Comparative Analysis of Effect of Time of Cultivation under Natural Conditions on Growth and Yield of Milky Mushroom (*Calocybe indica*)

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ABSTRACT

To study the impact of time of cultivation (temperature and humidity) on the growth and yield of Milky Mushroom (*Calocybe indica*) under natural conditions, an experiment was conducted in three batches in April, June and July 2025. The mean temperature in April 25 batch was 34°C (range 30.0 to 36.9°C), for batch June 25 was 27°c (26 -31°C) and July it was 280c (26-31°C). On the other hand, the mean RH was 69% (Range 52-77%) in April Batch, 80% in June batch (75-85%) and 80% in July batch (75-87%). The results showed a direct relationship between controlled temperature/humidity and successful milky mushroom cultivation. The temperature of 28°C during dark period and 28-29°C during fruiting period and relative humidity of > 80% during both the period's results in rapid mycelium growth, abundant pinhead formation and high yields. Further, the best time to cultivate milky mushrooms in Telangana region found to be from mid-June onwards.

Key words: *Calocybe indica,* Fruiting period, Incubation period, Milky white Mushroom, Time of cultivation.

The milky white mush room (*Calocybe indica*) originated in India and mainly grow in humus rich soils under tropical and subtropical parts of India (Suresh and Meena, 2021). Milky mushroom cultivation is popular in Tamil Nadu, A.P. and Karnataka where the temperature prevails more than 25-30°C. The milky mushroom is preferred by small farmers due to its suitability to warm humid climate (30-38°C and 80 to 85% humidity). On otherhand, the optimal temperature for mycelium growth of all the oyster mushroom species was reported to be 25±2°C (Lenka *et al*., 2022.). Further, it can be grown on any agricultural waste on cereal straw, sugarcane leaves and bagasse having high lignin, cellulose and hemicelluloses and cotton and jute wastes. Karpagavalli *et al*. (2023) reported that highest mycelial dry weight of 724.67 mg was recorded in paddy straw.

The mushrooms provide proteins, minerals and vitamins and the mushroom cultivation is an important microbial technology (Sangeetha and Rajappan, 2020) and these are obtained through an eco-friendly activity (Krishnamoorthy and Priyadharshini, 2016). For improving productivity, the study recommended the adequate supply of quality spawned compost bags at the doorsteps of growers at appropriate time and reasonable prices in addition to encouraging them to grow at least two crops in a year (Kangotra and Chauhan, 2026).

Milky mushroom (*Calocybe indica*) grows under hot and humid climate with a temperature of 35-35°C and 80 per cent relative humidity (Upadhyay, 1990). The milky mushroom cultivation is not widely practiced in Telangana region and also it is a new introduction to the region for mushroom production. Further, the information on appropriate time of cultivation of milky mushroom in this region is available. Therefore, an effort has been made to find out appropriate time for cultivation of milky mushroom at Dr D. Rama Naidu Vignana Jyothi Institute of Rural Development, Tuniki village, Medak district of Telangana during April, June and July months of 2025.

An experiment on milky mushroom production was conducted in three sets April, June and July 2025 at Dr. D. Rama Naidu Vignana Jyothi Institute of Rural Development, Tuniki, Medak District, Telangana State. Paddy straw was used as substrate for growing the milky mushroom. The substrate preparation for April 2025 was pasteurization and chemical method whereas for June and July 2025 sets the organic method in which the straw was sterilized by hot water treatment. The straw was cut into small pieces as per the standard process and used in the experiment.

In April 2025, 15 kg span was used in 45 bags while on June 25, 5 kg of spawn was used in 15 bags and on July 25 a set of 10 kg spawn was used in 30 bags. In three dates of experiment, the spawn was spread between two straw layers in side polythene bags following the

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Table 1: Temperature, relative humidity, number of harvests and yield of milky mushroom grown at different batches in Southern Telangana.

Batch	Preparation	Bags	Incubation temp/RH	Fruiting temp/RH	Harvests	Yield (kg)	Key adverse events
April	Chemical	45	34°C/69%	31°C/73%	0	0	Mold
June	Organic	15	27°C/80%	28°C/80%	3	6	None
July	Organic	30	28°C/80%	29°C/80%	8	18.5	Contamination (minor)

established Indian protocols (Suresh and Meena, 2021; Subbiah and Venkatesh, 2015).

The bags were kept in dark room for 21 days. The temperature and humidity maintained during the incubation period (Table 1). The mean temperature in April 25 batch was 34°C (range 30.0 to 36.9°C, for batch June 25 was 27°C (26-31°C) and July it was 28°C (26-31°C). On the other hand, the mean RH was 69% (Range 52-77%) in April Batch, 80% in June batch (75-85%) and 80% in July batch (75-87%).

After completion of dark room period, the casing was done with sterilized black soil after full mycelia colonization and the bags were shifted to light room where tube lights were fitted to racks. During light room period water was sprayed regularly at specific time interval (24 hour interval in the morning). The mean temperature for 21 days fruiting period was 31.4°C for April batch, 28°C for June batch and 29°C for July batch. The mean relative humidity was 73, 80 and 80 per cent respectively for April, June and July mushroom batches.

The key elements are like Temperature, moisture formation, pinhead initiation, contamination and harvesting were recorded systematically. The yield and number of harvests were computed at the end of the cropping cycle.

Incubation period

In April 2025 Batch, the mycelium formation started from day 3 and the bags exposed to often exceeding 34°C and humidity also fluctuated. Initial days saw irregular moisture. From day 21, black mold appeared, rapidly spreading to all bags and as a result there was no fruiting, thereby no mushroom yield. In June 2025 Batch, early and vigorous mycelium colonization was observed in all bags within 2 3 days post-inoculation. Consistent moderate temperature of 27°C and high humidity of 80% resulted in healthy, uniform mycelium formation. In July 2025 Batch, robust mycelial growth as that of June was observed and there was slightly warmer conditions 28°C noticed but they were with in favorable parameters.

Fruiting period

In April 2025 Batch, after casing and water application, on 8th day green mold was detected and it continued for entire period. It was due to high temperature and low relative humidity (31°C, RH 73%) which ultimately resulted in no pinhead formation and fruiting. In June 2025 Batch, there was rapid and uniform pin formation observed thereby fruiting was also developed faster and yield better. In July 2025 Batch, the large number of pinning and fruiting was observed and there were 8 harvests. The yield per bag observed in different batches of crop growth was 0 kg per bag in April; 0.4 kg/bag in June batch and 0.62 kg/bag in July batch of mushroom cultivation.

April batch's failure correlates directly with sustained high temperatures of about 32°C and humidity frequently below recorded 80-85%. The higher temperature resulted in suppression of growth of milky mushroom, encouraged the contamination because of increased substrate respiration (Suresh and Meena, 2021). It has been reported that higher storage temperature increases the respiration rate of milky mushroom (Arya *et al.,* 2016). On the other hand, there was rapid disease free mycelium, abundant pin formation and more yield in June and July batches as the temperature and humidity during incubation and fruiting periods were near 27-29°C and above 80% humidity. These results are in consistent with published research for *Calocybe indica*, where spawn running at 28-30°C and fruiting between 28-35°C with very high RH (Subbiah and Venkatesh, 2015; Suresh and Meena, 2021). Further, the organic method adopted for substrate preparation in case of June/July and careful environmental regulation avoided the contamination indicating that organic approach encourages beneficial microbes and careful monitoring, may increase resilience to pests and competitor fungi (Subbiah and Venkatesh, 2015). Sarmah *et al.* (2006) reported that milky mushroom can be successfully grown from May to August under the prevailing climatic conditions. The scale of cultivation may not makeup for environmental management in cultivation of milky mushroom as the larger number of bags in April did not produce yield. Contrarily, July batch's higher yield resulting from maintenance of ideal temperature/humidity, casing and rehydration practices. These results also show the Black and green mold (*Trichoderma* spp.) can be found when temperature/ humidity were less than optimum and also regular removal of affected bags, re-casing and strict control of microclimate are essential to promote healthy mushroom growth.

CONCLUSION

The comparative analysis of the milky mushroom experiments conducted in three batches April, June and July 2025 indicate that precise temperature/humidity management, proven organic preparation techniques, diligent hygiene protocols and adaptive crop monitoring are necessary for successful harvest of the mushroom. Further, the milk mushroom can be successfully cultivated from June onwards in Telangana conditions when rainy season starts and ambient temperatures are low. Hence, the best practices for milky mushroom cultivation require substrate or spawn quality and also holistic attention to the crops environment.

Conflict of interest

The authors declare that there is there is no conflict of interest to this article.

REFERENCES

Arya, K. Salu, B.K., Yadav, A., Santhakumaran, Venkatachalapathy, N. and Singaravadivel, K. (2016). Effect of temperature on the respiration of milky mushroom. *International Journal of Science, Environment and Technology*. **5(4):** 2161-2168.

Kangotra, A. and Chauhan, S.K. (2026). Economic viability of button mushroom cultivation in Himachal Pradesh, India. *Indian Journal of Agricultural Research*. **48(2):** 134-139. doi: 10.5958/j.0976-058X.48.2.022.

Karpagavalli, S., Abiakshara, V. and Chandrasekaran, P. (2023). Utilization of lignocellulosic substrateson oyster mushroom (*Pleurotus citrinopileatus*) cultivation. *Agricultural Science Digest*. doi: 10.18805/ag.D-5777.

Krishnamurthy, A.S. and Priyasharshini. (2016). Physical, chemical and biological properties of casing soil used for milky mushroom (*Calocybe indica*) Production. *Madras Agric. J.* **103(10-12):** 338-343.

Lenka, C.K., Padhan, B., Pradhan, N., Mantry, T., Sahu, R. and Venkatlaxmi, S. (2022). The effect of growth conditions on mycelial run of oyster mushrooms spp. (*Pleurotus spp*.): Implication for agricultural practices. *Bhartiya Krishi Anusandhan Patrika*. **37(2):** 137-143. doi: 10.18805 BKAP470.

Sangeetha, A. and Rajappan, K. (2020). Substrate comparison for yield maximization in white milky mushroom (*Calocybe indica*). *Int. J. Curr. Microbiol. App. Sci*. **9(7):** 106-113. https://doi.org/10.20546/ijcmas.2020.907.012.

Sarmah, L.M., Gogoi, R. and Rathaiah, Y. (2006). Possibility of milky mushroom cultivation in assam and use of moss as a casing material. *Ann. Agric. Res*. **27(1):** 37-41.

Subbiah, K.A. and Venkatesh, B. (2015). A comprehensive review of tropical milky white mushroom (*Calocybe indica* P and C). *Mycobiology*. **43(3):** 184-94. doi: 10.5941/MYCO. 2015.43.3.184. Epub 2015 Sep 30.

Suresh, K. and Meena, N.L. (2021). Cultivation Practices of Milky Mushroom, Krishi Udyan Darpan (Innovative sustainable Farming). **1(3):** 57-62.

Upadhyay, R.C. (1990). Cultivation of *Calocybe indica*. Compendium of Lectures, NCMRT (ICAR), Solan. pp. 273-275.