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Research Article

**IDENTIFICATION OF FUNGI ISOLATES FROM DRIED  
BUSHMEAT**<sup>1</sup>Orogu J.O\*, <sup>1</sup>Aphair, A.E., <sup>2</sup>Ehis-Eriakha, C.B.<sup>1</sup>Department of Science Laboratory Technology, Delta State Polytechnic Ozoro, Delta State, Nigeria<sup>2</sup>Department of Microbiology, Edo University, Iyamho, Edo State, Nigeria.**Abstract:**

The identification of fungi isolates from bush meat was analyzed with a view of isolating and identifying the fungi from bush meat. The samples were collected from Ozoro Market, Isoko North Local Government Area, Delta State, Nigeria. Samples of Bush fowl, Rabbit and Dear was collected and coded as sample A, B and C respectively. The fungi isolated are *Candida albican*, *Mold spp.* and *Penicillium spp.* The total heterotrophic count for all the samples ranges from  $3.2 \times 10^3$  cfu/g to  $6.4 \times 10^3$  cfu/g. *Candida albican* has the highest percentage occurrence of 50.0% while *Mold spp* has the lowest percentage occurrence of 16.7%. The fungi isolated from dried bush meat were likely to be as a result of cross contamination from the market by the buyers and sellers or those handling or preparing the dried bush meat with contaminated or unhygienic hands, unsanitary basket, and woven sisal bags.

**Key Words:** *Fungi, Identification, Bush meat, Dried, Market***Corresponding author:****Orogu Joshua Othuke,**

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**INTRODUCTION:**

The term “bush meat” stands for meat that was sourced from wild animal and is meant for human consumption. (Chomel, 2007).

The worldwide bush meat market, estimated to be a multi-billion business not only allows for expanded consumption of infected bush meat but for increased frequency of human exposure to zoonotic disease through direct contact with fresh bush meat. An article emerging infectious disease claims “tracking, capturing, handling butchering in the field, and transporting of carcasses involves risks of cross-species transmission (Weiss, 2008). The percentage of wild animals that are carriers for zoonotic diseases may be increasing, resulting in a growing concern for human safety. Handling and consumption of meat products from animal carrier’s poses great health concern worldwide. Bush meat is regularly consumed in African communities and may make up approximately 80 percent of all animals based protein eaten in central Africa. (Karesh, 2009).

The growing number of infected wildlife and this possibility for genetic recombination is of paramount importance in the development of new zoonotic diseases and their transmission to human (Chomel, 2008). Zoonotic disease from bush meat are not currently prevalent in the United States because the importation of bush meat into the United States is illegal. However, due to market expansion and illegal importation of meat, emerging zoonotic diseases can impact people in the United States as well (Karesh, 2009).

The natural fungal flora associated with food is dominated by *Aspergillus*, *Fusarium*, *Penicillium* genera (Sweeney and Dobson, 1998).

There are various developments and changes that have contributed to the increased sales of bush meat such as population growth, more efficient hunting, through more sophisticated weapons, and the accessibility of formerly isolated remote forest areas. The high demand in the urban regions means that the bush meat trade has become a lucrative business. Nowadays, regional foods are not only available at local market anymore; they can be distributed and sold around the globe within a matter of days. What used to be a means of self-sufficient and feeding a family has now become a global net with a growing demand.

A meaningful proportion of the Nigerian populace consumes bush meat and this serves as a major part of their meal. This present study focuses on Isolation and identification of Fungi from dried bush meat.

**MATERIALS AND METHODOLOGY:****STUDY AREA**

Ozoro is the administrative headquarter of Isoko North Local Government Area, Delta State. The people are Isoko and hospitable and they are mainly farming, and trading of most agricultural products.

**STERILIZATION OF GLASS WARE**

The glass wares that were used for this study were washed with detergent rinsed thoroughly and sterilized using autoclave at 121°C for 15 minutes.

**METHODS****SAMPLE OLLECTION**

Three different species of bush meat (Dear, Rabbit and Bush Fowl) was analyzed. The bush meats samples was purchased from the market in Ozoro Isoko North, Delta State, and it was labeled A (Rabbit), B (Dear) and C (Bush Fowl). The samples were transferred to the laboratory for analysis.

**ANALYSIS****ISOLATING OF TEST ORGANISM**

The sample (A, B, and C) bought from the market were blend and serial dilution on was carried out according to the method of Cheesbrough

(2002). 1ml of  $10^3$ , dilution was transfer to twelve plates of Saboroud dextrose agar (SDA). Media prepared was according to the manufacturer instruction and then used for enumeration of isolated fungi. The plates were incubated at 23°C for 72 hours. The fungi were identified based on colonial/morphological characteristic.

**RESULT AND DISCUSSION:****RESULT**

*Candida albicans*, *Mold spp.* and *Penicillium spp* were isolated from the dried bush meat. Table 1 shows the Morphological and microscopic characteristics of fungal isolates

Table 2 show the total Heterotrophic count in the samples

Table 3 shows the occurrence of fungi isolates.

**Table 1: Morphological and microscopic characteristics of Fungal isolates**

Morphological	Microscopic	Organism
The colony is circular about 4.0 -4.5cm in diameter, Colour is yellowish-green with age. Reverse is creamish-yellow.	Stipe is long, vesicle is dome-shaped. Metulae is small. Conidia is globose, rough and yellowish-green.	<i>Mold species</i>
Blue-green fluffy growth on plate.	Blue-green conidiospores borne in multi link chains.	<i>Penicillin species</i>
The colony are creamy without profuse growth.	Hyphae and conidiospores are non-septate.	<i>Candida albican</i>

**Table 2: The total heterotrophic plate count of the samples**

SAMPLES	cfu/ml
A1	3.2x 10 <sup>3</sup>
A2	3.6x 10 <sup>3</sup>
B1	6.4 x10 <sup>3</sup>
B2	6.1x 10 <sup>3</sup>
C1	4.8x 10 <sup>3</sup>
C2	5.0x 10 <sup>3</sup>

**Table 3: shows the percentage occurrence of fungi isolates**

FUNGI ISOLATES	% OCCURENCE
<i>Mold spp</i>	16.7
<i>Candida albican</i>	50.0
<i>Penicillium spp</i>	33.3

**DISCUSSION:**

The result obtained shows the Morphological and microscopic characteristics of fungal isolates (table 1). The total Heterotrophic count in the samples was well defined in table 2 and table 3 shows the percentage occurrence of the fungi isolate.

The fungi isolates were *Candida albicans*, *Mold spp.* and *Penicillium spp*. The total heterotrophic count ranges from (3.2 x 10<sup>3</sup> to 6.4 x 10<sup>3</sup>). The natural fungal flora associated with food is dominated by *Aspergillus*, *Fusarium*, *Penicillium* genera (Sweeney and Dobson, 1998).

*Candida albican* has the highest percentage occurrence of 50.0% while *Mold spp* has the lowest percentage occurrence of 16.7%. These fungal isolates has been reported to occur in bush meat by (Frazier and Westhoof ,2003). The high incidence of fungi in the dried bush meat sample examined is not expected. This could be due to the present method in which the fresh meat is processed; the dried bush meat are transported and handled. For example the fresh meat pieces are sometimes dried on open lawns. Samples are transported carelessly in unsanitary basket and woven sisal bags. The neat pieces are sometimes also displayed on bare concrete floor and

bare ground during sales in the market. During purchase a lot of people handle meat pieces by way of hand selection with unhygienic hands.

*Mold species* that produce mycotoxins are extremely common and they grow on a wide range of substrates under different environmental conditions, they occur in food commodities all over the world (Bennett and Klich 2003).

This study is in consonance with Fowoyo and Bodunde (2016) that isolated *Penicillium spp.* from smoked fish and bush meat.

**CONCLUSION AND RECOMMENDATION:****CONCLUSION**

The result of this study indicates that pathogenic fungi are associated with bush meat (Samples A, B & C). Since meat remains a major source of protein to man, Consistent efforts should be put in place to reduce the microbial load of bush meat

**RECOMMENDATION**

Bush meat vendor should be encouraged to improve on their hygienic standard during processing, transportation, storage and sales since the present of pathogen are dangerous to public health. Consumers

should be advised to properly wash and boil the dried bush meat before consumption

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