

A Study on the Ganoderma Lucidum of Warri South Local Government Area

Okigbo RN¹ and Obanubi SI¹

1. Department of Botany, Faculty of Biosciences, Nnamdi Azikiwe University

Abstract

A study on the medicinal mushroom (*Ganoderma lucidum*) was conducted from May to July 2015 to document the medicinal importance of *Ganoderma lucidum* "Itu" by the Warri South people in Warri, Delta State, Nigeria. This mushroom was identified and collected during field trip and visits to traditional medical practitioners. Four mushrooms species were identified out of which 2 are edible, 1 is used medicinally and 1 is feared by the locals and trial's of the community because of its poisonous content. These mushroom were briefly described, their uses, local names and part used were listed. These mushrooms are faced with rapid extinction because its knowledge and use are not passed to younger generation.

Corresponding author: Okigbo RN, Department of Botany, Faculty of Biosciences, Nnamdi Azikiwe University, PMB 5025, Awka, Anambra State, Nigeria. Email- rn.okigbo@unizik.edu.ng, okigborn17@yahoo.com

Received: January 13, 2020, **Accepted:** January 24, 2020, **Published:** January 27, 2020

Keywords: Medicinal Mushroom, Edible Mushroom, Poisonous Mushroom

Introduction

Mushrooms can be defined as macro fungi having distinctive fruiting bodies which grow either on the ground or substrates which can be seen with the naked eye and picked by hand Chang [1]. *Ganoderma lucidum*, a large, dark mushroom with a glossy exterior and woody texture is an oriental fungus. In the Southern part of Nigeria, *G. lucidum* is called Itu (representing a combination of spiritual potency and essence of life) and in the eastern part of Nigeria, it's called Ero (Cooner). The family Ganodermataceae describes polypore basidiomycetous fungi having double walled basidiospores (Donk). In all, 219 species within the family have been assigned to the genus *Ganoderma* (Moncal-

vo). Warri South is a Local government in Warri, Delta-State. The area is predominantly riverine, due to its soil type and vegetation type, this area is ideal for hosting and flourishing mushrooms. Medicinal mushrooms have long and rich history of use. More than 2,000 years ago, Paleolithic people knew and used mushrooms as powerful medicines to fight illness [2]. The medicinal use of mushrooms has a very long tradition in Asian countries, whereas their use in Western hemisphere has been slightly increasing only since last decades [3]. *Lucidum*'Itu' has been recognized as a medicinal mushroom for over 2,000 years and its powerful effects have been documented in ancient scripts [3]. Mushrooms are however economically useful not only for their

splendid taste, but also for their health benefits [4]. In addition to its nutritive value, mushroom possess some essential mineral nutrients which are considered as key factors for the normal functioning of the body [5]. And also used as an immune stimulant [6]. The specific applications and attributed health benefits of *G. lucidum*, 'Itu' include control of blood glucose levels, modulation of the immune system [7]. The various beliefs regarding the health benefits of *G. lucidum* are based largely on traditional cultural uses. However, recent reports provide scientific support to some of the ancient claims of the health benefit of *G. lucidum*'Itu' [8]. *Lucidum*'Itu' have long been used as a valuable food source and as traditional medicines around the world especially in Japan and China and in the Southern part of Nigeria (Hirano). *Lucidum* has been used for hundreds of years as a health promotion and treatment strategy in viral bacterial infection, diabetes, and liver injury [9]. *Lucidum* has been used for several thousand years in traditional medicine of the Far East for the treatment of various diseases including immunological disorders, asthma, and hepatitis. *Ganoderma* specie are natural sources of various antimicrobial, antioxidant, active compounds (Budavari). The low total fat content and high proportion of polyunsaturated fatty acids relative to the total fatty acids of mushroom are considered significant contributors to the health value of mushrooms [10,11]. Polysaccharides, peptidoglycans, triterpenes are three major constituents in *Ganoderma lucidum* [12,14].

The components of medicinal mushroom have long been ignored by many biomedical practitioners because its chemical composition, dosage and toxicity are not clearly defined [15]. Also, most traditional medicine practitioners tend to hide the identity of these mushrooms e.g. [*G. lucidum*]. Used for different ailments owing to the fact that they might lack patronage. Elemental analysis of 10g cultivated fruit bodies of *G. lucidum* revealed silica, sulphur, potassium, calcium and magnesium to be their main mineral components. Iron, sodium, zinc, copper, manganese and strontium were also detected in lower amounts [16]. *Lucidum* collected from the wild can also contain selenium (Se – up to 72µg/g dry weight). And Germanium (489µg/g). Germanium at lower doses has been credited

with immunopotentiating, antioxidant activities. Furthermore, *G. lucidum* spores were reported to contain a mixture of several long chain fatty acids that may contribute to the antitumor of the mushroom (Fukuzawa). Numerous *G. lucidum* products, prepared from different parts of the mushroom, are currently available on the market [17]. This study is aimed at documenting the medicinal potentials of *Ganoderma lucidum* in Warri South LGA, Warri Delta- State, Nigeria for eradicating some ailments and then create awareness to a large number of people.

Materials and Method

The materials used include: Writing materials, sterile polyethylene bags, Razor blade, Species of mushroom obtained from farmland in Warri South Local Government Area, Questionnaire. The method of Chang, et al. was used in the study area which involved the use of a well-structured questionnaire to obtain vital information from the respondents [18,19].

Study Area

The study region includes 3 communities in Warri South Local Government (Ubeji, Ekurede and Ajamimogha) which lies in between 50 31'N50 45'E latitude and 5.517oN5.750oE longitude, covering an area of 633km². Here, the soil is rich in nutrients with sandy loam to clay loam characteristics and PH range of 5.4-6.6. The area comprises of 3 ecological regions – Mangrove vegetation, freshwater swamp and lowland rainforest. The vegetation is dominated by mangrove trees, shrubs and grasses.

Field Study

A three months (May - June) survey among the three communities revealed that quite a number of macro fungal species grow on dead tree trunk and on ground which are consumed by the locals / tribal communities and to cure various ailments. The specimen (*Ganoderma lucidum*) was collected and put in the sterile polyethylene bag. . Those attached to a tree were carefully cut using razor blade (not allowing its sporophores to scatter), and the ones on dead wood (not strongly attached to the substrate) were carefully and gently pulled out. It was photographed in the sampling site and preserved

using a standard preservation technique.

Data Collection

During the survey, respondents (ages 25 – 75years) gave the local name, uses, beliefs and mode of preparation of the mushroom. The collected information regarding *G. lucidum* utilizations among the communities were verified by cross questioning key informants such as village elders, herbalist. Local market of each community was visited to find out its use in local communities and variation demands among clientele.

Experimental Design

The mean treatment of the analysis was obtained using Randomized Complete Block Design (RCBD) and simple percentage.

Results

The study showed that people in these communities collect and consume different types of mushroom as food and for treatment of several ailments (Plate 1). Altogether, 4 macro fungal species were found to be used by the locals and tribals of the regions among which 2 mushroom species were found to be edible (*Lentinus squarrosulus* and *Amanita vaginata*), 1 species used for medicinal purposes (*Ganoderma lucidum*) and 1 species found to be dangerous (*Daldinia concentrica*) (Table 1.0).

Of these species, *Ganoderma lucidum* was consumed more because of its medicinal uses like; its use in the cure of liver disease, for ease / safe delivery in pregnant women, and as love portion. Its use as love portion is mainly by traditional men and women as younger generation has little or no knowledge about it. Its various uses can be administered orally, by adding the mushroom (*G. lucidum*) to bathing water or added in a food. The fruit body plays an important role and can be cooked, chewed or grinded with other fruit substances such as *Garcinia kola* (Table 3.0). *G. lucidum* was preferred to other species of mushroom because of its nutrient content and medicinal properties; and priced high because of its proteineous content (30.00%) (Table 1.0). Other species, *A. vaginata* and *L. squarrosulus* are eaten at minimal quantity, because of its high starchy content (carbohydrate, 30.00%) (Table 2.0). The mushroom species are harvested (in a cool weather) from different substrate such as decaying wood, moist

soil, ground and bamboo wood, depending on its availability period in a year (Table, 4.0). Based on tradition, the mushroom collectors never harvested more than the amount needed either for consumption or for medicinal purposes and part of the sporocarp are left at the collection site because they believe that residual part would help the mushroom grow in subsequent favorable conditions.

The mushroom *G. lucidum* was preserved using different media. These include oven drying, sun drying and cooling method (refrigeration). Of these methods, sun drying is commonly used among mushroom farmers because it's affordable, effective and prevents the mushroom from easy decay. (Table 5.0).

Reasons	Reasons
Carbohydrate	26.67%
Protein	30.00%
Sugar	10.00%
Vitamin	16.67%
Amino acid	20.00%
Fibre	13.33%
Iron	23.33%

Table 1: Reason given by respondent for consuming *G. lucidum*.

Reasons	Reasons
Protein	26.67%
Carbohydrate	30.00%
Vitamins	20.00%
Sugar	23.33%

Table 2: Reason given by respondents for consuming *A. vaginata* and *L. squarrosulus*.

Mush-room	Local name	Mode of administration	Mode of preparation	Type of ailment cured	No of respondent with these information
Ganoderma Lucidum	Itu	Fruit body grinded with bitter kola (Garcinia kola)	Applied to food	Love portion	6.67%
Ganoderma Lucidum	Itu	Fruit body cooked	Oral or added to bathing water	Easy delivery	16.67%
Ganoderma Lucidum	Itu	Fruit body cooked	Oral	Liver disease	23.33%

Table 3: Medicinal uses of *G. lucidum* by Warri South people.

S/N	Mush-room	Local	Substrate	Time available in the year	No. of respondents with such information
1	Ganoderma Lucidum	Itu	Decaying wood	January-March	30.00%
2	Lentinus Squarrosulus	Itu	Decaying wood or bamboo wood	March	13.33%
3	Daldinia concentric	Ero/Itu	Decaying wood	August	6.67%
4	Amanita vaginata	Itu	Ground or decaying tree	April	3.33%

Table 4: Availability period of Mushroom and the substrate where it is found.

Methods	Response
Sun drying	50.00%
Oven drying	10.00%
Cool method (refrigeration)	40.00%

Table 5: Methods used by respondents for preserving *G. lucidum* and other mushrooms mentioned.

Conclusion and Recommendation

This study showed that mushrooms (*Ganoderma lucidum*) are still used by the Warri South people mainly the elderly men and women. The use and knowledge of this mushroom (*G. lucidum*) is rarely passed on to the younger generation because of lack of interest and advancement of technology. The mushrooms seen were examined and grouped into edible and medicinal mushrooms. All mushrooms examined were observed to inhabit mainly on logs of wood, tree trunk and on plain soil.

Mushrooms are however economically important to man within these 3 localities, their values include; source of protein, some essential amino acids, minerals, vitamins and other nutrients which is in line with the reports of Alofe, (1991); Tolentino, (1981) and Mori, (2000). They also have medicinal properties.

The challenge then is to promote mushroom use through research and enlightenment of the populace. This will help in alleviating some of the two major problems in Nigeria which are food insecurity and unemployment, consequently reducing poverty.

Conclusively, like all the people of the world, the Warri South people have their rich traditional or folk medicinal mushroom (*G. lucidum*) that needs to be properly organized and formerly integrated into the regular health care delivery system.



Figure 1: Medicinal mushroom found in Warri South Local Government Area. a. Amanita vaginata 'Itu' b. lentinus squarrosulus 'Ero/Itu' c. Ganoderma lucidum 'Itu' d. Daldinia concentric.

References

1. Chang ST (1992) Mushroom nutraceuticals. World Journal Microbial Biotechnology 12: 473-476.
2. Lowly EJ (1971) Mushroom use as sources for powerful medicine: Ganoderma lucidum as medicine in China 2: 24-56.
3. Lindequist U, TH Niedermeyer, WD Jülich (2005) The pharmacological potential of mushrooms. Evidence Based Complement Alternate Medicine 2: 285-299.
4. Gbolagade CB, JI Alao, CB Ibukun (2006) Traditional uses of mushroom in Western Nigeria: Nigerian Journal of Botany 2: 182-189.
5. Kalac CI (2009) Nutritional benefit of mushroom: Ganoderma lucidum as a health supplement.
6. Biswas C (2011) Ganoderma lucidum as an immune stimulant Pp 501.
7. Gao YH, SF Zhou, WQ Jiang, M Huang, XH Sai (2003) Effects of Ganopoly a Ganoderma lucidum polysaccharide extract) on immune functions in advanced-stage cancer patients. Immunol Invest 32: 201-215.
8. Mahato SB, S Sen (1997) Advances in triterpenoid research, 1990-1994. Phytochemistry 44: 1185-1236.
9. Kim SD, HJ Nho (2004) Isolation and characterization of alpha-glucosidase inhibitor from the fungus Ganoderma lucidum. Journal of Microbiology 42: 223-227.
10. Chang ST, JA Buswell (1999) Ganoderma lucidum P. Karst. (Aphyllorphomycetidae): A mushrooming medicinal mushroom. International Journal of Medicinal Mushrooms 1: 139-146.
11. Sanodiya BS, GS Thakur, RK Baghel, GB Prasad, PS Bisen (2009) Ganoderma lucidum: A potent pharmacological macrofungus. Currin Pharmacological Biotechnology 10: 717-742.
12. Bao X, X Wang, Q Dong, J Fang, X Li (2002) Structural features of immunologically active polysaccharides from Ganoderma lucidum. International Journal of Biochemical Chemistry 59: 175-181.
13. Zhou X, J Lin, Y Yin, J Zhao, X Sun, K Tang (2007) Ganodermataceae. Natural products and their related pharmacological functions. Journal of China Medicine 35: 559-574.
14. Giri AE, JE Wright, AI Arora (2012) Biomedical components of mushrooms and its negligence in our environment Pp 460.
15. Chen DH, WY Shiou, KC Wang, Wen-Yue Shiou, Shu-Ying Huang, et al. (1999) Chemotaxonomy of triterpenoid pattern of HPLC of Ganoderma lucidum and Ganoderma tsugae. Journal of China Chemical Society 46: 47-51.
16. Falandysz J (2008) Selenium in edible mushrooms. Journal of Environment Science Health Environmental Carcinogenic Ecotoxicol. 26: 256-299.
17. Chang ST, JA Buswell (2008) Safety, quality control and regulational aspects relating to mushroom nutraceuticals. Proc. 6th Intl. Conf. Mushroom Biology and Mushroom Products Pp 188.
18. Akpaja EO, Isikhuemhen OS, Okhuoya JA (2003) Ethnomycology and Usage of Edible and Medicinal Mushrooms among the Igbo People of Nigeria. International Journal of Medicinal Mushrooms 5: 313-319.
19. Moncalvo JM, HF Wang, HH Wang, RS Hseu (1995) The use of rDNA nucleotide sequence data for species identification and phylogeny in the Ganodermataceae. In: Ganoderma: Systematics. Phytopathology and Pharmacology. Taipei: Department of Agricultural Chemistry, National Taiwan University.

Copyright: ©2020 Okigbo RN. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.