



Review Article

A Review On: Oyster Mushroom

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ABSTRACT

The oyster mushroom, scientifically known as *Pleurotus ostreatus*, is a cultivated species of mushrooms that is characterized by unique culinary and medicinal properties. Its nutritional value is derived from the proteins, carbohydrates, fatty acids, vitamins, and mineral nutrients present in its fruit bodies. Due to its high fiber content and low-fat content, it is a valuable component of an atherosclerosis diet. The fruit bodies of oyster mushrooms are an important source of biologically active substances, specific polysaccharides, and polyphenols that influence the human immune system to fight against cancer cells. β -D-glucans have a beneficial effect on the digestive system, lower blood cholesterol and triglyceride levels, and decrease the risk of ischemic heart disease. The active substances present in the mushrooms have antioxidant, antibacterial, antiviral, antidiabetic, and anti-inflammatory properties. Numerous scientific studies have proven the high efficiency of therapy using preparations and extracts from *Pleurotus ostreatus* mycelia, both in the prophylaxis and cure of civilization diseases, atherosclerosis, and cancer.


INTRODUCTION

Mushrooms have not only been utilized as food ingredients due to their distinct flavor and texture, but they have been acknowledged as a significant source of biological active compounds with medicinal value. Mushrooms possess a diverse range of secondary metabolites, including phenolic compounds, polypeptides, terpenes and steroids. Additionally mushrooms contain lectins, polysaccharides, polysaccharides-peptides and polysaccharides-proteins complexes, which are known to exhibit immolator and anti cancer

properties.⁽¹⁾The oyster mushroom is the edible white-rot fungus that falls under the pleurotus species, which comprises approximately 40 species. OM is primarily found in northern temperate zones and thrives in clusters on wood in warm and wet weather conditions. OM is one of the most extensively cultivated mushroom, particularly in south Korea, where its annual commercial production reached approximately 45,957 M/T in 2007.⁽²⁾Recently, the pigments present colorful fruits and vegetable have garnered attention for their potential in reducing and

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preventing various diseases, such as obesity, atherosclerosis, hypertension and cancer. Certain type of OM exhibit colored fruits bodies including yellow (*pleurotus cornucopiae*) pink (*pleurotus salmoneo strainers*), or white (*pleurotus florida*) reported that the pink color of *salmoneostramineus* is attributed to a chromo proteins that serves a photosynthetic functions. ⁽³⁾

Scopes and Approaches:

The purpose of this report is to offer comprehensive evaluation of chemical compounds derived from the genus *pleurotus*, focusing on their potential biotechnological, nutritional, and therapeutics applications. The study primarily focuses on recent advancements in research on this genus, specially considering reports published after 2005. ⁽³⁾

Characterization and Occurrence: -



Fig: 1. Taxonomic description of *Pleurotus Ostreatus* mushroom.

Properties and Occurrence:-

- *Pleurotus Ostreatus*, a member of the Basidiomycete family Pleurotaceae, is originally indigenous to China but has since been dispersed globally. This particular species of oyster mushroom thrives as a saprophyte, deriving its sustenance from decaying wood found on various deciduous tree species, including willow, poplar, and birch and beeches. ⁽⁴⁾
- The emergence and growth of mushrooms is favored by low night-time temperatures in late autumn, resulting in the appearance of

fruiting bodies on beech trees. *Pleurotus* is successfully cultivated on straw bales, sawdust, and other plant-based materials in intensive and commercial settings. ⁽⁵⁾

- The fruiting bodies of *Pleurotus ostreatus* form characteristic groups, which give them their name. The pileus of *Pleurotus ostreatus* has a diameter of 5-25 cm and a smooth surface with slightly convex sides. As the fruiting body develops, the cap changes from a domed shape in juveniles to a flagellated or oyster-shell shape in mature individuals. The color of the cap also changes from dark in the early stages of growth to increasingly pale thereafter. ⁽⁶⁾
- The flat hymenophore sits on a short but sturdy white or gray stalk. In young individuals, it is mostly white or off-white, while in older individuals, it becomes gray or even purple. The trama is white, fibrous, and slightly hard, with a mild aroma and a pleasant mushroom scent. The taste and smell of the fruit bodies are directly influenced by the type and content of the medium used for cultivation. ⁽⁶⁾

Types of oyster mushroom :-

There exist more than 200 species of *Pleurotus*, however, these five prominent varieties are predominantly cultivated and commercially traded. ⁽⁷⁾

1) Yellow Oyster Mushroom



Pleurotus citrinopileatus, commonly referred to as the yellow or golden oyster mushroom, is a delicate and visually appealing variety. The caps

of this mushroom are typically small, ranging from 20 mm to 65 mm (3/4 inch to 2 ½ inches) in diameter, and exhibit a beautiful yellow hue. Fortunately, cultivating this variety at home is relatively simple. It does not require excessive amounts of oxygen and can thrive on various substrates. In the past, encountering yellow oyster mushrooms in the wild was highly unlikely. However, in recent times, they have been observed in significant quantities across the United States. It is believed that the growing popularity of small-scale farming has facilitated the spread of this species beyond its intended cultivation, resulting in its dominance over native decomposers. It is plausible that yellow oyster mushrooms may soon be classified as an invasive species in the United States.⁽⁷⁾

2) Pink Oyster Mushroom



The vibrant pink hue of *Pleurotus diamond* evokes imagery of blossoms, flamingos, and salmon. Resembling the delicacy of flowers and possessing a texture reminiscent of salmon, this particular variety of oyster mushrooms presents an impressive appearance in market stalls during the warmer months. Pink oyster mushrooms grow rapidly but have a limited lifespan after being harvested. Originating from Indonesia and similar tropical regions, they thrive in hot climates, with temperatures exceeding 30°C (86°F). If the temperature drops too low during the growth cycle, the mycelium will perish. Furthermore, pink oyster mushrooms do not fare well during transportation due to their short shelf life. Regardless of how you choose to utilize them,

whether in soups, stews, or pasta dishes, it is crucial to ensure thorough cooking in order to enhance their flavor.⁽⁷⁾

3) Blue Oyster Mushroom



The *Pleurotus ostreatus* var. *columbines*, commonly known as the blue Oyster Mushroom, exhibits a preference for colder temperatures. The intensity of its blue coloration is directly proportional to the temperature at which the fruiting body emerges. This variety is typically found in environments with temperatures ranging from 7°C to 18°C (45°F to 65°F). One of the unique challenges associated with cultivating this mushroom at home is its high oxygen requirement. Excessive levels of carbon dioxide can result in the production of a mushroom with a thick stem and small cap, lacking the vibrant hue characteristic of this particular strain.⁽⁷⁾

4) King Oyster mushroom



Pleurotus eryngii is commonly referred to as the king mushroom for good reason. Its substantial stems and petite caps distinguish it from other varieties found in specialty stores and Asian markets. Interestingly, this distinct shape is intentionally cultivated by exposing the mushrooms to environments rich in carbon

dioxide. These mushrooms can be found growing in various regions surrounding the Atlantic Ocean and the Mediterranean Basin. They also emerge in India, Central Europe, northern Africa, and the western parts of Asia. However, it is worth noting that in the wild, where oxygen levels are higher, *Pleurotus eryngii* develops larger caps compared to those seen in cultivated specimens. Regardless of their cultivation method, this particular oyster mushroom stands out as individual fruits rather than being clustered together in bouquets.⁽⁷⁾

5) Elm Oyster mushroom



Although the elm oyster mushroom does indeed grow on elm trees, it is important to note that the term "oyster" is somewhat misleading. This particular fungus does not belong to the *Pleurotus* genus; rather, its scientific classification is *Hypsizygus ulmarius*. Interestingly, it falls within the same genus as white beech mushrooms (*Hypsizygus tessellatus*, or buna shimeji). Why is this "imposter" mushroom worthy of mention? Firstly, it possesses significant potential for indoor cultivation. It exhibits a remarkable tolerance for high levels of carbon dioxide and produces far fewer spores compared to varieties such as the blue oyster. Moreover, these mushrooms are indeed edible, although their flavor differs from that of regular oyster mushrooms. When young, elm oyster mushrooms possess a delicate flavor and cook rapidly. As they mature, they can be utilized as a substitute for meat in vegetarian and vegan recipes⁽⁷⁾

Nutritional value: Numerous researchers have evaluated the nutritional value of mushrooms in

our diet and have determined that they are adequate in maintaining our overall health.

(a) Vitamins Composition

Edible mushrooms have been identified as a valuable source of various vitamins. *Pleurotus citrinopileatus*, in particular, is abundant in vitamins B3 (nicotinic acid), B5 (pantothenic acid), B2 (riboflavin), B1 (thiamine), B6 (pyridoxine), B7 (biotin), and B9 (folic acid). Notably, *Pleurotus ostreatus* has been reported to contain the highest levels of vitamin E (7.23 mg/g), vitamin A (0.363 mg/g), and vitamin C (0.363 mg/g).⁽⁵⁾

(b) Fatty Acid Composition

Fatty acids are characterized structurally as straight-chain mono-unsaturated and polyunsaturated with branched chain building blocks of dietary fats and oils. The essential fatty acids, namely linoleic and linoleic acids, are two long chain fatty acids that are fundamental to human diets. The production of total fat or lipid content varied from one species of *Pleurotus* to another. Linoleic acid (19.1%) was detected in *Pleurotus ostreatus*, while Palmitic acid (18.4%) was found in *Pleurotus pulmonarius*. In *Pleurotus sajor-caju*, linoleic acid (13.5%) was detected. These organisms also produce several other fatty acids, including pentadecanoic acid, stearic acid, oleic acid, methyl hexadecanoate, ethyl hexadecanoate, methyl 8,11-octadecadienoate, and ethyl linoleate⁽⁸⁾

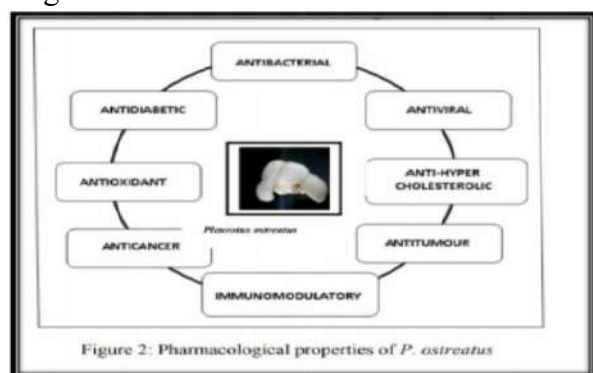
(c) Protein, Carbohydrates, Vitamin and Minerals Composition

In their study, Lee-Hoone et al. (2020) presented the nutrient composition of oyster mushrooms, including protein (3.31g), ash (1.01g), carbohydrates (6.09g), dietary fiber (2.3g), calcium (3mg), copper (0.24mg), iron (1.33mg), magnesium (18mg), manganese (0.11mg), phosphorus (120mg), potassium (420mg), selenium (2.6µg), sodium (18mg), zinc (0.77mg), thiamin (0.125mg), riboflavin (0.35mg), niacin

(4.96mg), and pantothenic acid (1.29mg) per 100g of edible portion. These nutritional attributes of oyster mushrooms hold great potential in supplementing the human diet. The consumption of these mushroom products could provide significant nutritional and medicinal benefits to humans.⁽⁹⁾

Medicinal Benefits of oyster mushroom

Historically, the medicinal properties of mushrooms have been extensively demonstrated, particularly in Eastern Asian countries. Currently, there is a renewed interest in traditional remedies in some parts of the world. Although there are limited direct human intervention trials, there is a rapidly expanding body of in vitro and in vivo animal trials that describe a potential range of health benefits. This is due to the large number of compounds, such as lectins, polysaccharides, polysaccharide-peptides, and polysaccharide-protein complexes, that have been isolated from mushrooms and found to possess antioxidant properties. The pharmacological properties of *P. ostreatus* were demonstrated to possess anticancer, antimicrobial, antidiabetic, antihypercholesterolemic, and immunomodulatory properties, as indicated by Cohen. These properties are visually represented in Figure.2⁽⁹⁾



1) Antibacterial

In 1994, Karacsonyi and Kuniak isolated an alkaline-isolated skeletal β -D Glucans from the fruiting bodies of *P. ostreatus*. This β -D Glucan, also known as pleuran, was found to promote the

survival of mice susceptible to bacterial infections.⁽¹⁰⁾ Additionally, the observed phenolic and tannin constituents of *P. ostreatus* may also elicit antibacterial activity, similar to many medicinal plants. These mechanisms of action include cell membrane lysis, inhibition of protein synthesis, proteolytic enzymes, and microbial adhesins (Cowan, 1999).⁽¹¹⁾ The antimicrobial potency of the oil of the macrofungus extracted with petroleum ether and acetone was observed to inhibit both gram-positive and gram-negative bacteria tested in vitro, suggesting that *P. ostreatus* has broad-spectrum antibacterial activity. Furthermore, organic extracts (methanol and chloroform) of *P. ostreatus* have been shown to be effective against Gram-positive bacteria.⁽⁴⁾

2) Antimicrobial

OM has been investigated as a potential treatment for both simple and drug-resistant strains of *Escherichia coli*, *Staphylococcus epidermidis*, *S. aureus*, *Candida* species, *Streptococcus*, and *Enterococcus*. Methanolic extracts of *Pleurotus* species have shown inhibitory effects on the growth of *Bacillus megaterium*, *S. aureus*, *E. coli*, *Klebsiella pneumoniae*, *C. albicans*, *C. glabrata*, and species of *Trichophyton* and *Epidermophyton*. The extent of inhibition varied depending on the specific antifungal agents used, such as Streptomycin and Nystatin. The antimicrobial and antifungal properties of OM were influenced by the solvent used for extraction, with ether extract exhibiting greater activity against Gram-negative bacteria compared to acetone extract.⁽⁸⁾

3) Antiviral

The objective of antiviral chemotherapy is to develop specific antiviral agents that can inhibit viral multiplication without affecting normal cellular division. It is crucial to identify and develop new antiviral agents that do not have adverse side effects and are not prone to viral resistance.⁽¹¹⁾ In a laccase enzyme was purified from *P. ostreatus* mushroom, which demonstrated

the ability to inhibit the entry and replication of the hepatitis C virus in peripheral blood cells and hepatoma HepG2 cells. Additionally, Wang and Ng in 2000 isolated a unique ubiquitin-like protein from *P. ostreatus* mushrooms that exhibited inhibitory activity against HIV-1 reverse transcriptase.⁽¹²⁾

4) Anti-diabetic

Hyperglycemia is a critical characteristic of diabetes mellitus. The combination of *P. ostreatus*, *Murraya koenigii*, and *Aegle marmelos* has been administered orally to alloxan-induced diabetic rats. It has been discovered that this combination produces synergistic effects and has confirmed blood glucose-lowering impact in both insulin-dependent and insulin-independent diabetic conditions. However, further investigation is needed to assess the antihyperglycemic action of oyster mushroom (*P. ostreatus*) and its impact on potential DNA damage, chromosome aberration, and sperm abnormalities in Streptozotocin-induced diabetic rats. The results of this study have shown that treatment with *P. ostreatus* extract, particularly at high levels, can reduce high blood glucose levels in hyperglycemic rats, although to a lesser extent than amaryl treatment.⁽¹²⁾ Additionally, the mushroom treatments were more effective in reducing genetic changes and sperm abnormalities in diabetes cases compared to amaryl treatment have postulated the antidiabetic potential of oyster mushroom *P. ostreatus* in alloxan-induced diabetic mice. Their study has demonstrated that *P. ostreatus* produces a significant hypoglycemic effect in diabetic mice and is capable of improving hyperlipidemia and impaired kidney functions. These findings suggest that *Pleurotus* mushrooms hold promise as antidiabetic nutraceuticals; however, there is a lack of sufficient scientific evidence. The mechanism underlying the antidiabetic effect of *Pleurotus* mushrooms remains unclear.⁽¹¹⁾

5) Antitumor

The bioactive compound 1,6-branched 1,3 β -glucans, produced by mushrooms, have been documented to possess the ability to hinder tumor growth by stimulating immune-compatible cells and cytokine production. Notably, the water-soluble extract derived from *Pleurotus ostreatus* exhibited significant efficacy against prostate cancer PC-3 cells. Additionally, hot water extracts of *Pleurotus ostreatus* demonstrated the ability to suppress the proliferation of MCF-7 human breast cancer cells.⁽¹³⁾

6) Antiaging activity

The study conducted by found that extracts of *Pleurotus abalones* and *P. ostreatus* showed elevated levels of vitamin C and E, as well as increased activities of catalase, superoxide dismutase, and glutathione peroxidase in aged rats.⁽¹³⁾ These enzymes are well-known for their potent antioxidant properties.⁽¹⁴⁻¹⁵⁾ Furthermore, the administration of mushroom extract to aged rats resulted in a decrease in the levels of malondialdehyde, a polyunsaturated lipid and electrophilic mutagen. This decrease was observed in the formation of a DNA adduct when malondialdehyde reacted with deoxyadenosine and dioxygenase in DNA.⁽¹⁶⁾

7) Hypocholesterolemia activity

Initial reports suggest that a diet containing 4-10% dried fruiting body of *Pleurotus leukocyte* results in a greater reduction in arterial pressure and blood cholesterol levels when compared to a normal diet.⁽¹⁷⁻¹⁸⁾ conducted studies on rabbits and rats and found that lovastatin, a drug used to lower blood cholesterol levels, produced by *P. ostreatus*, was approved by the FDA in 1987. When dried mushrooms were added to the diet of experimental animals, they acted as an accelerator of HDL and reduced the production of very LDL through LDL, cholesterol absorption, and HMG-CoA reductase activity in the liver.⁽¹⁹⁾

8) Hepatoprotective activity



Pleurotus species are known to contain active compounds such as β -glucan, phenol, and vitamin C that have been found to enhance the activity of antioxidant enzymes, specifically catalase and superoxide dismutase. These enzymes play a crucial role in reducing hepatic cell necrosis.⁽¹⁻²⁾ The hepatoprotective activity of this mushroom has been observed through increased levels of serum aminotransferase enzymes in animals.⁽²⁰⁾ Recently, reported that water-soluble polysaccharides extracted from *P. eryngii* have the ability to remove free radicals and also increase the activities of antioxidant enzymes in a liver injury mouse model.⁽³⁾

9) Anticancer

According to reports, the aqueous polysaccharide extract derived from *P. ostreatus* has demonstrated antiproliferative and pro-apoptotic effects on HT-29 colon cancer cells. This effect has been attributed to the presence of a newly identified low molecular weight α -glucan, which possesses promising antitumor-genic properties and has been found to be effective in preventing colon cancer cell proliferation by initiating programmed cell death.⁽²¹⁾ Additionally, the protein extract of *P. Ostreatus* has been reported to exhibit healing efficacy against human colorectal adenocarcinoma cells. Intake of oyster mushrooms in ICR mice treated with oyster mushroom has been shown to induce apoptosis in SW 450 cells and human monocyte leukemia cell line (THP-1 cells) through the production of Reactive Oxygen Species (ROS), depletion of glutathione (GSH), and dysfunction of mitochondria.⁽²⁰⁾ Previous studies have also reported the anti-cancer activity of oyster mushrooms in various animal models.⁽²²⁾

Way To Add Oyster Mushroom into Your Diet

Oyster mushrooms are highly esteemed for their gastronomic applications, and all components, including the caps, gills, and stems, are consumable. Below are some effortless methods to integrate oyster mushrooms into a meal plan:⁽²³⁾



- Incorporate them into the preparation of nutritious soups and stews.
- Combine them with pasta and other rice-based recipes.
- Sauté them with vegetables and garlic to create a wholesome side dish.
- Utilize them to enhance the flavor of rich curries and sauces.
- Roast and grill them alongside vegetables in the oven.⁽²³⁾

Common Disease of Oyster Mushrooms-

1) Green mould

Causal organisms include *Trichoderma harzianum*, *T. pleurotus*, *T. virens*, *T. atroviride*, *T. asperellum*, *T. citrinoviride*, *T. longibrachiatum*, and *T. pleuroticola*. Symptoms of infestation include difficulty in distinguishing the white hyphal growth of the pathogen and *Pleurotus* mushroom during the early stages. However, at a later stage, the pathogen produces conidiophores. According to, the pathogens in oyster mushrooms exhibit a green color. The characteristic symptoms include the emergence of green patches on the mushroom substrate approximately 10-15 days after cultivation. The development of *Pleurotus* mushroom hyphae is impeded on these green patches, which subsequently become covered by green mold and result in lesions on the stems. In severe instances, the entire mushroom crop is decimated, resulting in no yield.⁽²⁴⁾





Management:

- Ensuring adequate hygiene and sanitation practices are implemented during mushroom production is imperative.
- It is crucial to avoid the use of contaminated spawn with green mould.
- Prior to supplement usage, it is recommended to sterilize and thoroughly mix them, preferably after spawning.
- In the event of disease, spraying the affected mushroom with carbendazim or Chlorothalonil at a rate of 0.1% can aid in disease control.
- Additionally, mixing Chlorothalonil at a rate of 254ml per 100m² with casing material can be beneficial.

2) Ink Cap

Causal organism: Coprinus species.

Symptoms:

The Ink Cap fungus is observed to manifest both before and after the opening of bags, including during the fruiting period or spawn run. According to Tsarev (2003), the fruit body of the Coprinus fungus resembles a small mushroom. It has a thin cap that is supported by a slender white stalk. The caps are initially cream-colored when young, but they eventually turn into a black mass when fully matured. This black mass plays a crucial role in the development of a large number of spores that spread into healthy mushrooms and compost. The

mycelium of the Ink Cap fungus has a grey appearance and is challenging to differentiate from mushroom mycelium.⁽²⁴⁾



Management-

- The ink cap should be manually removed as soon as it begins to appear in order to prevent further spreading.
- Excessive watering of the mushroom should be avoided.
- The compost should be prepared using fresh straw that has been properly sterilized.
- The use of chemicals for controlling Coprinus is not recommended.
- During spawning, the ammonia level in the compost should be kept below 10 ppm.

3) Cobweb

Causal organisms responsible for this phenomenon include Cladobotryum dendroide, C. varium, C. multiseptatum, C. mycophilum, and C. verticillatum.

Symptoms:

The symptoms manifest as diminutive white patches of filamentous growth resembling cobwebs on the surface of the mushroom, subsequently extending to adjacent healthy mushrooms. These cobwebs consist of the mycelium of the fungus, which exhibits a delicate gray-white hue. In later stages, the mycelium transitions to a pink, pale brown, or yellow shade, enveloping the entire mushroom with a tender, powdery growth. Ultimately, the fruiting body becomes tender, dark brown, and initiates a process of decay, emitting a repugnant odor.⁽²⁴⁾



Management-

- Ensuring proper hygiene through regular cleaning and removal of mushrooms that are already infected.
- Implementing control techniques such as reducing humidity levels and improving air circulation.
- Annual disinfection of the mushroom house and its surroundings using a 2% formalin solution.
- Covering areas infected with cobwebs with salt.
- Sterilizing the substrate by adding methyl at a concentration of 40mg per litre and formalin at a concentration of 500mg per litre.
- Applying chlorothalonil and benzimidazole for effective control

4) Dry Bubble

Causal agent: *Lecanicillium fungicola*

Symptoms-

At the onset of infection, mushrooms of an onion-like shape are generated. Subsequently, dry bubbles containing an amorphous sporophore mass emerge on the infected pin or button of the mushroom. These bubbles eventually undergo a transformation, turning brown and exhibiting cracks and curls with necrotic regions. On the fully infected top of the fruit bodies, small pimple-like outgrowths or gray spots become visible. As a result of these blemishes or discolorations, the mushrooms are deemed unsuitable for marketing purposes.⁽²⁴⁾



Management-

- Appropriate sanitation measures must be implemented to prevent initial infection.
- The substrate, such as rice straw, must undergo proper sterilization.
- The application of volatile 1-octen-3-ol on *Pleurotus* that has been infected is recommended.
- The substrate should be drenched with a 0.1% solution of carbendazim.

5) Yellow Blotch

The causal organisms responsible for this condition are *Pseudomonas agarici* and *P. reactants*.

Symptoms

The disease initially manifests as depressed yellow to orange spots on the caps. As the severity of the disease increases, the fruit body becomes deformed by recurving near the base of the stripes with upright sporocarp with slimy body. In conditions of high temperature and humidity, the infected fruits emit a foul odour



Management-

- The reduction of air's relative humidity
- Antibiotics and disinfectants, such as streptomycin at a concentration of 400 parts

per million (ppm), Kasugamycin, Chloramine T, Bronopol, and essential oils, can be employed for the purpose of controlling yellow blotch.

6) Soft Rot

Causal agent: *Pantoea* sp.

Symptoms-

The symptoms of bacterial soft rot in its early stage manifest as small water-soaked lesions with brown fuscous spots on both the pileus and stripes of the mushroom, typically appearing within one week of being transferred to the cultivation room. Over the course of 7 to 14 days, these lesions progressively enlarge and acquire a viscous, discolored appearance. Subsequently, the affected area becomes mushy due to soft rot and emits a foul odor.⁽²⁴⁾



Management-

- Adherence to appropriate hygiene practices, sterilization, and meticulous care throughout the entirety of the production process.
- The utilization of chlorine, mixed with water at concentrations of 175 to 300 parts per million (ppm) of active chlorine, has been observed to significantly decrease infection rates without compromising crop yield.
- The application of calcium hypochlorite solutions containing 175 ppm of active chlorine has also proven to be an effective measure in reducing the prevalence of the disease.

Side effects:

In general, individuals who have an allergy to mushrooms may experience various side effects, including skin rashes, chills, fever, pain, and itching or swelling of the mouth and throat. It is important to note that oyster mushrooms have a limited shelf life of 7-8 days, and beyond this period, they become unfit for consumption. Therefore, it is advisable to purchase oyster mushrooms from reputable supermarkets rather than gathering them from the wild, as the latter may lead to symptoms of food poisoning, such as abdominal pain, diarrhea, dizziness, headache, and, in rare cases, loss of consciousness. Furthermore, it is recommended to consume oyster mushrooms in moderation, as excessive intake can result in gastrointestinal discomfort, including upset stomach, nausea, and gas accumulation in the intestines due to the difficulty in digesting certain carbohydrates.

The suggested daily consumption of oyster mushrooms is one cup

- It is worth mentioning that, although rare, some individuals may have an allergic reaction to fungi.
- Additionally, individuals with sensitive stomachs should exercise caution when consuming large quantities of oyster mushrooms, as it may trigger stomach-related issues such as nausea, flatulence, diarrhea, and stomach rumbling.

FUTURE PERSPECTIVES

Currently, *P. ostreatus* is regarded as one of the most valuable sources of nutrients and medicinal resources due to its numerous bioactive components that contribute to its extensive range of pharmacological effects. It is rich in essential nutrients such as carbohydrates, proteins, amino acids, vitamins, and fatty acids. Moreover, its high nutritional value and medicinal properties make it a functional food that can help manage various human ailments, including antioxidant, anti-inflammatory, anti-carcinogenic, anti-viral,

anti-fungal, antibacterial, anti-diabetic, anti-angiogenic, immuno-modulatory, hypoglycemic, and hepatoprotective effects. The benefits of *P. ostreatus* mushrooms are particularly noteworthy because they can be cultivated on low-cost agricultural or woodland wastes such as wheat straw, rice straw, teff straw, paddy straw, corn cobs, cotton waste, coffee pulp, and sugarcane bagasse. This review provides a comprehensive overview of the nutritional and medicinal importance and pharmacological properties of *P. ostreatus* mushrooms. Furthermore, there are several potential characteristics, both old and new, that offer pharmacological and health benefits, which require further investigation and in-depth studies to fully realize their potential.

CONCLUSION

Pleurotus ostreatus is a novel edible mushroom that possesses considerable nutritional and biomedical significance. This is due to its abundance of bioactive components, which contribute to its numerous therapeutic functions. Additionally, the high nutritional value of these mushrooms makes them a potential solution for combating malnutrition. Consequently, the majority of research efforts have been directed towards extracting these beneficial components from the fruiting body, with fewer studies focusing on extracts from cultivated fungi. Therefore, it is recommended that further research be conducted in this area. It is important to note that while the therapeutic effects of *P. ostreatus* have been demonstrated through in vivo and in vitro studies, clinical trials are necessary to fully understand and harness its potential benefits.

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