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RESEARCH PAPER

Effect of growth regulators on mycelial growth and yield of *Pleurotus eous*

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Abstract : The research experiment was conducted in mushroom research laboratory at Danteshwari College of Horticulture, Raipur (C.G.). Five different growth regulators *viz*., naphthaline acetic acid (NAA), giberlic acid (G.A.), cytokinin, 2, 4-D- dichlorophenoxy acitic acid (2, 4-D) and indole butaric acid (I.B.A.) were evaluated. Highest mycelial growth and yield of *Pleurotus eous* was more recorded in gibberlic acid incorporated medium. However it was least in 2, 4-D incorporated medium.

Key Words : *Pleurotus eous*, Growth regulators, Mycelia growth, Yield

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INTRODUCTION

Mushroom is a form at plant life and known as a fungus, a group of organism, separate from plant and animals. Mushroom can defined as macro fungus with a distinctive fruiting body, which may be either epigeous or hypogeous. Mushroom grow all over the world on various habits, varying from large heterogenous groups, having varying shape, size colour and all quite different in appearance and edibility (Chadha and Sharma, 1995). More than 15000 fleshy fungi have been identified, among them 2000 species are considered as edible throughout the world and more than 300 species have been reported from India (Chadha, 1994).

Mushroom are good source of quality protein with 70-80 per cent digestibility and all amino acid. Mushroom protein is superior to vegetable and fruit protein (Bano and Rathanam, 1982 and Chang and miles, 1989).

MATERIAL AND METHODS

The experiment was conducted in the Department of Plant Pathology and Biochemistry laboratory at Danteshwari College of Horticulture, Raipur (C.G.)

Effect of growth regulators on mycelial growth and bio mass production:

In the present investigation five different growth regulators *viz.*, naphthalene acetic acid (N.A.A.) gibberelic acid (G.A.), cytokinine, 2, 4-dichlorophenoxy acetic acid (2, 4-D) and indole butaric acid (I.B.A.) were evaluated. Each growth regulator was incorporated in basal medium (malt medium) @ 2 ppm. Without growth regulator basal medium served as control. Thereafter, media was sterilized and inoculated with pure culture of *P. eous.* The Petriplates were incubated at 25 ± 2^0 C and observations on radial growth were recorded after completion of growth in any one of the treatment.

For fresh and dry mycelial weight, all above growth regulators were incorporated liquid in medium (50 ml). The flasks were inoculated with 3 mm disc of activily growing culture of *P. eous* and incubated as 25 ± 2^0 C for 15 days. The observations were recorded for biomass production of *P. eous.* Each treatment had 3 replications.

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Effect of growth regulators for spawn run and yield *P. eous:*

To see the effect of different growth regulators on spawn run period and yield of *P. eous* five different growth regulators *i.e.* naphthalene acetic acid (NAA), gibberelic acid (GA), cytokinine, 2,4-dichlorophenoxy acetic acid (2, 4-D), and indole butaric acid (IBA) were evaluated. All the growth regulators were sprayed @ 2ppm before the spawning in the substrate and spray was done with the help of hand sprayer. Spawning was done through mixing method (4% on weight wet basis). Thereafter, the spawned substrate were filled in perforated polythene bags (0.5kg dry substrate per bag) and were shifted to cropping room, where the temperature relative humidity were maintained.

Three replications were maintained in each treatment and the observations on number of days taken for spawn run and yield per unit straw was recorded.

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Effect of different growth regulator on radial growth and biomass production of *P. eous:*

In vitro, different growth regulator were evaluated to see their influence on radial growth and biomass of *P. eous* and the results are depicted in Table 1.

There was significant difference in radial growth of *P. eous* with respect to different growth regulators. Significantly higher (90.00 mm) radial growth of *P. eous* was observed in gibberelic acid incorporated medium and control (86 mm). However, the radial growth *P. eous* was significantly less (34.66 mm) recorded in medium supplemented with 2, 4-D followed by NAA (51.66 mm), cytokinine (63.00) and indole butaric acid (64.33 mm).

The average biomass of *P. eous* considerably differed with respect to different growth regulators. On an average, maximum (1.54 g) biomass was obtained in gibberellic acid followed indole butaric acid (1.31 g) and control (1.26 g). However, least (0.60 g) biomass of *P. eous* was noticed in 2, 4-D (0.60 g), NAA (0.79 g) and cytokinine (1.16 g). The present results are in agreements with the findings of Halder and Haider (1998) and Fasidi and Jonathan (1994).

Effect of growth regulators on spawn run and yield of *P.eous :*

Different growth regulators were studied to see their influence on spawn run and yield of *P*. eous .The data are presented in Table 2.

Different growth regulators were found to influence the period required for spawn run of *P. eous*. During July 2007, significantly earlier spawn run was observed in gibberellic acid (10.33 days) followed by cytokinine (12.33) whereas it was significantly delayed in 2, 4-D (15.67 days) followed by, control (14.00 days), NAA (14.00 days), IBA (13.00 days). In October, spawn run period was also quicker in gibberellic acid (11.33 days), whereas it was slower in 2,

Table 1 : Effect of different growth regulator on radial growth and biomass production of *P. eous*

Treatments	Radial growth (mm)	Fresh wt. (g)	Dry wt. (g)	Average (g)
Naphthalene acetic acid	51.66	1.46	0.13	0.79
Gibberellic acid	90.00	2.70	0.39	1.54
Cytokinine	63.00	2.06	0.26	1.16
2,4-dichlorophenoxy acetic acid	34.66	1.13	0.08	0.60
Indole butaric acid	64.33	2.26	0.37	1.31
Control (malt extract agar medium)	86.00	2.11	0.41	1.26
C.D. (P=0.05)	5.30	0.21	0.01	
S.E.±	1.68	0.06	0.004	

Table 2 : Effect of growth regulators on spawn run and yield of *P. eous*

Treatments	Spawn run (Days)			Yield (g)/500 g dry substrate			Biological efficiency (%)		
	July	October	Average	July	October	Average	July	October	Average
Naphthalene acetic acid	14.00	13.33	13.66	223.33	215.00	219.16	44.66	43.00	43.83
Gibberellic acid	10.33	11.33	10.83	383.00	371.66	377.33	76.66	74.33	75.45
Coytokinin	12.33	13.67	13.00	241.67	230.00	235.83	48.33	46.00	47.15
2,4-Dichlorophenoxy acetic acid	15.67	17.33	16.50	191.67	185.00	188.33	38.33	37.00	37.66
Indole butaric acid	13.00	13.33	13.16	366.67	360.00	363.33	73.33	72.00	72.66
Control	14.00	13.33	14.33	351.67	331.66	341.66	70.33	66.33	68.31
C.D. (P=0.05)	0.73	1.03		23.52	15.69				
S.E.±	0.24	0.33		7.63	5.09				

4-D (17.33 days), followed by cytokinine (13.67 days). NAA (13.33 days), IBA (13.33 days) and control (13.33 days). The mean of two months data clearly indicate that gibberellic acid incorporated substrate required considerable less (10.83 days) period for spawn run of *P. eous*. In other growth regulators spawn run period varied from 13.16-16.5 days.

The fresh yield of *P. eous* also differed significantly with different growth regulators in both the months. During July 2007, significantly higher yield (383.00 g) of *P. eous* was obtained in gibberellic acid and IBA (366.67 g). However, it was significantly lower (191.67 g) observed in 2, 4-D and next was NAA (223.33 g), cytokinine (241.67 g) whereas control recorded 357.67 g. During October 2007, yield of *P. eous* was significantly were (371 g) recorded in gibberellic acid and IBA (360.0 g). The yield was comparatibly less noticed in 2, 4-D (185.0 g) which was closely followed by NAA (215.0g). The mean of two months data clearly indicated that gibberellic acid (377.33 g) and IBA (363.33 g) gave better yield than other growth regulators and it varied from 188.33 g to 235.83 g. Similar, findings were also reported by Ashrafuzzaman *et al*. (2005) and Khan *et al.* (2009).

Conclusion:

From the present findings it was concluded that growth and biomass and yield of *P. eous* was more in gibberelic acid incorporated medium. July, August and September months were found favourable for earlier spawn run, pinhead initiation and better yield of *P. eous.*

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