim

A. Habitat of basidiocarp B. Basidiocarp in longitudinal section C. Spores



Fig.6 *Termitomyces heimii* Natarajan



Fig.7 *Pleurotus ostreatus* (Jacq.) P. Kumm



Fig.8 *Pleurotus petaloides* (Bull.) Quèl



Fig. 9 *Pleurotus pulmonarius* (Fr) Quèl.



Fig.10 *Cantharellus cibarius* Fr.

A. Habitat of basidiocarp B. Basidiocarp in longitudinal section C. Spores
 Taxonomic description of collected species

1. *Auricularia auricularis* (Gray) G.W. Martin, Am. Midl. Nat. 30: 81 (1943)
(Fig.1)

Gyraria auricularis Gray, Nat. Arr. Brit. Pl. (London) 1: 594 (1821)

Local Name : Kyet-nyah-moh

Family : Auriculaceae

Description

Pileus 7.9 - 4.7cm broad, dark brown, convex then expanded, umbo absent. Gills absent. Stipe absent . Ring absent. Spores white, oblong, smooth, 5.0 X 2.5 μ m.

2. *Termitomyces badius* Otieno, Sydowia 22(1-4): 161 (1969) [1968]
(Figure 2)

Local Name : Unknown

Family : Lyophyllaceae

Description

Cap 4.5 - 9.8 cm broad, convex then expanded, umbonate, yellowish grayish brown. Gills thin, narrow, free, creamy white. Stipe 6.5 - 9.5 cm long, 1.3 - 1.8 cm

thick, equal, solid, white, tapering end. Ring absent. Spores bright pink, oblong, smooth, 12.5 \times 7.5 μ m.

3. *Termitomyces bulborhizus* T. Z.Wei, Y.J. Yao, B. Wang & Pegler. (2004)
(Figure3)

Local Name : Hmo ohm nat

Family : Lyophyllaceae

Description

Cap 3.5 - 4.5 cm broad, fleshy, convex then expanded, umbonate, grayish brown. Gills thin, crowded, free, creamy white. Stipe 4.0 - 4.8 cm long, 0.3 - 0.5 cm thick, equal, solid, white. Ring absent. Spores dark pink, oblong, smooth, 15.0 \times 10.0 μ m.

4. *Termitomyces clypeatus* R. Heim, Bull. Jard. bot. Ètat Brux. 21: 207 (1951) (Figure 4)

Local Name : Hnget sut hmo

Family : Lyophyllaceae

Description

Cap 5.0 - 5.5 cm broad, fleshy, convex then expanded, umbonate, yellowish brown. Gills thin, crowded, free, creamy white. Stipe 5.0 - 5.7 cm long, 0.3 - 0.4 cm thick, yellowish, tapered at the base, solid. Ring absent. Spores white, oblong, smooth, 12.5 - 15.0 \times 5.0 - 7.5 μ m.

5. *Termitomyces eurhizus* (Berk.) R. Heim [as` eurhizus`], Arch. Mus. Hist. Nat. Paris, ser.6 18:140 (1942) (Figure5)

***Agaricus eurhizus* Berk. 1847**

Local Name : Hmo ohm nat

Family : Lyophyllaceae

Description

Cap 7.0 - 8.5 cm broad, fleshy, convex then expanded, umbonate, grayish brown. Gills thin, crowded, free, creamy white. Stipe 8.5 - 13.5 cm long, 1.5 - 2.0 cm thick, white, tapering, solid. Ring absent. Spores pale pink, oblong, smooth, 7.5 \times 5.0 μ m.

6. *Termitomyces heimii* Natarajan, Mycologia 71 (4): 853 (1979)**(Figure 6)**

Local Name : Taung boht Hmo

Family : Lyophyllaceae

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Description

Cap 10.5 cm broad, fleshy, convex then expanded, umbonate, whitish with margin striate. Gills thin, crowded, free, white. Stipe 11.0 cm long, 1.5 cm thick, white, tapered at the base, solid. Ring present. Spores white, oblong, smooth, $12.5 - 15.0 \times 5.0 - 7.5 \mu\text{m}$.

7. *Pleurotus ostreatus* (Jacq.) P. Kumm., Fuhr. Pilzk. (Zerbst): 104 (1871)**(Figure 7)*****Agaricus ostreatus* Jacq. 1774**

Local Name : Unknown

Family : Pleurotaceae

Description

Cap 3.7 - 6.2 cm broad, white, fleshy, spathulate, imbricate, umbo absent. Gills white, thin, narrow, decurrent. Stipe 0.7 - 1.0 cm long, 0.2 - 0.5 cm thick, white, equal, solid. Ring absent. Spores white, oblongoid, smooth, $6.25 - 7.50 \times 3.75 - 5.00 \mu\text{m}$.

8. *Pleurotus petaloides* (Bull.) Quel., Mem. soc. Emul. Montbeliard, ser. 25: 226 (1872). (Figure 8)***Agaricus petaloides* Bull. [as petalodes] 1785**

Local Name : Unknown

Family : Pleurotaceae

Description

Cap 2.5 cm broad, spathulate, umbo absent, involute margin with tomentose, pale yellow. Gills thin, narrow, decurrent, yellowish white. Stipe 1.0 cm long, 0.2 cm thick, equal, tomentose, solid, pale yellow. Ring absent. Spores white, smooth, oblongoid, $7.5 \times 2.25 \mu\text{m}$.

9. *Pleurotus pulmonarius* (Fr) Quel., Mem. soc. Emul. Montbeliard, ser. 25: 11 (1872). (Figure 9)***Agaricus pulmonarius* Fr. 1821.**

Local Name : Unknown

Family : Pleurotaceae

Description

Cap 3.9 - 6.8 cm broad, fleshy, convex then depressed to funnel shaped, umbo absent, white. Gills thin, narrow, decurrent, white. Stipe 5.2 - 6.7 cm long, 0.2 - 0.4 cm thick, equal, solid, white. Ring absent. Spores white, smooth, oblongoid, $6.25 - 7.50 \times 3.75 - 5.00 \mu\text{m}$.

10. *Cantharellus cibarius* Fr., Syst. mycol. (Lundae) 1: 318 (1821) (Figure 10)

Local Name : Unknown

Family : Cantharellaceae

Description

Cap 2.8 - 4.5 cm broad, fleshy, thin, ovate then funnel, umbo absent, yellow. Gills thin, broad, decurrent, yellow. Stipe 2.5 - 3.5 cm long, 0.3 - 0.5 cm thick, equal, solid, yellow. Ring absent. Spores pale yellow, smooth, ellipsoid, $6.25 - 7.50 \times 5.0 - 6.5 \mu\text{m}$.

DISCUSSION AND CONCLUSION

The present investigation dealt with the morphological characterization of some wild edible mushrooms in Yinmabin village, during the rainy season of July to October, 2018. The total of 10 edible species belonged to three orders, four families, and four genera were identified and classified.

In this study, according to the morphological characters, the gilled mushrooms were found in 9 species, a jelly mushroom was one species. The umbo present mushrooms occurred in the genus *Termitomyces* and umbo absent mushrooms were the genus *Auricularia*, *Pleurotus* and *Cantharellus*.

The color of basidiospores is important for identification. They may be colorless, white, cream, yellowish, brown, pink, purple or black. The spore color may be due to pigments in the spore cytoplasm or in the spores wall (Webster 2007).

According to the resulting data, the two color spores were observed in the collected species. These spores' colors were white and pink. The white color genera were *Auricularia*, *Pleurotus* and *Cantharellus* the pink color spores was *Termitomyces*.

The basidiospores are typically a unicellular, uninucleate, haploid structure. They may be globoid, ellipsoid, oblongoid, angular, ovoid, fusoid, citriniform, phaseoliform and amygdaliform (Webster & Weber 2007).

In this study, two types of spores were found in the collected species. The ellipsoid in 4 species and oblongoid in 6 species (Table, 2).

Ecologically, macrofungi can be classified into three groups: the saprophyte, the parasite and the symbiotic. Most terrestrial macrofungi are saprobes or mycorrhizal symbionts. In the present, the distribution of mushrooms occurred in different habitats. In the present study, the genus *Termitomyces* belonging to the family Lyophyllaceae was symbiosis with termites. These were found near the termite's mounds. The genus *Auricularia* and *Pleurotus* were found decaying and living tree trunk.

Mushrooms can be roughly divided into four groups, such as edible mushrooms, medicinal mushrooms, poisonous mushrooms and miscellaneous (inedible) mushrooms (Christensen 1972). In this study, the edible mushrooms were collected in the study area. Many of these species are eaten by the local people in this area.

In conclusion, throughout the present survey, 10 species of mushrooms belonged to four genera under four families were identified. The predominant order was Agaricales. Because of these members were cosmopolitan in distribution. The final findings of this present survey emphasized on the edible mushrooms growing in Yinmabin village, Thazi Township.

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