SHORT COMMUNICATION

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Influence of substrate, organic additive and seasonal effect on biological efficiency of *Lentinus sajor-caju*

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The study on the effect of different substrates,additives and seasonal effect on *Lentinus sajor-caju* were evaluated. Of the different substratestested,paddy straw was found to be the.best with 85.83% B.E. Boiled wheat was found to be superior among the organic supplements tested. In Odisha, the best season for *L. sajor-caju* cultivation was November to February.

Key words: Oyster mushroom, substrate, organic additive, growing season, biological efficiency

Oyster mushroom is the second largest cultivated mushroom in India with an annual production of 15,000 metric tonnes. It contributes to 33 % of total mushroom production of Odisha (4003 metric tonnes/annum). *Lentinus sajor caju* [Syn.*Pleurotus sajor-caju* (Fr.) Sing] is the most preferred species of the state. Among seven agro-wastes evaluated for their yield performance, the conventionally used paddy straw was significantly superior in terms of yield (858.33 g/bag) and biological efficiency (85.83 %). It is cultivated under thatched roof (indoor cultivation) in both coastal and inland districts. Cultivation is done largely on non-pasteurized paddy straw substrate without organic supplements. The yield obtained varies from 1-1.5 kg/bag (66-100 % biological efficiency). The reasons for such wide variation in the level of productivity might be attributed to use of non-pasteurized straw without supplements and lack of after care. Raising bags under appropriate environmental conditions is also important. In this context, the present study was undertaken to assess the impact of substrate, organic additive and season in the cultivation of *Lentinus sajor-caju* in the East and South Eastern coastal plain of Odisha. Conventional method for cultivation of *Lentinus* was employed.

The six organic additives along with control (no additive) such as wheat bran, rice bran, boiled wheat, maize meal, mustard oil cake and poultry manure were used to study their role in yield improvement of *L. sajor-caju*. Different additives were used at 10 % of the dry weight of the substrate (200 g/bag).

To explore the seasonal adaptability of *L. sajor-caju* bags were raised at bimonthly intervals from 1st January to 1st November (six times) covering all the three seasons. The cultivation was subjected to ambient conditions to ascertain the appropriate time of cultivation. All experiments were designed in randomized block design with six replications in each treatment. Observations on days to spawn run, first harvest, number of fruit bodies and total weight of fruit bodies were recorded. Biological efficiency in respect of each experiment was calculated, as per

Table 1 : Effect of substrate on biological efficiency of *Pleurotus sajor-caju*

Treatment (substrate)	Days to spawn run	Days to first harvest	Number of fruit bodies	Mushroom yield (g)	Biological efficiency (%)
Jute stick	16.50	20.50	150.33	450.83	45.08
Paddy husk	16.16	19.50	206.33	705.33	70.53
Banana leaf	15.83	17.83	237.33	808.33	80.83
Coconut coir	16.66	20.83	219.83	692.50	69.25
Saw dust	16.00	22.00	207.83	682.00	68.20
Pulse stick	15.83	21.50	290.16	746.66	74.66
Paddy straw	15.83	22.33	249.16	858.33	85.83
C.D.(0.05)	NS	2.286	6.929	19.738	-
C.V. (%)	4.29	9.44	2.670	2.44	-

standard methodology.

The experiment was conducted to find out the appropriate substrate for obtaining higher yields from *L. sajor-caju*. It was evident from the data (Table 1) that paddy straw substrate was significantly superior in terms of yield (858.33 g) and biological efficiency (85.83 %). The relative performance of all other substrates including jute stick, paddy husk, banana leaf, coconut coir, saw dust and pulse stick were poor (450.83-808.33 g/bag) with corresponding biological efficiency of 45.08 to 80.83 %. The total crop period was also significantly low (50.33 days) in paddy straw substrate. However, statistical difference was not observed among the substrates in respect of days taken for spawn run. Realization of better yields through utilization of agro-wastes like paddy straw was in corroboration with the findings of Dar *et al,* (1995), Patra and Pani (1995), Singh *et al*, (1995), Mathew *et al,* (1996) and Raghunathan *et al,* (1996).

In the investigation on effect of different organic additives on mushroom yield, six additives were

Table 2: Effect of organic additives on biological efficiency of *Lentinus sajor-caju*

Treatment (additive)	Days to spawn run	Days to first harvest	Number of fruit bodies	Mushroom yield (g)	Biological efficiency (%)
Wheat bran	18.16	21.50	115.83	764.66	76.46
Rice bran	18.33	22.00	139.33	618.16	61.81
Boiled wheat	17.66	21.66	128.33	784.16	78.41
Maize meal	16.50	20.66	121.83	665.66	66.56
Mustard cake	18.83	21.83	63.66	544.33	54.43
Poultry manure	16.83	20.83	107.50	540.00	54.00
Control (No additive)	16.66	22.66	126.50	615.83	61.58
C.D.(0.05)	0.880	NS	12.298	42.954	-
C.V. (%)	4.20	4.27	9.17	5.53	-

Table 3: Effect of period of cultivation on biological efficiency of *Lentinus sajor- caju*

Treatment (Time of spawning)	Days to spawn run	Days to first harvest	Number of fruit bodies	Mushroom yield (g)	Biological efficiency (%)
1st November	18.67	21.83	310.67	920.83	92.08
1st January	18.33	22.33	315.50	825.00	82.50
1st March	18.67	22.67	102.33	316.00	31.60
1st May	19.50	24.83	24.00	90.00	9.00
1st July	18.50	22.33	152.67	429.83	42.98
1st September	19.00	22.17	165.00	536.83	53.68
C.D.(0.05)	NS	0.912	10.493	33.62	-
C.V. (%)	5.75	3.38	4.95	5.44	-

evaluated against the untreated check. Boiled wheat as a supplement could produce superior yields (784.16 g/bag) followed by wheat bran (764.66 g/bag) with corresponding biological efficiencies of 78.41 and 76.46 % respectively. Boiled wheat, as an additive could take a modest 17.66 days in respect of days taken to spawn run. However, no statistical difference was observed among the treatments in respect of days taken for first harvest. The relative performance of other supplements was relatively poor in respect of yield (540-665.66 g/bag) and biological efficiency (54-66.56 %). Veena *et al,* (1994) evaluated supplements in combination and indicated that *P. florida* performed well with a combination of rice bran and soya dal powder. Oilseed cakes, dried leaves and starch have also been evaluated (Easwaramoorty *et al*, 1983; Bano *et al*, 1993, Patra *et al*, 1998). However, better yield performance obtained from wheat bran, maize meal and rice bran could be a boon for the mushroom growers in view of their wider availability at cheaper rates.

In the investigation on seasonal influence on mushroom productivity, findings revealed that the cultivation of this mushroom was possible round the year in Odisha with differential success. However, the best season for cultivation in Odisha was found to be between November to February. Mushroom yields were poor during summer months (9-31.6 % BE). Temperature being the critical factor which not only influences yield but also the quality of produce. Hence, yield and quality were optimal during the months experiencing low temperatures. This observation was in agreement with the findings of Bano and Srivastava, (1974); Block *et al*, (1958); Jandaik (1974); Zadrazil (1978) and Chang and Miles (1982).

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