

Effect of Casing and Supplemented Meal on Yield of *Calocybe Indica*

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Abstract: Conducted trials to show the effect of casing and supplementation in casing at the time of its application on productivity of milky mushroom (*calocybe indica*). Before casing application soil was chemically sterilized. Six casing materials viz, SC (spent compost) + FYM (Farm yard Manure) + Sand + GS (Garden soil) (1:1:1:1), SC + FYM (2:1), SC alone, SC+FYM (1:1), SC+FYM (1:2) and FYM alone were taken. The casing materials using SC + FYM + Sand and GS in the ratio of 1:1:1:1 gave the highest yield as well as maximum number of fruit bodies. In another trial casing material of SC + FYM + Sand + GS (1:1:1:1) was supplemented with grain spawn@2 percent and soybean meal@4 percent, sweet pea meal@4 percent and Gram meal@4 percent. Supplementation of soybean meal@4 percent produced higher yield as well as number of sporophores than other treatments.

Keywords: *Calocybe indica*, casing and supplemented meal.

1. Introduction

Casing is the important operation in mushroom cultivation after spawn run. Casing is done when the fungal mycelium has completely impregnated the substrate after spawning. Quality of casing material affects the yield of mushroom as it stimulates the fruit body initiation and regulates the moisture, temperature and certain other factors of substrate i.e. physical, chemical, micro-biological and nutritional, which determine the suitability of casing material for the cultivation of *Agaricus bisporus*. Were investigated and documented (Hayes and Shandilya 1977; Garcha, 1980). Supplementation of casing with powdered soybean meal (1Kg/q compost) resulted in significant increase in yield of *A. bitorquis* in summer cropping in hills. On an average 15-25 percent increase in mushroom Yield was recorded by supplementation with soybean meal @ 1kg/ 100 kg compost, and beyond this quantity there was decreases in the mushroom yield (Vijay & Gupta, 1995). Various powdered pulses, various oil seed meals, cakes and rice and wheat bran. Etc. are reported as supplements for mushroom cultivation.

2. Materials and methods

To see the effect of casing mixtures and supplementation on productivity of mushroom trials were conducted. The casing India were prepared by thorough mixing of the selected substrates in the proper ratio and was chemically sterilized in

the proper ratio and was chemically sterilized by spraying with 2% formalin and then covered with polythene sheet for 4 days and media were turned on alternate days for 3 days to remove the fumes of formalin from the casing mixture. The selected substrate taken to prepare casing media were mixed in volume by volume basis. Farm Yard manure and spent compost were 2 years old. Garden soil was taken from the field. For the evaluation of casing material 5 kg spawned substrate (paddy straw) was filled in polythene bags of 50 x 30 cm size. The casing was done after 20 days of spawning and 2 cm. thick casing layer was applied in each treatment thrice. Second trial substrate (paddy straw) was spawned with fresh grain spawn @ 3 percent. 5 kg spawned substrate was filled in polythene bags of 50 x 30 cm. size. After completion of spawn run the bags were cased with perfectly sterilized mixture of spent compost, FYM, Sand and garden soil in the ration of 1: 1: 1: 1 V/v. The supplement soybean meal was added @ 4 per cent Sweet pea meal @ 4 per cent and Gram meal @ 4 percent of the substrates weight whereas grain spawn was added @ 2 percent. The temperature and relative humidity for spawn running and production were kept 35-40°C and 85-90 percent and 30-35°C and 90-95 percent respectively. Water spraying was done thrice in a day during spawn running and production. A period of 45 days the yield data were recorded.

3. Results and discussion

A. Effect of casing on Yield of *C. indica*

Effect of casing on yield of *C. indica* recorded in table 1 indicated that the mushroom pinheads started to appear in a bags after 16-20 days after casing. The bags cased with spent compost + FYM + Sand + Garden soil in the ratio of 1; 1: 1: 1 V/v and spent compost + FYM in the ratio of 2:1 V/v showed early pin heading. The best casing mixture was found a mixture of spent compost + FYM + Sand + Garden soil in the ratio of 1: 1: 1: 1 V/v in terms of yield, which gave (1703.75 gm. Mushroom / 5 kg wet substrate) with 47.66 average numbers of fruiting bodies. Casing media containing spent compost and FYM in the ratio of 2:1 also proved better in the cultivation of *C. indica*. Similarly casing media of spent compost alone and spent compost + FYM in ratio of 1:1 also gave more yields than the casing media prepared using FYM in high proportion.

Table 1
 Effect of casing on yield of milky mushroom (*C.indica*)

Casing Material	Days taken for Pin head initiation	AV.Yield in g/ 5 kg WS*	Number of fruit bodies
SC + F YM + Sand +GS (1:1:1:1)	16	1703.75	47.66
SC + FYM (2:1)	17	1519.16	46.00
SC alone	18	1336.66	36.00
SC + FYM (1:1)	19	1261.25	34.33
SC+FYM (1:2)	18	1065.83	30.00
FYM alone	20	1048.75	27.66
C.D.	0.919	182.70	5.94

*Wet Substrate

Table 2
 Effect of supplementation on Yield of milky mushroom (*C. indica*)

Treatment	Av. days for pin head initiation	Av.Yield in g/ 5 kg WS*	Av. number of sporophores
Soybean meal @ 4 percent	10	1859.16	50.00
Sweet Pea meal @ 4 percent	11	1655.41	46.33
Gram meal @ 4 percent	12	1512.08	44.66
Only spawn	14	1305.41	40.66
Only substrate	17	1170.41	30.00
C.D.	1.194	209.724	6.855

*Wet Substrate

Lowest yield (1048.75 gm. Mushroom / 5 kg wet substrate) was recorded, where FYM alone used as casing. Mixture of Spent compost + FYM+ sand + Garden soil (1:1:1:1 V/v) might have improved the physical and chemical properties of the casing media which resulted in better yield of mushroom.

B. Impact of supplementation on yield of *C. indica*

Effect of supplementation on yield of milky mushroom the result data indicated that supplementation of soybean meal, Sweet Tea meal Gram meal doses and grain spawn had great impact on the time for pin head initiation, yield and number of sporophores of *C. indica*. For the appearance of Pin heads in crop supplemented with grain spawn meals and non-supplemented took 10 to 17 days. It was observed that addition of grain spawn @ 2 percent only as well as in combination with Gram meal dose reduced the time for pin heads formation considerably in comparison to control. Soybean meal @ 4 percent supplemented in casing significantly increased number of sporophore formation, when compared to control. There was also increase in the number of fruiting bodies when sweet pea meal and Gram meal was used 4 percent supplementations of casing were found helpful in increasing the mushroom yield. In corporation of Soybean meal @ 4 percent, resulted in production of 1859.16 g mushroom 5 kg WS with Sweet Pea meal @ 4 percent, Gram meal @ 4 percent resulted in production of 1655.41 g mushroom / 5 kg WS and 1512.08 g mushroom / 5 kg WS respectively. However, the mushroom yield was 1305.41 g/ 5 kg WS in the treatment where only grain Spawn was added as compared to non-supplemented crop (1170.41 g/ 5 kg WS).

C. Wet substrate

The effect of Supplementation with wheat bran, rice bran, Soybean meal, cotton seed meal, ammonium nitrate etc. On

Yield of *A. bisporus* and *pleurotus spp.* has already been documented by earlier workers (jandaik, 1974; Randal, 1985; Bahram, 1989; Bahukhandi, 1990 and Vijay and Gupta, 1995). They reported 14-24 percent increase in yield when supplementation rate was ranging from 3-10 percent. In the present study 11.58 percent higher yield was recorded with supplementation as compared to control, thus present results are in accordance with the reports of earlier workers in case of mushrooms other than *calocybe indica*.

4. Conclusion

This paper concludes that the effect of casing and supplemented meal on yield of *Calocybe indica*.

References

- [1] Bahram, H. (1989). Edible oyster mushroom on the straw. Mushroom J. 9: 97-108.
- [2] Bahukhandi, D. (1990). Effect of various treatments on paddy straw on yield of some cultivated species of Pleurotus. Indian Phytopath. 34. 47-72.
- [3] Garcha, H.S. (1980). Mushroom growing. Punjab Agricultural Univ., Ludhiana. Publ., pp. 54.
- [4] Garcha, H.S. and Sidhu, A. (1987). Physiological manipulation for growing *Agaricus bisporus* in Punjab. Indian Mush. Scie. 2. 16-23.
- [5] Hayes, W.A. And Shandilya. T.R. (1977). Casing Soil and compost substrate used in the artificial culture of *A. bisporus*. The cultivated Mushroom. Indian J. Mycol. Pl. Pathol. 7:5-10.
- [6] Jandaik, C.L. (1974). Artificial cultivation of *Pleurotus sajorcaju*. Mushroom J. 22: 405.
- [7] Lilley, I.J., Hasuk, A., Ernst, A.A. and Stumfeldt, w.w.-Von (1986). Final investigations of the possible use of town compost as a casing material in mushroom growing. Champignon. No. 223: 15: 18-20.
- [8] Pandle, P.E. (1985). Supplementation of mushroom compost. Mushroom J 151: (152), 241-49.
- [9] Singh, R.P. (1995), "Effect of different casing media on the yield of button mushroom," Indian Phytopath. 38: 502-506.
- [10] Vijay, B. and Gupta, y. (1995). Production technology of *Agaricus bisporus*. Advances in Horticulture. 13: 49-106.