# CONTROL OF PLANT PARASITIC NEMATODES BY *TAGETES TENUIFOLIA*

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*Tagetes erecta* L., *T. minuta* L. and *T. patula* L. are known for nematotoxic properties (Oostenbrink, 1960; Daulton & Curtis, 1963; Wallace, 1963; Hackney & Dickerson, 1975; Alam, Masood & Husain, 1975). Interculture of vegetables with *Tagetes erecta* has been found effective in reducing nematode population (Alam, Saxena & Khan, 1977). *Tagetes tenuifolia* Cav. is another species which is widely grown as ornemental plant but nothing is known whether this is equally nematotoxic. Hence, in the present investigation an attempt has been made to evaluate *T. tenuifolia* as interculture plant for controlling *Meloidogyne incognita, Rotylenchulus reniformis* and *Tylenchorhynchus brassicae.*

## Materials and methods

Seedlings of tomato (*Lycopersicon esculentum* P. Mill.) cv. Pusa Ruby, eggplant (*Solanum melongena* L.) cv. Pusa Purple long, cabbage (*Brassica oleracea capitata* L.) cv. Pride of India and cauliflower (*Brassica oleracea botrytis* L.) cv. Maghi grown in sterilized soil were transplanted singly in the centre of 15 cm diam. clay pots containing 1 kg autoclaved soil. Five, three-week old seedlings of *Tagetes tenuifolia* were also transplanted at the same time of transplantation of the host plants, at equal distance at the periphery of the pots. The vegetable seedlings were then inoculated with 1 000 specimens of either of the three test nematodes viz., *Meloidogyne incognita* (Kofoid & White) Chitwood, *Rotylenchulus reniformis* Linford & Oliveira or *Tylenchorhynchus brassicae* Siddiqi separately. There were five replicates in each treatment. Uninoculated plants served as control. After two months, plant weight and root-knot index (on 0-5 scale of Taylor and Sasser, 1978) were determined. Final populations of the nematodes were determined by using Cobb's sieving and decanting method alongwith modified Baermann funnel technique (Flegg & Hooper, 1970).

Root-exudate of marigold was obtained according to the procedure described by Alam, Masood and Husain (1975) by dipping the root systems of ten seedlings of the same age in 50 ml distilled water contained in Erlenmeyer flasks of 100 ml capacity. The exudate was collected each day for five days and were stored at 5°. This exudate thus obtained was designated as standard (S). S/2, S/10 and S/100 dilutions were also made from the standard (S) by adding required amount of water. The test nematodes were transferred to 10 ml of different dilutions of root-exudates contained in 40 mm diameter petridishes following the method of Alam (1985). Similar number of nematodes were kept in distilled water for control. There were five replicates for each treatment. The number of active and inactive nematodes were counted after 12, 24 and 48 hr. The nematodes which did not regain mobility even after transfer to water were considered as dead. The per cent mortality was calculated over controls.

For hatching experiment, five average sized, healthy and freshly picked eggmasses were transferred to the Petridishes (40 mm diam.) containing 10 ml of different dilutions of the root-exudates. There were five replicates for each treatment. The total number of hatched juveniles was counted after five days. Hatching in water served as control.

## Results and discussion

Interculture of *T. tenuifolia* with tomato, eggplant, cabbage and cauliflower reduced the root-knot development and population of the root-knot nematode, the reniform nematode and the stunt nematode. In addition to this, the growth of the plants also improved and was more or less equal to healthy ones (Figs 1 & 2).

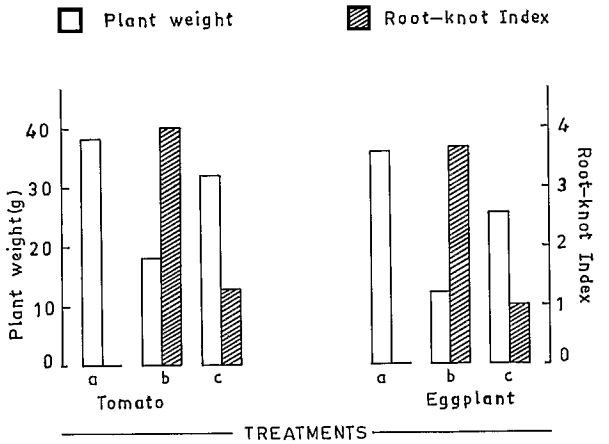


Fig. 1. Effect of interculture of *Tagetes tenuifolia* on root-knot development caused by *Meloidogyne incognita* and plant growth of tomato and egg-plant (a = without *Tagetes*, uninoculated; b = without *Tagetes*, inoculated; c = with *Tagetes*, inoculated).

The root-exudate of *T. tenuifolia* was found most toxic to *R. reniformis* followed by *T. brassicae* and *M. incognita* (Fig. 3). The inhibition in juvenile hatching from

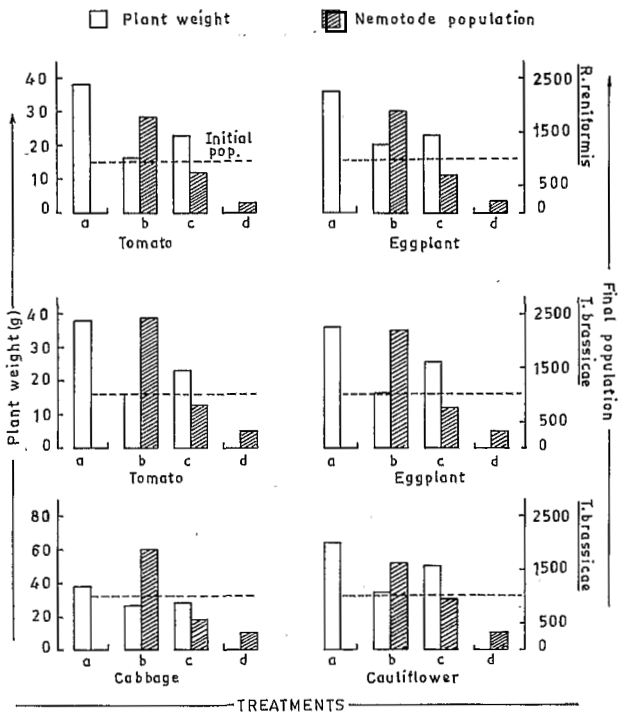


Fig. 2. Effect of interculture of *Tagetes tenuifolia* on the population of *Rotylenchulus reniformis* and *Tylenchorhynchus brassicae* and plant growth of their hosts (a = without *Tagetes*, uninoculated; b = without *Tagetes*, inoculated; c = with *Tagetes*, inoculated; d = *Tagetes* alone, inoculated).

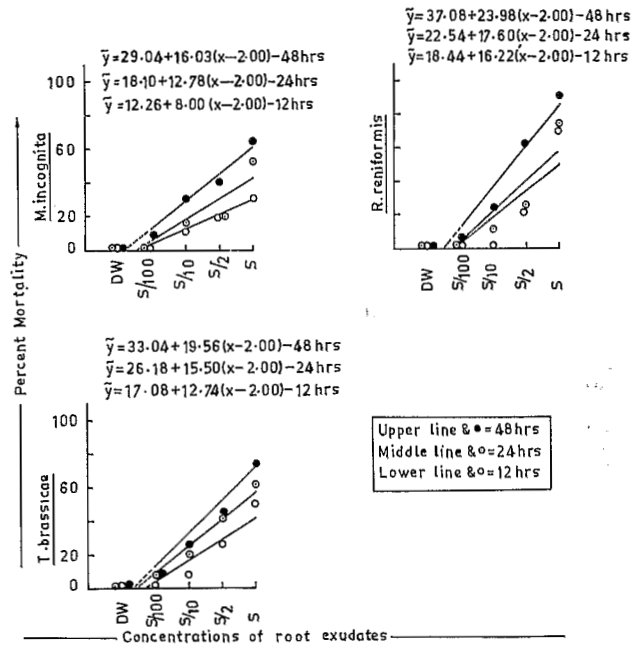


Fig. 3. Regression lines showing linear relationships between different concentrations of root-exudates of *Tagetes tenuifolia* and per cent mortality of *Meloidogyne incognita* larvae.

eggmasses of *M. incognita* exposed to the root-exudate for five days was 81.05 % at S concentration, 76.84 % at S/2, 48.97 % at S/10 and 15.30 % at S/100.

These results are in agreement with those of previous authors (Oostenbrink, 1960; Daulton & Curtis, 1963; Hackney & Dickerson, 1975; Alam, Saxena & Khan, 1977) who reported nemato-toxic properties of *Tagetes* spp. It is likely that the inhibitory substances are leached out from roots which adversely affect nematode as reported by Uhlenbroek and Bijloo (1958, 1959).

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