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Production and economic analysis of paddy straw mushroom (*Volvariella volvaceae*)

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Abstract
Mushroom industry is flourishing globally due to its flavor, taste, nutritive value and medicinal value. Income of rural youth can be increased by growing mushrooms in villages. Paddy straw mushroom (*Volvariella volvaceae*) can be cultivated commercially to meet the demand of mushroom for large population. Therefore, students were provided entrepreneurial skills and knowledge through hands on experience on paddy straw mushroom cultivation. This training helped the students to learn how to cultivate paddy straw mushroom in business mode. In the present study cost of production, profit earned and benefit cost ratio was calculated. It was demonstrated that growing paddy mushroom is a profitable enterprise.

Keywords: Paddy straw mushroom, *Volvariella volvaceae*, cost, profit

Introduction
Mushrooms are fruiting bodies of flesh fungi which can be seen with naked eyes (Chang and Miles, 1992) [3]. Mushrooms have no chlorophyll, so they can't synthesize their own food. Therefore they have to depend upon outside sources for nutritional requirement. Paddy straw (*Volvariella volvaceae*) mushroom is one of the popular mushrooms grown in India. Paddy straw mushroom is the third most important mushroom cultivated in the world. Nationally, the total contribution of Odisha to mushroom production is 11 percent (Ojha *et al*., 2025) [7]. Paddy straw mushroom belongs to the phylum basidiomycota, order agaricales and family pluteaceae (Singer, 1961) [8]. It can be grown during the month of February to August. It can be grown within temperature range of 25-35 °C and relative humidity of 75 to 80 percent. Mushrooms are rich in Vitamin C, Vitamin D, B-complex, minerals and proteins [Caglarirmak, 2007] [1]. Paddy straw is the main substrate for growing straw mushroom. Paddy straw mushrooms are efficient lignin degraders which can be grown on different agricultural wastes. The substrates on which paddy straw mushroom can be grown include banana leaves, rice bran, wheat bran, sugarcane baggage, wheat and rice straw, cotton wastes etc. (Tripathy, 1999; Cangy and Peerally, 1995; Maurya *et al*. 2016) [9, 2, 5]
In order to know the economic aspects of paddy straw mushroom cultivation, the present investigation was carried out to cultivate paddy straw mushroom commercially, analyzing costs involved in mushroom production, calculate the profitability of mushroom production, determining benefit cost ratio so that students can build up confidence to become a successful entrepreneur for paddy straw mushroom production.

Materials and Methods
The present study was conducted in a temporary mushroom production unit, Department of Plant Pathology, College of Agriculture, Chiplima, Sambalpur during January to April, 2024. Eleven (11) Nos of students under Experimental Learning Programme (ELP) were involved in carrying out the present work. Mushroom spawn was prepared in the laboratory of Plant Pathology, College of Agriculture, Chiplima, Sambalpur by the methods given below-

Spawn preparation
Disease free undamaged wheat grains were collected and washed thoroughly in tap water and soaked overnight in water. Then grains were boiled, drained off excess water and mixed with calcium carbonate at the rate of 2% on dry weight basis of the grains.

The grains were filled into glucose bottle, plugged with non-absorbent cotton and sterilized in autoclave at 121 °C for 30 min. Grains were then inoculated with actively growing mycelium of *Volvariella volvaceae* maintained on potato dextrose agar slants at 4 °C and incubated at 25 °C for mycelial growth until the mycelium fully covered the grains (Modified method of Michael *et al*., 2011) [6].

Mushroom bed preparation

Golden coloured disease free paddy straw were freshly collected from students' plot, College of Agriculture, Chiplima and used as cultivation substrate for bed preparation of paddy straw mushroom. Paddy straw were made into bundles of 45 cm length. For the purpose of making a bed, 14 bundles of paddy straw were used. The bundles were soaked in a water tank containing 100 liter of water and 10 g carbendazim for about six hours. Then straw was taken out from water tank, drained off excess water and dried to maintain 60 percent moisture in the substrate. On an elevated platform of bamboo structure, four soaked bundles were kept on one side lengthwise close to each other. Spawn was placed over the straw 3 to 4 inches inside the margin leaving a space of 5 cm from each other. Then small quantity of gram powder (besan) was sprinkled over the spawn bits. Four bundles of straw were placed in opposite direction of the first to prepare second layer. Spawn and gram powder were sprinkled in the same way as mentioned above. Third layer was prepared by putting another four bundles of the straw in the opposite direction of second layer. Then spawn and gram powder were sprinkled over the third layer. Another two bundles of straw were placed in opposite direction of third layer to cover the spawn. Then transparent polythene sheets were used to cover the beds for one week. When pinhead was emerged, polythene cover was removed. Watering was done as and when required to make the beds moist. First flush was harvested 14 days after bed preparation. Total yield of mushroom from each bed was weighed and recorded immediately after harvest.

Economic analysis of mushroom production

The cost items in the mushroom production includes different types of fixed costs and variable costs.

Fixed costs

Fixed cost include costs of items whose economic life is more than one year. They include mushroom production shed, sprayer, chaff cutter, weighing balance etc.

Variable costs

They include cost of mushroom spawn, polythene to cover mushroom beds, wheat grains, gram powder (besan), packaging materials etc.

Depreciation on fixed capital

The depreciation rates for different farm assets were taken as @ 10% per annum.

Net Profit

Net profit = Total revenue-total expenditure for one crop

$$\text{Benefit cost ratio (BCR)} = \frac{\text{Total revenue}}{\text{Total cost}}$$

Results and Discussion

Yield of mushrooms for three consecutive months from March to May, 2024 was recorded to study effect of temperature and relative humidity on yield of paddy straw mushroom and data are presented in Fig.1. Data revealed that highest yield of mushroom was recorded in the month of March (30.50 kg) followed by April (20.50 kg). Maximum yield of mushroom was recorded in the month of March when optimum temperature (between 28 °C to 35 °C) and relative humidity prevailed. Minimum yield (13.27 kg) was recorded in the month of May due to high temperature (above 40 °C) and low relative humidity. It can be assumed that due to high temperature mushrooms dried up before reaching to maturity which ultimately resulted in less yield. The data clearly shows that yield of paddy straw mushroom is highly influenced by temperature and relative humidity. The findings are in line with the observations obtained by Chitra *et al*., 2018 [4] who reported that high temperature and low humidity resulted in low yield of oyster mushroom in Tiruchirrapalli.

In order to know whether mushroom cultivation is a profitable business or not, economic analysis of mushroom production was done and presented in Table 1. The total cost of cultivation for mushroom production was found to be Rs. 8578/-. From 126 Nos of beds total 64.27 kg of mushroom was produced. Considering the selling price of mushroom @ Rs. 300/-per kg, total revenue of the production of 64.27 kg mushroom was found to be Rs. 19281/-. Net Profit was found to be Rs. 10703/-. Benefit cost ratio was calculated to know the economic viability of mushroom production. Benefit cost ratio was found to be 2.24. This indicates that cultivation of paddy straw mushroom is a profitable business. Paddy straw mushroom can be harvested within a very short time (14 days). Mushroom can be grown very easily which requires little space for cultivation. Paddy straw are very easily available locally at low cost. Processing of mushroom along with better packaging materials will help to increase the shelf life of mushroom which ultimately increase income of the farmers. In this paper, it was demonstrated that cultivation of paddy straw mushroom is a profitable enterprise. So, the farmers can be encouraged to go for cultivation of paddy straw mushroom which can give them additional or alternative source of income.

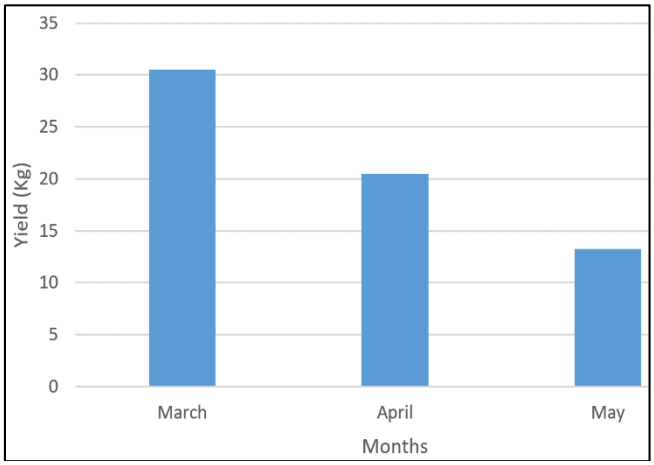

Fig 1: Yield of paddy straw mushroom for three months

Table 1: Economic analysis of paddy straw mushroom production

Particulars	Price (Rupees)
I) Non-Recurring expenditure	
Cost for temporary mushroom production shed	Rs. 8200/-
Sprayer (1 No.)	Rs. 2100/-
Straw sterilization tank (1 No.)	Rs. 4300/-
Straw Chaffer (1 No.)	Rs. 2100/-
Weighing balace (1 No.)	Rs. 1800/-
Total	Rs. 18500/-
II. Recurring expenditure	
Paddy straw 1764 bundles @ Rs. 2/-per bundle	Rs. 3528/-
Cost of spawn 126 bottles @ Rs. 5/-per bottle	Rs. 630/-
Polythene 4 kgs @ Rs. 150/-per kg	Rs .600/-
Carbendazim 300 gm @ Rs. 90/-per 100g	Rs. 270/-
Packaging materials	Rs 200/-
Gram powder or besan	Rs.1200/-
Miscellaneous costs	Rs. 300/-
Total	Rs. 7028/-
Depreciation (Non-Recurring expenditure) @10% for one year	Rs.1850/-
Total expenditure	Rs 8578/-
Revenue	
From 64.27 kg mushroom @ Rs. 300/-per kg	Rs. 19281/-
Net Profit	Rs.10703/-

References

1. Caglarirmak N. The nutrients of exotic mushrooms (*Lentinula edodes* and *Pleurotus* species) and an estimated approach to the volatile compounds. Food Chem. 2007;105:1188-1194.
2. Cangy C, Peerally A. Studies of *Pleurotus* production on sugarcane bagasse. Afr J Mycol Biotechnol. 1995;3:67-79.
3. Chang ST, Miles PG. Mushroom biology: a new discipline. Mycologist. 1992;6:64-65.
4. Chitra K, Venkatesh R, Dhanalakshmi K, Sharavanan PT, Bali Sasikumar C, Karthikeyani VK. Production and economic analysis of oyster mushroom (*Pleurotus florida*). Int J Curr Microbiol Appl Sci. 2018;7:379-383.
5. Maurya AK, Kumar P, Singh V, Kumar S. Evaluation of substrates and supplements for enhancing productivity of paddy straw mushroom (*Volvariella volvacea*). Res Environ Life Sci. 2016;9:717-720.
6. Michael HW, Bultosa G, Pant LM. Nutritional contents of three edible oyster mushrooms grown on two substrates at Haramaya, Ethiopia and sensory properties of boiled mushroom and mushroom sauce. Int J Food Sci Technol. 2011;46:732-738.
7. Ojha S, Pradhan S, Samal AK, Pani M, Nayak L, Parihar P. A review on paddy straw mushroom farming: cultivation, opportunities and challenges in Odisha, India. J Adv Biol Biotechnol. 2025;28(4):1004-1014.
8. Singer R. Mushroom and Truffles: Botany, Cultivation and Utilization. London: Leonard Hill; 1961.
9. Tripathy A. Cultural practices and seasonal condition affecting production of edible mushroom in South Orissa [MPhil dissertation]. Orissa (India): Berhampur University; 1999.