

CULTIVATION OF *PLEUROTUS OSTREATUS* IN WEST BENGAL

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The 'dhingri' mushroom *Pleurotus ostreatus* was successfully cultivated on paddy straw and saw dust beds in West Bengal. It was found that the mushroom could grow well during the months of October to February every year and optimum period of yield being the month of November. The yield is negligible in the months of July to September due to high temperature and humidity. The spawn was prepared on chopped paddy straw (3-5 cm) mixed with 3 percent oatmeal agar and inoculated containers were incubated at $25^{\circ}\pm 2^{\circ}\text{C}$ for 20 days. The optimum temperature ($25^{\circ}\pm 5^{\circ}\text{C}$) and humidity (75-80 percent) should be maintained for obtaining the maximum yield. It is assumed that the small scale cultivation of paddy straw and dhingri mushrooms can be implemented among the farmer at a minimum costs in West Bengal.

INTRODUCTION

Man has utilised several mushrooms as one of the items in their diet since time immemorial. Later the techniques to cultivate the mushrooms develop in different countries primarily on the basis of choiced one. But still there are few highly choiced mushrooms with good flavour and nutritive value which are yet to cultivate commercially. In India, the need to encounter the acute protein malnutrition and also due to late incorporation of the mushroom in regular diet, the cultivation of mushrooms receives a high impetus very recently. Now the techniques of cultivation of white (as *Agaricus campestris* and *A. bisporus*) and paddy straw mushroom (*Volvariella diplasia*, *V. volvacea*, and *V. esculenta*) have been almost standardised and as such these species of mushrooms are almost widely cultivated in several parts of India. Next to these two mushrooms, several species of *Pleurotus*, popularly known as 'dhingri' are now being tried to introduce throughout the India.

Nutritive value of different species of *Pleurotus* has been reported by various workers (Jandaik and Upoor, 1975; Kalberer and Kunsch, 1974; Kaul and Janardhanan, 1970; Bano *et al.*, 1963). Various workers (Block *et al.*, 1958, 1959; Bano and Srivastava, 1962; Kaul and Janardhanan, 1970) have reported

about experimental cultivations of different species of *Pleurotus*. Recently Jandaik (1976) has discussed in detail the commercial cultivation of *Pleurotus sajor-caju* and Rangad and Jandaik (1977) have discussed the quality spawn production in relation to yield.

In West Bengal, paddy straw mushroom is cultivated widely. Previously it has been shown that paddy straw mushroom could not be grown well during winter seasons due to low temperature and less humidity (Samajpati *et. al*, 1977). In this present investigation attempt has been made to cultivate the 'dhingri' mushroom in West Bengal climate in order to continue the mushroom cultivation throughout the year as it also grows at lower temperature range than paddy straw one.

MATERIALS AND METHODS

Culture

The culture of *Pleurotus ostreatus* was obtained from an infected mango tree near Calcutta. The tissue culture was maintained on potato dextrose agar slants.

Spawn production

Paddy straw spawn was prepared in a separate containers. Chopped paddy straw (3-5 cm) were mixed with 3 percent oatmeal agar and sterilized in a plugged glass bottles at 20 lbs pressure for 1½ hour. Then the sterilized containers were inoculated with sterile culture of *P. ostreatus* and incubated at (25°C ± 2°C) and 80-85 percent humidity for 20 days.

Preparation of bed

The mushrooms were cultivated on trays (100 cm × 50 cm × 29 cm). The trays were prepared with wire net mesh on all sides and with wooden bottom. The chopped paddy straw were soaked in water for 10 hrs and then the excess water was drained off. Then soaked paddy straw were filled in trays compactly so that it can bear the weight of mushrooms during cropping. In case of saw dust, the formulae of the compost is saw dust, 10 kg ; chicken manure, 3 kg. urea, 0.100 kg and gypsum 0.250 kg. These are thoroughly mixed and finally filled in the trays compactly. Care was taken that there was no excess water in the compost in order to avoid any rotting.

Spawning

Spawning was done by mixing the spawn with the compost at the rate of one bottle of spawn per square meter bed area. After spawning the trays were kept at (25°C ± 5°C) and relative humidity of 80—85 percent. To maintain the humidity the trays were covered with gunny bags but care was taken so that the gunny bags do not touch the trays anyway. Watering was done twice a day on the

gunny bags and if needed slight mist of water was sprayed on the compost. Within 10 days the mycelium found to grow profusely within the compost when the gunny bags were removed.

Cropping

The gunny bags were removed after the spawn has completely impregnated the compost. The beds were maintained at 25°–30°C and 80–85 percent humidity. After 15–20 days of spawning the pinheads of the *Pleurotus* started appearing and within next few days they developed into mature basidiocarps. Usually they appeared in flushes at 10–15 days intervals. The cropping will continue for 40–50 days after which it is better to abandon the beds for economical reasons. During cropping, water should be sprinkled very carefully so that there is no extra water in the beds or the beds never get dried.

Harvesting

The mushrooms were picked by gently twisting the lower part of the stipe when the caps start just to fold. After harvesting the lower parts with adhering soil or compost particles were cut off by a sharp knife. After this, they can be sold directly in market or dried either in sun or at 50°C, then packed and sold to market.

RESULTS AND DISCUSSION

The results obtained during the experimental periods are given in Table 1.
Table 1. Data (mean) showing the yield *P. ostreatus* in different months of 1976 and 1977

Month	Average temperature (°C)	Relative humidity (%)	Yield/bed (g/m ²)	
			Paddy straw	Synthetic compost
January	19.9	60	3610	4010
February	22.9	61.7	3423	4320
March	28.5	63.8	3012	4600
April	29.6	72.0	2712	4100
May	29.7	77.0	2676	3700
June	30.6	78.4	2100	3210
July	32.0	83.2	2427	3310
August	31.5	83.6	2892	3610
September	28.8	84.0	3100	4610
October	28.2	69.2	4230	6800
November	27.6	64.2	5210	7210
December	21.1	53.8	4010	5100

The data in Table 1 have suggested that the yield of mushrooms is conditioned by the temperature and relative humidity of the environment. It has indicated

further that yield is better in synthetic compost than in paddy straw beds. During the months of October to February, the yield is good. It is further revealed from the present investigation that if 'paddy straw mushrooms' are cultivated during the months of April to September and 'dhingri' during the months of October to February, cultivators will be highly benefited economically. The yield is rather poor in the months of March to June. It starts increasing from the month of July and become optimum in the month of November. From the month of December it starts declining again. It has been found that paddy straw mushrooms grow well from the month of April to September (Samajpati *et al* , 1977) in West Bengal climate.

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