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CULTIVATION OF OYSTER MUSHROOM (*PLEUROTUS FLORIDA*) ON PADDY STRAW BY DELAYED SPAWN INOCULATION

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ABSTRACT
The mushroom cultivation is a profitable agri-business and oyster mushroom *(Pleurotus florida*) is an edible mushroom having excellent flavor and taste. The present work deals with cultivation of *Pleurotus ostreatus* by standard protocol and delayed spawn inoculation on paddy straw. The result depicts, oyster mushroom on paddy straw by the delayed spawn inoculation is performing better in number of days taken for spawn running, number of days taken for formation of pinheads, number of days taken for formation of fruiting bodies and average number of fruiting bodies over standard protocol of cultivation. The findings are most promiscuous in terms of various parameters including biomass.

INTRODUCTION

Mushroom such as the genus *Pleurotus* known to be among the largest of fungi composed of filaments and survives very well in a damp or moist conditions (Oei, 1996). Many types of mushrooms both edible and non-edible exist. The edible mushrooms are widely used as human food (Chang, 1980).

The mushroom cultivation is a profitable agri-business and oyster mushroom (*Pleurotus ostreatus*) is an edible mushroom having excellent flavor and taste. The technology of artificial cultivation of mushroom is somewhat recent innovation, incorporation of non- conventional crops in existing agricultural system can help in improving the social as well as economic status of small farmers. Mushrooms are the good source of protein, vitamins and mineral (Khan *et al.,* 1981). Mushrooms contain about 85-95% water, 3% protein, 4% carbohydrates, 0.1% fats, 1% mineral and vitamins (Tewari, 1986). Mushrooms contain appreciable amount of potassium, phosphorus, copper and iron but low level of calcium (Anderson and Feller, 1942). Mushroom protein is an intermediate between the animal and vegetables (Kurtzman, 1976).

The cultivation of mushroom serves as the most efficient and economically viable biotechnology for the conversion of lingo cellulose waste materials to high quality food and this will naturally open up new job opportunities especially in rural areas (Fasidi *et al.,* 1993 and Hussian, 2001). The cultivation of it can be practiced on various commonly available organic wastes as substrate (Shah *et al.,* 2004, Nagaratna and Mallesha, 2007 and Onuoha *et al*., 2009).

Edible mushrooms like *Agaricus* sp. and *Pleurotus ostreatus* are commercially produced and sold in Asia, America and Europe (Okhuoya *et al.,* 1998). The present study, therefore evaluates the use of standard inoculation compare with delayed spawn inoculation on paddy straw.

MATERIALS AND METHODS

The pure culture of mushroom fungi (*Pleurotus florida*) used in the study was maintained in the Department of Biotechnology, Capital College, Bangalore. Paddy straw substrate was used for the cultivation of mushroom .The substrate was soaked overnight in water and excess water was drained off. The substrate was pasteurized using steam for 30 minutes at 85ºC in a closed chamber. The pasteurized straw was spread on a clean cement floor inside the room and allowed to cool to room temperature. Then substrate was filled into the polythene bags (18" X 12") and seeded with 5% *Pleurotus florida* grain spawn by following the method of Krishnamurthy (1981).

Similarly one more experiment designed with a slight modification *i.e.* delayed spawn inoculation. In the delayed inoculation the sterilized substrate was placed in a sterile room and left undisturbed for 48 hrs. Then the inoculums placed into the substrate.

RESULTS AND DISCUSSION

Cultivation of oyster mushroom on paddy straw by using standard protocol and delayed spawn inoculation method

Table 1: Growth stages of mushroom cultivation on paddy straw

Cultivation Methods	Number of days taken for spawn running	Number of days taken for formation of pinheads	Number of days taken for formation of fruiting bodies	Average number of fruiting bodies
Standard protocol	20	10	10	16.78
Delayed Spawn i noculation protocol	16	8	7	21.26

yielded the following results.

The spawn running in this case required 2-3 weeks after inoculation. The formation of pinheads is the next stage in the life cycle of the mushrooms. Small white pinheads were observed 10days after spawn running. The fruiting bodies appeared 10days after the pinhead formation (Table 1). These stages of results are agreed with the finding of Zadrazil (1978).

The oyster mushroom crop was harvested in two flushes and was observed that the first flush yielded the maximum harvest. This finding was in agreement with Shah *et al.,* (2004) who stated that the maximum yield was observed in the first flush.

According to the results obtained, it is seen that the cultivation of oyster mushroom (*Pleurotus florida*) on paddy straw by the delayed spawn inoculation method is most suitable for the climatic condition of Bangalore. The fruiting bodies can be harvested in 31days, compared to the standard method wherein it takes 40 days to harvest the flush. It is also seen that the average number of fruiting bodies per bag containing 1000g of the substrate is higher in the case of delayed spawn inoculation (21.26) when compared to standard method (16.78). These results show that the cultivation of oyster mushroom on paddy straw by the delayed spawn inoculation has numerous advantages when compared to the standard method of cultivation.

In the case of delayed spawn inoculation the loosening of the paddy straw making it more amenable to breaking down by enzyme secreted by the fungal mycelium. By delaying spawn inoculation for 48 hours and maintaining humid conditions, the straw is allowed to undergo partial degradation due to the exposure to the environment conditions to favor the formation and rapid growth of the mycelium.

The detailed research activities are required to understand the biochemical relation between the inoculums and the substrate for enhanced productivity and other parameters.

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