

EFFECT OF DIFFERENT DOSES OF SPAWN AND AGE OF SPAWN ON SPAWN RUN AND YIELD OF NEW STRAIN IGKVM-11 OF OYSTER MUSHROOM (*PLEUROTUS SP.*).

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Abstract: Studies were carried to find out the different doses of spawn and age of spawn on the production of new strain IGKVM-11 of oyster mushroom (*Pleurotus sp.*) was studied. Higher dose of spawn was found to be suitable for obtaining higher yield of new strain IGKVM-11 of oyster mushroom (*Pleurotus sp.*) on paddy straw substrate compared to lower rate of spawning and 38 and 18 days old spawn found more suitable for obtaining higher yield of new strain IGKVM-11 of oyster mushroom (*Pleurotus sp.*) on paddy straw substrate.

Keywords: *Pleurotus sp.*; paddy straw; doses of spawn; age of spawn; yield

INTRODUCTION

Mushrooms have been used as food and medicine from time immemorial. Nutritious food is the basic requirement in these days. Due to population explosion, the problem of protein hunger has become more and more acute. Being a good source of quality protein, mushroom production is an alternative source to decrease malnutrition. Oyster mushroom is one of the popular edible fungus cultivated in the subtropical and temperate zone of many countries.

Oyster mushroom (*Pleurotus spp.*) is commonly called as Dhingri in India because of its oyster like shape and has about 40 well-recognized species, out of which 12 species are cultivated in different parts of country. Different species of *Pleurotus* can grow well in variable temperature conditions; hence they are ideally suited for cultivation throughout the year in various regions of tropical climate.

The first stage of mushroom production is producing of strong spawn with increasing mycelium growth. It is equal to seed of higher plant. Spawn quality is the most important factor in the production of edible mushroom. Mushroom spawn is the mushroom mycelium growing on a given substrate. It serves as the planting material in mushroom cultivation. Spawn quality is counted the most important part in mushroom production (Mohammadi Goltapeh and Purjam, 2003) spawn production is a very technical process and requires a lot of expertise and specialized knowledge and care on the part of people producing it (Chinda and Chinda, 2007). It is infact the bedrock of the mushroom industry and the limiting factor to mushroom cultivation or production all over the world. In time, the mycelium completely grows through the grain. The fully colonized grain (spawn) is used to seed already prepared substrates agricultural and non-agricultural wastes) for mushroom production.

Mushroom cultivation technique is spreading nowadays through out the world as these are easy to grow and no any skilled person is required.

Mushrooms are reported to be easily grown on different lignocelluloses wastes such as banana leaves, cereal straw, paper wastes, sawdust and poultry droppings (Fasidi and Kadiri, 1993; Onuoha, 2007; Shah et al, 2004).

MATERIAL AND METHOD

Culture and spawn preparation

The pure culture of new strain IGKVM-11 of oyster mushroom (*Pleurotus sp.*) was obtained from All India Co-ordinated Mushroom Improvement Project (AICMIP), Department of Plant Pathology, Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.). The pure culture was sub cultured on potato dextrose agar medium and stored at 4°C until used for the entire works.

Spawn prepared in poly propylene bag (6" × 11" - 150 gauges) wheat grains were Clean, healthy and bold sized grains were taken substrate for preparation of spawn. Then grains were washed and soaked in water for overnight. On next day, water was decanted and grains were boiled for 10-15 minutes till they became soft while the seed coat remained intact. Thereafter, excess water was run off and evenly spread on muslin cloth for cooling. The cooled grains were mixed with calcium carbonate (0.5 percent) and calcium sulphate (2 percent) on wet weight basis and filled in bag and each bag contained 250 g. wheat grains. These bags were sterilized. After cooling bags were aseptically inoculated with 10-15 gm of mother spawn and incubated at 25 ± 2°C. the inoculated bags were incubated and frequently examined for any types of contamination and those exhibiting contaminations were immediately discard and those showing white, silky, uniform strandy mycelial growth. Covering all the grains was used for experimentation.

Spawn dose standardization

Different doses of spawn were test inoculated @ 40, 80, 120, 150 and 180 gram of wet weight of

substrate. Days taken for complete spawn run and biological efficiency were recorded.

Spawn age standardization

Different ages of spawn were test inoculated 18 days old spawn, 23 days old spawn, 38 days old spawn and 91 days old spawn of wet weight of substrate. Days taken for complete spawn run and biological efficiency were recorded.

Preparation of the substrates for cultivation

Freshly harvested chopped paddy straw (size 1-1.5") was used as substrate and The substrate was dipped in water (which has already mixed with 75 ppm carbendazim and 500 ppm formaldehyde) for 14 hours as per the method described by Vijay and Sohi (1987). Thereafter, excess water was drained off and straw was spread over on slopy, cemented floor till the moisture content of straw remained 65-70 percent. Spawn was mixed in substrate through layering method @ 4 percent on wet weight. The spawned substrate was filled in poly propylene bags (12" × 18" -150 gauges) and mouth of the spawned bag was tied with the help of nylon string. For perforation, 8-10 holes were made in each bag for allow free passage of air within the bags.

A unit of 2.5 kg dry straw substrate was used for each treatment, which was equally divided in five bags representing each as replication. The spawned bags were kept in mushroom growing room. After complete colonization of substrate by mushroom mycelium (spawn run), the bags were cut and poly propylene bags were removed. The compact mass of aggregated straw termed as 'bed' were ready for hanging to the iron racks.

Yield and biological efficiency

The time taken for pinning after spawn run was recorded. Fruiting bodies were harvested after maturity. Yield weighed with the help of single pan balance with a sensitivity of 1 gm and Biological efficiency was calculated using the following formula: (Chang *et. al*, 1981).

$$\text{Biological efficiency (\%)} = \frac{\text{Fresh weight of fruit body}}{\text{Dry weight of substrate}} \times 100$$

Statistical analysis

All the experimental data were analyzed by using completely randomized design and critical differences (C.D.) were calculated at 5 percent probability.

RESULT

Different doses of spawn i.e. 40, 80, 120, 150 and 180gm were used to see their influence on spawn run and yield of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) on paddy straw substrate. The results are presented in table 1.

The number of days taken for spawn run was significantly less (16.25 days) on 180gm followed by 150gm (16.50 days). However, the number of days taken for spawn run was significantly more (17.00 days) on 40gm, 80gm and 120gm. Similarly, the number of days taken for pinning was significantly less (18.25 days) on 180gm followed by 150gm (18.70 days). However, the number of days taken for pinning was significantly more (19.00 days) on 40gm, 80gm and 120gm.

The number of fruits obtained significantly more in 180gm (113.60) followed by 150gm (106.80) while, it was significantly less (78.40) on 40gm followed by 80gm (83.60), 120gm (94.40).

Highest fresh yield of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) was recorded on 180gm (344.00 g/ bag) with 68.8 % biological efficiency. and it was closely followed by 150gm (320.20 g/ bag) with 64.04 % biological efficiency and 120gm (309.00g/ bag) with 61.8 % biological efficiency However, the lowest fresh yield of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) was observed in case of 40 gm (255.80 g/ bag) with 51.16 % biological efficiency followed by 80gm (294.20 g/ bag) with 58.84 % biological efficiency.

Effect of age of spawn on spawn run, yield and biological efficiency of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) was recorded and the results are presented in table 2.

It is apparent from table that different old spawn did not show variation in the period required for spawn run by new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) in paddy straw. The period required for spawn run was varied from 17.00 to 17.50 days. Similarly different old spawn did not show variation in the period required for pinning by new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) in paddy straw. The period required for pinning days was varied from 19.00 to 19.50 days.

The number of fruits obtained significantly more in 38 days old spawn (117.60) followed by 91 days old spawn (108.40) while, it was significantly less (85.40) on 18 days old spawn followed by 23 days old spawn (96.20).

The fresh yield and biological efficiency of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) did also vary significantly with respect to spawn age. The yield and biological efficiency was significantly higher (336.40g and 67.28%) in case of 38 days old spawn followed by 18 days old spawn (313.00g and 62.6%). However, it was significantly lower (271.60g and 54.32%) 23 days old spawn followed by 91 days old spawn (280.60g and 56.12%).

Table 1: Effects of different doses of spawn on spawn run and yield of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.).

S. No.	Treatment	Spawn run (days)*	Pinhead initiation (days)*	No of fruits	Total yield	B.E. (%)
1.	T1	17.00	19.00	78.40	255.80	51.16
2.	T2	17.00	19.00	83.60	294.20	58.84
3.	T3	17.00	19.00	94.40	309.00	61.8
4.	T4	16.50	18.75	106.80	320.20	64.04
5.	T5	16.25	18.25	113.60	344.00	68.8
	SE (m)	0.170	0.158	3.945	13.64	
	CD (P=0.05)	0.514	0.476	11.89	41.11	

• Average of four replication

Table 2: Effects of different ages of spawn on spawn run and yield of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.).

S. No.	Treatment	Spawn run (days)*	Pinhead initiation (days)*	No of fruits	Total yield	B.E. (%)
1.	18 days	17.25	19.25	85.40	313.00	62.6
2.	23 days	17.50	19.50	96.20	294.40	58.88
3.	38 days	17.00	19.00	117.60	321.60	64.32
4.	91 days	17.50	19.25	108.40	309.00	61.8
	SE (m)	NS	NS	6.13	15.67	
	CD (P=0.05)			18.49	47.25	

* Average of four replication

DISCUSSION

Different doses and ages of spawn were compared with respect to production of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.). Higher dose of spawn was found to be suitable for obtaining Spawn run, number of fruits and higher yield of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) on paddy straw substrate compared to lower rate of spawning and 38 and 18 days old spawn found more suitable for obtaining higher yield of new strain IGKVm-11 of oyster mushroom (*Pleurotus* sp.) on paddy straw substrate. The present findings are very nearer to the results obtained by Biswas *et al.* (1997), El-Sawah *et al.* (2009). and Tewari (1991) who reported earlier spawn run and higher yield of *Pleurotus* spp. with increased the rate of spawning.

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