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Journal of Chemical and Pharmaceutical Research

J. Chem. Pharm. Res., 2010, 2(3):575-578

ISSN No: 0975-7384
CODEN(USA): JCPRC5

Nutrient distribution from a newly cultivated edible mushroom *Lentinus tuberregium* (Fr.) Tamil Nadu, India

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ABSTRACT

A newly isolated mushroom strain Lentinus tuberregium, was cultivated, and evaluated for nutritional profile (whole mushrooms) on dry weight basis for their proximate, mineral compositions. The cultivated mushroom accumulated higher concentrations of carbohydrates (55.8%) and protein (25%), moisture (9.4%) total ash (4.7%) crude fibre (3.6%) fat (1.6%) potassium (7.53mg/gm) calcium (2.66mg/gm) magnesium (2.45mg/gm) sodium (1.2mg/gm) iron(0.53mg/gm) copper(0.11mg/gm) zinc(0.41mg/gm) manganese(0.08mg/gm) energy(338kcal) concentrations. Of the nutritive elements analysed, potassium was the most dominant with concentration as high. Followed by calcium, magnesium, sodium respectively.

Key words: *Lentinus tuberregium*, cultivation, proximate composition.

INTRODUCTION

Edible mushrooms are sources of food and delicacies all over the world. They have a high nutritional value almost twice that of any vegetable or fruit. They are rich in vitamins B, C and D and mineral elements [1,2] but the bioavailability of some elements depend on the level of interactions with various antinutrients. Apart from their use as food, sufficient evidences suggest that many species contain substances that may prevent or alleviate cancer, heart diseases, diabetes and viral infections [3,4]. *L. tuberregium* (Oyster mushroom) which are primary wood rot fungi are well known edible mushrooms in different parts of the world [5]. *L. tuberregium*, a newly isolated mushroom strain in India, which is highly appreciated for its meaty taste and biting texture, is usually obtained from the wild (as a forest product). However, with rapid urbanisation, these habitats with suitable agroclimatic conditions are being destroyed alongside the germplasm of this fungus. Hence, efforts towards their domestication are necessary. Paddy

straw, sawdust, and sugarcane waste are agricultural wastes available in India in large quantities. After the removal of the grains, they are sometimes fed to livestock or simply burnt off since they could constitute a nuisance to the environment. However, this waste could be effectively exploited to yield useful food that can improve human nutrition and the remaining material after harvesting can be composted and applied directly to the soil as organic fertilizer. A comparative evaluation of the nutritional potentials of *L. tuberregium* cultivated on Paddy straw, sawdust, and sugarcane waste, is reported in this paper.

EXPERIMENTAL SECTION

For production of cultivated mushrooms, Paddy straw, was obtained from some farmers in Namakkal Dt, Tamil Nadu, India, were screened and cleaned to remove extraneous substances, shredded into pieces of between 1-3 cm long and soaked in water to achieve moisture content of about 60-65%. Polypropylene bags were then filled with moist corncobs substrate, sterilized at 121ºC for 15 min and after cooling inoculated with the mushroom spawn, watered regularly and incubated for 30 days and the emerging fruit bodies were harvested, and oven-dried at 60ºC and powdered in a Philips blender. Moisture content was determined by the direct oven drying method. The weight loss after oven drying of each sample (1g) at 105^0C to constant weight was expressed as % moisture content [6]. The protein was determined by using the adjusted conversion factor 4.38 for mushroom protein [4,7]. Crude fat was determined by using the Soxhlet extraction method using petroleum ether as the solvent [8]. Ash content of 1 g powdered sample was determined as the residue of incineration at 550^0C in a muffle furnace [8]. Total carbohydrate was determined by extracting 2 g of each sample in 50 ml distilled water of which 0.2 ml was diluted ten-fold. To 1 ml of the resulting solution and serial dilutions of glucose stock (10 mg/100 g) solution, 4 ml of anthrone reagent was added and absorbances of solutions were measured by a spectrophotometer at 620 nm against a reagent blank [9]. General metabolisable energy was estimated by multiplying the crude protein, fat and carbohydrate by 16.75, 37.6 and 16.75 (kJ g^{-1}) respectively [10]. The solution of ash dissolved in a drop of trioxonitrate (V) acid made up to 50 ml with deionised water was analysed for Ca, Mg, Cu and Zn using the atomic absorption spectrophotometer, for Na and K using a flame photometer, and for P using UV-Visible spectrophotometer at 436 nm after making ammonium vanadate molybdate complex according to established procedures of Perkin- Elmer [11]. All samples were analysed in triplicates and results were recorded as mean ± S.D. All glassware's used were washed in glass-distilled water and the chemicals used were analytical grade.

RESULTS AND DISCUSSION

Table 1 presents the proximate compositions (%) (on dry weight basis) of cultivated *L.tuberregium* fruitbodies. Moisture content distribution was ranging from (9.4±0.01) protein (25±0.01). In our study, the fat concentration is (1.6±0.01). A newly cultivated mushroom will be more useful in the formulation of weight restriction diets. The crude fibre content (3.6±0.01), total ash (4.7±0.01), carbohydrates (55.8±0.01). This is in agreement with the results of Fasidi and Kadiri [1] and Ola and Oboh [12] who found in the stalks of various edible mushrooms higher crude fibre (3.6±0.01) concentration than in caps. Fibres are an essential part of a healthy diet [4] and have an important preventive action for colorectal carcinoma[13]. Based on the crude protein, carbohydrate and fat contents the energy values (kcal) of the mushrooms were calculated. The newly cultivated mushroom would be a energy source of (338kcal). Mineral composition (mg g^{-1}) is shown in Table 2. Potassium was the most abundant nutrient (7.53mg/gm) followed by calcium (2.66mg/gm) and magnesium (2.45mg/gm), iron

(0.53mg/gm), manganese (0.08mg/gm), sodium (1.2mg/gm), copper (0.11mg/gm) Fasidi and Ekuerre [14] and Manzi et al. [15] also reported that potassium was the most abundant mineral element in various species of edible mushrooms. In our study potassium concentration was (7.53mg/gm), mushrooms are generally low in sodium (1.2mg/gm) concentration[12]. The low sodium and high potassium concentration is of significance as a Na/K ratio less than 0.6 [16] suggests that the mushrooms will be suitable for diet formulation for hypertensives. Zinc was distributed in the ratio of (0.41mg/gm). The results of the present study indicate that newly cultivated mushroom are rich in nutrients and minerals and low in fat, result poor mineral bioavailability.

Table-1

Parameters	**Proximate composition of newly cultivated edible mushroom *Lentinus tuberregium* (%)**
Total carbohydrates	55.8±0.01
Total protein	25±0.01
Total crude fibre	3.6±0.01
Total ash	4.7±0.01
Total fat	1.6±0.01
Moisture	9.4±0.01
Energy value(Kcal)	338

Analysed on dry weight basis, (mean ±SD)

Table-2

Minerals	**Proximate composition of newly cultivated edible mushroom *Lentinus tuberregium* (mg/gm)**
Pottasium	7.53mg/gm
Calcium	2.66mg/gm
Sodium	1.2mg/gm
Iron	0.53mg/gm
Magnesium	2.45mg/gm
Copper	0.11mg/gm
Maganese	0.08mg/gm
Zinc	0.41mg/gm

Analysed on dry weight basis, (mean ±SD)

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