

NEMATODES ASSOCIATED WITH PINEAPPLES IN UGANDA

N.D. Bafokuzara

Kawanda Research Station, P.O. Box 7065, Kampala, Uganda.

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ABSTRACT

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In surveys of pineapple [*Ananas comosus* (L.) Merr.] fields at Kawanda Research Station and in those of the Masaka Cooperative Union at Masaka, Uganda, 12 genera of plant parasitic nematodes were found. *Helicotylenchus* Steiner was the most frequently encountered; it was found in 88.6 and 90.0 percent of the 70 and ten soil samples from Kawanda and Masaka respectively. It was also the most numerous at both sites. *Pratylenchus brachyurus* (Godfrey) Goodey and *Meloidogyne* Goeldi were the predominant endoparasitic nematodes encountered at both sites. Also common and numerous at Kawanda were *Rotylenchulus reniformis* Lindford & Oliveira and species of *Scutellonema* Andrassy and *Tylenchus* Bastian. Nematode population densities were correlated with rainfall and past agroecosystems.

Additional key words: spiral nematodes, lesion nematodes, root-knot nematodes, reniform nematodes, vegetables.

RESUMEN

Bafokuzara, N.D. 1982. Nematodos de la piña en Uganda. *Nematropica* 12: 45-49.

En un reconocimiento nematológico de campos de piña [*Ananas comosus* (L.) Merr.] en Uganda en la Kawanda Research Station y en Masaka Cooperative Union se encontraron 12 géneros de fitoparásitos. *Helicotylenchus* Steiner fué el más frecuente hallándosele en un 88.6 y 90 por ciento de las 70 y diez muestras de suelo tomadas en Kawanda y en Masaka, respectivamente. Este género fué también el más numeroso en ambas localidades. *Pratylenchus brachyurus* (Godfrey) Goodey y *Meloidogyne* Goeldi fueron los endoparásitos predominantes en los dos campos. También fueron comunes y numerosos en Kawanda *Rotylenchulus reniformis* Lindford & Oliveira así como especies de *Scutellonema* Andrassy y de *Tylenchus* Bastian. Las densidades de poblaciones de nematodos estuvieron correlacionadas con la cantidad de lluvia y los agrosistemas preexistentes.

Palabras claves adicionales: nematodos espiraliformes, nematodos lesionadores, nematodos noduladores, nematodos reniformes, hortalizas.

INTRODUCTION

Some of the earliest reports (11) indicate that pineapples [*Ananas comosus* (L.) Merr.] have been grown in Uganda since the beginning of this century. They were first grown on a small scale all over the country as an approvable adjunct to native fruits that were in use. However, a good deal of increased production noticeable to-day can be attributed to increasing local demand, opportunities to export the fruits to foreign markets and official encouragement. The principal clones being cultivated are the Queen Variety, Singapore Spanish, Red Spanish, and Smooth Cayenne (12).

Nematodes can be a limiting factor to pineapple cultivation (1, 2, 3, 5, 8, 9, 10). Unfortunately nothing is known on whether economically important nematodes do occur on pineapples in Uganda.

The present investigations were undertaken to identify plant parasitic nematodes that occur on pineapples in Uganda and to determine their frequency of occurrence and distribution.

MATERIALS AND METHODS

The pineapple fields that were used were of Smooth Cayenne. Composite soil and plant root samples were taken from Kawanda Research Station and the Masaka Growers' Cooperative Union pineapple estates. Both areas are located in the southern region of the country, currently the main production area. At both places, plants were first ratoons. Samples were taken from healthy and unhealthy looking plants, 7.5 - 15 cm. deep in the rhizosphere of plants. Pineapple planting materials at both locations were collected from many different sources. The sampling took place between the months of December 1978 and May 1979.

Nematodes were extracted from 50 cm³ of each soil sample by the cotton-wool filter method (4). Nematodes in roots were extracted from 5 g. of root by the maceration-filtration technique (6). Nematode counts were made from a 10 ml. aliquot in a counting dish under a stereoscopic microscope.

RESULTS

Twelve genera of plant parasitic nematodes (Table 1) were found associated with pineapples at the two locations. *Helicotylenchus* Steiner were the most numerous and commonly encountered, having been found in 88.6 and 90 percent of the 70 and 10 soil samples from Kawanda and Masaka respectively. *Tylenchus* Bastian, *Meloidogyne* Goeldi, and *Rotylenchulus reniformis* Lindford & Oliveira were common and many in soil samples from Kawanda, whereas *Pratylenchus brachyurus* (Godfrey) Goodey and *Meloidogyne* spp. predominated in those from Masaka (Table I). The results also show the widespread occurrence of *P. brachyurus*, *Aphelenchoides* Fischer, *Helicotylenchus*, *Tylenchus* and *Meloidogyne* spp. in roots of plants from Kawanda.

Table 1: Occurrence and Distribution of Plant-parasitic Nematodes in Pineapple Fields in Uganda

Nematode species	Location and Nematode distribution in soil and roots							
	Kawanda Research Station				Masaka Cooperative Union			
	Frequency of occurrence in soil (%)	Frequency of occurrence in roots (%)	Nematode counts/50 cm ³ of soil ^d	Nematode counts/5 g. of roots ^b	Frequency of occurrence in soil (%)	Frequency of occurrence in roots (%)	Nematode counts/50 cm ³ of soil ^c	Nematode counts/5 g. of roots ^d
<i>Tylenchus</i> spp.	81.4	45.7	76.3	13.0	60.0	33.3	19.5	0.7
<i>Ditylenchus</i> spp.	20.0	40.0	2.5	12.8	40.0	33.3	10.0	3.3
<i>Scutellonema</i> spp.	70.0	22.9	80.4	2.4	20.0	-	0.8	-
<i>Rotylenchus</i> spp.	7.1	-	8.5	-	-	-	-	-
<i>Helicotylenchus</i>	88.6	48.6	163.4	18.7	90.0	33.3	29.8	2.7
<i>Rotylenchulus reniformis</i>	62.9	20.0	72.7	1.6	10.0	-	0.5	-
<i>Pratylenchus brachyurus</i>	24.3	51.4	3.0	23.0	80.0	33.3	15.3	0.3
<i>Meloidogyne</i> spp. ^e	77.1	42.9	42.4	5.9	80.0	33.3	13.3	0.7
<i>Aphelenchoides</i> spp.	35.7	51.4	4.4	16.0	40.0	66.6	6.5	5.7
<i>Tylenchorhynchus</i> spp.	32.9	-	7.7	-	-	-	-	-
<i>Xiphinema</i> spp.	2.9	-	0.4	-	-	-	-	-
<i>Hemicyclophora</i> spp.	1.4	-	0.1	-	-	-	-	-
Unidentified ^c	5.7	11.4	0.5	0.2	10.0	-	0.3	-

^aMean of 70 soil samples; ^bMean of 35 root samples; ^cMean of 10 soil samples; ^dMean of 3 root samples; ^eSecond stage larvae and a few mature males.

It was found that populations of nematodes, particularly those of the root-knot nematodes were related to past agroecosystems. More nematodes were recovered from soil samples taken from the fields a few days following a good amount of rainfall than from those taken during droughty weather.

DISCUSSION

It is noteworthy though disturbing that *R. reniformis*, *P. brachyurus* and *Meloidogyne* spp. known to be a cause of plant debility and poor yields in pineapples (9, 10, 1, 8, 3) were found in these surveys. *Scutellonema* Andrassy found in large numbers in these investigations have also been reported to be important in pineapples (7). The presence of several other plant parasitic nematodes in the pineapple fields forms an additional pressure of parasitism on the crop. Apparently many of these pests occur in large population densities; this constitutes a threat to pineapple cultivation in Uganda. It also suggests a need to devise ways of combating these pests.

The origin of most of the important nematodes just mentioned is unknown. It is probable, however, that infested planting materials and past agroecosystems were the main sources of infestations. This latter point is supported by the observation that at Kawanda areas of pineapple fields that were previously under pawpaws (*Carica papaya* L.) and sweet potatoes (*Ipomoea batatas* L.) had relatively high population densities of *Meloidogyne* spp. and *R. reniformis*; *P. brachyurus* also abounded in plots that were previously under potatoes.

Some of the plots that supported high population densities had patches of poorly growing plants, a possible indication of the severity of nematode attack.

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