

*Discula destructiva* 正體中文

**System:** Terrestrial

Kingdom	Phylum	Class	Order	Family
Fungi	Ascomycota	Sordariomycetes	Diaporthales	Gnomoniaceae

**Common name** dogwood anthracnose (English)

**Synonym**

**Similar species**

**Summary** *Discula destructiva* is a fungus that has caused serious losses to North American native flowering dogwood (*Cornus florida*) and other native and introduced species (*C. nuttallii* and *C. kousa*, respectively) of dogwood found in the natural environment and in ornamental plantings. Infection is more likely to occur at higher elevations and on moist to wet sites, and shade increases the risk of infection and mortality. Spores are washed onto new leaf tissue during periods of wet weather or sprinkler irrigation. Spores of *Discula destructiva* land on shoots and leaves penetrating them directly and causing the quick death of the plant tissue due to the production of several toxins by the fungus. Larger trees often die 2 to 3 years after the first symptoms are found in the leaves. Management of *Discula destructiva* is not readily available, but there are strategies available to enhance high value and ornamental populations of dogwoods through extensive care of individual trees.



[view this species on IUCN Red List](#)

## Species Description

The USDA Forest Service: Northeastern Area (UNDATED) states that, "Conidiomata of *D. destructiva* may form on necrotic leaf or bark areas. Masses of white to salmon coloured conidia ooze as cirrhi from the reddish to dark brown conidiomata during wet weather." The USDA Forest Service: Southern Region (UNDATED) adds that, "Initial symptoms of *D. destructiva* are small tan leaf spots that develop into large tan blotches. Often a purple border occurs between dead and healthy tissues and occasionally the entire leaf is killed."

## Notes

The USDA Forest Service: Northeastern Area (UNDATED) states that, "The origin of this disease is unknown. The fungus may have been introduced or a change in environment may have altered host/parasite relationships, enabling a previously innocuous fungus to become a significant pathogen." The USDA Forest Service: Southern Region (UNDATED) states that, "The dieback of twigs and branches in the lower crown led to the original name of 'lower-branch dieback' (Pirone 1980, in USDA Forest Service: Southern Region, UNDATED). Further knowledge of the pathogen allowed the disease to be renamed 'dogwood anthracnose.'" Zhang and Blackwell (2002) suggested that the fungus was introduced based on genetic data.

## Lifecycle Stages

Pecknold *et al.* (2001) states that, "On the underside of the leaf spots the fruiting structures of the causal fungus *Discula destructiva*, may be visible as small raised tan or brown specks scattered randomly over the lesion surface. Spores from these structures are washed onto new leaf tissue during periods of wet weather or sprinkler irrigation. If cool wet weather persists leaves may become severely blighted." The Plant Disease Diagnostic Clinic (2001) states that, "Reproductive structures of *D. destructiva* form underneath leaf spots and on the surface of twig cankers. Huge amounts of asexual spores are formed inside and, in the spring, ooze out in slimy beige clusters. Local dispersal of the spores occurs by splashing rain while long distance dispersal may also occur *via* insects and birds. Transportation of diseased stock into new areas spreads the disease as well, especially into areas where dogwoods are not native. Spores of the fungus land on shoots or leaves penetrating them directly causing the quick death of the plant tissue due to the production of several toxins by the fungus." Redlin (1991) states that *D. discula* produces acervular and subcuticular conidiomata on leaves and twigs of the host. Conidia are ellipsoidal and nonseptate. A sexual state is unknown.

## Habitat Description

The USDA Forest Service: Southern Region (UNDATED) states that, "Infection begins in leaves and spreads to twigs and branches, which dieback. Main-stem infections cause cankers, which kill the trees. In the South, infection is most likely at higher elevations and on moist to wet sites. Shade increases risk of infection and mortality."

## Reproduction

Asexual reproduction by conidia produced in structures called acervuli; sexual reproduction unknown (Redlin, 1991).

## Nutrition

Necrotrophic parasitism

## General Impacts

The USDA Forest Service: Northeastern Area (UNDATED) states that, "*Discula destructiva* Infections often progress down the petioles of blighted leaves into shoots, resulting in cankers. Direct infection of shoots, resulting in tiny cankers, may occur on *C. florida* during spring and fall. Girdling cankers typically develop at leaf nodes, causing twig dieback. On *C. nuttallii*, fall blighting of terminal leaves is common, resulting in death of terminal buds. Twig dieback is most common in the lower crown following years of extensive spring or fall leaf blighting. As a result of twig dieback, succulent shoots proliferate on the lower trunk and main branches of affected trees. These branches are very prone to infections, which may progress into the main stem. Multiple cankers can girdle individual branches or kill the entire tree." The USDA Forest Service: Southern Region (UNDATED) adds that, "Cankers may not be present on all the dead trees. Larger trees often die 2 to 3 years after the first symptoms are found in the leaves." The fungal growth and virulence at 28 C and higher is significantly decreased (Ning and Blackwell, 2002).

## Management Info

**Preventative measures:** The USDA Forest Service: Northeastern Area (UNDATED) states that, "Dogwoods receiving good cultural care will be better able to withstand *D. destructiva* during years in which the disease is favoured by weather conditions. Remove succulent branches as they form to prevent trunk canker formation. Avoid high nitrogen fertilizers, which stimulate succulent branching."

The USDA Forest Service: Southern Region (UNDATED) also offers suggestions for managing *D. destructiva*: "Inspect trees frequently to detect the presence of the disease in its early stages. Select healthy planting stock. If symptoms are seen on the planting stock, dispose of the infected trees. Avoid sites along streams, lakes, or ponds where moisture will remain on the foliage for many hours after sunrise. Prune and completely remove or destroy dead wood in the tree and leaves on the ground yearly. Avoid mechanical and chemical injuries to the trees. Lawnmower and string-trimmer wounds are particularly troublesome."

**Chemical:** Fungicides should be used only to supplement a cultural control program. Applications of chlorothalonil, mancozeb will protect against leaf infections. Apply fungicides registered for prevention or control of dogwood anthracnose when it is necessary to do so. Fungicides should be applied as buds are breaking in the spring and at least twice thereafter as the leaves are expanding (USDA Forest Service).

## Pathway

The origin of this disease is unknown. The fungus may have been introduced or a change in environment may have altered host/parasite relationships, enabling a previously innocuous fungus to become a significant pathogen.

**Principal source:** [How to Identify and Control Dogwood Anthracnose](#) USDA Forest Service: Northeastern Area, UNDATED.

[Dogwood Anthracnose and its Spread in the South](#) USDA Forest Service: Southern Region, UNDATED.

Zhang, N., and M. Blackwell. 2001.

Zhang, N., and M. Blackwell. 2002.

**Compiler:** National Biological Information Infrastructure (NBII) & IUCN/SSC Invasive Species Specialist Group (ISSG)

**Review:** Ning Zhang and Meredith Blackwell, Department of Plant Pathology, Pennsylvania State University, and Department of Biological Sciences, Louisiana State University.

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## ALIEN RANGE

[1] EUROPE

## BIBLIOGRAPHY

12 references found for *Discula destructiva*

### Managment information

[Dogwood anthracnose \(\*Discula destructiva\*\) in Ontario. Bulletin no. 1. Canadian Forestry Service, Great Lakes Forestry Centre.](#)

**Summary:** Factsheet of dogwood anthracnose in Canada.

[European and Mediterranean Plant Protection Organization \(EPPO\), \*Discula destructiva\*](#)

**Summary:** Dogwood anthracnose alert in Europe.

[Pecknold, P., G. Ruhl, and K. Rane. 2001. \*Dogwood Anthracnose\*. Purdue University: Department of Botany & Plant Pathology. BP-48-W Ornamental Diseases.](#)

**Summary:** Information regarding identification, symptoms, impacts, and control and management of species.

Available from: <http://www.agcom.purdue.edu/AgCom/Pubs/BP/BP-48.html> [Accessed 26 October 2003].

[Plant Disease Diagnostic Clinic. 2001. \*Dogwood Anthracnose \(\*Discula destructiva\*\) Factsheet\* Cornell University, 334 Plant Science Building, Ithaca, NY.](#)

**Summary:** Information regarding identification, symptoms, impacts, and control and management of species.

Available from: <http://plantclinic.cornell.edu/FactSheets/dogwoodanthracnose/dogwood%20anthracnose.htm> [Accessed 26 October 2003].

Tantardini A, Calvi M, Cavagna B, Zhang N, and Geiser D, 2004. The dogwood anthracnose disease has just been confirmed in Italy ( Primo rinvenimento in Italia di antracnosi causata da *Discula destructiva* su *Cornus florida* e *C. nuttallii*. *Informatore Fitopatologico*

**Summary:** Dogwood anthracnose report in Italy.

**USDA Forest Service: Northeastern Area. UNDATED. [How to Identify and Control Dogwood Anthracnose](#). Forest Health Protection, Northeastern Area.**

**Summary:** Information regarding identification, symptoms, impacts, and control and management of species.

Available from: [http://www.na.fs.fed.us/spfo/pubs/howtos/ht\\_dogwd/ht\\_dog.htm](http://www.na.fs.fed.us/spfo/pubs/howtos/ht_dogwd/ht_dog.htm) [Accessed 26 October 2003].

**USDA Forest Service: Southern Region. UNDATED. [Dogwood Anthracnose and its Spread in the South](#). Forest Health Protection, Southern Region.**

**Summary:** Information regarding identification, symptoms, impacts, and control and management of species.

Available from: <http://fhpr8.srs.fs.fed.us/pubs/dogwood/r8-pr26/dwr8pr26.htm> [Accessed 26 October 2003].

## General information

**ITIS (Integrated Taxonomic Information System), 2004. [Online Database \*Eleutherodactylus coqui\*](#)**

**Summary:** An online database that provides taxonomic information, common names, synonyms and geographical jurisdiction of a species. In addition links are provided to retrieve biological records and collection information from the Global Biodiversity Information Facility (GBIF) Data Portal and bioscience articles from BioOne journals.

Available from:

[http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p\\_action=containing&taxa=Eleutherodactylus+coqui&p\\_format=&p\\_ifx=plglt&p\\_lang=](http://www.cbif.gc.ca/pls/itisca/taxastep?king=every&p_action=containing&taxa=Eleutherodactylus+coqui&p_format=&p_ifx=plglt&p_lang=) [Accessed December 31 2004]

**NCBI (National Center for Biotechnology Information). 2003. [Discula destructiva](#). National Library of Medicine & National Institutes of Health [Online Database].**

**Summary:** Information on taxonomy and synonyms.

Available from:

<http://www.ncbi.nlm.nih.gov/Taxonomy/Browser/wwwtax.cgi?mode=Info&id=148313&lvl=3&lin=f&keep=1&srchmode=1&unlock> [Accessed 26 October 2003]

Redlin, S. C. 1991. *Discula destructiva* sp. nov., cause of dogwood anthracnose. *Mycologia* 83: 633-642.

Zhang, N., and M. Blackwell. 2001. Molecular phylogeny of dogwood anthracnose fungus (*Discula destructiva*) and the Diaporthales. *Mycologia* 93:356-364.

Zhang, Ning, and M. Blackwell. 2002. Population structure of dogwood anthracnose fungus. *Phytopathology* 92: 1276-1283.