African Journal of Agricultural Research Vol. 6(12), pp. 3946-3948, 18 June, 2011
Available online at http://www.academicjournals.org/AJAR
DOI: 10.5897/AJAR11.220
ISSN 1991-637X ©2011 Academic Journals

Short Communication

Impact of different spawn substrates on yield of *Calocybe indica*

Senthilnambi D.*, Balabaskar P. and Eswaran A.

Department of Plant Pathology, Faculty of Agriculture, Annamalai University, Annamalainagar - 608 002, India.

Accepted 30 May, 2011

Mushrooms have existed for millions of years and mankind has regarded them as a valuable food and at present, mushroom cultivation is the only economically viable biotechnology process where in waste materials or crop residues may be converted into valuable food. Paddy straw mushroom, *Volvariella* sp., and oyster mushroom, *Pleurotus* sp., could not perform better in the summer months because of their temperature preferences. Milky mushroom, *Calocybe indica,* with its ability to grow fairly at high temperatures with excellent shelf life seems to be the best alternative to such mushrooms. Due to this promising ability, an experiment was conducted to find the suitability of different grains as spawn substrates and their effect on yield parameters of *C. indica.* The results revealed the supremacy of sorghum grains as the most suitable substrate for early spawn run, which took only 13.7 days for hundred percent mycelial growth. The yield and number of buttons harvested were found maximum in the sorghum grain spawn followed by ragi grain spawn. The maize grain substrates took 19 days for complete spawn run and recorded low yield when compared to other spawn substrates. The days for pin head formation and first harvest of the crop were earlier in case of sorghum grain spawn followed by ragi spawn.

Key words: Mushroom, *Calocybe indica*, spawn substrate, sorghum grain.

INTRODUCTION

Mushrooms have existed for millions of years and the mankind has regarded them as a valuable food. Mushrooms with their flavour, texture, nutritional value and with very high productivity level per unit area rightly have been identified as an excellent food source to fight malnutrition in developing countries. Mushroom cultivation is the only current economically viable biotechnology process, where in waste materials or negative value, crop residues may be converted into valuable food (Wood, 1985).

Paddy straw mushroom, *Volvariella* sp., and oyster mushroom, *Pleurotus* sp., could not perform better in the summer months because of their temperature preferences. Milky mushroom, *Calocybe indica*, with its ability to grow fairly at high temperatures seems to be the best alternative to such mushrooms. *C. indica* with a high biological efficiency (>90%), has the ability to grow at a temperatures of above 30°C and produce attractive white sporophore with excellent shelf life. These qualities make cultivation of milky mushrooms most suitable in tropical and sub-tropical climates. Due to these promising characters, the current study mainly focused on finding the suitability of different grains as spawn substrates and their effect on yield of *C. indica.*

*Corresponding author. E-mail: goldnams@yahoo.com.

MATERIALS AND METHODS

Different grains namely maize seed, cotton seed, sorghum seed, horse gram, black gram, cow pea and ragi were used as spawn substrates. The spawn substrates were half cooked in water separately for about 30 min, excess water was drained out and the substrates were air dried until optimum moisture was obtained. 2% $CaCO_3$ was added and mixed thoroughly to neutaralise the substrate. The substrates were filled up to three fourth volumes in glucose drip saline bottle. The bottles were tightly plugged with non absorbent cotton and the mouth was wrapped with a piece of paper. The bottles were placed in an autoclave and sterilized at 15

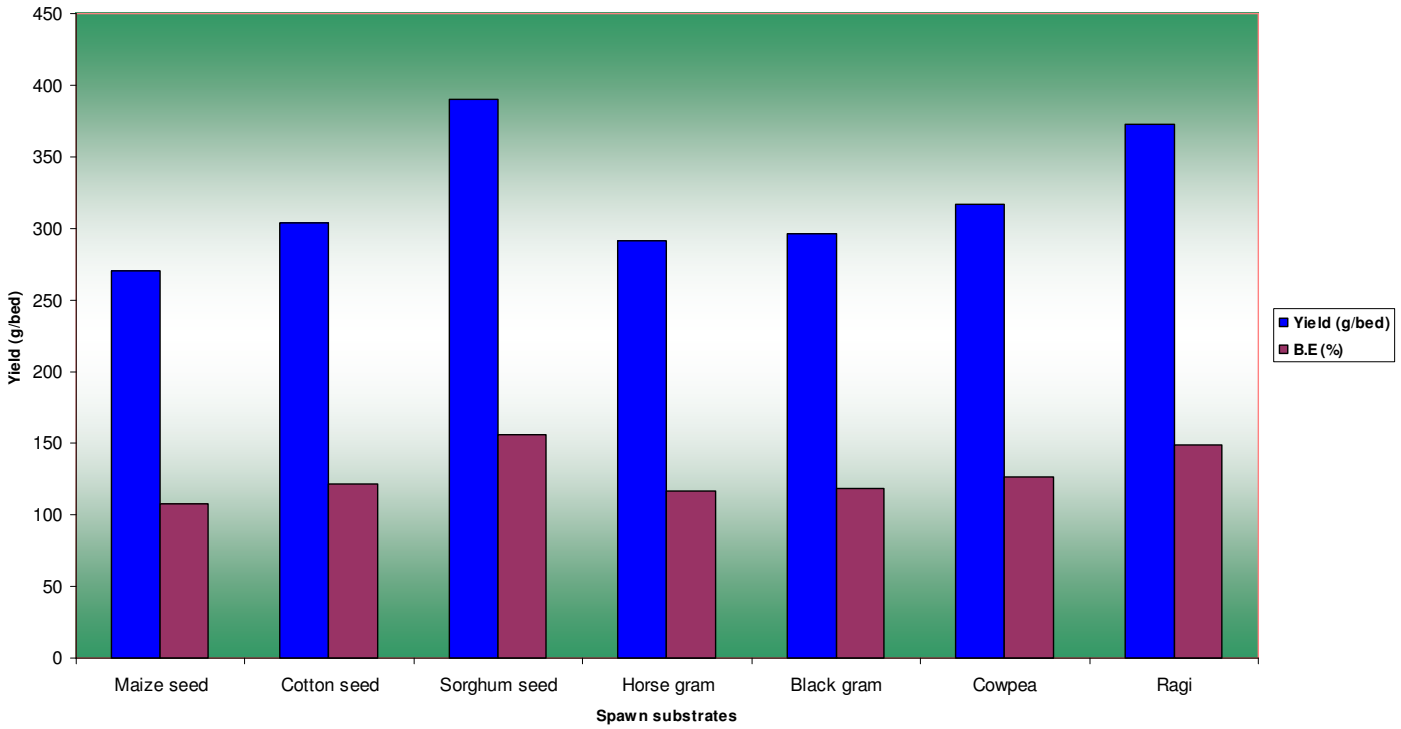

Figure 1. Effect of different substrates on the yield of *C. indica*.

lbs pressure for 2 h. After sterilization, the bottles were cooled at room temperature and were aseptically inoculated with the mushroom fungal mycelium and incubated at room temperature. After few days when the mycelial growth fully colonized the bottles, they were used for bed preparation. For all the substrates, red soil was used as a common casing material. After the necessary incubation, the yield and various morphological features were measured separately for each substrate and recorded.

RESULTS AND DISCUSSION

The yield *C. indica* varied significantly when the spawn was prepared using different substrates. The results revealed the supremacy of sorghum grains as the most suitable substrate for early spawn run, which took only 13.7 days for complete mycelial growth (100%). The yield and number of buttons harvested were maximum in the spawn prepared from sorghum grain, which recorded 390.6 g/bed and six numbers, respectively. The maize grain substrates took 19 days for complete spawn run. This was followed by ragi, which recorded 372.4 g/bed and 5.7 numbers of buttons, respectively. Spawn prepared from maize grains recorded low yield when compared to other spawn substrates (Table 1). The days for pin head formation and first harvest of the crop were earlier in the case of spawn prepared using sorghum grain followed by ragi (Figure 1). Similar results were reported by Doshi et al. (1989) who observed that early fruit body production was noticed on sorghum grain spawn. The variation in the colonization of different substrates could be due to the variation in the amount of moisture observed during boiling, which is one of the critical factors responsible for mycelial growth (Mehta, 1985). Rangad and Jandaik (1977a) found maximum yield with sorghum spawn in different *Pleurotus* spp. Sivaprakasam and Kandaswamy (1981) obtained

Table 1. Effect of different spawn substrates on yield of *Calocybe indica*.

Spawn substrates	Days for spawn run		Days for pinhead formation	Days for first harvest	Avg. weight (g/button)	No. of buttons harvested	Yield (g/bed)	Biological efficiency (%)
	50%	100%						
Maize seed	9.7	19.0	12.0	13.0	62.9	4.3	270.6	108.2
Cotton seed	9.3	18.3	10.7	11.3	60.9	5.0	304.3	121.7
Sorghum seed	7.3	13.7	9.3	10.0	65.1	6.0	390.6	156.2
Horse gram	9.3	18.3	10.7	11.3	61.9	4.7	290.8	116.3
Black gram	8.3	15.3	11.5	12.3	63.1	4.7	296.5	118.6
Cow pea	8.3	15.3	12.3	13.3	63.4	5.0	316.8	126.7
Ragi	7.7	13.7	9.7	10.7	65.3	5.7	372.4	149.0
SE	0.49	0.51	0.63	0.60	0.57	0.58	5.15	3.48
CD (0.05)	1.07	1.12	1.36	1.30	1.25	1.26	11.23	7.59

good yield of *P. sajor-caju* with sorghum and pearl millet.

REFERENCES

Doshi A, Sidana N, Chakravarti BP (1989). Cultivation of summer mushroom, *Calocybe indica* (P&C) in Rajasthan. Mush. Sci., 12: 395-400.

Mehta KB (1985). Studies on physiology and cultivation of *Pleurotus sapidus* (Schulzer) Kalch. Ph.D Thesis, HPKVV, COA, Solan, India.

Rangad CO, Jandaik CL (1977a). Effect of different spawn substrates and storage conditions on yield of *Pleurotus* Species. Indian J. Mushrooms, 3: 1-5.

Sivaprakasam and Kandaswamy TK (1981). Waste materials for the cultivation of *Pleurotus sajor-caju*. Mushroom J., 101: 178-179.

Wood DA (1985). Useful biodegradation of lignocellulose. Ann.Proc.Phytochem. Soc. Eur., 26: 295-309.