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Short Communication

Assessing the Nutritional Potential of Wild Edible Mushrooms in West Yagba, Nigeria

M. R. Adedayo[1], I. G. Olasehinde[2] and A. A. Ajayi[2]*

[1]Department of Microbiology, University of Ilorin, Kwara State, Nigeria.

[2]Department of Biological Sciences, College of Science and Technology, Covenant University, Ota, Ogun State, Nigeria.

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Studies were carried out on four different species of wild mushrooms: *Lentinus subnudus, Chlorophyllum molybditis, Marasmus* species and *Pleurotus tuberregium*. The fungal species were analyzed for their nutritional compositions, biological and structural characteristics. The fungal species were rich in proteins (amino acids) and carbohydrates. The fibres contained in the different species were also good sources of roughages. Moreover, their low acidity confirms their edibility. This study strongly recommends the commercialization of mushroom production as a means of additional source of protein requirements and income to the people in the developing economy of Nigeria.

Key words: Mushrooms, protein content, carbohydrate content.

INTRODUCTION

Mushrooms are fruit bodies of macroscopic, filamentous and epigeal fungi and they are made up of hyphea which forms interwoven web of tissues known as mycelium in the substrate upon which the fungus feeds (Svrcek, 1983). Most often, their mycelia are buried in the soil around the root of trees beneath leaf litters in the tissue of a tree trunk, on a fallen log of wood or in other nourishing substrates (Ingold, 1993). Mushrooms are of great economic importance to man; their occurrence is dated back to the time of the early man as Mushrooms appear in traditional Yoruba art works known as “tie and die” which are materials of traditional costumes (Adenle, 1985). Many genera of mushrooms are edible and are rich in essential nutrients such as carbohydrates, proteins, vitamins, mineral, fat, fibres and various amino acids (Okwulehie and Odunze, 2004). Most people eat mushrooms, mostly because of its flavour, meaty taste and medicinal value (Moore and Chiu, 2001). Mushrooms generally possess most of the attributes of nutritious food as they contain many essential nutrients in good quantity (Fukushima et al., 2000). It must however be emphasized that some mushrooms are poisonous and may claim lives within few hours after consumption (Phillips, 1985).

Considering mushroom’s growth requirement, they grow well on a wide range of lignocellulosic wastes as substrates (Okhuoya and Okogbo, 1990; Kadiri, 1991). It has been established that they grow and fruit on various agricultural wastes (Moncaio et al., 2005). Furthermore, some of these mushrooms have been cultivated in the laboratory (Kadiri, 1994; Fasidi, 1995). These substrates could be used in commercial production of mushrooms for food (Fasidi, 1995). In this part of the world, nutritive foods are scarce and when available they are usually very costly. However, lignocellulosic wastes are abun-dantly available and labour is inexpensive. Commercial production of mushrooms could therefore be particularly important. This research was therefore aimed at determining the nutritional value of some wild species of mushrooms, with the aim of producing them commercially to increase the sources of protein supply and source of income in Nigeria.

MATERIALS AND METHODS

Mushroom samples were collected as wild samples and when analyzed, they were labeled Plates A to D respectively; *Lentinus subnudus* (local name “Olu Oba”), *Chlorophyllum molybditis* (local name “Ese ediye”) *Marasmus* species (local name “Wowo”) and

*Corresponding author. E-mail: quietasever@yahoo.com. Tel: +2348030460901.

Table 1. The Nutritional content, pH, titratable acidity and moisture content of mushroom samples.

Specimens	Sugar content (g)	Moisture content (%) of fresh sample	Ash content (%) of dry weight	pH	Protein content (mg/ml × 10^{-2})	Amino acids (mg/ml ×10^{-2})	Titratable acid (ml/g × 10^{-1})
A (*L. subnudus*)	3.25	78.26	90	6.1	3.25	3.36	2.8
B (*C. molybditis*)	2.53	94.07	85	7.2	10.88	7.56	4.0
C *(Marasmus* sp.)	1.92	84.82	80	6.7	5.14	2.52	0.6
D *(P. tuberegium)*	3.48	89.06	85	6.1	3.61	3.08	2.4

Pleurotus tuberreguim (local name “Olumoyi”).

Collection of specimens

The specimens were collected from four different locations very early in the morning from farmlands in Egbe, West Yagba Local Government Area of Kogi State. The specimens were carefully uprooted by gently lifting them up and holding the stipe gently but firmly close to the rhizomorph, thus carrying some soil along with it. This is to avoid damaging the tissue of the mushroom. Each specimen was carefully labeled before transporting them to the laboratory in town. The specimens were air-dried and stored in transparent polythene bags that are loosely tightened to allow for proper aeration of the specimens.

Characterization and identification

Each of the wild species of the mushrooms were characterized and identified at the mycology Department, University of Agriculture, Abeokuta (UNAAB) as described by Fasidi (1995).

Ash content

The ash content of the samples was determined using the method suggested by Pearson (Pearson, 1975).

Protein content

The protein content of each specimen was carried out by the method described by Lowry et al. (1951) using bovine serum albumin as standard. The optical density of each specimen was read at 650 nm using the spectrophotometer.

Estimation of the total titratable acidity

This was determined by the method suggested by Pearson (Pearson, 1975).

Moisture content

The moisture content of each specimen was determined using the method described by AOAC (1980).

RESULTS

Table 1 shows the nutritional content, pH, titratable acidity and moisture content of mushroom samples.

It was observed that all the mushroom samples have high moisture content and high amount of ash. The pH of the samples was on the high side that is, low acidity. The result also revealed that the four mushroom samples are relatively rich in protein and they have a good amino acid spectrum which is an indication of the high protein content.

The titratable acidity of the samples decreases as pH increases. The highest titratable acidity was recorded in *C. molybditis* while *Marasmus* species had the lowest.

Analysis of the sugar content of the specimens reveals that the mushroom samples have reasonable amount of sugar.

DISCUSSION

The results of the nutritional analysis of the mushroom samples showed that all the specimens have high moisture content (Table 1). This is similar to the result obtained by Ragunathan et al. (1995) on the cultivation of various species of *Pleurot*us on various agro residues. However, the bodies of young mushrooms are soft and brittle and therefore contain higher moisture than fully matured ones which are often tough, almost leathery and must have probably lost some of their water content (Fasidi and Kadiri, 1993). The results also revealed that the specimens have good percentage of ash on dry weight basis with the least value (80%) of ash content found in *Marasmus* sp. which normally has a tiny size and soft fruity body which could account for its low percentage of ash. Generally, fresh mushrooms contain a relatively high amount of fibre which may be responsible for its relatively high amounts of ash (Cheung, 1998). He also described how edible mushrooms are an ideal food for the prev-ention of atherosclerosis due to their high fibre content. His study concluded that the inclusion of edible mushrooms into the diet has a hypocholes-

terolemic effect, perhaps due to dietary fibres such as b-glucans which may increase intestinal motility, reducing bile and cholesterol absorption. The low pH (6.1 - 7.2) and low titratable acid in the samples further suggests why they may be edible; they are neither acidic nor basic and so they are not likely to contain toxins which could be harmful to man or animal.

The relatively high sugar content recorded in the samples (Table 1) is a proof of their been highly nutritious and good for human consumption .This is in line with the report of Fasidi and kadiri (1993) that mature *L. subnudus* fruit bodies are rich in glycogen and sugar. Similar result was also obtained by Marlow Foods Limited (2001) on their research on mycoproteins. Mycoprotein shares much of the value of mushrooms especially in their nutritional composition (Trinci, 1992). *P. tuberregium*, a tuberous wild species has the highest amount of sugar recorded (34.8 g) on dry weight basis and this may be due to the fact that it is highly tuberous and contains a lot of fiber. The samples showed appreciable quantities of amino acids and high amount of protein content.

The nutritional analysis carried out on the four mushroom samples showed that they are all rich in sugar, amino acids and protein. Fasidi and Kadiri (1995) reported that seven Nigerian mushrooms studied for the presence of toxins were non-toxic. Phallotoxin and Amatoxin were found to be absent in these mushrooms. The various symptoms of poisoning which includes discomfort such as stomach upset, diarrhea, emesis, intoxication, dizziness, convulsion and in the case of highly toxic ones, death within two to five days after mushroom ingestion was not seen or recorded when these mushrooms were fed to rats during the research. They therefore concluded that the mushrooms were edible. Zoberi (1976) reported that some forms of *C. molybditis* are edible while others are regarded as poisonous, therefore he suggested that caution should be exercised at eating them until further proofs of their edibility are established. Fukushima et al. (2000) reported that some mushrooms have the ability to lower serum cholesterol concentration. This is promising in terms of health issues because cholesterol is regarded as a risk factor of coronary heart disease and related conditions.

Considering the fact that we have abundant Lignocellulosic wastes in the environment, coupled with the favorable environmental conditions and adequate technical knowledge of the production of mushrooms, it is strongly recommended that farmers should take a courageous and bold step of engaging themselves in commercial production or cultivation of mushrooms since it can be an alternative to meat for Nigerians for their protein requirements.

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