J. Phytol. Res. 24(2) : 249-250, 2011

EFFECT OF BIO CONTROL AGENTS ON THE GROWTH OF SEED-BORNE FUNGI OF PEA *(PISUM SATIVUM L.)*

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Among three antagonists, *Trichoderma harzianum* gave increased inhibition percentage of mycelial growth in all the tested five seed-borne fungi of pea. Maximum inbibition percentage was observed in *Fusarium oxysporum f.sp. pisi.*

Keywords : Pea; *Pseudomonas fluorescens;* Seed-borne pathogens; *Trichoderma viride; T. harzianum.*

Pea *(Pisum sativum* L.) is an important legume and vegetable crop. It is widely cultivated through out the world. One of the major constraints in the pea production is the attack of various diseases at different stages of growth including seed-borne diseases, which causing considerable yield losses[1,2]. Synthetic chemicals (fungicides) do not provide adequate control of the pathogen, besides being toxic to human and animal health. Alternatively, suitable antagonistic biological agents can check the spread of the pathogen and disease in effective way. This research was conducted to search for suitable fungal/bacterial organism (s) antagonistic to seed mycoflora of pea using *Trichoderma harzianum, T.viride* and *Pseudomons fluorescens.*

Laboratory tests with biocontrol agents consisted of growing the test fungi in sterilized Petri plates on Potato Dextrose Agar medium (PDA). Antagonist *T. viride* and *T. harzianum* were also grown on PDA medium in sterilized Petri plates and *Pseudomonas fluorescens* was grown on King's medium.

Poisoned food technique : The antagonists *T. viride* and *T. harzianum* were tested against pathogenic fungi. Seven days old culture of the biocontrol agents and pathogen were used in the experiment. The antagonist was inoculated on one side of the Petri plate (each containing 20ml PDA) and the pathogen was inoculated near the centre of Petri plate. Each treatment replicated three times having three plates in each replication. The Petri plates were incubated at 25±2°C for 5 days. After incubation, the size of the inhibition zones were measured for the difference between growth of pathogen and the antagonists. Per cent inhibition of growth was calculated by using the following formula[3].

I=C-T/C X 100 Where, I = Per cent inhibition, C=Mycelial growth in control (mm), T= Mycelial growth in treatment (mm)

For bacterial antagonist *(Pseudomonas fluorescens),* sterilized Petri plates (containing 20ml PDA) were inoculated with 7 days old culture of pathogen. The Petri plates containing the fungus were then streaked with *P. fluorescens.* These Petri plates were incubated at 25± 2°C for 72h. Inhibition zone was measured by comparing with control.

The data (Table 1) revealed that all the antagonist gave increased percentage inhibition of mycelial growth. *Pseudomons fluorescens* was found most effective in, reducing mycelial growth of *A. alternata* (69.44%). *T. harzianum* and *T.viride* caused maximum growth inhibition of all tested five fungi.

In the present investigation among all three antagonists *T. harzianum* was found superior against *F. oxysporum* f sp. *pisi, A. alternata* and *M. phaseolina* while *T.viride* was best against *R. solani* and *A. niger.* Inhibition of the fungus growth may be either due to the production of toxin by the *Trichoderma* spp. or coiling of hyphae against the hyphae of pathogenic fungi[4]. Velikanov *et al.*[5] observed that *T. aureoviride, T. harzianum, T.viride, Gliocladium virens* gave effective management of root rot of pea caused by *Rhizoctonia solani.*

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Table 1. Effect of biocontrol agents on mycelial growth of pathogenic fungi of pea.

S.N.	Fungi	Per cent Inhibition (PI)* in mycelial growth		
		Pseudomonas fluorescens	*Trichoderma harzianum*	*Trichoderma viride*
1.	*Alternaria alternata*	69.44 (56.44)	88.89 (70.53)	86.67 (68.59)
2.	*Aspergillus niqer*	23.50 (29.00)	39.99 (39.22)	53.33 (46.91)
3.	*Fusarium oxysporum f.sp. pisi*	69.06 (56.20)	91.19 (72.73)	65.55 (54.06)
4.	*Macrophomina phaseolina*	26.66 (31.08)	87.81 (69.56)	55.55 (48.19)
5.	*Rhizoctonia solani*	42.22 (40.52)	52.22 (46.27)	67.79 (55.42)
	Control	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
	S Em ±	0.498	0.635	0.463
	CD at 5%	1.478	1.887	1.377
	CD at 1%	2.026	2.585	1.886
	CV %	2.80	2.55	2.04

*Average of three replications

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