Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; Sp 9(1): 01-03
Received: 02-11-2019
Accepted: 05-12-2019

Uday Partap Singh
Asha Bhagwan Bax Singh PG collage, Pura Bazar, Ayodhya, Uttar Pradesh, India

Mahendra
Asha Bhagwan Bax Singh PG collage, Pura Bazar, Ayodhya, Uttar Pradesh, India

Corresponding Author:
Uday Partap Singh
Asha Bhagwan Bax Singh PG collage, Pura Bazar, Ayodhya, Uttar Pradesh, India

Evaluation of different supplementation effect to capsulated on the yield of oyster mushroom (*P. Sajor Caju*.)

Uday Partap Singh and Mahendra

Abstract
Experiments were conducted at Department of Plant Pathology, T.D.P.G. College, Jaunpur in the two consecutive year 2010-2011 and 2011-12. Edible mushroom *Pleurotus sajor caju (Fr.)*' Singer was Evaluation of different supplementation effect to capsulated on the yield. The experiments were laid out in completely Randomized design. The results are indicated that moisture content of the substrate was 72 percent and 69 percent during 2011 and 2012, respectively. It can be inferred from the data that the neem cake amendment reduced the days taken for spawn run (20 and 18 days) over control (22 and 21 days). It was followed by rice bran (21 and 19 days), during both year of study. The minimum day i.e. 23 days taken for first harvest in 2011 and i.e. 21 days in 2012 was also observed in neem cake supplemented substrate. When yield is taken into consideration, all the nutrients gave significantly higher yield over control. The neem cake supplemented substrate gave significantly higher yield of 596.0g and 612.0g in both the years. It was followed by rice bran (554.0 and 569.0g) supplemented substrate. Rice bran also gave significantly superior yield than wheat bran were statistically at par and significantly inferior to the wheat bran supplemented substrates during both the years.

Keywords: wheat bran, soybean meal, maize grain powder and rice bran

Introduction
Among commercially cultivated mushrooms Pleurotus species, commonly known as oyster mushroom or dhingri mushroom, is extensively cultivated throughout the world and contributes about 27% of total world production (Royse, 2014) [1]. The cultivation of oyster mushroom is becoming popular throughout the world because of its abilities to utilize a large variety of agricultural waste products (Stamets, 2000) [2]. It has the highest protein content and has many other constituents such as Vitamin B1 and Vitamin B2 and low calorie levels. In addition, they are reported to be low in fat (2 to 3% by dry weight), a good source. of essential amino acids and contain 5 to 9% fiber (Yang *et al*. 2001) [3]. Pleurotus species have extensive enzyme systems capable of utilizing complex organic compounds that occur as agricultural wastes and industrial by-products (Baysal *et al*. 2003) [4]. Pleurotus spp. is also reported to have antiviral, anti-inflammatory, anticancer and immune modulation activities (Jose *et al*. 2002).Mushrooms have been widely used as foods (Falconer, J *et al*. 1992, Gilbert, F.A *et al.* 1957) [6], and very often as delicious and nutritious foods (Vinceti, B *et al*. 2013) [7]. The Pharaohs prized mushrooms as a delicacy food (Daba, A.S *et al*. 2008) [8], and valuable resources for medicines as well (Lakhanpal *et al*. 2005) [9]. Mushrooms contain a large array of nutrients and other natural phytochemicals that have wide ranges of nutritional and health benefits (Cheung, P.C.K.2010) [10]. Their medicinal values include wound-healing, immunity-enhancement, and tumor-retarding effects (Chang, S.T, 1999, Dai, Y.C.2009) [11, 12]. Their value has recently been promoted to tremendous levels with medicinal mushroom trials conducted for HIV/AIDS patients in Africa, which have been generating encouraging results (Chang, S.T.2006) [13]. Collection from wild woodlands is still important in the world and particularly in southern Asia (Arora, D.2008, Yang, X. 2008) [14, 15] and other developing countries (Fanzo, J 2012). Chinese growers introduced shiitake cultivation techniques to Japanese farmers, who named the mushroom and were later responsible for its spread eastward (Royse, D.J. 2009) [17]. It is also an excellent example of rural economic development and poverty alleviation as well as typical recycle-economy and sustainable agriculture and forestry. The oyster mushrooms *Pleurotus sajor caju* (Fr.) Singer is a well-known edible fugus. It is being taken up for commercial cultivations different parts of the world. The great advantage is that they are easy to cultivate & have cast rate of growth also got the capacity to cover nutritional value substrate substances into height protein food.

The simple technique of growing *Pleurotus sajor caju* with vital substances like protein, mineral matter & important vitamins. Calorific valueof oyster mushroom is about 345 kilocalories per 100 g dry weight. The proteins of mushroom are considered to be intermediate between that of vegetables and animals. Amino acids required for different biological activity in human body was also found in oyster mushroom. P.Sajor caju productivity is maximum in a very short time providing more protein per unit area than any other crop. Due the high content of nitrogen and protein which increases the biological efficiency of oyster mushroom is very high. Oyster mushroom also produces metabolites of medicinal and pharmacological value. Pleurotus sps. can grow well in variable temperature conditions; hence they are ideally suited for cultivation throughout the year in tropica; regions of the world. They are able to colonize and degrade a large variety of lignocellulosic residues and required very short time for the growth than other edible mushrooms. Their fruiting bodies are not very often attacked by diseases and pests and they can be cultivated in a simple and cheap way.

Materials and Methods

Experiments were conducted at Department of Plant Pathology, T.D.P.G. College, Jaunpur in the two consecutive year 2010-2011 and 2011-12.Edible mushroom *Pleurotus sajor caju (Fr.)*' Singer was Evaluation of different supplementation effect to capsulated on the yield. The experiments were laid out in completely Randomized design. The observation like moisture content of the substrate at the time of spawning, days taken for first harvest and total yield of mushroom of all the harvest were recorded in each treatments. One hundred litres of tap water was filled in a plastic drum of 200 litre capacity. A stock solution with 125 ml formaldehyde and 7 g Bavistin in water. This solution was stirred properly with a slick for its mixing. Now 10 kg dry straw abstrate was steeped completely in this chemical solution. The mouth of the container was closed with the lid and kept as such for 18 hours. After 18 hours the straw was taken out from the chemical solution and put on a wire sieve for removal of extra solution. It was then spread in thin layers over a clean coneneted floor for further removal of excess moisture. The mushroom were grown on Paddy straw in surface sterilized polythene bags measuring 60 x 45 cms in size. These surface sterilized Polythylene bags were taken and two small vents were made on both corners of the bottom side for leaching the excess water of the chemically treated substrate. The two layer spawning was done by using the 120 g of spawn/kg dry substrate in a bag. One third-quantity (approximate 1.3 kg wet straw) of 1 kg dry substrate of above prepared subsrate was filled in these bags and gently pushed down. The fully grown spawn was broad casted over the upper surface of the substrate. The rest of the substrate (approximate 1.4 kg wet straw) was filled in the remaining spaces of the bags and the mouth of the bags were tied with threads. The spawned bags were transferred to spawn running room and kept on a flat surface under prevailing room temperature. These bags were watched daily for spawn run. When full growth of mycelium of fungus was seen in the substrate the polythene coverings were removed. The blocks of compact substrate were transferred in the cropping room, which was earlier surface sterilized, under prevailing room temperature. Humidity of cropping room was maintained by sprinkling of top water on the walls, roof, floor and beds with the help of sprayer and automizer frequently. Now 100 g of moist straw was transferred to an empty box as prepared above and weighed. The box, containing moist straw, was kept into hot air oven at 70^0 C for eight hours. Then it was cooled down and weighed. The process was repeated thrice to obtain constant weight.Moisture loss was calculated by subtracting weight of box along with wet straw before hot air drying and weight of box along with dried straw after hot air drying. seven different supplements on the yield of *P. sajor caju*, an experiment with four replication was carried out. The supplements were wheat bran, maize grain powder, rice bran, mustard cake, Neem cake, de oiled soyabean meal and soyabean meal. No supplementation was done in control treatment. These supplements were treated in autoclave at 15 lbms p.s.i. for 20 minutes. The supplements were added @ 5 percent (dry weight of straw basis) to chemically treated paddy straw at the time of spawning. The amount of dry straw and spawn i.e. 1 kg and 80g respectively were constant in each treatment. All necessary requirements were provided for obtaining good mushroom yield. Data on all observation for all treatments were recorded.

Results and Discussion

It is apparent from Table 1 that the results with indicated that moisture content of the substrate was 72 percent and 69 percent during 2011 and 2012, respectively. It can be inferred from the data that the neem cake amendment reduced the days taken for spawn run (20 and 18 days) over control (22 and 21 days). It was followed by rice bran (21 and 19 days), wheat bran, maize grain powder, mustard cake, De-oiled soyabean meal and soyabean meal, during both year of study. The minimum day i.e. 23 days taken for first harvest in 2011 and i.e. 21 days in 2012 was also observed in neem cake supplemented substrate. When yield is taken into consideration, all the nutrients gave significantly higher yield over control. The neem cake supplemented substrate gave significantly higher yield of 596.0g and 612.0g in both the years. It was followed by rice bran (554.0 and 569.0g), wheat bran (513.0g and 523.0g), De-oiled soyabean meal (491.0g and 503.0g), Soyabean meal (476.0g and 490.0g) and maize grain powder (452.0g and 460.0g) supplemented substrate. Rice bran also gave significantly superior yield than wheat bran, de-oiled soyabean meal, soybean meal, mustard cake and maize grain powder were statistically at par and significantly inferior to the wheat bran supplemented substrates during both the years.

To see the effect of supplements on the yield of *P. sajor caju*, seven organic nutrients viz., wheat bran, maize grain powder, rice bran, mustard cake, neem, cake, de-oiled soyabean meal and soyabean meal were tested @ 5 percent dry weight of straw. All supplements gave higher and significantly superior yields than unsupplemented paddy straw (check). Neem cake supplemented substrate produced maximum and significantly higher yields of 596.0g and 612.0g during 2011 and 2012, respectively. It was followed by rice bran, wheat bran, maize grain powder, mustard cake, de-oiled soybean meal and soybean meal in both years.

Table 4: Effect of different Supplementation to the substrate on the yield of *P. sajor caju*

Substrate	Moisture content of the substrate at spawning %		Days taken for spawn run		Days taken for first harvest		Mushroom yield (g/kg dry substrate) in 30 days		Biological efficiency %	
	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
Wheat bran	72	69	22	20	20	25	513.00	523.00	51.30	52.30
Maize grain powder	72	69	22	20	20	25	452.00	460.00	45.20	46.00
Rice Bran	72	69	21	19	19	24	554.00	569.00	55.40	56.90
Mustard cake	72	69	22	20	20	25	442.00	451.00	44.20	45.10
Neem cake	72	69	20	18	18	23	596.00	612.00	59.60	61.20
De-oiled soyabean meal	72	69	22	20	20	24	491.00	503.00	49.10	50.30
Soyabean meal	72	69	21	20	20	23	476.00	490.00	47.60	49.00
Control	72	69	22	21	21	26	384.00	390.00	38.40	39.00
CD at 5%	-	-	-	-	-	-	26.30	24.28	-	-

References

1. Royse J Daniel. A global perspective of the high five: Agaricus, Pleurotus, Lentinula, Auricularia and Flammulina. In Proceedings of the 8th International Conference on Mushroom Biology and Mushroom Products (Eds. Manjit Singh *et al*.). 2014; I:1-6.
2. Stamets P. Growing Gourmet and Medicinal Mushrooms 3rd Edn., Ten Speed Press, Berkeley, California, 2000, 574.
3. Yang JH, HC Lin, JL Mau. Non-volatile taste components of several commercial mushrooms. Food Chem. 2001; 72:465-471.
4. Baysal E, H Peker, MK Yalinkilic, A Temiz. Cultivation of oyster mushroom on waste paper with some added supplementary materials. Bioresour Technol. 2003; 89:95-97.
5. Falconer J, Koppell CRS. The major significance of ‘minor’ forest products: The local use and value of forests in the West African humid forest zone. In FAO Community Forestry Note; Food and Agriculture Organization of the United Nations: Roma, Italy, 1990.
6. Gilbert FA, Robinson RF. Food from fungi. Econo. Bot. 1957; 11:126-145.
7. Vinceti B, Termote C, Ickowitz A, Powell B, Kehlenbeck K, Hunter D. The contribution of forests and trees to sustainable diets. Sustainability. 2013; 5:4797-4824.
8. Daba AS, Kabeil S, Botros WA, El-Saadani M. Production of mushroom (Pleurotus ostreatus) in Egypt as a source of nutritional and medicinal food. World J. Agric. Sci. 2008; 4:630-634.
9. Lakhanpal TN, Rana M. Medicinal and nutraceutical genetic resources of mushrooms. Plant Genet. Res, 2005; 3:288-303.
10. Cheung PCK. The nutritional and health benefits of mushrooms. Nutr. Bull. 2010; 35:292-299.
11. Chang ST. World production of cultivated edible and medicinal mushrooms in 1997 with emphasis on Lentinus edodes in China. Int. J. Med. Mushrooms. 1999; 1:291-300.
12. Dai YC, Yang ZL, Cui BK, Yu CJ, Zhou LW. Species diversity and utilization of medicinal mushrooms and fungi in China (Review). Int. J. Med. Mushrooms, 2009; 11:287-302.
13. Chang ST. The world mushroom industry: Trends and technological development. Int. J. Med. Mushrooms. 2006; 8:297-314.
14. Arora D. Notes on Economic Mushrooms. Econ. Bot. 2008; 62:540-544.
15. Yang X, He J, Li C, Ma J, Yang Y, Xu J. Matsutake trade in Yunnan Province, China: An overview. Econ. Bot. 2008; 62:269-277.
16. Fanzo J, Cogill B, Mattei F. Metrics of sustainable diets and food systems. In Technical Brief-Madrid Roundtable; Bioversity International and Daniel and Nina Carasso Foundation: Rome, Italy, 2012.
17. Royse DJ. Cultivation of Shiitake on Natural and Synthetic Logs. College of Agricultural Sciences, Penn State University, University Park, PA, USA, 2009.