

Susceptibility of Leucothoe, Hybrid Rhododendron, and Azalea to *Cylindrocladium scoparium* and *C. theae*

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ABSTRACT

Mims, F., Benson, D. M., and Jones, R. K. 1981. Susceptibility of leucothoe, hybrid rhododendron, and azalea to *Cylindrocladium scoparium* and *C. theae*. Plant Disease 65:353-354.

Cylindrocladium scoparium was isolated from naturally infected Rainbow leucothoe with necrotic leaf spots, wilted leaves, and shoot dieback. Conidial suspensions of *C. scoparium* infected intact leucothoe, hybrid rhododendron, and Hershey Red azalea. Wound-inoculated leucothoe plants were killed in 20 days. *Cylindrocladium theae*, isolated from hybrid rhododendron, caused lesions on stems, petioles, and leaves of 8-mo-old hybrid rhododendron within 3 days of inoculation. Both *C. scoparium* and *C. theae* caused typical dark brown leaf spots with purple to red margins on Hershey Red azalea. *C. theae* infected wounded but not intact Rainbow leucothoe plants.

rhododendron cultivars tested.

Gill (4) recently reported that *C. vesiculatum* attacks *Leucothoë axillaris*, a native ericaceous plant. The disease developed as a leaf spot and blight, producing lesions with reddish brown margins on twigs. The fungus sporulated profusely on lesions during periods of high humidity.

In 1978, leucothoe (*Leucothoë catesbaei* cv. Rainbow) and rooted hybrid rhododendron cuttings from a western North Carolina nursery that were grown in Florida during winter months were submitted to the North Carolina State University Plant Disease and Insect Clinic. These plants had disease symptoms similar to those reported for *Cylindrocladium* (3,4,7,9). Leucothoe symptoms

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In 1969, Miller and Baxter (7) described a *Cylindrocladium* species on rhododendron from western North Carolina that caused stem lesions. Dark ellipsoidal lesions developed on stems of all inoculated plants of 20 hybrid

included necrotic leaf spots, wilted leaves, and shoot dieback; rhododendron symptoms included leaf spots and stem lesions.

We describe the isolation, identification, and pathogenicity of two *Cylindrocladium* species on Rainbow leucothoe, hybrid rhododendron, and evergreen azalea.

MATERIALS AND METHODS

Fungi were isolated from diseased tissue of Rainbow leucothoe and hybrid rhododendron on acidified potato-dextrose agar (PDA). Colony morphology, conidia, and conidiophore characteristics and descriptions of several *Cylindrocladium* spp. (1,2,8-10) were used to identify isolates.

Conidial suspensions were prepared by scraping 7-day-old cultures in sterile, distilled water with a rubber spatula. Suspensions were adjusted to $1.0-2.5 \times 10^4$ conidia per milliliter, and two drops of Tween 20 per 500 ml were added as a wetting agent.

Foliage of 10-mo-old azalea (*Rhododendron obtusum* cv. Hershey Red), 8-mo-old rooted cuttings of hybrid rhododendron cultivar Purple Splendour, and 10-mo-old Rainbow leucothoe rooted cuttings were sprayed to runoff with the conidial suspension with a hand atomizer. Plants were placed under intermittent mist (5 sec every 6 min) for 48 hr after inoculation, then moved to a greenhouse bench. Infection was recorded over a 5-21 day period. Uninoculated plants of each species were sprayed with distilled water. Plants were fertilized with a slow-release fertilizer (18-9-12). Greenhouse temperature ranged from 20 to 32 C. Inoculations were replicated five times per plant species in a completely randomized design.

Rainbow leucothoe leaves were also inoculated with PDA disks 6 mm in diameter from 5-day-old cultures of the *Cylindrocladium* isolates. Plants were incubated under mist as above.

Stem wounds made by removing leaves on Rainbow leucothoe plants were inoculated with PDA disks of the isolates. Stems and agar disks were wrapped with moist cheesecloth and plastic film. Sterile PDA disks were placed on wounded stems of uninoculated plants. Plants were incubated under mist as above.

RESULTS AND DISCUSSION

A single *Cylindrocladium* species was consistently isolated from leaves, stems, and roots of nursery-grown Rainbow leucothoe plants and was identified as *C. scoparium*. This fungus has been reported often on azaleas and other

woody ornamentals (1,3,5,6,9). A second *Cylindrocladium* species was isolated from stems and leaves of rooted cuttings of hybrid rhododendron and was identified by S. A. Alfieri, Jr. as *C. theae* (1,2).

Seven of 10 Rainbow leucothoe plants inoculated with *C. scoparium* developed light brown necrotic areas along the leaf margins in 5 days. Leaf spots typical of *Cylindrocladium* infections were not observed on Rainbow leucothoe. Severe wilting and death were observed in all 10 wound-inoculated plants at day 20.

C. theae from rhododendron was not pathogenic to Rainbow leucothoe in foliar inoculations, even when inoculum concentrations were increased from 1.0 to 2.5×10^4 conidia per milliliter. *C. scoparium* and *C. theae* both infected all 10 wound-inoculated Rainbow leucothoe, producing brown to black lesions that spread up and down the stem from the point of inoculation within 3 days. Foliage wilted within 14 days of wound inoculation, and plants died within 1 mo. Stem wounds on uninoculated plants healed with no apparent injury to the plant. No infection occurred when PDA disks of the fungi were placed on intact leaves of Rainbow leucothoe.

The stem lesions we observed in wound-inoculated Rainbow leucothoe were similar to lesions caused by *C. avesiculatum* on *L. axillaris* (4). Gill (4) also observed leaf blight symptoms in *L. axillaris* plants inoculated with *C. avesiculatum*, but none developed in our tests with *C. scoparium* or *C. theae*.

Hershey Red azalea was infected by *C. scoparium* (10 of 10 plants) and *C. theae* (8 of 10 plants) after foliar inoculation. Lesions developed on foliage as dark brown spots with purple to red margins. The lesions expanded rapidly, and tissue between lesions became chlorotic. Defoliation occurred 5 days after inoculation. Both species were recovered from the inoculated plants. Stem lesions were not observed.

The leaf spots and defoliation produced on azalea in foliar inoculations resembled those described in earlier pathogenicity tests of *C. scoparium* and *Calonectria theae* on azalea (1,6). The leaf blight and wilt phases reported in azalea propagation beds (3,5,9) were not observed in our tests.

Purple Splendour rhododendron (10 of 10 plants) developed symptoms 3 days after foliar inoculations with *C. scoparium*. Stem lesions developed as necrotic spots elongating within 2 days to 4-5 mm. Round black lesions were observed on petioles as well. Within 6 days, lesions on stems and petioles coalesced, causing

defoliation. *C. scoparium* has been previously reported to cause severe damage on certain azalea and rhododendron produced stem, petiole, and leaf lesions on Purple Splendour rhododendron cultivars (1,3,5,6,9).

C. theae from rhododendron produced stem, petiole, and leaf lesions on Purple Splendour rhododendron (10 of 10 plants) indistinguishable from those caused by *C. scoparium* on leucothoe and azalea plants. The small, black foliar lesions were surrounded by chlorotic halos. Lesions appeared 4 days after inoculation and expanded to 6 mm in 1 wk.

Results of these inoculations with *C. theae* on rhododendron complement those reported by Miller and Baxter (7). In their tests, stem lesions resulted from inoculations of wounded and unwounded stems of 20 rhododendron cultivars, including Purple Splendour.

This is the first report of *C. scoparium* and *C. theae* on Rainbow leucothoe. The popularity of the cultivar among nurserymen will no doubt increase its volume in the nursery trade. Its susceptibility to *Cylindrocladium*, however, may limit the use of Rainbow leucothoe unless control measures are employed to limit disease development.

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