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Effect of different supplements of *Adansonia digitata* L.on yield of *Pleurotus ostrearus*

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Abstract:

Malnutrition is a huge problem in developing third world countries. elm Oyster mushrooms, with their flavor, texture, nutritional and medicinal value, and high productivity per unit area, have been identified as an excellent food source to alleviate malnutrition in developing countries, 10 days of incubation period favored maximum mycelium growth of *Pleurotus ostrearus* Fruit pulp powder and wheat strawgave 470 gm. highest yield and the minimum yield of *Pleurotus ostrearus* by Control as a wheat straw is 180gm.

Introduction:

Pleurotus species, commonly known as oyster mushrooms, are edible fungi cultivated worldwide especially in Southeast Asia, India, Europe, and Africa (Mandeel Q et al., 2005). China produces 64 % of all edible mushrooms in the world and 85% of all oyster mushrooms all over the world (*Pleurotus* sp.) is also produced in China (Chang S-T 1999). Oyster mushrooms are the third-largest commercially produced mushroom in the world. (Obodi M et al., 2005 and Sánchez C 2010)

Oyster mushrooms are eaten as meat substitutes and flavoring and they can also be processed into various products through value addition. Currently, high biofuel prices have caused an increase in food prices and food scarcity in many countries. Oyster mushroom is unarguably one of the easiest of all mushroom species to grow. It is relatively fast-growing and it can grow on a variety of locally available and cheap substrate materials. To alleviate hunger and malnutrition in a world threatened by climate change and rising food prices, the cultivation of mushrooms is therefore necessary. The utilization of mushrooms by humans is believed to have originated during the Stone Age era by some anthropologists who suggest mushrooms had a huge influence on the course of human evolution (Stamets et al., 2010).Malnutrition is a huge problem in developing third world countries. Oyster mushrooms, with their flavor, texture,

nutritional and medicinal value, and high productivity per unit area, have been identified as an excellent food source to alleviate malnutrition in developing countries (Dubey D. et al., 2019)

The baobab fruit shell to measure the lignin, cellulose, hemicelluloses, volatile matter, carbon content, and nitrogen content. Baobab fruit shells have been found to contain lignin (54.08%), cellulose (24.87%), and hemicellulose (21.05%) content, as well as proximate analysis such as ash content (5.17%), moisture content (6.48%), volatile matter (86.73%), and carbon content (1.22%) (N. A. Kabbashi et al., 2019). The potential benefits of utilizing baobab fruit shells in the cultivation of oyster mushroom as it contains more nutritional requirements of oyster than some substrates which are currently being used by mushroom growers.

Material and Methods:

Collection and Preparation of the Substrate Baobab (*Adansonia digitata* L.) tree manure was collected from Dr. Babasaheb Ambedkar Marathwada University Aurangabad campus. Preparation of the substrates was done by the fermentation process of these agricultural waste materials, for fermentation, the substrates were first soaked in distilled water drum for 24 hours. After this, the soaked substrates were thoroughly spread on a polyethylene sheet to remove the extra water, and the moisture level was adjusted to about 65- 70%; pH 7.0 of the substrates was maintained by adding 5% gypsum on substrate dry weight. The substrates were covered with polyethylene sheets to keep the anaerobic fermentation process. The substrates were fermented for five days before filling the bags and further mixed as per treatment ratios. The following combinations of cellulosic and lignocellulogic materials were used as a substrate for the production of *Pleurotus ostrearus*.

Sterilization and preparation of substrates cultivation of mushroom we utilize *Adansonia digitata* L. plant parts and wheat straw as a substrate they were sterilized byfollowingthe sugar industrial waste were soaked in water for 12 hours before use to soften the tissues. Wastes were chemically sterilized in plastic pots. 25 liters of water were taken in a plastic pot. 5kg waste slowly steeped in water. In another plastic bucket, carbendazim 50% WP (75.ppm), Bavistin 7.5 g, and 25 ml formaldehyde (37- 40%) were dissolved and slowly poured on the already soaked wheat straw. Straw was pressed and covered with a polythene sheet. After 24 h straw was taken out andexcess water drained. The lab was fumigated with the chemical formalin and KMnO4. The preferable room temperature 26 ± 2°C was kept with a relative humidity of 70 – 80%

Filling and Sterilization of Bags For each treatment, 2.5 kg of the substrate was filled in the polypropylene bags of (8″×12″) size. After filling, these bags were autoclaved for sterilization in country style (drum) autoclave for 2 hours and kept the bags overnight at room temperature to cool down the bag's temperature for the inoculation of spawn.

Spawn Inoculation and Incubation of Bags The prepared spawn of *Pleurotus ostrearus* was used for the inoculation of pasteurized bags, and 20 g of *Pleurotus ostrearus* spawn was used to inoculate the bags. For the inoculation of spawn, the mouths of bags were opened and disturbed the upper 2-3 cm layer of the substrate and thoroughly mixed the spawn. After the inoculation of spawn, the inoculated bags were incubated at 20–25°C and 80-90% relative humidity in the mushroom growing room under complete darkness till the substrate colonized with mycelium.

Yield and Biological Efficacy Harvesting of mature fruiting bodies weredeveloped and attained their full sizeat the maturity of each flush, and the data for each picking was recorded in grams. The total yield of mushrooms was recorded in mass (grams) by adding the weight of all three pickings and takingtheir means (grams). The biological efficiency of *Pleurotus ostrearus* was calculated with the help of this formula

Biological Efficiency %= (Fresh weight of the harvested mushroom (g))

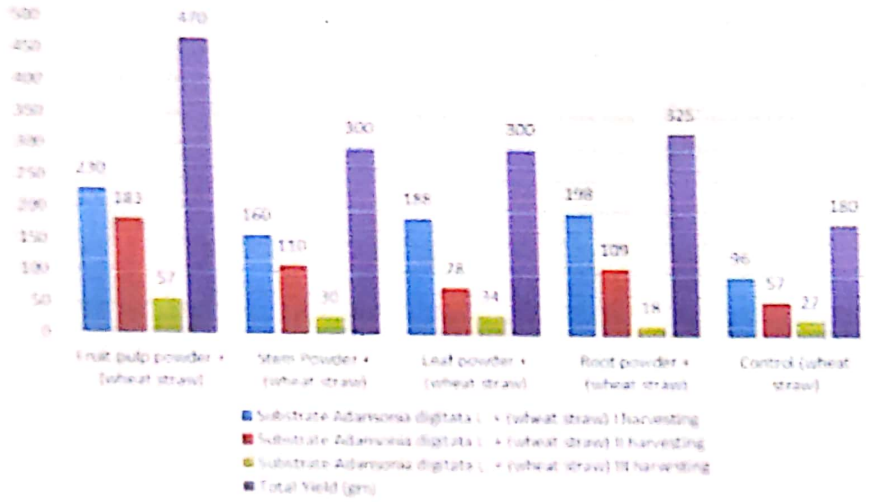
(The dry weight of used substrate (g)) × 100

Result and Discussion: Different substrates composition of the treatment groups were screened to study their impacts on the mycelium growth of *Pleurotus ostrearus* and results are given in Table 01. Maximum mycelium growth was recorded due to all substrates at 15 days of the incubation period. Moderate to minimum mycelium growth of *Pleurotus ostrearus* was observed at 10 days of the incubation period. Favored maximum mycelium growth of *Pleurotusostrearus*due to *Adansoniadigitata* Land wheat straw mixed substrates. It is revealed from the table that, as compared to control all the substrates gave a maximum yield of *Pleurotus ostrearus*. Fruit pulp powder and wheat strawgave 470 gm. highest yield of *Pleurotus ostrearus* followed by. Root powder and wheat straw gave 325 gm of *Pleurotus ostrearus* and Average yield of *Pleurotu sostrearus* was recorded in case of stem powder and wheat straw andleaf powder and wheat strawis 300gm. And the minimum yield of *Pleurotus ostrearus* by Control as a wheat strawis 180gm.

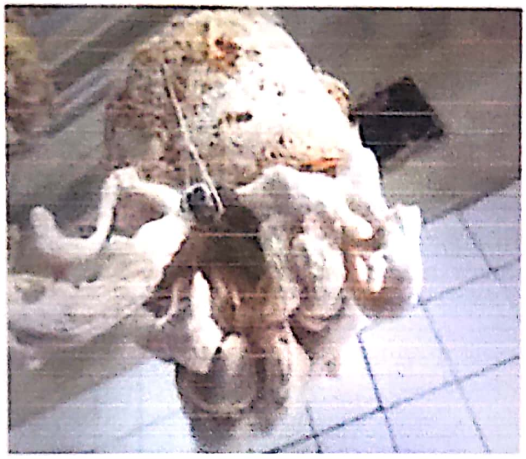
Table no.1 Substrate composition of the treatment groups used for the cultivation of *Pleurotusostrearus*mushroom

Sr. No	Substrate *Adansonia digitata* L. + (wheat straw)	Substrate *Adansonia digitata* L.+ (wheat straw)			Total Yield (gm)
		I harvesting	II harvesting	III harvesting	
1	Fruit pulp powder + (wheat straw)	230	183	57	470
2	Stem Powder + (wheat straw)	160	110	30	300
3	Leaf powder + (wheat straw)	188	78	34	300
4	Root powder + (wheat straw)	198	109	18	325
5	Control (wheat straw)	96	57	27	180

Graph No. 1 Substrate composition of the treatment groups used for the cultivation of *Pleurotus ostrearus*



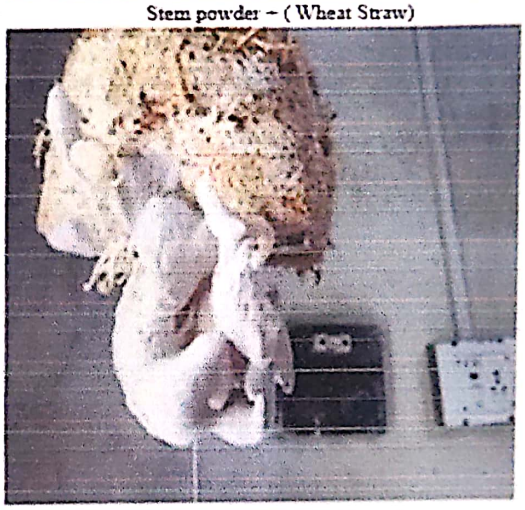
Effect of different suppliment with wheat straw on yeild of *Pleurotus ostreatus*



Fruit pulp powder – (Wheat Straw)

Stem powder – (Wheat Straw)

Leaf powder – (Wheat Straw)



Root powder + (Wheat Straw)

Control (Wheat Straw)

Conclusions:

The output of the experiment shows that, there were several traditional methods of cultivation of mushroom however when the supplementation of *A. digitata*is added into the preparation of substrate along with wheat straw the results are increasing. Out of the parts of *A. digitata* like fruit pulp, wheat stem, leaf powder, root powder is used it is observed that maximum yield is reported in the supplementations of fruit pulp of *A. digitate* along with good quality of *Pleurotus ostrearus.*

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