

ABSTRACT**Population Dynamics and Control Features of *Radopholus similis* in
Anthurium andraeanum Linden Ex Andre in Trinidad****Farzan Hosein**

Investigations were carried out on population levels of *Radopholus similis*, the effect of the nematode on the growth and production of *Anthurium andraeanum*, and the use of alternative methods to manage the nematodes in the crop. The aim of the study was to determine the distribution and density of nematodes in anthurium, the population dynamics of *R. similis*, the threshold population levels beyond which the nematode caused damage to the crop and the use of non-hazardous management strategies that can complement the existing control methods.

Radopholus similis was shown to be the predominant nematode associated with anthurium roots and growing media in growers' shade-houses during 1992 to 1993. *Paratylenchus minutus* was the only other potentially plant-parasitic nematode identified. Population densities of *R. similis* exhibited annual fluctuations, with maximum levels observed between August to September at the three locations. The population densities of the nematode varied widely with locations, but the composition of females, males and juveniles within populations were similar.

Root rotting was pronounced among *R. similis*-infested plants six months after inoculation. The highest population level of 137 nematode/g root was reached six months after inoculation, which eventually decreased to the lowest level of 28 nematodes/g root by the twelfth month. The multiplication rate ($R = P_f/P_i$) attained a maximum of 114.2 at the fourth month, then decreased and maintained a value around 1.0. The percentages of females, males and juveniles ranged between 42 and 57.5, 3 and 14, 30 and 41% respectively for roots and between 90.1 and 94.5, 0.4 and 2.5 and 0.1 and 6.2% respectively for growing medium.

Radopholus similis damage caused reduction of cumulative leaf buds, flower buds, peduncle length, spathe size, spadix length, leaf width, leaf area, petiole length and the total flower production to the extent of 14.8, 17.4, 27, 19.4, 19, 19.4, 29.9, 30.4 and 16% respectively, one year after inoculation. The dry weights of petioles, leaves, stems, roots, shoots and the total dry weight of the plant were reduced by 38, 36, 31, 48, 35 and 39% respectively. Under glasshouse conditions nematode damage caused reduction in shoot fresh weight, shoot dry weight, root fresh weight, root dry weight, total dry weight of the plant and petiole length over the control by 35.7, 35.2, 53.8, 50.5, 38.3, 18.6% respectively. At inoculum levels between 800 and 6400 nematodes the reduction of the same parameters were 63.54, 62.72, 77.25, 75.28, 65.3 and 37.4% respectively.

Azadirachta indica (neem) and *Leucaena leucocephala* (leucaena) leaves at a concentration of 500g/l leaves were toxic to *R. similis* when exposed at 24, 48 and 72 hours. When 2000 cm³ coir dust amended with treatments of aldicarb (1g) and green

leaves of neem, leucaena and water hyacinth (*Eichhornia crassipes*) at rates of 50, 100 and 200g each, significantly reduced *R. similis* populations after 21 days. Neem, leucaena and water hyacinth at 200g/2000 cm³ coir dust resulted in 0.24, 0.73 and 0.86% survival respectively, compared to 11.9% for aldicarb and 34.16% for the control. In shade-house studies, neem leaves used at 200g/ plant in 2300 cm³ growing medium, caused lower nematode populations at 60, 90 and 120 days after treatment (DAT). Significant improvement in root growth and reduction in root rotting occurred at 90 and 120d after treatment. Under glasshouse conditions, the use of neem leaf at 40 and 80g showed more effective control of *R. similis* compared to aldicarb at 1g/plant in 500cm³ growing medium after 90 days. *Radopholus similis* infested plants grown in coir dust composted with neem leaves and coir dust treated with fresh neem leaves produced significantly better growth than nematode-infested plants not grown with neem leaves after 240 days.

Key words: *Anthurium andraenum*, aqueous extracts, *Azadirachta indica*, growth characters, inoculum levels, leucaena, moisture regimes, mortality, nematode-infested, neem, population densities, population dynamics, *Radopholus similis*, root growth, water-hyacinth, yield.