TECHNIQUES OF SPAWN PRODUCTION AND CULTIVATING METHODS OF *PLEUROTUS FLORIDA* (WHITE OYSTER MUSHROOM)

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ABSTACT:

This is the study of standardize spawn production techniques and different cultivation methodologies of *PLEUROTUS FLORIDA* (WHITE OYSTER MUSHROOM Potato dextrose agar is used as the culturing media. The mushroom culture can be prepared in both slant and Petri plates. Various methods should be followed for the production of spawn and the standardized spawn will be prepared after the growth of mycelium in pure culture. Paddy husk is used for spawn bag preparation. Two types of spawning techniques have been used like alternate spawning method and top layer spawning method. As a result the alternating spawning method gives good result in harvesting of fruit body of mushroom.

KEYWORDS : *PLEUROTUS FLORIDA,* Potato dextrose agar, paddy husk, spawning techniques.

I. INTRODUCTION

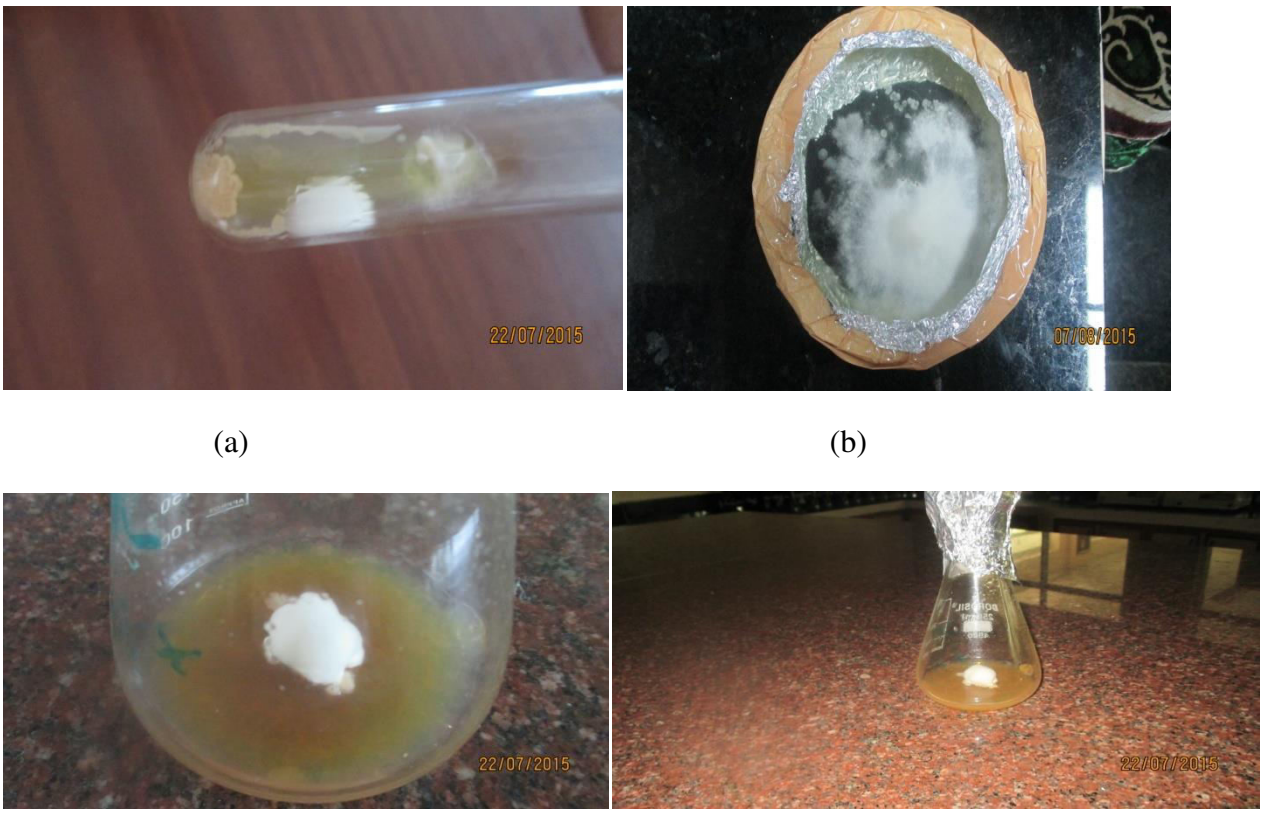
The cultivation of mushroom was first introduced in U.S.A in later part of the 19th century. In India the madras agriculture department cultivate the paddy straw mushroom in 1939. In south india and tamil nadu oyster mushroom becoming more popular (patherk et al, 1998) Three types of mushrooms are cultivated widely in india namely viz.button mushroom paddy straw mushroom and oyster mushroom.(Payal Mago et al.,2014). Pleurotous species mushroom can grow in 25 to 30 C and 80 to 90% humidity.317 million metric tons of fresh mushroom can be cultivated per year using 25% of cereal straws.(Chang And Miles,1989).the pleurotus genes has favourable organoleptic and medinal properties,low cost production technology and bio efficiency (Chirinang et al., 2009). Pleurotus mushrooms grow in tropical, subtropical and temperate regions and are easily artificially cultivated (Akindahunsi and Oyetayo, 2006). Mushroom is a basidomycetous fungus , which is a popular bio remediant. Mushroom's efficiency is that producing food proteins from different agro wastes (Kathiravan Subramanian et al., 2014). Cellulosic residues namely banana leaves, dry paddy straws, cotton waste and rice straw (Fasidi et al., 1993).

Mushrooms are the good source of B vitamins, especially niacin and riboflavin. And it ranks highest among all vegetables among the protein content. It is very low in fats and calories (Monali Bhaktan And Prasant Kumar 2013). Mushrooms have been identified as a excellent food source to alleviate malnutrition to developing countries. In the normal human body 100 and 200 grams of mushroom is required to maintain nuritional balance (Lintzel 1941, 1943).

Mushroom has many medicinal properties such as antimicrobial, antiviral, anti-human immunodeficiency virus (HIV), antineoplastic, antitumor, antimutagenic, antioxidant, hyperglycaemic,hypotensive,anti-inflammatory,hepatoprotective, hypocholesterolemic, immunomodulatory, anti-ageing(Yashvant Patel et al., 2012).

II. MATERIALS AND METHODS:

The specific medium required for growing fungus is potato dextrose agar (Shivaprakasam and Kandaswamy, 1983). By using PDA agar, medium has been prepared in Petri plates PDA agar, medium has been prepared in Petri plates . And keep in room temperature for observing the contamination in the medium For tissue culture mushroom after alcohol sterilization is cut longitudinally into 2 halves and bits from collar region (i.e. junction of cap and stalk) are transferred to re-sterilized PDA, which is incubated at 25°C±2°C in BOD incubator for one week. Then the plates were undisturbed for 7-10 days in the dark light .



(a) (b)

(c) (d)

Fig 1.Pure Culture Was Prepared Using PDA Agar In A) Test Tub B),Petri Dish And C) Conical Flask.

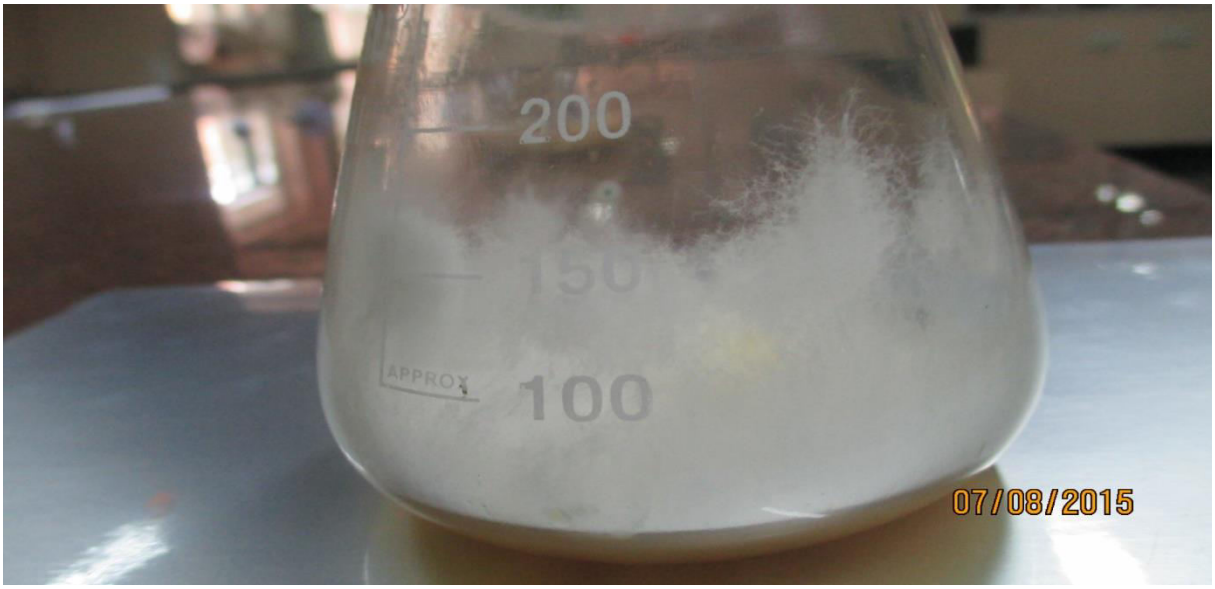


Fig2.: Fully Covered Mycelium

III. SPAWN PRODUCTION

1. MOTHER SPAWN:

The procedures of (Ram et al., 2013) were followed with certain modifications. The mushroom spawn using rice husk. Rice husk was soaked in water with systemic fungicide for 4 hours. Then it was air dried up to 10-15% of water content present. Then it was mixed with 2 % Calcium carbonate. 250 g of calcium carbonate mixed rice husk was filled in polypropylene bags of size 11 x 5 inch. It was sterilized at 121°C for 15 mins and kept at room temperature. And the pure culture was inoculated into the prepared spawn bags and kept undisturbed for 20-25 days.

Fig 3.Mother Spawn Prepared Using Pure Culture

2. COMMERCIAL SPAWN:

The mother spawn is inoculated into the spawn bags. Keep undisturbed for 20-25 days. The temperature should be maintained ±25°C. The mycelium covers entirely. These spawn bags are ready for mushroom bed preparation.

Fig4.Commercial Spawn Prepared Using Mother Spawn

IV. MUSHROOM BED PREPARATION:

1. SPAWNING TECHNOLOGY:

The common methods used for spawning are a) Alternate spawning method b) Top layer spawning method

The procedures of Krishnakumari et al., 2014 were followed with certain modification. The well matured paddy straw was soaked in water for overnight and sterilized in autoclave in 15 psi. Then it was air dried up to 10 -15% of water content is present. The paddy straw was filled in polypropylene bags. The bags were perforated with 1cm diameter holes the matured mushroom spawn was dispersed gently and used for mushroom bed preparation. a layer of paddy straw is followed by sprinkling of one hand full of spawn (30g). Likewise seven layers has to be fillled for a single bed of length 12 ϫ 24 inch. Then it was hanged with nylon thread and hanged in the mushroom shed for spawn running. The shed was maintained at the temperature range of 25±3°C for the growth of mushrooms. The two types of spawning methods have been used.

1. ALTERNATE SPAWNING METHODS:

The mushroom beds prepared using the alternate spawning method were covered by mycelium completely within 15 – 20 days. There will be a bud formation in the mushroom beds in 20 – 25 days. Mushroom harvested in 25 – 30 days from the date of spawning. Second harvest is taken in 15 – 20 days and third harvest is in 20 – 22 days. 550±20, 390±17, 260±15 grams were harvested in first second and third harvest. Totally 1200 grams have been harvested in life time of single bed having one kg of rice husk.

2. TOPLAYER SPAWNING METHOD:

The time required for the mycelium coverage is 20 – 24 days in toplayer spawning method. The bud formation is in 24- 30 days and the first harvesting has been done in 35-40 days. the yield during first, second and third harvest is 302±12, 245±15, 150±12 grams respectively. The total yield is 697 grams.

Fig 5:Bud Formation Agter The Mycilium Fully Cover On The Bed

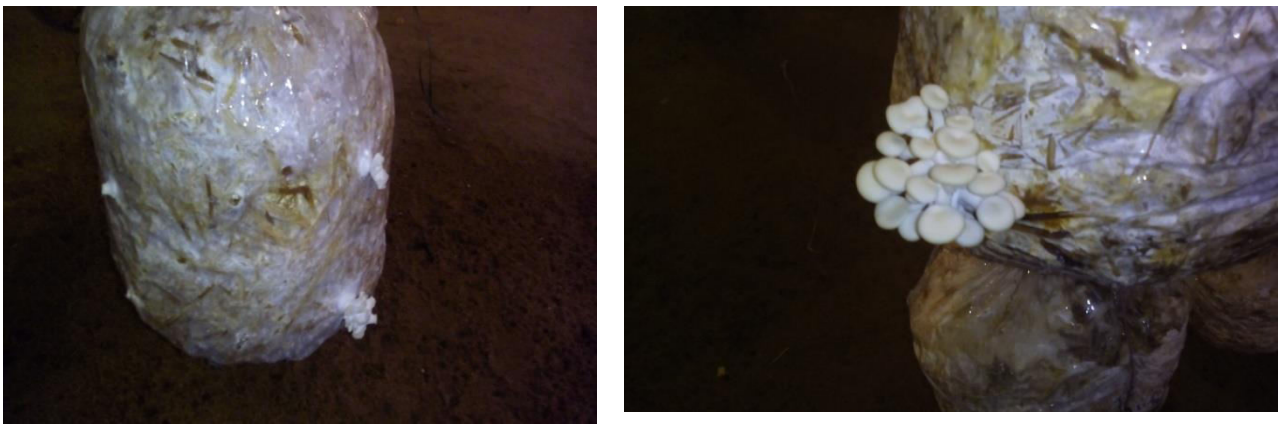


Fig 6: Mushroom Grown From the Bed

V. RESULT AND DISCUSSION

Using potato dextrose agar is for developing mushroom culture. The contaminated plates were discarded. And the spawn bags and the mushroom beds which are contaminated and damaged during the growing period and sterilization were discarded. Using the completely cover mycelium covered spawn the bags were prepared and the spawns and the beds were s during the incubation period. The contaminants were discarded to avoid the spoilage to the nearer bags. The

mushroom shed were maintained at correct temperature. The mycelium covered within 15 – 25 days in mushroom beds.

Growth rate:

Mushroom grows faster when it is warmer. The growth rate of the mushroom should maintain at 60˚F , 70˚F , 80˚F, if the temperature is too low the mushroom will grow very slowly or not at all. If the temperature too high the mushroom will die.

TABLE 1. GROWTH PATTERN FOR *PLEUROTUS FLORIDA* IN PADDY STRAW SUBSTRATE:-

SPAWNING METHODS	SPAWN RUN DAYS	DAYS FOR TINY HEADED APPEARANCE	DAYS FOR FIRST HARVEST	DAYS FOR SECOND HARVEST	DAYS FOR THE THIRD HARVEST
TOP LAYER SPAWNING	12±2	17±1	21±3	25±3	30±3
ALTERNATE LAYER SPAWNING	7±2	10±1	13±2	16±2	18±3

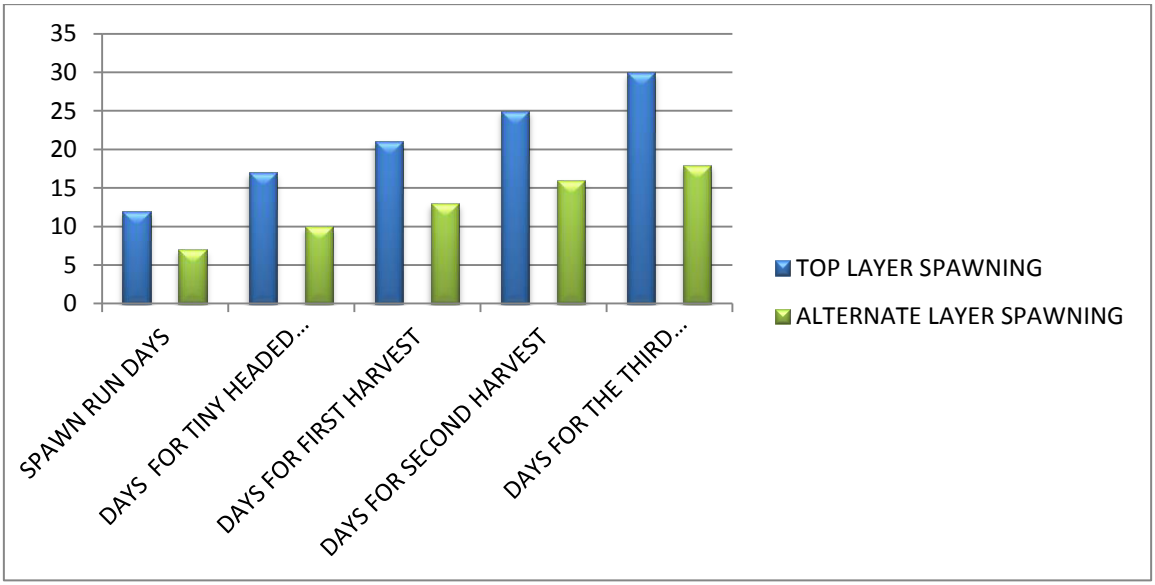


Fig 7: Total Cycle Involved After the Preparation of Bed

TABLE 2 : YIELD OF *PLEUROTUS FLORIDA* IN PADDY STRAW SUBSTRATE:

SPAWNING METHODS	YIELD(gms)			TOTAL YIELD(gms)
	I	II	III	
TOP LAYER SPAWNING	302±12	245±15	150±12	697
ALTERNATE LAYER SPAWNING	550±20	390±17	260±15	1200

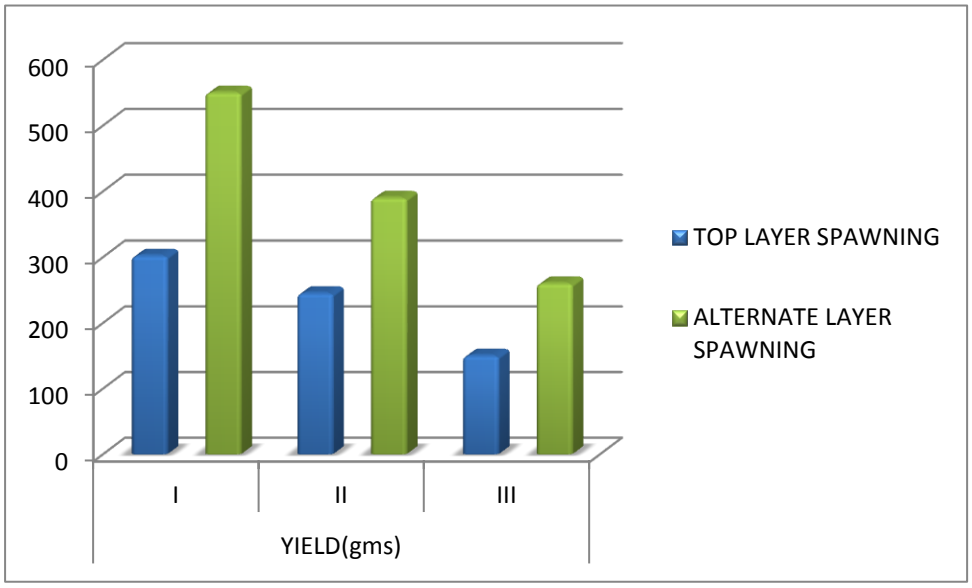


Fig 8: Comparison of Yield by Two Methods of Spawning

VIII. CONCLUSION

Based on the result, if proper temperature and relative humidity is not maintained properly there will be insufficient yield. Cultivation of white oyster give more profit and it is very suitable for the rural peoples and enterprise (Bahukandi et al., 1989). For commercial production of oyster mushroom cultivation the paddy straw plays a suitable substrate.utilization of the agro industrial waste it could be economically and ecologicaly practical for the production of oyster mushroom. mushroom has proteins and various micro nutrients and it is excellent small scale enterprise(Elaine Marshall and N.G (Tan) Nair, 2009).

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