SUSCEPTIBILITY OF TEN PLANT SPECIES TO FOUR *MELOIDOGYNE* ISOLATES IN MALAYSIA

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The perineal pattern has long being accepted as a reliable character to separate species in the genus *Meloidogyne*. However, alternative approaches have been attempted to supplement the existing technique. A differential host test method has been recommended in addition to perineal pattern studies for species identification in the International Meloidogyne Project Programme. This study attempts to identify isolates of *Meloidogyne* collected from four areas in Malaysia by using the perineal pattern and differential host test method.

Materials and Methods

Isolates of *Meloidogyne* spp. collected from various parts of Peninsular Malaya were maintained on tomato (unidentified local cultivar) or on coleous. For the purpose of the experiment, single egg-mass cultures of individual isolates were sustained on tomato plants until sufficient inoculum developed for commencing the experiment.

Four test plants of International Meloidogyne Project, namely Tomato cv. Rutgers, Tobacco, cv. NC 95, Peanut and watermelon, and six other crops, okra, cucumber, pepper (*Capsicum annuum), Amaranthus* sp., *Brassica rapa* and yard-long bean *(Vigna sesquipedalis)* were used. Tomato, tobacco, amaranthus and *Brassica rapa* were germinated and raised in germination boxes. When these plants were about 8 cm. high, uniformly grown plants were selected and transplanted individually into plastic cups partially filled with heat -treated soil. For peanut, watermelon, okra, cucumber, yard long bean and pepper, the seeds were directly sown into the heat-treated soil in plastic cups. Two seeds were placed in each cup. After germination, the seedlings were thinned out to one vigorously growing seedling per cup. All seedlings were inoculated with a predetermined inoculum of *Meloidogyne* eggs.

Inoculum for each *Meloidogyne* isolates used in this test was obtained according to a method reported earlier (1). To prevent cross infection the sieves were immersed in boiling water after obtaining the eggs from every individual isolate. Four nematode isolates were used, namely, University Pertanian, (UPM), Federal Experiment Station (FES), Kuala Pilah (KP) and Kuala Kangsar (KK) isolates. The host crops from which these respective isolates were obtained are as follows:—

Meloidogyne Isolates	Host Crops
UPM	Tapioca
FES	Okra
KP	Pepper
KK	Papaya.

Ten milliliter suspension of about 10,000 eggs of each nematode isolate was added to individual plants in the plastic cups. The plants were allowed to grow for twenty days in the cups before they were carefully transferred individually (together with the soil) into 8-inch-diameter clay pots partially filled with heat-treated soil. The pots were filled to the top with heat treated soil and placed in the glasshouse with temperature ranging from 25 C to 35 C. The plants were allowed to grow for a period of 30 days. Then the roots were washed free of soil under running tap water. The root galls were rated according to Sasser (2).

Twenty mature obese females were selected from each isolate, for the perineal pattern studies.

Results and Discussion

Results of the susceptibility of plants to attack by four *Meloidogyne* isolates are presented in Table. 1.

Of the 10 plant species tested against the four *Meloidogyne* isolates, seven were found to be susceptible to the nematode (rating of 3 to 5), whereas 3 were not susceptible. Tomato, watermelon, okra and cucumber were

Table 1. Galling responses of 10 plant genera to four isolates of *Meloidogyne*.

	Tomato	Watermelon	Peanut	Tobacco	Okra	Cucumber	Pepper	Amaranthus	*Brassica rapa*	Yard-long bean
Serdang	+*	+	-	-	+	+	-	+	+	+
FES	+	+	-	-	+	+	-	+	+	+
KP	+	+	-	-	+	+	-	+	+	+
KK	+	+	-	-	+	+	-	+	+	+

* + Galls present on roots
\- no gall on the root

found to be highly susceptible to all the isolates tested with gall rating of 5. Large galls were produced on the roots. Some root systems were reduced to clumps of finger-like knots before the test was terminated. *Amaranthus* sp., *Brassica rapa* and yard-long bean were also found to be susceptible to a certain extent. Galls present on the roots were small and more evenly distributed in the root system. Root growth and elongation appeared not to be affected. Likewise, the plants seemed to grow well within the test period of fifty days. In yard-long bean, root galling did not appear to affect bacterial nodulation. All these plants have a root gall rating of 3 to 4.

Tobacco (cv. NC 95), peanut and pepper were non-hosts to the four isolates of *Meloidogyne*. With the exception of one pepper plant, no galls were visible on the roots. Galls induced by the FES isolates on the root of one pepper plant were small and fewer (Rating of 2). Upon examining the galls, it was found that the nematode failed to reach the advanced stage of development within the test period. Most of the nematodes appeared to be in the early third larval stage.

The perineal pattern obtained from twenty mature females of each isolates strongly suggests that all the isolates were of *Meloidogyne incognita*.

Conclusion

The perineal pattern and the differential host test suggests that the four isolates belong to *Meloidogyne incognita*, which is the predominant species in Malaysia (3). The population which attacked pepper could be of a different species or a strain of *M. incognita* from the FES isolate. Unfortunately, this could not be confirmed by the perineal pattern, as the nematode failed to develop to mature females, nor inoculum for further differential host test could be obtained.

The ten plants used in this test are not sufficient to list the hosts and non hosts of these four isolates tested so far. Nevertheless, it is good to know that tobacco, peanut and pepper could be used in rotation with the other susceptible crops to reduce the population of *Meloidogyne incognita* in the field.

Literature Cited

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