

Cristulariella Leaf Spot on Florida Ornamentals¹

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INTRODUCTION: The production of woody ornamentals and annual flowering plants comprise an important part of Florida's horticulture industry. Strong emphasis is placed on the healthy appearance of plant products to promote sales. Any rapidly developing disease which can affect the aesthetic quality of a wide variety of plants is capable of causing significant economic losses.

When the proper environmental conditions exist, the fungus *Cristulariella moricola* (Hino) Redhead causes a target or zonate leaf spot on a myriad of woody and annual plants. Susceptible host plants (Alfieri *et al.* 1994) which can become infected in Florida are:

<i>Acer</i> sp.	<i>F. pennsylvanica</i> Marsh.
<i>A. rubrum</i> L.	<i>Hibiscus cannabinus</i> L.
<i>A. saccharinum</i> L.	<i>Lagerstroemia indica</i> L.
<i>Ailanthus</i> spp.	<i>Lycopersicon esculentum</i> Mill.
<i>Aleurites fordii</i> Hems1.	<i>Magnolia</i> sp.
<i>Ardisia crenata</i> Sims	<i>Malus</i> spp.
<i>Bucida buceras</i> L.	<i>Pentas lanceolata</i> (Forssk.) Deflers
<i>Caladium x hortulanum</i> Birdsey	<i>Platanus occidentalis</i> L.
<i>Catalpa</i> spp.	<i>Prunus persica</i> (L.) Batsch
<i>Carya illinoensis</i> (Wangenh.) K. Koch	<i>Punica granatum</i> L.
<i>Chionanthus virginicus</i> L.	<i>Ulmus parvifolia</i> Jacq.
<i>Cornus florida</i> L.	<i>Vitex</i> sp.
<i>Fraxinus</i> spp.	<i>Vitis rotundifolia</i> Michx.

SYMPTOMS: Susceptible foliage infected by *Cristulariella* displays symptoms quickly. During periods of cool moist weather entire leaves may become blighted. Initial symptoms vary from host to host, but generally, watersoaked, greenish-gray, circular or irregularly-shaped leaf spots develop, which may be accompanied by a chlorotic halo. Spots eventually produce alternating concentric bands of lighter and darker tissue, giving these lesions their common zonate or target appearance (Fig. 1). Depending on the host and weather conditions, lesions may coalesce and give a scorched appearance. Rapid tissue death is due to a combination of toxic and enzymatic processes. *Cristulariella* produces oxalic acid in toxic amounts and the pectic enzymes that degrade cell walls are synergized by the acid (Sinclair *et al.* 1987).



Fig. 1. Foliar symptoms of *Cristulariella* leaf spot on *Lagerstroemia indica* (crepe myrtle) showing typical concentric ring pattern and rapid expansion of leaf spots. Photography credit: Jeffrey W. Lotz.

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PATHOGEN: *Cristulariella* sporulates readily on infected tissue and can be observed easily with a hand lens or dissecting microscope. The conidia or propagules produced by the fungus are characteristically pyramidal or cone-shaped and are off-white in color (Fig. 2). Sporulation may occur on both sides of infected foliage. Propagule production varies with the host, temperature, and relative humidity. Cool, wet weather during mid- and late summer is optimum for disease development. *Sclerotium cinnamomi* Sawada, the sclerotial stage of *Cristulariella*, may also develop on diseased plant tissue. These sclerotia appear as black, crusty, irregularly-shaped structures approximately 2-5 mm in diameter (Fig. 3). Sclerotia serve as overwintering structures, and presumably play a role in apothecial development (Sinclair *et al.* 1987). The apothecial state of *C. moricola*, *Grovesinia pyramidalis* M. Cline, J. L. Crane, & S. Cline, has not been found in nature, but under laboratory conditions apothecia may develop from sclerotia after the appropriate chilling period and subsequent photoperiod is met (Cline *et al.* 1983).



Fig. 2. Close-up of pyramidal-shaped propagules on a blighted leaf of *Rites* sp. DPI file photo.

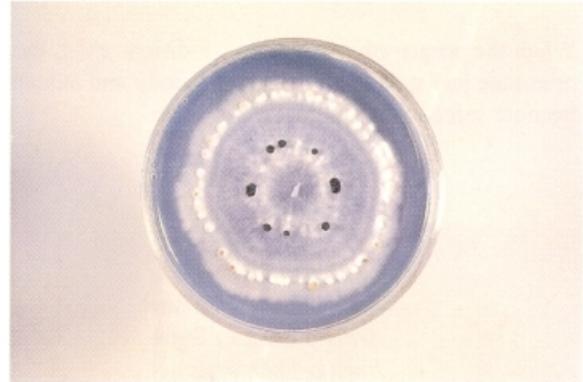


Fig. 3. A potato dextrose agar culture plate showing sclerotial development of *Cristulariella moricola*.

CONTROL: This disease, because of its rapid development, may be easier to control or prevent before symptoms appear. Simone *et al.* (1993) recommended protective sprays of systemic thiophanate methyl products (CLEARY 3336, DOMAIN FL, SYSTEC 1998, FUNGO, FUNGO FLO) which may prevent infection of susceptible plant tissue or slow disease development of infected plants. Fungicides containing mancozeb (DITHANE M-45, F-45, FORE) may also be used as a protective treatment. Removal and destruction of infected leaf litter is an excellent means of lowering the fungal inoculum, and will in turn reduce the potential for future disease outbreaks.

SURVEY AND DETECTION: Look for circular target or zonate type leaf spots with concentric rings. Target lesions usually have a tan or light-colored center. If *Cristulariella* is actively sporulating, small, white or cream-colored pyramidal or cone-shaped propagules should be easily observed within leaf lesions on either leaf surface. Black, crusty, irregularly shaped sclerotia may be observed on older infected foliage or fallen leaves.

LITERATURE CITED

- Alfieri, S.A. Jr., K.R. Langdon, J.W. Kimbrough, N.E. El-Choi, and C. Wehlburg. 1994. Diseases and disorders of plants in Florida. Florida Department of Agriculture and Consumer Services, Division of Plant Industry, Gainesville. Bulletin No. 14. 1114 p.
- Cline, M.N., J.L. Crane, and S.D. Cline. 1983. The teleomorph of *Cristulariella moricola*. *Mycologia* 75: 988-994.
- Simone, G., T. Kucharek, M. Elliot, and R. Mullin. 1993. Florida plant disease control guide. Vol. 1. Institute of Food and Agricultural Sciences, Florida Cooperative Extension Service. University of Florida, Gainesville. 307 p.
- Sinclair, W.A., H.H. Lyon, and W.T. Johnson. 1987. Diseases of trees and shrubs. pp. 62-63. Comstock Publishing Associates, Cornell University Press, NY.