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## RESEARCH NOTES—NOTAS DE INVESTIGACION

**ASSOCIATION BETWEEN *PRATYLENCHUS COFFEA* AND *SCUTELLONEMA BRADYS* IN YAM TUBERS UNDER AGRONOMIC CONDITIONS IN THE FRENCH WEST INDIES**

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## RESUMEN

Castagnone-Sereno, P., y A. Kermarrec. 1988. Asociación entre *Pratylenchus coffeae* y *Scutellonema bradys* en tubérculos de ñame en cultivo o en almacenamiento en las Antillas francesas. *Nematropía* 18: 155–157.

Un trabajo fue realizado durante los años 1985, 1986 y 1987 en las islas francesas del Caribe con el objeto de estudiar el parasitismo de tubérculos de ñame (*Dioscorea* spp.) por dos nematodos endoparásitos *Pratylenchus coffeae* y *Scutellonema bradys*. El análisis de los resultados de este amplio estudio permitió precisar ciertos aspectos de las relaciones entre estas dos especies. Cuando los niveles de población en los tubérculos fueron altos, el dominio de una especie sobre la otra se observó frecuentemente.

*Palabras claves:* ñame, *Dioscorea alata*, *D. cayenensis*, *D. rotundata*, *Pratylenchus coffeae*, *Scutellonema bradys*.

Several endoparasitic nematodes are associated with yam (*Dioscorea* spp.) tubers, including *Scutellonema bradys* (Steiner & Le Hew) Andrassy and *Pratylenchus coffeae* (Zimmerman) Filipjev & Schuurmans Stekhoven (3,6). Working under controlled conditions on Guinea yam (*D. rotundata*), Acosta and Ayala (2) showed the dominance of *P. coffeae* over *S. bradys*. When both species were present in roots or tubers, populations of *S. bradys* were always smaller. Data collected by the authors during a previous survey (7) were analysed to determine the relationship between these two nematode species under field and storage conditions on the main *Dioscorea* species present in the French West Indies.

The survey involved only yam tubers, the cortical zone of which may be infested with numerous endoparasitic nematodes (1). Tubers were collected directly from the field and from storage bins where they were maintained as seed stock. All of the French islands located in the West Indies were included in the survey which occurred from September to April during 1985, 1986, and 1987. Samples were brought to the laboratory where the cortex (0.5 to 1 cm in depth) was crushed and nematodes extracted using the centrifugal-flotation technique (8). The less important *Dioscorea* species (*D. trifida* L., *D. transversa* Br., *D. bulbif-*

*era*, L., and *D. esculenta* (Lour.) Burk.) represented only 2% of the sampled yams and were excluded from this study. The tubers of the most frequent yam species (*D. alata* L., *D. cayenensis* Lamk. and *D. rotundata* Poir.) that contained no nematodes (23% of the total) were also eliminated from this analysis of the association between *P. coffeae* and *S. bradys*. Final results were obtained on the basis of the remaining 314 samples.

During the 3 years of this study differences in nematode populations were not apparent either between field and storage samples or among years. Most of the stored tubers had been harvested just prior to sampling and the storage conditions probably did not influence the populations of nematodes. Accordingly, the data collected from both the field and storage were combined. The occurrence of *P. coffeae* and *S. bradys* together in the same tuber was infrequent (a maximum of 12% for *D. rotundata*), and infestation by one nematode only, despite the yam species, was the most usual situation, occurring in 88 to 92% of the samples (Table 1). These data suggest that the establishment of one species prevents the concomitant infection of the tuber by the other species. This apparent "exclusionary effect" has been reported by several authors who investigated other nematode-infected plants (4,5,9), and was observed here on tubers of *D. alata* and *D. cayenensis*.

As demonstrated experimentally by Acosta and Ayala (2), *P. coffeae* under our cultural conditions, appears to be the dominant parasite of *D. cayenensis*, whereas *D. alata* seems to be attacked with the same frequency by either nematode species. The low number of samples infected simultaneously with both species does not allow any specific statistical analysis. However, when combined populations of *P. coffeae* and *S. bradys* were detected, we observed that both species occurred in the tubers at equally low levels. At high levels, one of the two parasites was dominant, with no clear relationship with the different species of yam. Further studies are planned to provide a better understanding of the inter-relationship between these two nematode species and the main yams grown in the French West Indies.

Table 1. Natural infection of the three main yam species of the French West Indies with *Pratylenchus coffeae* and/or *Scutellonema bradys*.

<i>Dioscorea</i>	No. samples analyzed	<i>Dioscorea</i> samples infected (%)		
		<i>P. coffeae</i>	<i>S. bradys</i>	<i>P. coffeae</i> + <i>S. bradys</i>
<i>D. alata</i>	188	43	48	9
<i>D. cayenensis</i>	50	80	12	8
<i>D. rotundata</i>	76	71	17	12

## LITERATURE CITED

1. ACOSTA, N. 1974. Depth of penetration of phytoparasitic nematodes in yam tubers. *Nematropica* 4:7–11.
2. ACOSTA, N., and A. AYALA. 1976. Effects of *Pratylenchus coffeae* and *Scutellonema bradys* alone and in combination on Guinea yam (*Dioscorea rotundata*). *Journal of Nematology* 8:315–317.
3. ADESIYAN, S.O., R. A. ODIHIRIN, and M. O. ADENIJI. 1975. Economic losses caused by the yam nematode, *Scutellonema bradys*, in Nigeria. *Plant Disease Reporter* 59:477–480.
4. ESTORES, R. A., and T. A. CHEN. 1972. Interactions of *Pratylenchus penetrans* and *Meloidogyne incognita* as coinhabitants in tomato. *Journal of Nematology* 4:170–174.
5. GAY, C. M., and G. W. BIRD. 1973. Influence of concomitant *Pratylenchus brachyurus* and *Meloidogyne* spp. on root penetration and population dynamics. *Journal of Nematology* 5:212–217.
6. HUTTON, D. G., A. H. WAHAB, and J. DEHANEY. 1981. Effect of infection with *Pratylenchus coffeae* on growth and yield of yellow yam (*Dioscorea cayenensis*). Proceedings of the First Meeting of the Society for Plant Protection in the Caribbean. Kingston, Jamaica. Pp. 145–153.
7. KERMARREC, A., P. CASTAGNONE-SERENO, L. DEGRAS, A. ANAIS, and D. DENON. 1987. Nouvelle distribution de *Scutellonema bradys* (Tylenchida: Hoplolaiminae) dans la Caraïbe: le cas des Antilles Françaises. *Medelingen van de Faculteit Landbouwwetenschappen Rijksuniversiteit Gent* 52:617–624.
8. KERMARREC, A., and C. SCOTTO LA MASSESE. 1972. Données nouvelles sur la composition et la dynamique de la nématofaune des sols des Antilles Françaises. *Annales de Zoologie-Ecologie Animale* 4:513–527.
9. KRAUS-SCHMIDT, H., and S. A. LEWIS. 1981. Dynamics of concomitant populations of *Hoplolaimus columbus*, *Scutellonema brachyurum* and *Meloidogyne incognita* on cotton. *Journal of Nematology* 13:41–48.

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