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*Short Communication*

# SPOROPHORE PRODUCTION OF MILKY MUSHROOM (*CALOCYBE INDICA)* AS INFLUENCED BY DEPTH AND TIME OF CASING

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**ABSTRACT**
Casing of cultivation substrate is a common practice during milky mushroom cultivation. In the present study, the effect of depth and time of casing on sporophore production of *Calocybe indica* was investigated. Results indicate that 2 cm thick casing layer was ideal for quickest primordial initiation, higher sporophore number and maximum yield. There was no significant difference in these attributes between 1 and 2 cm casing depths. Thickness beyond 2 cm gradually decreased the mushroom yield and delayed the fruiting. Casing at the time of spawning was best in terms of quickest fructification (28 days), higher sporophore number (6) and maximum yield (74.6 % BE). There were no significant variations in yield attributes when casing was done just after substrate colonization. Delay in casing (18-25 days) resulted in gradual reduction in the number and weight of sporophores. It was concluded that a casing depth of 2 cm at the time of spawning should be allowed to obtain higher production of *C. indica*.

**KEY WORDS:** Casing, *Calocybe indica*, Depth, Time, Sporophore, Production.

## INTRODUCTION

*Calocybe indica*, popularly known as milky mushroom, is a relatively new introduction from India to the world mushroom growers (1). Its robust size, sustainable yield, attractive colour, delicacy, long shelf-life and lucrative market value have attracted the attention of both mushroom consumers and prospective growers (2). The mushroom is rich in protein, lipids, fibres, minerals, carbohydrate and contains an abundant amount of essential amino acids (3,4).It is an excellent source of thiamine, riboflavin, nicotinic acid, pyridoxine and ascorbic acid (5).It grows well at a temperature range of 25-35°C and relative humidity more than 80%. Thus, milky mushrooms can be cultivated throughout the year in the entire plains of India. The cultivation process resembles that of oyster mushroom but for the additional process of casing. Casing is an important cultural practice of milky mushroom cultivation. Casing means covering the cultivation substrate with a layer of soil or soil like material after spawn run which enhances the transformation of vegetative stage to reproductive stage. Casing of cultivation beds was first done by Purkayastha *et al* (6) with a mixture of soil and sand (1:1) and calcium carbonate (12 %) @ 2.5 kg of casing soil per tray during production of *C. indica*. In the present study, the effect of depth and time of casing on the sporophore production of *C. indica* was investigated.

## MATERIALS AND METHODS

Milky mushroom cultivation using chopped paddy straw substrates in cylindrical polythene bags (60 cm X 40 cm, 100 gauges) with layer spawning was followed (7). Vermicompost was used as casing material which was

sterilized in an autoclave at 15 lb p.s.i. for 15 minutes prior to use. After completion of spawn run in the substrate, the top end of the bag was opened, rolled outward and vermicompost was applied on the exposed surface unless otherwise specified. To study the effect of depth, the casing materials were applied in 1, 2, 3, 4 and 5 inch thickness. In another experiment, casing of the substrate was done up to 2 inches thickness separately at the time of spawning, at substrate colonization and 18 and 25 days after spawning. Optimum relative humidity of 80-95%, room temperature of 25-32°C and light intensity of about 1600 –3200 lux were maintained in the cropping room. Proper ventilation for gaseous exchange was also allowed. Water was sprayed regularly to keep the beds moist. Mushrooms were harvested 7-8 days after primordial initiation. After obtaining the first harvest, the casing medium was gently ruffled, slightly compacted back and sprayed regularly with water. Harvesting was done from a total of two flushes and fresh weights were immediately recorded. Biological efficiency was calculated as the ratio between fresh weights of mushrooms harvested and the dry weight of substrate pertaining to each bag which was expressed as per cent.

## RESULTS AND DISCUSSION

It was revealed (Table 1) that 2 cm thickness of casing layer was ideal for quicker primordial initiation (28 days), higher sporophore number (6) and maximum yield (73.8 % BE). Casing thickness of 1 cm was also equally

effective with regards to emergence of fruiting body (29 days), sporophore number (6) and biological yield (70.2 % BE).

**TABLE 1** Effect of casing thickness on production of *Calocybe indica*

| Casing thickness (cm) | Fruiting body initiation (days) | Sporophore No. | Yield (g) | Avg. wt. of sporophore (g) | Biological efficiency (%) |
|---|---|---|---|---|---|
| 1 | 29 | 6 | 702.0 | 117.0 | 70.2 |
| 2 | 28 | 6 | 728.0 | 121.3 | 72.8 |
| 3 | 30 | 5 | 684.0 | 136.8 | 68.4 |
| 4 | 32 | 5 | 614.6 | 122.9 | 61.4 |
| 5 | 34 | 4 | 493.3 | 123.3 | 49.3 |
| CD (0.05) | | | 38.31 | | |

Each observation was the average of three replications

**TABLE 2** Effect of casing time on production of *Calocybe indica*

| Casing time | Fruiting initiation (days) | Sporophore No. | Yield (g) | Avg. wt. of sporophore (g) | Biological efficiency (%) |
|---|---|---|---|---|---|
| At spawning | 28 | 6 | 746.6 | 124.4 | 74.6 |
| At substrate colonization | 29 | 6 | 712.0 | 118.6 | 71.2 |
| 18 days after spawning | 32 | 4 | 570.6 | 142.6 | 57.0 |
| 25 days after spawning | 38 | 2 | 276.0 | 138.0 | 27.6 |
| CD (0.05) | | | 70.80 | | |

Each observation was the average of three replications

There was no significant difference in yields obtained in response to 1 - 2 cm casing depth. Thickness of casing layer beyond 2 cm gradually decreased the mushroom yield and delayed the appearance of sporophores. Least weight of sporophores (BE 49.3 %) was recorded in the substrate with maximum casing depth (5 cm). This finding is in contradiction to the report of Amin et al (8) who reported that the yield of milky mushroom increased with increase depth of casing. However, they suggested a depth of 3cm to be the ideal casing layer. Deb (9) has also reported 1 cm casing while Sharma et al (10) suggested 2.5 cm thick casing for obtaining higher yield of milky mushroom. Sassine *et al* (11) has suggested that the casing should be very loose, otherwise the primordia cannot penetrate from the bottom to the top of the casing layer. Casing of substrate at the time of spawning was found to be the best (Table 2) in terms of various yield attributes *viz*. quickest fructification (28 days), higher sporophore number (6) and maximum yield (74.6 % BE).There were no significant variations in these attributes when casing was done after completion of mycelial growth in the substrate. Delay in casing resulted in gradual reduction in the number and weight of sporophores as the casing materials exerted more physical load on the reproductive fungal mycelia. This finding is in agreement with similar report (9). Significantly least yield (27.6 % BE) and reduced number (2) of sporophore were obtained in the substrate in which casing was made after 25 days of spawning.

It was concluded that casing of cultivation substrate should be done at the time of casing/just after substrate colonization up to a thickness of 1-2 cm for optimum yield of *C. indica.*

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