First Report of *Hibiscus latent Fort Pierce virus* in New Mexico

Jean E. Allen, New Mexico State University, Department of Entomology, Plant Pathology, and Weed Science, Las Cruces 88003; Ivanka Kamenova and Scott Adkins, USDA-ARS, U.S. Horticultural Research Laboratory, Fort Pierce, FL 34945; and Stephen F. Hanson, New Mexico State University, Department of Entomology, Plant Pathology, and Weed Science, Las Cruces 88003

Corresponding author: Stephen F. Hanson. shanson@nmsu.edu


*Hibiscus* spp. are common landscape and potted ornamental plants throughout the southern United States. Two new tobamovirus species have recently been isolated from *Hibiscus rosa-sinensis* plants with diffuse chlorotic spots and rings and an overall chlorotic mottle (1,4). One of these viruses was first identified in Florida, and it was named *Hibiscus latent Fort Pierce virus* (HLFPV) to reflect the location and host from which it was isolated (3). The other virus was first identified in Singapore and was named *Hibiscus latent Singapore virus* (HLSV) (4). During the summer of 2003, foliar symptoms including chlorotic spots and chlorotic mottling were observed on *H. rosa-sinensis* and *H. syriacus* plants in and around Las Cruces, NM (Fig. 1).

![Fig. 1. Representative New Mexico *Hibiscus* spp. plants tested for *Hibiscus latent Fort Pierce virus* (HLFPV). (A) Virus-like symptoms including diffuse chlorotic spots and chlorotic mottle in a leaf from an *H. rosa-sinensis* plant that tested positive for HLFPV by TBIA. (B) Leaf from a *Hibiscus rosa-sinensis* plant that tested negative for HLFPV by TBIA. (C and D) *H. syriacus* plants that tested negative and positive, respectively, for HLFPV by TBIA. (E and F) Individual leaves from plants shown in C and D, respectively.](image-url)
Fifty *Hibiscus* spp. plants including indoor potted plants, landscape plants, and local nursery stock were sampled from eight different locations, including three local nurseries. Twenty-eight of the 50 samples had virus-like symptoms, whereas the remaining samples were from randomly selected asymptomatic plants. Twenty-three of the 28 symptomatic plants had mild symptoms, including chlorotic spots (Fig. 1A), which were consistent with previous reports of HLFPV, whereas five of the plants had more severe symptoms such as leaf distortion, stunted growth, and a lack of flowering (Fig. 1C-F). Initial testing for HLFPV was by tissue blot immunoassay (TBIA) using IgG prepared to HLFPV virions as previously described (2). No cross reaction of this IgG with HLSV-infected hibiscus has previously been observed in double antibody sandwich enzyme-linked immunosorbent assays. TBIA identified 16 HLFPV-infected samples (Fig. 2), all of which came from plants with virus-like symptoms. HLFPV was not detected by TBIA in any of the 22 asymptomatic plants. Electron microscopic analysis of leaf dips from symptomatic leaves revealed rigid, rod-shaped particles with dimensions of ~15 nm in width and ~250 to 300 nm in length (Fig. 3), consistent with tobamovirus virions and supporting the HLFPV diagnosis by TBIA. Similar particles were not observed in leaf dips from asymptomatic leaves.

The presence of HLFPV was confirmed by amplification of the capsid protein gene by immunocapture reverse-transcription polymerase chain reaction (IC-RT-PCR) using previously described methods and primers specific for HLFPV (2). The expected size product (535 bp) was amplified from a TBIA-positive, symptomatic *H. syriacus* sample (Fig. 4, lane 5). Sequence analysis of the IC-RT-PCR DNA fragment revealed 100% nucleotide identity with the corresponding portion of the HLFPV capsid protein gene. This finding supports the identification of HLFPV in New Mexico, and distinguishes it from HLSV, which only shares 68% nucleotide identity with the HLFPV capsid protein gene (1). No DNA fragments were amplified by IC-RT-PCR from uninfected *Nicotiana tabacum*, TBIA negative *H. rosa-sinensis* and *H. syriacus* leaves (Fig. 4, lanes 1-4), or HLSV-infected *H. rosa-sinensis* leaves (data not shown).
Symptoms alone are not reliable diagnostic indicators for HLFPV or HLSV infection of hibiscus because as a vegetatively propagated crop, hibiscus can accumulate multiple viruses over time. Based on surveys in Florida (1), it is possible (and perhaps even probable) that some of the plants sampled in the current work are co-infected with one or more additional viruses which complicate symptomatology. For this reason, we used multiple methods (TBIA, electron microscopy, IC-RT-PCR, and sequence analysis) to conclude that HLFPV, previously identified in Florida (1) and Thailand (Adkins and Chiemsombat, unpublished), is also present in multiple locations and environments in Las Cruces, New Mexico. Detection of HLFPV in numerous *H. rosa-sinensis* and *H. syriacus* samples in New Mexico suggests that it may be widely distributed in this state, as is the case in Florida (1) and Thailand (Adkins and Chiemsombat, unpublished). This represents the first report of HLFPV in the western United States. Movement of ornamental plants could increase the geographic distribution of HLFPV.

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**Literature Cited**