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# Analysis of nutritional composition and antioxidant activity of oyster mushrooms grown in Bangladesh

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**Abstract**
In the present investigation, two species of oyster mushroom (*Pleurotus hiking* and *Pleurotus ostreatus*) were analyzed for nutritional values (carbohydrate, protein, vit-$B_2$, vit-C, β-carotene, lycopene, ash, moisture and minerals concentration) and antioxidant activities. The research showed significantly different results for most of the parameters studied. Between the two oyster mushrooms *P. hiking* contained the higher concentration of protein, ash, calcium (Ca), zinc (Zn) and iron (Fe) than *P.ostreatus*. On the other hand, *P. ostreatus* contained the higher amount of carbohydrate, vit-$B_2$, vit-C, total moisture and manganese (Mn) content as well as pleasing antioxidant activities than *P. hiking*. The concentration of β-carotene and lycopene were found very negligible in both the species. The findings also showed that the studied oyster mushrooms may be used not only as an admirable nutritious dietary food but also unobjectionable pharmaceutically significant with high antioxidant.

**Keywords:** oyster mushroom, nutritional values, minerals concentration, antioxidant activity

## 1. Introduction

The genus *Pleurotus* is belongs to gilled fungi which include one of the most widely eaten species popularly known as oyster mushroom. It is found in both tropical and temperate climates. The oyster mushrooms are in the third place after the white button and shiitake among the world mushroom productions [1-2]. Oyster mushroom is a prevalent edible mushroom that is commercially cultivated worldwide [3]. This mushroom has high nutritional value as an important source of protein, carbohydrates, vitamins, calcium and iron [4]. Its extract can lower cholesterol as effectively as dietary supplements [5]. Furthermore, *P. ostreatus* has potent antinociceptive, antitumor, antioxidant and immunological activities [6-8]. Generally, people in Bangladesh are still not very aware regarding the nutritional and medicinal importance of mushrooms. The history of mushroom cultivation is very recent in Bangladesh. Only some species of mushrooms are now cultivated in the country and among them *P. ostreatus*, *P. sayoncayu, P. florida* and *Calocybe indica* are popular and widely accepted [9]. Antioxidant supplements or antioxidant containing foods are important in the human diet to prevent or to reduce oxidative damage [10-11]. *Pleurotus* mushroom is an admirable source of no starchy carbohydrates [12], with a high content of dietary fiber and a moderate quantity of proteins including most amino acids, minerals and vitamins [13]. Oyster mushroom is rich in vitamin C, B complex and mineral salts required for human health [14].

Mushroom contains various bioactive ingredients such as phenolic compounds, polyketides, terpenes and steroids which are recognized as excellent antioxidants [15]. The fruiting body of *Pleurotus* possesses a higher concentration of antioxidants than other commercial mushrooms [16-17]. Antioxidants present in mushrooms are possible to be protective agents to help the human body to reduce oxidative damage without any interference [18]. The present investigation was undertaken to analyze the nutritional quantities and antioxidant activity of two mushroom species of *Pleurotus* genus grown in Bangladesh.

## 2. Materials and Methods

### 2.1 Materials

#### 2.1.1 Mushroom Sample

The dried fruiting bodies of *Pleurotus hiking* and *P. ostreatus* were used in the present investigation. Samples were collected from the Mycopath Laboratory of the Department of Botany, University of Rajshahi, Bangladesh.

### 2.2 Methods

#### 2.2.1 Nutritional composition analysis

#### 2.2.1.1 Determination of carbohydrate concentration

The total carbohydrate concentration was estimated according to the enthrone method which is a simple colorimetric method [19]. Briefly, ethanolic extracted sample mixed well and transfer in 1 ml to a COD tube. Two (2) ml of already chilled 75% $H_2SO_4$ solution was added to COD tube then vortex and 4 ml of already chilled enthrone solution was also added. The COD tubes were placed on the heating block and boiled at 100ºC for 15 min. After cooled down to room temperature the absorbance of the solution was measured at 578 nm in a spectrophotometer (Beckman DU-640 Spectrophotometer). The carbohydrate concentrations were calculated according to the referred formula.

#### 2.2.1.2 Determination of soluble protein concentration

The soluble protein concentration of the mushroom was determined [20]. Briefly, Reagents (i) (2% $Na_2CO_3$ solutions in 0.1 N NaOH) and (ii) (0.5% $CuSO_4.5\ H_2O$ in 1% Na-K tartrate) were mixed in the ratio of 50:1 and the reagent (iii)

(Folin-Ciocalteu's Reagent-FCR) was diluted just before use. In 9 glass test tubes, 0.0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6 and 0.8 ml of the standard protein solution were taken and the volume was made up to 1 ml with distilled water. One (1) ml of the sample was taken in a test tube and a duplicate was made. To each of the tubes, 5.0 ml of (i and ii) mixture was added and after10 min 0.5 ml of FCR was added. The absorbance of the solution was recorded after 30 min at 650 nm. Protein content was calculated by preparing standard curve with bovine serum albumin (BSA).

#### 2.2.1.3 Determination of *β*-carotene and lycopene concentration

*β*-carotene and lycopene were determined following the method described by [21]. Briefly, about 100 mg of dried ethanolic extract was vigorously shaken for 1 min with acetone and hexane (4:6 v/v) mixture making a final volume of 10 ml and filtered through Whatman no. 1 filter paper. The absorbance of the filtrate was measured at 453, 505 and 663 nm *β*-carotene and lycopene concentrations were calculated according to the referred formula.

#### 2.2.1.4 Determination of moisture content

Moisture content was determined following the conventional procedure [22].

#### 2.2.1.5 Determination of ash content

Ash content was determined following the method of [23]. Briefly, about 50 g of fresh mushroom was weighed in a porcelain crucible which was previously cleaned, heated to 100 $^0$C, cooled and weighed. The crucible was placed in a muffle furnace for about 4 hours at 600 $^0$C. It was then cooled in desiccators and weighed. To ensure completion of ashing, the crucible was again heated in the muffle furnace for half an hour, cooled and weighed again. This was repeated till two consecutive weights were the same and the ash was almost white in colour.

#### 2.2.1.6 Determination of vitamin C content

Vitamin C estimation was determined following the Folin-ciocalteu reagent method by [24], with slight modifications. Extracts (0.5 ml) were added to 0.8 ml of 10% trichloroacetic acid and vigorously shaken and the mixtures were kept on ice for 5 min and then centrifuged at 3000 rpm for 5 min. This extract (0.2 ml) was then diluted to 2 ml with distilled water. Commercially prepared 2.0 M Folin-Ciocalteu was diluted 10 fold with distilled water and 0.2 ml of this diluted reagent was added to the mixture and vigorously shaken. After 10 min at room temperature, the absorbance was measured at 760 nm against distilled water as a blank and the vitamin C content was estimated through the calibration curve of ascorbic acid.

#### 2.2.1.7 Determination of vitamin $B_2$ (Riboflavin) content

Following Spectrophotometric methods vitamin $B_2$ (Riboflavin) from the two mushroom cultivars was determined [25]. Briefly, 5 g of the sample was extracted with 100 ml of 50% ethanol solution and shaken for 1 hour. This was filtered into a 100 ml flask. 10 ml of the extract was pipette into 50 ml volumetric flask.10 ml of 30% $H_2O_2$ were added and allowed to stand over a hot water both for about 30 min. 2 ml of 40% sodium sulphate (made with ethanol) were adding. This was made up to 50 ml mark and the absorbance measured at 510 nm in a spectrophotometer and vitamin $B_2$ content was estimated through the calibration curve of riboflavin dust.

#### 2.2.1.8 Determination of mineral content

The mineral content of the mushroom was determined by the atomic absorption spectrophotometric method [26]. Briefly, about 50 g of mushroom was taken from each cultivar and all samples were washed with tap water followed with de-ionized distilled water. Samples were cut into small pieces and sun dried in a concrete floor about 12 hours. After drying the samples were ground into powder from. Approximately 0.5 g of each sample in duplicate taken into digestion tube and to each of the tubes 5 ml of nitric acid and 2.5 ml of per chloric (followed by 2:1 ratio) acid was added and mixed well. The test tubes were heated to about 100 $^0$C for 10-12 hours in boiling water bath and cooled. Then 2.5 ml of nitric acid was further added to each of the tubes and heated to about 3-4 hours in a boiling water bath till the solutions becomes transparent. The solutions were cooled and filtered through Whatman no. 1 filter paper and made up to 100 ml with de-ionized distilled water (working standard). All the glassware's including digestion tubes were shocked with 30% $HNO_3$ for 8 hours and finally washed with de-ionized distilled water. Aliquot of 14 ml of the solution of each treatment was pipette into test tubes. A reagent blank was prepared by taking 14 ml of de-ionized distilled water in a test tube. The absorbance and concentrations (ppm) of the solution were measured at 422.67 (Ca), 371.99 (Fe), 403.08 (Mn), 307.59 (Zn) nm in an atomic absorption spectrophotometer (AAS). The amount of minerals content in the mushrooms was calculated from the concentrations (ppm) of the solutions.

### 2.2.2 Antioxidant activity by DPPH radical scavenging methods

The antioxidant activity of the extracts was measured on the basis of the scavenging activity of the stable 1, 1- diphenyl 2-picrylhyorazyl (DPPH) free radical according to the method described by [27] with slight modifications. 1 ml of 0.1 mM DPPH solution in ethanol was mixed with 1 ml of plant extract solution of varying concentrations ( 50, 100, 150, 200 and 250 µg/ml). Corresponding blank sample were prepared and L-Ascorbic acid (1-100 µg/ml) was used as reference standard. Mixer of 1 ml ethanol and 1 ml DPPH solution was used as control. The reaction was carried out in triplicate and the decrease in absorbance was measured at 517 nm after 30 minutes in dark using UV-Vis spectrophotometer. The inhibition % was calculated using the following formula.

Inhibition % = Ac-As/Ac×100, Where Ac is the absorbance of the control, as is the absorbance of the sample.

## 2.3 Statistical Analysis

All experiments were performed having at least three replications for each sample. Statistical analyses (*t-test*) were performed using Genstat software (14$^{th}$ edition) and graphical presentation was prepared using Graph Pad Prism 6. The significance level was at ($P \leq 0.05$).

## 3. Results & Discussion

In the present observe two oyster mushroom genotypes had been evaluated for their nutritional well worth like sugar, protein, $\beta$-carotene, lycopene, moisture content, ash content, vitamin C concentration, vitamin $B_2$ concentration and mineral attention like Iron (Fe), Zinc (Zn), manganese (Mn) and potassium (k) for the analysis of their significance. Further, antioxidant activity turned into evaluated by comparing them with the antioxidant activity of ascorbic acid in DPPH radical scavenging approaches. The effects derived from those special techniques are represented underneath the following distinctive subheads.

### 3.1 Nutritional Analysis

The results of these parameters of nutritionary quantities are shown in Table 1. A detail of the results was obtained from each of the experiments are represented underneath different heads:

#### 3.1.1 Total carbohydrate concentration (%)

Pleurotus genus beneath this investigation was considerably totally different in total carbohydrate concentration in keeping with t-test (Table1). The species *P.ostreatus* was found to possess the higher total carbohydrate concentration (40.22 0.40%) whereas the quantity of *P.hiking* was showed (34.83 0.29%). Carbohydrate is a vital constituent of mushrooms of top quality. The macromolecule content of mushroom represents the majority of mature bodies accounting for 50 to 64 on a dry weight basis. Free sugars quantity to concerning a 145 [28]. Carbohydrate acts as an associate energy supplier and that they are often found in several foodstuffs. The same development was according to by several earlier researchers. 33.57% and 37.64% carbohydrate within the fruiting bodies of *P. ostreatus*, *P. sajorcaju* [29]. Many species of oyster mushroom reported that sugar of *P. eryngii*; *P. ostreatus* and *P. sajorcaju* were 39.85, 37.87 and 37.72 g/100 g severally [30]. Different studies rumored that the sugar contents of *P. ostreatus* varied 46.6-81.8% [31-33] abreast of that carbohydrate contents found in oyster mushroom were 62.5% on the dry weight basis.

#### 3.1.2 Total protein concentration (%)

The statistical analysis for the whole protein content of two species showed significant variation consistent with the t-test. The highest quantity of soluble protein was found in *P. hiking* (41.91±0.67%). The lowest quantity of soluble protein was ascertained in *P. ostreatus* (39.56±0.84%) conferred in Table one. Protein is a crucial constituent of dry matter of mushrooms of top quality. The protein contents of mushrooms are full of a variety of things specifically the kind of mushrooms, the stage of development, and the part sampled, level of nitrogen available and therefore the location [34]. The protein of mushroom is of top quality and wealthy in varied essential amino acids [35]. Analysis [36] in agreement that mushroom contains high protein content among fruits and vegetables although the quantity isn't similar to fish, eggs, chicken or beef. Protein content in mushrooms varies otherwise among species and that they are suffering from environmental factors and stage of fruiting body maturity [37]. *Pleurotus sp.* is taken into account a decent supply of superior quality protein with well distributed essential amino acids [38]. Many species of mushrooms grownup in Finland and according to that protein content of *P. ostreatus* and *Lentinula edodes* were 24.6 and 21.4% of dry matter severally [39].

#### 3.1.3 *β*-Carotene concentration

$\beta$-carotene content of tested mushrooms was recorded between (0.013 ± 0.004 to 0.015 ± 0.001) mg/100 ml. The highest $\beta$-carotene content in *P.ostreatus* (0.015 ±0.001 mg/100 ml) and therefore the lowest carotene content in *P. hiking* (0.013 ± 0.004 mg/100 ml) (Table1). Each value doesn't have any significant distinction per the t-test. In the present study $\beta$-carotene and lycopene were additionally found however in little concentration. Both molecule acts as a strong antioxidant. $\beta$-carotene may be a member of the antioxidant family, that are extremely pigmented (red. orange, yellow), fat-soluble compounds naturally present in several fruits, grains, oils, and vegetables. Among the naturally occurring carotenoids that may be converted to fat-soluble vitamin within the physical body, supposed 'Provitamin A carotenoids, $\beta$-carotene is that the most abundant and most effective are found in foods.

#### 3.1.4 Total lycopene concentration

The highest lycopene content was determined in *P. ostreatus* (0.003± 0.002 mg/100 ml) whereas very cheap in *P. hiking* (0.003±0.001 mg/100 ml). There was no significant difference in line with the t-test. Lycopene contains eleven conjugated and a couple of non-conjugated covalent bond which ends up in its high undershirt oxygen termination ability [40]. They each facilitate to cut back the chance of vessel diseases and adenocarcinoma. Each is found in terribly tiny concentration eaten mushroom samples. Mushroom of *Pleurotus ostreatus* has a comparatively high concentration of antioxidant like $\beta$ -carotene [41].

#### 3.1.5 Total moisture content

The highest quantity of total moisture content was determined in *P. ostreatus* (80.55±0.26%) and therefore the lowest quantity of total moisture content was determined in *P. hiking* (78.23±0.40%). The statistical analysis was considerably totally different in keeping with the t-test. Mushroom typically have a high moisture content that accounts for their short shelf life as they deteriorate simply once harvest if preservative measures aren't used [42]. Fresh mushroom contains regarding 90% moisture and 10% dry matter and dry mushroom contains 90% dry matter and 10% moisture [43]. Goyal *et al*. 2006 rumored that *P. sajor caju* contains 89.58% of moisture. Various species of Pleurotus and rumored that *P. ostreatus* contains highest moisture (86.0%) followed by *P. Sajor caju* (87.0%) and *P. florida* (87.5%) [44]. within the present study, the moisture content of various oyster mushroom was found to vary 78.23±0.040 to 80.55±0.26 percent that shows the similarity with the previous study done. The moisture content (91.42-94.20%) of the oyster mushroom *Pleurotus ostreatus* that rumored [45-46].

### 3.1.6 Total ash content
Ash content of tested mushrooms was recorded between 6.41±0.46 to 5.66±0.29%). The highest ash content was ascertained in *P.hiking* (6.41± 0.46%) whereas the lowest was found in *P.ostreatus* (5.6±0.29%). Each value was no significant distinction in keeping with the t-test. The most constituents of the mushrooms are ash, K and P (totally 60%) [47]. Within the present study, ash content was found within the range of 5.66±0.29 to 6.41±0.46 correlating the current findings with alternative works utterly. The ash content of two oyster mushrooms *viz*, *P. ostreatus* (5.65%) and *P. pulnonarius* (7.95%) [29]. The ash content of three species of *Pleurotus viz*, *P. cryngii*, *Pleurotus ostreatus* and *P. sajorcaju* and found it to be 4.89, 7.78 and 5.84% severally [30], however in another work allotted by [1] for *P. sajorcaju* wherever, ash content was discovered 7.46%. Ash contents were 8.0% and 5.8% on a dry weight basis severally [33]. On top of findings are quite just like our findings just in case of ash content during this study.

### 3.1.7 Total vitamin-C concentration
Significant variation was determined between two species of genus *Pleurotus* in respect of aliment concentration. The highest quantity of vitamin-C was obtained from *P.ostreatus* (68.06 mg/kg) and therefore the lowest quantity of vitamin-C was recorded from *P. hiking* (24.68 mg/kg) (Figure1). Mushroom is taken into account to be a decent supply of antioxidant or vitamin C. within the tested samples vitamin C content ranges to 24.68 - 68.06 mg/kg. The entire amounts of vitamin C were higher in *P. ostreates* then *P.hiking*. There are several reports describing in respect of vitamin C content in mushroom. Mushroom of *Pleurotus ostreatus* has a comparatively high concentration of vitamin C [41].

### 3.1.8 Total vitamin-$B_2$ concentration
The statistical analysis for vitamin-$B_2$ concentration of two species showed vital variation. The very best and therefore the lowest quantity of vitamin-$B_2$ concentration were found in *P.ostreatus* (2.876 mg/kg) and *P. hiking* (1.746 mg/kg), severally (Figure1).

### 3.1.9 Total mineral concentration
Mineral content is additionally necessary for the organic process worth of mushrooms. The species provides an affordable quantity of minerals compared with vegetables [48]. Determination of the key minerals and trace components in mushroom are dole out and reportable that species, soil kind and chemical content of soil will cause variation within the minerals content of Mushrooms. The higher-yielding mushroom has lower concentrations of some mineral components in their fruit body then lower yielding species once grownup in some atmosphere however this is often not universally discovered.

#### 3.1.9.1 Manganese (Mn) content (mg/kg)
The best Mn content 6.59 mg/kg was resolute within the species *P.ostreatus* and lowest content resolve within the species *P. hiking* (4.79 mg/kg) (Fig. 2). Manganese (Mn) is a necessary metal required for biological systems like metalloproteinase [49]. The toxicity limit of Mn is 400-1000 mg/kg. The literature has reportable the degree of Mn as 14.2-69.7 mg/kg [50]. The Mn level of mushroom *Pleurotus sp.* was 12.9-93.3 mg/kg [51]. Many mushrooms and reportable that the Mn was present in mushroom as 14.5-63.6 mg/kg [52].

#### 3.1.9.2 Zinc (Zn) content (mg/kg)
The best quantity of Zn was found in *P. hiking* (6.73 mg/kg), whereas the bottom quantity was found within the *P. ostreatus* species was 4.04 mg/kg (Figure 2). Zinc (Zn) is a necessary metal and a element of a large form of completely different enzymes within which it's concerned in chemical change, structural and regulative roles. Zn content recorded within the studied mushroom *viz. P. hiking* and *P. ostreatus.* The lower concentration of Zn present within the studied samples. The permissible limit of Zn is 60 mg/kg in foods. Many mushrooms and reportable that Zn was present in mushroom as 45.0-173.8 mg/kg [50]. Zn level reportable in literature was 33.5-89.5 mg/kg [51] and 29.3-158 mg/kg [52].

#### 3.1.9.3 Iron (Fe) content (mg/kg)
The utmost quantity of Fe was found in *P. hiking* (9.52 mg/kg), whereas the bottom quantity was found in *P.ostreatus* (4.279 mg/kg) (Figure 2). Iron (Fe) was additionally present in fairly low amounts however could create a contribution to dietary intake. It's a necessary metal concerned in biochemical processes. Among all different micronutrients, iron is needed by the plants within the largest quantity. The Fe content of the tested mushrooms ranged from that are below was the safe limit of 15 mg/kg set by World Health Organization. Levels of Fe reportable by [51] were 14.6-83.5 mg/kg. Many mushrooms and reportable that the Fe content of mushroom was 18.0-4.07 mg/kg [52]. On the opposite hand, levels of Fe reportable by [52] were 3.13-11.90 mg/kg.

#### 3.1.9.4 Calcium (Ca) content (Mg/kg)
The utmost quantity of Ca was found in genus *P. hiking* (7.97 mg/kg), whereas the bottom quantity was found in *P.ostreatus* (2.36 mg/kg) (Figure 2). Calcium (Ca) presents in fairly low quantity however could create a contribution to dietary intake. There was a decent agreement with some previous studies on mushroom whereas values of Ca were low as compared with previous studies [33]. *Pleurotus hiking* stands intent on be comparatively wealthy in Ca.

### 3.2 Result of Antioxidant activity assay
#### 3.2.1 Antioxidant activity of *P. hiking*
The extract of *P. hiking* was tested against DPPH stable radicals spectrophotometrically that was unconcealed that the unconventional scavenging activity of alcohol extract of *P. hiking* possessed wonderful antioxidant capability with the increasing concentration of the extract (Figure 3). Just in case of five completely different concentrations (2.5, 5, 10, 15 and 20 mg/ml) the reasons scavenging activity of this species was step by step exaggerated 29.22%, 45.37%, 56.67%, 68.50%, 72.06% and just in case of ascorbic acids maximize scavenging activity was 31.79%, 38.67%, 65.03%, 76.81%,

and 79.83%. Whereas the $IC_{50}$ value of this species and ascorbic acid were severally 7.65 mg/ml and 5.59 mg/ml (Figure 4). Therefore, *P.hiking* was showed higher $IC_{50}$ value than ascorbic acid meaning less potent antioxidant than ascorbic acid.

### 3.2.2 Antioxidant activity of *P. ostreatus*

Similarly, the extract of *P. ostreatus* was tested against DPPH stable radicals spectrophotometrically that were discovered that the novel scavenging activity of *P.ostreatus* with grain alcohol extract possessed wonderful antioxidant capability with the increasing concentration of the extract (Figure 3). In case of five completely different concentrations (2.5, 5, 10, 15 and 20 mg/ml) the justifications scavenging activity of this species was gradually magnified 36.93%, 51.28%, 66.84%, 67.67%, 68.20% and just in case of ascorbic acid's maximize scavenging activity was 31.79%, 38.67%, 65.03%, 76.81% and 79.83%. Whereas the $IC_{50}$ value of this species and ascorbic acid were severally 6.64 mg/ml and 5.59 mg/ml (Figure 4). *P. ostreatus* showed a better $IC_{50}$ value than ascorbic acid. Which means it absolutely was less effective antioxidant than ascorbic acid, however relatively potent antioxidant than *P.hiking*.

The DPPH methodology was wont to verify the free radical scavenging activity of *P.hiking* and *P. ostreatus*. DPPH (2, 2-diphenyl-l-picrylhydrazyl) antioxidant assay could be a stable free radical, to bleach within the presence of antioxidants. DPPH antioxidant assay is employed to judge scavenging activity of antioxidants. The DPPH free radical, which may simply receive an election from antioxidant molecules, the DPPH becomes colorless. Extracts were subjected to the analysis of antioxidant activity by exploitation DPPH radical scavenging assay. All the extract showed antioxidant activity in an exceedingly concentration-dependent manner. The scavenging activity on DPPH radical of ethanolic extract of mushroom was compared with ascorbic acid (Standard).

Radical scavenging activity is measured by a decrease in absorption of samples [54]. Two tested extracts at completely different concentration within the present study showed sensible radical scavenging activity. The tested samples *viz. P. hiking* and *P. ostreatus* extracts showed $IC_{50}$ value for DPPH scavenging activity 7.65 mg/kg and 6.64 mg/kg severally. Lower $IC_{50}$ values represent higher antioxidant activity. Therefore we are able to say that *Pleurotus ostreatus* have high antioxidant capability relatively than *Pleurotus hiking*.

Earlier studies with genus *Pleurotus* species extracts showed $EC_{50}$ value for DPPH scavenging activity 11.56 mg/ml for *P. ostreatus* [55]. The variation is also attributed to the distinction within the concentration of the antioxidant compounds due to the solvent used for extraction. Antioxidant compounds exist within the sample can transfer electron or hydrogen atom to react with DPPH. The odd electron within the DPPH radical offers a powerful absorption and maximum at 517 nm and is purple in color [56]. Reacted DPPH can flip the colour from purple to yellow. RSA of mushroom samples varied from 29.22 to 72.06 and 36.93 to 68.20 severally and it absolutely was inflated with the rise in concentration. At 100% concentration, species *Pleurotus hiking* will inhibit 72.06% DPPH and *Pleurotus ostreatus* will inhibit 68.20% DPPH.

**Table 1:** Nutritional assay of studied oyster mushrooms

| Properties | Mushroom species | |
|---|---|---|
| | ***P. hiking*** | ***P. ostreatus*** |
| Protein (%) | 41.91±0.67 a | 39.56±0.84 b |
| Carbohydrate (%) | 34.83±0.29 b | 40.22±0.40 a |
| Moisture (%) | 78.23±0.40 b | 80.55±0.26 a |
| Ash (%) | 6.41±0.46 a | 5.66±0.29 a |
| β-carotene (mg/100 ml) | 0.0131±0.0041 a | 0.0153±0.0018 a |
| Lycopene (mg/100 ml) | 0.0036±0.0013 a | 0.0039±0.0024 a |

Values are mean of three replicates ± standard deviation, the t-test was performed where $p<0.05$.

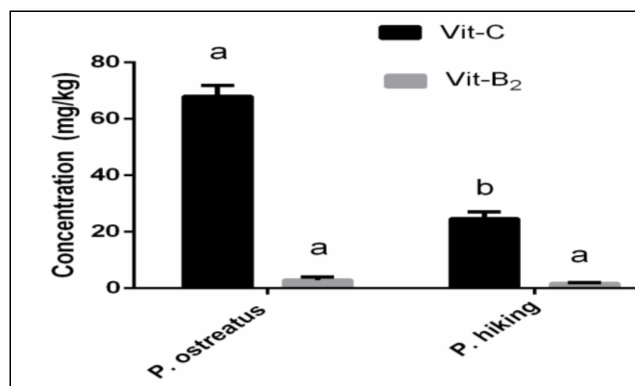


**Fig 1:** Vitamin-C and b2 concentration of two mushoroom species, the lettering was performing according to the T-test (at $p<0.05$ level)

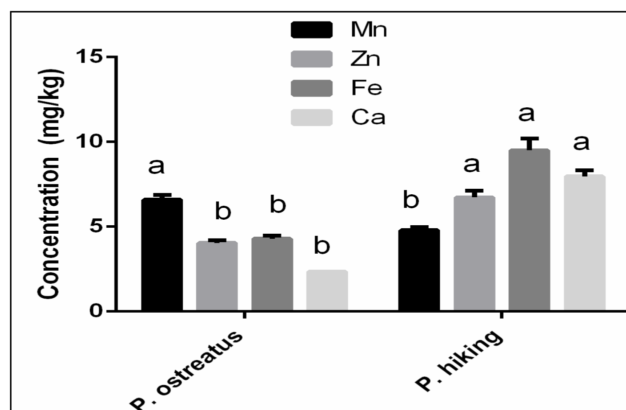


**Fig 2:** Mineral concentration of two mushroom varieties, the lettering was perfroming according to the t-test (at $p<0.05$ level).

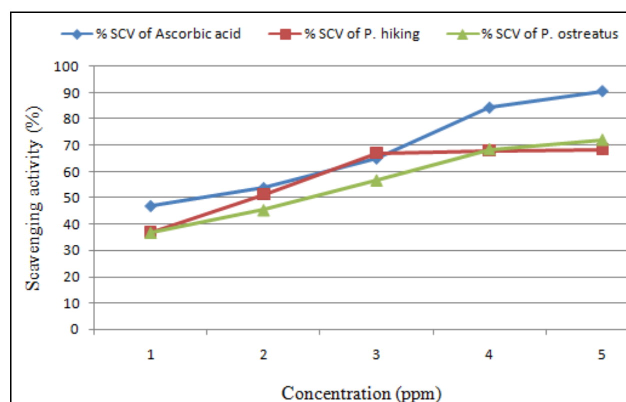


**Fig 3:** Comparison of the scavenging activity on DPPH radical of ethanolic extract of *Pleurotus ostreatus*, *P. hiking* and ascorbic acid

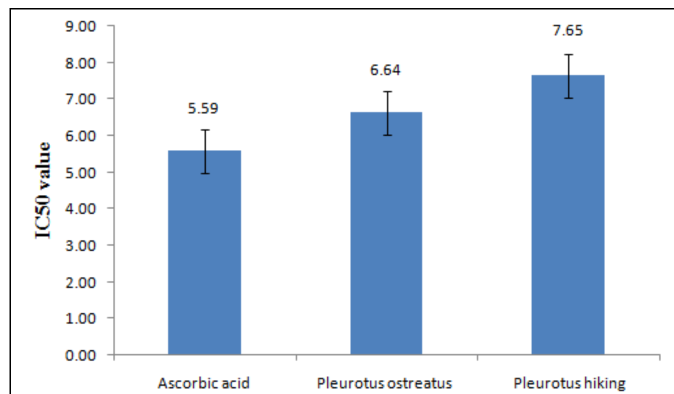


**Fig 4:** DPPH radical scavenging activity ($IC_{50}$) of two oyster mushrooms. Each value is the mean of three replicate determination± standard deviations (P<0.05)

## 4. Conclusion

In Bangladesh, oyster mushroom is favored and *P. ostreatus* and *P. hiking* species are commercially developed all over the year by misuse sawdust and/or rice, wheat straw since of the most substrate. This examination was designated for natural prepare component examination and antioxidant action of those oyster organism assortments. The two species of fungus genus appear a considerable variation in concentration of the different organic process components. All the social orders inside the world nourishment are one in all the foremost considerations.

## 5. Acknowledgments

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