

## Effect of Some Organic Substances on the Root-knot Disease of Brinjal

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**Abstract:** In the mortality test of *Meloidogyne javanica* (causative of root knot disease of Brinjal) organic substances like chicken litter, tea waste, cattle urine, human urine and pineapple extract were applied. All organic substances had nematocidal properties, of which pineapple extract was found to be more toxic to the juveniles of *Meloidogyne javanica* followed by chicken litter.

**Key words:** Effect, organic substances, root-knot, brinjal

### Introduction

Brinjal (*Solanum melongena*), is an important, popular, cheap and mostly available vegetable in Bangladesh. Brinjal is affected at various stages of growth by root-knot caused by *Meloidogyne spp.* (Timm and Ameen, 1960; Chowdhury, 1976; Ahmad, 1977 and Mian, 1986). Existing practice of chemical control is very expensive, particularly, for poor farmers of Bangladesh. In addition, their harmful effects are responsible for air, soil and water pollution (Alam, 1987). Various organic amendments have recently been reported to have nematocidal properties (Ahmad, 1977; Mian and Rodriguez-Kabana, 1982; Mahmood *et al.*, 1982; Sartaj *et al.*, 1985; Pathak *et al.*, 1989; and Ahmad and Karim, 1990). Chemical control is discouraged now-a-days all over the world to avoid environmental pollution along with costliness. Organic amendment with indigenous organic substances is one of the useful method for controlling root-knot diseases. Organic substances like chicken litter, tea waste, cattle urine, human urine and pineapple extract are cheap and easily available in Bangladesh. Hence, the experiment is undertaken to observe the effect of some indigenous organic substances on the mortality of *Meloidogyne javanica* in brinjal.

### Materials and Methods

The juvenile mortality test of *Meloidogyne javanica* was conducted in the laboratory during the period ranged from the 15<sup>th</sup> February, 2000 to the 10<sup>th</sup> June, 2000. In this study, effect of five organic substances viz. chicken litter, tea waste, cattle urine, human urine and pineapple extract along with a control (distilled water) were tested for the mortality test of juveniles of *Meloidogyne javanica* in the laboratory. Chicken litter and cattle urine were collected from the poultry and dairy farm of Bangladesh Agricultural University, respectively. Original cattle and human urine after 24 h of collection were treated as standard (S). Tea waste was collected from the tea stall after 24 h of disposal and pineapple extract was collected from fresh pineapple by pressing in a pestle mortar. 10 g of chicken litter and Ten gram of tea waste were taken and soaked separately in 100 ml distilled water. All these preparations were left for 24 h and then filtered. These filtrates were arbitrarily termed as standard (S). Subsequent dilutions S/2, S/10 and S/100 were also prepared with distilled water in 6 cm diameter petri dishes, separately. Petridish containing only distilled water served as control and each treatment was also replicated three times followed

by completely

Table 1: Effect of some organic substances on the juvenile mortality of *Meloidogyne javanica*

Organic substances	Exposure hours	Mean per cent mortality at concentration				
		Control	S	S/2	S/10	S/100
Chicken litter	12	0	100	100	50	36
	24	0	100	100	66	58
	48	0	100	100	85	72
	72	1	100	100	87	79
	96	5	100	100	88	80
Tea waste	12	0	100	54	14	8
	24	0	100	77	68	40
	48	0	100	89	80	56
	72	1	100	91	82	64
	96	4	100	95	92	77
Cattle urine	12	0	89	82	17	7
	24	0	100	98	72	60
	48	1	100	100	75	70
	72	2	100	100	86	72
	96	6	100	100	97	76
Human urine	12	0	90	70	6	2
	24	0	100	97	81	19
	48	2	100	99	88	37
	72	5	100	100	94	60
	96	7	100	100	98	68
Pineapple extract	12	0	100	100	100	74
	24	0	100	100	100	75
	48	1	100	100	100	80
	72	3	100	100	100	90
	96	7	100	100	100	95

S = Standard solution

randomized design.

Dead and surviving nematodes were counted after 12, 24, 48, 72 and 96 hours with the help of a laboratory counter and the mean per cent mortality was calculated ignoring the fraction of the juveniles number. Mortality of the juveniles was assessed by touching the juveniles with a fine needle

### Results and Discussion

The experiment was conducted in the laboratory of Plant Pathology. In the mortality test, pineapple extract was found to be more toxic to the juveniles followed by chicken litter

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solution (Table 1). Standard concentration (S) of all solutions except cattle and human urine caused 100 per cent mortality within 12 hours. Taking tea waste into account, a mortality range in percentage 54 - 100, 77 - 100, 89 - 100, 91 - 100 and 95 - 100 among the tested solutions of S/2 after 12, 24, 48, 72 and 96 hours, respectively. The juvenile mortality was found to increase with the increase of concentration and exposure period (Table 1). Similarly, a mortality range 14 - 100, 68 - 100, 80 - 100, 82 - 100 and 92 - 100 % were recorded among the S/10 solutions after 12, 24, 48, 72 and 96 hours, respectively. In case of S/100 solution, it ranged from 8 - 74, 40 - 75, 56 - 80, 64 - 90 and 77 - 95 % after 12, 24, 48, 72 and 96 hours, respectively. The results indicated that all organic substances had nematicidal properties from which pineapple extract gave more toxic effect on the *J.* nematodes (Table 1). Hassan *et al.* (2000) working with extracts of seed, bark and leaf of neem, Kashem (1992) with garlic extract and Hassan (1992) with ginger extract, found that even at lower concentration of the organic extracts suppressed the nematode activity as was evident with present findings.

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