Research Note

PATHOGENICITY OF MELOIDOGYNE INCOGNITA *IN TANIER* (XANTHOSOMA CARACU)[1]

Tanier, *Xanthosoma* spp. is economically the second important of the starchy-root crops in Puerto Rico. It is grown in small farm operations throughout the mountain region. Its production has remained stable during the last years. During 1985-86 total production was 127,000 cwt with a farm value of approximately $2.9 million[2].

In Puerto Rico, as in most tropical countries, crops are adversely affected by several genera of phytoparasitic nematodes, limiting yields.[3] High populations of *Meloidogyne incognita* have been detected in roots of taniers and other crops.[3] Román,[4] in 1978, reported various nematode genera associated with roots of taniers. *Meloidogyne* spp. (Kofoid and White) Chitwood was associated with declined tanier plantings. Affected plants were chlorotic and stunted, with roots severely galled. Information on the effects of this nematode on tanier tuber and roots in Puerto Rico and elsewhere is lacking, although the damage of *M. incognita* to the tanier tuber itself was first observed by Acosta (personal communication) in 1979 (fig. 1). The present work was undertaken to determine the inoculum level of *M. incognita* necessary to reproduce in the greenhouse the root-knot symptoms in tanier roots and tubers as observed in the material brought from the field (Fig. 1).

A tanier hybrid (Kelly × Vinola) was used. Juvenile tanier plants propagated from apical meristems, nematode free, and about 12 cm tall, were established in 20 cm clay pots containing an alluvial sandy loam soil pretreated with methyl bromide. Half of the two-leaf plants were inoculated with a mixed population of *M. incognita*, while the others were maintained nematode-free as control. Inoculum levels were 1,000, 10,000, and 100,000 eggs plus second stage juveniles of *M. incognita* per pot. The inocula were increased in tomato plants, cv. Rutgers in the greenhouse and extracted from roots with the method described by Hussey and Barker.[5] the inoculation treatments were made by pouring the appropriate suspension of eggs and second-stage juveniles around the plant roots. There were five replications of each treatment arranged in a completely-randomized design.

The tanier plants were maintained on a greenhouse bench for 45 days and irrigated as needed. Each plant received 100 cm^3 of a commercial fertilizer formulation (20-20-20) every 15 days throughout the duration of the experiment. Data on plant dry shoot weight and height, and on the number of *M.*

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[2] Anónimo, 1986. Ingreso Bruto Agrícola de Puerto Rico, 1985/86. Oficina de Estadísticas Agrícolas. Departamento de Agricultura de Puerto Rico. Santurce, P.R.

[3] Ayala, A., 1969. Nematode problems in Puerto Rican Agriculture. *In*: Proceedings of the Symposium on Tropical Nematology. Ramos, J. et al. (Eds.), Univ. P.R. Agric. Exp. Stn. 135–45.

[4] Román, J., 1978. Fitonematología Tropical, Esta. Exp. Agric., Univ. P.R., Río Piedras, P.R.

[5] Hussey, R. S. and K. R. Barker, 1973. A comparison of methods of collecting inocula of *Meloidogyne* spp., including a new technique. *Plant Dis. Rep.* 57: 1025–29.

TABLE 1.—*Effects of inoculum level of* Meloidogyne incognita *on tanier plants*[a].

Inoculum			*Larvae in roots and soil*
Eggs and larvae/plant	*Dry weight (g)*	*Height (cm)*	*(× 1,000/plant)*
0	4.00 a	21.8 a	0.0 a
1,000	2.92 a	19.6 a	1.0 a
10,000	3.66 a	22.2 a	4.2 a
100,000	1.64 b	14.5 b	58.0 b

[a]Mean values in the same column bearing unlike letters differ significantly ($P > 0.05$).

incognita larvae from roots were collected at harvest (45 days after inoculation). Larvae from each plant were extracted by the method of Christie and Perry.[6]

Results indicate that 100,000 nematodes per pot sigificantly reduced plant weight and height (table 1). The largest number of larvae were recovered from roots of plants having a high number of root knot galls, as well as reduced number of roots. There were no significant differences among 0, 1,000 and 10,000 larvae in terms of dry weight, height of plants nor larvae per plant. On basis of the results herein reported and the observations in the field (fig. 1), it can be theorized that a longer exposure of tanier plants to the *M. incogita* damage, once the edible tubers are formed, would have affected their quality regardless of the initial inocula. This is the first report on the pathogenicity of *M. incognita* in tanier.

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[6]Christie, J. R. and V. G. Perry, 1951. Removing nematodes from soil, Proc. Helminthol. Soc. Wash. 18: 106–08.

FIGURE 1.—Tanier tuber from a commercial farm severely infected with *Meloidogyne incognita*. Notice the severe galling (arrows) in the tuber.