

PEST ALERT

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Hibiscus-infecting cilevirus (HiCV)

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INTRODUCTION

Hibiscus is an economically important plant of Florida's ornamental industry. Florida is the largest producer of *Hibiscus rosa-sinensis* Linn, the Chinese hibiscus or China rose, and produces 91 percent of the total U.S. market (USDA-CHS, 2014).

Hibiscus-infecting cilevirus (HiCV) was first described in *H. rosa-sinensis* from Hawaii in 2013 (Melzer et al. 2013) and recently from Florida. (Roy et al. 2018a). Although initially thought to be restricted to hibiscus, the recent discovery of this virus in mixed infection with citrus-infecting cilevirus (CiLV-C2) in sweet oranges (*C. sinensis*) (Roy et al. 2018b) in Colombia raised speculation and concern that HiCV may cause citrus leprosis in citrus (Roy et al. 2018b). Because of HiCV's relatedness to CiLV-C, and its recent detection in citrus, there is increased urgency to monitor the virus's presence in Florida.

BIOLOGY

All cilevirus are localized within the cytoplasm of the infected host plant. This group of viruses belongs to a complex with three species and various strains involving both cytoplasmic (cilevirus) and nuclear viruses (dichorhavirus). Among known members of the cilevirus genus, HiCV is most closely related to CiLV-C2 (92 percent amino acid identity), the primary causative agent of Citrus leprosis worldwide. Interestingly, this virus is only present within the local lesions and is incapable of moving systemically within the plant. To date, HiCV has been found only in *H. rosa-sinensis* and *C. sinensis*. Currently, it is unclear whether HiCV is present in other *Hibiscus* species present in Florida, including *H. syriacus* (rose of Sharon), *H. sabdariffa* (roselle), and many native species including *H. moscheutos* (rose mallow, swamp mallow) and *H. coccineus* (Texas star).

SYMPTOMS

Symptoms of HiCV vary in *H. rosa-sinensis* but are typically observed as green ringspots on senescent leaves. Ringspots may be with or without necrotic centers; size of the lesions may vary from 4–12 mm in diameter (see Figures 1–3).

VECTOR

Although the vector of HiCV is unknown, false spider mites, *Brevipalpus* spp. (Figure 4) and specifically *B. yothersi* Baker, are considered potential vectors because of their demonstrated role of transmission of CiLV in citrus (Leon et al. 2017).

MANAGEMENT AND CONTROL

As with all plant viruses, there are no chemical controls to rid infected hibiscus of HiCV. Because of HiCV's unique non-systemic nature, the symptomatic leaves may be pruned to remove the virus. However, symptomatic leaves may also occur on healthy senescing plants. The only way to confirm the presence of HiCV is with molecular diagnostic tools. If less than 50 percent of the plant is symptomatic, the United States Department of Agriculture (USDA) recommends pruning only the infected material. The remaining plant material will require re-inspection after one month. If more than 50 percent of the plant is symptomatic, remove the entire plant. Treating the plant with acaricides will limit vector movement as well.



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REFERENCES

- Leon, G., Roy, A., Choudhary, N., and Brlansky, R. (2017).** Citrus leprosis transmission by *Brevipalpus yothersi* mites through non citrus hosts. *Corpoica Cienc. Tecnol. Agropec.* 18, 307-319.
- Melzer, M. J., Simbajon, N., Carillo, J., Borth, W. B., Freitas-Astúa, J., Kitajima, E. W., Neupane, K.R., and Hu, J. S. (2013).** A cilevirus infects ornamental hibiscus in Hawaii. *Archives of virology*, 158(11), 2421–2424. doi:10.1007/s00705-013-1745-0.
- Roy, A. Stone, A.L., Melzer, M. J., Hartung, J.S., Mavrodieva, V.A., Nakhla, M.K., Schneider, W.L., and Brlansky, R.H. (2018a).** First Report of a Cilevirus Associated with Green Ringspot on Senescent Hibiscus Leaves in Tampa, Florida. *Disease Notes*, 102(6), 1181.
- Roy, A. Stone, A.L., Leon- Martinez, G.M., Hartung, J.S., Wei, G., Mavrodieva, V.A., Nakhla, M.K., W.L., and Brlansky, R.H. (2018b).** First Report of *Hibiscus-infecting cilevirus* in *Citrus sinensis* in Meta and Casanare, Colombia. *Disease Notes*, 102(8), 1675. <https://doi.org/10.1094/PDIS-01-18-0150-PDN>
- Roy, A., Choudhary, N., Guillermo, L. M., Shao, J., Govindarajulu, A., Achor, D., Wei, G., Picton, D.D., Levy, Nakhla, M.k., Hartung, J.S., and Brlansky, R.H. (2013a).** A novel virus of the genus *Cilevirus* causing symptoms similar to citrus leprosis. *Phytopathology* 103, 488-500.
- USDA- Census of Horticultural Specialties (CHS) (2014).** https://www.nass.usda.gov/Publications/AgCensus/2012/Online_Resources/Census_of_Horticulture_Specialties/HORTIC.pdf



Figure 1. Brown ring lesions with internal chlorotic spots in a senescing *H. rosa-sinensis* leaf.
Photo by Maria Velez-Climent, FDACS-DPI



Figure 2. Green ring lesions with no internal chlorotic spots in a senescing *H. rosa-sinensis* leaf.
Photo by Maria Velez-Climent, FDACS-DPI



Figure 3. Green ring lesions with internal chlorotic spots in a senescing *H. rosa-sinensis* leaf.
Photo by Maria Velez-Climent, FDACS-DPI



Figure 4. Adult female false spider mite, *Brevipalpus phoenicis* (Geijskes).
Photo by United States Department of Agriculture