J. Mycopathol. Res.36(1) :49-50 (1998) Printed in India
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Control of *Macrophomina phaseolina* infection of jute

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A varied group of chemicals in the nature of phytoalexin inducers for different plant species were tested, mostly at dilute concentration, for their possible effect in controlling *Macrophomina phaseolina* infection of jute. Chemicals like indole acetic acid and chitosan, a biological compound, significantly reduced the disease incidence and increase fibre yield as compared to the control treatment.

Key words : Jute, *Macrophomina phaseolina*, non-conventional compounds, seed treatment, symptom reduction

INTRODUCTION

Macrophomina phaseolina (Tassi) Gold is one of the most important fungal pathogen which causes variety of symptoms like seedling blight, stem rot, collar rot and root rot on jute in West Bengal. Chemical control of this disease with conventional fungicides has been tried earlier with some success (Das, 1978; Das and Mohanty, 1985). Information is now available that treatment with diverse group of unconventional chemicals with little or no direct toxicity can significantly reduce symptom expression in many crop diseases and restrict resultant damage within tolarable limits (Lazarovits, 1988; Sinha, 1989). In that contest, it seemed that such unconventional chemicals might be useful in the control of *M. phaseolina* infection of jute. The present paper reports the observations recorded from studies with a widely divergent group of chemicals on *M. phaseolina* infection of jute.

MATERIALS AND METHODS

Seeds of jute (cv.JRC 212) were treated with unconventional chemicals viz. 2,4-Dichlorophenoxy acetic acid (10^{-6}M), Indole-3-acetic acid (10^{-3}M), Cupric chloride (10^{-3}M), Lithium sulphate (10^{-3}M) and biological compound, Chitosan (0.03%) for 12 h and before sowing in the field, seeds were dried on the floor. Seeds were sown in kharif season in 1994 and 1995 in 6 m X 3 m plot with four replication in a randomized manner. The fertilizers were applied as $N_{60}P_{30}K_{30}$ kg/ha and appropriate agronomic practices were followed. Percentage of infected plants were recorded twice i.e. at seedling stage (21 days after sowing) and at harvesting stage (120 days after sowing).

RESULTS AND DISCUSSION

From Table 1, it was evident that at seedling stage, chemicals like IAA, Cupric chloride and Chitosan had significantly (P=0.01) reduced disease as compared to the control plants. Other chemicals like 2,4-D and Lithium sulphate had no effect on disease incidence. At harvesting stage, the protective effects recorded were in general less pronounced than that recorded in seedling stage. The results showed the same trend both in 1994 and 1995 crop seasons. The treatments like IAA, Cupric chloride and Chitosan recording very significant increases in fibre yield were also the ones that reduced collar rot symptoms substantially. Among the different treatments, Chitosan showed best results in all aspects. The same compound showed inhibitory effect on symptom expression in pea plants against *Fusarium solani* (Hadwiger and Beckman, 1980). Such compounds merit further exploration.

Table 1. Effect of seed treatment with unconventional chemicals on *Macrophomina phaseolina* infection of jute

Treatment	Percentage of infected plants				Yield of fibre (q/ha)	
	1994		1995		1994	1995
	Seedling	Harvesting	Seedling	Harvesting		
Control(Water)	16.1	19.6	18.9	19.3	18.1	19.6
2,4-D (10^{-6}M)	13.8	17.2	17.4	19.9	19.6	19.7
IAA (10^{-4}M)	6.1	14.9	3.4	15.8	22.1	22.5
Cupric chloride(10^{-3}M)	7.7	15.2	6.8	14.9	22.7	22.9
Lithium sulphate(10^{-3}M)	16.9	19.3	17.5	18.5	18.1	20.4
Chitosan (0.03%)	4.9	13.6	4.9	13.9	22.4	22.9
C.D. (P=0.05)	3.55	0.92	2.87	2.38	0.94	0.95
C.D. (P=0.01)	4.98	1.29	4.02	3.33	1.32	1.34

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(Accepted for publication 30 May 1997)