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Research article

EVALUATION OF CULTURE MEDIA FOR MYCELIAL AND SPORANGIAL PRODUCTION OF *PHYTOPHTORA COLOCASIAE*.

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ABSTRACT: Eight different culture media were used to determine where *Phytophthora colocasiae* would bet grow and reproduce. Mycelia growth of 86 mm, 79.6 mm, 80.6 mm, 72 mm and 50 mm growth of *P. colocasiae* were obtained in Carrot Agar, Carrot Potato Agar (CPA) medium, Papaya Sucrose Agar, Host leaf extract agar, Oat meal agar respectively. *P. colocasiae* grown on Carrot agar for 4-7 days gave Carrot agar was supplement the nutrients to *Phytophthora* spp. to enhanced production of sporangial growth.
Key words: Culture media, Mycelial, Sporangial, Phytoptora

INTRODUCTION

Taro (*Colocasia esculenta* (L.) Schott) a tropical aroid is an important staple crop in the developing countries especially in Africa and South East Asian countries. It is widely cultivated in South Africa, Asia, Oceania, Central Africa, West Indies and the islands of the Caribbean and Central America (Chandra, 1984). Leaf blight caused by *Phytophthora colocasiae* Raciborski is the most important disease of Taro and was recorded for the first time by Butler and Kulkarni (1913) in India. Leaf blight has become a limiting factor for production in all taro growing areas in India moderate to severe form causing 25% to 50% yield loss every year (Misra, 2007). Leaf blight disease is prevalent in almost all the major taro growing districts of Andhra Pradesh with varying intensities on different varieties causing yield loss of 10-55 per cent (Laxmi *et al.* 2012). The disease appears with the onset of monsoon and spreads the entire field during rainy season through zoospores and sporangia (Misra *et al.*, 2007).reports have revealed, however, that *P. colocasiae* is relatively short lived in infected leaf tissue. Like any other foliar pathogen of taro. The fungus seems to have a poor competitive saprophytic ability. This contributes to the lack of success in isolating and growing *P. colocasiae* in an artificial medium. In order to culture the fungi in the laboratory, it is necessary to supplement in the medium, those essential elements and compounds needed for their growth and other metabolic processes. Neither all media are equally good for all fungi nor there will be an artificial medium on which all fungi grow. Hence different media were tried in the present investigation to select the best medium suitable for the growth of the pathogen.

MATERIALS AND METHODS

Isolation and identification of the pathogen

Diseased leaves showing typical symptoms of Taro plants were collected from different Taro growing areas of Andhra Pradesh (ARI, Rajendranagar, Hyderabad, East and West Godavari districts). These leaves were put in sterilized polythene bags and brought to the laboratory for isolation and identification of the organism involved.

Taro leaves showing typical symptoms of the disease were selected and washed with sterile water. Small bits of diseased tissue along with some healthy tissue were cut with the help of a sterile scalpel and surface sterilized with 1% sodium hypochlorite solution for 1 minute. The surface sterilized leaf bits were transferred aseptically into sterilized Petridishes containing solidified Potato Dextrose Agar and incubated at 180±2^{0}C in incubator for mycelial growth. After 3 days of incubation mycelial growth was absorbed along with diseased leaf bits. Hyphal tips from the advancing mycelia were transferred to the Water agar medium. The isolated pathogen was identified as *Phytophthora colocasiae* based on its mycelial and sporangial characters through standard mycological keys (Waterhouse 1963; Hemmes, 1993) and by CMI descriptions.

Composition of different media

a)	**Potato Dextrose Agar (PDA)**		
	Peeled potato slices	:	200 g
	Dextrose	:	20 g
	Agar agar	:	20 g
	Distilled water	:	1000 ml
b)	**Carrot Potato Agar (CPA)**		
	Carrot	:	150 g
	Peeled potato slices	:	50 g
	Dextrose	:	20 g
	Agar agar	:	20 g
	Distilled water	:	1000 ml
c)	**Carrot Agar (CA)**		
	Carrots	:	200 g
	Agar agar	:	20 g
	Dextrose	:	20g
	Distilled water	:	1000 ml
d)	**V-8 Juice Agar (V-8)**		
	V-8 vegetable juice	:	200 ml
	Agar agar	:	20 g
	Distilled water	:	800 ml
e)	**Host Leaf Extract Agar (HLEA)**		
	Colocasia leaves	:	200 g
	Dextrose	:	20 g
	Agar agar	:	20 g
	Distilled water	:	1000 ml
f)	**Corn meal agar (CMA)**		
	Maize meal	:	30 g
	Agar agar	:	20 g
	Distilled water	:	1000 ml
g)	**Papaya Sucrose Agar (PSA)**		
	Peeled papaya slices	:	400 g
	Agar agar	:	20 g
	Sucrose	:	20 g
	Distilled water	:	1000 ml

Each prepared medium was initially cooked using a pressure cooker and thoroughly mixed. The medium was transferred to flasks, plugged with cotton and sterilized using an autoclave at 15 psi for 15 min.

CULTURAL GROWTH

Mycelia discs from water agar culture transferred to different culture media (Potato Dextrose Agar (PDA), Carrot Potato Agar (CPA), Carrot Agar (CA), Papaya Sucrose Agar (PSA), Oat Meal Agar (OMA), Host Leaf Extract Agar (HLEA), Corn Meal Agar (CMA) and Water Agar (WA)) and incubated for one week. Data on mycelia growth were recorded.

RESULTS AND DISCUSSION

The radial growth of the pathogen *Phytophthora colocasiae* on different media was recorded 7 days after inoculation and the results are presented in Table. The results revealed that among all the media tested, maximum radial growth of the pathogen was recorded on Carrot Agar (86 mm), followed by Papaya Sucrose Agar (PSA) medium (80.6mm), Carrot Potato Agar (CPA) medium (79 mm), Host Leaf Extract Agar (HLEA) medium (72.0 mm) and Oat Meal Agar (OMA)were recorded 52.0 mm radial growth. Whereas minimum growth of the pathogen was recorded on PDA medium (22 mm) and Corn Meal Agar medium (29 mm). Carrot agar was supplement the nutrients to *Phytophthora* spp. to enhanced production of sporangial growth. Hence the pathogen was maintained on carrot agar medium for conducting further studies.

Table. Effect of different media on radial growth of *Phytophthora colocasiae*

S. No.	Name of the media	Radial growth (mm)
1	Carrot agar	86.0
2	Carrot potato agar	79.6
3	Papaya sucrose agar	80.6
4	Host leaf extract agar	72.0
5	Oat meal agar	52.0
6	Potato dextrose agar	22.0
7	Corn meal agar	28.6
8	Water agar	50.6
	CD at 5%	5.92
	SEm±	11.70
	CV%	5.79

Palomar et al., 1999 was studied different artificial media for sporsngisl production of *Phytophthora colocasiae* they reported V-8 juice agar was best medium for growth and reproduction. In their study V8 juice agar was given 83.47 mm of mycelia growth compare to other media viz., V8 juice agar II(79.90 mm), Onion agar (OA)(76.90 mm), Potato dextrose agar (PDA) (51.46 mm) (Figure-1).

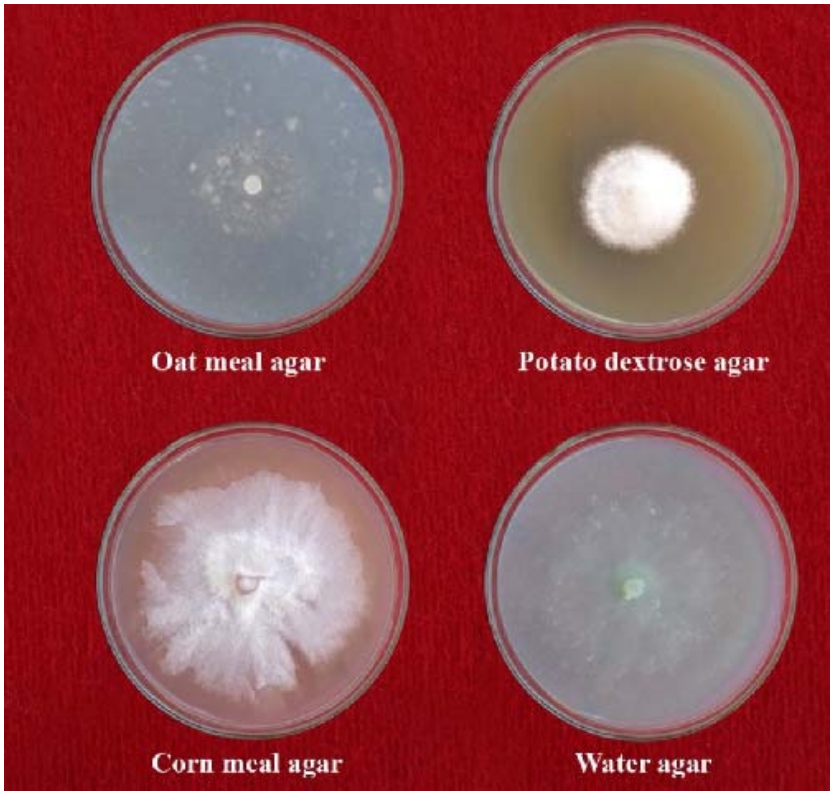

Figure-1: Effect of different media on radial growth of *Phytophthora colocasiae*

CONCLUSION

Based on the results mentioned earlier. Carrot Agar mediuj is recommended instead of Potato Dextrose and V8 juice agar for sporangial and mycelia production of *P. colocasiae*. Another advantage of using Carrot agar is the low cost of preparation.

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