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Evaluation of Culture Medium for the Growth of *Alternaria brassicae* causing Alternaria Blight of Mustard

Bhagyashree Singh*, R.K. Pandya, Ravi Yadav, Ajay Kaurav and Prashant K. Singh

R. V. S. K. V. V. College of Agriculture Gwalior (M.P.), India
**Corresponding author*

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A B S T R A C T

Rapeseed-mustard (*Brassica juncea* L) is an economically prodigious and utile oilseed crop of the world**.** Potato dextrose agar media was significantly superior over other tested media at 5 and 7 days after inoculation. However it was at par with mustard leaf dextrose agar at 3 days after inoculation and significantly superior over the rest culture media. The maximum mycelia growth on seven days after inoculation was recorded in Potato dextrose agar medium (90.00mm) followed by Mustard leaf dextrose agar (70.00 mm), Potato leaf dextrose agar medium (68.33 mm), Cauliflower dextrose agar medium (60.16 mm), Czapex dextrose agar medium (60.00 mm), Malt dextrose agar medium (58.33 mm), Tomato leaf dextrose agar media (51.66 mm), Marigold leaf dextrose agar medium (50.16),Pea grain dextrose agar medium (48.33 mm), Cauliflower dextrose agar medium (43.66 mm), Malt apple dextrose agar medium (43.33 mm), Radish potato dextrose agar medium (40.00 mm), water agar medium (36.83 mm) and Carrot potato dextrose agar medium (28.33). While minimum growth was recorded in Pea husk dextrose agar medium (20.36 mm).

Introduction

Rapeseed-mustard (*Brassica juncea* L) is an economically prodigious and utile oilseed crop of the world. In India, rapeseed-mustard is grown over in diverse agro-climatic conditions ranging from north-eastern/north-western hills to down south. It is second largest indigenous oilseed crop, contributing 32 per cent of total oilseed production in India.Forty two fungal pathogens are associated with rapseed mustard out of these *Alternaria* blight caused by *Alternaria brassicae* (Berk) Sacc. And *Alternaria brassicicola* (Schw.) Wiltsh, are the most important diseases causing heavy losses throughout the country attacking all brassica species. Four species of *Alternaria viz.*, *Alternaria brassicae* (Berk) Sacc. *Alternaria brassicicola* (Schw.) Wiltsh. *Alternaria raphani* Groves and Skolka and *A. alternata* (Fr) Keissler have been reported for the cause of *Alternaria* blight. This pathogen is characterized as pseudo-fungi with absence of identifiable sexual stage and reported as cosmopolitan in nature. The causal pathogen is characterized by large obclavate, olive grey to dark coloured conidia having longitudinal as well as transverse septa (Aneja and Agnihotri, 2013).A critical and comprehensive knowledge of nutritional patterns and factor influencing the growth of fungi is prerequisite for any study leading to the understanding of host –pathogen

relationship. Hence tested the different culture medium for the mycelia growth as well as colony characteristics of the *A. brassicae*.

Materials and Methods

The different solid mediums were evaluated for obtaining maximum mycelial growth of the *Alternaria brassicae*. The experiment was laid out in complete randomized design with replicated three times. Ten solid culture medias *viz*., Malt Extract Apple Agar medium, Malt Extract Agar medium, Czapek's-Dox Agar medium, Potato Dextrose Agar medium, Potato Carrot Agar medium, Mustard leaf Dextrose Agar medium, Pea leaves Dextrose Agar medium, Pea husk Dextrose Agar medium, Pea grain Dextrose Agar medium, Cauliflower leaf Potato Dextrose Agar, Cauliflower Dextrose Agar, Raddish Dextrose Agar and Water Agar were used to compare the growth rate of *Alternaria brassicae*. The Culture Mediums were prepared by the standardized method and autoclaved at 121.6 °C, 15 psi pressure for twenty minutes. Uniform quantities (20 ml) of each medium were poured in 90 mm Petri plates. Each Petri plate was inoculated separately with uniform mycelia culture bits (5 mm) cut with the help of cork borer from young (5 days) vigorously growing culture were placed on the middle of the each pre poured medium and incubated at 25±1oC.Each treatment was replicated three times. The diameter of the growth of the fungus was measured after inoculation 3, 5, and 7 days on radial growth of mycelium.

Results and Discussion

Radial growth of the pathogen

In order to find out the most effective culture media for the growth of *A. brassicae*. A total fifteen culture media were evaluated against *A. brassicae* under *in vitro* condition and the data summarized in table 1 no- reveals that Potato dextrose agar media was significantly superior over other tested media at 5 and 7 days after inoculation. However it was at par with mustard leaf dextrose agar at 3 days after inoculation and significantly superior over the rest culture media.

The maximum mycelia growth on seven days after inoculation was recorded in Potato dextrose agar medium (90.00mm) followed by Mustard leaf dextrose agar (70.00 mm), Potato leaf dextrose agar medium (68.33 mm), Cauliflower dextrose agar medium (60.16 mm), Czapex dextrose agar medium (60.00 mm), Malt dextrose agar medium (58.33 mm), Tomato leaf dextrose agar media (51.66 mm), Marigold leaf dextrose agar medium (50.16),Pea grain dextrose agar medium (48.33 mm), Cauliflower dextrose agar medium (43.66 mm), Malt apple dextrose agar medium (43.33 mm), Radish potato dextrose agar medium (40.00 mm), water agar medium (36.83 mm) and Carrot potato dextrose agar medium (28.33). While minimum growth was recorded in Pea husk dextrose agar medium (20.36 mm).

Colour of the culture

Among all media tested for evaluation, colour of culture did not differ from each other.

A total fifteen culture media were evaluated against *A. brassicae* under in vitro condition. The maximum mycelia growth was found in Potato dextrose agar media followed by Mustard leaf dextrose agar medium and potato leaf dextrose agar medium. While the least mycelia growth was recorded in Pea husk dextrose agar medium. Similarly he founded that maximum growth of the pathogen was recorded in Mustard leaf agar medium followed by Nutrient agar, Czapek-Dox-agar and Potato-Dextrose-agar and minimum growth was recorded on Malt agar.

Mustard Leaf Agar medium was found more appropriate for the culture of A. blight as it was significantly superior over three tested media (Shakya 2012).

Table.1 Evaluation of different culture medium against *A. brassicae*

S.No	Solid culture medium	Mycelial growth(mm)			Culture colour
		3 DAS	5 DAS	7 DAS	
1	Pea husk dextrose agar medium	6.83	16.66	20.36	Light brown colour whitish cottony growth
2	Cabbage dextrose agar medium	11.66	28.33	43.66	Light brown
3	Cauliflower potato dextrose agar medium	18.33	43.33	60.16	Dark black colour
4	Pea grain dextrose agar medium	21.66	33.33	48.33	Light brown
5	Carrot potato dextrose agar medium	10.00	13.33	28.33	Dark brown
6	Marigold leaf dextrose agar medium	15.00	31.66	50.16	Dark brown
7	Malt Apple dextrose agar	16.66	30.66	43.33	Black
8	Mustard leaf dextrose agar medium	38.333	53.33	70.00	Black
9	Raddish potato dextrose agar medium	21.00	30.00	40.00	Light brown
10	Malt dextrose agar medium	30.00	32.66	58.83	Light brown
11	Czapex dextrose medium	18.33	30.00	60.00	Light black
12	Water agar medium	14.00	31.00	36.83	Black
13	Potato dextrose agar medium	36.66	63.33	90.00	Black
14	Potato leaf dextrose agar medium	26.66	52.33	68.33	Dark Brown
15	Tomato leaf dextrose agar medium	23.33	38.33	51.66	Dark Brown

Sem ±	**1.55**	**1.68**	**1.54**
CD at 5%	**4.50**	**4.87**	**4.47**

Earlier Ansari *et al.,* (1988) found that *Alternaria brassicae* growth sporulates well on range of media but maximum growth was recorded in PDA.Mehta and Sangwan (1998) found that mustard leaf extract media was compared favorably with other 12 other culture medium for the growth and sporulation of *A. brassicae.*

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