RESEARCH ARTICLE — FOOD SCIENCE RESEARCH JOURNAL — Volume 5 | Issue 1 | April, 2014 | 56-58

Study on nutritional evaluation and composition of oyster mushrooms (*Pleurotus florida*)

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The present investigation was conducted to study nutritional composition of oyster mushroom (*Pleurotus florida)*. Standard methods of analysis have been employed to find out the proximate composition and other nutritional parameters of the mushroom. *Pleurotus florida* was found to contain 91.80 per cent moisture, 27.92 per cent crude protein, 7.82 per cent total ash, 0.72 per cent fat, 11.87 per cent of crude fibre and 47.80 per cent carbohydrates. Total soluble sugars, reducing sugars and non-reducing sugars were 3.01, 0.38 and 2.63 per cent, respectively. Acid detergent fibre and neutral detergent fibre content were 17.82 and 43.22 g/100g, respectively and *in vitro* protein digestibility was 78.96 per cent. Oyster mushrooms also found to have good amount of total mineral content. As the oyster mushroom found to have good nutritional composition thus can be utilized in preparation of various nutritious recipes for improving the nutrition status of the population of the country. As it has low calorific value and very high content of protein, dietary fibres and minerals, devoid of cholesterol, these make an ideal diet for the heart patients. With very high fibre and alkaline elements, mushrooms are suited to those suffering from hyperacidity and constipation and it is also found to have good protein digestibility.

Key Words : Oyster mushroom, Nutritional evaluation, Dietary fibre, Proximate composition

How to cite this article : Bora, Parul and Kawatra, Asha (2014). Study on nutritional evaluation and composition of oyster mushrooms (*Pleurotus florida*) . *Food Sci. Res. J.,* **5**(1): 56-58.

INTRODUCTION

Mushroom is a macroscopic fungi having various shapes, sizes, appearance and edibility. They are used as a food since time immemorial due to their taste and other health beneficial functions. Mushroom is a fleshy sponge umbrella shaped form belonging to kingdom Mycota. It lacks the usual green chlorophyll and, therefore, cannot synthesize its own food photosynthetically, therefore, needs a substrate for their own absorptive nutrition. They produce enzymes that degrade complex organic substances. Mushrooms are known as wonder vegetable as they have unique growth pattern and quick multiplication. The significant feature of mushrooms is that they are cultivated entirely on waste products and convert a wide spectrum of agriculture and industrial waste into substance on which growth is supported. So mushroom cultivation is emerging as a promising agrobased and land independent enterprise, having capacity to convert nutritionally valueless substance into high protein food.

Mushrooms are popular food and commercially available in India. The food experts have also realized and increasingly appreciated the food value of mushroom because of the low calorific value and very high content of protein (20-40% on dry weight basis), vitamins and minerals. These are very low calorie food suited to those interested in cutting down the calorie intake, like obese persons. Being low in fat, devoid of cholesterol, these make an ideal diet for the heart patients. With very high fibre and alkaline elements, mushrooms are suited to those suffering from hyperacidity and constipation, consumption of fibre has gained importance in general health maintenance. Mushroom can serve as one of the most important sources of vegetable protein combating the growing shortage of protein especially in vegetarian population. FAO

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has recommended it as a supplementary food item in context of world protein shortage for the growing populations of the developing countries. The protein content of fresh mushroom is higher than most of vegetable with the exception of green peas and pulses. Mushrooms are almost equal to meat and milk in nutritional value. Essential amino acids index, amino acids score and nutritional index lies intermediate between low grade vegetable and high grade meats and values are close to that of milk. Among different types of mushroom white button mushrooms are the most popular one while fewer researches have been done on oyster mushroom. Thus, the study was planned to analyse the proximate composition and nutritional content of oyster mushrooms.

METHODOLOGY

The study was carried out in the Department of Foods and Nutrition, I.C. College of Home Science, CCS Haryana Agricultural University, Hisar. The oyster mushrooms (*Pleurotus florida)* were procured from mushroom farm, Department of Plant Pathology, CCSHAU, Hisar. Fresh mushrooms were dried in hot air oven at 50°C, powdered and were analyzed chemically for their nutritional composition.

Proximate composition of mushroom *i.e*. moisture, crude fat, ash, crude fibre content was determined by employing the standard method of analysis (AOAC, 2000). The total nitrogen was estimated by a standard method of AOAC (2000). The crude protein was calculated by using the conversion factor of N × 6.25 of analysis. Crude fat was estimated by employing the standard method of analysis (AOAC, 2000) using the soxhlet extraction apparatus. Total soluble sugars were estimated by method of Cerning and Guilhot (1973). To 500 mg of the sample, 25 ml ethanol (80%) was added in a round bottom flask. The flask was connected to a condenser and kept on a boiling water bath for 30 minutes with occasional stirring. The extract was cooled, centrifuged at 8000 rpm for 15 minutes. The supernatant was collected in a beaker. This procedure was repeated twice, each time taking 25 ml ethanol (80.00%). The extract was kept on a boiling water bath to evaporate ethanol. The residue was dissolved in distilled water and volume was made to 50 ml. Total soluble sugars and reducing sugars were estimated by method of Yemm and Willis (1954) and Somogyi's modified method (Somogyi, 1945), respectively. The amount of non-reducing sugars was calculated as the difference between total soluble sugars and reducing sugars. Dietary fibres were estimated by Van Soest and Wine (1967) method and modified method of Mertz *et al*. (1983) has been used to estimate *in vitro* protein digestibility. Oyster mushrooms were also analysed for the total mineral content by atomic absorption spectrophotometer AABQ-20 by employing method of Lindsey and Norwell (1969) and phosphorous content was analysed calorimetrically by Chen *et al.* (1956).

OBSERVATIONS AND ASSESSMENT

Oyster mushrooms (*Pleurotus florida)* were analyzed for proximate composition, carbohydrates, dietary fibres and *in vitro* digestibility. Mean values for moisture, crude protein, crude fat, total ash and crude fibre of oyster mushroom are depicted in Fig. 1.

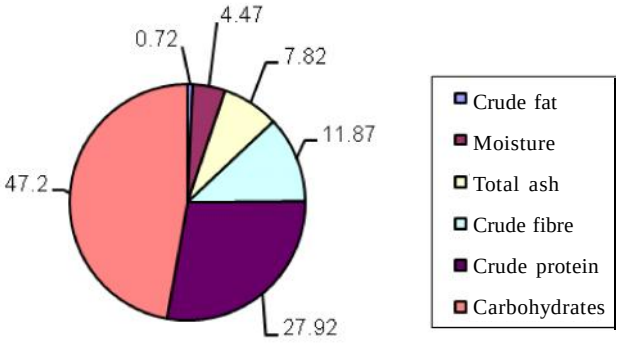

Fig. 1: Proximate composition of oyster mushroom (*Pleurotus florida*) on dry weight basis

Moisture content in *Pleurotus florida* was found to be 91.80 per cent on fresh weight basis. Crude protein, crude fat and ash content were 27.92, 0.72 and 7.82 g/100g on dry weight basis, respectively. Crude fibre was found to be 11.87 g/100g. The carbohydrate content was 47.20 g/100g on dry weight basis. Data on total soluble sugars, reducing sugars, non-reducing sugars ADF, NDF AND *in vitro* protein digestibilty are presented in Table 1. The total soluble sugars content was found to be 3.01 per cent in oyster mushroom. Reducing sugars and non-reducing sugars in *Pleurotus florida* were 0.38 and 2.63 g/100g on dry weight basis, respectively. Dietary fibre content and *in vitro* digestibility of protein depicts that the ADF content of oyster mushroom was 17.82 g/100g on dry weight basis whereas NDF content was 43.22 g/100g. *In vitro* protein digestibility of *Pleurotus florida* was

Table 1 : Total soluble sugars, reducing sugars, non-reducing sugars,ADF,NDF and *invitro* protein digestibility (g/100g) of oyster mushroom (*Pleurotus florida*) on dry weight basis

Parameters	Content
Total soluble sugars	3.01±0.05
Reducing sugar	0.38±0.10
Non-reducing sugars	2.63±0.06
Acid detergent fibre (ADF)	17.82±0.01
Neutral detergent fibre (NDF)	43.22±0.07
In vitro protein digestibility	78.96±0.47

Values are mean ± SE of three independent determinations

78.96 per cent.

The mineral content of oyster mushroom is presented in Table 2. Data reveals that iron content in *Pleurotus florida* was 11.60 mg/100g. Zinc was found to be 13.60 mg/100g, phosphorus content was 1254 mg/100g, manganese was 5.46 mg/100g, calcium was found to be 1280.33 mg/100g and copper was 3.83 mg /100g on dry weight basis. It can be concluded from the present study that oyster mushroom (*Pleurotus florida*) is highly nutritious especially rich in proteins with high digestibility, high fibre and good *in vitro* protein digestibility. It can be used in the dietaries of population to improve their nutritional status and it can used as cheap alternative for non-vegetarian food to provide vital proteins in good amount. Acceptability of oyster mushroom indicated that incorporation of mushroom in product development would lead to increase in demand of this mushroom which will help in motivating the farmers to grow this crop. This indirectly, would also help in improving their economic as well as nutritional standards.

Table 2 : Mineral content (mg/100g) of oyster mushroom (*Pleurotus florida*) on dry weight basis

Minerals	Content
Iron	11.60±0.06
Zinc	13.60±0.05
Phosphorus	1254 ±0.12
Manganese	5.46±0.56
Calcium	1280.33±0.44
Copper	3.83±0.51

Values are mean ± SE of three independent determinations

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Received : *23.12.2013;* **Revised:** *18.03.2014;* **Accepted :** *30.03.2014*