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Comparative study of different grains for spawn production of *Pleurotus florida*

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Edible mushrooms are nutritionally rich (mostly Basidiomycetes) that grow on the trunks, leaves and roots of trees as well as decaying woody materials (Chang and Miles, 1992; Stamets, 2000; Lindequist *et al*., 2005). These edible mushrooms include *Agaricus* spp. (button mushrooms), *Volvariella volvacea* (oil palm mushrooms), *Auricularia auricular* (wood ear mushroom), as well as *Pleurotus florida* (oyster mushroom). The inoculums of mushrooms are known as the 'spawn' in mushroom growing technology. Spawn is a medium that is impregnated with mycelium made from a pure culture of the chosen mushroom strain. Spawn production is a fermentation process in which the mushroom mycelium will be increased by growing through a solid organic matrix under controlled environmental conditions. In almost all cases the organic matrix will be sterilized grain *e.g*., wheat, maize, sorghum *etc.* (Jain and Vyas, 2005; Jain, 2005)

In the present study, *Pleurotus florida* was grown on five different grains: wheat, maize, bajara, sorghum, and mustard. A pure culture of oyster mushroom (P. florida) was obtained from the Directorate of Mushroom Research, ICAR, Solan (Himachal Pradesh). This culture was used to prepare master spawns for the experiments. Healthy, clean seeds of each grain were used for spawn preparation. The selected grains were washed with tap water separately, semi-cooked in hot water (80°C) for 20 minutes, and then the excess water was drained. The grains were uniformly spread on a clean cloth and mixed with calcium carbonate (2.0%) and calcium sulphate (0.5%) by weight to adjust the pH to around 7.0 to 7.5. About 100 grams of each grain were placed in 250 ml conical flasks and sterilized in an autoclave at 121°C and 15 psi for 20 minutes. The flasks were then kept in a laminar air flow chamber and exposed to UV light for 20 minutes. After this, *P. florida* fresh mycelium bits (5 bits of 5 mm each) from a previously prepared culture petri plate were inoculated into the flasks. The inoculated flasks were incubated in a BOD incubator at 25 ± 2°C until full mycelial growth of *P. florida* was achieved. Observations on the initiation of mycelium on the grain and the days required for complete colonization of mycelium on the grain were recorded.

Effect of different grains on the growth spawn

The time taken for the mycelial run on different grains varied from 2.00 to 6.75 days (Table 1). Significantly fewer days (2.00) were required for the initiation of the mycelium run of oyster mushroom (*P. florida*) on bajara and sorghum grains. On the 3rd day of incubation, the mycelial run occurred on wheat and maize grains. In contrast, a significantly higher number of days (6.75) was required for the initiation of the mycelium run on mustard grain.

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Table 1. Effect of different grains on the growth of oyster mushroom (*Pleurotus florida*) spawn

Tr. No.	Treatments	Days for initiation of mycelium	Days for complete colonization
T1	Wheat grains	3.00*	9.25*
T2	Bajra grains	2.00	7.00
T3	Maize grains	3.00	9.00
T4	Sorghum grains	2.00	8.00
T5	Mustard grains	6.75	21.00
	S.Em. ±	0.06	0.11
	C.D. at 5 %	0.19	0.34
	C.V. %	3.85	2.06

*Mean of four repetitions in all treatments

Results on the complete colonization of *P. florida* on different grains ranged from 7.00 to 21.00 days. A significantly minimum time (7.00 days) for complete colonization of P. florida was required on bajara grain, which was statistically at par with sorghum grain (8.00 days), followed by wheat grain (9.25 days). The next best treatment was maize grain (9.00 days). In contrast, a significantly maximum time of 21 days was required for the complete colonization of *P. florida* on mustard grain. These results align with the findings of Devi and Sumbali (2021), who recorded the shortest spawn run time in bajara grain, followed by wheat, and attributed the variation in spawn preparation time to grain size. They noted that the smaller grains of bajara were more quickly enveloped by mushroom (*Macrocybe gigantea*) mycelium compared to the larger grains of wheat and maize. Similarly, Bhivaji (2016) reported the shortest spawn run completion period for *P. eous* in wheat grain (11.00 days), followed by sorghum (11.66 days), bajara (11.66 days), and maize (13.33 days).

From the above findings, it can be inferred that among the five different grains evaluated, bajara and sorghum grains were excellent, requiring a minimum of 2 days for the initiation of mycelium on the grain. This was followed by wheat and maize grains, which required 3 days. In terms of complete colonization of the grain for spawn production of oyster mushroom (*P. florida*), bajara was the fastest (7 days), followed by sorghum grain (8 days).

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