

Oyster (Dhingri) Mushroom Cultivation

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SUMMARY

Mushrooms are a group of fleshy macroscopic fungi. Mushrooms live on dead matter as they are saprophytes. It has all nutritional, medicinal, economic and environmental benefits (Ferdousi L., *et al.*, 2017). Consumption of mushrooms slows down the spread and effect of cancer, heart disease, HIV/AIDS (by boosting immune system). It is income generation and employment creation. Mushroom cultivation uses agricultural waste as substrate- mostly waste materials from farms, plantations or factories. It is biodegradable hence environmental conserver. Most suitable for rural areas and can create self-employment to people. Easy to post harvest processing particularly dehydration. Its production by poor people can help to bring them above poverty line and improve their socioeconomic status.

INTRODUCTION

Oyster mushroom popularly known as “Dhingri” has been grouped under the genus *Pleurotus* of Basidiomycetes fungi. They lack the green matter (chlorophyll) and grow on dead and decaying organic matter as phytoparasite. From these decaying substrates, they absorb their nutrition with the help of very fine thread like structure (mycelium) which penetrates into the substratum and are generally not visible on the surface. After the mycelium has grown profusely and absorbed sufficient food material, it forms the reproductive structure which generally comes out of the substrate and forms fruiting body, commonly known as “Mushroom”. It can be grown on a variety of agricultural waste materials like wheat straw, cotton stalks and leaves, paddy straw, soybean straw etc. Rahman M. S., *et al.*, (2017).



Different Species of Oyster Mushroom

There are different species of *Pleurotus* which are suitable for cultivation under temperate to tropical climate. In recent years, 25 species are commercially cultivated in different parts of the world. However, in India some commercially cultivated species are *Pleurotus sajor kaju*, *P. eous*, *P. florida*, *P. ostreatus*, *P. flabellatus*, *P. eryngii*, *P. levis*, *P. cystidiosus* etc.

Nutritive Value

Mushrooms are most nutritive, delicious and having high protein content (3.5 to 4.0%). It is well recognized that mushrooms contain all essential components of a balanced food. In fact, being rich in highly digestible lysine-rich protein, vitamins and minerals, mushrooms lack fats and are low in carbohydrates. They are rich in folic acid, phosphorus, potassium, calcium, copper, iron, and vitamin B complex. In place of starch,

mushroom contains sorbitol and linolenic acid. They are excellent source of Thiamin, Riboflavin, Niacin, Pantothenic acid, Biotin and Vitamin B, C and D which prevents many diseases caused due to deficiency. They are unique food for diabetic patients and obesity. Many medicinal mushrooms also showed hematological, antiviral, antitumour, antioxidant, cardiovascular and renal effect. The interesting fact is that the K: Na ratio is very high and it is suitable for people who suffer from hypertension. Besides its nutritional and medicinal value, mushrooms are relished as a source of food due to the pleasant aroma, taste and its fleshy nature.

Advantages of Oyster Mushroom Production

This is the most popular subtropical mushroom and stands next only to the button and shitake mushrooms in world production. *Pleurotus* mushroom can degrade any kind of agricultural or forest wastes which are containing agricultural waste.

- It grows on wide range of agricultural waste.
- It can grow in wide Range of temperatures 15 C to 35 C
- Its conversion rate i. e. mushroom production from the substrate is highest
- It is less prone to diseases and competitor moulds than other mushrooms.
- Faster growth rate and easy cropping.
- Low cost of production.
- Most suitable for rural areas and can create self employment to people.
- Easy to post harvest processing particularly dehydration.
- Its production by poor people can help to bring them above poverty line and improve their socioeconomic status.
- Production is easy work because it requires only a little technical efficiency and a highly profitable agribusiness as evident for its lucrative benefit cost ratio (Ferdousi L., *et al*, 2017).

Growing Conditions:

The oyster mushroom can be grown in ordinary thatched huts or semi permanent structures. The optimum temperature and humidity required about 25 C and 85 % respectively and it can be easily maintained without any artificial means during the period from June to March with little manual control. Adequate cross ventilation and defused sun light is necessary for spawn run and cropping.

Cultivation Technique:

- Select the locally available agricultural waste like paddy, wheat, cotton and soybean straw, which is well dried and carefully stored.
- This material is chopped in to pieces of 3 to 5 cm and soaked in fresh water for 4 to 12 hrs depending upon hardness and further ensure that it become sufficient moist and soft.
- It is removed from water and allowed to drain off excess water. The straw can retain upto 60 % moisture of its dry weight and it favour the growth of mushroom mycelium.

Pasteurization of Straw

The mushroom mycelium growth can take place on simple water treated straw but there are number of other cellulolytic mold already present on straw. These competitor molds sometimes restrict the growth of *Pleurotus* mushroom mycelium due to secretion of toxic substances or metabolites. Following are the methods to kill undesirable microorganisms present in straw to favour the growth of *Pleurotus* mycelium.

- **Hot water treatment:** The substrate (straw) is soaked in hot water at 80 °C for 1 hour and after removing from hot water, excess water is drained off.
- **Steam treatment:** The steam is generated by boiler and inserted in bulk straw for 1 hour.
- **Autoclaving:** The moist straw can be sterilized in autoclave at 30 Lb presser for 30 minutes.
- **Chemical treatment :** The dry straw after chopping is soaked in water for 16 to 18 hrs by adding Carbendazim @ 7.5 + Formalene @ 125 ml per 100 L of water. However, this method is not applicable for growing organic mushrooms.

- After pasteurization, 5 to 6 kg of wet sterilized straw having 60 % moisture is filled into polythene bag of 35 x 55 cm size.
- While filling the straw, spawn is added into layers of 5 to 8 cm and pressed gently.
- 200 gm spawn is sufficient for 10 Kg of wet straw.
- The bag is tied and 20 -30 pin holes are made all over the surface of bag.
- It is put over a stand or rack and incubated for 15 days. During this period mycelia growth is completed which shows white colour.
- Then bed is taken out from the bag and watered with spray pump once /twice a day depending upon weather. Humidity of 80 to 90 % is maintained in growing room.
- Pinheads will start appearing within 3 to 4 days and attain their full size within 8 to 10 days after removing of polythene bag.
- All mushrooms on the beds are harvested by twisting with hands at a time and packed into perforated polythene bags.
- After harvesting the mushroom, little outer portion of the bed is scrapped and beds are again watered regularly for second flush.
- Three flushes of mushroom are harvested at an interval of 8 to 10 days.
- An average yield of 70 % of the dry weight of substrate can be obtained from three flushes within 30 days.
- The fresh mushroom can be stored under refrigeration for 4 to 5 days or they can be easily dried either by using tray drier or keeping in bright sunlight for 2 to 3 days.
- From one Kg fresh mushroom 100 gm dried mushroom are obtained. The dried mushroom can be preserved for 5 to 6 months.

Shelf Life

Unlike white button mushroom, the oyster mushroom fruit bodies can be easily dried and stored dried oyster mushrooms can instantly used after soaking in hot water for 5 to 10 minutes or it can be used in powdered form for several preparations. Fresh mushrooms have a shelf life of 24 to 48 hrs even at room temperature.

Plant Protection

If the incidence of green mould disease is observed, remove the affected portion and treat the patch with 2 % formalin solution. In case the insect infestation is noticed, spray beds with 0.02 % Malathion.

Marketing

There is demand for mushroom from departmental stores, bakeries, hotels and catering agencies in big metropolitan cities. It has also got export potential in developed countries like America, Japan and Canada etc.

Recipes

Different types of recipes i. e. Indian, Continental and Chinese viz., Mushroom Paneer, Noodles, Bhurji, Soup, Pizza, Omlet, Pulav, Manchurian, Biryani, Roles, Pakoda, Samosa, Curry, Fry, Pickles, Papad, Biscuits etc. can be prepared from fresh/dry oyster mushrooms.

Challenges in Mushroom Growing

- Lack of skills on mushroom production
- Spawn is expensive and quality not guaranteed
- Lack of awareness of benefits of mushroom
- Traditional beliefs of some communities

CONCLUSION

Mushroom possesses unique flavor and exotic taste. It is a rich source of quality proteins (20-35% on dry weight basis), which is higher than the protein content of vegetables and fruits Finn J. A. & Giller P. S. (2000).

Have a high percentage of all the nine essential amino acids and are rich in lysine and tryptophan, the two deficient in cereals. They help in keeping our body healthy and ward off diseases by strengthening the immune system, having antibiotic activities, anticancer, hypolipidemic, hypocholesteremic and antihypertension effects. 8. Mushroom cultivation is easy and simple. 9. Mushrooms have a short crop cycle. Easy to post harvest processing particularly dehydration. Its production by poor people can help to bring them above poverty line and improve their socioeconomic status.

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