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EFFICACY OF SEED DRESSING WITH EXTRACTS OF NEEM AND PERSIAN LILAC AGAINST *MELOIDOGYNE INCOGNITA* AND *ROTYLENCHULUS RENIFORMIS*

by
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Root-knot and reniform nematodes are among the major nematode pests of vegetables in Northern India. They have been controlled by the soil application of various organic amendments including oil-seed cakes of neem (margosa) (*Azadirachta indica* A. Juss.). Singh *et al.* (1980) have claimed significant reduction of root-knot development on tomato by seed dressing with neem cake. In the present study we have tested the feasibility of the use of crude extracts of different parts of neem and an allied species, Persian lilac (bakain) (*Melia azedarach* L.) as seed dressings against *Meloidogyne incognita* (Kofoid *et* White) Chitw. and *Rotylenchulus reniformis* Linford *et* Oliveira.

Materials and methods

Different plant parts of neem and Persian lilac (leaves, flowers, fruits and bark) were thoroughly washed, chopped and 25 g of each comminuted in a grinder and then soaked in 75 ml of distilled water for 24 hr. Then, after thorough mixing, these were centrifuged, filtered and the extracts arbitrarily termed as standard (S). Gum from both the test plants was additionally included for comparisons and a 10% (w/v) concentration was prepared in distilled water. Seeds of tomato (*Lycopersicon esculentum* Mill. cv. Pusa Ruby), eggplant (*Solanum melongena* L. cv. Pusa Purple Long) and okra [*Abelmoschus esculentus* (L.) Moench. cv. Pusa Sawani] were thoroughly mixed with different extracts to give a uniform and smooth

coating over the seeds. The treated seeds were then spread in an enamel tray and allowed to dry in the shade before sowing. Excepting okra, the treated as well as untreated seeds were then sown in earthern pots containing sterilized soil. The pots were watered daily and were kept on glasshouse benches (temperature = 28±2°C).

Three-week old seedlings were transplanted singly in 1 kg sterilized soil contained in 15 cm clay pots. After two days the seedlings were inoculated with different inoculum levels of the reniform nematode, *R. reniformis* and second stage juveniles of the root-knot nematode, *M. incognita*. In the case of okra, the seeds were directly sown after treatment with the extracts and the pots were inoculated when the plants were 3 weeks old. There were three replicates for each treatment.

After three months the plants were uprooted and washed. In the case of *M. incognita* - inoculated plants the root-knot development/root-gall index, based on visual observations, was rated on a 0-4 scale. The final populations in the soil were determined by using Cobb's sieving and decanting technique.

Results and Discussion

The data presented in Tables I and II clearly indicate that seed dressing in water extracts of different plant parts of neem and Persian lilac significantly ($P=0.05$) reduced the root-knot development caused by *M. incognita* and the population build-up of *R. reniformis* on tomato, eggplant and okra. The effect was more pronounced in the plants raised from seeds treated with fruit extracts. Gum was the least effective of the treatments. The water extracts of neem were generally more efficacious than those of Persian lilac (Tables I and II).

The effect on the nematodes may have been due to the leaching of the seed coatings into the rhizosphere of the plants and thus acting directly as a chemical nematicide, or possibly because the plants, grown from treated seeds, had acquired some resistance/tolerance against the nematodes. The latter view is supported by Alam *et al.* (1977, 1980) who found that there was poor multiplication of *Tylenchorhynchus brassicae* on cabbage and cauliflower and reduced root-galling caused by *M. incognita* on tomato, eggplant and chilli, when the seedlings were raised in soil treated with neem cake and then transplanted to untreated soil.

Table I - *Effect of seed dressing with different extracts of neem and Persian lilac on the root-knot development caused by* Meloidogyne incognita *on tomato, eggplant and okra.*

Seed Treatment		Inoculum level	Root-knot indices[1]		
			Tomato	Eggplant	Okra
CONTROL (Untreated)		50	0.4	0.3	0.8
		500	1.7	1.5	2.1
		5000	3.1	3.0	3.5
NEEM	Leaf	50	0.1	0.0	0.5
		500	0.9	0.7	1.1
		5000	2.5	2.4	2.1
	Flower	50	0.2	0.1	0.6
		500	1.0	0.8	1.2
		5000	2.6	2.5	2.2
	Fruit	50	0.0	0.0	0.4
		500	0.7	0.5	0.9
		5000	2.3	2.1	2.0
	Bark	50	0.3	0.2	0.7
		500	1.1	0.9	1.3
		5000	2.7	2.6	2.3
	Gum	50	0.3	0.3	0.7
		500	1.3	1.0	1.4
		5000	2.8	2.8	2.5
		C.D. (P=0.05)	0.63	0.55	0.50
PERSIAN LILAC	Leaf	50	0.2	0.1	0.6
		500	1.1	0.9	1.2
		5000	2.7	2.8	2.4
	Flower	50	0.3	0.2	0.7
		500	1.2	1.0	1.3
		5000	2.8	2.6	2.5
	Fruit	50	0.1	0.0	0.5
		500	1.0	0.8	1.0
		5000	2.7	2.7	2.3
	Bark	50	0.3	0.3	0.7
		500	1.2	1.1	1.4
		5000	2.9	2.5	2.5
	Gum	50	0.3	0.2	0.8
		500	1.3	1.2	1.6
		5000	3.0	2.6	2.7
		C.D. (P=0.5)	0.56	0.72	0.57

[1] Each value is an average of three replicates.

Table II - *Effect of seed dressing with different extracts of neem and Persian lilac on the population of* Rotylenchulus reniformis.

Seed Treatment		Inoculum level	Nematode populations per pot on different hosts[1]		
			Tomato	Eggplant	Okra
CONTROL (Untreated)		50	130 (2.6)[2]	110 (2.2)	120 (2.4)
		500	760 (1.5)	720 (1.4)	950 (1.9)
		5000	6340 (1.3)	6110 (1.2)	8340 (1.7)
NEEM	Leaf	50	25 (0.5)	20 (0.4)	35 (0.7)
		500	240 (0.5)	230 (0.5)	450 (0.9)
		5000	4020 (0.8)	3830 (0.7)	4000 (0.8)
	Flower	50	40 (0.8)	10 (0.2)	20 (0.4)
		500	270 (0.5)	240 (0.5)	460 (0.9)
		5000	4480 (0.8)	3910 (0.8)	4100 (0.8)
	Fruit	50	20 (0.4)	— (0.0)	30 (0.6)
		500	210 (0.4)	200 (0.4)	360 (0.7)
		5000	3980 (0.8)	3750 (0.8)	3870 (0.8)
	Bark	50	10 (0.2)	— (0.0)	35 (0.7)
		500	398 (0.6)	250 (0.5)	470 (0.9)
		5000	4120 (0.8)	3940 (0.8)	4160 (0.8)
	Gum	50	60 (1.2)	50 (1.0)	50 (1.0)
		500	300 (0.6)	310 (0.6)	480 (1.0)
		5000	4260 (0.9)	4150 (0.8)	4270 (0.9)
	C.D. (P=0.05)		67.22	65.78	71.20
PERSIAN LILAC	Leaf	50	40 (0.8)	25 (0.5)	30 (0.6)
		500	270 (0.5)	250 (0.5)	290 (0.6)
		5000	4110 (0.8)	4040 (0.8)	4020 (0.8)
	Flower	50	30 (0.6)	25 (0.5)	40 (0.8)
		500	280 (0.6)	260 (0.5)	300 (0.6)
		5000	4150 (0.8)	4090 (0.8)	4120 (0.8)
	Fruit	50	20 (0.4)	20 (0.4)	30 (0.6)
		500	250 (0.5)	240 (0.5)	310 (0.6)
		5000	3910 (0.8)	3830 (0.8)	4110 (0.8)
	Bark	50	40 (0.8)	40 (0.8)	30 (0.6)
		500	300 (0.6)	270 (0.5)	350 (0.7)
		5000	4190 (0.8)	4140 (0.8)	4210 (0.8)
	Gum	50	30 (0.6)	40 (0.8)	50 (0.0)
		500	440 (0.9)	310 (0.6)	450 (0.9)
		5000	4380 (0.9)	4250 (0.9)	4280 (0.9)
	C.D. (P=0.05)		62.71	68.33	64.40

[1] Each value is an average of three replicates.

[2] The reproduction factor ($R = \frac{Pf}{Pi}$) of the nematodes is given in parenthesis.

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