

A Study on Morphological Characters of Wild Mushrooms in the Vicinity of Hinthada University Campus

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Abstract

In this paper, 16 different species belonging to the families Agariaceae, Tremellaceae and Lycoperdaceae were studied. Collected specimens were examined by morphological characters of the fruiting body. Their habitat and growing seasons were recorded for each specimen. Moreover, observation of spore characters and measurement of spore size were made by microscope. Classification was carried out by analytic key with the aid of illustration (Pacioni, 1981). Macro-fungi were collected from Hinthada University Campus, Hinthada Township during the period of May to September 2014. Collected specimens were photographed and preserved in F.A.A (solution).

Keywords: macro-fungi, mushroom, spore, Hinthada University Campus.

Introduction

Macro-fungi have been of interest to mankind from the very earliest times. Mushrooms are sought as food by mushroom lover all over the world. Mushrooms are well worth for the attention of all, many are good to eat, some are useful for medicine and attractive to others.

According to Greeks and Roman, writers living before the birth of Christ wrote about the mushrooms and other fungi which they recognized. Mushrooms are divided into edible and poisonous kinds. Mushrooms are the fleshy fungi which constitute a major group of lower plant Kingdom. They reproduce structure of edible fungi that belong to Ascomycotonia and Basidiomycotina. They comprise a large heterogeneous group with different shapes, sizes, colours and edibilities. They are good source of high quality protein and are rich in vitamins and minerals. Mushrooms contain 20 - 35% protein. Mushrooms have the medicinal properties; the extract has a high amount of retene that has an antagonistic effect on some form of tumor. Some mushrooms extracts induce and have hypocholesterolemic activity (Ignold, 1971).

Mushrooms are found at the condition of sunny day after the rainfall. The most favourable places for the emergence of mushrooms are the woods. As far as pH is concerned, ground can be neutral, basic or acidic. The optimum pH of many fungi is close to a neutral level. Edible mushroom have more important nutritive value compared to those of different fruits and vegetables (Stevenson, 2005).

Identification was made by morphological characters. Spores are also important factors in the study of fungi. Analytic Key (Pacioni, 1981; Webster, 1999) was used for classification. In this paper, 15 genera and 16 species were included.

Materials and Methods

Mushrooms were collected at least two times per months during the period of May to September, 2014. Collected areas were Hinthada Township. According to Jordan method, the equipment are required such as minimal paper or plastic bags, convenient basket, a stout knife, a pocket knife, a razor blades, a field note book and a camera (Jordan, 2000). In

collecting specimens in the field, a stout knife, a pocket knife and a razor blade were used. Large specimens were collected with the help of a stout knife. The gilled mushrooms were collected by a pocket knife or razor blade (Hawksworth 1974).

Collected specimens were transported from the field to the laboratory, with an ordinary splint basket with hinged cover and handles. Collected specimens were photographed and measurements were made. Then, they are preserved in F.A.A (10 % solution).

When mushrooms are collected for identification, it is important to use an entire fleshy fruiting body. In using the references, specific characteristic of mushroom should be considered; the cap, stipe and gill (size, shape, colour and dimension) were recorded.

Spores were taken on glass slides for microscopic studies. Microscopic study of the size, colour and nature of the spore were made.

Morphological characters, spore characters and Analytic Key (Pacioni, 1981) for the genus have been presented for tentative classification.

Results

Morphological Characters of Mushroom

1. Maung - Yin - Hmo

Amanita caesarea (Scop) Pers.

This mushroom has an orange-red cap, 2-10 cm broad, hemispheric, then expanded, the surface smooth and margins striated. The free gills are pale to golden yellow. The cylinder-shaped stipe, 12 - 15 cm long, 2-3 cm wide. The ring is near the top of the stem, yellow. The base of the stipe is thicker than the top, a greyish-white cup-like volva, ovate, white. The spores are white, 10 -12 μ m elliptic (Figure - 1).

2. Zaung - Pya- Hmo

Amanitopsis vaginata Karst.

This mushroom has an gray cap, 5 - 9 cm broad, rather thin and fragile, at first ovate, convex or nearly plane, smooth, slightly viscid when young, deeply and distinctly striate on the thin margin. The free gills are white. The cylinder shaped, stipe 10-12cm long, 2.0 cm wide, hollow, fragile. The volva whitish, elongated, sheathing the base of stipe. The spores are white, globose, shining, 5 - 12 μ m (Figure - 2).



Figure (1)



Figure (2)

3. Kywet - na - ywet - Hmo (ear fungus)

Auricularia auricula Judae.

The fruiting bodies are ear-shaped, 5 - 15 cm broad, lobed and folded, translucent, velvety, gelatinous when moist, hard when dry, appear surface brownish flesh coloured, lower surface whitish to nearly black when dry. The hymenium is exposed without peridium. The spores are white, smooth, oblongoid, cylindrical, $10 - 15 \times 4.0 - 6.0 \mu\text{m}$ (Figure - 3)

4. Wa Yaung - Hmo

Cantharellus infudibuliforms (Scop) Fr.

In *Cantharellus*, growing in bamboo bush; the cap 4 - 10 cm broad thin, broadly convex when young, umbilicate or tunnel-form with age, brownish- yellow or grayish yellow. Gills are narrow, distinct, decurrent, and yellowish. The stipe is 6-8 cm long, 0.5- .0 cm thick, glabrous, hollow, yellowish. The spores are globose, white, $6.0-7.5 \times 3.0 - 5.0 \mu\text{m}$ (Figure 4).



Figure (3)



Figure (4)

5. Tha - Yet - Hmo

Clitocybe caespitosa Pk.

True *Clitocybe* have fleshy stem, growing on wood, commonly ceptiose. The cap 1- 4 cm broad, thin, infundibuliform, white to cream colour. The gills narrow close, decurrent, white, the spores are white, ellipsoid, $4 -6 \times 2 - 3 \mu\text{m}$ (Figure - 5).

6. Nya-Hmo

Corpinus disseminatus (Curt) Fr.

This mushroom, growing on grassy ground, at the base of old trees; sometime grows in dense cluster. The cap is 1-3cm, broad, thin, ovate, then campanulate or expanded, buff yellow. Gills are crowd, whitish, then pinkish or purplish brown finally black. The stipe is 3.0 cm long, 2.5cm thick, slender, hollow, white. The spores are $9.0 - 10.0 \times 6 - 7 \mu\text{m}$, oblong, brown (Figure - 6).



Figure (5)



Figure (6)

7. In- U

Geastrum spp. (Truffle)

In-U found in groups below the soil and growing, edible mushroom. The cap is globose, white, 2.5-5.0 cm in diameter. Outer peridial layers split along radial fissures and when wet open out in the form of a star. Exoperidium whitish-grayish, open into 8-10 rayed, exoperidium is globose, sessile, with apical opening. The spores are brown, round, 12-13 μm ×3-5 μm (Figure - 7).

8. Hmo-Chin-Taung

Dicytophora indusiata (Pers.) Fish

This mushroom, found solitary or group, on the ground in rich soil in sheltered spots. They grow from July to September. Pale yellow cap is bell-shaped, 2-3 cm long, free from the stipe except at the top. The indusium is 10-13 cm long, veil hanging almost to the ground, with wide polygonal chains formed by elliptical strands, white. A stinkhorn with white stipe is fusiform, 14-18 cm long, 1.2-2.0 cm wide, broad towards the top, spongy, hollow, porous white. Mucilaginous gleba is 3.5 cm long and olive-green. The spores are 4-6 x 3-4 μm , white, elliptical, smooth (Figure - 8).



Figure (7)



Figure (8)

9. Hmo-thanguin sut

Lepiota morgani Pk.

This mushroom, growing in open wood, inedible. The cap is globose, then convex and finally flat, 10-30cm board, white, breaking up into irregular scales, flesh, thick. Gills are free, close, and white. The stipe is 10-20 x 1.5-2.0cm, tapering upward from the club-shaped base, hard, glabrous. Ring is large, thick, double, movable near the cap. The spores are subelliptic, white, 12-15x10-12 μ m (Figure - 9).

10. Myet-Kya-Hmo -U

Lycoperdon wrightii Berk. and Curt.

This mushrooms are found, pasture and grassy places closely crowded together. Peridium 1-3 cm in diameter, globose, sessile, white, smooth, columella present, capillitium and spore are olive. Spores are smooth, globose, white, 4-6 x 1-1.5 μ m (Figure - 10).



Figure (9)



Figure (10)

11. Hmo - Chay - To

Russula delica (Pres.) Fr.

This mushroom, grows in mixed wood. It is edible, but poor in taste. The cap often drops the surrounding leaf mould on their rough surfaces. The cap can be 16 cm, viscid, flesh, white, at first convex, but later flattens. The gills are decurrent and are quite closely spaced initially, white cream. White stipe is short and stout, 7.0 - 9.0 cm long and 2.0 cm thick. The spores are white, globose, 8-12 x 7-9 μ m (Figure 11).

12. Kun - Tatawe - Hmo

Russula emetica (Schaeff.) Pers.

This mushroom, growing under small trees, is inedibility as it causes vomiting and diarrhea when consumed. It has an extremely pappery taste. The cap is viscid, depressed, margin very acrid, 3 - 10 cm broad. The gills are white cream, adnexed, narrowly spaced. The stipe is up to 7cm long and wide, cylindrical and white. The spores are white, globose, 10-12 x 9-10 μ m (Figure 12).



Figure (11)



Figure (12)

13. Earth ball

Scleroderma citrinum Pers.

Earth ball, look- likes of the edible puffball, wide spread in woods. The subglobose cap is 4-5 cm in diameter, Peridium is very thick, bright yellow, split into polygonal scales, coarse in texture. The spores are globose, spring with faint reticulum, brownish black, 7-8 μm (Figure - 13).

14. Taung - Bo - Hmo

Termitomyces schimperi (Pat) Hein

This mushroom is growing on clayey soil, edible. The cap is convex, then expanded unbonate, silky, darker at the centre, whitish, 5 - 10 cm broad. Gills are free, close, crowded whitish. White stipe is 20 - 30 cm long, penetrates the earth deeply, slightly tapering upward near the cap, stuffed and fibrillose above the ring, hollow, lower part grayish, ring is double, conspicuous, whitish. Spores are rosy, broadly elliptic, 3 - 6 \times 3 - 5 μm (Figure - 14).



Figure (13)



Figure (14)

15. Hmo - Ohn - nat

Tricholoma personatum (Fr) Quel.

This mushroom, growing on open grassy places, is edible. The cap is convex when young, expanded with age viscid. brown, margin wavy, darker at the centre and paler to the margin .Gills are crowded, whitish, close. Solid stipe is whitish, with tint of violet, fibrillose, 10-15cm long and 1-2 cm wide. The spores are subelliptics,sordid, white, 7-9 \times 4-5 μm (Figure - 15).

16. Kauney-Yo- Hmo

Volvariella volvacea Bull. Fr.

This mushroom, growing on rich soil or paddy straw, is solitary or in group. The cap is fleshy, convex, flattened at full growth, the surface is silky or slightly flaky, 6-10 cm broad. Gills are free broad pinkish and tend to dark brown at full growth. The stipe is hard, fleshy, whitish, 8-12 cm long and 1-1.5 cm wide. The spores are brown, ovate, elliptic, $8.9 \times 4.6 \mu\text{m}$ (Figure - 16).



Figure (15)



Figure (16)

Discussion and Conclusion

In the present research work, 16 different species belonging to 3 families such as Agariaceae, Tremellaceae and Lycoperdaceae were described. Nowadays, in the forest land of the developed countries the favorable conditions for mushrooms are created because in the modern natural science, the mushroom is considered an important ecological balance. Mushrooms are capable of agro-waste degradation. They are grown on organic substance either raw or compose. Most edible cultivated mushrooms belong to the family Agariaceae (group of Basidiomycetes)

Volvariella spp. can be used to reduce the high blood pressure and the growth of tumor cell. *Lepiota*, some species are edible, while others species are highly poisonous. Several species of *Amanita* produce poisonous compound amatoxin. In *Cantharellus spp.* the taste is nutty. *Russula* is edible but poor, having an unpleasant taste, leading some to classify it as inedible, some species are poisonous, the symptoms are mainly gastrointestinal in nature diarrhoea (Jordon,2000).

In Myanmar, In-U, Myet-Kya-Hmo-U, Earth ball and Kauney- Yo- Hmo are eaten by local people. In *Dictyophora spp.* is used as medicine for inflammation and glands found in the armpits. Kywet-Na-Ywet-Hmo is very popular and used as food and has been grown in China for last 100 years (Dube, 1980).

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