IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Harvesting period and Yield performance of Oyster Mushroom (Pleurotus ostreatus) on different agro-substrate

Kamlesh K. Gautam and Shashi Bala

Assistant professor

Department of Botany and Department of Horticulture

Udai Pratap Autonomous College, Varanasi-221006

ABSTRACT

Mashroom is an excellent food source to alleviate malnutrition in developing countries due to its flavor, texture and nutrition. It is very popular and widely cultivated through the world mostly in Asia and Europe. The four simple substrates namely wheat straw, paddy straw, maize stalk and saccharum straw were tested for growing *P. ostreatus* by poly bag method. The present investigation have indicated that wheat straw is also a good substrate and give high yield performance for the cultivation of *pleurotus ostreatus*

Key Words : *Pleurotus ostreatus, substrate wheat, paddy maize, straw yield ,Basidio corp.*

INTRODUCTION

Pleurotus species is simply a macro fungus and its cultivation in rural area helps to solve the problem of agro-waste management in a profitable way along with the upliftment of socioeconomic status of the farmers by producing a highly nutritious food item. *P.ostreatus* is the most common oyster mushroom species, on dry weight basis contains protein 47.93%, reducing sugar 0.28%, ascorbic Acid 0.06% ,ash 8.25% ,non reducing sugar is lacking, starch 9.12% and fat 2.26% .Bahl, 1994 and Dhoke 2001.

Pleurotus ostreatus is the part of oyster mushroom or tree mushroom is a common edible mushroom. It was first cultivated in Germany as a subsistence measure during World War I and is now grown commercially around the world for food. India has tremendous potential for cultivation of edible mushrooms due to its vast availability of agricultural bi-products and raw material. Its cultivation required low infrastructural facilities and less space. Technical skilled people are required for its cultivation. It is related to the cultivated King oyster mushroom they are rapidly growing species, very high in yield, excellent quality of the fruiting body. Colour of fruiting body varies from shade grey-blue (temp below 16^0 C) to grey brown and are of big thickness (diam. 7a 10 cm) and short stemmed (stalk). They are very tasty and the preserve well.

Pleuroturs ostreatus prefers different agro wastes for its cultivation. The present investigation was planned with the objective to study the effect of different agro-wastes on harvesting and yield of basidiocarp of *P. ostreatus.*

MATERIAL AND METHODS

Experiment was conducted during 2014-15 in Plant Pathology and Ecopathology Lab, department of Botany, U.P. College, Varanasi. The Pure culture of *Pleurotus Ostreatus* was maintained on PDA slants used for preparation of master and mushroom seed OR spawn used in present study.

Preparation of spawn. The Success of mushroom production depends on selecting the ideal seed material (Spawn). The mycelium of mushroom Fungus is multiplied on a grain husk for the purpose of mushroom production and is called spawn. The spawn of *pleurotus ostreatus* was prepared on wheat grains by technique described by lamke (1972) and slightly modified by Awasthi and Singh (1993). Wheat grains were washed in tap water and boiled. The excess water was drained off and wheat grains were spread over blotting paper sheet for soaking of excess water calcium carbonate and calcium sulphate (Gypsum) were mixed at the rate of 0.5 and 2%, respectively on dry weight basis with boiled grains of wheat. Thereafter, 300 g grains per bottle were filled in empty glass bottles (500ml Capacity) and plugged with cotton. The plugs were wrapped with aluminum foil and steam sterilized for 2 hrs at 15 lb pressure in an auto clave. The sterilized and culled bottles were inoculated under aseptic condition, with cultures of *pleurotus*

ostreatus. The bottles were nearly half filled in 11 days and full in 3 weeks with white mycelia growth and were used for production of *P. Dstres.*

CULTIVATION

Various plant materials viz, wheat, paddy, Fenugreek, maize and saccharum straw were used to study the harvesting period and yield of basidiocarp *P. Ostreatus*. The Standard polythene bag method of cultivation was used. The polythene bags of 70-100 gauge thickness and 35 x 45 cm size were used, which was sufficient to accommodate 500 gram of dry weight straw, the bag was provided with five vent holes at bottom and 3-4 at top. The polythene bags were sterilized in 2% formalin by dipping. The lower corners of the bags were tied with string so that the bed assumed a round shape after filling the straws.

The dry weight substrates were chopped to small pieces (3-5cm) and socked in cold water for 4-6 hours. After soaking, the substrate was taken out and the excess of water drained of these substrates were then sterilized in autoclaved at 15 lb P.S.I for 15-30 min. After autoclaving, the substrate was cooled down to filling the polythene bags. The organic supplement in the form of dal powder were added to mushroom beds at the time of spawn mixture @ 1% ie 20g dal powder/bag. The growing room used was partially ventilated with diffused light.

The relative humidity was maintained above 85 percent by sprinkling the walls and floor with water and the temperature was maintained range 20-23^{0}C. Due care was taken for proper air circulation and CO_2 Concentrations 1000 ppm. The procedure of Bahl (1988), singh et. al. 1995. Dhoks et.al (2001) was adopted with certain modifications for cultivation of *P. ostreatus*. Daily observations were recorded for total harvesting period and yield of basidiocarp of *P. Ostreatus* on different substrates.

RESULTS AND DISCUSSION

Harvesting period of *P. ostreatus* are different for 1st 2nd and 3rd picking and presented in Table-1. The Harvesting period of *pleurotus ostreatus* for third picking varied from 44 to 45 days in various substrates. The day required for first packing indicated, that wheat straw took 23 days to produce first harvesting mushroom, with regard to the paddy straw they took 22 days to produce first crop of harvestable mushroom, and a minimum of 19 and 21 day required for saccharum straw for the first picking of mushrooms. For second Harvesing saccharam straw took maximum day (30 days) while, wheat straw took minimum (28 days).The third Harvesting was

complete in 44 days in case of wheat straw, which was statistically more early as compared to paddy straw and maize stalk. The effect of various substrates on the yield of fresh mushroom the results indicated that high yield of 400.00g, ½ kg was obtained on wheat straw followed by paddy straw and maize stalk, the minimum yield of basidiocarop of 290g ½ kg was recorded in saccharum straw. The result obtained were in conformity with Patil *et al*. (1989) and Dhoke *et. al (*2001) Patil and Jadhav (1997) who also reported good growth of *pleurotus spp*. on paddy straw and wheat straw.

It is therefore recommended to grow mushroom *P. ostreatus* on the substrate of wheat straw, paddy straw, maize stalks and saccharum straw which are easily available and have a higher yield of basidiocarp of *P. ostreatus.*

Table : Effect of different substrates on Harvesting period (days) and on Yield of Basidiocarp (g) of P. ostreatus.

Substrates	Average yield of basidiocarp g/500 g dry weight of substrate						
	1st Picking		2nd Picking		3rd Picking		Total Yield
	Day	Yield	Day	Yield	Day	Yield	
Wheat Straw	23	310	28	120	44	75	480
Paddy Straw	22	275	29	95	44	50	420
Maize Stalk	21	200	29	80	44	50	330
Saccharum Straw	19	182	30	70	45	38	290

REFERENCE :

1. Bahl, N. (1988) Handbook on Mushroom. Oxford and IBN Publ. New Delhi, PP: 1-8.
2. Bahl, N. (1994) Handbook on Mushroom. 2nd Edn. Oxford and IBN Publ. Pvt. ltd., New Delhi, pp 97-104.
3. Chandra.S:, Singh A.k.; Bhat M.N. and Kumar S. (1998) yield performance of *Pleurotus sajor-caju* on some selected substrates in North Eastern region of India. Mushroom Res. 7(2) 79-80
4. Chang, S.T. and Miles, P.G. (1993). Edible Mushrooms and their cultivation. CBS Pbl., New Delhi. pp: 8-40.
5. Dhoke et. al (2001) cropping period and yield of oyster mushroom *Pleurotus sajor-caju* on different agro-substrate.
6. Gautam K.K. Ph.D. thesis .(2002) department of Botany, Banaras Hindu University, Varanasi.
7. Lamke 1972. Text book of mushroom cultivation. Edition by DP oxford and Bh publishing.
8. Patil, B.D., Jadhav, S.W. and Kakade, D.S. (1989). The studies on cultivation of *Pleurotus sajor-caju* on differnet substrates. J. Maharashtra Agri. Univ. 14:156-158.
9. Patil, M.B. and Jadhav, V.T. (1997) Studies on productivity of oyster mushroom on different agro-wasted under marathwada condition. J. Maharashtra AGric. Univ. 24:162-163.
10. Singh, A.K., Awasthi, s.K. and Rai B. (1995) Utilization of sugarcane trash for production of oyster mushroom. Mush. Res. Dev. 9:35-38.