# Notes brèves

## VERTICAL MIGRATION OF FOUR NATURAL POPULATIONS OF *MELOIDOGYNE*.

Jean-Claude PROT.*

Prot (1977) has shown that juveniles of a clone of *M. javanica* (Treub, 1885) Chitwood, 1949 maintained in the laboratory were able to travel relatively great distances before infecting a susceptible tomato. The percentages of juveniles that migrated 25, 50 and 75 cm vertically after nine days were approximately 66, 50 and 25%, respectively. These movements were rapid since 16% of the juveniles moved 25 cm in three days and 25% moved 50 cm in five days. In order to determine if this capacity of movement was specific to this clone or whether it occurred frequently among the *Meloidogyne* of West Africa, vertical migration of other populations was studied.

Experiments were made with the experimental apparatus previously described (Prot, 1977). A glass tube, with an internal diameter of 1.2 cm and a length of 5, 10, 25, or 50 cm depending on the experiment, was filled with autoclaved soil (120 °C for 30 min). The top was covered with a screen having openings of 10 µm held in place with a small ring of Rhodorsil. Three hundred juveniles were introduced into the bottom of the tube after which it was closed with a cork. The top of the tube was then inserted into a hole made in the bottom of a 6 cm diameter plastic pot. Approximately 80 $cm^3$ of the same soil was placed in the pot into which was transplanted a 4-week-old Roma tomato seedling.

With this apparatus, vertical migration of four field populations was studied : one population of *M. javanica*, one of *M. incognita*, one with a perineal pattern intermediate between *M. arenaria* and *M. incognita* and one population containing a mixture of these species.

Migration was studied as a function of distance by introducing the juveniles at 0, 5, 10, 25 and 50 cm from the root systems leaving the plant in position for nine days. Migration was also studied as a function of time ; juveniles were placed 25 cm from the roots and the experiment terminated one, three, five, seven and nine days after their introduction.

At the end of an experiment tomato plants were removed from the pot and their root systems stained with cold cotton blue-lactophenol (de Guiran, 1966). Only juveniles found in the roots were counted. Nematodes that entered the pots but that did not infect were not considered. Five replications were used for all experiments.

Results of the experiments are presented in Figure 1. The mean numbers of juveniles in the roots nine days after inoculation and placed 0, 5, 10, 25 and 50 cm from the root systems are shown in Figure 1-A. Figure 1-B represents the mean penetration of juveniles when placed 25 cm from the roots one, three, five, seven and nine days before examination.

In the experiments in which distance between the point of introduction of nematodes and roots of tomato was varied, results were approximately the same for the four populations at distances less than 25 cm. The sole exception occured with the heterogenous population at a distance of 0 cm (in direct contact with the roots). In this case in three of the five replicates many of the roots died resulting in a non-realistically low penetration figure. When nematodes were introduced 5 or 10 cm from the roots, penetration was similar to that obtained when the same populations were introduced at a distance of 0 cm.

At a distance of 25 cm, median percentages of penetration of the four populations varied between 50 and 66%. At a distance of 50 cm, approximately 50% of the *M. incognita* population (Fig. 1-A, black squares) penetrated the tomato roots within nine days. This figure is similar to that obtained with a clone of *M. javanica* (Prot, 1977). Less that 15% penetration was observed at this distance with the other three populations.

In the experiment in which the distance was constant, 25 cm, the rapid rate of movement is evident ; *i.e.* in three of four populations approximately 33% of the juveniles reached and penetrated the tomato roots within three days. Within seven or nine days a penetration of more than 50% was achieved with each population.

* *Laboratoire de Nématologie, ORSTOM, B.P. 1386, Dakar, Sénégal.*

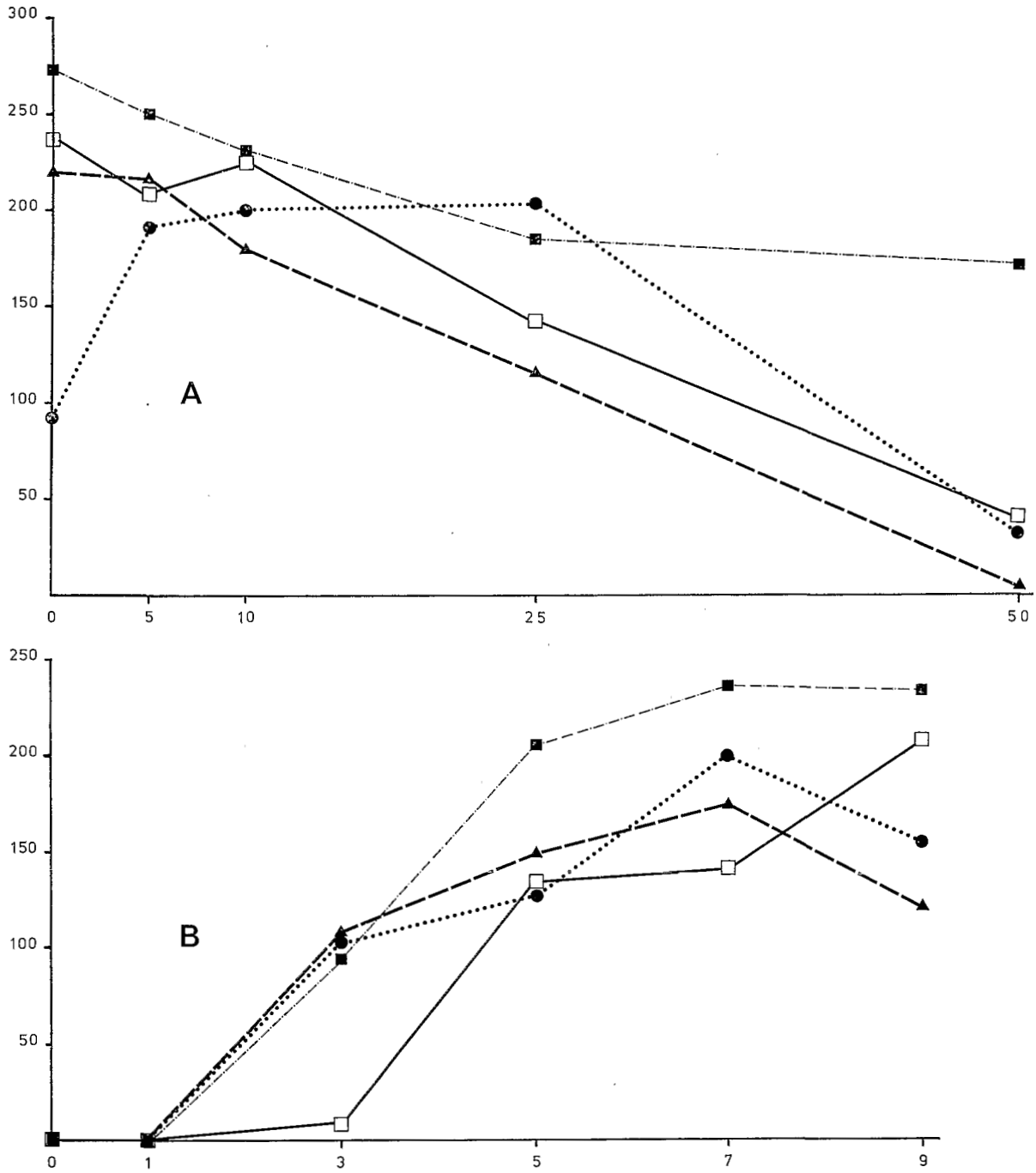


Figure 1 : Vertical migration of juveniles of four natural populations of *Meloidogyne*. Black squares : *M. incognita ;* white squares : *M. javanica ;* black triangles : population intermediate between *M. arenaria* and *M. incognita ;* black circles : population including the three previous species.

A : vertical migration as a function of the distance between root systems and inoculum (abscissa) ; ordinate : number of juveniles in the roots after 9 days.

B : vertical migration of juveniles placed 25 cm from root systems as a function of time ; abscissa : time of experiment in days ; ordinate : number of juveniles found in the roots.

On the basis of these results it is concluded that the capacity to migrate relatively large distances is common within populations of *Meloidogyne* from West Africa. It seems logical to assume that the same ability exists within *Meloidogyne* population from other geographical areas as well. It should be noted that populations do vary in this character *e. g.* higher penetration figures were obtained in both experiments with the *M. incognita* population than with the others tested.

*Accepté pour publication le 3 octobre 1977.*


REFERENCES

GUIRAN, G. de (1967). Coloration des nématodes dans les tissus végétaux par le bleu coton à froid. *Nematologica*, 12 : 646.

PROT, J.-C. (1977). Amplitude et cinétique des migrations du nématode *Meloidogyne javanica* sous l'influence d'un plant de tomate. *Cah. ORSTOM, sér. Biol.*, 11 (1976) : 157-166.


## TESTS PRELIMINAIRES DE SENSIBILITÉ DE DEUX CULTIVARS DE TOMATE ET D'UN CULTIVAR D'ARACHIDE A DEUX SOUCHES DE *ROTYLENCHULUS RENIFORMIS* (NEMATODA : TYLENCHIDA).

Gaetano GERMANI.*

La grande majorité des plantes cultivées aux Iles du Cap-Vert est affectée à des degrés variables, par le nématode *Rotylenchulus reniformis* Linford & Oliveira, 1940. Les expériences préliminaires relatées ci-dessous visaient à tester la virulence de cette souche comparativement à la souche présente au Sénégal.

Deux souches de *Rotylenchulus reniformis*, l'une provenant de l'archipel du Cap-Vert et l'autre endémique au Sénégal ont été inoculées au cultivar d'arachide 28-206 et aux cultivars de tomate Rossol et Roma respectivement résistant et sensible à *Meloidogyne* spp.

Trois lots de jeunes plantes comportant chacun dix répétitions ont été infestés avec *R. reniformis* provenant des Iles du Cap-Vert et trois autres lots avec la souche sénégalaise. Les plantes ont été cultivées en serre dans des pots contenant deux décimètres cubes de sol et ont été inoculées avec 10 000 individus (femelles immatures, mâles et juvéniles). Un même nombre de plantes, non inoculées et cultivées dans les mêmes conditions, a été pris comme témoin. Soixante seize jours après l'inoculation les plantes ont été prélevées et l'infestation a été évaluée. Les formes actives de *R. reniformis* du sol ont été extraites à l'élutriateur (Seinhorst, 1962) et celle des racines par la méthode des asperseurs (Seinhorst, 1950). Dans le tableau 1 est consigné le nombre moyen de *R. reniformis* par pot calculé sur les dix répétitions. De nouvelles plantules ont été repiquées dans chacun des pots et le taux de mortalité des plantes a été relevé trente jours après le repiquage.

Les différentes observations effectuées sont consignées dans le tableau 1. L'analyse mathématique des données a été faite au moyen du test de Mann-Whitney (Snedecor & Cochran, 1967).

Le cultivar d'arachide 28-206 n'est sensible ni à l'une ni à l'autre des souches de *R. reniformis*. Les populations initiales inoculées étaient, au 76e jour de végétation, fortement réduites. Par ailleurs, à cette date, les plants infestés montraient, comparativement au témoin, une meilleur végétation. Un phénomène similaire a déjà été observé sur un cultivar de soja résistant à *R. reniformis*, (Rebois & Johnson, 1973).

Le cultivar de tomate Rossol (résistant à *Meloidogyne* sp) montre une plus grande sensibilité aux deux souches de *R. reniformis* que le cultivar Roma (sensible).

La souche de *R. reniformis* provenant des Iles du Cap-Vert manifeste, dans l'ensemble, une plus grande agressivité que la souche sénégalaise tant sur Rossol que sur Roma.


REFERENCES

LINFORD, M. B. & OLIVEIRA, J. M. (1940). *Rotylenchulus reniformis*, nov. gen., n. sp., a nematode parasite of roots. *Proc. helminth. Soc. Wash.*, 7 : 35-42.

REBOIS, R. V. & JOHNSON, W. C. (1973). Effect of *Rotylenchulus reniformis* on yield and nitrogen, potassium, phosphorus and amino acid content of seed of *Glycine max*. *J. Nematol.*, 5 : 1-6.

SEINHORST, J. W. (1950). De betekenis van de toestand van de grond voor het optreden van aanstasting door het stengelaaltje (*Ditylenchus dipsaci* (Kühn) Filipjev) *Tijdschr. Pl. Ziekt.*, 56 : 291-349.

SEINHORST, J. W. (1962). Modifications of the elutriation method for extracting nematodes from soil *Nematologica*, 8 : 117-128.

SNEDECOR, G. W. & COCHRAN, W. G. (1967). *Statistical methods*. Sixth Edit., Iowa St. Univ. Press., 593 p.


* *Laboratoire de Nématologie, ORSTOM, B.P. 1386, Dakar, Sénégal.*

*Accepté pour publication le 28 octobre 1977.*