

IN VITRO STUDY OF TOMATO EARLY BLIGHT EFFECT OF CULTURE FILTRATES OF *P. FLUORESCENS* ON THE MYCELIAL GROWTH AND MYCELIAL DRY WEIGHT OF *A. SOLANI* (EARLY BLIGHT OF TOMATO)

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ABSTRACT

The present investigation on "*In vitro* evaluation of culture filtrates of *P. fluorescens* on the mycelia of *A. solani* (Early Blight of Tomato). It was carried out in the laboratory of plant pathology , Uttaranchal University, Uttarakhand. Among the several diseases in tomato, early blight of tomato is one the most destructive disease. Which cause heavy losses in fruit yield of tomato. In this study was to evaluate the culture filtrates of *P. fluorescens* on the mycelia of *A. solani* at *invitro* condition.

INTRODUCTION

Tomato (*Solanum lycopersicum* L. syn: *Lycopersicon esculentum* Mill) is a very important vegetable crop from Solanaceae family and grown worldwide (Tolentino *et al.*, 2011) and is the second most important vegetable after potato (Gondal *et al.*, 2012). Tomato is used for local consumption due to its high nutritive values, antioxidant and curative properties (Sahu *et al.*, 2013). Tomato plants are highly susceptible to early blight infection (Chaerani *et al.*, 2007). This disease affects crop production as they cause premature defoliation and result in heavy losses in production by reducing quality and quantity of fruit (Holm *et al.*, 2003). Crowded plantation, high rainfall and extended period of leaf wetness are responsible factors to induce disease development (Gondal *et al.*, 2012). It was well established that the tomato early blight fungus could survive on the infected seeds for several days. *Alternaria* blight affects plant by reducing photosynthetic area which is very difficult to control (Paschee *et al.*, 2004). Failure to control this disease can cause reduction in yield (Malik *et al.*, 2014). The present study was to evaluate the culture filtrates of *P. fluorescens* on the mycelia of *A. solani* at *invitro* condition.

MATERIALS AND METHODS

Preparation of the culture filtrate *P. fluorescens*

The effective *P. fluorescens* isolates were inoculated into Erlenmeyer flasks containing 50 ml of sterile King's B broth and kept on a rotary shaker at 100 rpm for 48 h. The cultures were then filtered through bacteriological filter under vacuum and the filtrate thus obtained was used for the studies.

In vitro evaluation of culture filtrates of *P. fluorescens* on the mycelia of *A. solani* (Liquid medium assay)

50 ml of PDA broth taken in 250 ml Erlenmeyer flasks were sterilized and amended with culture filtrates of (*P. fluorescens*) at different concentrations like 10,20,30,40 and 50 per cent and inoculated with mycelia disc (9mm) of *A. solani* collected from the periphery of seven days old culture. The flask amended with Mancozeb (0.1%) was used for comparison and a suitable control was also maintained. The flasks were incubated for 10 days at room at $28 \pm 2^{\circ}\text{C}$ and thereafter, filtered through filter paper Whatman no. 42 in vacuum. The dry weight of mycelial biomass was recorded in mg.

RESULT AND DISCUSSION

Effect of culture filtrates of *P. fluorescens* on the mycelial growth and mycelial dry weight of *A. solani*

The results of the *in vitro* studies conducted to find out the effect of culture filtrate of *P. fluorescens* on the mycelial growth and mycelial dry weight of *A. solani* are summarized in table 5. The results revealed an increasing trend in the per cent inhibition with an increase in the conc. of culture filtrate of *P. fluorescens*. The flasks inoculated with pathogen and amended with culture filtrate of *P. fluorescens* recorded significant reduction in the mycelial dry weight whereas, the flasks inoculated with *A. solani* alone (control) recorded the maximum mycelial dry weight (303.91mg). The minimum mycelial dry weight (02.01 & 01.65mg) of *A. solani* was recorded in 50 per cent conc. of the culture filtrate of *P. fluorescens* and 0.2 % mancozeb respectively.

In solid media, the culture filtrate of *P. fluorescens* at 50 per cent conc. completely inhibited the mycelial growth of *A. solani* which was statistically on par with mancozeb. Among all conc. used, *P. fluorescens* @ ten per cent conc. was found to be the least effective (60.74%).

The mycelial growth and mycelia dry weight of *A. solani* was found reduced with an increase in the concentration of culture filtrates of all the isolates tested and the reduction was significantly the

maximum in *P. fluorescens* at all the conc. tested (Table 1). Krishna and Pande, (2005) made similar such observations. Perusal of literature revealed the inhibitory effect of *P. fluorescens* against various fungal pathogens (Sundaramoorthy and Balabaskar, 2012; Toua *et al.*, 2013; Sivasakthi *et al.*, 2014). The results of the present investigations were confirmed by the above reports.

CONCLUSION

This experiment concluded that, the culture filtrate of *P. fluorescens* at 50 % conc. completely inhibited the mycelial growth, mycelial dry weight and conidial germination of *A.solani*.

Table 1 : Effect of culture filtrates of *P. fluorescens* on the mycelial growth and mycelial dry weight of *A.solani*

Tr. No	Conc. Of the culture filtrate (%)	Solid medium assay		Liquid medium assay	
		Mycelial growth (mm)	Per cent decrease over control (%)	Mycelial dry weight (mg)	Per cent decrease over control (%)
1.	10	35.33	60.74	179.28	41.00
2.	20	27.13	69.85	98.25	67.67
3.	30	10.34	88.51	28.89	90.49
4.	40	NG	100.00	1.98	99.34
5.	Manozeb 75 % WP (0.1%)	NG	100.00	1.65	99.45
6.	Control	90.0	-	303.91-	
7.	SED CD (p=0.05)	0.73	-	0.98	-
		1.05		2.11	

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