B-66: The effect of some organic materials on the production of oyster mushroom (*Pleurotus* sp)

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Mushroom consists of high protein (36.9% dry weight basis), and other mineral nutrients (Ca,P,Fe,Na, & K). It can be easily substituted for animal protein at relatively low cost.

Mushroom production becomes an income generating enterprise for smallholders, by utilising organic materials such as straw, paddy husk, cadjan leaves and waste paper. Findings from the preliminary studies indicate that there is a good potential for growing mushroom in the Eastern part of Sri Lanka. This study investigated the effect of some selected organic materials on the production and quality of Oyster mushroom (*Pleurotus* sp)

The experiment was conducted in a Complete Randomized Design (CRD) with 8 replicates. Four types of organic materials (straw,paddy husk,cadjan,leaves,waste paper) and 2 types of mineral supplements ($CaSO_4/CaCO_3$) were used.

Mushroom was grown in a cadjan shed. Light and ventilation were adjusted by the opening/closing of door and windows. Inside the cadjan shed, there was a darkroom constructed with wooden planks, for incubation.

Formulation of media preparion per kg (dry weight basis) was as follows: organic substrate (paddy husk/straw, cadjan leaves, waste paper) 929 g; rice bran 50 g; soybean flour 10g; $CaSO_3/CaCO_4$ 10g; Epsom ($MgSO_4.7H_2O$) 1 g. Organic materials were chopped into small pieces (5cm length) and soaked in boiling water for 1/2 to 1 hour. After soaking, the organic waste were squeezed to remove excess water. Other constituents were added to it and mixed well. The mixture was filled in polypropylene bags (gauge 200; length 25 cm; width 15 cm). (To constitute for 1 kg straw mixture, 3 bags were required for paddy husk, waste paper and cadjan leaves 2 bags were required). Mouths of bags were plugged with a piece of conduit pipe, cotton wool and aluminium foil.

Under the tested conditions of this experiment Straw + $CaSO_4$ showed highest yield and shortest time taken for the first harvest among the tested organic waste material. Cadjan leaves and $CaSO_4$ showed largest size mushroom flushes and longest time taken for the first harvest among the used organic waste material. Among organic wastes (straw, cadjan leaves, waste paper and paddy husk) straw is the best organic waste for oyster mushroom production under given conditions.

Bags with media were autoclaved at 121°C for 2 h. After cooling of media to room temperature, bags were inoculated with spawn (obtained from Mushroom Development Authority Ratmalana), and allowed for incubation in a darkroom for 25-35 days. Bags were unplugged and kept in growing house, where temperature and relative humidity were maintained at 25-30°C & 60-90% respectively, by sprinkling water into gunny bags (walls of growing house) 2 to 3 times per day. Variables were subjected to Analysis of Variance. Means were compared by using Duncans Multiple range Test.

Yield from straw + $CaSO_4$ was significantly ($F = 16.73$; $p \leq 0.05$) higher (495 g/kg dry weight of straw) compared to other organic materials.

The results shows that the nutrient required for mushroom growth and development may have been higher in straw or easily available to mushroom or both, than that of the other organic wastes tested.

Flushes from cadjan leaves + $CaSO_4$ showed significantly ($p < 0,05$) larger diameter (9 ± 0.13) compared to other organic wastes.
This media may consist of chemical compounds that can facilitate cell elongation of mushrooms and or low density of flushes and more space for growth. Incubation period required for different wastes did not vary significantly ($p > 0.05$).

The time for the first bloom, after keeping bags in growing house (blooming period) was 11.75 and 31 days in straw + $CaSO_4$ and cadjan leaves + $CaSO_4$ respectively. The difference between the 2 media may be due to the difference between the availability of nutrients in time.

During the experimental period catterpillar damage and some abnormal blooming were noticed, but there was no considerable yield reduction. The abnormal blooming may be due to the aberration in climatic conditions: light, relative humidity, temperature and ventilation.

Analysis of nutrients in mushroom was also done with randomly selected fruit bodies produced during this study. The composition of mushroom was as follows: Moisture: $92.12 \pm 0.31\%$, Ash (dry weight): $8.67 \pm 2.2\%$, Crude protein (dry weight): $29.26 \pm 1.3\%$.