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EFFECT OF NEEM SEED COAT OIL FRACTIONS ON STORED GRAIN FUNGI

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ABSTRACT

Neem seed coat oil fractions were evaluated for their efficacy against three grain storage fungi i.e. *Aspergillus flavus, A. fumigatus* and *A. wentii* and one soil fungus *Alternaria tenuis.* The neem oils significantly inhibited the growth of *A. flavus* than other three fungi.

Key-words: Neem seed coat, oil fraction, storage grain fungi, fungicidal activity

INTRODUCTION

Plant extracts have proved quite successful for controlling certain plant diseases Carlos and Doughs (1948) were the first to determine the antimicrobial activity of extracts of certain higher plants. Dharamvir and Sharma (1985) reported the antifungal activity of neem against *Alternaria tenuis* and noted that fungal activity decreased by increasing the concentration of neem oil extracts. Vir and Sharma (1985) found that 10% concentration of neem oil gave 100% fungal growth inhibition of *Aspergillus niger, Drechslera rostrata, Fusarium moniliformis* and *Macrophomina phoseolina.* According to Dwivedi and Dubey (1986), extract of neem oil showed fungicidal effects against sclerotial fungi. Singh and Singth (1981) observed strong fungicidal activity of neem oil on germination and conidial germ tube growth of *Erysiphe polygoni.*

MATERIALS AND METHODS

Test organisms

Anti-fungal activity was tested against 4 common pathogenic fungi of wheat, namely *A. tenuis, A. flavus, A. fumigatus* and *A. wentii.* All these four species were isolated from infested wheat grain and their cultures were maintained on Sabourad's Dextrose Agar

Fungicidal Activity

Neem oil and neem seed coat fractions (extracted with hexane on a soxhiet's extraction apparatus) were studied for their antifungal properties against above 4 mentioned fungi by agar diffusion plate method. Required amounts of plant extracts were dissolved in pure acetone and thoroughly mixed with melted sabourad's Dextrose Agar to provide 0.1, 0.05 and 0.025% concentrations. About 10ml treated or untreated medium was poured into Petri plate (dia. 70mm). Seven days old inocula discs each of the above four fungi maintained in the laboratory were placed in the centre of each Petri plate. The inoculated Petri plates were incubated at room temperature for seven days. The daily radial growth of the fungal colonies was measured.

RESULTS AND DISCUSSION

Neem oil and neem seed coat fractions (NGI-NG5) tested by agar diffusion method caused significant reduction in the growth of *A. tenuis. A. flavus, A. fumigatus* and *A. wentii.* Neem oil was quite effective against *A. tenuis, A. flavus and A. wentii.* Neem fractions (NGI-NG5) caused significant reduction in the growth of the test fungal species (Table 1). NG3 and NG4 were comparatively more effective than other fractions. However, NG2 was the most effective against *A. fumigatus* while *A. wentii* was the most susceptible to neem seed coat fraction in the reduction of fungal growth. Growth inhibition was dependent on the concentration of the test fraction in the agar medium. Thus present studies confirm those reported by Dharmavir and Sharma (1985) who found antifungal activity in neem oil against *Alternaria tenuis* and *Aspergillus* species.

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Table 1. Growth of Four Fungal Species in Agar Medium Treated with Neem Seed Fractions at Different Concentrations.

		Fungal Growth (cm)			
Neem seed coat fractions	Conc.%	*Alternaria tenuis*	*Aspergillus flavus*	*Aspergillus fumigatus*	*Aspergillus wentii*
Neem Oil	0.1	1.30 ghi	0.97 g	1.07 gh	1.00 hi
	0.05	1.63 efg	1.17 g	2.70 cde	1.20 gh
	0.025	2.00	1.23 g	3.30 ab	1.47 ab
NG 1	0.1	2.33 c-f	2.33 bc	2.13 f-i	1.40 ijk
	0.05	1.70 ghi	2.63 b	2.27 eh	1.60 hhij
	0.025	2.37 cde	2.63 b	2.73 bc	2.47 ab
NG 2	0.1	2.10 dg	1.93 de	1.83 jk	1.47 jk
	0.05	2.70 bc	1.57 e	1.83 ijk	2.30 bc
	0.025	3.07 ab	2.60 b	2.40 cde	2.37 b
NG 3	0.1	1.77 f-i	1.93 de	1.43 i	1.360 k
	0.05	2.03 a-h	2.07 cd	2.03 h-k	1.70 g-j
	0.025	2.67 bc	2.53 b	2.37 e-f	2.13 cd
NG 4	0.1	1.30 i	1.83 de	1.67 kl	1.73 f-i
	0.05	1.90 e-h	1.97 cd	2.13 g-j	1.77 e-h
	0.025	2.50 bcd	1.90 de	2.37 d-g	1.90 def
NG 5	0.1	1.83 f-l	2.33 bc	2.63 bcd	1.80 efg
	0.05	1.53 hi	2.57 b	2.80 b	1.97 de
	0.025	2.20 c-g	3.10 a	3.23 a	2.07 cd
Control	0	3.37 a	3.16 a	3.27 a	2.70 a

Similar letters in each column are not significantly different from each other at $p<0.05$ according to DMRT.

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