OYSTER MUSHROOM CULTIVATION USING THE POLYTHENE BAG METHOD

INTRODUCTION TO OYSTER MUSHROOMS

Oyster mushrooms, scientifically known as *Pleurotus* species, are a diverse group of edible fungi that are widely cultivated and consumed around the world. These mushrooms are characterized by their distinctive fan or oyster-shaped caps and off-center stems. They are prized for their delicate flavor, meaty texture, and numerous health benefits.

IMPORTANCE OF OYSTER MUSHROOMS

Oyster mushrooms are an excellent source of protein, fiber, and various essential vitamins and minerals, including vitamin D, B vitamins, and antioxidants like selenium and ergothioneine. They are low in fat and calories, making them a nutritious addition to a balanced diet. Oyster mushrooms have been studied for their potential medicinal properties. They contain compounds that may have anti-inflammatory, antioxidant, and immunomodulatory effects, which could contribute to the prevention and management of various health conditions, such as diabetes, heart disease, and certain types of cancer. Oyster mushrooms can be cultivated on a wide range of agricultural and industrial waste materials, such as straw, sawdust, and coffee grounds. This ability to grow on lignocellulosic waste makes them an attractive option for sustainable food production and waste management. Oyster mushrooms have a mild, savory flavor and a meaty texture that makes them a versatile ingredient in various cuisines. They can be sautéed, grilled, fried, or used in soups, stews, and other dishes, adding depth of flavor and nutrition. The cultivation of oyster mushrooms has become a significant industry, providing employment and income opportunities, particularly in rural areas. Their ease of cultivation, fast growth rate, and high yields make them an attractive crop for small-scale farmers and commercial growers alike. As oyster mushrooms can be grown on agricultural waste, their cultivation contributes to sustainable agricultural practices by reducing waste and promoting the efficient use of resources. Oyster mushrooms have gained popularity worldwide due to their culinary appeal, nutritional value, and potential health benefits. Their ability to grow on various substrates and their environmental and economic advantages have made them an important crop in the mushroom cultivation industry and a valuable part of sustainable food systems.

STANDARD OPERATING PROCEDURE (SOP):

Materials Needed:

1. Oyster mushroom spawn
2. Substrate (Wheat straw or Paddy straw)
3. Polythene bags (large)
4. Water spray bottle

5. Pressure cooker/Drum/Autoclave

6. Rubber Band

7. Thermometer and hygrometer

8. Hut with ventilation system (optional)

9. Shelves/Rope/ Racks for bag placement

10. Clean working area

Procedure:

1. Preparation of Substrate:

- The material wheat/paddy straw must be chopped into shorter pieces
- Soak the substrate overnight

2. Sterilization:

- Sterilize the substrate in a pressure cooker/drum/steam generator at around 121°C (250°F) for 1-2 hours. This kills competing microorganisms.
- Allow the substrate to cool down to room temperature in a clean area.

3. Bagging

- Inoculate the bags with oyster mushroom spawn by adding a layer of spawn between the layers of substrate.
- Ensure even distribution.

4. Incubation:

- Seal the inoculated bags with rubber band
- Place the bags in a dark, warm (around 24-28°C or 75-82°F) and humid environment for spawn colonization. This typically takes 2-3 weeks.

5. Pinhead Formation and Fruiting:

- After the mycelium has colonized the substrate, move the bags to a well-ventilated area with indirect light (or use a ventilation system).
- Mist the bags with water using a spray bottle to maintain humidity around 90%.
- Gradually decrease humidity to around 80% to encourage pinhead formation (initial mushroom growth).

6. Harvesting:

- Once the pinheads have fully developed into mature mushrooms, carefully harvest them by twisting and pulling gently to avoid damaging the substrate.
- For a second flush of mushrooms, spray the bags with water, then repeat the pinning and fruiting process.

8. Cleaning and Reusing:

- After harvesting, remove any remaining mushroom debris from the substrate and sterilize the bags again for reuse in the next batch.

These are general steps and specific conditions and might vary based on factors like mushroom variety, climate, and equipment available.

MARKETING STRATEGIES THAT HELP TRAINEES DOING OYSTER MUSHROOM CULTIVATION TO LINK WITH THE MARKET

- Help trainees understand the market demand and pricing for oyster mushrooms in their local area. This can be done through market research and connecting trainees with existing mushroom vendors. Knowing what prices and volumes sell well can inform production plans.

- Assist trainees in identifying and reaching out to potential buyers like grocery stores, restaurants, farmers markets, etc.
- Suggest trainees brand and package their mushrooms attractively for retail sale. Simple branding and packaging can increase perceived value.
- Advise trainees to promote their oyster mushroom business through social media, online listings, advertisements, and word-of-mouth networks. Getting the word out about their products is key.
- Encourage trainees to offer promotional deals, discounts, and samples to new buyers to get them hooked on their mushrooms. This can help establish long-term relationships.
- Facilitate trainees' certification for organic, fair trade, or other sustainability programs that add value for certain buyers and markets.
- Connect trainees so that learning from experienced growers' successes can boost their own.

FAQ FOR OYSTER MUSHROOM

1. What is Oyster mushroom?

The oyster mushroom is scientifically known as Pleurotus in English or Dhingri mushroom in Hindi.

2. When and where we can cultivate Oyster mushrooms?

Oyster mushrooms can be cultivated in any part of India during the summer or winter season by selecting suitable Oyster mushroom species.

3. What type of substrate is required for growing Oyster mushrooms?

Oyster mushrooms can be cultivated on any kind of dried agricultural waste like wheat or paddy straw, maize, jowar, or bajra waste, or wastes from oil seeds or leguminous crops.

4. How much spawn is required to prepare bagging?

1 kg spawn is sufficient for a 40 kg wet straw.

5. How can we prevent contamination?

Preventing mushroom contamination involves proper hygiene, sterilization, air filtration, substrate pasteurization, sterile inoculation techniques, environmental control, monitoring, crop rotation, and thorough facility cleaning.

6. What are the conditions or cultural practices required during cultivation?

After the mycelial growth on the straw, bags are to be exposed for fruiting with below 25°C temperature and high humidity (85-90 % RH), fresh air, and light (6-8 hours) are required for fruiting.

7. What types of growing rooms are required for cultivating Oyster mushrooms?

Oyster mushrooms can be cultivated in hoods, huts, mud houses, RCC cropping rooms, or insulated polyhouses.

8. How long we can store Oyster mushrooms?

Oyster mushrooms immediately after harvesting should be spread on muslin cloth for 1-2 hours and then packed in perforated polythene bags and these bags can be stored for 2-3 days under freeze conditions. We can also dry oyster mushrooms in the sun or oven. Dried Oyster mushrooms can be stored for 2-4 months.

9. What is the production of Oyster mushrooms from 1 kilo of dry straw?

If we use good quality spawn, and substrate and under optimum conditions, one can easily harvest 600-900 grams of fresh mushroom from 1 kilo of straw.

10. What are the uses of spent Oyster mushroom waste?

The spent straw can be used for biogas production, making organic compost, or as cattle feed if it is not infected by molds.

11. How many days does an Oyster mushroom take to grow?

Faster growth rate and early cropping are observed. About 5 to 6 crops can be taken in a year as the total cropping period is 60 days. Oyster mushrooms can grow at moderate temperatures ranging from 20 to 30^0 C and humidity of 85 to 90% for a period of 6 to 8 months in a year.

12. What are the importance and benefits of Oyster mushrooms?

Oyster mushrooms are a popular type of mushroom linked to several health benefits. In addition to being highly nutritious, they may promote heart and immune system health, encourage healthy blood sugar control, and provide antioxidant and anti-inflammatory effects.

13. In which season does Oyster mushroom grow in Kachchh?

It can be cultivated in any month by providing the extra humidity required for its growth, especially during summer.

14. Can Oyster mushrooms be eaten raw?

The mushrooms should not be eaten raw. They can be cooked, grilled or stir-fried.

15. Is oyster mushroom rich in protein?

They have considerable importance in the human diet as they are rich in protein, non-starchy carbohydrates, dietary fiber, minerals, and vitamin B and have no cholesterol and negligible amounts of fat.

16. What temperature do Oysters need to grow?

Oysters thrive in salinity that ranges from 14-28 ppt. The optimum water temperature for oysters to survive is between 68-90 degrees Fahrenheit, but adult oysters can tolerate water as cold as 38 degrees and as hot as 120 degrees for short periods.

17. What triggers Oyster mushroom fruiting?

For oyster mushrooms to form proper fruits, they need the right combination of light, humidity, and fresh air throughout most of the growing process. Maintaining adequate levels of both humidity and fresh air can be a challenge.

18. Does temperature affect mushroom growth?

Temperature is a very important environmental factor for the mycelium growth of fungi. This mushroom will go below 25°C.

19. What vitamin is in Oyster mushrooms?

Oyster mushrooms are an excellent source of several vitamins, including niacin (providing 21% of your recommended daily intake), riboflavin (18%), and pantothenic acid (11%). You'll also get smaller amounts of folate, vitamin B6, and thiamin.

20. What humidity does Oyster mushroom grow?

As the mushrooms begin fruiting, it is important to keep the humidity high (85-90% is recommended). Allow air to flush through the growing area before spraying (oyster mushrooms require a consistent source of fresh air).