A Preliminary Study on The Nematicidal Effect Of Some Local Flora on *Meloidogyne Incognita* Chit wood Infesting Mulberry

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***Abstract*—** Nematode *Meloidogyne incognita* is one of the major disease causing organism in Mulberry. Due to the perennial nature of mulberry the loss due to nematode *Meloidogyne incognita* Chitwood is estimated as 10-12% in addition to depletion in nutritive value**[2]**.Among the different management methods to control nematodes botanical nematicides are found to be one of the best ecofriendly methods.In the present study a preliminary study was conducted to screen few local flora for their nematicidal properties. In this study leaf extracts of *Datura stramonium,Azadiracta indica,Calotropis procera,Crotalari*a *juncea* were tested against nematode egg hatching.Among the plants tested neem flowed by *Datura ,Calotropis* were found to cause nematode juvenile mortality.

***Keywords*—**Botanicals,*Meloidogyne incognita*,nematode egg hatching, ,nematicidal properties**.**

I. INTRODUCTION

PLANT parasitic nematodes cause a considerable damage to all agriculture and allied crops. The average leaf yield loss due to nematode on all crops is estimated as 12.3 percent [5].Mulberry the only food source of silkworm Bombyx mori.L.is prone to various diseases and among these root knot disease caused by *Meloidogyn*e incognita is one of the major diseases which causes leaf yield loss both quantitatively and qualitatively. Nematode management includes a number of physical, chemical and biological methods. Among these though chemical methods are quick and effective the various demerits like non ecofriendly,high cost has created a new approach of nematode management which are ecofriendly in nature.

In the nature plants produce a number of secondary metabolites to defend themselves against various pests and pathogens. In India huge number of plants are available which have pesticidal properties. The botanical petsicides offer alternate strategy for nematode management due to their facile biodegradability, selective toxicity to target organisms and ecofriendlyy and renewable nature. Different plant leaf extracts have been used by different scientists to test their nematicidal properties.

[3] shows the nematicidal properties of chopped pine apple *(Annanas comosus* L) leaves when used as organic amendments against *Meloidogyne sp*. [9]. shows nematicidal properties of various plant parts of crotalaria,marigold, in powder form and reduction in nematode population.

Reference 1 studied seven plants viz.*Annanus comusus*.L)., *Punica granatum* L., *Nerium indicum,Calotropis procera (Aitan),Ricinus communis,Plumaria rubra* and *Ipomea fistulosan* for their nematicidal activity by testing nematode juvenile hatching.

Keeping in view the importance of botanicals in the management of nematode an attempt was made to study nematicidal effect of locally available four plants like *Datura stramonium,Azadiracta indica,Calotropis procera,Crotalari*a *juncea* using their leaf extracts.

II. MATERIALS AND METHODS

Leaves were collected from *Datura stramonium,Azadiracta indica,Calotropis procera,Crotalari*a *juncea* and were shade dried for a week till the leaves were fully dried. Then leaf powders were prepared with the help of grinder. Methanol extracts of leaves were prepared using soxhlet apparatus. The extract was dissolved in Methanol (1:10)w/v and stock solution was prepared. Different concentrations of plant extracts were prepared using distilled water. The different concentrations prepared were 25,50,75 and 100%.

Nematode culture was maintained on tomato seedlings. Well matured and full Nematode egg masses were collected in pertiplates containing sugar solution for hatching.. After hatching 100 second stage juveniles were collected and kept in each pertiplate containing 10 ml of different concentrations of leaf extracts. Juvenile mortality was observed by counting the number of dead and alive juveniles after 12 hrs and 24 hrs. Each treatment replicated three times keeping control.

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III. Results And Discussion

In this study it was observed that all the four plants have nematicidal properties. But the efficacy varied in different plant extracts .Among the four plants studied (**Table- 1)** Neem extract at 100 percent concentration has shown 62 Percent of mortality after 12 hrs and 82.8 percentage of mortality after 24 hrs.The percentage of mortality of juveniles gradually reduced with concentration of extract.

In this study Neem extract showed highest percentage of (82.8 %) juvenile mortality after 24 hrs followed by *Datur*a with 52.8%, *Calotropis* with 42% and *Crotalaria* with 30%.

This research finds are inconformity with the findings of [7] shows the efficacy of *Calotropis* leaf extracts on nematode population [4] shows that terpenoid extracted from *Calotropis* are effective against nematode population. [6] Shows the efficacy of different plant extracts including Neem,*Calotropis*,*Datura* and Crotalaria against nematode population. [8] shows seed extracts of *Calotropis* on nematode egg hatching inhibition and juvenile mortality.

Table I
Effect Of Plant Extracts On Nematode Juvenile Mortality After12 And 24 Hrs At Different Concentrations

S.No	Name of the leaf extract	Exposure duration (hrs)	Concentration of extract & number of juveniles dead			
			100	75	50	25
1	*Azdirachta indica*	12 24	15.5 20.7	11.4 16.9	7.5 12.0	5.5 6.0
	% of mortality		62.0 82.8	45.6 67.6	30.0 48.0	22.0 24.0
2	*Datura stramonium*	12 24	11.3 13.2	10.5 12.1	9.6 9.8	8.6 8.9
	% of mortality		45.2 52.8	42.0 48.4	38.4 39.0	34.4 35.6
3	*Calotropis procera*	12 24	9.9 10.5	7.9 8.0	7.7 7.8	7.8 8.1
	% of mortality		39.6 42.0	31.6 32.0	30.8 31.2	31.2 32.4
4	*Crotalaria juncea*	12 24	6.5 7.5	7.0 7.0	6.8 6.9	5.2 5.4
	% of mortality		26.0 30.0	28.0 28.0	27.2 27.6	20.8 21.6
	Control with distilled water	12 24	25 juveniles (no mortality)			

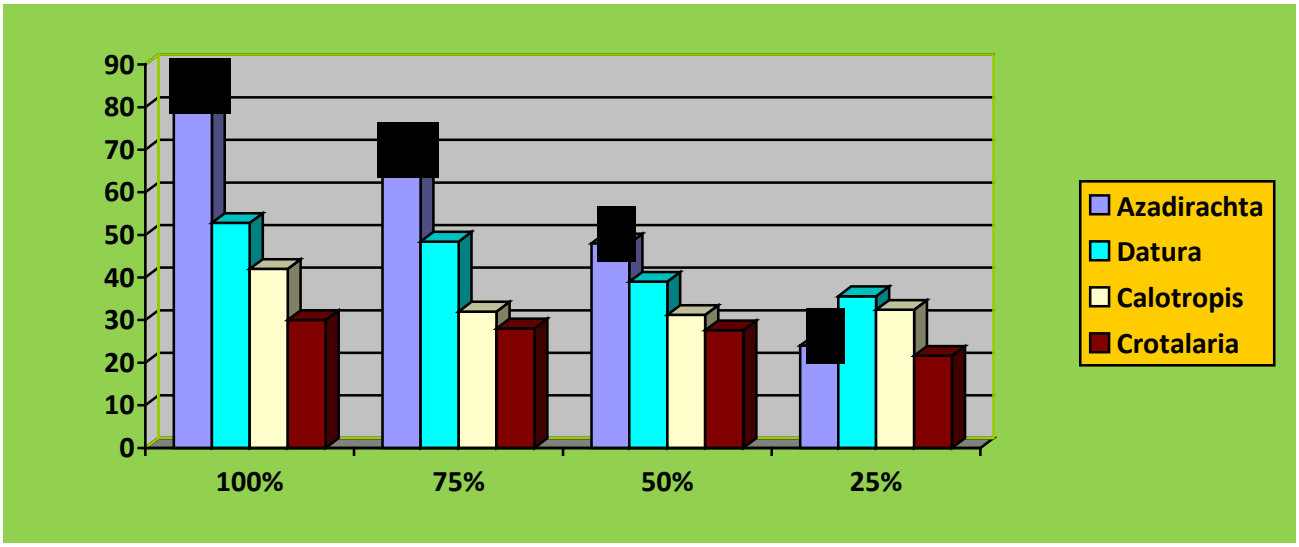

Fig. 1 Effect of plant extracts on nematode juvenile mortality after 24 hrs at different concentrations

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Fig. 2.Root knot disease in mulberry

Fig. 3 Nematicidal plant Neem

Fig. 4 Petri plates with Plant extracts and nematode egg mass