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CORN COB GRITS: A NEW SUBSTRATE FOR MUSHROOM SPAWN (*PLEUROTUS FLORIDA*)

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ABSTRACT

Corn cob grits, an agro-waste produced after harvesting of crop was tried for commercial spawn to reduce the economics of spawn preparation. The corn cob grits spawn showed better quality than of wheat grain spawn. After cropping and harvesting, corn cob grits spawn sowed good yield and biological efficiency. Over all, it was found to be economical with high yielding capacity.

Key words: Spawn,Economics,Corn cob grits, *Pleurotus floridal*

Introduction

In recent years, mushroom technology has advanced considerably, with efforts to domesticate various mushroom species occurring globally[1-8]. Many of these species are now cultivated commercially for both food and medicinal purposes[9-13]. Training in mushroom cultivation is increasingly offered by research institutions and universities. However, a significant challenge remains: the high cost of mushroom spawn, which is still produced by specialized personnel and facilities. To address this, there is a growing focus on reducing spawn production costs by using various types of agricultural and industrial waste, which are plentiful and often underutilized.

In India, where maize is a major crop, the cobs are often discarded or burned after harvest. Recent research has examined the potential of using corn cob grits as a substrate for mushroom spawn production. While corn cob grits have been explored as a substrate for mushroom cultivation, their effectiveness for spawn production had not been thoroughly tested until now[14-16].

This study investigates the use of chopped corn cobs as a substrate for mushroom spawn and compares its efficiency to traditional spawn production methods using wheat grains. The findings suggest that corn cob grits can effectively support the growth of mushroom spawn, offering a cost-effective and sustainable alternative to traditional methods.

By utilizing corn cob grits as a substrate, this approach not only helps in waste management but also has the potential to reduce production costs and enhance the sustainability of mushroom farming.

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Materials and Methods

This work was carried out in Ethno Mushroom Laboratory, Jabalpur (M.P). The substrate selected for spawn preparation was chopped Corn cob grits and wheat grains of which latter was considered as control. The spawn was prepared by the method suggested by Sinden[17].One kg of substrates (Corn cob grits/ Wheat grains) were water soaked over night. On the following day the substrates were washed again and boiled with water for 10-15 minutes. The excess water was drained off and boiled substrate was allowed to cool. It was then thoroughly mixed with 2%gypsum and 1% calcium carbonate. The mixture was then packed in heat resistant polyethylene bags and autoclaved at 15 lbs for 40 minutes. After autoclaving the bags were removed from autoclave. Next day, these were inoculated with mother spawn of fungus, *Pleurotus florida* within aseptic conditions. The incubation time, grade of spawn and economics were recorded for both kinds of spawns. For the preparation of bed, wheat straw was water soaked overnight in 2% formaldehyde solution. At the next morning the water soaked substrates were spread over cleaned and inclined cemented floor to drained off the excess of water. The bed was prepared by layer spawning following the procedure adopted by Bano. The bags were then incubated in cultivation room at 20-30° C for spawn run. After completion of spawn run, polyethylene packets were turned off and humidity of room was maintained at 85-95% with the help of humidifier. The time for spawn run time of appearance of pinheads, number and amount of sporocarp produced and biological efficiency etc. were separately recorded.

Results and Discussion

The results obtained during the present observation are shown in Tables: 1 & 2. It was observed that incubation period for corn cob grits spawn preparation was higher (14 days) than grain spawn (12days). It is due to chemical nature of Corn cob grits which contains cellulose, hemicellulose and lignin chemically more complex structures then starch, available in wheat grain. It has been suggested that the complex composition of corn cob grits.

Table 1: Comparison between corn cob grits and wheat spawn in respect to spawn quality and production of mushroom.

Particular		Wheat spawn	Corn cob grits spawn
incubation time		12	14
day required for spawn run		14	16
1st fulush	day of pin appear	20	22
	day of harvest	24	25
	yield	200	310

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2ndfulush	day of pin appear	28	32
	day of harvest	32	36
	yield	170	240
3rdfulush	day of pin appear	50	52
	day of harvest	55	57
	yield	87	65

Table 2 Economics of Commercial spawn preparation

Name of spawn	Cost per kg. of Substrate (Rs.)	Processing cost (Rs.)	Total input/kg (Rs.)
Corn cob grits spawn	15.00	10.00	25.00
Wheat	40.00	10.00	50.00

limits the action of microbial enzyme and resulting in low digestibility and requiring long incubation period for spawn run in comparison to wheat grain. The corn cob gritsspawn was found superior over control in respect of better mycelial growth which was due to higher surface area available for enzymatic activity of fungus that breaks down complex molecules to simpler available forms. Similar enzymatic action hydrolyzing cellulose, hemicellulose and lignin by mushroom mycelia has been reported [19-20]

The time Japes in spawn run and pin appearance was longer in the bed sown with corn cob gritsspawn than with wheat grain spawn. It was comparatively due to big size of spawned corn cob gritswhich covered less surface area of substrate then wheat grains. Thus it took long time for spawn run· and as a result delayed primordial development. [25, 26, 27]

The yield biological efficiency and weight per sporocarp was also higher in the bed spawned with corn cob gritsspawn (Table-1). It was due to quality of spawn which provided additional nutrient material to the fungus in form of cellulose and hemicellulose, present in pieces of cobs.[28, 29]Chang et. al., have reported that the yield of *Pleurotussajor-caju* could be increased by supplementing a cellulosic material, viz., cotton waste with straw. The good quality of spawn is convincingly able to produce high quality fruit bodies". Above all, corn cob gritsspawn was considered economic because cost of grains did not included in total input of spawn production (Table-2).

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