Nematol. medit. (1993), 21: 97-98

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EFFECT OF PHENOLICS ON THE GROWTH OF TOMATO AND REPRODUCTION OF *ROTYLENCHULUS RENIFORMIS*

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Summary. Root dip treatments of phenolics viz. catechol, hydroquinone, phloroglucinol, pyrogallol and orcinol for 30 and 60 min. in different concentrations reduced multiplication of *Rotylenchulus reniformis* and improved growth of tomato plants. Improvement in growth was directly proportional to the concentration of phenolics (except higher concentration of hydroquinone which was toxic to plants) and time of root dip treatment. Among the phenolics used, hydroquinone was best fellowed by phloroglucinol, catechol, pyrogallol and orcinol.

Correlation between the level of plant resistance and phenolics present in the plant tissue has been reported by various workers (Giebel, 1970; Giebel, 1974; Mahmood and Saxena, 1986). Taylor and Murant (1966) reported that treatment of free phenols like catechol and hydroquinone reduced the population of *Longidorus elongatus*. Chang and Rohde (1969) observed a repellant effect of phenols on *Pratylenchus penetrans*.

In the present study five free phenols viz. catechol, hydroquinone, phloroglucinol, pyrogallol and orcinol were used as seed treatment for the management of *Rotylenchulus reniformis* Linford *et* Oliveira on tomato.

Materials and methods

Seeds of tomato cv. Pusaruby were surface sterilized in 0.1% mercuric chloride for 2 min., washed in distilled water and sown in 30 cm earthen pots containing steam sterilized soil. Three week old seedlings were dipped for 30 and 60 min. in aqueous solutions of catechol, hydroquinone, phloroglucinol, pyrogallol and orcinol separately prepared at concentrations of 10, 100 and 1000 ppm. Treated seedlings were transplanted into 15 cm earthen pots containing 1 kg steam sterilized soil. Each pot was inoculated with 1000 immature females of *R. reniformis*. Pots were randomly distributed in a glasshouse with each treatment replicated four times. Watering was undertaken as required. Thirty days after inoculation the experiment was terminated, plant height, fresh weight and nematode density were recorded. Nematodes were extracted from the soil by Cobb's sieving and decanting technique followed by Baermann funnel. Females in roots were stained in cotton-blue lactophenol and counted using a stereomicroscope. Egg masses were handpicked and placed in a solution of sodium hypochlorite, then poured on to a 400 mesh sieve from which the eggs were recovered and counted. Data were analysed statistically by simple randomized method and significance were calculated at 5% level.

Resullts and discussion

Root dip treatments at all concentrations of phenolics significantly reduced *R. reniformis* multiplication and improved plant growth compared with control treatments (Table I). Improvement in growth was directly proportional to the concentration of the phenolics and the duration of root-dip treatment, except for hydroquinone at 1000 ppm which was toxic to the plants and adversely affected plant growth. Of the five phenols used, hydroquinone was the most effective in reducing nematode multiplication followed by phloroglucinol, catechol, pyrogallol and orcinol (Table I). In the absence of resistant cultivars against reniform nematodes, the phenols like hydroquinone which gave promising results under pot condition can be used as root dip treatment before transplanting the seedlings in the field. Rootdip treatment of phenols will be cheap as only small quantity will be required for its application.

Acknowledgement Co-author is thankful to Council of Scientific and Industrial Research, New Delhi for the award of Research Associateship.

TABLE I - *Effect of phenolics on the growth of tomato and reproduction of* Rotylenchulus reniformis.

Treatment	Dip time (min.)	Concentration (ppm)	Length (cm)	Length % reduction	Fresh wt. (g)	Fresh wt. % reduction	Nematodes/kg soil (x 10^3)	Nematodes/kg soil % reduction
Control			54	–	9.3	–	–	–
Inoculated			32	41	5.2	44	10.4	–
Catechol	30 min.	10	35	35	6.2	33	5.5	47
		100	38	30	6.7	28	4.9	53
		1000	45	17	7.5	19	4.3	59
	60 min.	10	38	30	6.5	30	4.8	54
		100	41	24	7.1	24	4.6	56
		1000	47	13	8.0	14	3.5	66
Hydroquinone	30 min.	10	40	26	7.0	25	4.1	61
		100	48	11	7.5	19	3.8	63
		1000	44	19	6.7	28	2.9	72
	60 min.	10	46	15	7.5	19	4.0	62
		100	51	6	8.8	5	3.5	66
		1000	41	24	6.5	30	2.3	78
Phloroglucinol	30 min.	10	36	33	6.5	30	5.0	52
		100	42	22	7.0	25	4.3	59
		1000	47	13	8.1	13	3.4	67
	60 min.	10	43	20	6.8	27	4.4	58
		100	45	17	7.5	19	3.8	63
		1000	50	7	8.0	14	2.8	73
Pyrogallol	30 min.	10	37	31	6.0	35	6.1	41
		100	35	35	6.5	30	5.8	44
		1000	43	20	7.1	24	5.0	52
	60 min.	10	35	35	6.4	31	5.9	43
		100	40	26	6.8	27	4.5	57
		1000	45	17	7.7	17	3.8	63
Orcinol	30 min.	10	36	33	5.8	38	6.8	35
		100	37	31	6.1	34	6.0	42
		1000	42	22	6.8	27	5.7	45
	60 min.	10	37	31	5.9	37	6.1	41
		100	38	30	6.4	31	5.9	43
		1000	43	20	7.2	23	5.3	49
L.S.D. 5%			1.3		0.5		0.6	

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Accepted for publication on 12 February 1993.