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COLLECTION, IDENFICATION AND PRESERVATION OF MUSHROOMS GROWING WILD IN KADUNA AND ITS ENVIRONS

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ABSTRACT

This study was carried out to determine the various species of edible and poisonous mushroom found within and around the city of Kaduna. Ten species of mushrooms were collected using pocket knife and were kept via basket for identification in the laboratory .They were preserved in glass bottles with 70% formalin. The identification was done using a mushroom guide. P*olyperusalveolaris*, L*entinusspp* and *Hapahapilusnidulans* were the edible species collected. Other species such as *Amanita spp*found were poisonous. Edible mushrooms are nutritional, medicinal and source of income to human. The study aimed at identifying the edible species for the purpose of domestication.

Key words; *Mushrooms, nutrition. preservation*,

INTRODUCTION

Fungi constitute one of the most diverse groups of organisms. There are approximately 75,000 describe species of fungi, but this is regarded as significantly fewer than the actual number of species. However, a figure of 1.5 million species has been proposed as a working hypothesis (Hansworth, 2006). The most advanced group of fungi are the club fungi of the phylum basidiomycota, containing about 30,000 described species or 37% of the described species of fungi (kirk et al, 2008).The largest subphylum of basidiomycota are the agaricomycotina, the most familiar of all fungal groups because they mostly produce large fruiting bodies including the group that are the gilled mushroom(agarics), puffballs, bracket fungi and many others.

Mushrooms are saprophytes and grow well on organic matter. They grow luxuriantly in most part of the world on different substrates. Mushrooms are found growing on rootless of certain trees (as mycorrhizae) and on termitaria, lawns or fields(Singer, 1986). Mushrooms proteins are valued to be better quality than those of meat, milk, egg and legumes (Isikhuemhem et al, 1996). There is no clear delimitation between poisonous and edible mushroom. Most people are not aware of the nutritional value of some mushroom therefore they do not normally regard them as an important constituent of diet. The aim of the work was to collect, identify and classify the different species of mushroom around Kaduna and its environment to form a baseline studies for taxonomy of macro fungi.

MATERIALS AND METHODS

The research was carried out in Kaduna metropolis. Kaduna city is located in Kaduna state at longitude 7^0 27^1E of the equator. It has dry and wet season with a mean annual rainfall of 1100mm. the samples were collected from Akpaka, kawo site, Unguwan Rimi, river Kaduna and Barnawa. Questionnaires were used as source of information. 250 questioners were design and distributed around the five areas listed above. Fifty questionnaires were distributed in each site. The questionnaires were design for traders, collectors and consumers with age ranges for consumers from 6-17, 18-28, 29-39, and 40 and above. Mushroom species were collected in the morning and evening during the raining season between the months of June to September, 2012. Those collected represent all stages of development. Flat bottom flask and a knife were used for the collection; small plastic containers and waxed paper were used for small or fragile collections. The mushroom were cleaned with a tissue paper and information were recorded for each species such as habitat, location, date of collection and type of soil the species was found growing on. Three methods were used for preservation of the mushroom,viz: wet preservation method using 30% FAA and 70% distilled water, dry preservation using oven dry method (at 45^{o}C

between 20 – 24hours, *Polypores* were preserved at 70^{o}C) and sun drying(at 140^{O}F) and cold preservation(in the fridge) for just few days then transfer to FAA. Identification of collected mushroom species was done by taken to the Department of Biological Sciences and Crop Protection, A. B. U. Zaria, Nigeria.

RESULTS

Classification of mushrooms collected

1. *Chanterellus cibarius*
Kingdom: Fungi
Basidiomycota
Class: Agaricomycetes
Order: Polyporales
Family: Ganodermataceae
Species: *cibarius*

2.Ganoderma tsugae Kingdom: Fungi
Phylum: BasidiomycotaPhylum:
Class: Agaricomycetes
Order: Chantharellales
Family: Chantharellaceae
Genus: *Chantharellus*Genus: *Ganoderma*
Species: *tsugae*

3. *Ganorderma lucidium*
Kingdom: Fungi
Phylum: Basidiomycota
Class:Agaricomycetes Order: Polyporales
Family: Ganodermataceae
Genus: *Ganoderma*
Species: *lucidium*

4.Polyporus aleolaris Kingdom: Fungi
Phylum: Basidiomycota
Class: Agaricomycetes
Order: Polyporales
Family: Polyporaceaes
Genus: *Polyporus*
Species: aleolaris

5. *Pleurotus pulmunaris*
Kingdom: Fungi
Phylum: Basidiomycota
Class:Agaricomycetes
Order: Polyporales
Family: Pleurotaceae
Genus: *Lentinus*

6. Lentinus species Kingdom: Fungi
Phylum: Basidiomycota
Class: Agaricomycetes
Order: Agaricales
Family: Pleurotaceae
Genus: *Polyporus*
Species: *alveolaris*

7. *Hapalopilus nidulans*
Kingdom: Fungi
Phylum: Basidiomycota
Class:Agaricomycetes
Order: Polyporales
Family: Fomitopsidaceae
Genus:*Piptoporus*
Species:*betulinus*

8. Piptoporus betulinus Kingdom: Fungi
Phylum: Basidiomycota
Class: Agaricomycetes
Order: Polyporales
Family: Polyporaceae
Genus: *Hapalopilus*
Species:*nidulans*

9. Ganoderma applanatum
Kingdom: Fungi
Phylum: Basidiomycota
Class:Agaricomycetes
Order: Agaricales
Family: Pleurotaceae
Genus: *Pleurotus*
Species: *ostreatus*

10. Pleurotus ostreatus Kingdom: Fungi
Phylum: Basidiomycota
Class: Agaricomycetes
Order: Polyporales
Family: Ganodermataccae
Genus: *Ganoderma*
Species: *applanatum*

Table 1: Percentage of individual that responded to questionnaires.

Individuals	Number of Questionnaires	Percentage
Collectors	7	3.11
Traders	38	16.89
Consumers	68	30.22
Cultivators	3	1.33

Table 2: Showing age range frequency of consumers

Age Range	Frequency
6 – 17	5
18 -28	11
29-39	30
40 and above	60

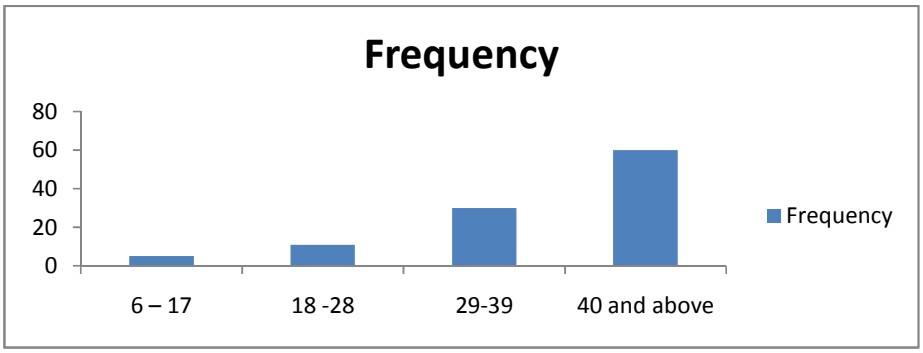


Fig.1. Consumers response based on age

DISCUSSION

The ten species belong to the kingdom fungi, phylum basidiomycota, and class agaricomycetes. Mushroom number (1) belongs to the family chanterellaceae which is in agreement with the work of Kate(2009) at USA, the species was found in several location all within 5miles radius of each mushroom, they were found on hard wood, ferns and leaf litter and at the bark of dead tree on loamy soil and the size of the species was 7cm, with a light yellow to cream color, veins are very thick, it has a fruity smell, faint odor and a peppery taste. It normally appear between June to October, its consider as an excellent edible mushroom (Boa *,2004*).

Collections of mushroom number (2),(3),(9) belong to families of Ganodermataceae (*Ganoderma tsugae, Ganoderma lucidum, and Ganoderma applanatum*), this results agrees with the description given by Atri and Kaur (2005) who collected from different localities of North East, which were first describe from India. They grow on dead trees and logs and normally appear in the raining season between May to November. The size of *Ganoderma tsugae* was 15cm long, *Ganoderma lucidium* was 14cm long and *Ganoderma applanatum* was 16cm long. G. tsugae has a kidney shape, G. lucidum has a semi- circular shape, and G.applanatum has a convex or concave shape. Caps are flat ranging between 5 -30cm, the upper surface are shiny reddish to brown orange, the spore prints were either brown or white. Ganoderma species are said to have medicinal properties, it is a non poisonous but generally consider unedible due to its solid woody nature.

Collections Nos. 4, 6 and 7 belong to the family Polyporaceae (*Polyporous aleolaris*, *Lentinus spp* and *Hapalopilus nidulans*) this agrees with the work of Oniyishi (2008) in Nsukka. The mushroom encounters were previously reported in Nigeria (Kadiri, 1996). It was found growing on logs and hard wood found along river Kaduna, it is a saprobic on loamy soil, size of 15cm, rounded to kidney shape. Collection 4 ranges from yellow to orange, collection 5 is white to grey while collection 6 was white, cream or grey depending on the environment where it was collected. Fruit bodies sometimes have stem. The species are unedible due to its tough nature. They normally appear between May to November. Collection NO. 8(*Piptoporus betulinus*) belongs to the family Fomitopsidaceae, Kuo (2010) found similar species on dead birch trees and wood. Technically, it is an edible species. It has been reported to have medicinal properties which include; anti-inflammatory compounds (Kamo *et al.,* 2003), and anti bacterial properties (Schlegel et al., (2000),these mushrooms were collected at Unguwan Rimi Kaduna ont the barks of woods, on clay soil, and color ranges from white to dark brown. It measured 6cm long, it has kidney shape.The species appears all through the year.

Collection Numbers (No) 5 and 10 belong to the family of Pleurotaceae (*Plearotus pulmunaris*, and *Pleurotus ostreatus*). The species are popularly known as Oyster mushroom, they are primarily consumed for their nutritive value and are used Industrially as bioremediators (Lakshmi, 2004) *Pleurotus* hasa medicinal properties according to (Badok *et al*., 2008). Its effective in the treatment of hay fever and the powder reduced sneezing, nasal rubbing, and diabetics. Species No. 5 was collected at Barnawa site at the bark of hardwoods or logs. Color ranges from white to grey or pale blue, soil type are clay soil. Species No. 10 were collected at kawo site, color ranges from white to grey or dark brown. Species No. 10 ranges from 10cm to 15cm and is fan or kidney shape. Both species normally appear from late may to November (Stamets and Paul, 2000). *Pleurotus ostreatus* and *Pleurotus pulmunaris* are difficult to distinguished from one another but *P. pulmunaris* has a lung shape while those of *P. ostreatus* are more dimidiate(split into two equal parts) but the most distinguishing character is seasonality. *P. ostreatus* appears early in the raining season while *P. pulmunaris* appears in mid rainy season.

Numerous higher basidiomycetes are important sources of medicinal substance used in the treatment of a wide range of diseases among different cultures of the world. According to the information gathered orally from consumers, it showed that some people used mushroom for eating, some as medicinal source and others for ritual purposes or traditional belief. From consumer reports, they stresses that the supply of mushroom is realy reached. The cultivators do not have much idea or message about mushroom except only in higher learning institution that are used for research. The weather was highly unfavorable and mushrooms were highly sensitive to temperature and humidity. The information gathered orally from consumer showed that mushroom used to be poisonous, thereby making people afraid of consuming mushroom.

CONCLUSION

Mushrooms are a major part of fungal diversity with very unique ways of nutritional life pattern. They grows in all sorts of environment making them unattractive to people who would have loved to eat the edible species. According to the research it was shown that they are not horrible as they seem. They are very beneficial to man in medicine, agriculture and in an environmental cleaning. In fact, their varying uses to man cannot be over emphasized. Effective exploration of this species will go a long way towards providing alternative source of income and revenue in Nigeria, therefore, it is recommended to carry out the biodiversity studies of more of these macro fungi and to bring them for domestication.

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