

Morphological and Chemical Studies on *Ganoderma lucidum* from Hmawbi Township, Yangon Region

Khine Kyi Oo¹

Abstract

In Myanmar *Ganoderma* species are widely distributed in Yangon Region and locally known as Lingzhi-Hmo. Fruiting bodies (Lingzhi-Hmo) were collected from Hmawbi Township from June to November in the year 2017-2018. The collected *Ganoderma lucidum* was identified and classified according to their morphological characters by using various literatures. The powder of *Ganoderma lucidum* was tested to determine the preliminary phytochemical test, and physico-chemical properties by using the physico-chemical standards of Unani Formulations (1987, India). Extraction of crude extract was made from *Ganoderma lucidum* to isolate the vitamins. Water soluble vitamin B complex and vitamin C were found in aqueous extract of *G. lucidum* by using thin layer chromatography method (TLC).

Keywords: *Ganoderma lucidum*, Morphology, phytochemical and physico-chemical test and vitamin, Hmawbi Township

Introduction

Ganoderma species are well known in the Far East Asia as medicinal fungus of thousand of years. *Ganoderma* is a mushroom, a member of basidiomycetes included in the poroid family of Aphyllophorales. Myanmar land lies within the Asia-tropical Zone having a regular alternating hot-dry and hot-wet rainy seasons. The dense wood forests with high humidity are best suited for the growth of mushroom.

This *Ganoderma lucidum* has been known in Myanmar since old days. The people in the central Myanmar called it Ut-hto-hmo or Ut-site-hmo, hmo because the dried corky fruiting body had been used as pin-cushions in households and the word Ut-meant pin or needles, hto-meant to stick in and hmo-referred the fungus. In Myanmar, Hmo is the term used for mushrooms, and in general, it is the fungi.

Ganoderma are wood decaying saprophytes and they can be found growing on dead or decayed woods, the fallen logs or tree stumps within the clumps of moistened woody roots, dead or living and on the damp soil and grasses under shady trees. The trees with rough or cracked barks are the best and favourite hosts for *Ganoderma* species. In this study, collected species of *Ganoderma lucidum* during (2017-2018) were studied for the morphology characters of this mushroom. The present research work also involves phytochemical and physico-chemical tests of the mushroom body of *Ganoderma lucidum* which is growing in Hmawbi Township, Yangon Region. Lingzhi mushroom was extract, contains Vitamin C and Vitamin B complex.

¹ Dr, Professor, Department of Botany, Sittway University

Materials and Methods

Botanical Study

Sample collection

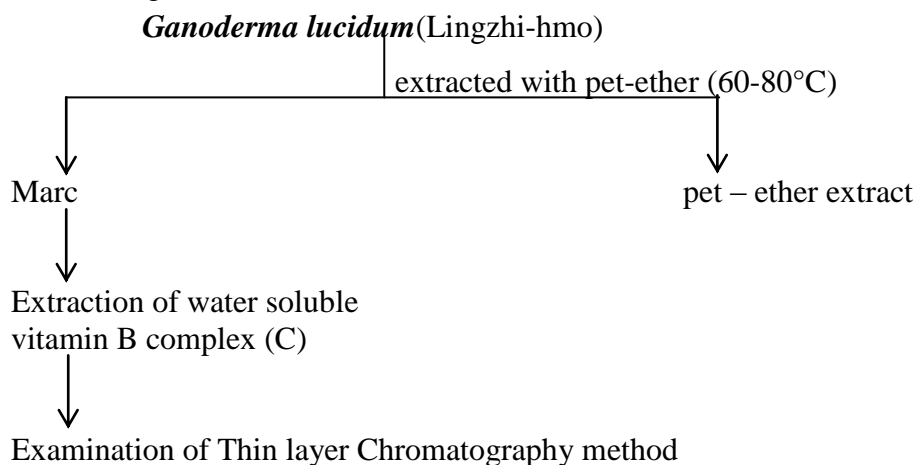
Ganoderma lucidum used in this study was collected (March – August 2017 and May- August 2018) from Hmawbi Township in Yangon Region. They were recorded, described and identified as *Ganoderma lucidum*, at the department of botany, West Yangon University.

Materials and Methods

A tough basket with hinged cover, paper bags and plastic bags, a stout knife, shovel and camera. The nature of the cap, size, shape, color and odor were recorded. The persistence or changing the color during the investigation was recorded. The nature of hymenium, attachment, nature of color when young and mature were also investigated according to the method given by Rookuya Imazeki & Tsuguo Hongo (1965), Alexopolous (1996), Terry Willard (1990) and Tom Volk's Thomas (1999). The soft and fleshy specimens were preserved in the glass bottles which are filled with F.A.A. 2.5%.

Chemical Study

Extraction, isolation and identification of some active constituents from *Ganoderma lucidum*(Lingzhi-hmo)



The Specimens in this research work were collected from Hmawbi Township from the month of March to August in 2017-2018.

These mushrooms were crushed, carefully washed with water and allowed to dry in shady place. After drying in air for 3 weeks, it was ground to powder by using grinding mill and then stored in glass bottles.

The preliminary phytochemical investigations were examined according to the Physico-chemical standards of Unani formulations (1987, India) seen in table-1. Standard procedure of AOAC was used to determine the moisture content, Ash content, and extracted values of air dried Lingzhi powdered in Table -2.

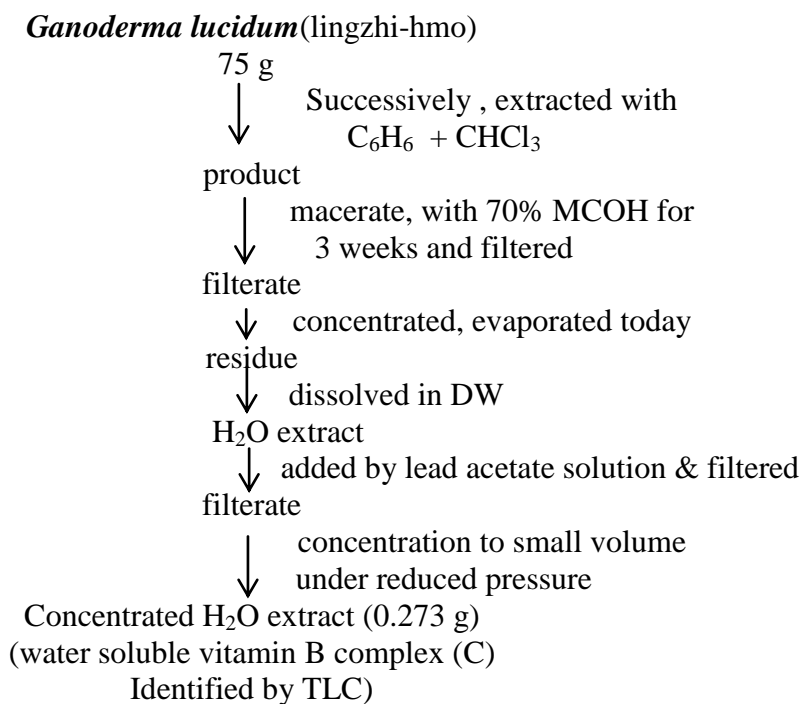


Figure . Extraction of water soluble vitamin B complex Vitamin C of *Ganoderma lucidum* (Lingzhi-hmo)

RESULTS

Botanical Name	:	<i>Ganoderma lucidum</i> Leys : Ex FrP.Karst
Type	:	Reddish Brown
Habitat	:	on decayed woods
Habit	:	Tufted Fig.1(C)
colour of cap	:	Reddish Brown
Basidiocarp	:	2.0 cm – 4.0 cm broad,semicircular or circular shaped, the
(Fruiting body)	:	uppersurface of the cap is reddish brown, concentric rings are circular zonate , margin brown, the outer surface of the cap is white when young and becomes whitish brown when mature. Pores are minute, white and smooth. Fig.1(A) & 1(B)& 1(D)
Stipe	:	Cooperation of the body, 0.5 – 0.8 cm broad, attached to the centre of the cap. Fig.1(A) & 1(B)
Spores	:	9-11 x 5.5 -0.7 microns, elliptic brown, warty. Fig.1 (E)
Common name	:	Reishi, Lingzhi-Hmo
Local name	:	Thit-Kat-Hmo
Season	:	March to August
Host plant	:	on decayed woods



Fig.1(A).Upper surface of *Ganoderma lucidum* Fig.1(B) Lower surface of *Ganoderma lucidum*



Fig.1(C)Habit of *Ganoderma*

lucidum Fig.1(D) Poroid form of *Ganoderma lucidum*

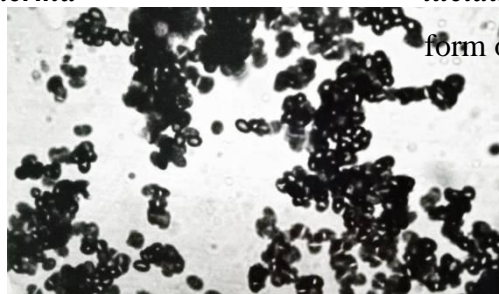


Fig. 1(E) Spore character of *Ganoderma lucidum*

Figure 1. The characters of *Ganoderma lucidum*

Chemical Studies

The results of preliminary phytochemical tests of air dried powdered mushrooms was shown in Table1.

No	Compound	Test Reagents	Obervation	Result
1	Alkaloid	Dragendoroff's	Orange red	++
		Mayer's	Pale Yellow	+
		Wagner's	Yellowish-brown	++
2	Flavonoid	Dil HCl & Mg	Pink	++
3	Glycoside	NaOH solution	Yellow	+++
4	Cyanogenic Glycoside	Sulphuric Acid, Sodium picrate in neck	No brick red color	-
5	Carbohydrate	Benedict's solution	Brick-red	+
6	Starch	Iodine solution	No blue color	-
7	Steroids	Acetic anhydride, H ₂ SO ₄ solution	Greenish blue	+++
8	Aminoacid	Ninhydrin	No purple color	++
9	Phenolic compound	PbOAc	Yellow	++
10	Tannin	Ferric Chloride	Blue-black	+

- = negative (not detected)

++ = positive (medium detected)

+ = positive (detected)

+++ = positive (most detected)

Table 1. Phytochemical tests on various extract of *Ganodermalucidum*Physico – Chemical properties of *Ganoderma lucidum*

The result of moisture content, total ash and extractive values of air dried lingzhi powder were shown as the following in Table 2.

<i>Ganoderma lucidum</i>							
Moisture content %			Ash Content %	Extractive values			
July	September	November		Petroleum Ether	Ethyl acetate	Ethenol	Water
12.11	20.47	13.58	9	1.87	1.6	4.75	6.65

Table 2. The moisture content, total ash and extractive values of air dried lingzhi powder

The results of examination of water soluble vitamin B complex by using TLC method with authentic B₁, B₂, B₆ and C were shown in Figure1 .

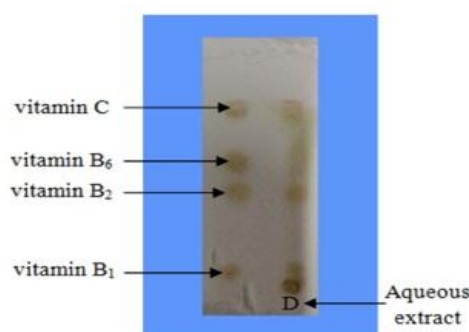


Figure 2 . Examination of water soluble vitamin B complex by using TLC method

Discussion and Conclusion

In this research, the medicinal mushroom *Ganodermalucidum* has been studied. The gross morphological characters of *Ganodermalucidum* including the colour variation of the cap are in accordance with the reference for the research paper (Dube Hc, 1990, Tom Volk's , 1999, Alex opoulous , 1981). The basidiocarp is semi-circular shape, the cap is reddish brown, pores are minute, white and smooth, the cap is white when young and whitish brown colour in mature. These data are agreement with those mentioned by (Rookuya Imazeki & Tsuguo Hongo, 1965, Terry Willard 1990). Alexopolous (1996) and Tom Volk (1999). Vitamins are essential for human being. The antioxidant nutrient vitamin C is also present in *Ganodermalucidum*.

Moisture content of *Ganoderma lucidum* was recorded at three seasonal period, March, June and August. Vitamin B and Vitamin complex C from aqueous extracts of *Ganoderma lucidum* were investigated. These data are in agreement with those mentioned by Zhou, Xuanwei et al (2007). These data from the present research could be used as valuable information for the identification of other fungal species.

Therefore, this investigation showed the usefulness of active constituents of lingzhi-hmo which can produce effective drugs for human society.

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