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Effect of different substrate on the development and yield of *Pleurotus sajor-caju*

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Abstract
Mushroom is an especial horticultural crop. It is alternative to food shortage in the world and used as consumption and medicinal purpose. The development effect of *Pleurotus sajor-caju* on different substrate has studied in lab. The production recorded on wheat straw, rice straw, soybean straw, groundnut husk and gram straw substrates found 2.80 kg, 2.40 kg, 2.22 kg, 2.15 kg and 1.35 kg respectively. Meanwhile, pin head formation on substrates found wheat straw (30.60 days), rice straw (30.35 days), soybean straw (32.62 days), groundnut husk (31.45 days) followed by gram straw (28.50 days). Wheat straw showed good result against other experimented substrates. It having maximum yield followed by rice straw. Whereas groundnut, pea and gram straw recorded significantly less. Among experimented substrates wheat straw found most effective for production yield but gram straw takes less days for pin head formation.

Keywords: Mushroom, substrate, consumption, wheat, rice, straw

Introduction
Mushroom is an especial horticultural crop. It is alternative to food shortage in the world and used as consumption and medicinal purpose. The important priority of profession is to maximize the production of mushroom by using various techniques. The genus *Pleurotus* (oyster mushroom) is a fast growing fungus, which decomposes the complex organic materials to simpler compounds for its nutrition (Chang and Miles, 1991). It produces metabolites of medicinal and pharmacological interest, such as antioxidant antimicrobials, immune stimulants and antitumor activities (Nayana and Janardhanan, 2000; Manpreet *et al*., 2004; Elmastas, 2007). Wilkins and Harris (1946) critical studied that the water content of the substrate and temperature are the major factors influencing fruit body production. Pleurotus species are efficient lignin degraders, which can grow on different agricultural wastes with broad adaptability to varied agro-climatic conditions (Jandiak and Goyal 1995). Growing oyster mushrooms convert a high percentage of the lingocellulosic substrate to fruiting bodies increasing profitability. Also, mushroom production gives additional and alternative income to farmers looking for a value-added product and a way to supplement farm income while making use of by products or coproducts from other crops. Strengthening mushroom production sector could be essential in order to enable the rural economy to keep its vibrancy and development. The present experiment was undertaken to evaluate influence of locally available different substrates on the development and yield of *Pleurotus sajor-caju.*

Materials and Methods
The experiment was carried out during the months of October-January. The pure culture has been taken from Horticulture Experiment and Training Centre, Barua Sagar, Jhansi. Inoculum multiplication, substrate preparation, inoculums of substrates, maintenance of beds and for harvest proposed by (Survase, 2012; Vijay and Sohi, 1987) [7, 8]. Yield of mushrooms and their biological efficiency was determined by using the formula (Siddhant *et al*., 2013) [9]. The fruit bodies were analysed for their moisture content (Raghuramulu *et al*., 2003) [10]. One kg wet substrate was filled in the polypropylene bag of 25cm×15cm in size and autoclaved at 121°C at 15 lbs pressure for an hour and allowed to cool overnight. After cooling, about 2.5 % grain spawn were inoculated on the surface of substrate and incubated in a dark at controlled temperature of 20-25 °C. After colonization, the plastic bag was removed from the substrate and was placed in the growing room of temperature between 15 18 °C, relative humidity 70-80

% and light intensity of 200-500 lux. After casing, bed surface should be sprayed with a light formation solution to eliminate contamination. The data for the characters considered in this experiment statistically analysis following the complete randomized design (CRD).

Table 1: Effect of different substrate on development and yield of *Pleurotus sajor-caju*

Treatment	Mycelium spreading (day)	Pin head formation (day)	Production starting (day)	Length of mushroom (cm)	Width of mushroom (cm)	Crop cycle (No.)	Production per bag (kg)
Wheat straw	6.20	30.60	42.64	11.80	7.30	3.20	2.80
Rice straw	5.91	30.35	41.25	10.20	7.10	3.40	2.40
Soybean straw	6.40	32.62	43.40	9.35	6.25	2.20	2.22
Groundnut straw	6.20	29.85	45.00	9.25	6.50	2.15	1.80
Pea straw	5.75	29.80	38.50	8.54	5.80	1.50	1.20
Gram straw	5.52	28.50	36.40	9.15	6.15	1.15	1.35
Groundnut husk	6.50	31.45	42.38	9.23	5.90	2.20	2.15
CD (0.05%)	1.12	1.70	3.25	0.72	0.61	0.022	0.21

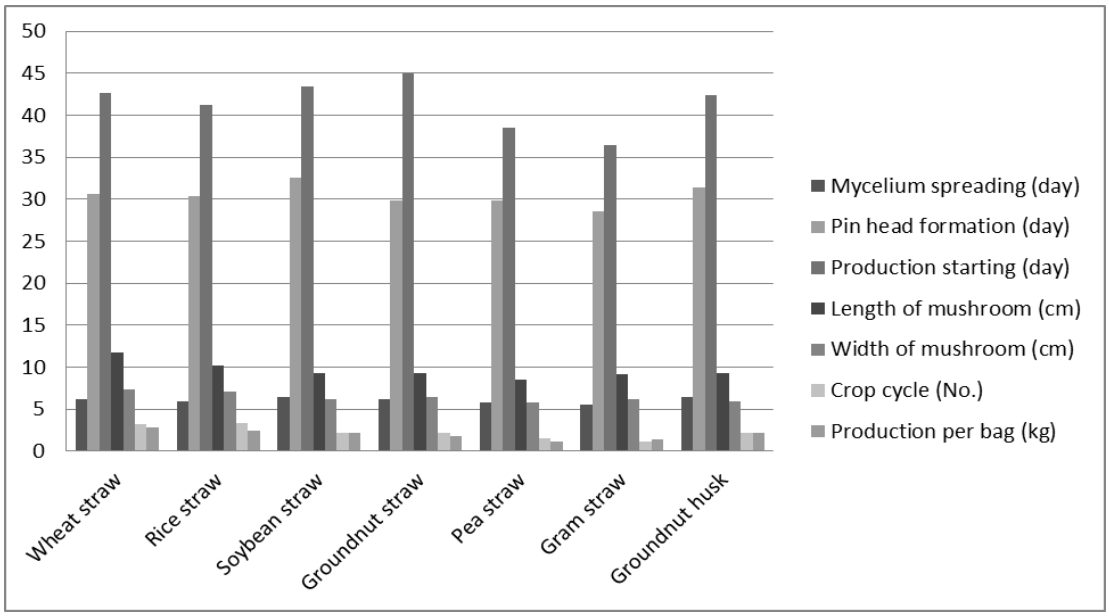

Fig 1.

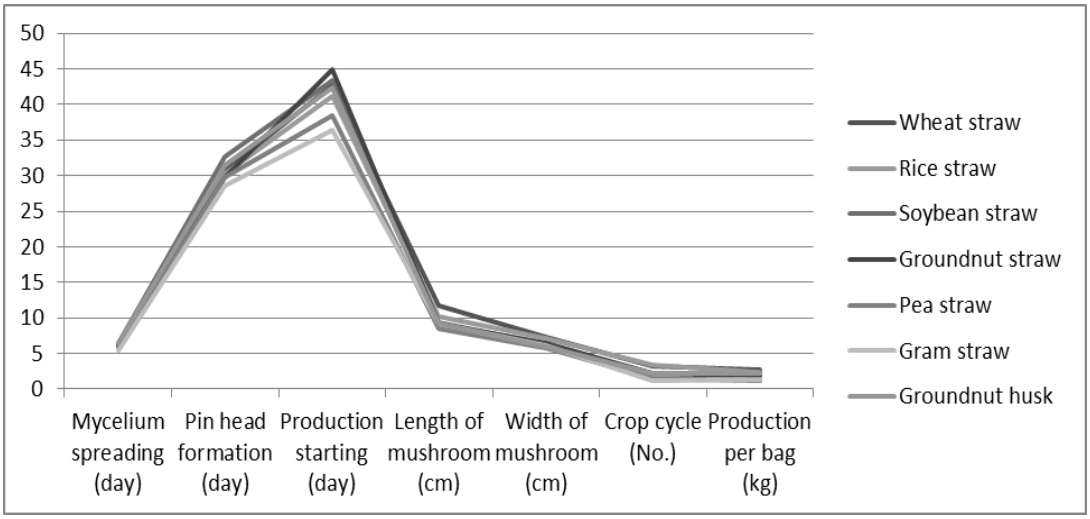

Fig 2.

Fig 1, 2: Effect of different substrate on development and yield of *Pleurotus sajor-caju*

Results and Discussion

Data pertaining to *P. sajor-caju* performance development have been presented in Table1. Persual of data clearly indicated that mycelium spreading time minimum was 5.52 days recorded in gram straw followed by pea straw. Whereas maximum time 6.50 days was recorded in ground nut husk followed by ground nut straw whereas 6.20 days reported in wheat straw and soyabean straw. It is clearly indicated that

gram and pea straw having more water holding capacity in comparison with other substrate. Fungus requires more moisture to early spreading mycelium. Ground nut husk quality that it is hardy crops and take less moisture in side. Pin head formation significantly less time 28.5 days recorded in gram straw followed by 29.80 days in pea straw where as maximum time was recorded 32.62 days in soybean straw followed by wheat straw 30.60 days there is no significant different were observed between soybean straw and ground nut straw, similarly pea straw and gram straw. The early mushroom production was recorded in gram straw i.e., 38.50 days followed 36.40 days in pea straw. Whereas maximum day recorded for mushroom production was 45.0 in ground nut straw followed by 43.5 days in soybean straw. The length of mushroom significantly maximum recorded 11.8 in wheat straw followed by 10.20 cm in rice straw where as minimum 0.54 cm was recorded in pea straw. In soybean straw and gram straw were recorded at par. There are significant difference was recorded difference was observed in gram straw and ground nut husk similarly depth of mushroom maximum 7.2 cm was recorded in where straw followed by rice straw. Whereas minimum 5.80 cm was recorded in pea straw. Life cycle also maximum 3.4 was recorded in rice straw followed by 3-2 in wheat / pea and gram straw. Similarly maximum yield was obtained 2.80 kg in wheat straw followed by 2.24 kg in rice straw.

Conclusion

Wheat straw showed good result against other experimented substrates. It having maximum yield followed by rice straw. Whereas groundnut, pea and gram straw recorded significantly less. It will happened due to they are no containing significant amount of cellulose for fungus survival and production.

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