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MONOCULTURE OF *AGARICUS BISPORUS (LANGE) SING* ON AMENDED SUBSTRATE

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ABSTRACT

Linseed cake and mustard cake in different concentration viz. 125g, 250g and 375g was thoroughly mixed in 10 kg of compost and growth of sporophore of *A. bisporus* was monitored. The number of sporophore which emerged after different days viz10, 13, 16, 19, 22, 25, 28, 31, 33, 36, 39, 42, 45, 46, 49, 52, 55 and 58 was recorded. It has been observed that at a concentration of 375g of linseed and mustard cake, the emergence of sporophore has been faster (10 days, 15 days in control) and in greater number (In linseed, 63 in 13 days however no growth in the control), whereas in mustard cake the number has been 79 in 13 days no growth in control, which can be adopted for growth of *A. bisporus.*

Keywords: Linseed and Mustard Cake, Concentration, Sporophore, Number

INTRODUCTION

Agaricus bisporus (button mushroom) has been recognised as a protein substitute and all over the world and in various parts of India. In recent years its consumption has increased manifold due to which attempt has been made to increase its production. Various technological pursuits have also been applied to increase the yield of this crop. During studies it has been noticed that the crop grows in flushes, marked by increase or decrease in yield. Various reasons have been assigned to explain this, such as nutrient component of the substrate, built up of soil moisture thickness of the bed. On the basis of which it has been suggested that decrease in yield is due to

deposition of toxic substances or depletion of nutrient. Supplementation of substrate to increase the yield with different agricultural waste such as cotton seed meal, soybean meal, wheat bran and mustard cake has been suggested **[1]** in *A. bisporus*. Supplementation with paddy straw, wheat straw, black gram waste, mustard waste, sugarcane bagasse, tea waste and banana pseudo stem have also been suggested to increase the yield of *Pleurotus sajar-caju* **[2]**. Present study aims to monitor the effect of linseed cake and mustard cake as means of supplementation in substrate for growth and development of *A. bisporus*. **[3]** used wheat bran, rice bran, gram powder, neem cake, chicken manure to record an increase in yield of *Volvariella diplasia*. **[4]** used cotton seed cake, cotton waste, neem cake, soybean meal, deboiled rice bran, mustard cake, wheat bran and peanut cake to increase the yield of *Volvariella volvacea* MTCC 957.

MATERIALS AND METHODS

Strain

The strain of *Agaricus bisporus* was obtained from IARI, New Delhi.

Composition of the Substrate

This was prepared by mixing following ingredients by adopting long method **[5]**.

Wheat bran - 2.5kg; Molasses of sugarcane - 1kg; Calcium Ammonium Nitrate - 0.4kg; Gypsum - 2kg; Urea - 0.3kg; Furadon – 0.25kg; Wheat straw - To make a quantity of 10 kg. Quantity of the mixture (substrate) was prepared as per requirement in above ratio.

Preparation of Spawn

Wheat grain was obtained from commercial source. It was boiled and to this was added calcium sulfate (13.5g/kg) and calcium carbonate (3.5g/kg), pH was adjusted to 6.6 to prevent sticking of the grains. The inoculums was transferred to the medium and mixed thoroughly by vigorous shaking. The growth was allowed to undergo at 25°C for seven days and then the bottle was shaken occasionally to allow proper distribution of emerging mycelia thread. The operation was terminated after 20 days when the bottle was filled up with the white mycelium of the fungus. This served as spawn.

Preparation of Substrate

In 10 kg of the substrate various supplements were mixed in different quantity (125g, 250g and 375g) and mixed thoroughly for even distribution. Substrate without supplementation served as control.

Preparation of Inoculums

In prepared substrate 0.5 kg freshly cultured spawn was mixed thoroughly to allow even distribution of the inoculums. This was then spread over the shelf of the thatched house having a thickness 10".

RESULTS AND DISCUSSION

Emergence of sporophore after varying period of time in linseed and mustard cake was recorded and has been described.

Effect of linseed cake - Effect of this treatment has been presented **(Table 1)**. On review of data **(Figure 1)** it appears there has been no emergence of sporophore in the control treatment even up to 15 days, whereas, considerable number of sporophores emerged after 10 days in treatments, the value being 27 (125g), 18 (250g) and 05 (375g). On 16 day 9 sporophore emerged in the control treatment whereas this value was 20 at 125g, 34 at 250g and 26 at 375g of Linseed cake respectively. On review of data it appears that treatment for 13 days yields faster growth of sporophore the value being 61 (125g), 56 (250g) and 63 (375g). In control treatment increasing trend was recorded after 19 day (48 sporophore), 25 day (44 sporophore), 33 day (39 sporophore), 49 day (39 sporophore) and 55 day (39 sporophore). In treatment with 125g of linseed cake the increasing-decreasing trend was recorded on 13 day (60 sporophores) and treatment for further days exhibited down ward trend as 28:50, 33:46, 39:56 and 52:27. In treatment with 250g of supplementation however the result was 13 day (56 sporophore), 25 day (61 sporophore), 28 day (32 sporophore), 33 day (32 sporophore) and as 36 day (27 sporophore). Treatment with 375g yielded result as 13 day (63 sporophore), 19 day (27 sporophores), 25 day (105 sporophores), 28 day (84 sporophore), 33 day (118 sporophore) and 45 day (67 sporophore) recorded. This is consistent with earlier finding **[1]. [2]** reported reduction in time in first harvest (*Pleurotus sajar caju*) by 5 days in neem cake, 2 days in wheat bran, 3 days in rice bran, no change was recorded in mustard cake. **[3]** reported reduction in time in first harvest and also in increase in number of sporophores when wheat bran, rice bran, gram powder, neem cake and chicken manure were used as supplementation in on *Volvoriella diplasia*.

Effect of Mustard Cake

There was no growth of sporophore up to 15 days in the control, but in treatments sporophore emerged after 10 days 15 (125g), 21 (250g) and 11 (375g). A steep rise in emergence of sporophore was recorded after 13 days, the value being 60 (125g), 69 (250g) and 77 (375g). Treatments made for 25 days yielded 08 (Control), 13 (125g), 75 (250g) and 130 (375g). Emergence of sporophore after 25 days exhibited upward and downward trend in pattern of growth **(Figure 2)**. In control the growth was recorded after 19 day (40 sporophore), 28th day (34 sporophore), and 35 day (45 sporophore). In treatment with

125g of Mustard cake the emergence of sporophore was recorded after 13 day (60 sporophore), 28 day (16 sporophore), and 45 day (18 sporophore). Treatment with 250g yielded result as 13 day (69 sporophore), 25 day (75 sporophore), 28 day (72 sporophore), 35 day (116 sporophore) and 36 day (61 sporophore). Whereas during treatment with 375g of mustard cake sporophore emerged as 13(77), 19(54), 25(130), 28(116), 33(132), 45(103), 52(82) and 58(83).

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Table 1: Effect of Linseed Cake on Emergence of Sporophore in *A.bisporus*

S. No.	Number of days after which harvested	Quantity of linseed cake added (in g)			
		Control	125 g	250 g	375 g
1	10	00	27	18	05
2	13	00	61	56	63
3	16	09	20	34	26
4	19	48	64	12	27
5	22	12	10	05	04
6	25	44	22	61	105
7	28	26	50	32	84
8	31	04	23	27	23
9	33	39	46	32	118
10	36	34	22	27	72
11	39	41	56	08	66
12	42	09	00	01	04
13	45	06	12	06	67
14	46	25	12	03	03
15	49	39	04	07	10
16	52	17	27	06	107
17	55	39	02	10	18
18	58	28	30	10	96

NOTE: Average of Two Replicates

Table 2: Effect of Mustard Cake on Emergence of Sporophore in *A. bisporus*

S. No.	Number of days after which harvested	Quantity of mustard cake added (in g)			
		Control	125 g	250 g	375 g
1	10	00	15	21	11
2	13	00	60	69	77
3	16	17	19	47	23
4	19	40	12	25	54
5	22	18	01	07	11
6	25	08	13	75	130
7	28	34	16	72	116
8	31	20	08	12	12
9	33	45	07	116	132
10	36	03	09	61	31
11	39	01	03	20	78
12	42	02	04	10	04
13	45	01	18	11	103
14	46	00	01	03	04
15	49	00	02	00	03
16	52	02	03	09	82
17	55	04	04	08	15
18	58	00	02	14	83

NOTE: Average of Two Replicates

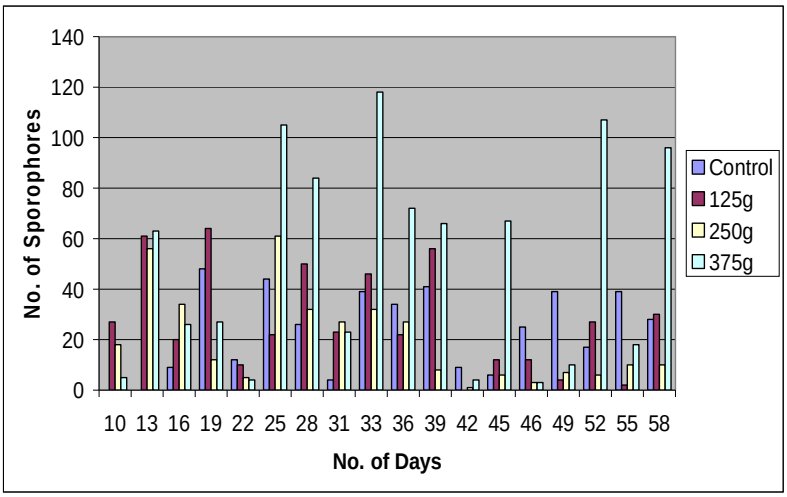

Figure 1: Effect of Linseed Cake on Emergence of Sporophore in *A. bisporus*

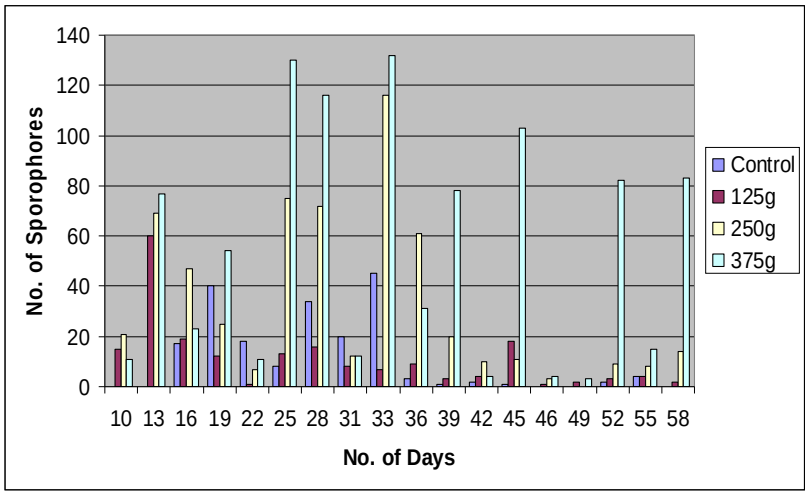

Figure 2: Effect of Mustard Cake on Emergence of Sporophore in *A. bisporus*