

EFFECT OF SPAWNING METHODS ON SPOROPORE PRODUCTION OF *CALOCYBE INDICA*

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Received: 26 March 2011, Revised: 23 May 2011

ABSTRACT

Different methods of spawning *viz.* thorough spawning as well as spawning in 1, 2, 3, 4 and 5 layers were followed to study their effect on sporophore production of *Calocybe indica*. Results indicate that spawning of substrate in 4 to 5 layers induced quicker substrate colonization (15 days) and fruiting initiation (29-30 days) and sustained higher mushroom yield (68.9 – 69.0 % BE), the yield difference between these two layers being statistically *at par*. Lowest yield (31.0 % BE) and longest fruiting time was recorded in response to single/ middle layer spawning.

Key words: Spawning methods, mushroom, sporophore, yield, *Calocybe indica*

INTRODUCTION

Calocybe indica, is tropical edible basidiomycetes of Indian origin (Purkayastha and Chandra 1974) belonging to the family Tricholomataceae. It is popularly known as milky mushroom or white summer mushroom. It is appreciated for its large- sized milky white fruiting bodies. *C. indica* contains 32.3 % protein on dry weight basis and possesses 41 % crude fibers (Krishnamoorthy 2003). Besides protein, it is rich in lipids, fibres, minerals, carbohydrate and contains an abundant amount of essential amino acids (Alam *et al.* 2008; Mallavadhani *et al.* 2006). It is an excellent source of thiamine, riboflavin, nicotinic acid, pyridoxine and ascorbic acid (Breene 1990). Simple cultivation technology, low capital investment, substantial yield, long shelf-life and unique nutritional status are some of the attributes which make this mushroom popular among growers as well as consumers. Milky mushroom is also propagated through spawn produced with wheat grain as substrate. Like any other cultivated mushroom species, quality spawn is the key to successful cultivation of *C. indica*. Though different aspects of mushroom cultivation aimed at higher yield have been investigated by various workers (Purkayastha and Nayak 1977; Chandra and Purkayastha 1978; Krishnamoorthy and Muthusamy 1997; Theradimani *et al.* 2001; Sherin *et al.* 2004; Tandan *et al.* 2006; Tandan and Sharma 2006), literature regarding the role of methods of spawning the cultivation substrate on mushroom yield is almost lacking. Therefore, the present study was undertaken to evaluate different spawning methods on the sporophore yield of *C. indica*.

MATERIALS AND METHODS

Cylindrical beds were prepared using polythene bags of 60 cm X 40 cm size (100 gauge) with chopped paddy straw and wheat grain spawn as per the method described (Pani and Das 1998). Each polythene bag contained one kg of paddy straw on dry weight basis.

Spawning was done in 1,2,3,4, and 5 layers. Thorough spawning of the substrate was also followed in which the spawn was thoroughly mixed with the wet substrate before bagging. No casing was done (Pani 2007). A temperature of 30- 35°C and relative humidity of 80-90 % were maintained in the cropping room throughout the growing period sufficient light and controlled ventilation were also allowed. Mushrooms were harvested just before flattening from a total of two flushes and fresh weights were immediately recorded. Biological efficiency of the fungus was calculated as a ratio between the fresh weight of harvested fruiting bodies and dry weight of substrate and was expressed as a percent. Data pertaining to yield was statistically analyzed.

RESULTS AND DISCUSSION

Results (Table 1) indicate that spawning of substrate in 4 to 5 layers resulted in quicker substrate colonization (15 days), earlier primordial emergence (29-30 days) and significantly higher yields (68.9 – 69.0 % BE g) compared to other treatments, the difference in yields between these two layers being statistically in-significant. Spawning in 3 layers as well as thorough spawning of the substrate also sustained satisfactory mushroom yields (59.1 - 63.1 % BE). Spawning only in the middle layer took the longest period (25 days) for the growing mycelia to spread both upward and downward in order to cover the substrate. The thin mycelia load also predisposed the crop to the incidence of contaminating fungi. All these apparently resulted in delayed fruiting (40 days) and lowest biological harvest (31 % BE) in the middle-layer spawning. In general the increase in spawning layers was directly proportional to quicker substrate colonization and fruiting. Sharma *et al.* (1994) has reported earlier button formation of *C. indica* when spawning of substrate was done in three layers. Average weight of the sporophore was highest (162.2 g, 48.6 % BE) in double –

layer spawning while it was lowest (114.8 g) in the substrate spawned in 5 layers.

Table 1: Effect of spawning method on the production of *Calocybe indica*

Spawning Method	SC (days)	FI (days)	Sph. No	Yield (g)	Avg. sph. wt. . (g)	BE (%)
Thorough spawning	21	38	5	591.3	118.2	59.1
Middle layer spawning	25	40	2	310.6	155.3	31.0
Spawning in 2 layers	20	39	3	486.6	162.2	48.6
Spawning in 3 layers	17	33	5	631.3	126.2	63.1
Spawning in 4 layers	15	30	6	690.3	115.0	69.0
Spawning in 5 layers	15	29	6	689.3	114.8	68.9

CD (0.05)

45.13

S. E.

17.21

Each of the observation was the average of three replications

SC- Substrate Colonization FI- Fruiting Initiation Sph.- Sporophore

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