

## ***Alternaria alternantherae* From Alligatorweed Also is Pathogenic on Ornamental Amaranthaceae Species**

G. E. Holcomb

Associate Professor, Department of Plant Pathology, Agricultural Experiment Station, Louisiana State University, Baton Rouge, LA 70803.

Accepted for publication 29 July 1977.

### ABSTRACT

HOLCOMB, G. E. 1978. *Alternaria alternantherae* from alligatorweed also is pathogenic on ornamental Amaranthaceae species. *Phytopathology* 68: 265-266.

*Alternaria alternantherae* from alligatorweed was pathogenic on seven ornamental and one weed species in the family Amaranthaceae which were artificially inoculated with suspensions of conidia. Light leafspot infections with moderate defoliation occurred on *Amaranthus caudatus*, *A. retroflexus* (a local weed species), and *Gomphrena globosa*.

Moderate infections and defoliation occurred on *Alternanthera phylloxeroides* (alligatorweed) and *A. bettzickiana*. Severe infections, defoliation, and occasionally death occurred from inoculations on *Celosia argentea* var. *crispata*, *C. argentea* var. *plumosa*, and *Iresine herbstii*.

A leafspot of alligatorweed, *Alternanthera phylloxeroides* (Mart.) Griseb., was described recently as caused by *Alternaria alternantherae* Holcomb & Antonopoulos (1, 2). The fungus causes small (2-3 mm diameter) purple spots on the leaves that develop sunken, tan, necrotic centers. Stem lesions are elongate, purple streaks and are less numerous than the leafspots. The disease is present on alligatorweed from about April through November in south Louisiana. Heavy infections cause defoliation of all except the terminal leaves, but the overall effect on the plants appears slight because of the vigorous growth of alligatorweed.

This paper reports the susceptibility of a number of commonly cultivated, ornamental amaranths to infection by *A. alternantherae* from alligatorweed.

### MATERIALS AND METHODS

The ornamental species of the Amaranthaceae used in pathogenicity tests were started from seed or cuttings obtained from local commercial sources. *Alternanthera bettzickiana* (Regal) Standl. (garden alternanthera) and *Iresine herbstii* Hook. f. (bloodleaf) were started from cuttings. *Amaranthus caudatus* L. (love-lies-bleeding), *A. tricolor* L. (Josephscoat), *Celosia argentea* L. var. *crispata* Kuntze (cockscomb, crested form), *C. argentea* var. *plumosa* (cockscomb, plume form), and *Gomphrena globosa* L. (globe-amaranth) were grown from commercial seed. *Alternanthera phylloxeroides* (alligatorweed) was grown from cuttings of local, native plants and was included in all tests for comparative purposes. The other native weed species tested was *Amaranthus retroflexus* L. (pigweed), which was collected at the seedling stage from the field.

Inoculum of *A. alternantherae* was conidia produced on 20% V-8 juice agar (3) at 25 C under a combination of

fluorescent and incandescent light sources of about 5,595 lx (520 ft-c) for 14 hr a day. Conidia were collected from 7- to 14-day-old cultures by flooding the culture dishes with water and scraping the spores off the mycelia. Spore suspensions were filtered through two layers of cheesecloth to remove large mycelial fragments and adjusted with sterile water to 25-50 conidia per microscope field ( $\times 125$ ). Spores were applied to the upper leaf surfaces of test plants with a hand atomizer. Each test plant species was included in at least three different experiments in which three plants of each species were inoculated. Inoculated and noninoculated (leaves atomized with water only) plants were enclosed in plastic bags for up to 40 hr and then placed on greenhouse benches after removal of the bags. In some tests the plants were placed in a humidity chamber for 24 hr and then moved to a growth chamber at 27 C with 16 hr daylight for observations on disease development. All plants were inoculated when they were 10-15 cm tall.

### RESULTS AND DISCUSSION

Inoculation with *A. alternantherae* on seven cultivated species and one weed species in the Amaranthaceae gave reactions that ranged from highly susceptible to slightly susceptible (Table 1). Symptoms appeared 2 days after inoculation on all plant species tested. Symptoms ranged from small necrotic specks on *Amaranthus retroflexus*, from which plants rapidly recovered, to severe leafspot, blight, and death of *C. argentea* var. *crispata* and var. *plumosa*. Symptoms on most plant species were purple- or reddish-pigmented leafspots. *Iresine herbstii* reacted severely but did not produce leafspots; lesions appeared watersoaked at first and then coalesced, covering most of the leaf area. These leaves abscised after 2-3 days. *Alternaria alternantherae* was readily reisolated from inoculated plants.

Natural infections of these cultivated Amaranthaceae species have not been observed. The disease has the

TABLE 1. Reaction of species of the Amaranthaceae to inoculation with *Alternaria alternantherae*

| Plant species                                     | Symptoms                                                                         | Comparative symptom severity                                          |
|---------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <i>Alternanthera phylloxeroides</i>               | Purple leafspots 2-3 mm in diameter with necrotic centers; elongate stem lesions | Moderate infections, moderate to severe defoliation                   |
| <i>bettzickiana</i>                               | Purple leafspots 1-2 mm in diameter with necrotic centers                        | Moderate infections, little defoliation                               |
| <i>Amaranthus caudatus</i>                        | Necrotic specks on oldest leaves, < 1 mm in diameter; a few stem lesions         | Light infections, moderate defoliation                                |
| <i>retroflexus</i>                                | Necrotic specks on oldest leaves, < 1 mm in diameter; a few stem lesions         | Light infections, moderate defoliation                                |
| <i>tricolor</i>                                   | Purple leafspots, < 1 mm in diameter; a few stem lesions                         | Light infections, moderate defoliation                                |
| <i>Celosia argentea</i> var. <i>cristata</i>      | Leafspots 3-4 mm in diameter with necrotic centers; leaf and stem blight         | Severe infections, moderate to severe defoliation, some plants killed |
| var. <i>plumosa</i>                               | Leafspots 3-4 mm in diameter with necrotic centers; leaf and stem blight         | Severe infections, moderate to severe defoliation, some plants killed |
| <i>Gomphrena globosa</i>                          | Leafspots 3 mm in diameter with purple borders and necrotic centers              | Light to moderate infections, no defoliation                          |
| <i>Iresine herbstii</i> red and green/white forms | Watersoaked lesions that coalesce to cover large leaf areas                      | Severe infections, severe defoliation                                 |

potential of being serious on the highly susceptible *Celosia* and *Iresine* species if grown close to inoculum sources of *A. alternantherae*.

#### LITERATURE CITED

- ANTONOPOULOS, A. A., and G. E. HOLCOMB. 1976. A leafspot of alligatorweed caused by a new species of *Alternaria*. Proc. Am. Phytopathol. Soc. 3:230-231.
- HOLCOMB, G. E., and A. A. ANTONOPOULOS. 1976. *Alternaria alternantherae*: A new species found on alligatorweed. Mycologia 68:1125-1129.
- MILLER, P. M. 1955. V-8 juice agar as a general-purpose medium for fungi and bacteria. Phytopathology 45:461-463.