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Review Article

A Review on Oyster Mushroom [*Pleurotus ostreatus*] Cultivation

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A B S T R A C T

Oyster mushroom is basically an edible mushroom. Oyster mushroom name originated from Latin [*pleurotus- sideways, oyster- shape of the cap*] which is namely refers to the shape of the fruiting body and the sideway growth of the stem with respect of the cap. Edible Mushroom belongs to the wide range of Division –Basidiomycota and Kingdom– Fungi. Oyster Mushroom is commonly known as "Dhingri" in India. It may also grow on rot and organic matter. At present time it is commercially cultivated all over the world but firstly cultivated at Germany during World War .Even now a day it is used as industrially for mycoremediation purpose. Oyster mushroom is commonly sought wild mushroom, it is lingo cellulose fungus growing in nature on living or dead. Recognized as peculiar morphology with eccentric short stem or stipe. Cultivation technology of oyster mushroom is very simple and cheap. Theoretically each crops takes 45 days under controlled conditions and hence there can be 8 crops per year. It is the 3rd largest cultivated mushroom in the World. China alone contributes 88% of the total world population. Oyster mushroom can grow at moderate temperature ranging from 20 to 30^0 C and humidity 55-70% for a period of 6 to 8 months in a year. It can also be cultivated in summer months by providing the extra humidity required for its growth in hilly areas above 900m. Oyster mushroom is economically profitable crop with high demand and supply pattern and exports. Its management is simple and easy to maintain on a closed low ventilation room. Oyster Mushroom can be used in Women Empowerment, the small village's women can make money by cultivating oyster mushroom at their home. Major problem we suffer in oyster mushroom is the nutrient requirement and the Common fungal and bacterial disease are Moulds, Green moulds, Ink caps, Brown spot, Yellow blotch, Bacterial rot.

Keywords

Fruiting body, Decaying, Mycoremediation, Lingo cellulose, Peculiar, Eccentric, Dhingri

Introduction

Oyster Mushroom (*Pleurotus ostreatus)* belonging to class Basidiomycetes and Family Agaricaceae is popularly known as 'dhingri' in India and grows naturally in the temperate and tropical forests on dead and decaying wooden logs or sometimes on dying trunks of deciduous or coniferous woods [nhb.gov.in] . On commercial ways for the economical an edible purpose people grows it on the preparing the substrate of organic matter. The fruiting bodies of this mushroom are distinctly shell or spatula shaped with different shades of white, cream, grey, yellow, pink, light brown depending upon the species . The Oyster mushroom is one of the more regularly looked for wild mushrooms, however it can likewise be developed on straw and other media. It has the clashing fragrance of benzaldehyde (which is also characteristic of bitter almonds) [https://en.wikipedia.org/ wiki/ Pleurotus_ostreatus].

Origin

Cultivation of a spp. Oyster mushroom was started on test premise in Germany by Flack during the year 1917 on tree stumps and wood logs. Growing innovation was consummated in USA by Block, Tsao and Hau. Name - Both the Latin and regular names allude to the shape of the fruiting body. The Latin pleurotus (sideways) alludes to the sideways development of the stem as for the cap, while the Latin ostreatus (and the English common name, oyster) refers to the shape of the cap which resembles the bivalve of the same name. Many also believe that the name is fitting due to a flavour resemblance to oysters.

The name oyster mushroom is also applied to other *Pleurotus* species, so *P. ostreatus* is sometimes referred to as the tree oyster mushroom or the *grey oyster mushroom* to differentiate it from other species in the genus ["Pleurotus ostreatus" – news · newspapers books scholar JSTOR *(April 2017)*].

Morphology

Mushrooms have restorative (medicinal) just as nutritive worth and broadly utilized as human food from the time immortal. In request to decide the hereditary variety among Pleurotus types of mushroom utilizing morphological and irregular enhanced polymorphic DNA (RAPD) markers, around seven distinct species were gathered. The mushroom has a broad, fan or oyster-shaped cap spanning 5–25 cm; natural specimens range from white to grey or tan to dark-brown; the margin is enrolled when young, and is smooth and often somewhat lobed or wavy. The flesh is white, firm, and varies in thickness due to stripe arrangement. The gills of the mushroom are white to cream, and descend on the stalk if present. If so, the stipe is off-centre with a lateral attachment to wood. The spore print of the mushroom is white to lilac-grey, and best viewed on dark background. The mushroom's stipe is often absent. When present, it is short and thick (Shukla, 2011).

Scientific classification

KINGDOM	Fungi
DIISION	Basidiomycota
CLASS	Agaricomycetes
ORDER	Agaricales
FAMILY	Pleurotaceae
GENUS	Pleurotus
SPECIES	*P. ostreatus*

KEYWORDS- temperate, tropical, deciduous, coniferous, substrate, shell, spatula, sought, wild, benzaldehyde, polymorphic, off-centre

Objective

-The main objective of my project is to cultivate the oyster mushroom in two environmental condition.
-To cultivate the oyster mushroom on completely on home conisation
-To understand the benefits of growing oyster mushroom to the farmer and environment and the heath benefit for consuming mushroom.

Different species of Oyster Mushroom

- *Pleurotus ostreatus*
- *Pleurotus florida*
- *Pleurotus sajor-caju*
- *Pleurotus sapidus*
- *Pleurotus eous*
- *Pleurotus membranaceous*
- *Pleurotus flabellatus*

Importance of mushroom

Mushrooms are significant constituents of minor woods produce, that develop on the most plentiful biomolecule of this biosphere, that is, cellulose. By and by mushrooms are viewed as a large scale parasite with an unmistakable fruiting body which can be either epigeous or hypogenous and sufficiently huge to be seen with the unaided eyes and to be picked by hand (miles, 1992). Just fruiting body of the mushroom can be seen through the remainder of the mushroom stays underground as mycelium (Bilal Ahmad Wani, 18 December, 2010).

Mushrooms have been discovered successful against cancer, cholesterol decrease, stress, insomnia, asthma, sensitivities and diabetes. (Medicinal value of edible fung, 1983, pp. 203-209) Mushroom as functional food used as nutrient supplement for increasing immunity due to the presences of high protein. Even used for diabetic and heart patients due to the presences of low starch content into it. Used as the anticancer drugs because of polysaccharide content used to combat HIV effectively. (Maitake mushroom the king mushroom, 1993)

Organically dynamic mixes from the mushrooms have antifungal, antibacterial, cancer prevention agent and antiviral properties, and have been utilized as bug sprays and nematicides also.

Hence keeping in see the enormous uses of mushrooms, the current examination audits various perspectives of mushrooms towards human medical advantages, for example, food, medication, minerals, drugs.

Production technology

Agroclimatic requirement

The most suitable temperature for the growth of Oyster mushroom ranges from 20^{o} to 30^{o} C and humidity ranges from 55-70% up to the period of 6-8 months in a year. The cultivation practices during summer months can be done by providing extra humidity required for its growth and development. The best growing season for oyster mushroom is the month of March/April to September/October. (Reddy, December 28 2019).

Cultivation

History of cultivation

Oyster Mushroom mushrooms are developed around the world due to its simple development innovation, accessibility of crude materials and number of species appropriate for climate (Kacharoo, 1977) (Falck, 1917) in Germany performed the first successful experimental cultivation of *P. ostreatus*. Falck (1917) growth tree stumps and wooden logs with mycelium of *P. ostreatus* (*Agaricus ostrelis*) and could harvest fresh oyster mushroom. Kaufert (1935) reported medium, sexual spores of *Pleurotus carticatus* Fr. Furthermore; Block *et al.*, (1959) cultivated *P. ostreatus* first time under laboratory conditions using sawdust as substrate. They used a mixture of oatmeal, sawdust for the cultivation, and found best results on eucalyptus sawdust followed by pine sawdust. They reported some growth abnormalities in due to insufficient light conditions and found optimal mushroom production within 10-32°C temperature range.

In India (Bano, 1962) at CFTRI Mysore revealed development of P. flabellatus on paddy straw. In an alternate preliminary, corncobs as substrate were utilized under the sterile condition for developing *P. ostreatus* (Toth, 1970) A Hungarian method based on sterile production was patented in 1969

(HTTV patent) for growing oyster mushrooms. (Stanek, 1917) developed a method of application of thermophilic microorganisms in the fermentation of substrate used for the cultivation of P.ostreatus (Zadrazil, 1974) reported a method for continuous preparation of substrates used in Pleurotus mushroom (P.ostreatus and P.florida) cultivation. (Jandaik, 1974) . grew, P. sajor-caju on various substrates including wheat and banana pseudostems. Too successfully developed a method for cultivation of P. sajor-caju using cotton waste from textile industry. (Singh, 1994).

Cultivation technology

The procedure for oyster mushroom cultivation can be divided into following four steps:

i. Preparation or procurement of spawn
ii. Substrate preparation
iii. Spawning of substrate
iv. Crop management

Spawn perparation

Commercial strains of clam mushrooms with a reach of fruiting temperatures (15o-30o C; 59o - 86o F) are accessible. Present day strategies of generate readiness utilize oat grains (e.g., wheat, millet, rye), which are sanitized in glass containers or polypropylene plastic packs, immunized with a chosen strain, and brooded at fitting temperatures for complete colonization. An elective little scope technique utilizes sequential weakening of basidiospores from a spore print to plan grain generate. Other natural crude materials (e.g., straw, espresso mash, cotton squander, sawdust), alone or joined in various combinations, are additionally used to make generate**.** (Badshah, 1992)

Subtrate preparation

In the wake of homogenizing molecule size, changing water content (about 70%) and pH (5-6), numerous substrates have been demonstrated to be appropriate for development (e.g., straw, espresso mash, cotton squander, wood shavings, banana pseudo Stem, cotton seed bodies, squander paper, different plant leaves, cardamom mash, sawdust blends, corn-cobs, tequila bagasse, mash plant slimes, cocoa shell waste, and Cassia side-effects). The immediate utilization of a portion of these substrates, for example with no further treatment, for provincial development in the field was accounted for from China. (Martínez-Carrera, 1998) [http://books.mcgraw-hill.com].

KEYWORDS- thermophilic, fermentation.

In any case, a few strategies have been created to make substrates more appropriate for developing shellfish mushrooms on an enormous or little scope:

1) Sterilization, substrates are autoclaved at 100^0-120^0C (212^0 – 250^0F) for 1-2 h

2) Pasteurization, substrates are set in a suitable room or burrow and purified with steam at 60o - 100^0C (140^0 – 210^0F) for 6-24 Hours, or drenched in heated water at 70^0- 90^0 C (158^0 – 194^0F) for 1-2 h;

3) Aerobic maturation, substrates are vigorously aged for a couple of days (2-6), and afterward purified with steam at 60^0 - 82oC (140o - 180o F) for 12-24 Hours

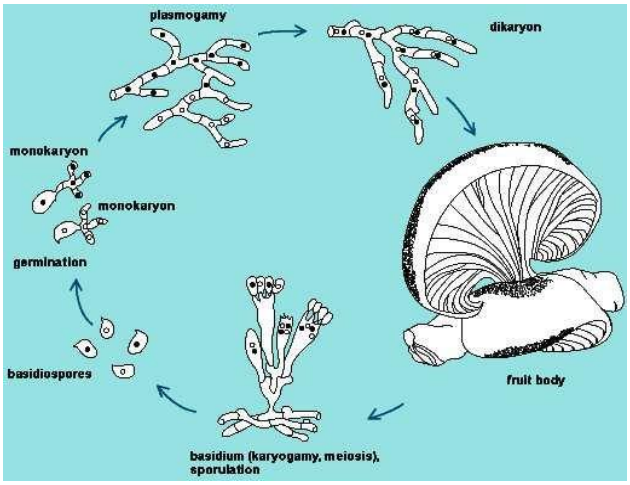
4) Semi-anaerobic maturation, substrates are inundated in water (7-10 days) for inciting lactic corrosive aging

5) Xerothermic measure, dry substrates are treated with steam at 100^0 C (210^0F) for 1 h in a little passage, and afterward cool water is included. Supplementation might be

conveyed out before treatment to build supplement substance and yields (Lemke, 1994) (Miles, 1989) (Elliott, 1995).

KEYWORDS- Sterilization, Pasteurization, Aerobic maturation, Semi – anaerobic, Xerothermic.

Life cycle of oyester mushroom



SOURCE - [http://books.mcgraw-hill.com].

Production system

Arranged substrates are homogeneously vaccinated with the produce, either by hand or precisely, at the pace of 0.5-3% of new substrate weight. The produced substrate is set in an assortment of holders. In the passage cycle, the substrate is colonized in mass under Controlled conditions, and afterward moved to more modest holders. The utilization of Plastic packs of various sizes containing 7-30 kg (15-66 pounds) of brought forth substrate is a typical practice. Even plate, racks, vertical plastic sacks, and squeezed rectangular squares are likewise utilized. Holders are set inside developing spaces for brooding. After complete colonization of the substrate by the mushroom mycelium (15-40 days), light, ventilation and watering are expanded in the developing rooms to advance fruiting. (Martínez-Carrera, 1998)

Development of an alternative technology for the oyster mushroom production using liquid inoculum

Pleurotus ostreatus, overall known as oyster mushroom, was developed in banana straw utilizing inoculate delivered by two distinct cycles - fluid inoculum and the generally utilized strong inoculum. Various proportions (5, 10, 15, and 20%) were tried. Natural proficiency, yield, profitability, natural issue misfortune, and dampness of fruiting bodies just as physical-compound qualities of banana straw were considered. Critical contrasts were watched for cellulose, lignin, and hemicellulose content somewhere in the range of one and two harvests for both strong and fluid inoculate. It was seen that *P. ostreatus* development advanced higher debasement of lignin (80.36%), trailed by hemicellulose (78.64%) and cellulose (60.37%). Noteworthy contrasts somewhere in the range of one and two harvests were additionally watched for the creation boundaries (natural productivity and yield) for the two sorts of inocula, fluid and strong. Nonetheless, huge contrasts in efficiency between harvests were watched distinctly for strong inoculum (Aliment, 2008) SOURCE= [http:/doi.org/10.1590/S1010]

Materials and Methods

Microorganism and Maintences- *Pleurotus ostreatus* DSM 1833 was maintained in PDA (potato dextrose agar) medium, in Petri dishes (FURLAN *et al.*, 1997).

Inoculum Cultivation in solid medium- Wheat grains were used as colonization support, growth substrate, and energy source. Polypropylene bags were prepared with 250 g of wheat grains, 1.3% (w/w) calcium sulphate, and 0.35% (w/w) calcium carbonate. The bags were closed, sterilized

for 1 hour at 120 °C, cooled to room temperature, and inoculated with 3 agar disks (15 mm diameter) containing the mycelium of *P. ostreatus* removed from the Petri dishes. The bags were incubated at 30 °C in the dark for 15 days or until complete colonization of the surface of the grains by the mycelium. The bags containing the "solid inoculum" were kept for 3 months at 4 °C for further use. (GERN, WISBECK, RAMPINELLI, NINOW, & FURLAN, 2008).

Inoculum Cultivated in Liquid Medium- Liquid inoculum" was obtained from submerged cultivation of *P. ostreatus* in POL medium (5,0 $g.L^{-1}$ $(NH_4)_2SO_4$; 0,2 $g.L^{-1}$ $MgSO_4.7H_2O$; 1,0 $g.L^{-1}$ K_2HPO_4; 2,0 $g.L^{-1}$ yeast extract; 1,0 $g.L^{-1}$ peptone) using 40 $g.L^{-1}$ glucose in a stirred tank reactor MD B. BRAUN with initial K_La equal to 15 h^{-1}, pH 4.0 and 30 °C (WISBECK, ROBERT, & FURLAN, 2002) After 14 days of cultivation, the cell suspension was centrifuged and the mycelium was resuspended in 0.9% saline solution, transferred to Eppendorf tubes, and stored at 4 °C for further use.

Culture Medium and Condition- Banana leaves dried in an oven (SILVEIRA, WISBECK, NINOW, GERN, & FURLAN, 2006) at 60 °C for 1 hour and packed in raffia bags. The bags were submerged in water for 12 hours, as described by (MADAN, VASUDEVAN, & SHARMA, 1987). After eliminating the excess of water, the substrate was weighed, supplemented with 5% (on a dry weight basis) rice bran and transferred to polypropylene bags. These were then closed, sterilized in an autoclave for 1.5 hours, cooled to room temperature, and vaccinated. For the two sorts of inocula, strong and fluid, the accompanying vaccination proportions were tried: 5, 10, 15, and 20% of dry weight. The immunized substrate was kept up at 25 °C under light until absolute colonization with the parasitic mycelium. The sacks were moved to the development space for fruiting bodies creation. Natural conditions utilized in this progression were: 27 °C, 88% air moistness, and 12 hours of light for every day. Primordia were prompted by making little holes in the packs. Fruiting bodies were collected with a surgical blade following 20 days of development (STURION, 1994) and dried in an oven at 45 °C for 24 hours. All experiments were carried out in octuplicate.

Crop management

Incubation

Studies were conducted to evaluate culturing of the edible mushroom and the bacterium *Erwiana carotovora* on wheat straw as a means of improving the nutritive value of straw for ruminant animals. In vitro dry matter digestibility (IVDMD) of the straw was not improved (P>.05) by hatching the straw with *P. ostreatus* alone. Be that as it may, 56-d hatching periods at half dry issue (DM) with *P. ostreatus* and E. carotovora expanded (P<.05) IVDMD from 32.7 to 47.7%. Preheating or autoclaving the straw before immunization was discovered not to be important. The IVDMD of the straw was improved all the more reliably when the straw was hatched at half DM instead of at 33 or 25% DM. DM deterioration of the straw ranged from 28.8 to 55.9%. Neither molecule size nor substrate to inoculum proportion influenced (P>.05) IVDMD. Lignin deterioration of 10 g of straw preheated at 25 C and hatched at 25 C and half DM for 56 d was 69%, which was transitional to that of hemicellulose, at 83%, and cellulose, at 55%. It is accepted that such bio delignification and the simultaneous 15-rate unit increment in IVDMD demonstrate that the refined of *P.*

ostreatus and *E. carotovora* on straw may, indeed, improve the straw's nutritive incentive for ruminant creatures. (C. L. Streeter, 01 January 1982)

Spawned bags, trays or boxes are arranged in a dark cropping room on raised platforms or shelves for mycelium colonization of the substrate. Although mycelium can grow from 10 to 33 degree Celsius, but the optimum temperature for spawn running lies within 22 to 26 degree Celsius.

KEYWORDS- *Erwiana carotovora*, Ruminant animal, IVDMD, hatching, autoclaving, immunization, deterioration, bio delignification, colonization

Fruiting

At the point when the mycelium has completely colonized the substrate, the organism is prepared for fruiting. Defiled packs with moulds might be disposed of while sacks with sketchy mycelial development might be left for scarcely any more days to finish mycelial development.

While different species require diverse temperature systems all require high moistness (70-85%) during fruiting. Successive showering of water is needed in the editing room contingent on the environmental mugginess. Organic product body delivered under muggy conditions (85-90%) is greater with less dry issue while those created at 65-70% relative dampness are little with high dry issue.

The oyster mushroom, Pleurotus ostreatus, developed in strong state on sugarcane bagasse–wheat grain (5:1) medium within the sight of veratryl liquor brought about an expanded creation of the fruiting body at prior occasions contrasted with when the organism was filled without veratryl liquor. The outcomes demonstrate another physiological function for veratryl liquor in invigorating fruiting body development. Veratryl liquor likewise animated laccase creation during the mycelial development stage. Proof is likewise introduced that laccases were engaged with the physiological advancement of the fruiting body (Hélio H. Suguimoto, 1, January 2001)

Production system

Production of fruiting bodies shifts as per every species, generate quality, substrate quality, ecological conditions (temperature, light, relative dampness, grouping of O_2/CO_2), and effect of irritations (flies, vermin) and infections (growths, microorganisms, infections). Normal organic efficiencies (yield of new mushrooms as a level of the dry weight of substrate at producing) revealed from assorted substrates range

From 35-159%, considering an entire creation pattern of around 70-80 days. Late development of P. tuber-regime has opened up the likelihood to broaden business creation from natural product bodies to palatable sclerotic (a firm, as often as possible adjusted, mass of mushroom tissue, impervious to negative ecological conditions) (Martínez-Carrera, 1998)

KEYWORDS- contingent, sclerotic, Laccase

Stages done for the oyster mushroom

Stages 1: Good quality straw should to be chosen from grains like paddy or wheat.

Stages 2: Cut the straw into 3-4 cm long pieces.

Stages 3: The substrate should to be set up in one of the accompanying ways

a) Hot water treatment: Soaking the slashed straw in boiling water for 1hr at that point depleted the overabundance water. Before utilizing the straw ought to be left to semidry condition. Be that as it may, this technique isn't reasonable for business creation.
B) Chemical Treatment: Most ranchers favour this technique as it is simple and advantageous to rehearse. The cleaved straw is absorbed clean water blended in with 10gm of Carbendazim (in 100 litters of water) for 8-12 hours. The overabundance water is depleted and the straw is permitted to dry in a shade.
C) Pasteurization: This serious strategy is exorbitant and takes 3-4 days so most ranchers can't manage the cost of it. In this technique, the pre-wetted straw is put inside a sanitization chamber at 58°C - 62°C for 4 hours and afterward at 40°C - 45°C for 36-48 hr. The temperature of the sanitization room is kept up with the assistance of steam through a heater.

Stage 4: Spawning: Fill the straw and generate layer by layer in a plastic pack of 45cm X 30cm and tie the sack.

Stage 5: Pinning - Pinning is the stage when minimal white buds, or pins, first beginning showing up. Changing the temperature and mugginess at this stage can direct the development rate and size of the mushrooms. Store the mushroom packs in a dim editing room.

Stage 6: Harvesting – should be possible following 20-30 days.

Pest and diseases

Mushroom creation yields can be fundamentally decreased by a variety of vermin and infections. A portion of the regular ones are depicted underneath and anybody genuinely considering going into mushroom development ought to get proficient help and preparing. Brief control measures, which can go from embracing great practices to utilizing synthetic compounds to regular controls have likewise been portrayed for every single one of them. Common control strategy alludes to following great act of development, for example measures taken up to forestall passage of bug bothers. Cleanliness and sterilization are the essential strategies for bother control in mushroom development. The shed utilized for mushroom development and its encompassing zones ought to be kept flawless and clean. Legitimate purification/sanitization of the substrate, brooding of packs at the correct temperature, utilization of new substrate with right pH after treatment and appropriate cleanliness ought to be kept up during producing and editing to decrease the frequency of form and the presence of undesirable microorganisms. More established harvests draw in creepy crawly bothers so opportune evacuation and disposing of utilized substrate to a faraway spot ought to be polished. Flies are likewise a significant danger to mushroom development (R, 1996) (S.T, 1999).

The creation of oyster mushroom is influenced by a few nuisances, including Pseudomonas spp. furthermore, flies, yet in later a long time the most extreme harvest misfortunes have been brought about by green form diseases around the world. The infective operators were recognized as new-to-science types of the filamentous parasitic sort *Trichoderma*, and they have as of late been depicted as *T. pleurotum* and *T. pleuroticola*. A PCR-based technique was created for the quick and explicit

identification of two pathogenic species. This gives an apparatus to the distinguishing proof of the causal specialists of the sickness without the need of DNA grouping examinations. So as to forestall and control the sickness, the impact of different elements, such as temperature, pH and substrate dampness content, were read and advanced for oyster mushroom development. Treatment with different synthetic fungicides, just as utilization of opposing microorganisms, has been appeared to control the illness viably. These snippets of data may help producers of clam mushroom to perceive and forestall or control green shape sickness of *P. ostreatus*, and along these lines lessen crop misfortunes (Phylogenetic relationships of Trichoderma, 1998) (Lóránt Hatvani1).

KEYWORD- filamentous, dampness, legitimate purification

Pest and diseases

Mushrooms are a rich source of supplements, especially proteins, mineral nutrients just as bioactive constituents, for example, phenolic mixes, terpenes, steroids and polysaccharides. The Pleurotus spp. of basidiomycete's class has a place with a gathering known as "white decay parasites" as they produce a white mycelium and are commonly developed on non-treated the soil lignocellulosic substrates. This family requires little development time, contrasted with different mushrooms. (M.B. Bellettini, 2017).

Mushroom endurance and increase are related to various elements, which may act exclusively or have intuitive impacts among them. Serious developments of eatable mushrooms can regularly be influenced by some parasitic and bacterial sicknesses that somewhat often cause sensational creation misfortune. (G.L. Bruno, 2015)

These diseases are encouraged by the specific conditions under which the mushroom development is usually done, for example, warm temperatures, moistness, carbon dioxide (CO_2) levels and presence of bugs. Because of these reasons, mushroom cultivators are every now and again tested by mushroom sickness of bacterial and contagious beginning. While an expanding number of business ranches develop mushrooms, cultivators have confronted genuine difficulties brought about by different viral contamination (H.S. Ro, 2007)

The disease has been known to cause scarcely any critical phenotypic consequences for mushrooms. Albeit cautious homestead the executives and extraordinary cleanliness may forestall significant assaults, a few sicknesses are hard to control. Also, timeframe of realistic usability quality is seriously influenced by illnesses that are as yet asymptomatic at the hour of collect.

The utilization of disinfectants, for example, chlorine (family fade) and the use of chosen fungicides is commonly polished in the development of mushrooms, which include critical expenses. Besides, the utilization of synthetic compounds in development leaves undesired build-ups, a few of which have been restricted from use. Most synthetic substances that are still permitted have neglected to enough control significant mushroom illnesses as opposition is effectively initiated. In this manner, great choices must be found. (F.J. Gea, 2003)

Brown plaster mould

Pathogen: *Papulaspora byssina*

SYMPTOMS

- This is first seen as a whitish development on the uncovered surface in plate or on the sides of developing sacks because of the build-up of dampness.
- Then, it further forms into huge thick fixes which bit by bit change tone into earthy coloured and rust tone.
- On these patches, no mushroom mycelium development can happen prompting lost yield and pollution.

(J.T. Chen, 2004)

Control measure

- Very good hygiene
- Proper pasteurization and sterilization
- Use of neem leaves by spraying extracted neem juice mixed with water

Green mould

Pathogen: *Trichoderma viride, T. hamatum, T. koninggi*

SYMPTOMS-

- A unadulterated whitish development of mycelium on the outside of generate
- Later on, because of weighty sporulation mycelial mats transform into green tone
- Mushrooms creating in or close to this mycelium will get earthy coloured or may break and mutilate

(S.L. Woo, 2004) (J. Sinden, 1953) (L. Hatvani, 2012)

Control measures

- Very good hygiene
- Proper pasteurization and sterilization
- Spraying of extracted neem juice mixed with water
- Using of correct concentration of formalin (maximum 2%)

Pest

FILES =

SYMPTOMS

- Puncture the stipe and pileus
- opening displays in their inside
- causing its general devaluation
- grown-up flies spread infections and vermin

CONTROL MEASURE

- Alcohol (80%)
- pyrethroids and water sticky traps (white or yellow-coated, double-sided)

(M.B. Bellettini F. F., 2016) (R.H.L. Disney, 1999)

BEETLE =

SYMPTOMS –

Lay their eggs inside the mushroom and when hatched feed on nutrients from mushrooms

CONTROL MEASERE –

Pepper mash or Bordeaux mixture with adhesive.

(M.B. Bellettini F. F., 2015)

It is concluded that now a day's oyster mushroom is cultivated on a very vast ratio. At this review paper I had discussed about the needs, requirement, and situation to grow. Discussed about the history its life cycle. Discussed about the common

diseases. And also mentioned the latest review articles. Oyster mushroom is very economical crop easy to cooperate and grow but having high ratio of yield. It is having high amount of nutritive and medicinal values and content the macronutrients which is required for human body.

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