

NEW CONTRIBUTIONS TO THE STUDY OF THE NEMATODE FAUNA IN THE FRENCH WEST INDIES. A. Kermarrec and C. S. La Massese. INRA, CRAAG, Petit-Bourg, Guadeloupe; INRA, CRA, Antibes, France.

### SUMMARY

A new nematological survey campaign in the French Antilles (West Indies) demonstrates the presence of some main phytophagous species associated with miscellaneous host plants as well as the deterioration of the structure of the nematode fauna with the initiation of land cultivation. The ratio  $R = \text{total population/number of phytophagous Tylenchs}$  is introduced to allow an evaluation of the changes which take place in the natural equilibrium of nematode populations after beginning land cultivation.

### RESULTS OF THE SAMPLING CAMPAIGN 1968 - 1971

#### A. CHECK LIST OF THE PHYTOPHAGOUS NEMATODE SPECIES FOUND ACCORDING TO HOST PLANT

- 1) Sugar cane (*Saccharum officinarum* L.)  
*Tylenchorhynchus* sp.; *Telotylenchus* n. sp.; *Trophurus* n. sp.;  
*Meloidogyne javanica*; *Meloidogyne* sp.; *Helicotylenchus erythrinae*;  
*Helicotylenchus* n. sp.; *Pratylenchus brachyurus*; *P. zeae*;  
*Macroposthonia denoudeni*; *M. onoense*; *M. palustris*; *M. sphaerocephala*;  
*Longidorus laevicapitatus*.
- 2) Banana and Plantain (*Musa* sp.)  
*Meloidogyne* sp.; *Helicotylenchus multicinctus*; *Pratylenchus coffeae*;  
*Pratylenchus* sp.
- 3) Avocado (*Persea americana* Mill.)  
*Telotylenchus* n. sp.; *Trophurus* n. sp.; *Helicotylenchus concavus*,  
*Pratylenchus* sp.
- 4) Mango (*Mangifera indica* L.)  
*Trophurus* n. sp.; *Helicotylenchus concavus*; *Helicotylenchus* sp.; *Pratylenchus* sp.
- 5) Coffee (*Coffea arabica* L.)  
*Trophurus* n. sp.; *Meloidogyne* sp.; *Helicotylenchus multicinctus*;  
*H. pseudorobustus*; *Pratylenchus coffeae*; *Pratylenchus* sp.;  
*Pratylenchus* sp.; *Macroposthonia sphaerocephala*, *Hemicriconemoides*  
*strictathecatus*; *Xiphinema brevicolle*.
- 6) Cotton (*Gossypium* sp.)  
*Tylenchorhynchus acutus*
- 7) Pimento  
*Tylenchorhynchus capitatus*; *Helicotylenchus* sp.; *Rotylenchulus* sp.
- 8) Citrus (*Citrus* spp.)  
*Tylenchorhynchus* sp.; *Telotylenchus* n. sp.; *Helicotylenchus erythrinae*;  
*H. concavus*; *H. tropicus*; *Helicotylenchus* sp.; *Meloidogyne* sp.;  
*Peltamigratus luci*; *Pratylenchus zeae*; *Pratylenchus* sp.; *Rotylenchulus* sp.;  
*Macroposthonia denoudeni*; *M. palustris*; *M. sphaerocephala*;  
*Criconema* n. sp.; *Longidorus laevicapitatus*; *Xiphinema americanum*;  
*X. vulgare*; *Xiphinema* sp.
- 9) Pangola grass (*Digitaria decumbens* Stent.)  
*Tylenchulus* sp.; *Trophurus* n. sp.; *Helicotylenchus erythrinae*; *H. tropicus*;  
*Helicotylenchus* sp.; *Pratylenchus brachyurus*; *P. zeae*;  
*Pratylenchus* sp.; *Rotylenchulus* sp.; *Macroposthonia denoudeni*.

## 10) Forest

*Tylenchus* spp.; *Trophurus* n. sp.; *Meloidogyne* sp.; *Helicotylenchus erythrinae*; *Helicotylenchus* sp.; *Macroposthonia* sp.; *Criconema octangulare*; *Criconema* sp.; *Longidorus laevicapitatus*; *Xiphinema rivesi*; *Xiphinema* sp.

## B. NEW OBSERVATIONS ACCORDING TO THE SPECIES

- 1) *Tylenchorhynchus capitatus* played a prominent role in the poor growth of a pimento crop.
- 2) *Telotylenchus* n. sp. will be described soon by one of the authors of this paper. This species, lacking males, has been found on sugar cane at a rate of more than 500 individuals per 100 g of soil.
- 3) *Trophurus longimarginatus* had already been found by Scotto La Massese on sugar cane (1969). A new species previously shown on pangola grass in Guadeloupe (500 individuals per 100 g of soil) was found again on *Ficus leavigata* and *Mangifera indica* in Marie-Galante.
- 4) *Peltamigratus luci* was found on citrus and pineapple.
- 5) *Helicotylenchus erythrinae*, without considering banana and plantain crops, remains the most frequently found species. Its population levels under sugar cane reached 400 individuals (ind) per 100 g of soil. It was found again on pangola grass in primary forests. A new species, to be described shortly, was found on sugar cane (700 ind/100 g of soil). The actual damage caused by the many species of *Helicotylenchus* remains to be studied.
- 6) *Meloidogyne exigua* and *M. javanica* are the two species of the Heteroderidae group found until now.
- 7) *Pratylenchus brachyurus*, *P. coffeae*, and *P. zaeae* are also present in Guadeloupe. A new species closely related to *P. crenatus*, without spermatheca, with 3 head annules and a crenated tailtip, but showing a much more highly situated vulva, was found under an old Pangola grass pasture and in natural savanna.
- 8) Among the Criconematinae, 3 *Macroposthonia* species are commonly found: *M. sphaerocephala*, *M. denoudeni*, *M. onoense*. A species nearly allied to *M. palustris*, described from Guinean banana trees, was found in Guadeloupe under sugar cane and citrus trees. *Criconema octangulare*, *C. murrayi*, and 2 new species were found in forests and undisturbed cultivated areas (old orchards).
- 9) Among the Dorylaimids, some *Xiphinema* belonging to the *americanum* group (as *X. americanum*, *X. brevicolle*, *X. rivesi*) were found. It is interesting to note that *X. rivesi*, recently described from a population found in the southwest of France, is a subtropical species and seems to have been imported into Europe through the harbor of Bordeaux. *X. vulgare* shows, by its Caribbean presence, a southward extension of its area.

## C. SOME ASPECTS OF THE DYNAMICS OF CERTAIN POPULATIONS

The analysis of the evolution of the nematode fauna under sugar cane, established after clearing forests, shows installation of phytophagous species when cultivation becomes old. One species dominates particularly: *H. erythrinae*.

The ratio R (nematode population/phytophagous Tylenchs) tends to become one (1) with increasing time. When sugar cane follows a natural savanna, R decreases in the same way. After a banana crop the level of phytophagous nematodes is already high at the establishment of sugar cane. Replanting sugar cane after 15 years of intensive cultivation of this Gramineae decreases R still more: the internal equilibrium of the nematode population structure is destroyed by uprooting and replanting. The percentage of phytophagous Tylenchs has increased more than twice.

As pangola grass pasture becomes older the ratio of Tylenchs increases. A negligible infestation quickly achieves a dangerous level, the harmfulness of which remains to be specified. A preceding soil occupation of savanna brings its share of endemic nematodes (*Pratylenchus*, *Trophurus*). After pineapple, a pangola grass pasture exercises great influence on the structure of the nematode fauna =  $1/R$  ‰ increases from 7 (without crop) to 59 (under pangola grass). This is a potential supply of very noxious nematodes. The ratio  $R$ , or  $1/R$  ‰ which is more significant, could be used to determine some danger points in association with the main phytophagous species. For example:  $1/R = 73$  ‰ (*Helicotylenchus* sp., *Pratylenchus zae*, *P. brachyurus*).

A more accurate study could correlate  $1/R$  to the actual noxiousness of the phytophagous nematodes present in the sample by applying an index from 1 to 5 for the plant's vigor.

#### RESUMEN

Una nueva campaña de estudios nematológicos en las Indias Orientales Francesas demostró la presencia de algunas especies fitófagas importantes asociadas con varias plantas hospederas, así como el deterioro de la estructura de la fauna nematológica con el inicio de la labranza del suelo. Se introduce la relación  $R = \text{población total/número de Tylenchidas fitófagos}$  que permite evaluar los cambios que se suceden en las poblaciones de nematodos en equilibrio natural después del inicio de la labranza del suelo.