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Studies on growth and yield of oyster mushroom (*Pleurotus ostreatus*) grown under different leaves layer with different levels of wheat-straw

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Abstract
Over 70% of India's population lives in rural areas, with agriculture being the primary source of livelihood. The agricultural sector provides food security, economic security and employment opportunities for rural youth, but land degradation is increasing the number of smallholder farmers, making this sector alone It doesn't have enough potential to support the livelihoods of the people. Farmers. Mushroom cultivation provides a nutrient-rich substrate, mainly obtained by composting agricultural waste such as rice straw, sugarcane bagasse and wheat straw. The purpose of these studies was to examine the growth and yield of oyster mushrooms (*Pleurotus ostreatus*) grown under different foliar layers using different percentages of wheat straw. Yields of oyster mushrooms grown with Appropriate treatments were found to be higher with the T0 treatment (wheat straw) and lowest with the T5 treatment (maize leaf + 0% wheat straw). In the second mushroom harvest, treatment T0 (wheat straw) gave the highest yield and T7 (corn leaf + 30% wheat straw) gave the lowest yield. So I advised farmers to use wheat straw.

Keywords: oyster mushroom, *Pleurotus ostreatus*, growth, yield, wheat straw

Introduction
Oyster mushroom (*Pleurotus ostreatus)* is increasing in popularity in our country, In India, mushroom production in 2021-22 is about 1.30 tons, while farmers are more interested in growing mushrooms now. In addition to being used to eat, straw mushrooms are also used as medicine in our country due to the high properties such as carbohydrates, proteins, mineral salts and vitamins present in mushrooms, it is of particular importance in food worldwide. Many foods are made from mushrooms, such as: - Noodles, Jam (Anjeer Mushroom), Bread, Kheer, Biscuit, Sev, Biscuit, Crispy, Extra Fitness Powder, Soup, Papaya, Gravy, Toast, Chakli, etc. (Pancharatnam, P. 2021) [8].

Mushrooms are large fungi with pronounced fruiting. Juvenile with a large body Sufficient to see with the naked eye and pick by hand (Zadrazil, 1974; Flegg *et al*., 1985; Chang & Miles, 1992) [12, 6, 4]. Mushroom cultivation has also been reported as an effective method Opportunities to reduce poverty in developing countries (Masarambi *et al*., 2011) [7]. Oyster mushrooms contain 20-35 D44 proteins on a dry weight basis, more than oyster mushrooms. Vegetables and fruits (Yao, 1998) [11]. Mushrooms are ideal for consumption by hypertensive patients. Diabetic patients (Wermer and Beelman, 2002) [10]. Other Mushrooms are known to have medicinal properties (Chang and Buswell, 1999) [3] For example, the mushroom (*Ganoderma lucidum*) was used to treat disease Management of HIV and AIDS patients (Anon., 2007) [2]. Immunomodulatory and antitumor activity Polysaccharide-protein complex (Wang *et al*. 1997) [9] provide these valuable medicinal benefits.

The purpose of this study was to examine its effect. Supplement with a variety of locally available substrates Wheat bran content of oyster mushroom (*Pleurotus ostreatus*) growth, development and yield. Wheat bran moistened to about 65-75% moisture content. A squeeze method was also used for the measurements of moisture content. After that, 1 kg of the substrate was packed. Place in an autoclave bag and secure with a rubber band. All Substrates were then sterilized by autoclaving (Dlamini *et al*., 2012) [5].

Materials and Methods

Study Area

The study of "Growth and yield of oyster mushroom (*Pleurotus ostreatus)* grown under different conditions with different levels of wheat-straw" was carried out in Department of Agriculture, Mangalayatan University, Beswan, Aligarh, UP, situated at Latitude 27.643562°. Longitude 77.895257^0, soil type of the site is sandy to loam. The average temperature of the area is 24.7 °C, annual rainfall is about 816 mm.

Spawn collection

Collection of spawn in Pearl mushroom spawn lab, Shastri Nagar, Kanpur in the month of October 2022.

Treatment Details: The study is carried out 12 treatments with 3 reapplication were employed, as mentation below:

Table 1: Levels of treatments

S.no.	Treatments	levels of treatments
1.	T0	100% Wheat straw (control)
2.	T1	Paddy Straw + 0% wheat straw
3.	T2	Paddy Straw + 20% wheat straw
4.	T3	Paddy Straw + 30% wheat straw
5.	T4	Paddy Straw + 50% wheat straw
6.	T5	Maize leaves + 0% wheat straw
7.	T6	Maize leaves + 20% wheat straw
8.	T7	Maize leaves + 30% wheat straw
9	T8	Maize leaves + 50% wheat straw
10.	T9	Banana leaves + 0% wheat straw
11.	T10	Banana leaves+ 20% wheat straw
12	T11	Banana leaves+ 30% wheat straw
13.	T12	Banana leaves+ 50% wheat straw

Leaves was collected in the farmer's field. Corn leaves, banana leaves, and rice straw should be shredded before sterilization. Pouches containing different substrates were labeled and sterilized by him at 100 °C for 4 h at Mangalayatan University. After sterilization, the bags were inoculated under a laminar airflow to reduce contamination. The bags were then placed in an incubation room (24-28 °C) for colonization (Dlamini *et al*., 2012) [5]. Optimal colony formation occurs at a temperature of approximately 24-28 °C.

Design of experiment and Data collection

The experimental setup was a factorial experiment (leaf layer x wheat straw levels) stacked together Randomized Block Design (RBD). Substrate not fortified with wheat straw (0%) Controls to compare with other treatment, wheat straw modified substrates. Each treatment was repeated 3 times. 3 sachets per repetition. Collected data were analyzed with SPSS. Statistics package. Analysis of variance I ran (ANOVA) and there was a significant difference Detected at 5% probability level at average distance Manufactured by LSD (Gomez and Gomez, 1984) [1]. Data were collected on the following parameters: the number of Contaminated bags, days to complete colonization, Mushroom Yield (g), Mushroom diameter (cm) and mushroom length (cm) were collected after 45 days, watering were done manually when needed till the completion of the experiment.

Result and Discussion

The present investigations on "Growth and yield of oyster mushroom (*Pleurotus ostreatus*) grown under different leaves layer with different levels of wheat-straw" were carried out to study the extent of leaves layer with different levels of wheat-straw of oyster mushroom (*Pleurotus ostreatus*). The results obtained from the present study are presented Fig. 1.

Number of Contaminated bags

The values of contaminated bags are presented in Fig.1. The Contaminated bags recorded highest percent in T4 treatment and lowest contaminated bags percent recorded T9 treatments. Parameters were recorded significant (p= 0.05).

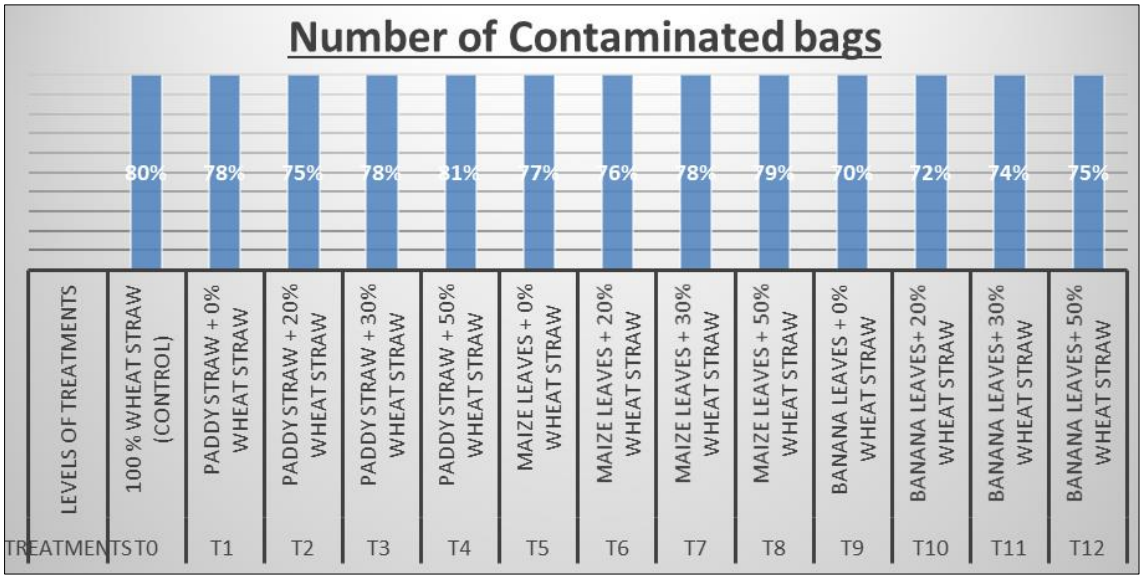


Fig 1: Number of Contaminated bags

Days to complete colonization: The number of days to complete colonization were recorded among respective treatment were recorded significant (p= 0.05) in Fig.2. Number of days to complete colonization recorded highest in T9 treatment and lowest number of days to complete colonization were recorded T0 (control) treatments.

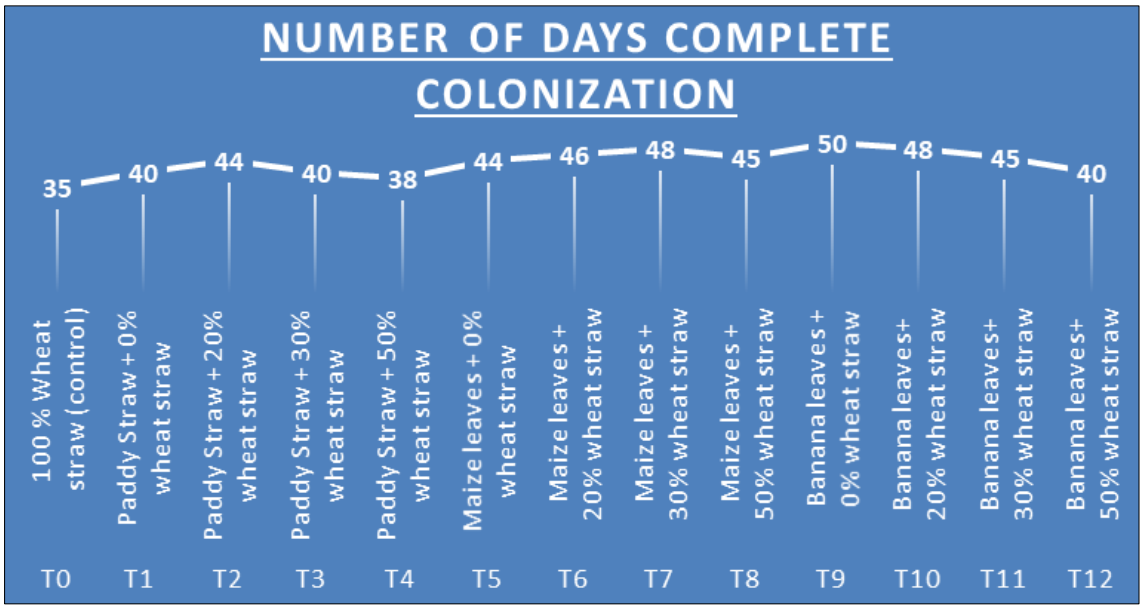
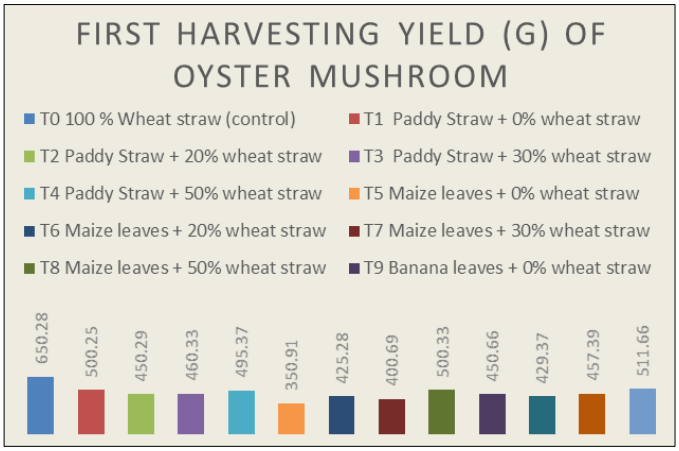


Fig 2: Number of Days complete colonization

Mushroom Yield (g)

The first harvesting yield (g) of oyster mushroom were recorded among respective treatment were recorded significant (p=0.05) in Fig.3. First harvesting yield (g) of oyster mushroom were recorded among respective treatment highest in T0 treatment and lowest were recorded T5 treatments. Whereas second harvesting of mushroom found in highest yield in treatment T0 and lowest yield recorded in T7.

Pic 1: Oyster mushroom (*Pleurotus ostreatus*) cultivation



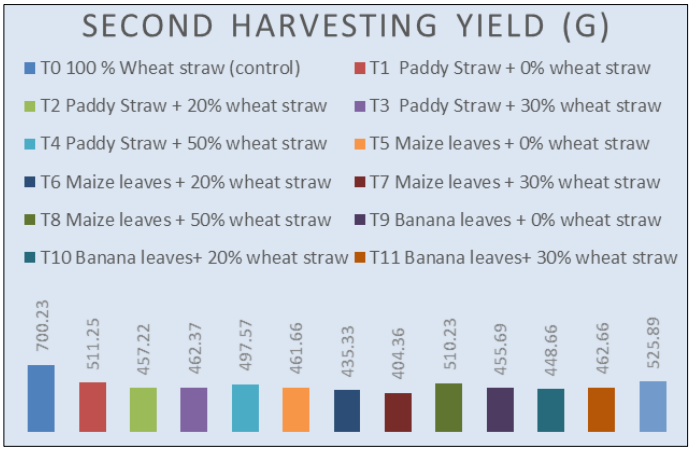


Fig 3: first & second harvesting of yield

Diameter (mm) and Length (mm) of Mushroom: The diameter (mm) and length (mm) of Mushroom were recorded among respective treatment were recorded significant (p= 0.05) in Fig.4. Length of highest mushroom were recorded among respective treatment in T0 treatment and lowest were recorded T11 treatments. Whereas diameter of mushroom recorded in highest in treatment of T0 and lowest diameter recorded in T11.

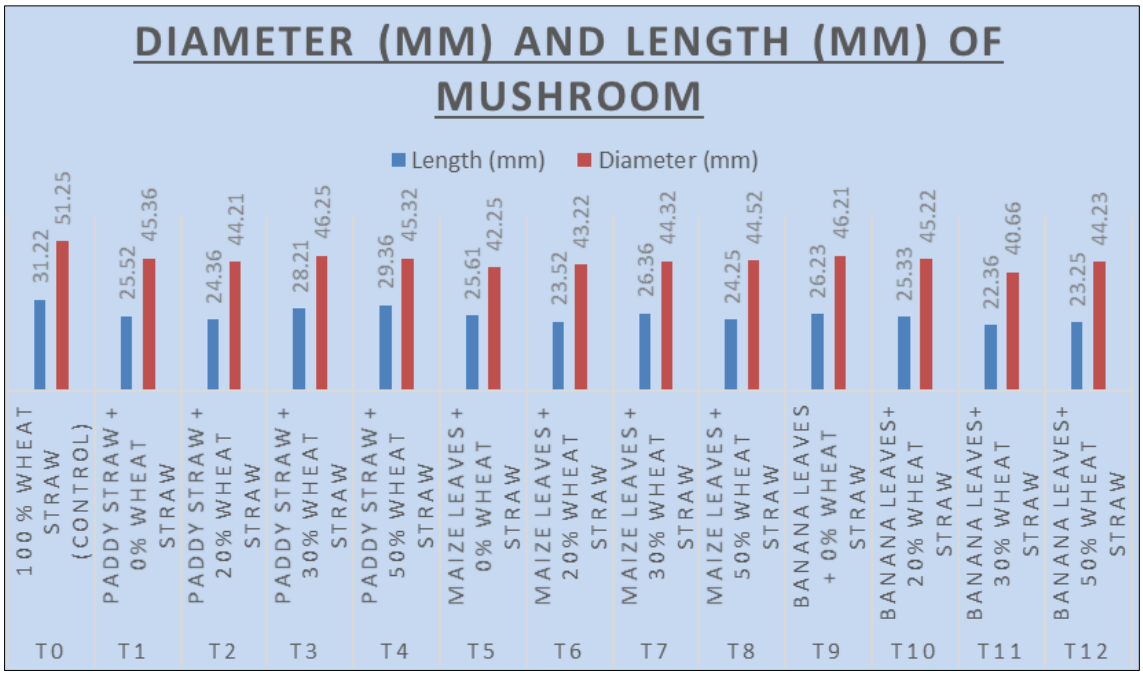


Fig 4: Diameter (mm) and Length (mm) of Mushroom

Conclusion

The yield, of oyster mushrooms grown in respective treatments found higher yield in T0 (Wheat straw) treatment and lowest were recorded T5 (Maize leaves + 0% wheat straw) treatments. Whereas second harvesting of mushroom found in highest yield in treatment T0 that is Wheat straw and lowest yield recorded in T7 that is Maize leaves + 30% wheat straw. So that I recommended for farmers to use wheat straw.

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Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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