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Effect of various culture media on growth of *Pleurotus eous*

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Abstract

A preliminary experiment was carried out to analyse the growth performance of *P. eous* mushroom cultures using different media. Eight culture media viz., Ashby's manitol agar, yeast extract agar, yeast manitol agar, Corn meal agar, Potato dextrose agar, potato malt agar, Czapek's dox agar and Malt extract agar were used. The maximum colony diameter of *P. eous* was recorded on potato dextrose agar (90 mm), followed by Malt extract agar (88.16), Yeast manitol agar (87.50 mm), Yeast extract agar (86.33 mm), Corn meal agar (86.10), Potato malt extract (85.66) and minimum colony diameter was recorded on Ashby's manitol agar (14.66 mm) which was lesser than Czapek's dox agar (85.30 mm).

Keywords: *Pleurotus eous*, culture media, potato dextrose agar, corn meal agar

Introduction

Mushrooms were so far considered as luxury food especially among the rich community because of their unique flavor and excitingly different taste but now they have grown to a common mans food. Mushrooms are traced as special kind of food, since ancient times. The Greeks believed that mushrooms provided strength for warriors in battle and Romans regarded them as "Food of Gods" or "Gods Flesh", which were served only on festival occasions.

China leads in world mushroom production by cultivating more than 20 different types of mushrooms on commercial scale. USA is the second largest producer of mushrooms sharing 16 per cent of the world production (Prakasam, 2012; Singh *et al.*, 2011)^[8, 10]. Currently India stands 54 in the world ranking of mushroom producers. India ranks 6th and world market share 4.44 per cent. Mushroom production in India has been estimated at 48000 tonnes per annum.

At present, only three mushrooms viz., button mushroom (*Agaricus bisporus*), oyster mushroom (*Pleurotus* spp.) and paddy straw mushroom (*Volvariella* spp.) is being cultivated on commercial and small scale in India. Button mushroom is mainly cultivated in mechanized mushroom farms on commercial scale in States such as Jammu & Kashmir, Himachal Pradesh, Uttaranchal, etc. To date approximately 70 species of oyster mushroom (*Pleurotus* spp.) have been recorded. The oyster mushroom (*Pleurotus* spp.) also called 'Dhingri or Abalone' (Chadha and Sharma, 1995)^[2]. Oyster mushroom is usually coloured including dark blue, white, cream, brown, or yellow and pink.

Oyster (*Pleurotus* spp.) mushroom is the 2nd largest cultivated mushroom in the world and its annual production is 797,000 tones. India produces only small quantity (25000 tons) of oyster mushroom in the state of Orissa, Karnataka, Maharashtra and Andhra Pradesh etc..

Various *Pleurotus* species have been shown to possess a number of medicinal properties, such as antitumor, immunomodulatory, antigenotoxic, antioxidant, anti-inflammatory, hypcholesterolaemic, antihypertensive, antiviral and antimicrobial activity (Gregori *et al.*, 2007)^[5]. The production of oyster mushroom has been increasing steadily recent past years. with the availability of sub tropical climate in most part of India, widely adoptability, low coat growing technology, high biological efficiency, ability to grow on variety of agro- wastes and easy to adopt cultivation technology, the cultivation of oyster mushroom has been popularized in various state of country.

There are quite suitable for commercial cultivation of various *Pleurotus* species including *P. sajar-caju*, *P. eous*, *P. florida*, *P. flabellatus*, *P. ostreatus* etc. *Pleurotus eous* produces pinkish coloured fruit bodies either singly or in clusters. The pileus is oyster shaped initially but becomes deeply lobed and folded at maturity. The stipe is solid, rigid, eccentric and pink in

colour. This mushroom grew excellently at 18-24 °C temperature range but can grow up to 28 °C.

Materials and Methods

Effect of different culture media

To study the effect of different liquifiable solid cultural media on cultural characteristics of *P. eous*, eight culture media viz., Ashby's manitol agar, yeast extract agar, yeast manitol agar, Corn meal agar, Potato dextrose agar, potato malt agar, Czapek's dox agar and Malt extract agar were used. The media were sterilized in autoclave at 15LBS/inch² pressure for 20 min. Autoclaved and cooled media were poured @ 20ml/plate in sterilized glass Petri plates (90 mm dia.), and allowed to solidify at room temperature. On solidification of the media, Petriplates of each culture medium (two plates/medium/replication) were inoculated by placing at the centre 5 mm mycelia disc of actively growing seven days old pure cultures of *P. eous* and incubated at 20⁰C temperature.

Experimental details

Design : Completely Randomized Design (CRD)

Replications : Three

Treatments : Eight

Treatment details

T₁ : Ashby's manitol agar T₅ : Malt extract agar

T₂ : Yeast extract agar T₆ : Potato malt agar

T₃ : Czapek's dox agar T₇ : Corn meal agar

T₄ : Yeast manitol agar T₈ : Potato dextrose agar (PDA)

The observations on radial mycelia growth/colony diameter (mm) were recorded at 24 hours interval and continued till 10 days after inoculation. Observations obtained were averaged and the data was analyzed statistically.

Statistical analysis

All the data related to diseases incidence and yield was statistically analyzed. Calculations were made after applying the test of significance of the means (Panse and Sukhatme, 1978)^[7].

Result and discussion

Effect of different culture media

The effect of eight different culture media on colony diameter, color and growth type of *P. eous* were studied and observation obtained were presented in the table 1 and depicted in the PLATE I and Fig. 1.

The average colony diameter of *P. eous* in present investigation ranged between 14.66 to 90 mm. The maximum colony diameter of *P. eous* was recorded on potato dextrose agar (90 mm), followed by Malt extract agar (88.16), Yeast manitol agar (87.50 mm), Yeast extract agar (86.33 mm), Corn meal agar (86.10), Potato malt extract (85.66) and minimum colony diameter was recorded on Ashby's manitol agar (14.66 mm) which was lesser than Czapek's dox agar (85.30 mm).

Table 1: Effect of various culture media on growth of *P. eous*

Tr. No.	Treatments	Average colony Diameter (mm)	Color of colony	Type of growth of colony
T ₁	Ashby's manitol agar	14.66	Light pink	Flatted
T ₂	Malt extract agar	88.16	Whitish	Rised puffed
T ₃	Yeast extract agar	86.33	Pink	Rised puffed
T ₄	Potato malt agar	85.66	Whitish	Rised puffed
T ₅	Czapek's dox agar	85.30	Light pink	Flatted
T ₆	Corn meal agar	86.10	Pink	Flatted
T ₇	Yeast manitol agar	87.50	Whitish Pink	Rised puffed
T ₈	Potato dextrose agar	90.00	Pink	Flatted
	S.E. ±	0.74		
	C.D. 1%	2.23		
	C.V.	1.19		

* : Mean of three replication.



T₁ : Ashby's manitol agar T₅ : Czapek's dox agar

T₂ : Malt extract agar T₆ : Corn meal agar

T₃ : Yeast extract agar T₇ : Yeast manitol agar

T₄ : Potato malt agar T₈ : Potato dextrose agar

Plates I: Effect of various culture media on growth of *P. eous*

The colour and growth of *P. eous* on potato dextrose agar was recorded pink and flattened growth followed by Ashby's manitol agar (light pink and flattened growth), Yeast manitol

agar (whitish pink and puffed growth) and brownish white and flattened growth on Czapek's dox agar, creamy white and raised puffed growth on Yeast extract agar.

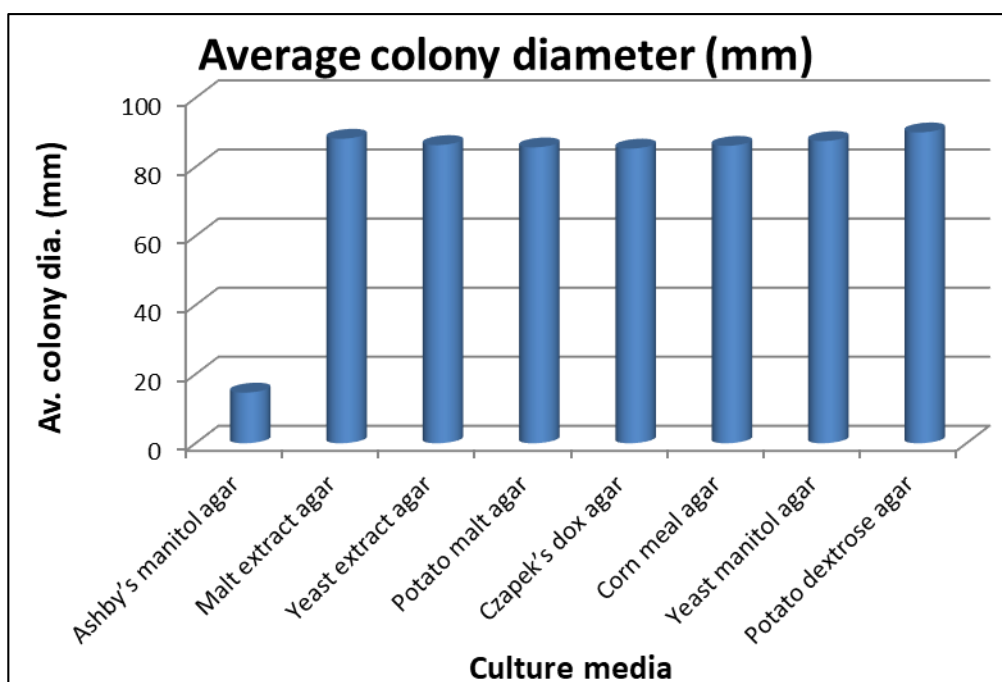


Fig 1: Effect of different culture media on growth of *P. eous*

Potato dextrose agar reported superior over all culture medium in present investigation. Similar variation in colony diameter of culture of *P. eous* has been reported by earlier workers (Gibriel *et al.*, 1996; Dey *et al.*, 2007; Bhatt *et al.*, 2010; Thulasi *et al.*, 2010; Rawate and Diwan., 2011; Stanley and Nyenke., 2011; Mansue *et al.*, 2012 and Uddin *et al.*, 2012) [4, 10, 12, 9, 11, 7, 13].

Conclusion

The maximum colony diameter of *P. eous* was recorded on potato dextrose agar (90 mm), followed by Malt extract agar (88.16), Yeast manitol agar (87.50 mm), Yeast extract agar (86.33 mm), Corn meal agar (86.10), Potato malt extract (85.66) and minimum colony diameter was recorded on Ashby's manitol agar (14.66 mm) which was lesser than Czapek's dox agar (85.30 mm).

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