

Control of fungi associated with green gram seeds by using *Trichoderma* species

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Abstract

In the recent years, the biological control has received a worldwide attention and is being integrated effectively with other pesticides. Moreover, in the context of environmental pollution the use of biological agents is considered quite safe. Three *Trichoderma* species viz. *T. viride*, *T. harzianum* and *Trichoderma* sp. (Local) were evaluated against *Aspergillus niger*, *A. flavus*, *Alternaria tenuis*, *Fusarium oxysporium*, *Penicillium citrinum*, *Drechslera longirostrata* and *Fusarium solani*. All the *Trichoderma* species were effective against above pathogens but *Trichoderma* (Local) proved to be superior for inhibition of the above pathogen as compared to other *Trichoderma* species.

Keywords: Seed mycoflora, antagonist, *Trichoderma* species

INTRODUCTION

Among the greatest hazards in crop production, fungi associated with seeds are the main problem. These fungi can reduce crop yields with suddenness. For combating fungi associated with seeds, successful chemical treatment has been developed over the years. Though chemicals have played a significant role in maximizing crop productivity, they are causing harmful and undesirable effects not only on man and wild-life, but on the whole ecosystem. With the increasing awareness of the problems and expense of conventional methods of fungi control, biological control of seed borne pathogens has many attractions. Biological control mainly consist of using a micro-organisms to control harmful micro-organisms causing plant disease without disturbing the ecological balance. The biological control of root diseases of crop plants by introduction of antagonistic microorganism has been suggested as an environmentally safer alternative to the use of fungitoxic chemicals [1]. In the present investigation, the biocontrol of *Trichoderma* species against some seed pathogenic fungi was studied under laboratory conditions.

MATERIALS AND METHODS

Detection of Seed Mycoflora

The seed mycoflora was isolated by using different methods such as Standard blotter paper method, Agar plate method, Rolled paper towel method and Seed plate as recommended by International Seed Testing Association ISTA (1966) [2] and Neergaard (1973) [3].

Table 1. Fungi associated with seeds of green gram (*Vigna radiata* L.)

Sl.No.	Name of Fungi	Percent (%) incidence of Mycoflora		
		Standard blotter paper	Agar plate	Seed washates
1	<i>Aspergillus flavus</i>	20	30	15
2	<i>Aspergillus niger</i>	29	34	25
3	<i>Alternaria tenuis</i>	30	40	20
4	<i>Fusarium oxysporum</i>	48	50	40
5	<i>Fusarium solani</i>	15	22	10
6	<i>Drechslera longirostrata</i>	15	20	10
7	<i>Penicillium citrinum</i>	0	5	0

Biological control

Antagonistic property of fungi were tested by Dual culture technique for fungi. It consists of growing the test organism and pathogenic organism on the same plate. Twenty ml of PDA medium was poured in each petriplates. 9 mm mycelial disc of actively growing colonies of pathogenic culture was placed from the margin of the near the periphery on one side of the PDA plate.

Then 9 mm mycelial disc of test organism (*Trichoderma harzianum*, *Trichoderma viride* and *Trichoderma local*), was placed on the other side of same plate opposite to the first disc i.e. at an angle of 180°C. Petriplates were incubated at 28± 1°C.

RESULTS AND DISCUSSION

Three species of *Trichoderma* were tested for their antagonistic nature against *Aspergillus niger*, *A. flovus*, *Alternaria tenuis*, *Fusarium oxysporium*, *Penicillium citrinum*, *Drechslera longirostrata* and *Fusarium solani*. The results from table 2 clears that all the fungi associated with green gram seeds were found to be significant in inhibition of fungal growth in the presence of *Trichoderma* spp. Among these antagonist *Trichoderma* sp. (local) proved to be stronger antagonistic as compared to other species of *Trichoderma*. It was observed this was the possible mechanism of bioagents in controlling fungi. In the present study it also clearly

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evident that antagonistic effects of all three *Trichoderma* Spp. against fungi associated with seeds of green gram.

Table 2. Antagonistic activity of *Trichoderma* sp. against fungi associated with gram seeds (after 7 days)

Sl. No.	Plant pathogenic Fungi	Control (Growth of fungus in mm without <i>Trichoderma</i> species)	% inhibition of fungal growth due to <i>T. viride</i>	% inhibition of fungal growth due to <i>T. horzianum</i>	% inhibition of fungal growth due to <i>T. Local</i>
1.	<i>Aspergillus niger</i>	87.00	71.43	81.57	86.89
2.	<i>A. flavus</i>	71.00	63.57	71.00	73.23
3.	<i>Alternaria tenuis</i>	47.00	36.00	51.00	51.00
4.	<i>Fusarium oxysporium</i>	75.00	60.15	61.25	62.675
5.	<i>Fusarium solani</i>	68.00	61.76	61.71	63.57
6.	<i>Penicillium citrinum</i>	72.10	55.32	78.10	72.00
7.	<i>Drechslera longirostrata</i>	74.00	63.33	60.00	55.10

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