J. Mycopathol. Res. **42**(2) : 249-250 (2004)

In-vitro assessment of some fungicides, plant oils and *Trichoderma viride* against *Sclerotium rolfsii* causing collar rot of groundnut

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In-vitro assessment of some fungicides, plant oils, and *Trichoderma viride* in inhibiting mycelial growth of *Sclerotium rolfsii* was made. Among the fungicides, Bavistin (0.01%) + Score (0.01%) (carbendazim + Difenoconazole 25% EC) gave the best result in mycelial growth inhibition of (97.18%), followed by Bavistin, Score and Indofil. Limon oil, Citronell oil, Neem oil and Parmarasa oil also showed considerable inhibitory effect on mycelial growth of *S. rolfsii*. Inhibitory effect of *Trichoderma viride*, was considerably lesser.

Key words : Groundnut, *Sclerotium rolfsii*, fungicides, plant oils, *Trichoderma viride*

INTRODUCTION

Groundnut (*Arachis hypogaea*) is one of the most important oilseed crops grown in different parts of the world. The crop is affected by *Sclerotium rolfsii* (Sacc.) causing mainly collar and stem rot symptoms. It may also infect the foliage and causes leaf spot symptoms. Application of pentacholoronitrobenzene (Brassicol) in soil @ 15-20 kg ha^{-1} has been reported to control the disease. (Sharma *et al.* 1990). But it is unavailable in market. The persent study was undertaken to assess the efficacy of some fungicides, plant oils and *Trichoderma viride* in inhibiting mycelial growth of *S. rolfsii.*

MATERIALS AND METHODS

The small, brown to black coloured round sclerotia were collected from infected groundnut plants. After surface sterilization in sodium hypochlorite solution the sclerolia were placed on PDA and incubated at 28±1°C for three days. The sclerotia produced on fresh cultures thus prepared were used for experiment.

Poisoned food technique (Nene and Thapliyal, 1979) was used to study comparative efficacy of fungitoxicants. Fungicides used were Score (Difenconazole 25% EC). Mancozeb 75WP (Indofil-M-45) and Carbendazim 50WP (Bavistin). Lemon oil, Citronella oil, Pamorosa oil, Neem oil, Karanja oil, Jara oil were the plant oils used. Beside *Trichoderma viride* @0.01, 0.02, 0.03 per cent respectively of formulation was used. Fungitoxicant in different doses, suspended in measured distilled water was added aseptically to sterilized and melted PDA kept around 40°C in petridishes. The medium without fungitoxicant served as control. The petridishes were inoculated with 3 to 5 fresh sclerotia form a seven day old culture of the fungus grown on PDA. Each treatment was replicated three times and the inoculated petridishes were incubated at 28±1°C. The observations on the colony diameter were recorded after ten days of incubation and the per cent inhibition of mycelial growth was calculated (Vincent, 1947).

RESULTS AND DISCUSSION

All the test of fungicides, plant oils, and biocontrol

agent exhibited fungitoxic properties. Among the fungicides, Score was found to be most effective in inhibiting mycelial growth of *S. rolfsii,* and efficacy of Score increased when Bavistin was added (Table 1).

Table 1 : Efficacy of fungicides and biocontrol agent against *Sclerotium (Corticium) rolfsii.*

Treatments	Concentration (Per cent)	Radial mycelial Growth (mm)	Per cent mycelial growth inhibition over control
Score (Difenoconazole 25% EC)	0.01	6.5	92.67
Score (Difenoconazole 25% EC)	0.015	5.5	93.79
Score (Difenoconazole 25% EC)	0.02	6.8	92.33
Score (Difenoconazole 25% EC)	0.03	6.0	93.23
Indofil	0.015	14.67	83.45
Bavistin (Carbendazim)	0.01	61.67	30.44
Bavistin (Carbendazim)	0.015	66.17	25.37
Bavistin (Carbendazim)	0.02	8.5	90.41
Bavistin+Score (Carbendazim + Difenoconazole 25% EC))	0.01+0.01	2.5	97.18
Bavistin+Indofil (Carbendazim + Mancozeb)	0.01+0.015	19.0	78.57
Lemon oil	0.01	5.33	93.98
Citronella oil	0.01	9.67	89.09
Karanja oil	0.01	20.0	77.44
Neem oil	0.01	5.0	94.36
Pamorosa oil	0.01	5.17	94.16
Jara oil	0.01	48.33	45.49
Trichoderma viride		35.0	60.52
Control		88.67	
SEM (±)		1.95	
CD (P = 0.05)		3.98	

Except Karanja and Jara oil, radial mycelial growth of *S. rolfsii* in all other plant oils was statistically at per at 0.01 per cent concentration and the mycelial growth inhibition over control varied from 89.09 to 94.36 per cent. The biocontrol agent *Trichoderma viride* inhibited mycelial growth by 60.52 per cent over control.

Although chemical fungicides may be very effective in inhibiting a fungus, but large scale use of these chemicals may lead to environmental hazards. So, products like plant oils, biocontrol agents etc. have promising future due to their strong fungitoxicity, readily available sources, and ecofriendlyness.

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(Accepted for publication April 15, 2004)