

ORIGINAL RESEARCH ARTICLE

Environmental Factors Influence on Yield Variation of Indian White Summer Mushroom (*Calocybe indica*)

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ABSTRACT

The aim of this study was to find out the most favourable and unfavourable month for the cultivation of *Calocybe indica* and the influence of temperature and relative humidity on mushroom yield. Significant variation in the yield and other parameters existed when *Calocybe indica* was grown during different periods of study the year of 2011 to 2012. In summer months (March to July), a general increase in mushroom yield was observed but variation of temperature other months the yield do not reduced. The maximum yield was recorded in the month of May and June 2012 (460.7 g per bed). However, the yields obtained in the months of May to November 2012 were found to be on par with that of the above observation. Mushroom attained harvesting maturity almost one day earlier during monsoon months. In addition, during this period, the average weight of individual mushroom was found to be comparatively high was noticed during summer monsoon.

Key words: *Calocybe indica*, Yield, Temperature and Relative humidity.

1. INTRODUCTION

Presently button and oyster mushrooms were commercially cultivated in the tropical and sub-tropical regions of India. The oyster mushrooms can be easily grown under natural condition whereas button mushrooms require controlled conditions. Huge inputs are required to provide ideal condition for button mushrooms to provide cold condition. Therefore, button mushroom cultivation is beyond the reach of ordinary farmers. The milky mushrooms require 25 - 35°C temperature. In subtropical region of India, ample quantity of agricultural wastes are available and temperature of 28-35°C is prevalent for about 4 - 5 months.

Mostly summer season is suitable for cultivation of *Calocybe indica* and Tamilnadu is major white summer mushroom producer. The climatic nature of Tamilnadu has huge variation between summer season and winter season of every year. During winter period, this state receives maximum range of rainfall and high humidity, raising the temperature around 19 - 23°C during Nov- Feb. In summer period, the state is very hot, produce minimum range of rain fall and produce low humidity raising the temperature around 32 - 40°C and above. *Calocybe indica*, a tropical edible

mushroom, belongs to the family Tricholomataceae of the order Agaricales^[1,2]. It is becoming more popular, due to its robust size, attractive color, sustainable yield, delicious taste and unique texture^[3].

2. MATERIALS AND METHODS

Paddy straw substrate was soaked in cold water for 4 hrs. After draining excess water, the materials were treated with hot water (90°C) for 60 min and allow air dried in shade. The preparation of bed, using polythene bags of 60 x 30 cm size and 100 gauge thickness was used and cylindrical beds were prepared using average weight of 0.5 kg of substrate (dry weight) per bed. The sorgham grain spawn of *Calocybe indica* was used at 6% - 8% level to the wet average weight of the substrate and the beds were spawned following layer method of spawning^[4]. After 10 to 15 days, the incubated beds were fully mycelial colonized by the mushroom fungus; they were cut into two equal halves and applied with casing soil to a height of 2 cm over the spawn run substrate in each of the half bed. The beds were uniformly and regularly sprayed with water and the performance of *Calocybe indica* were recorded in different months, mushrooms beds were laid out from

August, 2011 to November, 2012 at monthly intervals. The yield of mushroom along with other morphological characters and weather parameters were also recorded.

3. RESULTS AND DISCUSSION

The results obtained on the performance of *Calocybe indica* during different months are presented in Table - 1. Significant variation in the yield and other parameters existed when *Calocybe indica* was grown during different months of 2011 to 2012. In summer months (March to August), a general increase in mushroom yield was observed. The maximum yield was recorded in the month of May and June 2012 (460.7 and 457.0 gm per bed). However, the yields obtained in the months of May to Nov 2012 were found to be on par with that of the above observation.

Mushroom attained harvesting maturity almost one day earlier during monsoon months. In addition, during this period, the average weight of

individual mushroom was found to be comparatively high. Interestingly, a marginal but comparable reduction in stipe length was noticed during summer months. Increase in mushroom yield had a positive relationship with the reduction in temperature and increase in relative humidity.

Similar reports were made by earlier workers. [5] reported that 20 to 28°C temperature was optimum for obtaining maximum yield of *Pleurotus flabellatus*. *Pleurotus flabellatus* required relative humidity (RH) of 70 to 80% for its cultivation which is lower than required for *Pleurotus sajor - caju* [2,7]. Similar findings have been reported in India earlier by [4:7:8:9:10] was reported on *Calocybe indica* required a temperature range of 30 to 32°C and more than 90% RH for its better yield. But, some insect infestation and bacterial infections in bed was observed during rainy season which is a major constraint for the cultivation of *Calocybe indica*.

Table 1: Yield variation of *Calocybe indica* in different months of 9/2011 to 11/2012

Month 2011-2012	Temperature (°C)			Mean relative humidity (%)	Rain fall (mm) Maximum	Average weight (g/button)	Number of buttons harvested	Yield (g/bed)	Bio- efficiency
	Maximum	Minimum	Mean						
Sep	32.7	27	29	85.0	60.7	46.7	6.3	320.9	64.17
Oct	30	22	27	87.0	40.0	40.7	6.0	220.5	44.10
Nov	30	21	26	89.0	30	40.2	5.0	210.9	40.20
Dec	27	19	24	93.0	97	35.0	5.0	120.5	24.10
Jan	29	22.5	21	14.8	19.2	56.5	5.3	239.0	47.80
Feb	31	23	23	87.0	9.0	59.0	6.2	390.0	78.00
Mar	32	24	26	78.0	13.6	60.0	6.5	421.5	84.30
Apr	34	27	29	76.5	13.4	60.2	6.5	440.0	88.00
May	42.5	28	29.6	72.0	14.8	60.3	6.5	460.7	92.14
Jun	38	29	33	67.0	113.6	60.5	6.3	457.0	91.70
Aug	37	32	32	87.0	19.2	60.4	6.5	445.0	89.00
Sep	33	29.5	31	83.0	9.0	60.6	6.5	450.0	90.00
Oct	31	28	29	87.0	7.0	60.4	6.5	449.5	89.80
Nov	30	23	26	89.0	12.4	60.7	6.5	452.9	90.58

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