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# Nutritional Value of Cultivated Pleurotus Ostreatus

**S.Sharmila, L.Jeyanthi Rebecca, E.Kowsalya, Merina Paul Das, R. Kamalambigeswari**

***Abstract:*** ***A mushroom is macro fungus having good source of protein, vitamins and minerals. The development and nutritional value of Pleurotus ostreatus were analysed using different substrates such as areca nut husk(AH), areca palm leaves(AL), topsoil(TS), bamboo shoots(BS), and it's mixture with top soil were used for cultivation. The growth of mycelia on bamboo shoot was decayed after few days. The maximum mycelia growth was detected in topsoil and very less in mixture of bamboo shoot and topsoil and mixture areca palm leaves and topsoil.***
***Index Terms: Areca nut husk, areca palm leaves, bamboo shoots, Pleurotus ostreatus, , topsoil.***

## I. INTRODUCTION

Mushrooms which are suitable for human consumption are successfully cultured commercially. The *Pleurotus spp* was cultivated on different agro wastes. It has has the maximum amount of protein content [1]**.** Gibriel et al., stated that potato dextrose extract as liquid or solid media was found to be the best medium for the growth of *Pleurotus* [2]. Other substrates such as sawdust and water hyacinth are also used for the growth of *Pleurotus* sp. Artificial substrates were also analysed for cultivation of *Pleurotus* [3]. *Pleurotus ostreatus* grown on different substrates are nutritious with high protein, fiber and low fat. Best substrate for the growth of mushroom was found to be rice straw with 10% rice bran [4]. Cultivation on wheat with rice bran showed best growth of followed by wheat with straw in *Volvariella sp* and also wheat with wheat bran in *Volvariella diplasia* [5]. Mixture of corn waste and sawdust which was fermented were also found to be the best substrate for sclerotial production [6].

## II. MATERIALS AND METHODS

**Collection of spawn** The spawns of *P.ostreatus* were

collected from Indian Mushroom Farm, Virugambakkam, Chennai, and Tamil Nadu.

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***** Correspondence Author
**Dr. S.Sharmila,** M.Tech., Ph.D. Environmetal Biotech, Bioprocess, Enzyme Engineering.
**Dr.L.Jeyanthi Rebecca D.Sc.,** Research Area: Plant biotech, Enzymology.
**E. Kowsalya** M.Tech., (Ph.D), Research Area: Environmetal Engineering, Bioprocess.
**Merina Paul Das,** M.Tech, Ph.D., Research Area: Nanobiotechnology, Biochemistry
**R.Kamalambigeswari,** M.Tech, Ph.D., Research Area: Enzymology, Molecular biology.



### *A. Cultivation of mushroom*

Mushroom was cultivated in a polyethene bags at standard temperature and moisture condition.

### *B. Incubation and harvest*

The bags were incubated at 22-25$^0$C in dark room for spawn run and fructification. The humidity of the bags was maintained by spraying water thrice or twice a day using a spray bottle. When primordia or pinheads developed, they were allowed to grow to mature fruiting bodies optimizing the temperature by 17-20$^0$C. The fully grown mushrooms were removed from the substrates and then the weight for analysis of the nutritional values of mushrooms obtained from each substrate.

### *C. Nutritional analysis*

Various parameters such as moisture content, total protein, total lipid, crude fiber, total ash and biological Efficiency (BE) of cultivated mushroom were determined as per the standard methods.

## III. RESULTS AND DISCUSSION

The effect in the nutritional values of mushroom is due to the different substrates that are used for cultivation. After 3-4 days the mycelia formation was observed. Pinheads could be seen after 18 days of inoculation in topsoil substrate, 20 days for areca palm leaves and 21 days for areca nut husk substrate. In the mixture of areca nut husk and topsoil, mixture of areca palm leaves and topsoil, and mixture of bamboo shoot and topsoil, pinheads were observed after four weeks. Topsoil was found to be the best for mycelia growth. However, the fruiting bodies produced were more in areca palm straw as compared to other substrates used. The temperature was maintained at17-20$^0$C during fructification of mushroom to avoid loss in moisture content and shrinkage of mushroom. Excess water hindered the growth of mushroom. The bag containing bamboo shoot as a sole substrate showed no mycelia growth of mushroom instead it was decayed and worms started to grow. However, there was growth in mycelia when bamboo shoot is mixed with topsoil (Table.1&2).

**Table 1: Effect of substrates on the biological efficiency**

| Substrates | Biological efficiency (%) |
|---|---|
| Topsoil | 76 |

| | |
|---|---|
| Areca nut husk | 57.5 |
| Areca palm leaves | 60 |
| Areca nut husk + topsoil | 68 |
| Areca palm leaves + topsoil | 54 |
| Bamboo shoot + topsoil | 48 |

The growth of mycelia on bamboo shoot was observed for a few days and then it was decayed. The highest mycelia growth was observed in topsoil followed by areca nut husk, areca palm leaves, mixture of areca nut husk and topsoil and very less in mixture of bamboo shoot and topsoil and mixture areca palm leaves and topsoil. The protein content of mushroom was highest in areca nut husk(10.17%) followed by the mixture of bamboo shoot and topsoil(10.15), areca palm leaves(10.09%), topsoil(10.07%), mixture of areca nut husk and topsoil(10.03%) and mixture areca palm leaves and topsoil(10.025%). The biological efficiency was highest in topsoil (76%) and lowest in the mixture of bamboo shoot and topsoil (48%).

**Fig.1 Primordia or Pin heads**

**Fig.2 Fruiting clusters**

**Table 2: Nutritional analysis of *P.ostreatus* mushroom**

| Total content (%) | Top soil | Areca nut husk | Areca palm leaves | Areca nut husk + topsoil | Areca palm leaves + topsoil | Bamboo shoot + topsoil |
|---|---|---|---|---|---|---|
| Crude fiber | 2.4 | 2.6 | 1.8 | 2.4 | 2 | 2.8 |
| Crude protein | 10.07 | 10.17 | 10.09 | 10.03 | 10.025 | 10.15 |
| Moisture content | 84.28 | 81.5 | 83.86 | 84.97 | 85.15 | 85.76 |
| Ash content | 3 | 3.2 | 2.2 | 2.8 | 2.6 | 3.4 |
| Crude lipid | 0.5 | 0.5 | 1 | 0.25 | 0.5 | 0.25 |

**Fig.3 Matured Oyster**

## IV. CONCLUSION

For the maximum yield of oyster mushroom, areca palm leaves can be used as a substrate followed by topsoil in compilation with other substrates. The main advantage of growing oyster mushrooms is the ease in the cultivation technique as well as the fast growth. Also mushrooms are high in protein which is vital in the maintenance of body tissue, including development and repair. They are not easily attacked by diseases and pests, so they can be grown in rural areas where strict environmental conditions are not to be followed. Further studies may be carried out to increase the protein content and other nutritional values of mushroom.

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## AUTHORS PROFILE

**Dr. S.Sharmila,** M.Tech., Ph.D. Totally published 50 papers in various scopus Journals and also in refreed journals. Research Area: Environmetal Biotech, Bioprocess, Enzyme Engineering.

**Dr.L.Jeyanthi Rebecca D.Sc.,** Totally published 100 papers in various scopus Journals and also in refreed journals. Research Area: Plant biotech, Enzymology.

**E. Kowsalya** M.Tech., (Ph.D), Totally published 20 papers in various scopus Journals and also in refreed journals. Research Area: Environmetal Engineering, Bioprocess.

**Merina Paul Das,** M.Tech, Ph.D., Totally published 50 papers in various scopus Journals and also in refreed journals. Research Area: Nanobiotechnology, Biochemistry

**R.Kamalambigeswari,** M.Tech, Ph.D., Totally published 20 papers in various scopus Journals and also in refreed journals. Research Area: Enzymology, Molecular biology.