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EFFECT OF SOME WEED AND SHRUB EXTRACTS ON PENETRATION AND GALL FORMATION BY *MELOIDOGYNE JAVANICA* ON BRINJAL

by
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Various workers (Patel and Desai, 1964; Johnson *et al.*, 1967; Singh and Sitaramaiah, 1967; Hameed, 1970 and Prem and Nair, 1976) have tested different plant parts/extracts against root-knot nematode with success. The objective of the present study was to evaluate the nematicidal efficacy of some commonly occurring weeds and shrubs in our agricultural lands together with their persistence and field application potential against root-knot nematode, *Meloidogyne javanica* (Treub) Chitw., on brinjal, *Solanum melongena* L. The four weeds and shrubs, namely, *Calotropis procera* (Ait.) R.Br., *Ricinus communis* L., *Xanthium strumarium* L. and *Datura stramonium* L., used in this study, were previously, found to be very promising in preliminary screening tests (Nandal and Bhatti, 1983).

Material and Methods

Finely ground leaves of the above mentioned four plant species, each at the rate of 10, 20, 40 and 80 g were mixed per kg river sand. There were four replicates of each treatment.

In the first experiment, penetration of second-stage juveniles was studied up to six weeks after infestation. Clay pots (18 cm diam.) were filled with river sand mixed with ground leaves. Four-week old brinjal seedlings (cv. Pusa Purple Long) were transplanted singly into the posts. After four days, each pot was infested with 200 freshly hatched second-stage juveniles of *M. javanica*. Observations were made on juvenile pene-

Table I - *Effect of ground leaves on juvenile penetration of brinjal roots by* Meloidogyne javanica.

Treatment	*Percent juvenile penetration up to 6 weeks and rate of leaf admixture (g/kg soil)*																											
	3 days				1 week				2 weeks				3 weeks				4 weeks				5 weeks				6 weeks			
	10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40	10	20	30	40
Calotropis procera	1.0	0	0	0	0.8	0	0	0	0.9	0	0	0	1.6	0.1	0	0	1.3	0.4	0	0	1.6	1.1	0	0	1.9	0.7	0	0
Datura stramonium	1.1	0	0	0	0	0	0	0	0.9	0	0	0	1.1	0	0	0	0.7	0.1	0	0	0.9	0.1	0	0	1.3	0.9	0	0
Ricinus communis	0.4	0	0	0	1.0	0	0	0	0.8	0	0	0	1.6	0	0	0	0.9	0.6	0	0	0.9	0.6	0	0	1.3	0	0	0
Xanthium strumarium	1.0	0	0	0	0	0	0	0	1.0	0	0	0	1.6	0.8	0	0	2.1	0.6	0	0	1.6	0.8	0	0	2.8	1.1	0.3	0
Control	7.7				12.8				13.8				14.1				12.6				12.3				11.1			

Table II - *Effect of ground leaves on gall formation by* Meloidogyne javanica on *brinjal roots*

Treatment	Ground leaves (g/kg soil)	Number of galls per plant after			
		15 days	30 days	45 days	60 days
Calotropis procera	10	13	31	55	79
	20	9	37	27	65
	40	7	32	38	64
	80	6	21	29	63
Datura stramonium	10	15	29	35	46
	20	11	22	26	30
	40	9	16	26	22
	80	8	18	21	31
Ricinus communis	10	28	60	78	85
	20	17	31	44	60
	40	12	21	43	58
	80	11	22	33	36
Xanthium strumarium	10	49	101	111	115
	20	25	43	52	72
	40	19	38	46	74
	80	20	48	43	60
Control	—	94	120	157	172
C.D. at 5%		13.7	23.4	21.6	28.6

tration by gently uprooting the plants, washing the roots in tap water, staining in acid-fuchsin-lactophenol and clearing in lactophenol.

In a second experiment, 18cm clay pots were filled with heavily infested soil (500 juveniles/250 ml soil) mixed with ground leaves. One week later, four-week-old brinjal seedlings were trasplanted singly in the pots. Hoagland's nutrient solution was applied weekly. The numbers of galls per plant were recorded at 15, 30, 45 and 60 days intervals by gently uprooting the plants and washing the roots in tap water.

Results

All the plant leaves were very effective in reducing juvenile penetration (Table I). Higher doses (30 and 40 g/kg soil) of all the four plant leaves completely prevented juvenile penetration up to 6 weeks (except *X. strumarium* at 6th week). At 20 g/kg soil dose, juvenile penetration was prevented for up to 2 weeks. Even at the lowest dose (10 g/kg soil) there was little penetration at any of the time intervals, compared with the untreated control.

Table II shows that there were significant reductions in the number of galls up to 60 days for all the plant leaves and at all the 4 doses (except *X. strumarium* at 10 g/kg soil dose after 30 days) when compared with the untreated control. *C. procera* and *D. stramonium* were equally effective at all the doses; whereas the lowest dose (10 g/kg soil) of *R. communis* and *X. strumarium* was less effective compared with the other doses. *D. stramonium* was the most effective as even at the lowest dose, the results were comparable with the highest doses of the remaining three plants after 60 days.

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