

# A Review on Lab Scale Cultivation of *Calocybe Indica* and Its Medicinal Value

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## Abstract

*Calocybe indica*, a tropical edible mushroom and it is popular because it has good nutritive value and it can be cultivated commercially on a large scale. Mushrooms are in the great demand everywhere and hold a unique place in the world today due to their typical taste and rich in protein, vitamins, minerals. Other than nutritional value, it is also playing a major role in medicinal field. Milky mushroom is known to have anti-oxidant and anti-cancer effect. Paddy in particular used as a substrate in Milky mushroom considered as inexpensive and it is a popular variety among people because of its distinct flavor, higher protein content and shorter cropping duration compared to other cultivated mushrooms. The present study designed to explain how the mushroom was cultivated using paddy straw in India.

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## Introduction

Fungi produce variety of enzymes and secondary metabolites which includes organic acids, pigments and other food additives. Also, it showed remarkable role in pharmacological application than to their nutritional value. Mushroom is a nutritious vegetarian delicacy and has many varieties which are almost edible in nature. It contains many vitamins and minerals but very low on sugar and fat.<sup>11</sup>. It was also found that 14 to 27% crude protein on dry weight basis in *Agaricus bisporus*, *Lentinus subnudus*, *Calocybe indica*<sup>7</sup>. Mature fruit body of *Calocybe indica* contains highest protein while young pin heads contain the lowest proteins<sup>10</sup>. In earlier history, Mushrooms were included in diet by Greeks and Romans were included mushrooms in their diet and considered as food of God<sup>1,6</sup>. Mushrooms produce a number of volatile compounds that will vary with the species, variety and conditions<sup>9</sup>. Milky mushrooms is morphologically resembles like button mushroom and it has been popular in southern Indian states and also it is slowly getting popular in other countries<sup>5,8</sup>. The required temperature is between 20 and 30 degree Celsius and required relative humidity is 55 to 75%. Therefore, North-East region has very good prospects and deals in cultivation as well as processing. The common substrates are Paddy straw, wheat straw, coconut coir pith which is widely used for mushroom cultivation<sup>2,3</sup>. Among this, the easiest and cheapest substrate used to grow Milky mushroom is Paddy straw. Milky mushrooms do not require huge investment and very easy to grow. Hence, this deals with cultivation and processing of milky mushrooms.

## Materials and Methods

The materials used for the cultivation are Spawn, Paddy straw, Plastic bags, Formalin (40% formaldehyde), Carbendazim. The step by step procedure for the bag preparation and cultivation are as follows.

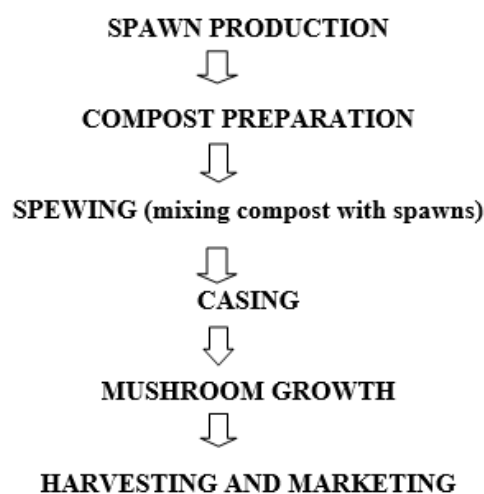
### Compost Preparation

Milky mushroom was grown on various substrates like paddy straw, wheat straw and vegetable plant residues. But, paddy straw is easily available and cheap, it is commonly used. Paddy straw used was fresh and well dried. Paddy straw was soaked in fresh water containing formalin (500 ppm) and Carbendazim (75

ppm) for more than 12 hours(4). Drain off the Excess water from straw by spreading it in jute cloth. In synthetic compost, wheat straw is supplemented with nitrogen nutrients, organic and inorganic. In organic compost, horse dung is added. The compost can be prepared by long or short composting method. Only those who have pasteurizing facility can employ short cut method. Good compost is dark-brown, ammonia free, little greasiness and having 65-70% moisture.

### Spewing

Next step after Compost preparation is Spewing. Layer spewing is the method that Compost can be separated into equal layers and spawns spread in each layer. Result is spawning in different layers, Surface spewing is 3 to 5 cms of compost is remixed, spawns spread and cover with compost and through spewing is to Spawns are mixed with compost and pressed. A bottle of spawns is good enough for 35 kg of compost spread over 0.75 sq.mt. area (about 2 trays).



That is, spawn to compost ratio is 0.5%. Trays are then arranged in tiers in the cropping room and covered with newspapers in that 2% formalin is sprinkled over them. Desired room temperature is around 18°C with 95% humidity.

### Casing

In the commercial cultivation of mushrooms, compost colonized with mushroom mycelium is covered with the 3-5 centimeters thick casing layer to initiate the development of sporophores. The history of edible mushroom cultivation dates back to many centuries and the use of casing to induce the development of

sporophores has been practiced since 17th centuries. The main function of casing layer is the production of mushroom in quantity. Casing layer, which nutritionally deficient medium, about important morphological changes from transition of vegetative growth to fruiting stage. Casing is generally done to make a surface where uniform frutification can take place. It also provides anchorage and essential reserves for developing sporophores of mushrooms. In most of the mushroom growing countries, peat/moss alone or in combinations with other materials is used for casing. But, in India, moss/peat moss is not available and are restricted to some reserves in Kashmir valley and cannot be used on a commercial scale. Therefore, it is work on a suitable substitute to peat moss. Different workers in India have studied the suitability of various materials as a casing substrate for the production of *Agaricus bisporus*.

### Mushroom Growth

Several types of edible mushroom species are available. Unlike what we may assume, all have rather similar environmental needs, including very high moisture level, a temperature of 25-35 degree Celsius. None requires light and so can be grown both above ground as well as below ground, and in buildings. With regard to this, for professional cultivation, they are often grown below ground or in buildings, since temperature and humidity can be controlled there.

However, one major difference for the cultivation is the type of substrate on which the mushrooms grows. Basically different types of mushroom species grow better on different types of substrate. In general, we can distinct between various types of substrates: Wooden logs or saw dust, Manure, compost, straw or combination any of these. When using wooden logs, make sure you take wooden logs of about 5 and 15 cms, a log need to come from recently chopped trees about 5-15cms in diameter. The best results are attained with betula, fagus and quercus.

### Harvesting and Marketing

The last step to mushroom cultivation are harvesting, storing, and selling the mushrooms. Milky mushrooms have an extremely fast growth rate. When growing the mushrooms typically need to be harvested twice a day in morning and night. The mushroom

should be harvested before the edges of the caps flatten out completely or even flip up. Having a slight role on the edge of the Milky mushroom will maintain the ideal texture and storability of the mushroom. Harvesting at this stage also limits number of spores being released by the mushroom. After harvesting, it should be properly packed and ready for marketing. Marketing is the crucial and important step for the mushroom growers.

### Conclusion

The Species of *lyophyllaceae* are cheapest and easiest to grow among all the cultivated edible mushrooms. Milky mushroom has a nutritional value due to its high level of vitamins and proteins and its non-saturated fatty acids. The Consumption of Milky mushroom reduce Cholesterol levels, diabetes and has also showed its potential in anti-cancer properties. Milky mushroom will have greater effect and acceptability in the market, because of its appearance, shelf life, over productivity and low production cost, milky mushroom. Higher yield of Milky mushroom by Paddy straw revealed that it is easiest and cost-effective process and also provide a good yield.

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