

VIRULENCE OF THREE CYLINDROCLADIUM SPECIES
TO YELLOW-POPLAR SEEDLINGS

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Abstract

Cylindrocladium crotalariae and C. scoparium caused severe root rot on potted yellow-poplar seedlings. They appeared to be equally virulent. C. floridanum caused necrosis only on feeder roots of the seedlings.

Among the fungi in the genus Cylindrocladium that occur commonly in the Southeastern United States, Cylindrocladium scoparium Morg., C. crotalariae (Loos) Bell & Sobers, and C. floridanum Sobers & Seymour are known pathogens. C. scoparium causes root and stem

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rot on yellow-poplar (*Liriodendron tulipifera*) seedlings (2, 3), and severe losses in a State Forestry Commission Nursery in Mississippi were attributed to it. *C. crotalariae* and *C. floridanum* have been shown to be pathogenic on several woody species (1, 4) but not on yellow-poplar. In the study reported here, virulences of *C. floridanum* and *C. crotalariae* to yellow-poplar were compared with that of *C. scoparium*.

MATERIALS AND METHODS

A *C. scoparium* culture was isolated from diseased yellow-poplar, and *C. floridanum* was isolated from black walnut seedlings growing in the Tennessee State Forest Tree Nursery at Pinson, Tennessee. Dr. E. K. Sobers supplied a culture of *C. crotalariae* which Bell and Sobers (1) isolated from diseased peanut plants in southwestern Georgia. Dr. Sobers also verified the identification of the fungi.

Yellow-poplar seedlings were grown for 1 year in nursery beds at the Southern Hardwoods Laboratory in Stoneville, Mississippi. The beds were treated with 430 pounds per acre of methyl bromide prior to planting. In February 1968, 60 disease-free seedlings were lifted and replanted in 6-inch clay pots containing steam-sterilized soil. One seedling was planted in each pot.

Fifteen seedlings were randomly assigned to each fungal isolate and 15 were kept as controls. Sixty days after seedlings were potted, 10 g of oat inoculum were added to each pot of soil in four holes 6 inches deep. Check pots received uninoculated oats. The inoculum was prepared by allowing the fungus to grow on sterilized oats for 30 days in 1/2-gallon jars. Mycelia of all three species spread around and into all the oat grains. The test was done in a lath house where the seedlings were subjected to prevailing winter and spring temperatures (-10 to 37°C). The seedlings were watered regularly to insure optimum soil moisture for their growth.

The roots of the seedlings were examined after 90 days and indexed for disease severity. A severity rating scale of 0 to 10 was adopted, where 0 = no infection and 10 = all roots infected. Isolations were made from diseased and healthy roots after they were surface-sterilized with 2.6% sodium hypochlorite for 10 minutes.

RESULTS AND DISCUSSION

C. scoparium caused severe rotting of root collars, tap roots, and lateral roots (Fig. 1). An average disease-severity index of 10 was assigned it because all of the roots of all inoculated seedlings were infected. In view of reports of severe damage in a Mississippi nursery and elsewhere (3), the virulence of *C. scoparium* in the present study was not surprising.

The damage caused by *C. crotalariae* was a surprise. It, too, was assigned a severity index of 10. The type and severity of damage caused by it were identical to those caused by *C. scoparium*. Both caused mortality of one of the 15 seedlings exposed to them, and both caused a marked loss in vigor of the other exposed seedlings. The fungi were readily isolated from diseased tissues.

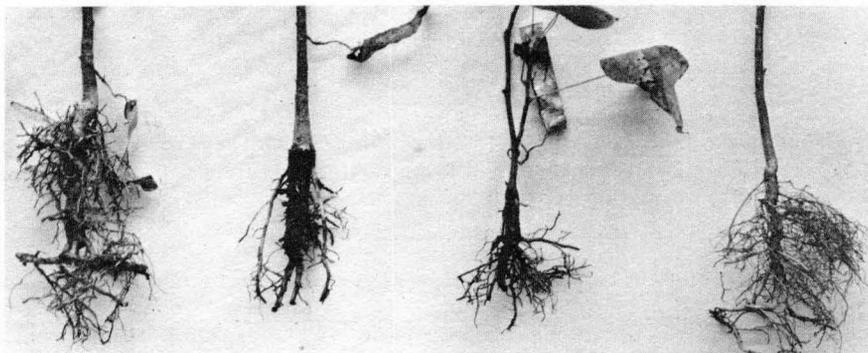


FIGURE 1. Yellow-poplar seedlings 90 days after inoculation with *Cyindrocladium floridanum* (left), *C. scoparium* (left center), *C. crotalariae* (right center), and no fungus (right).

This is the first report that yellow-poplar is susceptible to *C. crotalariae*. Although the results were obtained under artificial conditions, it seems likely that the fungus also causes damage under natural conditions.

C. floridanum was less virulent than its sister species. It caused necrosis only on some feeder roots and was assigned an average disease-severity index of 4. It caused no seedling mortality and could not be isolated from diseased tissues. At the end of the study, none of the check seedlings had disease symptoms, and all were growing satisfactorily.

Literature Cited

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