

FUNGI ASSOCIATED WITH NEMATODE LESIONS ON PLANTAINS IN HONDURAS [HONGOS ASOCIADOS A LESIONES DE NEMATODO EN PLATANO EN HONDURAS]. J. Pinochet and R. H. Stover. AGRAR, Actividades Agrícolas Aragonesas, Zaragoza 14, Spain; Tropical Agriculture Research Services (SIATSA), La Lima, Honduras.

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ABSTRACT

Fungi associated with nematode induced lesions on plantains were identified. Isolations were made from root and rhizome tissue generally infested with the lesion nematode *Pratylenchus coffeae*. The fungi *Acremonium stromaticum* and *Cylindrocarpon musae* accounted for 74% of the total isolations. The fungi associated with nematode lesions on plantains are the same ones found on bananas. Nematode-fungi interaction is discussed.

Key Words: Nematode-fungi associations, plantain, lesion nematode, *Musa*.

INTRODUCTION

Plantain (*Musa* AB) is an important crop in Central America used mainly for local consumption and export to the United States. In Honduras, the nematode most commonly associated with root and rhizome injury on plantain is the lesion nematode *Pratylenchus coffeae* (6). Other nematodes such as *Radopholus similis*, which is the nematode of major concern on bananas, are occasionally found on plantains. Lesions caused by *R. similis* on bananas are similar to those formed by *P. coffeae* on plantains, although uproot losses appear to be higher on bananas. Fungi associated with *R. similis* induced lesions on bananas have been identified and studied (1, 3, 4). The 4 most common fungi are *Acremonium stromaticum*, *Cylindrocarpon musae*, *Fusarium moniliforme* and *Fusarium solani*. These fungi are all wound invaders that can become pathogenic when wounds are provided contributing substantially to the root and rhizome rot caused by the burrowing nematode. Information on nematode-fungi associations on plantains is unavailable. This study reports the identification and relative frequency of fungi associated with nematode induced lesions on plantains.

MATERIAL AND METHODS

A total of 103 root and rhizome samples were collected throughout 4 plantain farms of the Horn variety in the Ulua Valley in Honduras. Samples were taken from the top 60 cms of soil around the pseudostem. Root material presented extensive lesions along the cortex mainly caused by the lesion nematode, *Pratylenchus coffeae* and in a few samples by the burrowing nematode, *Radopholus similis*. Rhizomes also presented typical nematode lesions ranging from 3-5 mm to 5-6 cm. Material was taken to the nematology laboratory in La Lima, Honduras for processing. Nematodes associated with the lesions were extracted and identified.

Small pieces of root and rhizome tissue were selected, washed with tap water to remove soil debris and left soaking in a solution of 5.25% sodium hypochlorite for 4-5 minutes. Lesioned material was then thoroughly rinsed in sterile water and wrapped in moist sterile paper towels. Isolations were made with flamed scalpel from necrotic tissue and from the edges of lesions that border healthy tissue. Pieces of 1-3 mm were

Table 1. Fungi associated with nematode lesions in four Horn plantain farms from the Uluva Valley in Honduras.

Locality	Nematode ²	Media	Tissue	Fungi					Positive Isolations	Total Isolations
				A.s.	C.m.	F.m.	F.s.	M. ¹		
Paleto	Pc	Martin's	Root & Rhizome	30	15	--	2	13	60	130
Las Flores	Pc	PDA	Root & Rhizome	--	4	--	1	1	6	79
Las Flores	Pc, Rs	PDA	Root & Rhizome	15	12	--	1	--	28	41
Guaruma	Pc	Martin's	Rhizome	--	4	--	--	--	4	88
Guaymas	Pc	Martin's	Rhizome	2	5	10	2	--	19	88
Totals				47	40	10	6	14	117	428
Percentage				40.1	34.1	8.5	5.1	11.9	100%	

¹ *Rhizoctonia solani*, *Fusarium roseum*, *Cunninghamella* sp., *Trichoderma* sp., *Penicillium* sp., *Cladosporium* sp., *Mucor* sp.

² Pc: *Pratylenchus coffeae*; Rs: *Radopholus similis*; A.s. = *Acremonium stromaticum*; C.m. = *Cylindrocarpon musae*; F.m. = *Fusarium moniliforme*; F.s. = *Fusarium solani*; M. = Miscellaneous.

placed on petri dishes containing Martin's rose begal medium plus streptomycin (0.1 gr in 250 cc of medium) and potato dextrose agar (PDA) with lactic acid (1 drop of 25% lactic acid per petri dish). Plates were placed in a 26-27°C incubator for 4 days and fungi transferred to PDA tubes for identification.

RESULTS AND DISCUSSION

From a total of 428 isolations 117 were positive (Table 1). The fungi *Acremonium stromaticum* and *Cylindrocarpon musae* were consistently isolated (40 and 34% respectively). Also present but less frequent were *Fusarium moniliforme* (8.5%) and *Fusarium solani* (5.1%). These are the same fungi associated with nematode lesions on bananas, although in different relative frequencies. On bananas none of these 4 fungi reached more than 22% of the total isolations (3). This difference may be due to a smaller size sample in the plantain survey, host, nematode, soil type and locality.

Rhizoctonia solani, *Fusarium roseum*, *Cunninghamella* sp., *Trichoderma* sp., *Cladosporium* sp., *Mucor* sp., and *Penicillium* sp., were occasionally isolated and appear to be unimportant. Their occasional detection suggests they cannot compete with *A. stromaticum* or *C. musae* or with *F. moniliforme* and *F. solani*. The causal organism of Panama disease, *Fusarium oxysporum* f. s. cubense, was not recovered from nematode lesions on plantains. *R. similis* in the presence of this fungus has been reported to increase the incidence of Panama disease on Gros Michel bananas (2). The Horn plantain is highly resistant to Panama disease.

Throughout the survey, *P. coffeae* was the main nematode found associated with root and rhizome lesions on plantains. This confirms earlier observations in Honduras that plantains are a preferred host of *P. coffeae* (5, 6). In Las Flores Farm, *R. similis* was recovered from a few samples in mixed population with *P. coffeae*.

A. stromaticum and *C. musae* are the same fungi found associated with nematode lesions on bananas, and the feeding habits of the nematodes involved are similar (migratory endoparasites). Therefore, it is believed that the nematode-fungi interaction that causes root and rhizome rot is similar in bananas and plantains.

RESUMEN

Hongos asociados a lesiones de nematodos en plátano fueron identificados. Aislamientos fueron hechos de tejido de raíz y rizoma generalmente infestados del nematodo de las lesiones, *Pratylenchus coffeae*. Los hongos *Acremonium stromaticum* y *Cylindrocarpon musae* representaron el 74% del total de los aislamientos. Los hongos asociados a lesiones de nematodos en plátano son los mismos que se encuentran en bananos. Interacción nematodo-hongo es discutida.

Claves: Asociaciones nematodo-hongo, plátano, nematodo de las lesiones.

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