Ornamental, Garden & Landscape Section

*Proc. Fla. State Hort. Soc.* 125:359–360. 2012.

# *Colletotrichum sansevieriae* Causing Anthracnose of *Sansevieria trifasciata* 'Laurentii' and 'Moonshine' in South Florida

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**Additional index words.** *Sansevieria* sp, snake plant, fungal disease, *Colletotrichum*, foliage disease, plant pathogen.

**Sansevieria (snake plant) is known to be an easy plant to grow and can be seen throughout the South Florida landscape as ground cover. Its attractive foliage makes it a popular choice for the interiorscape. During mid to late summer of 2010, several ornamental nurseries submitted diseased samples of sansevieria to the Florida Extension Plant Diagnostic Clinic, Homestead, FL. Infected plant leaves were covered with circular water-soaked lesions that rapidly enlarged and coalesced resulting in severe leaf blight. Characteristic brownish black acervuli were observed on lesions and maintained on potato dextrose agar (PDA). Sequences of the rDNA internal transcribed spacer (ITS) region of two isolates (GenBank Accession Nos. JF911349 and JF911350) exhibited 99% nucleotide identity to an isolate of *Colletotrichum sansevieriae* (GenBank Accession No. HQ433226). Pathogenicity of sequenced isolates was evaluated in greenhouse experiments. Twelve-week-old sansevieria plants were inoculated with conidial suspensions (1 × 106 conidia/mL) of *C. sansevieriae*. Inoculum or autoclaved water was sprayed over the foliage until runoff. Four plants of each of two cultivars were sprayed per treatment and the experiment was repeated twice. Inoculated plants were placed in a greenhouse at 29 °C with 70% to 85% relative humidity. Within 10 d of inoculation for both cultivars, no symptoms developed on the control plants. On the inoculated plants, foliar lesions closely resembled those observed in the affected nurseries and *C. sansevieriae* was consistently re-isolated from symptomatic tissue. It was determined that this disease must be managed preventatively and local nurseries discarded hundreds of thousands of plants due to the disease outbreak.**

## Materials and Methods

Symptomatic leaf tissue from *Sansevieria trifasciata* 'Laurentii' and 'Moonshine' were collected from local nurseries in Miami Dade County during late summer of 2010. Diseased leaf tissue was surface disinfested and then cultured on acidified potato dextrose agar (APDA). Five to seven days later, the fungal colonies that emerged were aseptically transferred to half-strength potato dextrose agar (PDA). Seven-day-old colonies on half-strength PDA appeared grayish-white and partly cream to pink; felted with aerial mycelium with reverse color grey to dark olivaceous grey. Conidia were one celled, cylindrical, obtuse at the apex, and slightly acute at the base. To obtain a pure culture, the colony was single-spored and stored on filter paper in the –80 °C freezer. DNA was extracted from the pure culture and PCR was conducted using universal primers for the internal transcribed spacer (ITS) region.

**Koch's postulates.** Pathogenicity was evaluated in greenhouse experiments using 12-week-old sansevieria plants. A conidial suspension (1 × 106)/mL of *C. sansevieriae* was sprayed over the foliage using a hand held sprayer until runoff. Autoclaved water was used for the control. Four plants of each of the sansevieria cultivars 'Laurentii' and 'Moonshine' were sprayed per treatment and the experiment was repeated. Inoculated plants were placed in a greenhouse at 28 to 30 °C range and 70% to 85% relative humidity.

## Results

**Molecular characterization.** Sequences of the rDNA ITS regions of two isolates (GenBank Accession Nos. JF911349 and JF911350) exhibiting 99% nucleotide identity to an isolate of *Colletotrichum sansevieriae* (GenBank Accession No. HQ433226) collected from diseased sansevieria in Australia.

**Koch's postulates.** Within 10 d post inoculation symptoms of anthracnose were observed on both cultivars of inoculated sansevieria plants. No symptoms developed on the negative control plants. *Colletotrichum sansevieriae* was consistently re-isolated from symptomatic tissue collected from greenhouse experiments (Fig. 1A–B).

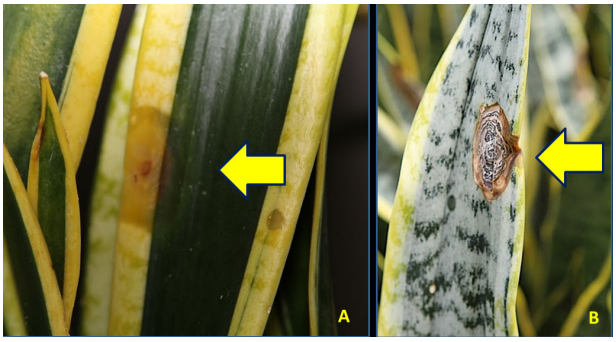


Fig. 1. (**A**) Initial symptoms are small water soaked lesions that eventually expand across the width of the leaf. (**B**) As the disease progresses characteristic black fungal structures (acervuli) form in a concentric ring.

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Fig 2. Low marketability of diseased sansevieria (snake plant) affecting nursery and landscape industries.

Fig 3. Pruning affected leaves is an effective control measure. Be sure that all pruning efforts are done under dry conditions.

## Discussion

This newly introduced disease has greatly impacted sansevieria producers in South Florida. In fact, several local nurseries have stopped growing the plant even though producing sansevieria has been profitable for many years (Fig. 2). These profits were a result of low input costs for crop maintenance. Until recently, sansevieria has had minimal pest and disease issues. The pathogen can be effectively managed, but this requires a preventative approach (Tables 1 and 2).

Disease management recommendations include the use of microjet or drip irrigation, so that the foliage remains dry. If this is not an option, monitor irrigation, so that the foliage has time to dry before evening. Scouting for early symptom development is very important. Diseased leaves should be removed and discarded. All pruning should be done under dry conditions (Fig.3). Good sanitation including properly disinfecting tools that come into contact with the plants, covering the ground with cloth and surface dis-infesting benches, and maintaining a weed free nursery are essential for disease control.

Table 1. Preventative foliar spray treatment results to control Anthracnose disease. Values within each column with the same letter do not differ significantly Tukey's Studentized Range (HSD).

| Product | Rate | Number of symptomatic leaves | Number of lesions | Severity | Marketability |
|---|---|---|---|---|---|
| 1-Non-inoculated control | --- | 9.25±1.89 ab | 18.0±3.42 ab | 1.52±0.21 ab | 1 |
| 2-Inoculated control | --- | 16.0±5.14 a | 50.5±19.5 a | 4.45±1.59 a | 0 |
| 3-Disarm 480 SC (fluoxastrobin) | 16 fl oz/100 gal | 6.25±0.85 ab | 10.75±3.09 b | 1.75±0.60 ab | 2 |
| 4-Pageant (pyraclostrobin + boscalid) | **18 fl oz/100 gal** | **2.0±0.58 b** | **3.75±1.38 b** | **0.22±0.08 b** | 6 |
| 5-Heritage (azoxystrobin) | 6 fl oz/100 gal | 4.75±0.75 ab | **7.75±0.85 b** | **0.62±0.33 b** | 5 |
| 6-Concert (propiconazole+chlorothal) | 28.5 fl oz/100 gal | 7.0±3.56 ab | **8.25±4.17 b** | **0.67±0.45 b** | 5 |
| 7-Affirm WDG (polyoxin D zinc salt) | 0.375 lbs/100 gal | 8.75±2.02 ab | 17.3±4.17 ab | 1.37±0.40 ab | 1 |
| 8-Torque (tebuconazole) | 7 fl oz/100 gal | 5.25±1.97 ab | **7.25±2.84 b** | **0.77±0.37 b** | 5 |
| 9-Xeroton X3 (hydrogen peroxide + acids) | 1:1500 dilution | 9.25±1.05 ab | 23.8±10.1 ab | 2.05±1.05 ab | 0 |
| | *P*= | 0.0022 | 0.0105 | 0.0555 | --- |

Table 2. Curative foliar spray treatment results to control Anthracnose disease. Values within each column with the same letter do not differ significantly Tukey's Studentized Range (HSD).

| Product | Rate | Number of symptomatic leaves | Number of lesions | Severity | Marketability |
|---|---|---|---|---|---|
| 1-Non-inoculated control | --- | 27.25 ± 10.14 | 97.75 ± 52.71 | 11.63 ± 6.36 | 0 |
| 2-Inoculated control | --- | 36.00 ± 12.81 | 103.75 ± 35.69 | 16.50 ± 6.59 | 0 |
| 3-Disarm 480 SC (fluoxastrobin) | 16 fl oz/100 gal | 23.75 ± 8.77 | 72.50 ± 29.21 | 10.00 ± 3.49 | 0 |
| 4-Pageant (pyraclostrobin + boscalid) | 18 fl oz/100 gal | 25.75 ± 8.72 | 74.25 ± 33.27 | 10.25 ± 4.31 | 0 |
| 5-Heritage (azoxystrobin) | 6 fl oz/100 gal | 55.50 ± 30.80 | 74.00 ± 30.46 | 9.35 ± 3.36 | 0 |
| 6-Concert (propiconazole+chlorothal) | 28.5 fl oz/100 gal | 33.00 ± 14.22 | 89.00 ± 42.73 | 15.00 ± 7.27 | 0 |
| 7-Affirm WDG (polyoxin D zinc salt) | 0.375 lbs/100 gal | 26.50 ± 4.92 | 58.00 ± 11.58 | 12.75 ± 2.39 | 0 |
| 8-Torque (tebuconazole) | 7 fl oz/100 gal | 32.50 ± 5.33 | 82.25 ± 19.14 | 12.00 ± 1.96 | 0 |
| 9-Xeroton X3 (hydrogen peroxide + acids) | 1:1500 dilution | 37.50 ± 8.05 | 50.50 ± 9.13 | 13.75 ± 1.31 | 0 |