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PRODUCTION TECHNOLOGY OF PADDYSTRAW MUSHROOMS

Borda Mitkumar H, Akbari Raj T and Sneha Mistry J*
*Anand Agricultural University, Anand – 388110, Gujarat, India
*Corresponding author: snehamihir@aau.in
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Introduction

The Chinese mushroom, often called the paddy straw mushroom (*Volvariella volvacea*), is the sixth most popular fungus in the world. It is a fungus that may be eaten that is endemic to the tropics and subtropics, and cultivation of it began in China in 1822. Primordia are the antecedents of fruiting bodies, which develop through a variety of morphological phases. Primordia are teeny-tiny clusters of white hyphal aggregates. The following phases are referred to as "button," "eggs," "elongation," and "mature," accordingly. Differentiation can be seen first at the 'button' stage. At maturity the buttons enlarge and umbrella like fruit bodies emerge after the rupture of the volva.

This fungus has several benefits, including the need for tropical or subtropical temperatures, quick growth, simple culture methods, and high customer acceptance. The nation also has a considerable deal of the inexpensive and plentiful fundamental ingredients needed for its cultivation. Because it needs high temperatures for growth, it is a fantastic alternative for adoption in year-round mushroom production.

Agro-climatic Requirements

Production of mushrooms benefits from a good environment in the West Bengal and Odisha regions. It needs temperatures between 25 and 35 °C and humidity levels between 80 and 90 percent for the best growth and development.

Varieties / Strains

By cultivating them on conventional paddy straw beds from April to August, six strains of rice straw mushrooms from the *Volvariella volvacea* and *V. diplasia* families were put to the test. The strains with the highest and lowest yields, respectively, were V. diplasia IIHR and V. volvacea IARI, with biological efficiencies of 7.9% and 3.9%.

Cultivation Technology

1) Spawn Production

Paddy straw mushroom production is uncontrollable at low temperatures. Therefore, standard cultures are maintained at 17–20 °C or above. The spawn of this fungus can grow on a variety of substrates, including grains, straw, etc. On the other hand, paddy straw mushrooms are incubated in bags at 30-35°C following inoculation. The substrate can get completely colonised in about 5-7 days, and the spawn is ready for use after a week. Spawn must be utilised within 10 to 15 days and cannot be kept.

2) Soaking

Bundles of the appropriate size are used, and they are immersed in water for 8–10 hours. Lime is added to the mixture to maintain a consistent pH. Bundles are pulled out of the solution and held at an angle to allow excess water to drain.

3) Compost preparation

The pile is created from wet cotton waste as well, and it is allowed to ferment outdoors under cover when it is raining or extremely cold. If necessary, 5% rice bran is added to the water while flipping paddy straw substrate for the first time after two days. Nothing is added when using substrate made from cotton waste. The following two days are spent letting the new pile ferment.

4) Bedding and Pasteurization

By applying light pressure, the surface is leveled. A 6 cm rubber hose is used to inject live stream after the compost has been dispersed for 8–12 hours. While compost generated from paddy straw is kept at 650°C for six hours, compost made from cotton waste is kept at 620°C for two hours. After steaming, the shed or room is sealed off to maintain a temperature of 500C for the following 24 to 36 hours, at which point the substrate cools on its own. When the temperature approaches 35 °C, compost is released.

5) Spawning

((I) Spot Spawning: In a depth of 5 cm, spawn clumps are sown. Compost was applied over the holes.

(II) Surface Spawning: The spawn was distributed over the compost and buried three to five centimetres deep. A thin layer of compost has been placed on top of the area.

(III) Layer Spawning: Similar to surface spawning, three to four layers of spawn mixed with compost are covered with a thin layer of compost. 500–750g of the spawn were added into every 100 kg of compost.

6) Spawn Running

Compost is placed inside polythene bags that have newspaper and polythene on top. Mycellium colonises in two weeks. 300C was the maintained temperature. RH is 80%, so it would be advantageous if CO2 levels were greater than usual.

7) Fruiting

A temperature of 30 °C, a relative humidity of 80%, fluorescent lighting, and occasionally fresh air are the best circumstances for fructification. Due to its rapid growth, this mushroom requires a lot of oxygen and water, two elements that are inherently incompatible. Compost should rarely be watered since it decreases productivity, suffocates the tiny primordia, and diminishes warmth.

Harvesting and Yield

It usually takes 9 to 10 days from spawning to the first crop being harvested, with the initial flush lasting about 3 days and producing around 70 to 90% of the predicted output of mushrooms. In the interim period of three to five days, thorough watering and maintenance of optimal conditions within the cropping rooms are necessary (Fig.1).

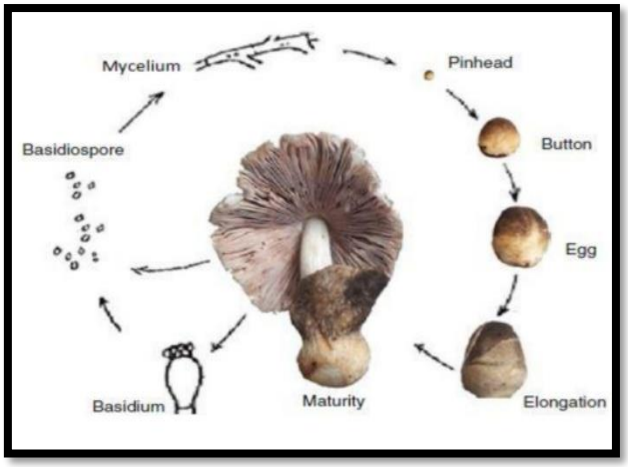

Fig.1: Paddy straw mushroom cycle

Packing and Storage

Paddy straw mushrooms' shelf life can be increased to three days by pre-cooling them in air at 14 °C for two hours, then packing them in punnets that are 75 thick and 1.2% perforated as their primary packaging and keeping them in an EPS cabinet as their secondary packaging. Ice is used as a chilling agent in the EPS cabinet to maintain the proper storage temperature while transporting mushrooms. The temperature profile of the cabinet was investigated under no-load and full-load scenarios.

Diseases Problems

Rice straw mushroom is extremely sensitive to environment including sunlight, temperature, water, oxygen and carbon dioxide. Sudden temperature changes can restrict or limit growth of straw mushroom. Sunlight is required for different growth stages from sphere to egg stages. Significant reduction of vitamin E and unavailable of vitamin D is observed with the absence of sunlight, and melanin pigment may not form in the mushroom. In India, straw mushroom is subject to competitor moulds. Chaetomium sp., *Alternaria* sp., *Sordaria* sp., are generally observed as contaminants on straw bundles of wheat, rice, Kans, Jowar, barley and maize (Gupta *et al.*,1970).

Conclusion

The paddy straw mushroom has a high nutritional value due to its good sources of numerous elements and vital amino acids, as well as a sizeable amount of protein, crude fibres, and ash. One of the health advantages of the paddy straw mushroom is decreased gastrointestinal cholesterol. Beta-glucan also inhibits the growth of malignant cells and functions as a natural insulin alternative for diabetics, in addition to vitamin D, which strengthens bones. It also promotes heart health and avoids anaemia.

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