

Effect of different grain substrates on spawn growth and productivity of *Pleurotus djamor*

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ABSTRACT

Studies were undertaken to determine the best grain substrate for spawn production of *Pleurotus djamor* and its effect on yield. The cereal grains of jowar (*Sorghum bicolor*), kodo (*Paspalum scrobiculatum*), maize (*Zea mays*), wheat (*Triticum aestivum*), bajra (*Pennisetum typhoides*), oat (*Avena fatua*) and barley (*Hordeum vulgare*) were evaluated as spawn substrates. Observations were recorded for number of days taken for spawn development. Spawn raised on different grains was also used for cultivation on wheat straw substrate to assess the period of spawn run, number of days taken for primordial formation and weight of sporophores. The shortest period for spawn development was obtained with kodo (8 days), bajra (8.3 days) and wheat (8.6 days) grains the three being statistically at par indicating their suitability for effective spawn production. The different grains also influenced the duration of spawn run and pin head formation including the biological efficiency of *P. djamor* on wheat straw. The yield of *P. djamor* varied significantly with the kind of grain used for spawn development and it was maximum in case of wheat (224 g/300 g dry substrate). The overall biological efficiency was also highest on wheat grain spawn (74.76%).

Keywords: *Pleurotus djamor*; spawn; substrate; grains; biological efficiency

INTRODUCTION

Mushrooms as the product of transformation of inedible agro-waste into edible biomass are gaining wide popularity among farmers. These are the edible fungi which are saprophytic in nature and have distinguished identity by their macroscopic fruiting body. *Pleurotus* sp commonly known as oyster mushroom ranked second in the world mushroom production. The cultivation of oyster mushroom is now becoming more popular in developing countries because of easy and cheap cultivation technology and availability of choice of species and suitability to varying agro-climatic conditions (Rajaratnam and Bano 1987). It also has good shelf-life and agreeable distinctive taste. Oyster mushroom is becoming popular among the rural people of Himachal Pradesh. Therefore present experiments were conducted to find out the best substrate for its spawn production and cultivation on locally available substrate.

MATERIAL and METHODS

The pure culture of *Pleurotus djamor* was procured from Directorate of Mushroom Research Chambaghat, Solan, Himachal Pradesh. Seven cereal grains (wheat, bajra, oat, maize, jowar, barley and kodo) were evaluated as spawn substrates. The spawn was prepared as per the standard procedure of commercial spawn production (Munjal 1973). Observations were recorded for number of days taken for spawn development. Spawn raised on different grains was also used for cultivation on wheat straw substrate to assess the period of spawn run, number of days taken for primordia formation and weight of sporophores. The chopped straw substrates were steeped in water containing 75 ppm carbendazim + 500 ppm formaldehyde for 18 h. Excess water was decanted on sloppy cemented floor and was dried in shade to retain 65-70 per cent moisture. Spawning was done

with grain-based spawn @ 2 per cent on w/w basis of straw by thoroughly mixing; spawned substrate (1 kg/bag) was filled in perforated polyethylene bags and the mouth of the bag was closed with nylon rope. The bags were kept in cropping room and after complete colonization of straw with mycelium, polyethylene bags were removed. The bags were moistened by sprinkling water on them twice a day. Observations were recorded on number of days taken for spawn run, initiation of primordia, total yield (up to 32-38 days) and biological efficiency.

RESULTS and DISCUSSION

In order to cultivate any edible fungus preparation of spawn is must and in the present studies seven different grain substrates were tried to see their suitability for preparation of spawn. The method of sterilization of substrates and preparation of spawn was the same as described in material and methods. It is clear from results given in Table 1 that *P. djamor* took 8.0 to 16.00 days for spawn development on different

grain substrates. The number of days taken by *P. djamor* for spawn development on different grains differed significantly (Plate 1, Fig 1). The shortest period for spawn development was obtained with kodo (8 days), bajra (8.3 days) and wheat (8.6 days) grains the three being statistically at par indicating their suitability for effective spawn production. Different grain-based spawns also influenced the duration of spawn run and pin-head formation as well as biological efficiency of *P. djamor* on wheat straw substrate (Plate 2). The yield of *P. djamor* varied significantly (106.3 to 224.3 g/300 g dry substrate) with the kind of grain used for spawn development on wheat straw. The overall biological efficiency was highest due to wheat grain spawn (74.76%). In all the treatments the type of mycelium was dense, less dense, normal and fluffy.

Cereal grains especially wheat and rye are the universally accepted substrates for spawn production. However various workers have tried other substrates or agricultural wastes also because of their easy availability, accessibility or low cost.

Table 1. Effect of cereal grain substrates on spawn development and spawn run of *Pleurotus djamor* on wheat straw substrate

Substrate	Spawn development period (days)*	Type of mycelium	Spawn run (days)*	Primordia initiation stage (days)*	Yield* (g/300 g dry substrate)	Biological efficiency (%)
Wheat	8.6	Dense	13.67	17.00	224.3	74.76
Bajra	8.3	Less dense	14.67	19.33	117.3	39
Oat	10.0	Dense	15.00	18.67	106.3	35.43
Maize	12.0	Dense	12.33	19.33	153.7	51.23
Jowar	13.3	Less dense	16.67	23.00	142.3	47.33
Barley	16.0	Normal	20.00	23.67	133.7	44.56
Kodo	8.0	Fluffy	12.00	15.00	136.3	45.43
Mean	10.88		14.91	19.43	144.84	
CD _{0.05}	1.14		1.20	3.48	11.84	
SE	0.53		0.56	1.62	5.52	

*Average of three replications

Spawn run was highest in case of barley (20.00 days) and lowest in case of kodo (12.00 days) and maize (12.33) the latter two being statistically at par. The primordia initiation stage took 15.00 to 23.67 days in different treatments. More or less similar results were also observed by Sharma (2003) with *P. djamor*. These results are in consonance with the earlier studies conducted by Bano and Srivastava (1962), Jandaik and Kapoor (1976), Garcha et al (1984) and Ram (1995).

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Platse 1. Spawn run on different cereal grains

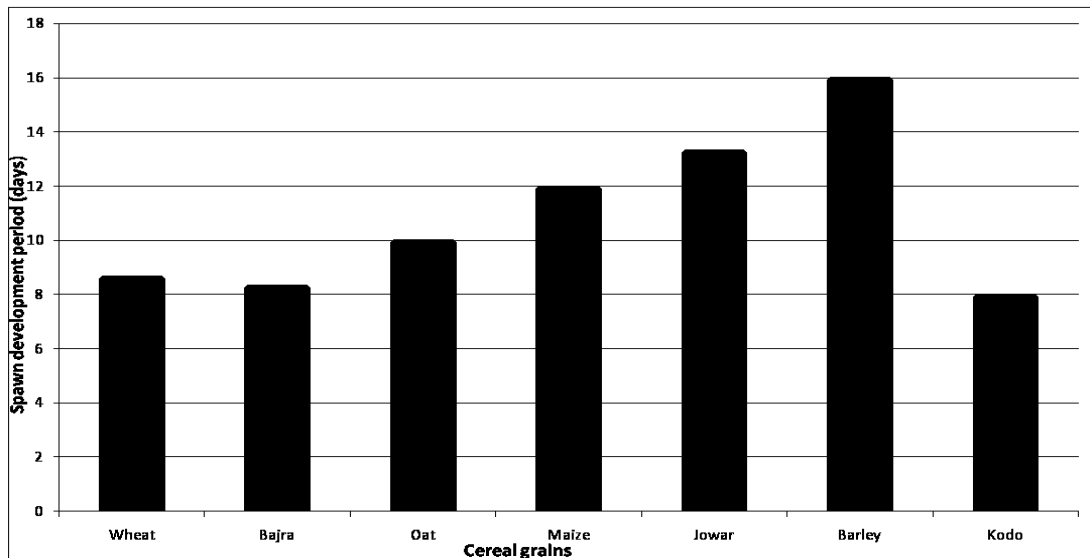


Fig 1. Effect of cereal grains on spawn development of *Pleurotus djamor*



Plate 2. Sporophores of *Pleurotus djamor* on wheat straw substrate

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