Fusarium Wilt of Hebe Species

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ABSTRACT

Fusarium oxysporum, isolated from Hebe odora (H. buxifolia) and from Hebe cultivars ‘Coed,’ ‘Lake,’ and ‘Patty’s Purple’ showing yellowing, browning, and occasional abscission of lower leaves, wilting, and vascular discoloration, was shown by experimental inoculation to be the cause of the problem. Ten Hebe species, two hybrids, and four cultivars were found susceptible. The fungus, named F. oxysporum f. sp. hebeae, was not pathogenic to herbaceous or other woody members of the Scrophulariaceae that were inoculated.

About 20 yr ago, Fusarium oxysporum was isolated from plants listed as Hebe buxifolia (Benth.) Cockayne & Allan. According to McClintock and Leiser (3), this species is not cultivated and plants so listed probably are H. odora (Hook. f.) Cockayne. Infected plants were traced to a nursery in the San Francisco Bay area of California. A preliminary report was made and the fungus was named F. oxysporum Schlecht.f. hebeae Raabe (4).

The nursery destroyed all the stock of H. odora, and the disease disappeared until 2 yr ago when it appeared in northern and southern California. It was found on H. odora and on Hebe cultivars ‘Coed,’ ‘Lake,’ and ‘Patty’s Purple.’

Symptoms appear as a yellowing and browning of the leaves, starting at the stem bases and progressing upward. Symptoms may appear on one side of the plant or on one branch as is characteristic of many of the Fusarium wilts. Infected plants usually are stunted. Symptomatic leaves frequently abscise, but abscission rarely progresses to the top of the plant before infected stems die. The tips of such stems bend downward, giving the appearance of wilt (Fig. 1). Shortly after leaf symptoms appear, the vascular system becomes completely brown. This is followed by a browning of the pith. Infected plants usually die.

Because this was a new form specialis of F. oxysporum, the host range of the fungus was studied. Plants in the genus Hebe were collected as cuttings and were rooted in a mixture of half peat and half sphagnum rock. When rooted, they were transplanted into U.C. mix half sand and half peat steamed at 82°C for 30 min) in 7.6-cm clay pots until they were established. Plants were removed from the root substrate and the roots were washed and dipped in a spore suspension of the fungus. Inoculum was prepared from a monosporous isolate of the fungus originally obtained from H. odora and then grown on potato-dextrose agar. After inoculation, plants were planted in U.C. mix in 10.2-cm pots and put in a greenhouse that varied in temperature from about 27°C during the day to about 21°C at night. Ten plants of each species were inoculated. After 6 wk, reisolation was attempted from one stem from each plant. Five cross sections about 3 mm thick and cut about 1.5 cm above ground level were surface-sterilized in 0.5% sodium hypochlorite for 1 min and plated on pea straw natural media (5).


Other woody plants inoculated included the following members of the Scrophulariaceae: Paulownia (Paulownia tomentosa (Thunb.) Steud.), cape fuchsia (Phygelius capensis E. H. Mey. ex Benth.), and P. aequale (Harv. ex Hiern. Two members of the Bignoniaceae also were inoculated: trumpet vine (Campsis radicans Seem.) and common catalpa (Catalpa bignonioides Walter). Because F. oxysporum also has been reported on the woody plants Albizia julibrissin Durazz (2,7) and Rhus typhina L. (6), these plants were inoculated as were R. chinensis Mill., R. coriaria L., and R. succedanea L. All plants were grown from seed, and 10 plants of each were inoculated as described. In all experiments, rooted cuttings of H. odorais also were inoculated. After 6 wk, all plants were assayed for infection as described above. The pathogen was isolated only from H. odora.

To further test the host range, herbaceous members of the Scrophulariaceae were grown from seed, transplanted in 7.6-cm pots, and inoculated as described. Plants included snapdragon (Antirrhinum majus L.), Creton bear's-tail (Celisa arcturus Jacq.), foxglove (Digitalis purpurea L.), Hebenstretia comosa Hochst., linaria (Linaria sp.), monkeyflower (Mimulus tigrinus Hort.), penstemon (Penstemon gloxinoides Hort.), and butterfly flower (Schizanthus...
pinnatus Ruiz & Pav.), wishbone plant (Torenia fournieri Lind.), and veronica (Veronica spicata L.). Rooted cuttings of H. odor a also were included. After 6 wk, plants were assayed and *F. oxysporum* was isolated only from *H. odor a*.

The fungus *F. oxysporum* f. sp. *hebe* found in *Hebe* was similar to other formae speciales of *F. oxysporum* in that its host range is limited to some members of a single genus. This is one of the few reports of a woody plant found infected by a formae specialis of *F. oxysporum* that causes vascular wilt.

**LITERATURE CITED**