INTRODUCTION

Mushrooms, also called ‘white vegetables’ or ‘boneless vegetarian meat’ contain ample amounts of proteins, vitamins, fibres and medicines. Mushrooms are edible fungi which is suitable for wide range of age group. It produces high quantity of quality food which has high biological value grown on many substrates. Mushroom is a macro fungus which has distinctive fruiting bodies that can either be epigeous or hypogenous. Mushroom produces enough amount of quality and quantity food which is of high biological value and suites wide range of groups from child to elder people and it is suitable for heart patients as it also contains all kinds of amino acids needed by human body. Mushrooms with their flavour, texture, nutritional value and high productivity per unit area have been identified as an excellent food source to alleviate malnutrition in developing countries. The practice of mushroom cultivation not only produces medicinal and nutritious food but also improves the straw quality. This takes place by reducing lignin, cellulose, hemicelluloses, tannin and crude fibre content of straw making it ideal for animal feed. Oyster mushroom extracts contain bioactive compounds, such as saponins, alkaloids, flavonoids, and cardiac glycosides, thus, they are considered to have hypoglycaemic effects (Johnny and Okon, 2013).

Our project focuses on the cultivation of mushrooms, an essential part of sustainable agriculture and nutrition. We aim to explore and implement innovative methods for growing high-quality mushrooms, leveraging their nutritional value, environmental benefits, and potential economic contributions. This project outlines a method foe cultivating oyster mushrooms using mush pellets developed by Rahul Govind and Sreekanth punnad, inside our college campus.

Among the different types of mushrooms, oyster mushroom is also one of the most cultivated species. However, Obodai et al. reported that oyster mushroom is the third largest commercially produced mushroom in the world market. Oyster mushroom (Pleurotus ostreatus) belongs to the family Agaricaceae and class

Basidiomycetes and also commonly known as ‘Dhingri’ in India. Oyster mushroom in known for its rich content in vitamin C and vitamin B complex and its protein content varies from 1.6 to 2.5 percent along with mineral salt which is essential for human body . And among the types of mushroom, oyster mushrooms species namely Pleurotus ostreatus has antitumor activity while Pleurotus cystidiosus has strong antioxidant properties. Pleurotus species require carbon, nitrogen and inorganic compounds as their nutritional sources. Pleurotus species are a rich source of protein, minerals (P, Ca, Fe, K, and Na) and vitamin (thiamine, riboflavin, folic acid, and niacin). Mushroom cultivation depends on many factors such as temperature, humidity and sterility of the substrates which act individually or its interaction between them. And the infections on mushroom are facilitated by the factors under which they are cultivated and the presence of pest.

Objectives of the study

- To educate students about the science and techniques of mushroom cultivation.
- To provide hands-on experience in sustainable farming and resource utilization.
- To generate income that can be reinvested into educational or environmental initiatives.

REVIEW OF LITERATURE

Nongthombam *et al.,*(2021) said that mushrooms are edible fungi that are appropriate for a variety of age groups. great-quality food with great biological value is produced in large quantities on a variety of substrates. Because mushrooms are low in calories and high in protein, they are good for heart patients. They also include a variety of amino acids that the body needs. And as everyone knows, oyster mushrooms are the most widely grown of the many distinct varieties of mushrooms. Oyster mushroom cultivation involves the following steps: preparing the substrate, spawning the substrate, incubating, fruiting, and harvesting. The entire process takes 25–30 days to produce a good and healthy yield, but because of a lack of knowledge about the causes and outbreaks of diseases, oyster mushroom production has declined. For this reason, the primary goal of this review article is to learn more about the factors or causal agents and to identify the best control measures for oyster mushroom diseases.

Mahari *et al.,*(2020) examined that This review focuses on the cultivation and valorization methods, conditions, and current research status of oyster mushroom species and waste generated in mushroom cultivation. Of particular interest are the value-added recovery and hazard mitigation of waste mushroom substrate (WMS), a waste that is abundant in the mushroom cultivation industry. The current mushroom industry's output rate is insufficient to satisfy market demands, according to the evaluated studies. New techniques for growing mushrooms are required in order to ensure a rise in both the quantity and quality of mushrooms (their nutritional and therapeutic qualities). This review demonstrates that in terms of increasing mushroom output and cost effectiveness, the cylindrical bag log growing method is superior than the wood tray cultivation method. For every kilogram of mushrooms produced, about 5 kg of potentially dangerous WMS (spreading illnesses in mushroom farms) are produced. As a result, WMS is valued in a variety of ways for use in energy conversion and agriculture, primarily as bio compost, plant growing media, and bio energy.. The use of WMS as bio fertilizer has shown favorable performance compared to standard chemical fertilizer, whilst the use of WMS as energy feedstock could create cleaner bio energy sources compared to conventional fuels.

Patel *et al.,* (2012) As evidenced by ancient literature, mushrooms have been utilized as a dietary supplement for ages due to their flavor, scent, and nutritional value as well as their potential medical benefits. Because of their superior proteins, vitamins, fibers, and several therapeutic benefits, they are also recognized for their culinary qualities and are referred to as nutra ceuticals. Over the past 20 years, Pleurotus's research and development efforts have increased due to its growing significance as a health promoter and environmental restorer in comparison to other therapeutic mushrooms. Polysaccharides, lipopolysaccharides, proteins, peptides, glycoproteins, nucleosides, triterpenoids, lectins, lipids, and their derivatives are among the chemical types of the bioactive substances found in this mushroom. In order to update the current status and predict future possibilities of Pleurotus for their biomedical potentials, databases were thoroughly searched, gathered, and analyzed for this review. Researchers will gain a fresh perspective on transforming Pleurotus species from functional food to holistic mushroom medicine as a result of the material presented.

Zhang *et al.*,(2002) studied that how the oyster mushroom, Pleurotus sajor-caju, could be grown on rice and wheat straw without the addition of nutrients. The impacts on mushroom yield, biological efficiency, bioconversion efficiency, and substrate degradation were assessed in relation to the type of substrate (rice versus wheat straw), particle size, spawn inoculation level, and straw size reduction technique. Two techniques for reducing size—chopping and grinding—were contrasted. Compared to chopped straw, the ground straw produced a better yield and growth rate of mushrooms. For a same particle size, the mushroom growth cycles using the ground substrate were five days shorter than those using the chopped straw. However, it was discovered that the mushroom production dropped when the straw was ground into too-small particles. The 12% spawn level produced a noticeably lower mushroom production than the other two levels out of the three tested spawn levels (12%, 16%, and 18%). When compared to wheat straw, rice straw produced almost 10% more mushrooms under the same growing circumstances. Following mushroom growth, the substrate's dry matter loss ranged from 30.1% to 44.3%. Fungal fermentation did not increase the feed value of the straw because the leftover straw fiber after fungal utilization was less biodegradable than the initial straw fiber.

Deepalakshmi *et al.,*(2014)observed that a staple of the typical human diet, mushrooms come in a wide variety of species, and their consumption has increased significantly in recent years. Known as "oyster mushrooms," the genus Pleurotus contains over 40 distinct species. Pleurotus ostreatus (P. ostreatus) is one of the species in this genus that is widely consumed worldwide because of its flavor, taste, high nutritional content, and therapeutic qualities. Numerous nutritional components and active compounds found in P. ostreatus have been shown to have antiviral, antibacterial, anticholestrolic, antiarthritic, antioxidant, anticancer, and eye health properties. P. ostreatus mushrooms are the most significant nutraceutical functional foods, according to this review, which also highlights the mushrooms' excellent nutritional benefits and their medical applications.

Piska *et al.,*(2017) states that a mushroom that is edible The biological activity and dietary relevance of Pleurotus ostreatus, or oyster mushrooms. Polonorum Acta Scientiarum. Cultus Hortorum, 16(1).The oyster mushroom, Pleurotus ostreatus (Jacq.) P. Kumm. (Basidiomycota), is a species of mushroom that grows on every continent with the exception of Antarctica. It has been widely grown for commercial purposes ever since World War I. Pleurotus ostreatus is an important nutritional mushroom. It is abundant in chemical components with physiological importance as well as primary and secondary metabolites. One hundred grams of fresh fruiting bodies has 0.5 mg of vitamin B12, 40% of niacin, riboflavin, and thiamin, and 15% of the daily required amount of vitamin C. Additionally, this species is distinguished by a high concentration of oleic acid (40%) and linolenic acid (55%), as well as compounds that lower serum cholesterol levels. Fruiting bodies of this species have been reported to contain high levels of pleuran, an immuno modulating polysaccharide, and lovastatin, an authorized hypolipidemic medication. It has immunomodulatory, antioxidant, hypoglycemic, anticancer, and antiatherosclerotic qualities. P. ostreatus is regarded as a therapeutic mushroom because of its diverse range of biological activity. P. ostreatus fruiting bodies and extracts have been used to cure disorders associated with civilization, particularly cancer, diabetes, and arteriosclerosis. Additionally, it may contain active compounds used in cosmetics and preparations for topical application.

Sharma *et al.,*(2013) said that Pleurotus ostreatus was cultivated on a variety of substrates, including rice straw, rice straw plus wheat straw, rice straw plus paper, sugarcane bagasse, and alder sawdust. 10% rice bran was added to each substrate, with the exception of rice straw. The control was the substrate devoid of any supplements. Biological efficiency (BE), mycelial growth, colonization time, primordial appearance time, mushroom yield, mushroom size, and chemical composition were all examined in relation to different substrates. With yield (381.85 gm) and BE (95.46%), rice straw (control) was the best substrate overall for mushroom cultivation. It was followed by rice plus wheat straw and rice straw plus paper waste. Additionally, mushroom fruit cultivated on rice straw had a higher nutritional composition.

Baysal *et al.,*(2003)found that on waste paper supplemented with peat, chicken manure, and husk rice (90+10; 80+20 w:w), oyster mushroom (Pleurotus ostreatus) spawn running, pin head and fruit body formation, and mushroom yield were examined. The substrate containing 20% rice husk by weight produced the largest yield (350.2 gr), the fastest spawn running (mycelia development) (15.8 days), pin head formation (21.4 days), and fruit body formation (25.6 days). While additional peat and chicken manure had a detrimental influence on growth, increasing the proportion of rice husk in the substrate generally hastened spawn running, pin head and fruit body formation, and produced higher mushroom harvests.

Royse *et al.,*(2004)states that a combination of pasteurized cottonseed hulls (75% dry weight), 24% chopped wheat straw, and 1% ground limestone (all ingredients wt./wt.) and chopped, pasteurized switch grass (Panicum virgatum, 99%) were used to grow Pleurotus cornucopiae 608 (yellow basidiomata) in order to find a more affordable alternative substrate. The substrates were either non-supplemented or supplemented with commercial delayed release nutrients (Campbell's S-41) at different levels (0%, 1.5%, 3%, 4.5%, 6%, 7.5%, and 9% dry weight, crop II) and spawned at different levels (2.5%, 3.75%, or 5% wet weight, crop I). At 3.75–5% spawn level and 6% S-41 supplement, the maximum yield (weight of fresh mushrooms picked at maturity) was achieved on cottonseed hull/wheat straw substrate. A linear increase in spawn and supplement levels boosted yields on switch grass substrate. On a cottonseed hull/wheat straw substrate, however, comparable treatments only produced maximum yields of 46% or less. Switch grass harvested after the grass had senesced (winter; beige hue) produced three times as much as material harvested when the grass was green (summer; flowering time). The material's yield potential may be increased by further physical processing, such as grinding.

Jayakumar *et al.,*(2011) postulated that despite the fact that practically every organism has evolved antioxidant defense and repair mechanisms to guard against oxidative stress, these mechanisms are frequently insufficient to totally stop damage brought on by oxidative stress. Consequently, oxidative damage to the human body can be lessened with the use of antioxidant supplements or natural products that contain antioxidants. For thousands of years, humans have included mushrooms in their regular diet. In recent years, the amount of mushrooms ingested has increased significantly, incorporating a wide variety of species. The 40 species that make up the genus Pleurotus are generally known as "oyster mushrooms." It has been demonstrated to have immunomodulatory, antiviral, antithrombotic, antitumor, and cholesterol-lowering properties. Compared to other edible mushrooms like Agaricus bisporus (brown), A. bisporus (white), and Lentinus edodes, Pleurotus ostreatus has higher quantities of cystine, methionine, and aspartic acid. Research on edible mushrooms has mostly concentrated on their nutritional value up to this point, but little is known about their antioxidant activity or potential application in reducing oxidative stress. Therefore, the purpose of this review was to provide an overview of the antioxidant properties of P. ostreatus mushrooms both in vitro and in vivo.

Mowsurni *et al.,*(2010) observes that a significant part of the fungus world is found in mushrooms, which contributes to their immense diversity. Most of these are unsuitable as foods, yet taken as a whole, they are crucial for good health. Some of them are utilized as medicinal, while others are used as food. Mushrooms include a number of unidentified, enigmatic substances that are crucial for maintaining the body's equilibrium and are now acknowledged as a significant field for biomedical research. One such mushroom that is utilized as food and medication to maintain bodily fitness is the oyster mushroom (Pleurotus ostreatus). Protein, carbs, fat, fiber, water, various vitamins, minerals, and secondary metabolites are all present. Its statins are excellent at lowering blood pressure and dangerous plasma lipids, which lowers the risk of cardiovascular disorders. Beta-glucan, found in oysters, strengthens the immune system. This mushroom has also been demonstrated to be beneficial and effective in the treatment of diabetes, cancer, and microbiological infections, among other ailments. However, many more life-saving components of oyster mushrooms are still unknown in terms of their composition, effectiveness, and mode of action. These significant unknown facts are currently the subject of research. Bangladesh is doing these kinds of studies, just like other countries, but much more work needs to be done in this field. Nowadays, oyster mushrooms are unquestionably a great alternative food and medicine.

Mandeel *et al.,* (2005) said that a specialty mushroom cultivation on lignocellulosic wastes is one of the most inexpensive and efficient organic recycling methods. An experimental evaluation of three Pleurotus species—P. columbinus, P. sajor-caju, and P. ostreatus—was conducted using untreated organic wastes, such as chopped office papers, cardboard, sawdust, and plant fibers. In a specifically constructed growing room for spawn run and cropping, production tests were conducted in polyethylene bags weighing around 1 kg wet weight and 5% fresh weight spawning rates of substrate. The biological efficiency, or the proportion of dry substrate weight converted to fresh mushroom weight, was calculated. The largest yield was produced by P. ostreatus on cardboard (117.5%), followed by paper (112.4%), while the best biological efficiency was observed with P. columbinus on cardboard (134.5%) and paper (100.8%). Overall, P. sajor-caju yield was quite low, ranging from 47 to 78.4%. Five to six flushings of the sporophores were the norm. Consistent with earlier reports elsewhere, the results indicate that P. columbinus and P. ostreatus are superior to P. sajor-caju. Additional testing of P. columbinus alone on various bagging systems with partially pasteurized office papers as a growth substrate showed that, in comparison to pottery (86%), plastic trays (72%), or polyester net (56%), polyethylene bags produced 109.4% biological efficiency. The aforementioned results show that oyster mushrooms, particularly P. columbinus, have a commercial potential for using various practical and affordable recyclable wastes.

Hoa *et al.,* (2015) The purpose of the study was to investigate how various agro-wastes affected the nutritional makeup, growth, and yield of Pleurotus ostreatus (PO) and Pleurotus cystidiosus (PC), two types of oyster mushrooms. Seven different substrate formulations were examined, including sawdust (SD), corncob (CC), and sugarcane bagasse (SB) both by themselves and in combination with 80:20, 50:50 ratios between SD and CC and SD and SB. The findings showed that the two oyster mushrooms PO and PC's total colonization time, fruiting body characteristics, yield, biological efficiency (BE), nutritional makeup, and mineral contents varied significantly depending on the substrate formula. The findings demonstrated that raising CC and SB improved the mineral contents (Ca, P, and Mg) of substrate formulas while decreasing the C/N ratio. The protein, ash, and mineral contents (Ca, K, Mg, Mn, and Zn) of the fruiting bodies of both mushrooms were improved by the higher amounts of CC and SB in the substrate formulas. The best substrate formulae for growing oyster mushrooms PO and PC were those that had 100% CC and 100% SB. These substrates produced the highest values of cap diameter, stipe thickness, mushroom weight, yield, BE, protein, fiber, ash, mineral content (Ca, K, and Mg), and short stipe length. However, the initial harvest of both PC and PO mushrooms took the longest with substrate formula 100% CC (46.02 and 64.24 days, respectively). The overall colonization period, mushroom weight, yield, BE, and protein content of mushrooms PO and PC are also found to be closely correlated with the C/N ratio of substrate formulations.

Randive *et al.,*(2012) founded that a controlled bioconservation of agro-industrial lingo-cellulosic waste and leftovers is achieved by the production of edible mushrooms. Growing mushrooms has several benefits and fits very nicely with sustainable farming. It makes use of agricultural waste. After harvesting, the spent substrate is still a strong soil conditioner, and a high production per surface area can be achieved. A solid cash crop is mushrooms. The development of oyster mushroom (pink and grey) production techniques on agricultural waste, such as wheat and paddy straw, yields a very high yield. The nutritional content, which includes fat, protein, ash, calcium, magnesium, carbohydrate, and crude fibers, was also examined.

Ahmed *et al.,* (2013) assessing the yield and chemical makeup of oyster mushroom strains that had recently been introduced in Bangladesh was the aim of this study. Pleurotus high-king (strain PHK), P. ostreatus (strain PO2), and P. geesteranus (strains PG1 and PG3) strains were assessed for their proximate composition and yield components. As the control, Pleurotus ostreatus was employed. Primordia grew the fastest in Pleurotus high-king, but fruiting bodies flushed somewhat. Better chemical composition, particularly in terms of protein and mineral contents, as well as increased biological performance and economic yield were demonstrated by Pleurotus geesteranus (PG1). Since Pleurotus geesteranus (PG1) performs better than P. ostreatus (PO2), the edible species that is most commonly grown for commercial purposes in Bangladesh, it ought to be suggested for commercial cultivation..

Pathmashini *et al.,*(2009) studied that utilizing sawdust was carried out to investigate the impact of various spawn types on the production of oyster mushrooms (Pleurotus ostreatus). For spawn production, locally accessible grains of paddy (Oryza sativa), sorghum (Sorghum bicolor), broken maize (Zea mays), and kurakkan (Eleusine coracana) were utilized. The spawn running (mycelia development), pinhead and fruit body formation, mean yield, and biological efficiency of sawdust spawned with several P. ostreatus spawn types were all evaluated. Three repetitions and a fully randomized design were used to set up the experiment. When compared to other spawn types, such as maize, sorghum, and paddy, the kurakkan spawn produced a higher yield, faster spawn running, and the production of pinheads and fruit bodies. Kurakkan spawn produced the largest mean yield of 55.37±0.67 g, the fastest spawn running of 21±1 days, the pinhead formation of 35±1 days, and the maximum fresh mushroom yield percentage of 30.76±0.01.

Hoa *et al.,* (2015) In a lab experiment conducted in the summer of 2014, the effects of temperature and nutritional circumstances on the mycelium growth of the oyster mushrooms Pleurotus ostreatus (PO) and Pleurotus cystidiosus (PC) were examined. The experiment's findings showed that the best media for oyster mushroom PO mycelium growth were potato dextrose agar (PDA) and yam dextrose agar (YDA). In contrast, the four media (PDA, YDA, sweet potato dextrose agar, and malt extract agar medium) did not significantly differ in their ability to support oyster mushroom PC mycelium growth. 28°C was shown to be the ideal temperature for both oyster mushroom species' mycelium growth. Carbon supplies like glucose and molasses enhanced the mycelium growth of oyster mushroom PO, and the mycelium colony diameter of the mushroom PO reached its maximum value at a concentration of 1~5% sucrose. On the other hand, oyster mushroom PC's mycelium grew well when carbon sources such as glucose, dextrose, and sucrose were used. The PC mycelium colony diameter reached its maximum at a concentration of 1~3% sucrose. The highest mycelium colony diameter values for mushrooms PO and PC were also obtained at ammonium chloride concentrations of 0.03~0.09% and 0.03~0.05%. The best rice for the mycelium growth of two oyster mushroom species was discovered to be brown rice. Furthermore, it was determined that corn cob, sugarcane waste, and acasia sawdust were the best sources of lignocellulosic substrates for the mycelium growth of both oyster mushrooms.

Mondal *et al.,*(2010) In order to assess the superior performance of oyster mushrooms Pleurotus florida in various substrate compositions and to determine the best substrate for mushroom growing, an experiment was conducted in the mushroom cultivation laboratory at the Horticulture Center in Khairtala, Jessore. Banana leaves and rice straw had the highest mycelium running rate (1: 1), whereas the control had the lowest. Banana leaves and rice straw had the shortest mycelium running times (1: 3 and 3: 1, respectively).The control group had the highest number of total and effective primordia, although rice straw had the thickest pileus. Rice straw produced the highest economic and biological yields (164.4 g and 151.1 g), which were significantly greater than the control. The graphical approach revealed both positive and negative correlations between various yield-contributing qualities and economic yield.

Girmay *et al.,*(2016) According to reports, growing mushrooms is a commercially feasible biotechnology method for converting different lignocellulosic wastes. This study was carried up at Wondo Genet College of Forestry and Natural Resources with the goal of evaluating the suitability of selected substrates (agricultural and/or forest wastes) for oyster mushroom cultivation, given the dearth of technological know-how on mushroom cultivation. As a result, the effectiveness of four substrates—cotton seed, paper waste, wheat straw, and sawdust—in producing oyster mushrooms was examined. The mycology lab at Addis Ababa University's Department of Plant Biology and Biodiversity Management provided the pure oyster mushroom culture. To prepare the spawn, the pure culture was inoculated onto potato dextrose agar. The fungal culture was then added to the sorghum-containing spawn to encourage the growth of fruiting bodies on the agricultural trash. Aseptic conditions were used to cultivate the oyster mushroom, which can grow with different growth performances on cotton seed, paper waste, sawdust, and wheat straw. The highest biological and economic yield, as well as the highest percentage of biological efficiency of oyster mushroom was obtained from cotton seed, while the least was from sawdust. The study recommends cotton seed, followed by paper waste as suitable substrates for the cultivation of oyster mushroom. It also suggests that there is a need for further investigation on various aspects of oyster mushroom cultivation in Ethiopia to promote the industry.

Ashraf *et al.,* (2013) said that Three species of Pleurotus—P. sajor-caju (V1), P. ostreatus (V2), and P. djmor (V3)—were cultivated on three distinct substrates: cotton waste (T1), wheat straw (T2), and paddy straw (T3) in order to assess the effects of various agricultural wastes on the growth and yield of mushroom production. T1 took the fewest number of days to achieve the fastest spawn running, primordial initiation, harvesting stage, largest number of fruiting bodies, and maximum yield. While T1 took the highest yield in the second and third flushes, T3 displayed the highest yield in the first flush with no discernible variations from treatment T1. P. djmor had the highest dry matter percentage (17.23%), whereas P. sajor-caju had the highest moisture content (87.37%).The highest levels of protein (27.23%) and fiber (26.28%) were found in P. ostreatus and P. sajor-caju. P. sajor-caju had the highest ash content (9.08%). Pleurotus djmor had the greatest fat and carbohydrate levels, at 3.07 percent and 37.69 percent, respectively.

Rathod *et al.,*(2021) Around the world, many societies have classified mushrooms as a good and nourishing food. Because of their tasty flavor and health advantages, mushrooms are a popular option among gourmets. The fact that mushrooms have been utilized for ages suggests that they are a significant part of the cultural legacy. Generation after generation has been taught about its edible species and therapeutic qualities. Folk literature has documented their qualities, diversity, and habitats. Therefore, there has been a connection between humans and mushrooms from prehistoric times. A healthy diet must include a significant amount of protein for bodybuilding, which may be achieved by include mushrooms in the diet because they are nutritive and contain a good amount of essential proteins, vitamins, and minerals. Because mushrooms are low in calories, they are therefore advised for people with diabetes and obesity. Mushrooms have antibacterial, antioxidant, and immunomodulatory qualities that are beneficial to health. These qualities have been acknowledged in several nations, particularly China, which is currently the world leader in the production of cultivated mushrooms. With five or six cultivated species, Pleurotus comes in second, whereas Lentinula is the first large genus that contributes to the world's cultivated mushrooms. Since mushrooms have been shown to have a wide variety of chemical elements and bioactive substances, research interest in mushrooms is growing daily. The production, bioactive value, and commercial standing of oysters and a few other mushrooms have been the main topics of this review chapter.

Background of the study

The study was initiated by discussing about different methods of mushroom cultivation techniques that could possibly execute in our campus. The idea of mushpellet and new method of cultivation was introduced among us incidentally, through a class or a session conducted by the Agricultural office, Peravoor about Mushroom cultivation .Hence the first step in this cultivation process is participating in the workshop as a part of their new programme called " mushroom village".

The class was taken by Rahul govind, an expert in mushroom cultivation. Instead of traditional ways of cultivation o f mushrooms he uses an innovatory method using mush pellets, which is also formulated by his team.

MATERIALS & METHODS

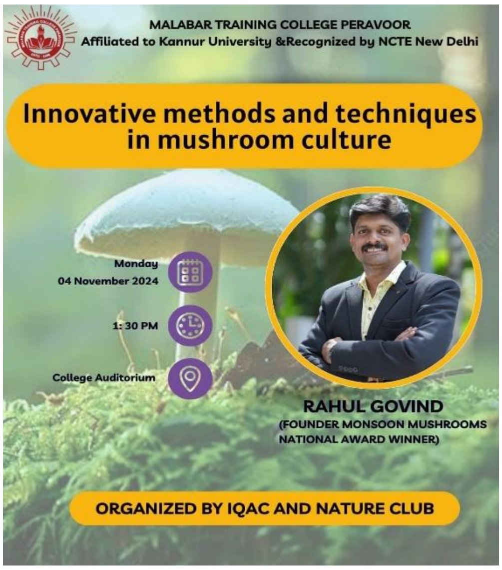
This project outlines a method for cultivating oyster mushrooms using mush pellets developed by Rahul Govind, inside our college campus.

Initial step: attending the class by Rahul Govind

After the mushroom cultivation class in the agricultural office . We contacted Rahul Govind and Sreekanth Punnad, to conduct a workshop of mushroom cultivation in our college.

They have conducted a worthy session about their innovative method of mushroom cultivation and the benefits of mushrooms in a healthy eating plate . The class provided invaluable knowledge regarding

- Insights of effective use of mush pellets
- Practical techniques for cultivation and troubleshooting



Material required

1. **Mush pellets**
    - Pre-prepared nutrients-rich mushroom substrate pellets (mush pellets) developed by Rahul Govind.
2. **Cultivation containers**
    - Pp covers (polypropylene covers) for growing mushrooms.
    - Microporous tape for allowing proper airflow
3. **Sterilization equipment**
    - Pressure cooker or autoclave for sterilizing substrates.
    - Dettol for sanitizing working surfaces and tools.
4. **Growing environment setup**
    - A designated cultivation room or space.
    - Thermometer and hygrometer for monitoring temperature and humidity.
    - Sufficient natural light
    - Humidity maintaining by traditional ways using palm leaves and jute bags.

5. **Additional supplies**
    - Inoculum (mushroom spores or spawn).
    - Spray bottles filled with water for misting.
    - Ph strips for testing the acidity of the substrate.
    - Measuring tools (scales, weighing machine, cups) for precise ingredient handling.

Method

The 14 students and class teacher Ms. Bhavya of natural science department of Malabar training college prepared a proposal for cultivating oyster mushrooms in the campus and with the permission of principal Indu k Mathew, we grouped into 4 team containing few members each to manage time efficiently according to the work to be conducted afterwards. Mr. Narayanan, the official Gardner of Malabar training college helped for room set up and other minor works.

A. Room setup

1. **Choose a suitable location**:
    - Sheltered place
    - Find a clean, dry, and dimly lit area for mushroom cultivation (ideally, temperature-controlled space of 20-28°c)
2. **Design the space**:
    - Set up shelving units to maximize vertical space.
    - Ensure enough room for air circulation while keeping light low or adjustable.
3. **Environmental controls**:
    - Install humidifiers to maintain humidity levels above 85%.

- thermometers to monitor the room's conditions.

4. **Lighting**:
    - typically, oyster mushrooms require 12-16 hours of indirect light.
5. **Ventilation**:
    - Allow fresh air exchange while maintaining humidity.

B. Preparation of room setup

- Choose a clean, room with good airflow and temperature control (ideal temperature: 20-28°c). Install shelving or tables to optimize space for mushroom growth.
- Set up specially designed roofs using palm leaves and jute bags or materials to maintain desired humidity levels of 80-90%.

C. Substrate preparation

Prepare the bed of cultivating mushroom by weighing out 1kg of mush pellet in each pp cover and soaking it in 1.5 litre of boiling water, immediately folding the pp cover in order to avoid contamination. The rehydrated substrates are allowed to rest until the temperature of pellets cool down.

D. Inoculation

- Sterilize all tools and working surfaces using alcohol.
- Prepared mush pellet may look like a solid soil to ease the inoculation process the solid substrate is mixed and loosened to a fine or medium texture.
- now inoculate the substrate with mushroom spawn. 50 g of spawn is mixing up with one mush pellet bed and immediately the opening of the pp cover is closed by taping along the opening with a microporous tape, which ensure the proper airflow.

- with 1kg of spawn 2 beds are inoculated. Likewise 50 beds are prepared initially.
- Ensure proper sterile techniques to prevent contamination.
- Seal the room after placing the prepared bed on sterilized desks.

E. Incubation

- Place inoculated containers in a warm environment for incubation (optimal conditions: 25-28°c).
- During this period, check for moisture levels and avoid direct sunlight.
- Allow 10-15 days for mycelium to fully colonize the substrate.

F. Hanging of mushroom bed

- After 14-15 days mycelium starts to colonize, it's the time to hang the beds vertically on a stand.
- First drain the excess moisture content inside the bed by cutting the opening closed by the pp cover, without contaminating it, and tie the

opening side of bed tightly allowing a little air inside so that the fruiting body can easily pop out.

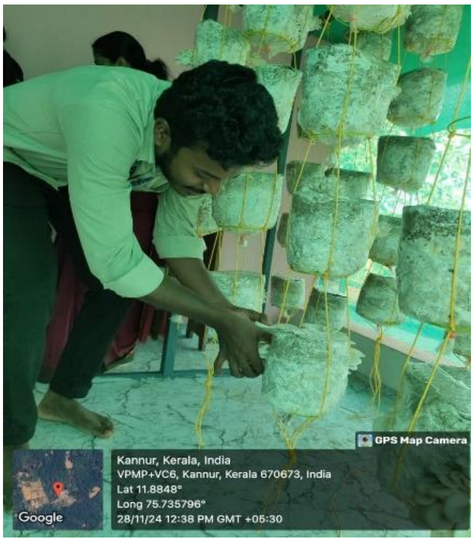
- The beds are inverted vertically and hanged.
- A small cut of 1 -2 inch is made where the white mycelial patches are prominent.
- After preparing and hanging all the beds room is sterilized and sealed.

G. Mist regularly:

- Use spray bottles to mist the growing area 2-3 times a day to preserve humidity.
- Also maintain the humidity of the room

H. Harvesting:

- Mushrooms can be harvested once they reach the appropriate size (typically 5-7 days after pinning or hanging, depending on the inoculation date).



F. Post-harvest

1. **Clean up**:
   - Remove any residues and sanitize the area to prevent fungal diseases for subsequent batches.
   - Resume misting the substrate to encourage further fruiting.
2. **Record keeping**:
   - Track growth cycles, yields, and input costs for evaluating production efficiency.

RESULT AND DISCUSSION

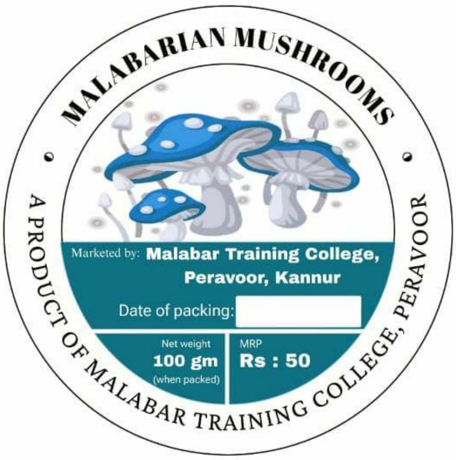
RESULT

Oyster mushroom (Pleurotus ostreatus) cultivation was initiated on the college campus as a sustainable agricultural practice aimed at enhancing food security, promoting environmental awareness, and providing experiential learning opportunities for students. Over a span of 2 months, a controlled study was conducted to evaluate the feasibility and yield of oyster mushrooms cultivated using substrate called Mush pellet introduced by Rahul Govind and team.

1. Student Engagement: Over 14 students participated in workshops and hands-on training sessions concerning mushroom cultivation.

2. Expenditure: The total expenditure for the Oyster Mushroom Cultivation project on the college campus amounted to 50,000 rupees. This cost includes the purchase of mushroom spawn, substrate materials, and necessary cultivation equipment. The investment also covers initial setup expenses and maintenance for optimal growth conditions.

3.Yield Measurement: The average yield of oyster mushrooms from the substrate was found to be approximately 5 kg per batch per week. Multiple batches were cultivated, with consistent yields achieved across three growing cycles.



4. Sale inauguration

On 29/11/2024 the inauguration and first sale of mushroom was conducted. Program inaugurated by Ms.Sandra MM ,Agricultural officer,peravoor krishibhavan.

We marketized our mushroom product named as Malabarian Mushrooms.

The first commercial Product handover to Mohanan, office superintendent.

Malabar training college also having an online market or a community of customers in what sup, hence the mushroom marketing is much easier and appropriate after fresh harvest.


MALABARIAN MUSHROOMS
A PRODUCT OF MALABAR TRAINING COLLEGE, PERAVOOR
Malabar Training College,
Peravoor, Kannur
Date of packing
100 gm
Rs : 50

DISCUSSION

The successful cultivation of oyster mushrooms on campus illustrates a viable model for integrating sustainable agricultural practices within educational institutions. We used an innovative method using a substrate called mush pellet which is marketized by Rahul govind (National award winner on Mushroom culture) and team. Mushpellet is a product which is highly resilient with changing environmental conditions and produces high yield. The positive yield obtained (2.5 kg per week) (Agarwal & Singh, 2019). This study suggests that not only can colleges engage in environmentally friendly practices, but they can also create new educational and community engagement opportunities.

The significant usage and repurposing unused room supports the notion that urban agriculture on college campuses can facilitate a more circular economy (Zhao et al., 2020). Additionally, engaging students in the hands-on process of cultivation promotes experiential learning, vital for the education of future professionals in sustainable practices. The high approval rating among students indicates a growing interest in sustainable agriculture topics and suggests potential for future courses or curriculum integration regarding food systems, sustainability, and environmental science.

Further research could explore expanding the variety of mushrooms cultivated and assessing the financial aspects of such projects. Collaborations with local restaurants for sourcing substrates and offering mushrooms in campus dining services could provide an even more comprehensive sustainability model.

CONCLUSION

our mushroom project has been a comprehensive and enlightening study on the cultivation, nutritional value, and economic viability of mushrooms. Through our research and experimentation, we have gained valuable insights into the optimal conditions for mushroom growth, the various species of mushrooms and their characteristics, and the potential applications of mushrooms in food, medicine, and other industries.

Our project has not only deepened our understanding of mushrooms but also highlighted their immense potential as a sustainable and environmentally friendly crop. We hope that our findings will contribute to the growing body of research on mushrooms and inspire further innovation and entrepreneurship in this field. Furthermore, this project has provided us with hands-on experience in research design, experimentation, data analysis, and reporting. We have developed valuable skills in teamwork, problem-solving, and critical thinking, which will serve us well in our future academic and professional pursuits.

In conclusion, our mushroom project has been a rewarding and enriching experience that has broadened our knowledge, skills, and perspectives. We are confident that our findings will make a positive impact and contribute to the advancement of knowledge in this field.

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