



MANAGEMENT OF MAJOR DISEASES AND INSECTS OF OYSTER MUSHROOM DURING CULTIVATION

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ABSTRACT

The biotic and abiotic factors greatly influence the cultivation and yield and quality of mushroom. Fungi, bacteria, viruses, nematodes, yeast, mould, insects and mites are the living causal factors whereas water, temperature, pH, moisture and relative humidity are the non-living factors. Sometimes, these non-living factors exhibit similar symptoms like the living. Solution of such problem is gradually done on basis of the personal practical experiences. Both factors influence similarly in different growth stages of mushroom. The factors are determined by the abnormal mycelial growth resulting in fewer yields. In mushroom cultivation, this is most essential to know about the living causal factors like mode of entry, the source of its infection, stage of infection and the mode of infection spread or expansion.

Keywords: Oyster Mushroom, Mycelium, Mould, Spot, Rot.

INTRODUCTION

Oyster or “Dhingri” is the mushroom of *Pleurotus* species [1]. Oyster mushroom has markedly increased because its production technology is very simple and the yield is quite substantial. There is no need of compost formation in its production process. Any waste of agricultural produce with cellulose or cellulosic by products can be will utilized as substrate. *Pleurotus* spp. Can be easily grown on various agricultural waste materials e.g., Paddy and wheat straw etc. they grow well on a mixture of paddy straw and rice bran, saw dust and rice bran, saw dust and other combinations of tropical wastes, cotton saw dust and other

combinations of tropical wastes, cotton waste, corn cobs, corn leaves, sugarcane bagasse and leaves, rice husk, grasses and water hyacinths leaves etc.

Oyster is the most popular mushroom after the button mushroom. The different species of *Pleurotus* grow well within temperature range of 15oC to 30oC.

MATERIAL AND METHOD:

Selected dry paddy straw is cut into 3 – 5 cm long bits and sterilized the bits of straw by Chemical treatment (by dipping 7.5g Carbendazime + 125 ml formaldehyde 40%/litre of water solution overnight). It can also be treated with Hot water (30 minutes in boiling water), Pasteurization, and Fermentation methods. Spread the treated paddy straw bits in sterilized surface. Drain off the excess water and add supplement such as 10% Besan (Gram dal powder) and 15% wheat bran. Add 8 – 10% spawn (on the basis of dry weight of the straw). Place the spawned straw in net bags/polythene bags (50×75 cm)/wood tray/bamboo baskets/cylinder polythene bags (60×180 cm) or any other conductive pots. Place the bags in cropping rooms and maintain temperature 20 – 30oC, humidity 80 – 85%, darkness with good ventilation. After 10 – 25 days spawn running will over according to species of *Pleurotus* and environmental conditions. Polythene bags are taken out or cut by sharp knife. Mustard like knots will be seen on the surface of the white fully grown mycelium (Pinning stage). After 3 – 4 days full grown Oyster mushroom develop. During the whole process several disease like bacterial, viral disease may be appeared which is to be controlled either biological or chemical treatment. [2]

COMPETITOR MOULDS/WEED MOULDS

These are the following moulds which affect different stages of mushroom. Their effects are more pronounced at above 30oC. There are as, *Arthrobotrys*, *Aspergillus niger*, *Aspergillus flavus*, *A. fumigatus*, *Alternaria alternata*, *Cephalosporium aspermum*, *C. acremonium*, *Chaetomium globosum*, *Cladosporium chladosporoides*, *Coprinus rotirugis*, *C. sterquilinus*; *Chochliobolus specifier*, *Drechslera bicolor*, *Fusarium moniliforme*, *Mucor*, *Penicillium*, *Rhizopus*, *Trichoderma spp.* *Phialospora*, *Sclerotium rolfsii*. [3]

Management

Most of the moulds are successfully controlled with carbendazim (Bavistin, Derosal etc.), Topsin M, Blitox-50 (Cu-oxychloride 50%) or Thiram. Bavistin (0.05%) or Topsin (0.1 %) and Blitox - 50 (0.3%) or Thiram (0.15%) should be sprayed. Indofil M-45 @ 2 g per liter of water can also be sprayed for its effective management.

VIRAL DISEASES

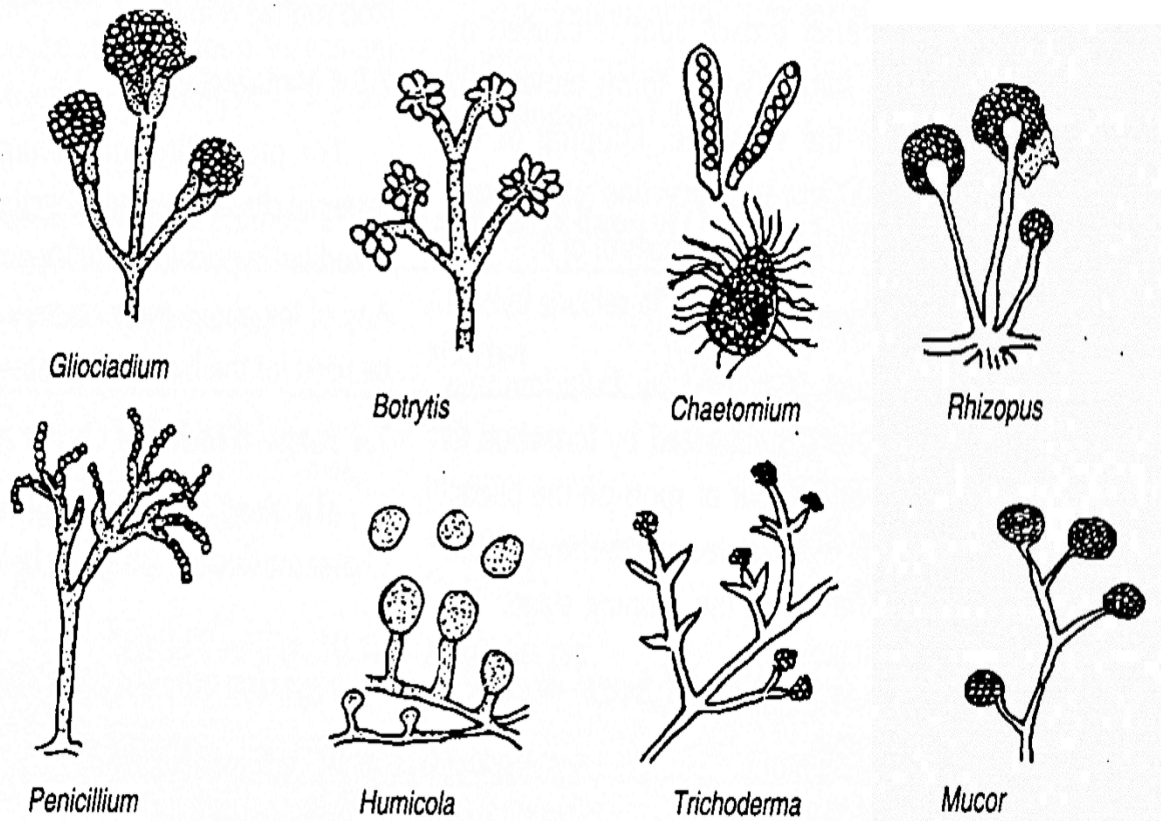
In India, the viral diseases symptom has been observed in the *Pleurotus florida* only, in which shrinkage occurs in pileus, the upper part, stipe swollen or becomes abnormally long. The basidiospores drop out earlier: The viral infected spores may live long.

Management

1. Mushroom should be picked up before its maturity, otherwise this viral disease can affect other lots with help or medium of spores.
2. Proper or perfect sterilization of the substrate should be done.
3. The cultivation of such affected variety should be stopped.

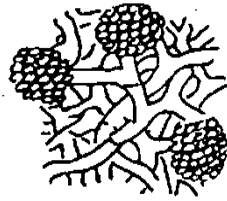
BACTERIAL DISEASES

In India, these are the following bacterial diseases found on mushroom, during its cultivation.





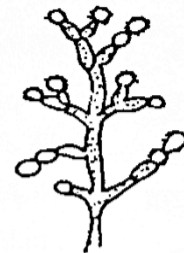
Actinomycetes



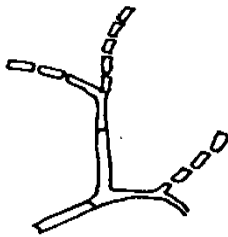
Papulospora



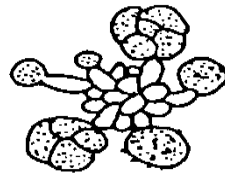
Sepedonium



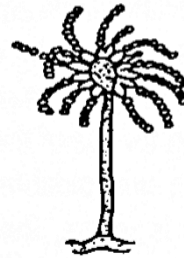
Chrysosporium



Geotrichum



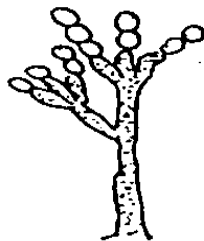
Epicoccum



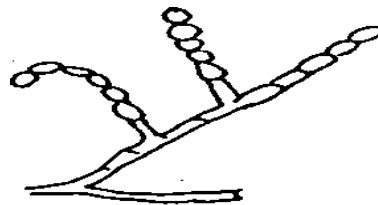
Aspergillus



Alternaria



Scopulariopsis



Monilia

Bacterial rot

Bacterial rot of mushroom is caused by *Pseudomonas alcaligenes*. This disease usually appears at the time of initial process of mushroom formation after pinning. The rotting starts in pileus and the gills become pale or yellow. Pileus looks torn and bends up or down.

Brown spot

This bacterial brown spot is caused by *Pseudomonas stutzeri* which forms brown spot symptoms in the substrate. Dipping of the substrate in 100 ppm. Streptomycin and 25 ppm formalin solution gives good control of it.

Yellow blotch

This disease is caused by *Pseudomonas agarici*, which is characterized by formation of different size and colour of spots in the pileus. The whole crop is devastated and destroyed if

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this disease is observed in the pinning stage. The affected mushroom starts rotting and gives foetic (bad rotting) odour.

Management

For prevention or management of these bacterial diseases oxytetracycline, Streptocycline or sodium hypochlorite (400ppm) should be used. Any of the above three bactericidal solution can be used for the bacterial disease management.

FUNGAL DISEASE OF OYSTER MUSHROOM

The short descriptions about the fungal diseases of Oyster mushroom are given in table below

1.	<i>Monillia spp.</i>	Orange mould	<i>Pleurotus spp.</i>	Inhibits mycelial growth
2.	<i>Penicillium spp.</i>	Green mould	<i>Pleurotus sajor-caju</i> <i>P.flabellatus</i>	Inhibits mycelial growth results in less yield.
3.	<i>Sibirina fungicola</i>	Sivirina rot	<i>Pleurotus spp.</i>	The rotting of basidium funnel and its discoloration.
4.	<i>Trichoderma spp.</i>	Green mould	<i>Pleurotus spp.</i>	Stops mycelial growth.
5.	<i>Verticillium fungicola</i>	Dry bubble disease	<i>Pleurotus ostreatus</i>	Bubbling on sporophores and depressed discoloured areas on basidiocarp.
6.	<i>Cladobotryum apiculatum/Cladobotryum variosporum</i>	Soft rot	<i>Pleurotus spp.</i>	Soft rot of basidiocarp.
7.	<i>Gliocladium deliquescens</i>	Brown rot	<i>P. sajor-caju</i>	Discoloration and rotting of basidiocarp.
8.	<i>Gliocladium virens</i>	Brown rot	<i>Pleurotus spp.</i>	Discoloration and rooting of basidiocarp
9.	<i>Gliocladium virins</i>	Brown rot	<i>Pleurotus spp.</i>	Discoloration and rotting of basidiocarp.

Management

As we know that the incidence and severity of the pest problems on mushroom are usually related to degree of control of the growing environment. These controls as technological devices for air movement, air filtration, air-conditioning, humidification, insulation and post-harvest storage technologies have made pest management much easier and more technically sound, economically viable and environmentally safe. Cleanliness of the mushroom farm is the best method for fungal management. The recommendation for use of the fungicide should be done only in unavoidable circumstances. If fungal problem is severe, then the whole farm (growing chamber in and outside) should be thoroughly washed with the fungicidal solution during intermittent period. 500 ppm of carbendazim (Bavistin or Derosal) @ ½ gm per litre of water or Indofil M-45 @ 2g per litre water can be sprayed in the substrate for management of the fungi as preventive measure.

IMPORTANT INSECTS/MITES IN OYSTER MUSHROOM

The important insects/mites affecting oyster mushroom cultivation have been listed in the following table.

Sl. No.	Name of the insect	Common name	Affected species/ Oyster affected	Mushroom part
1.	Lepidocyrtus spp.	Spring trails	The species of mushroom which are grown outside.	Insects devour mycelium and other parts of the basidiocarp.
2.	Lycoriella spp.	Sciarid flies	Pleurotus spp.	Gradual mycelial loss and presence of larvae
3.	Megaselia spp.	Phorid flies	Pleurotus spp.	Gradual loss of mycelium
4.	Pygmaephorus stercoricola	Pigmy mites	Pleurotus spp.	It devours mycelium causing gradual loss of it; mushrooms look dirty.
5.	Trichophagus dimidiatus	Straw or hay mites	Pleurotus spp.	Loss of mycelium.

Management

As natural control for prevention of increasing insect population, cleanliness of the farm is essential. The wire-nets should be fixed on each and every window and ventilation. The door

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should be opened occasionally. No undesired article is placed in the room, which may prove source of dirtiness and contamination. In the intermittent period of two crops, the room should be thoroughly washed with any effective insecticidal solution such as, malathion etc. The following alternatives should also be kept into consideration.

1. The spraying of Dichlorvos @ 30 ml/300 litre water/140 sq. meter gives good control of Phlorid flies and Sciarid flies etc. The aerial spraying is also done during spawn running and cropping.
2. Pirimiphos methyl also gives effective control of the above flies (Phorids and Sciards) which is also used as aerial fog @ 70 ml/100 sq. meters. [4]

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