Notes brèves

PRESENCE OF ABERRANT JUVENILES IN A POPULATION OF *MELOIDOGYNE ARENARIA*

Caspar Netscher (*)

Approximately 10% of the juveniles of a population of *Meloidogyne arenaria* maintained for six months on sweet potato *(Ipomoea batatas)* cv. CDH were morphologically aberrant. The plants were growing in a two-liter-pot in an air-conditioned room with a ten hours light period. Daily temperatures fluctuated between 22 and 26°. Aberrant juveniles had unusual tail shapes (Fig. 1a and 1b) and, less frequently, bulges along the body resulting in strongly irregular shapes (Fig. 1c and 1d).

To verify whether the aberrant juveniles belonged to the off-spring of particular females, 50 egg-masses were taken from the roots of the sweet potato plant. Each egg-mass was stored in a small vial with water. After three days, ten vials were chosen at random and the number of juveniles which had hatched from each egg-mass counted. Three categories were distinguished : normal juveniles (N), individuals with aberrant tails (T), and irregularly shaped nematodes (I). About 10% of the juveniles counted were aberrant (Tab. 1). Only one out of the ten females produced normal juveniles only. All others produced aberrant juveniles in varying numbers not exceeding 24% of the total number of juveniles hatched.

Three-week-old tomato seedlings (cv. Roma) growing in sterile soil were inoculated with approximately 200 normal juveniles each. Two other tomato seedlings received about half of the 252 juveniles with aberrant tails, whereas the 70 juveniles with irregular body shape were inoculated onto another tomato seedling.

Five weeks after inoculation the root systems were washed free of adhering soil and placed in a mist chamber (Seinhorst, 1950) to extract juveniles. From plants inoculated with normal juveniles or juveniles with aberrant tails, aberrant nematodes were recovered, however never more than 2% (Tab. 2).

No reproduction of *M. arenaria* occurred on the tomato plant inoculated with irregularly shaped nematodes. Most aberrant juveniles had abnormal tails. Only two plants inoculated with normal juveniles yielded a few nematodes with irregular body shape.

To imitate conditions under which nematodes had produced a relatively high proportion of aberrant individuals, cuttings of sweet potato cv. CDH were grown in five two-liter-pots placed in the room where the aberrant juveniles had been obtained and inoculated with the same culture of *M. arenaria*. Six months after inoculation nematodes were extracted from each pot. None of the five cultures yielded a high percentage of aberrant juveniles. Therefore it seems unlikely that either the host or the environment were responsible for the appearance of aberrant juveniles.

Discussion

It is difficult to explain what mechanism is responsible for the occurrence of the aberrant juveniles. The results obtained clearly indicate that selection did not increase the occurrence of aberrant nematodes. *Meloidogyne arenaria* reproduces by mitotic parthenogenesis (Triantaphyllou, 1966), thus the offspring of one female constitutes a clone. Therefore juveniles issued from a single egg-mass should be either all normal or all aberrant if the morphological changes were genetically determined. Sturhan (1970) found aberrant forms similar to those reported here in *Ditylenchus dipsaci*. By selecting aberrant individuals as parents he could produce a population a third of which consisted of aberrant nematodes. However continued inbreeding with aberrant individuals either failed or a predominantly normal offspring was produced, a situation similar to the one described here.

* Laboratoire de Nématologie, B.P. V-51, Abidjan, Ivory Coast.

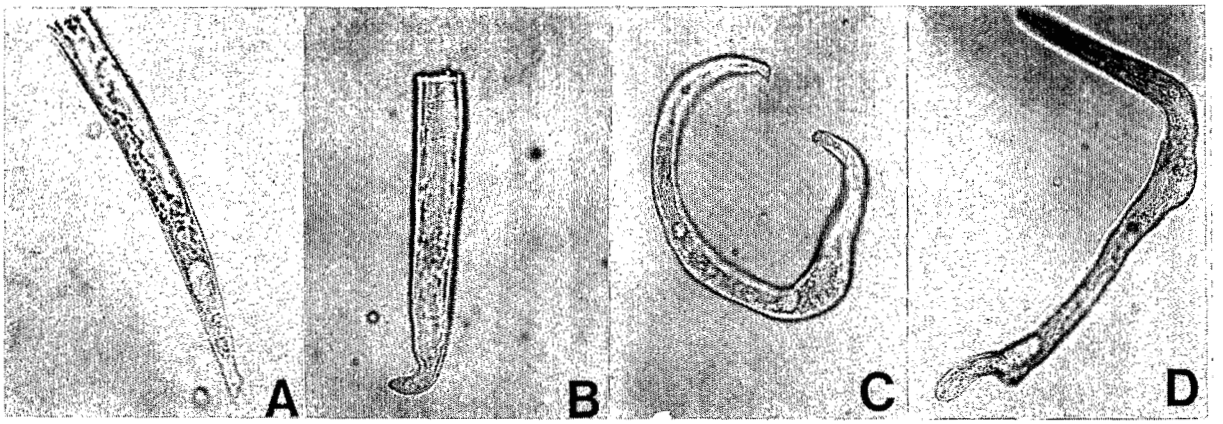

Fig. 1. Aberrant juveniles of *Meloidogyne arenaria*. a & b : aberrant tails ; c & d : irregularly shaped juveniles.

Table 1

Number of normal juveniles (N), juveniles with aberrant tails (T), and juveniles with irregular body shape (I) hatched from 10 egg-masses of *M. arenaria*

N	*T*	*I*	*% of aberrant juveniles*
261	41	18	18.4
352	38	—	10.8
247	—	—	0
215	18	—	7.7
306	24	3	8.2
248	16	4	7.5
213	11	16	11.3
252	54	23	23.4
385	45	—	10.5
227	5	6	4.6
Total : 2.706	252	70	10.6

Table 2

Number of juveniles recovered and % of aberrant juveniles extracted from tomato plants inoculated with : normal juveniles (N), juveniles with aberrant tail (T) or juveniles with irregular body shape (I)

Type of inoculum	*Number of juveniles recovered* *	*% of aberrant juveniles*
N	1 560	0.3
N	3 125	1.6
N	3 685	0.8
N	4 530	0
N	2 270	1.1
T	2 140	0.7
T	1 285	0.4
I	0	0

* Determined by counting aliquots of 5 cm³ of nematode suspensions concentrated to 50 cm³.

It may be that a disease caused the morphological aberrations. In fact since the variants were noticed, aberrant juveniles have been observed in many of our cultures of *Meloidogyne*. The presence of juveniles of *Sarisodera africana* with aberrant tails (Taylor & Luc, 1979) reported from this laboratory coincides with the occurrence of abnormal juveniles of *M. arenaria* reported here and both occurrences may be due to the same cause.

Accepté pour publication le 10 mars 1981.

References

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. PlZiekt.*, 56 : 289-348.

Sturhan, D. (1970). Intraspezifische Variabilität und Mutationen bein Nematoden. *Proc. IX Int. Nem. Symposium (Warsaw 1967)* : 209-220.

Taylor, D.P. & Luc, M. (1979). Observations on *Sarisodera africana* (Nematoda : Heteroderidae) : Redescription of anterior end of females and occurrence of juveniles with aberrant tails. *Revue Nématol.*, 2 : 110-114.