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## PRELIMINARY SCREENING OF SOME PLANTS FOR THEIR NEMATICIDAL ACTIVITY AGAINST *MELOIDOGYNE JAVANICA*

by

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**Summary.** Ethanol extracts of 60 plant species were screened against 2nd stage juveniles of *Meloidogyne javanica*. Some of the plant extracts showed significant nematocidal properties. Percent mortality of juveniles increased with the exposure time to the extracts. Extracts of *Annona squamosa* L., *Cocculus pendulus* (Forsk.) Diel, *Datura fastuosa* L. and *Solanum surattense* Burm. f. produced 100% mortality of juveniles after 72 hr exposure.

Aqueous extracts and products of plants are known to have nematocidal properties (Akhtar and Mahmood, 1994). The nematocidal potential of extracts of some locally available plants against juveniles of the root-knot nematode, *Meloidogyne javanica* (Trueb) Chitwood, was evaluated.

### Materials and methods

Leaves and shoots of 60 plant species belonging to a wide range of families were dried, ground and soaked separately in ethanol for one week. After one week, ethanol extracts were filtered through a cotton plug and then the filtrates were concentrated in a rotary vacuum evaporator at reduced pressure at 40 °C. The residue obtained was termed the crude extract. Each of the crude extracts were dissolved in methanol and 1000 ppm solution of each plant extract was prepared. Two ml of each solution were then put in a watch glass and were left to allow the solvent to evaporate. Egg-mass-

es of *M. javanica* obtained from pure culture maintained in a glass house on the roots of egg-plant, *Solanum melongena* L., were placed in distilled water and incubated at room temperature for 24 hr. After hatching, juveniles were collected and a suspension of juveniles in distilled water was prepared. Two ml of the juveniles suspension were added to each watch glass (at 50 juveniles/watch glass) to assess juveniles mortality at room temperature (25±5 °C) at 24, 48 and 72 hr intervals. Percent mortality was calculated and all data were subjected to analysis of variance.

### Results and discussion

Of 60 plant species tested, four, namely *Annona squamosa* L., *Cocculus pendulus* (Forsk.) Diel, *Datura fastuosa* L. and *Solanum surattense* Burm. f., were found to possess greater nematocidal activity causing 100% mortality and 26 were found effective with more than 50% of nematodes being killed after 72 hr (Table I). In

TABLE I - Effect of ethanol extracts of some plants on the mortality of second stage juveniles of *Meloidogyne javanica*.

Plant species	Family	% Mortality after		
		24	48	72 hr
Control		2	5	8
<i>Abutilon indicum</i> (L.) Sweet	Malvaceae	4	6	30
<i>Acacia ampliceps</i> Maslin	Fabaceae	71	79	80
<i>Acacia nilotica</i> (L.) Delile	Fabaceae	23	24	43
<i>Aerva javanica</i> (Burm. f.) Juss.	Amaranthaceae	15	21	30
<i>Amberboa ramosa</i> (Roxb.) Jafri	Compositae	6	47	49
<i>Annona squamosa</i> L.	Annonaceae	100	100	100
<i>Argemone mexicana</i> L.	Papaveraceae	50	59	64
<i>Asphodelus tenuifolius</i> Cavan.	Liliaceae	12	39	45
<i>Atriplex stocksii</i> (Wt.) Boiss.	Chenopodiaceae	2	9	22
<i>Bacopa monnieri</i> (L.) Wettst.	Scrophulariaceae	42	59	61
<i>Bergia ammanioides</i> Roxb.	Elatinaceae	12	43	59
<i>Brassica oleracea</i> s. var. <i>botrytis</i> L.	Brassicaceae	4	10	23
<i>Caralluma edulis</i> (Edgew.) Bth. ex Hk.f.	Asclepiadaceae	7	11	52
<i>Cassia fistula</i> L.	Fabaceae	2	6	16
<i>Citrullus lanatus</i> (Thunb.) Mansf.	Cucurbitaceae	0	1	8
<i>Cocculus pendulus</i> (Forsk.) Diels	Memisperaceae	93	100	100
<i>Convolvulus rhyniospermus</i> Hochst. ex Choisy	Convolvulaceae	8	15	21
<i>Cordia rothii</i> Roem. et Schultt.	Boraginaceae	2	18	22
<i>Cyamopsis tetragonoloba</i> (L.) Taub.	Fabaceae	25	73	75
<i>Datura fastuosa</i> L.	Solanaceae	50	67	100
<i>Daucus carota</i> L.	Apiaceae	19	39	59
<i>Dianthus caryophyllus</i> L.	Caryophyllaceae	37	45	53
<i>Enhydra fluctuans</i> Lour.	Compositae	29	30	42
<i>Enicostemma verticillatum</i> (L.) Engler	Gentianoaceae	2	20	39
<i>Erythrina glabrescens</i> (Prain) Parker	Fabaceae	7	12	16
<i>Eucalyptus camaldulensis</i> Dehnh	Myrtaceae	12	20	38
<i>Euphorbia caducifolia</i> Haines	Euphorbiaceae	16	31	49
<i>Euphorbia granulata</i> Forssk.	Euphorbiaceae	12	22	30
<i>Euphorbia hirta</i> Forsk.	Euphorbiaceae	31	37	44
<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	27	45	73
<i>Fagonia indica</i> Burm.	Zygophyllaceae	69	79	85
<i>Fumaria indica</i> Haussknt. ex Pugsley	Fumariaceae	2	42	59
<i>Haloxylon recurvum</i> Bunge ex Boiss.	Chenopodiaceae	23	46	54
<i>Heliotropium curassavicum</i> L.	Boraginaceae	20	26	29
<i>Heliotropium tuberculosum</i> Boiss	Boraginaceae	18	26	27
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	50	68	71
<i>Hibiscus tiliaceus</i> L.	Malvaceae	1	9	23
<i>Justicia adhatoda</i> L.	Acanthaceae	33	50	90
<i>Lactuca remotiflora</i> DC.	Asteraceae	14	24	38
<i>Manilkara zapota</i> (L.) P. Royen.	Sapotaceae	27	33	40
<i>Melia azedarachta</i> L.	Meliaceae	40	47	90
<i>Mimosa hamata</i> Willd.	Fabaceae	9	49	66
<i>Morus alba</i> L.	Moraceae	32	61	65
<i>Phoenix sylvestris</i> (L.) Roxb.	Arecaceae	0	44	77
<i>Prosopis juliflora</i> Swartz	Fabaceae	33	43	78
<i>Psidium guajava</i> L.	Myrtaceae	22	36	44
<i>Rhazya stricta</i> Decene	Apocynaceae	15	21	24
<i>Rhus mysurensis</i> Heyne. ex Wight	Anacardiaceae	16	36	43
<i>Rhynchosia minima</i> (L.) DC.	Fabaceae	82	90	94
<i>Solanum surattense</i> Burm. f.	Solanaceae	68	70	100
<i>Tamarix stricta</i> Boiss.	Tamaricaceae	8	27	32
<i>Tephrosia strigosa</i> (Daiz.) Sant. et Mab.	Fabaceae	9	29	54
<i>Tephrosia subtriflora</i> Hochst. ex Baker	Fabaceae	18	30	52
<i>Tephrosia uniflora</i> Pers.	Fabaceae	38	56	60
<i>Terminalia catappa</i> L.	Combretaceae	29	71	74
<i>Thespesia populnea</i> (L.) Sol. ex Corr.	Malvaceae	33	47	90
<i>Tinospora malabarica</i> Miers.	Menispermaceae	13	33	42
<i>Vallis solanacea</i> (Roth) O. Kutze	Apocynaceae	10	26	34
<i>Vigna trilobata</i> (L.) Verde	Fabaceae	1	1	16
<i>Withania somnifera</i> Dun.	Solanaceae	58	74	87
LSD 0.05		3.66	4.63	6.24

each case juvenile mortality increased with length of exposure to the plant extracts. From the present work it may be concluded that ethanol extracts of several plant species are nematocidal but to varying degrees. It is not known whether the nematicidal activity demonstrated by these plants is due to a single compound or a complex of compounds. Additional work is needed to isolate and characterize the compound(s) responsible for mortality of root knot nematode juveniles, particularly with those plant species that have been shown to have a high nematicidal activity.

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#### **Literature cited**

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