



St. Augustine Orchid Society

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Rots in Catasetums

by Sue Bottom, sbottom15@gmail.com

Catasetum repotting begins in the winter, after they have spent weeks to months in a dry dormant state. The year begins when the new green growths begin to emerge at the base of the youngest pseudobulbs in late winter to early spring. This is a great time to repot them, because you know the new green roots will form soon and grow into the fresh mix.

During the weekly inspection for new growths, it was apparent that many of the catasetums had developed isolated rots. The rot was always in the older pseudobulbs, and ranged from a complete collapse of the tissue into a withered husk of a bulb, to a softer wilted bulb with brown discoloration, sometimes black near the rhizome. The newest pseudobulbs remained green and the tissue healthy, with no soft spots on them. Thinking back to last summer, there had been isolated rots on catasetums in the shade house that had been attributed to the very rainy summer we had. But these plants were kept dry all winter long, how had so many of the plants developed rots?



Last year's growths are happy and healthy, but the older growths are wilted and rotting.

Time to consult with Fred Clarke, and it turned out to be an hour well spent as he had some astute observations and suggestions. Fred talked about how catasetums as a group are good at walling off diseases and problems from the healthy tissue. In nature, you often find big clumps of catasetums with healthy new growths and then when you look closer, you see the back bulbs are bent over and rotten. Plant pathologists call this the hypersensitive response, a localized death of cells at the site of infection because of the plant cells recognizing the invading pathogen and committing suicide to thwart it. The dead cells wall off the pathogen and this necrotic barrier prevents the transmission of the pathogen through the plant. You often see this in *Cycnoches*, where the youngest growth is hard and healthy and the older growths rot and die, so many times there is only a single bulb in the pot.

But why was there so much more rot this year than I had ever seen before. Fred recounted the parable of the frog and the boiling water. As the story goes, if you put a frog in a pan of boiling water, the frog will quickly jump out. On the other hand, if you put a frog in cold water



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and slowly bring the water to a boil, the frog will boil to death, slowly without realizing or noticing he is fading away. This fable teaches us how our failure to notice gradual changes can result in huge problems down the road. When you see a problem in your growing area, like I did with the increase in rots during the summer, address the problem.



*Older bulb has brown to almost black discoloration, with soft spots extending about half way up the bulb. Younger bulb has sunken brown to black necrosis at base and another spot about 1/3 of the way up the bulb. Waypoint Analytical found the fungal pathogens *Fusarium* and *Lasiodiplodia*.*



*Reddish-purplish discoloration in rhizome and along nodes moving up the pseudobulb (first 3 nodes from base). Waypoint Analytical found the plant pathogen *Fusarium* in the tissue.*

Then Fred talked about the disease triangle. Three factors must be present at the same time for a plant disease to occur, a susceptible host, a disease organism and a suitable environment. If any one of the three factors is missing, plant disease does not occur. Clearly, the catasetums are susceptible to this form of rot, but what organism caused the rot? It is not one of the water molds that cause the fast moving black rot in cattleyas. This is a more slowly moving disease, like one of the bulb rots caused by *Fusarium* or *Rhizoctonia*. Or, could it have been some exotic disease blown in with the Saharan dust during one of our tropical storms or a contaminant present in the Purely Organic fertilizer? He also mentioned that he drenches his plants in the fall with a combination of Subdue and Terrachlor to lower the disease pressure. That's step one in minimizing the impact on one leg of the disease triangle.

Fred recommended a testing lab to see if we can identify the pathogen, Waypoint Analytical in California. We sent samples of infected bulbs off to Waypoint and said they found *Fusarium* species in both samples. The characteristic red/purple rings we see in cattleya rhizomes are not so different from what you see in catasetum pseudobulbs and rhizomes. Surprisingly, the lab also found the fungal pathogen *Lasiodiplodia* (sexual state *Botryosphaeria*) in the pseudobulb that had necrotic lesions. The fungus is found throughout the tropics and subtropics and is a well-known pathogen commonly associated with root,



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collar and stem rot, dieback and post-harvest diseases, although it is not ordinarily identified in orchids..

So what environmental conditions were favorable to rot formation? The wet summer and tropical storm season surely contributed to the problem. The plants grow out under the shade house that is covered only by shade cloth so they get wet when it rains. Anticipating this, the plants are potted so that the bottom third to half the pot is filled with Styrofoam chunks and then the top of the pot is sphagnum moss. During the growing season, they are watered every other day when it does not rain. So when the rainy season begins, perhaps one change that should be made is let them go to a harder dry between storms. Allow 3 or 4 days between waterings instead of watering every day. Particularly after the main growing season is over, in the early fall, extend the time between watering even further.

You learn a lot about your plant culture when you repot your orchids. If your plants grew well, you can tell by the healthy roots and growths on your plant. The rots on many of the catasetums told a different story. The older growths were all cut away and discarded during the repotting process. This is the one sure fire way to remove disease pathogens from your growing area, sometimes referred to as 'sanitizing' your plants in the orchid books. Then, they were potted up in preparation for their move out to the shade structure later in the year. Once watering begins in the spring, they will be given an Empress/Subdue drench, as will the cattleyas to protect against Fusarium, Rhizoctonia and their nemesis, Black Rot. After the new growths mature in the summer, we'll be more careful with watering, watering every third or fourth day instead of every second day. In the fall, before dormancy begins, they will be given a second chemical drench. We want our frogs by the hot tub to stay healthy and happy!

Citations and Additional Reading

Lopes, U.P., Zambolim, L. & Pereira, O.L. First report of *Lasiodiplodia theobromae* causing leaf blight on the orchid *Catasetum fimbriatum* in Brazil. *Australasian Plant Disease Notes* 4, 64–65 (2009). <https://doi.org/10.1071/DN09027>