

Transmission of *Aphelenchoides besseyi* to *Ficus elastica* Leaves via *Sporobolus poiretii* Inflorescences

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ABSTRACT

An unusual mode of transmission of the foliar nematode, *Aphelenchoides besseyi*, was discovered. The nematode moved from soil to plants to seed heads of a grass, *Sporobolus poiretii*, and thence to

Ficus elastica 'Decora' leaves touched by the grass inflorescence. Nematodes did not migrate from soil to *Ficus* leaves via the *Ficus* stem. Phytopathology 60:543-544.

The rubber plant, *Ficus elastica* Roxb. 'Decora', is the fifth most important export of Florida's tropical foliage plant industry. A foliage-disfiguring disease caused by the nematode, *Aphelenchoides besseyi* Christie, was recently reported (3). The following experiments were carried out to determine how this soil-borne nematode gained access to rubber plant foliage, as *Ficus* leaves rarely touch the soil.

Failure of the nematode to migrate to Ficus leaves via the stem.—*F. elastica* air-layers (2) were planted singly in 96 plastic pots, 48 of which were inoculated biweekly with *A. besseyi*. Half, or 24, of the inoculated plants and 24 noninoculated plants were sealed in polyethylene sheets, leaving only the top one-third of the plants uncovered. It was assumed that, if the nematodes usually moved up the stem surface from the soil to the leaves (a distance of 30 to 60 cm), sealing the plants would provide moisture sufficient to form the necessary film of water on the stem. Plants were examined biweekly for symptoms of nematode infections.

None of the 96 rubber plants growing alone in nematode-infested or noninfested soil showed symptoms of leaf infection after 18 months. It is therefore unlikely that the foliar nematode moves from soil to leaves via live rubber plant stems.

In a second experiment, nematodes were added to soil of 12 potted *Ficus* plants containing detached autoclaved *Ficus* branches embedded in the soil and extending upward so as to touch at least one rubber plant leaf. Twelve control plants received no nematodes. It was thought that if the nematodes could not migrate up a live *Ficus* stem, perhaps they could move up a dead one. None of the *Ficus* plants potted with a dead branch developed symptoms of nematode infection.

Migration via smut-grass.—Rubber plants are grown in open fields in southern Florida. A recent survey revealed that groves which were unusually weedy often had an exceptionally high incidence of foliar-nematode infection. Furthermore, the seed heads of smut-grass, *Sporobolus poiretii* (Roem. & Schult.) Hitchc., were often seen directly under or touching a severely infected *Ficus* leaf. Grass heads attained at least 125 cm height when shaded. Several such seed heads were examined microscopically, and numerous nematodes were found under the glumes. The nematodes were

identified by V. G. Perry, Depart. of Entomology and Nematology, Univ. of Fla., as *Aphelenchoides besseyi* Christie.

Noninfested grass seeds were collected in an open field, and were sown in flats of soil which had been fumigated with methyl bromide to kill nematodes and weed seeds. Smut-grass seedlings were transplanted to soil in peat pots, half of which were inoculated with nematodes. When grass plants were 15 cm tall, four nematode-inoculated plants were transplanted to each of 12 large pots containing rubber plants. Controls consisted of nematode-free grass plants transplanted to 12 additional pots of *Ficus* plants. Nematodes were introduced into the soil of pots containing inoculated grass at biweekly intervals during the remainder of the experiment.

Many leaves on all 12 rubber plants that were grown in pots containing grass grown in nematode-inoculated soil had lesions containing the foliar nematodes. The period extending from transplanting young grass to *Ficus* pots and first evidence of symptoms was 135 days. The lesions usually occurred where a grass inflorescence touched the leaf, similar to the observation made in groves (Fig. 1). Many lesions and grass seed heads from each of these twelve plants were examined microscopically; all contained numerous foliar nematodes.

With the exception of one small lesion, none of the 12 rubber plants that were potted with noninoculated grass showed any disease. The grass potted with the one plant having a lesion was found to be contaminated with the nematodes. Grass seed heads from the remaining 11 pots in the group were free of nematodes.

The experimental results indicate that *A. besseyi* moves from soil to plants of *S. poiretii*, to inflorescences, and thence to *F. elastica* leaves.

DISCUSSION.—Nematodes were not actually seen migrating from grass seed heads to *Ficus* leaves. Therefore, other vectors such as insects may have aided in transmission. In fact, an *Aphelenchoides* sp. has been found in frass of scolytid beetles (4). The existence of weeds other than *Sporobolus*, which can act as transmitting agents for the foliar nematode, has not been investigated. Air currents could possibly aid in dispersal of the nematodes. Discovery of this unique mode of transmission (1) has not excluded the various

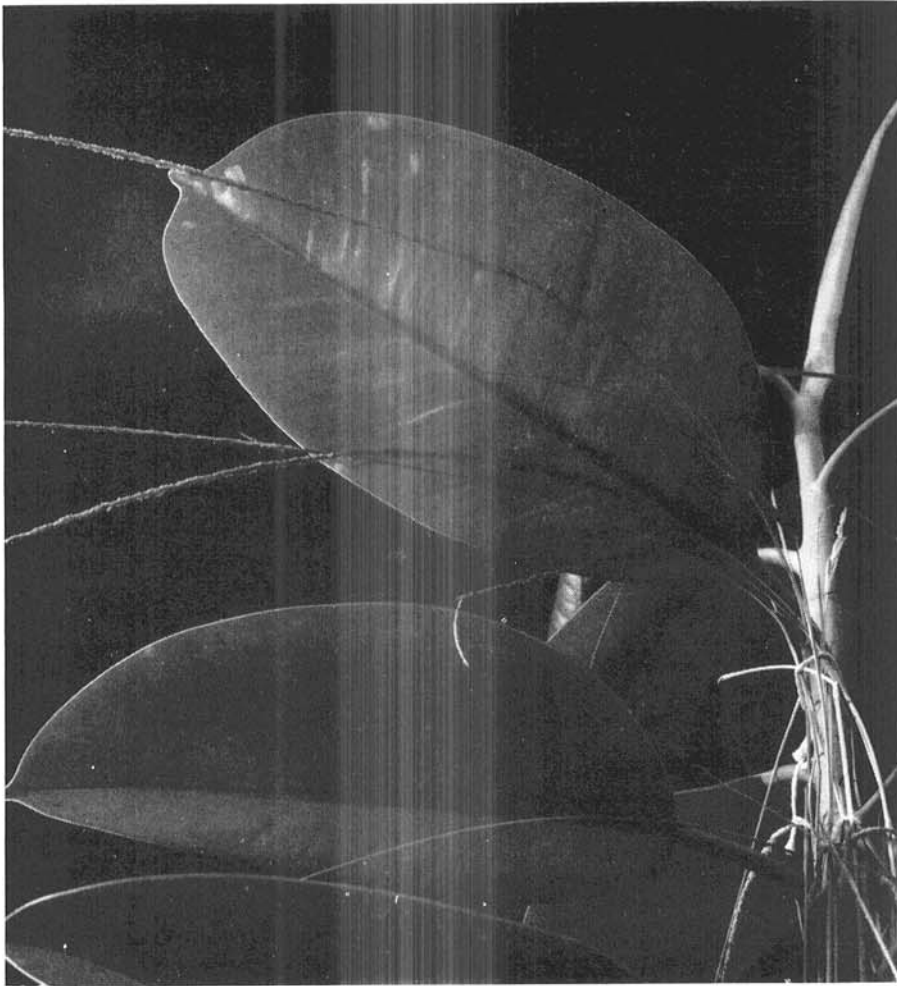


Fig. 1. Leaf of *Ficus elastica* 'Decora' with chlorotic stripes caused by *Aphelenchoides besseyi* having migrated from the inflorescence of *Sporobolus poiretii*.

other possible means by which *A. besseyi* might reach *Ficus* leaves.

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