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NOTE BREVI - SHORT COMMUNICATIONS

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CHANGES IN GROWTH INHIBITORS OF TOMATO ROOTS AFTER INFECTION BY *MELOIDOGYNE JAVANICA*

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In root galls of nematode infected plants, the presence of growth promoters such as indoleacetic acid, indoleacetonitrile, indoleacetic acid ethyl ester and indolebutyric acid have been reported by Bird (1962) and Yu and Viglierchio (1964). Little is known about the growth inhibiting substances in nematode infected roots. This paper describes investigations on the occurrence of growth inhibiting substance in *Meloidogyne* infested and healthy roots of tomato.

Seeds of tomato (*Lycopersicon esculentum* Mill.), surface sterilized with 95% ethanol and 5% sodium hypochlorite solutions and washed several times with sterilized distilled water, were sown in 15 cm diameter clay pots containing 1 Kg of autoclaved soil and grown in a greenhouse at 23 ± 3°C. Two weeks after germination, the number of plants of approximately equal size in each pot was reduced to five by thinning. Half of the total pots were inoculated in the root zone with 5 ml of a suspension containing about 800 *Meloidogyne javanica* (Treub) Chitw. juveniles. Nematode infection reduced the height of the plant and the total length of the roots by about 50% as compared to healthy plants.

After six weeks growth, 10 g of roots were taken from each nematode-infected or uninfected pot, cut into small segments and immersed in 100 ml of 80% ethanol in a 250 ml conical flask. After 24 h of extraction at 20°C in the dark, ethanol was decanted and fresh 50 ml ethanol was added and collected after 24 h of incubation. This extract was filtered, evaporated to the water phase and solid

$NaHCO_3$ was added to give a 2% $NaHCO_3$ solution. This was extracted with an equal volume of ethyl acetate and the organic fraction was discarded. This procedure was repeated four times and the remaining aqueous fraction was adjusted to pH 2.5 with 0.5 N HCl and extracted five times with an equal volume of ethyl acetate each time. The combined ethyl acetate fraction was evaporated to dryness and redissolved in 0.5 ml of ethanol which served as an acidic fraction. Growth regulators present in this acidic fraction were separated by ascending paper chromatography using isopropanol : ammonia : water

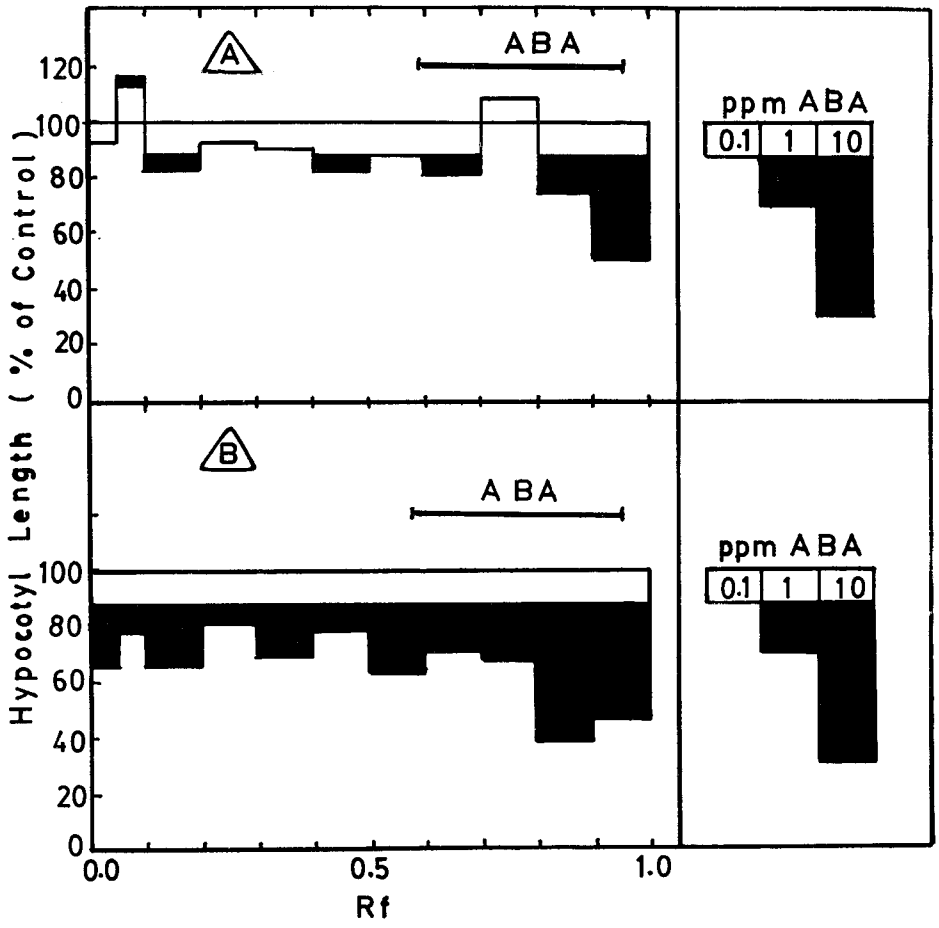

Fig. 1 - Histograms showing growth promoting and inhibiting zones in the acidic fraction of the uninfected (A) and *Meloidagyne javanica* infected (B) roots of tomato. Dark areas are significantly different (P 0.05) from the control.

(10 : 1 : 1 V/V) and assayed by the lettuce hypocotyl test (Brian *et al.*, 1964) in which the presence of growth inhibitors was demonstrated by reduction in growth. The results presented in Fig. 1 indicate the presence of three growth inhibitors at Rfs 0.1-0.2, 0.4-0.7 and 0.8-1.0. A growth promoter was also present at Rf 0.05-0.1 in healthy uninfected plants and not in the nematode infected plants. Growth inhibitors at Rf 0.0-1.0 in the nematode infected plants were present in larger quantities than in the healthy plants. The inhibiting zones in the acidic fraction of healthy and nematode infected plants at Rf 0.6-1.0 had Rfs similar to that of the marker abscissic acid (ABA), a well known growth inhibitor.

The increased production of growth inhibitors in nematode infected plants accounts for the considerable reduction in growth of roots as compared with uninfected plants.

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