

BSc. IVth Sem: UNIT IV

- CULTIVATION OF OYSTER MUSHROOM

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- Oyster mushroom is known as Pleurotus species
- Common name=Dingri
- Good source of nutrition
- Phylum-Basidiomycotina
- Class-Basidiomycetes
- Family-Polyporaceae
- Genus Pleurotus.

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NUTRITIONAL VALUE OF OYSTER MUSHROOM:-

Sr. No.	Nutrient	Quantity
1.	Water	76.69 gm
2.	Energy	28 kcl
3.	Protein	2.85 g
4.	Lipid(Fat)	0.35 g
5.	Ash	0.87 g
6.	Carbohydrate	5.24 g
7.	Fiber	2.0 g
8.	Sugar	0.95 g

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MINERALS:-

Sr. No.	Minerals	Quantity
1.	Ca	8 mg
2.	Fe	1.14 mg
3.	Mg	15 mg
4.	P	103 mg
5.	K	361 mg
6.	Na	15 mg
7.	Zn	0.66 mg
8.	Cu	0.210 mg
9.	Mn	0.097 mg
10.	Se	2.2 mcg

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Pleurotus florida



Pleurotus ostratus



Pleurotus sajor-caju



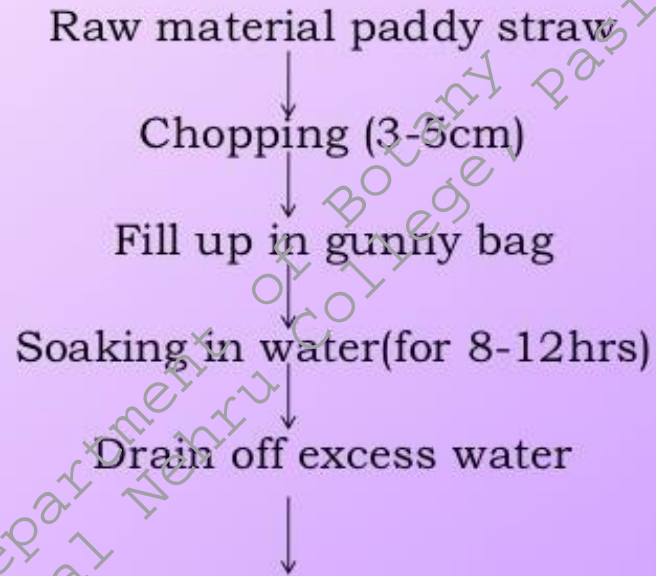
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species

- 1. **Pleurotus sajor-caju –summer species**
- 2. **Pleurotus pulmonarius-summer species**
- ***Pleurotus ostreatus –winter species***

cultivation

FLOW CHART:-



Hot water treatment(for 30-60 min)

Drain off excess water

Drying(up 60-70% moisture)

Prepared bed

Pinning the bed

Spawn running

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YIELD:-

More than 500 kg of fresh mushroom
per ton of dry wheat or paddy straw.

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SUBSTRATE PREPARATION AND TREATMENT:

- Mushrooms grows on substrates like paddy straw, maize cobs or leaves, vegetable wastes, industrial wastes such as paper mill sludge, coffee by products, leaf litter, tree barks etc...
- Since paddy straw is easily available and cheap, well dried and fresh paddy straw is widely used. The straw is chopped into 3 – 4 cm pieces and soaked in water for 8 – 16 hrs. Excess water is drained and the straw is sterilized.

SPAWN PREPARATION:

- Wheat/rice grains are boiled in water for 15 min and excess water is drained. The grains are allowed to cool in sieves.
- Wheat/rice grains are then mixed with required quantities of Gypsum and Calcium carbonate.
- These grains are filled into bottles and autoclaved for 2 hrs at 121 °C.
- The pH is maintained at 7.
- These bottles are inoculated with mycelium or spores and incubated at 22 – 44 °C in a dark place.
- It takes 2 weeks for complete spread of mycelium.

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SUBSTRATE INOCULATION:

- In Polythene bags (35 x 50 cm, 150 gauge) wet substratum is compressed and filled layers by layers. Upon each layer the grain spawn is spread at 2% on the whole surface uniformly. Holes of about 2 mm in diameter are made on the bags for breathing .

SPAWN RUN AND PIN INOCULATION:

- Temperature of the room is maintained at 25°C and relative humidity above 85%. Humidity is maintained by frequent sprinkling of water on the floor and walls.
- It takes 20 – 22 days for complete spread of mycelium on the spawn.
- After about 22 days the bags are fully impregnated with white mycelium and are transferred to cropping rooms.

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FRUITING AND PICKING :

- The blocks are kept in the racks at 60 cm gap. Temperature is maintained between 20 – 33 °C.
- Relative humidity in the room is maintained by spraying water on the floor and walls.
- Spraying of water on the blocks is avoided for first 2 – 3 days.
- When the pins reach 2 – 3 cm little heavy watering is required. The heads are harvested before they shed spores.
- After first flush 0.5 – 1 cm outer layer is scrapped to initiate second flush which occurs in about 10 days.

To start growing mushrooms you need to buy the spores. The spores shown below have been grown on a corn cob. One "bottle" of spore can be used for 2 sacks. The spores on the right have been broken into 8 pieces.



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Step 1: Preparing the straw You will need sterilized straw. Sterilized straw will ensure all other fungi spores are killed.

To sterilize straw, boil it in water for half an hour. Squeeze water out of the straw. The straw has to be 60% moist i.e. when you squeeze the straw, no water should be wrung out. The straw is ready to use.



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Step 2: Preparing the bag Start packing the straw into the plastic bag of approximate dimensions 12*24 inches. Fill in two inches of straw. Crumble one chunk of the the spore on top of the straw along the edges. Spores grow out from the sides of the bag, so it is important to distribute the spores along the edges. Spores in the middle will not germinate.



Step 3: Layering Pack in four inches of straw. Repeat the process three more times. After the last layer of spore, pack in two inches of straw.



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Step 4: Closing Twist the open end and tie the bag tightly.



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Step 5: Making air holes Make 12 – 20 holes using a sharp stick all over the bag. This will promote air circulation. The mushrooms will grow out through these holes.



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Step 6: Germination

Your mushroom bag is now ready. Set in a cool dark place to promote mycelium growth.

You can also get the cool dark effect by hanging a wet jute sack around the grow bag. Make sure that the sack is at least one foot away from the plastic bag. Spray the sack every 5 days to keep it moist.

Mushrooms will start sprouting in 18 days.



MOULD DISEASE

- Mould infect substrate as well as fruiting oyster.
- Infection may start from spawning stage to harvesting stage.

Identification of mould

- 1. on substrate they appear as
 - greenish
 - Brownish
 - Blackish
 - Yellowish mycelia growth
- 2. discoloration of fruiting body.
- 3. infected mushroom become deformed and rotted

moulds

- . Aspergillus niger
- A. flavus
- A.. fumigatus
- Arthrotrys sp.
- Alternaria alternata
- Cephalosporium aspermum
- Cladosporium cladosporoides
- Fusarium moniliforme
- Penicillium spp.
- Rhizopus sp.
- Trichoderma viride

Control measures

- 1. sanitation of mushroom house
- Disposal of left over materials
- Removal of infected spawn, fruiting bodies
- Very old, rotten, with high moistened straw should not be used.
- Fumigation of mushroom house by using formaldehyde before grow.
- Spray with Benomyl, carbendazim, Blitox and Thiram chemicals.

Substrate supplementation

- Use horse gram powder (8g/kg of stra)

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- Polyethylene bags—1 kg
- Water sprayer.

Procedure

1. Take dried paddy straw.
2. Chop the straw into 1 to 2 cm bits.
3. Soak the chopped straw into water overnight.
4. Drain off the excess water.
5. Add coarse gram powder at the rate of 8 g/kg.
6. Add spawn at the rate of 30 g/kg.
7. Mix all the constituents.
8. Fill the mixture into polyethylene bags with holes.
9. Keep 6/15 bags per field bags in a room at 21 to 30°C with sufficient light and ventilation for 15-16 days for spawn running.
10. Cut open the polyethylene bags on the sides without disturbing the bed.
11. Spray water over the bags twice a day.

Observations

Observe for the mushroom crop after 3 to 4 days of opening the polyethylene bags (i.e. after 20-12 days of spawning).

12. Harvesting

First harvesting is to be done 20-22 days after spawning, 2nd harvesting 27-29 days after spawning and 3rd harvesting 34-35 days after spawning.

Precautions

1. For better yields, temperature of the room should be in the range of 20-26°C and relative humidity of 70-90%.
2. Provide light for 15-20 minutes during cropping period.
3. Polyethylene bags with holes should be used.

Oyster cultivation

polyethylene bags, iron baskets or in wooden

Requirements

- Thatched hut/polyethylene chamber, mud/pucca house
- Dry paddy straw (chopped) or other agro-wastes—100 kg
- Horse gram powder—4 kg
- Spawn bottles of *Pleurotus* sp.

Oyster cultivation

(mg/100 g fresh weight)

The genus contains over 50 species. Of these, *P. ostreatus*, *P. flabellatus*, *P. sajorcaju*, *P. sapidus*, *P. fossulatus*, *P. squarrosules*, *P. cornucopiae*, *P. sapathulatus* and *P. florida* have been cultivated in India. In *Pleurotus*, the stipe is usually lacking, context hyphae mostly thin walled before maturity. In *P. osteratus*, the Oyster cap, the white Oyster shell-like caps appear on logs or tree stumps in shell-like layers.

The Oyster mushrooms are rich in proteins, mineral contents, devoid of starch and low in calories and carbohydrates (Table 23.5). These are ideal food for diabetic and heart patients and those who do not want to put on weight.

The various substrates utilized for the cultivation of *Pleurotus* are banana pseudostems, wheat straw, paddy straw, ragi straw, compost prepared from straw, saw dust, beech saw dust, sunflower stalks, rice husk and karad hay. However, the highest yields are obtained on rice straw. These can be grown in any container, e.g. earthen pot, cane gasket, polyethylene bags, iron baskets or in wooden trays.

Requirements

Temperature: 20-25°C
Humidity: 85-95%
Light: Indirect light
Substrate: Rice straw, wheat straw, paddy straw, etc.
Container: Earthen pot, cane gasket, polyethylene bags, iron baskets or in wooden trays

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thanks

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