Nematology Circular No. 154
June 1988

Fla. Dept. Agric. & Consumer Serv.
Division of Plant Industry

HOSTS OF TYLENCHULUS GRAMINIS AND T. PALUSTRIS

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The citrus nematode, Tylenchulus semipenetrans Cobb, 1913, has several physiological races that attack citrus (Citrus spp.). Nematodes considered to be races of this species that do not attack citrus and parasitize only noncultivated plants were reported in Florida (4,5,6,7). These "wild" races which were previously subject to the same regulatory restrictions as T. semipenetrans infecting citrus, were recently separated into two species, Tylenchulus graminis and T. palustris Inserra et al., 1988 (3). Characterizing the "wild" races as two new species that differ morphologically and biologically from each other and also from T. semipenetrans (2) has now made large areas of noncultivated lands available for citrus nurseries. In the past these lands did not meet site approval requirements because they were infested with these "wild" races. Although T. graminis and T. palustris are not regulated species, it is necessary to identify them to prevent confusion of them with T. semipenetrans which is a regulated species. Very often identification is difficult (2) because only one or a few second stage juveniles (J2) may be present in samples. The probability of detecting T, graminis abd T. palustris is increased by knowing the hosts of these two parasites and taking the samples from these hosts in potential citrus nursery sites. Because T, graminis and T. palustris have been found on several noncultivated plants indigenous to Florida, a survey was conducted during two and one half years to determine the hosts of these two species. The results of the survey are presented here.

IDENTIFICATION

Determination of new hosts was based on the presence of mature adult females infecting the roots of plants collected from noncultivated vegetation. To detect swollen adult females on the suspected hosts, roots were washed gently with tap water and observed in water with the aid of a stereomicroscope using transmitted and incident illumination. Adult females present in the roots were teased from the root tissues, mounted in water agar (1) and identified with a compound microscope.

HOSTS

T. graminis was found infecting four species of monocots which are widespread in Florida (Table 1).

Table 1. Hosts of Tylenchulus graminis and T. palustris

Nematode species	Plant Host		County of detection
	Scientific Name	Common Name	
T. GRAMINIS	Andropogon virginicus L.	broomsedge	Glades, Hernando, Highlands, Lake, Putnam, Sarasota, Sumter, and Taylor
	Axonopus furcatus (Flugge) A. Hitchc.	carpet grass	Glades
	Eremochloa ophiuroides (Munro) Hack.	centipede grass	Taylor
	Schizachyrium rhizomatum (Swallen) Gould	-----	Highlands (6)
	Sporobolus junceus Kunth	wire grass	Clay
T. PALUSTRIS	Baccharis halimifolia L.	salt bush	Dixie
	Fraxinus caroliniana Mill.	pop ash	Dixie, Polk, and Taylor

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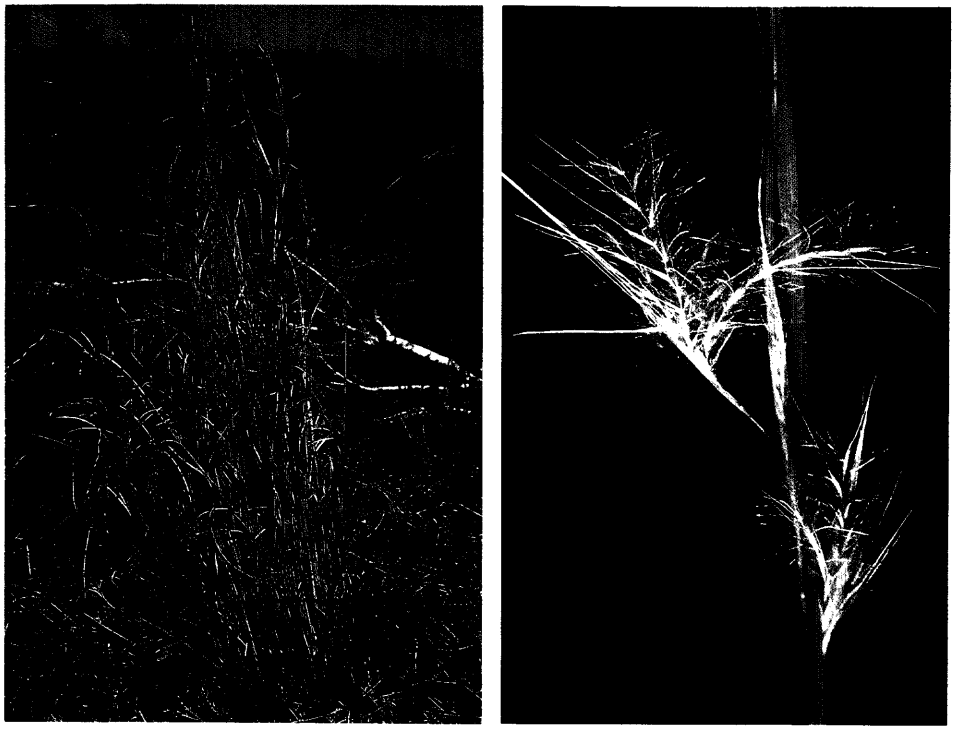

Fig. 1. Morphological characteristics of broomsedge (Andropogon virginicus L.). Entire plants with regenerated sprouts (left), and inflorescence with open flowers (right).

The most common host of T. graminis was broomsedge, Andropogon virginicus L. (Fig. 1). Two strains of broomsedge, one with hairless and another with hairy leaves and stems, were infected with this species in the field. Nematode infectivity was confirmed on these two strains in greenhouse tests on seedling plants grown for six months in 25-cm-diam. pots containing soil infested with 1000 J2 per pot. Other broomsedge species such as Andropogon glomeratus (Wal.) B.S.P., also widespread in Florida, were not found infected with T. graminis during our field investigations. Differentiation of broomsedge species is difficult, especially if the plants are lacking inflorescences. The inflorescence is denser and larger in A. glomeratus than in A. virginicus (Fig. 2).

Fig. 2. Dense inflorescence of Andropogon glomeratus (Wal.) B.S.P, (left) compared with the sparse one of A. virginicus (right).

Adult females of T. graminis were also found infecting the roots of other native grasses reported in Table 1 (Figs. 3,4,5). These grasses are perennial and regenerate new sprouts and stolons after flowering, thus providing roots receptive to nematode invasion year after year. In Florida, these

Fig. 3. Carpet grass (Axonopus furcatus) (Flugge) A. Hitchc.).

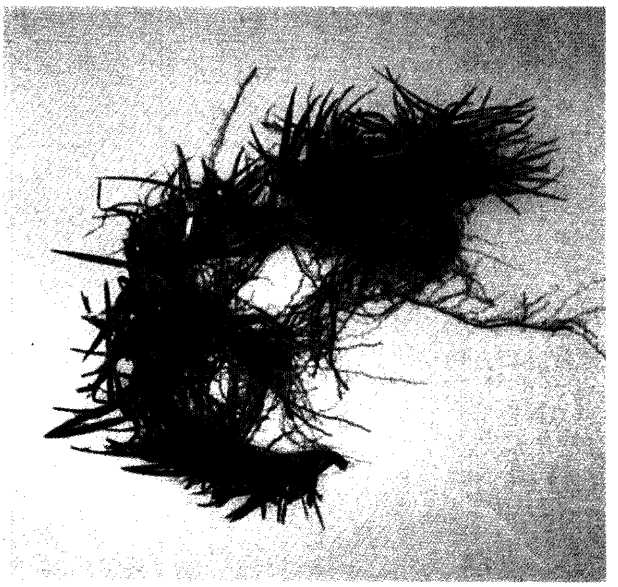

Fig. 4. Centipede grass (Eremochloa ophiuroides (Munro) Hack.) stolon.

Fig. 5. Morphological characteristics of wire grass (Sporobolus junceus Kunth). Entire plant (left), and inflorescence (right).

plants are common in flatwoods and marshes and are widely distributed along with T. graminis in the northern, central, and southern parts of the state.

The hosts of T. palustris are reported in Table 1 (Figs. 6,7). The host range of T. palustris was confined to nonrutaceous dicots growing in swamps mainly in northern Florida.

Population densities of T. graminis and T. palustris on native hosts were lower than those of T. semipenetrans on citrus and rarely were greater than 1 nematode/cm^3 of soil, compared with T. semipenetrans densities ranging from 30 to 150 nematodes/cm^3 of soil (8).

SURVEY AND DETECTION

In surveying noncultivated areas destined for commercial citrus nurseries, all the plants reported in Table 1 can be selected to detect T. graminis or T. palustris; however, broomsedge (Fig. 1) and pop ash, Fraximus caloliniana Mill. (Fig. 7) are the key hosts for T. graminis or T. palustris, respectively, as shown by the wide distribution of the two nematodes on these hosts in several Florida counties (Table 1). Samples taken from these selected hosts usually contain all developmental stages of the two nematodes, facilitating their correct identification (2). In noncultivated lands destined for potential citrus nurseries, any disturbed site should be sampled

Fig. 6. Salt bush (Baccharis halimifolia L.).

Fig. 7. Pop ash (Fraxinus caroliniana Mill.) limb with the characteristic fruits (samara).

separately to detect accidental introduction of regulatory nematodes. If the land has a history of citrus cultivation, samples should be taken from any citrus sprouts present after tree removal.

ACKNOWLEDGEMENT

The authors thank V. G. Brown, L. J. Chambliss, S. A. Fuller, H. L. Gillis, C. E. Nelson, W. W. Smith, and J. Thomas of the Bureau of Plant Inspection for their assistance and cooperation.

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Contribution No. 336, Bureau of Nematology

This publication was issued at a cost of $1,698.04 or $0.38 per copy to provide information on proper recognition of plant pests. PI88T-23