

## RESEARCH NOTES

### OCCURRENCE OF *the* NEMATODE MELOIDOGYNE JAVANICA ON PIGEONPEA ROOTS IN PUERTO RICO

The Javanese root-knot nematode, *Meloidogyne javanica* (Treub 1885) Chitwood 1949, was the first species of this genus to be described.<sup>1</sup> It was originally found infecting sugarcane roots in Java. In 1949 Chitwood separated the genus from *Heterodera*, cyst-forming nematodes, describing seven species under the new genus *Meloidogyne*.

In 1911 Bessey<sup>2</sup> reported the attack of root-knot on pigeonpea, *Cajanus indicus* Spreng, and although the nematodes were abundant they were apparently causing little damage to the plants. Sandground<sup>3</sup>, studying its life history and control, found that the infestation on this crop was severe. In Hawaii, Godfrey<sup>4</sup> found one pigeonpea variety which was completely resistant, but others were susceptible to this nematode. Collins<sup>5</sup> in Rhodesia and Beeley<sup>6</sup> in Malaya observed infection of pigeonpea roots by this nematode.

Several efforts to infect different varieties of pigeonpea with different root-knot species and isolates under greenhouse conditions in Puerto Rico, have failed. At the same time, samples taken from the field were always free of this nematode group, thus suggesting a degree of resistance, since samples were taken in some instances from heavily infected fields. However, this plant is very susceptible to the attack of other nematode species like *Rotylenchulus reniformis* Lindford and Oliveira 1940, *Criconemoides* sp., *Helicotylenchus* sp., and *Hoplolaimus* sp.

Studies made in the Island, mainly on sugarcane<sup>7</sup> and pineapple, have revealed the occurrence of three species of root-knot: *Meloidogyne arenaria*,

<sup>1</sup> Treub, D. M., Quelques mots sur les effects du parasitism de l' *Heterodera javanica* dans les racines de la canne a sucre, *Ann. Jard Buitenzorg* 6 93-6, 1887.

<sup>2</sup> Bessey, Ernest A., Root-knot and its Control, *U.S. Bur. Plant Ind. Bul. No.* 217, pp. 89, 1911.

<sup>3</sup> Sandground, J., A study of the life history and methods of control of the root-gall nematode, *Heterodera radicola*, (Greef Muller) in South Africa, *So. African J. Sci.* 18 399-418, 1922.

<sup>4</sup> Godfrey, G. H., Legumes as Rotation and Trap Crops for Nematode Control in Pineapple Fields, *Hawaii Assoc. Pineapple Cannery Exp. Sta. Bul. No.* 10, pp. 1-21, 1928.

<sup>5</sup> Collins, J. C., Nematode investigations, *Rhodesia Agr. J.* 34 409-16, 1937; 35 431-8, 1938.

<sup>6</sup> Beeley, F., A nematode pest of roots of cover plants, *Rubber Res. Inst. Malaya I.* 9 51-8, 1939.

<sup>7</sup> Román Jessé, Pathogenicity of five isolates of root-knot nematodes (*Meloidogyne* spp.) to sugarcane roots, *J. Agr. Univ. P.R.*, 45 (2) 55-85, 1961.

*M. incognita acrita*, and *M. incognita incognita*. So far, the Javanese root-knot nematode, *M. javanica*, has not been found under field conditions.

Recently, an examination of the roots of a pigeonpea plant of the Saragateado variety, growing close to our laboratory at the Agricultural Experiment Station was found to be heavily infested with root-knot. Examination of perinneeal patterns and head ends including the esophageal

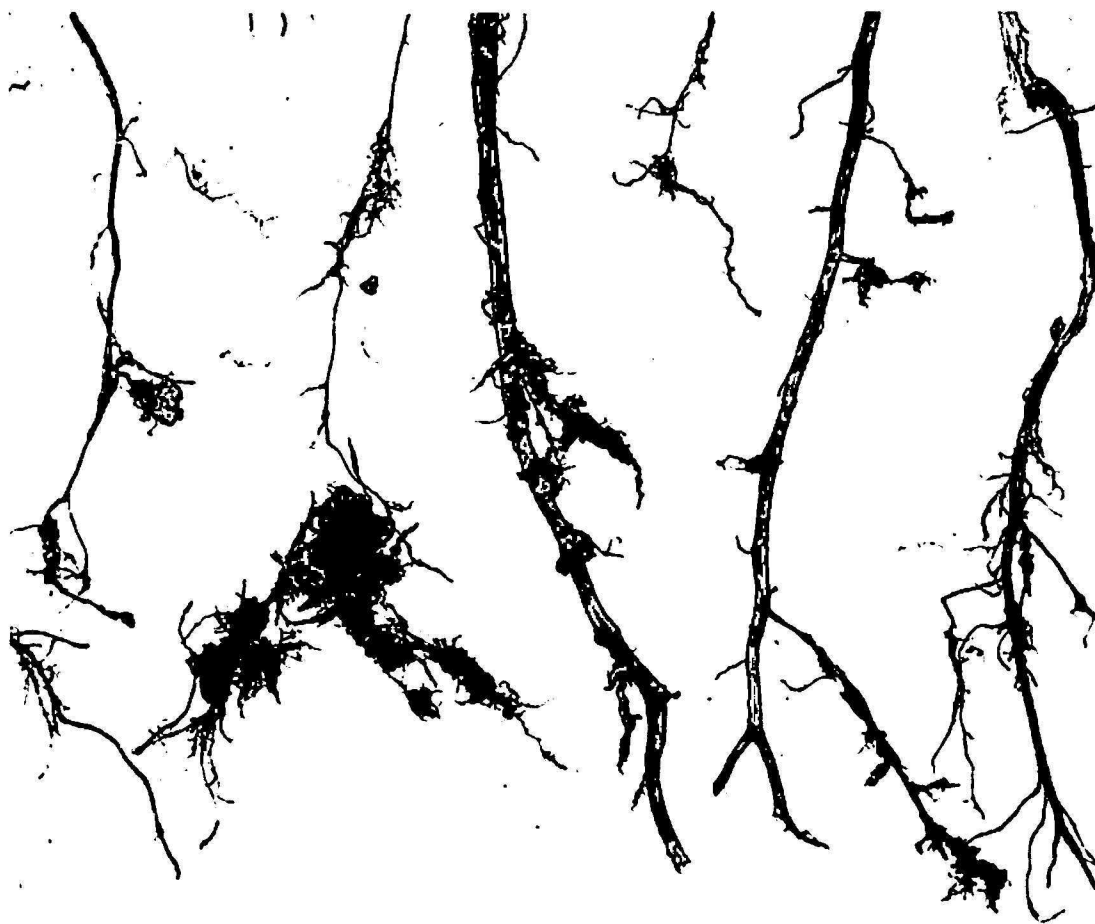


FIG. 1.—Roots of pigeonpea showing damage caused by the Javanese root-knot nematode. Note small swellings and the formation of very short and undeveloped roots. Larger nodules may be observed at the lower left.

region immediately placed this species in the *javanica* group. Some morphological differences of minor importance were observed when compared to the original description.

The infested roots had swellings which were usually small as shown in figure 1. Most of the secondary and tertiary roots were galled and short. Small swellings were predominant, but in some instances these grouped together to form club-shaped root tips. Swellings were found not only at the tips but all along the roots, forming bedlike roots. When primary roots were attacked corky tissue was observed from which a large number of

females were excised. Necrotic areas and cracking were also associated with this infection.

Pronounced proliferation of the roots resulting in "brooming" and club-shaped roots was prevalent when root tips were attacked. New roots were invaded immediately after being formed, as evidenced by the formation of very short side roots which developed incompletely. Even when these symptoms were predominant no aerial effects on the plants were observed.

This is the first time that this species of the root-knot nematode, *Meloidogyne javanica*, has been reported from Puerto Rico and it is probably the first time that this species has been found attacking pigeonpea roots in the Western Hemisphere. Research and survey work will be directed to determine the distribution and host range of this species so as to continue or discontinue the recommendations of this plant for rotation with other minor crops with which root-knot is the major problem.

*Alejandro Ayala*  
*Department of Entomology*