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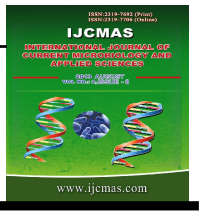

Original Research Article

Effect of wheat straw components on the yield of *Pleurotus eous*

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A B S T R A C T

Keywords
Biological efficiency; Wheat straw. *Pleurotus eous.*

Present study deals with the use of various components of wheat straw e.g. fine and coarse pieces of leaves and leaf sheath (0.2 and 0.4cm) and stem (1.0 and 1.7cm) for various parameters of mushroom production. Among various component of wheat straw, pieces of stem (1.0 and 1.7cm) were proved best with 341 gm, 68.2% and 336 gm, 67.2% yield and biological efficiency, respectively than wheat straw as a whole.

Introduction

Pleurotus is commonly known as Oyster mushroom. It can be cultivated on wide range of agro-wastes (Poppe, 2004). Most of these wastes have a C/N ratio between 32 and 600 and a P^H 5.0 and 7.5 (Poppe, 2000). A lot of work has been done in India and abroad for *Pleurotus* cultivation on various kinds of agro-wastes like cereal and millet waste (Rai, 1997; Sharma, 2003; Siddhant *et al* .,2009), pulses and oil crop waste (Jain and Vyas, 2005; Nivedita and Singh, 2004), vegetable and fruit waste (Yoshikawa and Tsuetaki, 1979; Poppe, 2004), beverage and sugarcane crop waste (Chandrashekar *et al* .,2001; Moda, 2005), cotton and palm waste (Pani *et al* .,1997; Croan, 2000; Shah *et al* .,2004), wood and wood products (Das *et al* .,2000; Singh and Kaushal, 2001), grasses and weeds (Poppe, 1995; Negi and Gupta, 1995; Kumar *et al* ., 2000; Singh *et al.*, 2000, Poppe, 2004) at different time interval. Although, on the commercial scale, only few of them have been accepted for its cultivation. Among them, wheat straw is one of the popular substrate which is obtained from the threshing of harvested wheat crop. It is composed of pieces of stem (S), leaves (L) and leaf sheath (LS). In present communication, these were assessed for the yield potential of pink oyster mushroom *Pleurotus eous*.

Materials and Methods

Micro-organism

The pure culture of *Pleurotus eous* (Berk) Sacc. was obtained from the mushroom section of Plant Pathology Department, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur

(U.P.) India. The culture was maintained and subcultured on potato dextrose agar (PDA) medium.

Spawn strategy

Wheat grains (*Triticum aestivum*) were used as a spawn substrate. The spawn was prepared by the conventional method.

Substrate preparation

Different component of wheat straw, viz., fine pieces of L and LS (0.2 cm), coarse pieces of L and LS (0.4cm), small (1.0cm) and large pieces of stem(1.7 cm) were washed separately in fresh water and then pasteurized in the solution of Formaldehyde (500ppm) and Bavistin (75ppm) for 18 hours as recommended by Vijay and Sohi (1987).

Method of cultivation

The beds were prepared from pasteurized substrate by layer spawning following the procedure of Bano (1971). These were incubated in a cultivation room at 22-30°C for spawn running. When mycelium had completely covered the beds, the polythene covering was taken off and the relative humidity was maintained 85-95 % with the help of humidifier.

Data concerning and Biological efficiency

The yield parameters recorded were, time lapsed in spawn running, pin head initiation and maturity of fruit bodies, number of flushes, mushroom yield, biological efficiency, total number and weight per sporocarp on different crop waste. The biological efficiency of mushroom was worked out as percentage yield of fresh mushrooms in relation to the dry weight of the substrate according to Chang and Miles (1989).

$$\text{Biological efficiency} = \frac{\text{Yield of fresh mushroom (gm)}}{\text{Total weight of dry substrate used (gm)}} \times 100$$

Statistical analysis

Completely randomized design (CRD) was followed for the experiment. All data were statistically analysed. The critical difference (CD) was processed at the five per cent probability level.

Results and Discussion

The component had variable effects on duration of spawn running, pinning and fruit body maturation, which ranged from 15-24 days, 18-29 days and 22-34 days, respectively (Table). The fine and coarse component i.e. pieces of leaf and leaf sheath took longer duration in aforesaid manifestations. It was due to less air space available and much water holding capacity of the substrate particles. They also showed decrease in yield with greater incidence of contamination. Low biological efficiency of mushrooms might be due to less food material available in L and LS while susceptibility against contaminants was possibly due to presence of dust particles that provide inoculum for the development of competitors.

The highest yield was obtained from the small and large pieces of stem with 341 g, 68.2% and 336 g, 67.2 %, respectively. Statistically, these were at par to each other. Absence of contaminants along with higher yield revealed the importance of these components.

Table Effect of different component of wheat straw on mushroom production

Component of wheat straw	Spawn run (Days)	Primordial development (Days)	First harvest (Days)	Total yield from three flushes [g/500 g dry substrate]	Biological efficiency (%)	Average number of sporocarp	Weight per sporocarp (g)
Fine pieces of L and LS (0.2 cm)	24	29	34	218	43.6	69	3.15
Coarse pieces of L and LS(0.4 cm)	22	27	31	260	52.0	68	3.82
Pieces of stem (1.0 cm)	15	18	22	341	68.2	56	6.08
Pieces of stem (1.7 cm)	15	18	22	336	67.2	58	5.79
Control	16	19	23	301	60.2	44	6.84
SE	--	--	--	13.18	2.63	5.24	0.39
CD (P=0.05)	--	--	--	29.39	5.87	11.68	0.88

L: Leaf, LS: Leaf Sheath; Average of three replication

Based on the investigations, mushroom farmers are advised to avoid pieces of leaves and leaf sheath while collecting wheat straw from the site of harvesting.

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