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Leaf Spotting Fungi in Cattleyas Part 3 - Anthracnose from *Colletotrichum*

by Sue Bottom, sbottom15@gmail.com

Anthracnose is a name given to fungal infections caused by *Colletotrichum* and *Glomerella* species. Many fungi reproduce both sexually and asexually, and each stage produces different fruiting bodies and spores. Typically, the asexual stage is more important in the spread of the disease. The pathogen usually associated with Anthracnose is *Colletotrichum gloeosporioides* (asexual stage, the sexual stage is known as *Glomerella cingulata*). In thin leaved orchids, we often recognize Anthracnose caused by this pathogen by the alternating lines of dead tissue with little tan dots, the spores, that extend down from the leaf tip. The Bakers describe the symptoms of Anthracnose from *Colletotrichum gloeosporioides* as follows:

Leaf tips turn brown beginning at the apex and proceeding toward the base. Dark brown or light gray patches develop, sometimes as concentric rings or as numerous dark bands across the leaf. The affected area is usually sharply defined and somewhat sunken, while the remainder of the leaf appears normal. Sporing bodies develop in the infected area.



1. In thin leaved orchids, orchids like many oncidiums, gongoras, stanhopeas, and dendrochilums, the symptoms of Anthracnose usually begin at the leaf apex and move toward the base of the leaf, with alternating bands of dead tissue and sporing bodies in the dead area.

The damage seen in thick leaved orchids like cattleyas is not so easily identified. In some cattleyas, the damage begins at the leaf tip and moves downward relatively slowly. The damaged portion of the leaf becomes necrotic and eventually papery. Younger sections



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have a dark demarcation line with a yellow advancing edge, with tiny dots, the spores, in the dead tissue. Lower leaf surface just shows discolored tissue. The sporing bodies are on the upper surface only. Leaves on the oldest pseudobulbs show the most damage.

In other cattleyas, affected leaves have discoloration from the leaf tip advancing downward without a strong demarcation line. Leaf tips have discolored yellow to brown blotches, extending downward mostly along the leaf edges, with leaf yellowing ahead of the discoloration. Discoloration is present on the leaf undersides corresponding to the upper leaf surface damage. Sporing bodies only appear on the upper leaf surfaces.

Colletotrichum species causing Anthracnose leaf spotting

Entire Plant



2. Lc. Nell Clark, excellent vigor, oldest four pseudobulbs had leaves with discolored tips.

Leaf Upper Surface



3. The damage on the upper leaf surface began at the leaf tip and continued down the leaf, with a darker band at the advancing edge and many sporing bodies evident in the dead tissue.

Leaf Under Surface



4. The leaf under-surface showed necrotic tissue with a distinct demarcation of discolored tissue and a slight advancing yellow margin.



5. Blc. Samba Splendor 'Puerto Rico', a vigorous grower.



6. Leaf tips have discolored brown blotches, extending downward mostly along the leaf edges, with leaf yellowing ahead of the discoloration. No distinct line of demarcation.



7. Discoloration is present on the leaf undersides corresponding to the upper leaf surface damage, No sporing bodies present on leaf undersides.

Anthracnose does not always start on the leaf tips. A friend was having problems with her *Laelia purpurata*. These symptoms were unlike anything I had ever seen before. It sounded



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like it happened fast, suggesting either sunburn, a bacterial infection or black rot. One of the images looked like sunburn, but that usually appears on the highest point of the leaf where the sun's rays impact the most directly. That was not the case for the discolored area in the other in the other images. So, perhaps it was caused by a bacterial rot from water pooling in the pseudobulb sheath, but there was no sheath and there was green tissue between the leaf axil and the discolored area. The next thought was perhaps black rot, but the discolored tissue was not soft or odorous. Whatever the source of the problem, there was a clear need for emergency surgery to stop the spread of disease.



8. Severely damaged leaf, with black necrotic discoloration and spores evident in the discolored area.



9. In this Cattleya alliance plant, the circular area of dead tissue from Anthracnose begins above the leaf axil and there are numerous spores in the dead area.

Some leaves were collected for laboratory analysis. The damage in this cattleya alliance plant was in roughly circular patches at the base of the leaf rather than at the leaf apex. The necrotic tissue contained many fine dots, the spores, that spread the disease. The leaves on all the cattleyas pictured in this article were sent to the Florida Department of Agriculture laboratory in Gainesville for diagnostic analysis. They determined the disease is Anthracnose caused by *Colletotrichum* fungi.

The pathogen usually associated with Anthracnose is *Colletotrichum gloeosporioides*, but as we reported in 2018, cattleyas can also be infected with the leaf spotting fungus *Colletotrichum theobromicola*, not before reported as an orchid pathogen. This pathogen causes a chlorotic mottling on the upper surface of the leaf, with corresponding patches of fine tiny spots occurring on the leaf underside. There is an occasional sunken or necrotic spot. The upper surface chlorotic leaf mottling with patches of fine spots underneath is the key diagnostic for this pathogen.



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10. *C. Astraea* 'Ginny', a vigorous grower.



11. Chlorotic mottling where the chlorosis aligns with most serious under leaf spotting.



12. Brown blotchy splotches where fine dark spots coalesce, occasional sunken spots.

The first step in responding to anthracnose is to sanitize the plant, which means removing all the damaged tissue to remove the fungus and its sporing bodies to prevent it from spreading. Afterwards, a protective fungicide can be applied to help prevent recurrence. Copper or Daconil can be used, as can Cleary's 3336 or Heritage, although the more expensive Pageant provides very good control.

The problem with relying on chemicals to cure an infection is the fungal hyphae in the leaf are beyond the reach of most fungicides, so the spores spreading the disease will continue to form. While fungicides will help prevent the spores from spreading onto uninfected leaves, cutting away diseased tissue is the best way to prevent the spores from forming in the first place.

Citations and Additional Reading:

Baker MLB, Charles O (1996) *Orchid species culture: Dendrobium*. Timber Press, Portland.

Bottom, S. 2018. Leaf Spotting Fungi in Cattleyas, Part 1 – The New Anthracnose. *Orchids*, 87(11) 818-822.

Chase, A. R. 2011. *Colletotrichum* is a Common Disease. *Greenhouse Management*, October 14, 2011. Accessed online 9/19/2017;
<http://www.greenhousemag.com/article/gm1011-colletotrichum-common-plant-disease/>

Leonhardt K, Sewake K, editors. 1999. *Growing dendrobium orchids in Hawaii: production and pest management guide*. Honolulu (HI): University of Hawaii. p. 55.

McMillan Jr, R.T., 2011. Efficacy of Fungicides for Control of *Colletotrichum gloeosporioides* on *Dendrobiums*. In *Proc. Fla. State Hort. Soc.* (Vol. 124, pp. 314-316).



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Simone, Gary W. and Burnett, Harry C. 2002. Diseases Caused by Bacteria and Fungi, pp 50-70.
In: *Orchid Pests and Diseases*. Rev. Ed., T.J. Watson editor, American Orchid Society, Delray
Beach, Florida.