

## ***First Report of Downy Mildew on Gynura aurantiaca Caused by Plasmopara halstedii sensu lato in Florida***

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## plant disease

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## DISEASE NOTES

## First Report of Downy Mildew on *Gynura aurantiaca* Caused by *Plasmopara halstedii* sensu lato in Florida

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## ABSTRACT

*Gynura aurantiaca* is a member of the Senecionaea tribe of the Asteraceae, indigenous to Java. Commonly known as purple velvet plant, this tropical species is well adapted to landscapes in South Florida, but is mostly seen as a potted plant for use in the interiorscape. During February 2013, a local nursery submitted *Gynura aurantiaca* samples to the Florida Extension Plant Diagnostic Clinic in Homestead, FL, where 30% of 1,000 plants were affected. Downy, white mycelium was observed on the abaxial leaf surface, and the adaxial surface of affected leaves appeared darker in color. Severely affected leaves began to curl as the tissue turned necrotic. The pathogen was identified as *Plasmopara halstedii* (Farl.) Berl. & De Toni based on the presence of coenocytic mycelium, and right-angled, monopodially branched sporangiophores with sporangia that were hyaline, obvoid to elliptical, and measuring 21 × 29 × 17 to 21 μm (Delanoe 1972). Molecular identification was conducted by extracting pathogen DNA using the QIAGEN Plant DNA kit (QIAGEN, Gaithersburg, MD). PCR of the 5' terminal domain of the nuclear DNA coding for the large subunit (LSU rDNA) was performed with primers NL1 and LR3 (Kurtzman et al. 1998; Vilgalys and Hester 1990). The PCR product was purified with the QIAquick kit (QIAGEN) according to the manufacturer's instructions and sequenced bidirectionally. The

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sequence from our isolate (GenBank Accession No. KR028988) was nearly identical (exhibited 97% nucleotide identity; 98% query coverage; E value = 0.0) to an isolate of *P. halstedii* (EF553469). A phylogenetic analysis was performed using the obtained sequence data and fifteen *Plasmopara* sequences from GenBank and a *Fusarium solani* accession as an outgroup (Maximum Likelihood, Tamura-Nei model). Our isolate grouped with *P. halstedii* with high bootstrap support (98% bootstrap value, 1,000 replicates) further supporting identification as *P. halstedii*. Pathogenicity of the sequenced isolate was evaluated in shade-house experiments. Two-month-old *Gynura aurantiaca* plants were inoculated with a sporangial suspension ( $1 \times 10^6$  sporangia/ml) of *P. halstedii* that was collected by washing sporangia from the abaxial surface of purple passion leaves using autoclaved distilled water. Inoculum or autoclaved water was sprayed over the foliage until runoff. Six plants were sprayed per treatment and the experiment was repeated twice. Inoculated plants were placed in a shade house (73% shade) when temperatures ranged from 17 to 28°C with 78 to 98% relative humidity. Plants were observed for disease development, and pathogen sporulation occurred within seven days of inoculation. No symptoms developed on the control plants. To our knowledge, this is the first report of *Plasmopara halstedii* causing downy mildew on *Gynura aurantiaca*. *Gynura aurantiaca* is highly valued for its stunning purple foliage and low input production costs, but a disease such as downy mildew has the potential to substantially reduce if not eliminate commercial production.

## References:

Section:  ▾

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