



Nutritional Profile of Two Nigerian Edible Mushrooms: *Pleurotus ostreatus* and *Pleurotus pulmonarius*

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ABSTRACT: This study evaluated the nutritional profile of two *Pleurotus* species namely *Pleurotusostreatus* (*Po*) and *Pleurotuspulmonarius* (*Pp*). The basic compositions studied in each of the mushrooms were Crude protein, total carbohydrate, crude fiber, ash, moisture, and fat contents. Both mushrooms had appreciable nutritive content. The results of the study indicated that *Pp* had higher moisture content of 10.77g/100g on dry weight basis than *Po*. However, *Po* had higher carbohydrate and protein content with values of 70.03g/100g and 8.68g/100g respectively. It can be deduced from this study that despite the variations in value due to certain factors such as storage conditions, environmental conditions and growth substrate, the nutrients content of the mushrooms makes them healthy food stuff and could be used as a cheaper source of protein especially in rural areas.

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Mushrooms are known to have been in existence since creation in its wild form and have been treated as special kind of food (Tiimub *et al.*, 2015). They represent one of nature's greatest untapped resources of nutritious food though being consumed as a delicacy in some parts of the world. The *Pleurotus* species belong to the Phylum Basidiomycota in the Kingdom Fungi. In Nigeria, wild edible mushrooms are used in place of meat in stews and soups by the Yorubas' and Igbo speaking people. Report has it that edible mushrooms collected from various farmlands, forests and plantations may be sold or cooked fresh after treatment with warm salt water, with the addition of essential ingredients like pulped pepper, tomatoes, onions, salt and oil or smoked or sun-dried for later use (Osemwegie *et al.*, 2006).

Edible mushrooms, vegetables and meat have a very similar nutritional value, and are increasingly considered as essential for healthy and balanced diet (Courtecuisse and Duhem, 1994; De Kessel *et al.*, 2001). Research has shown that some wild edible mushrooms are rich in carbohydrates, proteins, vitamins, minerals, fat and fibers (Jiskani, 2001; Johnsy *et al.*, 2011). The nutritional benefits of edible mushrooms such as *Pleurotus ostreatus* and *Pleurotus pulmonarius* have not been fully harnessed possibly due to insufficient information on the viability of these mushrooms which thus necessitated this research.

MATERIALS AND METHODS

Sample Preparation: Fresh mushroom bodies were obtained from Federal Institute of Industrial Research, Oshodi. The mushrooms were dried at 40°C to constant weight and grinded to powder. The powdered samples were then stored in pre-cleaned air-tight containers prior to analysis.

Sample Analysis: The powdered mushroom samples were analyzed for nutritional content according to the Association of Official Analytical Chemists (AOAC, 2000). The constituents determined include crude fiber, fat, protein, ash, moisture and carbohydrate contents. The moisture and ash contents were determined gravimetrically. Briefly, for moisture content analysis, 5.0g of sample was oven dried to constant weight at 105°C. In the determination of ash content, approximately one (1) gram of the dried mushroom powder was charred first and then ashed in a muffle furnace at 500°C overnight. Then weight measurements were taken after cooling. Crude fiber was determined via sample digestion with 1.25% H₂SO₄ and 1.25% NaOH using Fibertec 2010 and then subjected to cold extraction using a known volume of acetone. The amount of crude fiber was then obtained gravimetrically after oven drying. Protein content was assayed using Kjeldahl method while the carbohydrate content analyzed using the Anthrone method as described by Hedge and Hofreiter, (1962).

RESULTS AND DISCUSSION

Table 1 presents the nutritional profile of the two edible mushrooms (*Pleurotus ostreatus* and *Pleurotus pulmonarius*). The moisture content of the mushrooms studied ranges from 5.55g/100g in *Pleurotus ostreatus* to 10.77g/100g in *Pleurotus pulmonarius* on dry weight basis. This value is lower than that reported by Akyuz and Kirbag, (2010) for *Pleurotus ostreatus* with a value of 10.3g/100g. Both mushroom species had similar amount of ash content (9.33g/100g and 9.31g/100g respectively). This conforms with the value of 6.10g/100g to 9.80g/100g reported by Crisan and Sands (1978) for *Pleurotus ostreatus* though lower than that (5.81g/100g) reported by Chirinang and Intarapichet, (2009). Crude fiber contents were also similar with values 11.10g/100g and 11.54g/100g respectively. Fat contents ranges from 1.34g/100g for *Pleurotus ostreatus* to 1.70g/100g for *Pleurotus pulmonarius*. The crude protein content of both mushrooms was 8.68g/100g and 7.88g/100g respectively with *Pleurotus ostreatus* having a higher value. It was found that *Pleurotus ostreatus* had carbohydrate content of 70.03g/100g and *Pleurotus pulmonarius* had a lower value of 60.80g/100g.

Table 1: Nutritional contents (g/100g) of *Pleurotus ostreatus* and *Pleurotus pulmonarius*

Parameter	<i>Pleurotus ostreatus</i>	<i>Pleurotus pulmonarius</i>
Moisture	5.55±0.109	10.77±0.187
Ash	9.33±0.624	9.31±0.144
Crude Fiber	11.10±0.102	11.54±0.396
Crude protein	8.68±0.025	7.88±0.038
Carbohydrate	70.03±1.79	60.8±3.27
Fat	1.34±0.02	1.70±0.092

Values are expressed as mean±std.deviation

The results of this study reveals that the mushrooms investigated are rich in carbohydrates, protein, fiber, ash, and moisture but low in fat. This is in conformity with the findings of some workers who reported that mushrooms have high nutritional components that make it viable as a food source. Mushrooms are known to contain a high amount of moisture depending on the mushroom species and other parameters related to harvest, growth, culinary and storage conditions (Guillamon *et al.*, 2010). Agrahar and Subbulakshmi, (2005) also alluded that the moisture content of mushrooms depends on their harvesting time, maturation period and environmental conditions like humidity and temperature in growing period. This could account for the difference in moisture content of the two mushrooms investigated. Crude fiber contents recorded in this study differs from the result of another study by Roy *et al.*, 2015 who reported a value of 2.4g/100g for *Pleurotus ostreatus* and 3.5g/100g for *Ganoderma lucidum*. The high fiber content of these mushrooms makes them easily digestible. Mushrooms

are also known to be low in fat as reported by many workers (Ezeibekwe *et al.*, 2009, Zoho Bi *et al.*, 2016 and Reis *et al.*, 2012) with values ranging from 0.15g/100g to 3.24g/100g. The result of this work is in line with this range and this actually makes mushrooms suitable for patients with cardiac problems or at risk of lipid induced disorders (Egwim *et al.*, 2011). Crude protein content values reported by this study are lower than that reported by Zoho Bi *et al.*, (2016) and Ayodele and Okhuoya, (2009). The earlier mentioned reasons could account for the variation in values for same species of mushroom. Carbohydrates usually accounts for the prevailing component of mushroom fruit bodies as reported by many workers (Ouzouni and Riganakos, (2007); Barros *et al.*, (2007a); Manzi *et al.*, (2004)). This is true of this study and the values falls within the range of values reported by Crisan and Sands, (1978).

Conclusion: The mushrooms studied were found to be rich in protein, fiber amongst others as does some other edible mushrooms as reported by several workers. They thus, could be considered as source of protein in diet and also as a source of nutraceuticals as its low fat content suits some diet conditions of patients with low cholesterol tolerance.

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