

Hosta virus X

Sherrie Smith
Plant Health Clinic
Diagnostician

Rose Gergerich
Professor - Plant
Virologist

Jim Robbins
Professor - Horticulture -
Ornamentals

Rick Cartwright
Professor - Plant
Pathologist

Introduction

Hostas are popular shade plants in the American landscape. Gardeners love these plants for their wide range of sizes, textures and colors. Hostas are usually easy to grow and historically have had few serious pests besides snails and slugs.

In 1996 a new and potentially serious virus was described on hosta (Currier and Lockhart). The virus belongs to the potexvirus group [named for the Potato X (potex) viruses] and was named *Hosta virus X* (HVX).

Potexviruses are spread by any means that moves plant sap from infected plants to healthy plants. This sap transfer can happen by a variety of physical or mechanical methods including plant division, removing bloom scapes or leaves with contaminated hands or tools or simply walking on plants. Home gardeners and some nurseries propagate hostas by simple division. This physical means of propagation and the failure to recognize *Hosta virus X* symptoms on many hosta varieties have led to the rapid spread of the virus throughout the country. Virus symptoms such as unusual mottling and spotting were thought by many to be the result of a color mutation, and these odd plants were propagated and sold as new and highly prized varieties such as 'Leopard Frog', 'Blue Freckles', 'Lunacy', 'Eternal Father', 'Kiwi Watercolours' and 'Breakdance'.



Figure 1. Gold-leaved hosta with *Hosta virus X* symptoms.

All of these varieties were derived from virus-infected stock and therefore should be removed from existing plantings or not planted.

Many gold-leaved varieties such as 'Sum and Substance', 'Golden Tiara' and 'Gold Standard' are highly susceptible to *Hosta virus X* (Figure 1). Susceptibility to the virus should be considered before planting these varieties.

Researchers initially believed that some varieties were immune; however, recent evidence strongly suggests that hosta varieties originally reported as immune are at least somewhat susceptible. To dramatically reduce the incidence of this virus, gardeners and the nursery industry need to carefully monitor their plants and destroy those plants with visible symptoms. See Table 1 for information on known or suspected reactions to *Hosta virus X* among hosta varieties currently being sold. The table serves as a current guideline, and information may change with new discoveries.

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<http://www.hostalibrary.org/fistlock/HVX.htm>

Figure 2. Blue and green mottling on leaf surface due to *Hosta virus X* infection.



<http://www.hostalibrary.org/fistlock/HVXpics1.htm>

Figure 3. Unusual mottling, twisting and puckering are highly visible on variegated varieties.



http://www.ipm.msu.edu/CAT05_land/L05-13-05h.osia.htm

Figure 4. Twisting, puckering and other foliar symptoms of *Hosta virus X*.

Symptoms

Symptoms vary widely depending on the variety and are of limited value in diagnosing *Hosta virus X*. The most common symptom is bleeding of color along veins and blue or green mottling on the leaf surface (Figure 2).

This is particularly striking on variegated varieties where the unusual spotting shows up well on light-colored portions of the leaves. The virus may also cause the leaves to pucker, twist or develop mosaic ring spots (Figures 3 and 4). Necrotic (dead) spots are not uncommon, and very susceptible plants may lose entire leaves (Figure 5).

Other plants may carry the virus but display no symptoms at all. Some infected plants will not develop symptoms for three to four years after becoming infected. These plants are still capable of transmitting the virus to healthy plants. *Hosta virus X* is not usually fatal to the plant, unless the variety is highly susceptible. The presence of the virus can be confirmed using a sensitive antibody test (ELISA).



Figure 5. Necrotic (dead) leaf tissue on a highly susceptible *Hosta* variety infected by *Hosta virus X*.

Photo courtesy of Dr. Ben Lockhart, University of Minnesota.

Spread of the Virus

Researchers do not currently believe that *Hosta virus X* is spread by insects, nematodes or infected seed. Moving sap from an infected plant to an uninfected plant is the only known method of spreading the virus in nature. Major activities that have been identified as spreading the virus in plants to be sold include mechanical weeding in hosta production fields and power washing of bare-rooted hostas before shipping. These activities probably result in passing the virus to large numbers of plants.

Control

There is no practical cure for this virus. Infected plants may or may not consistently display symptoms, but they will still serve as a source for the virus. The only way to minimize the current situation is to destroy known infected plants and start over with healthy plants (not infected).

Helpful tips include:

- Do not share, purchase or sell any hosta plants showing abnormal leaf spotting or mottling.
- If symptoms are noticed in a particular variety, then do not purchase (or sell) other plants in the same lot.
- Plants that display symptoms after planting should be dug up and destroyed. The virus is not known to be soil borne, so the site would be safe for replanting as long as all plant parts including all roots have been removed.
- Diseased plants should not be composted but should be removed from the property.
- Since symptoms may take years to show up, care should be taken when trimming, deadheading and

dividing hostas. Tools should be dipped in 10 percent bleach solution and hands washed thoroughly between working on each plant.

- Growers should submit plants with suspicious symptoms to the Plant Health Clinic for testing with ELISA (an antibody tests). While ELISA tests for *Hosta virus X* are not 100 percent accurate, they represent the most practical testing procedure currently available and will detect the virus in most infected plants. ELISA testing for this virus is conducted in the laboratory and requires special training and equipment.

Hosta virus X is not the only virus that infects hostas. There are at least six other less common viruses that attack hostas. Therefore, a plant with symptoms that tests negative for *Hosta virus X* could still be infected with HVX or one of the following

viruses: *Tomato ringspot virus*, *Impatiens necrotic spot virus*, *Tobacco rattle virus* or several unidentified viruses. Regardless, hostas with virus symptoms, even if not confirmed to be *Hosta virus X*, should be destroyed.

References

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Table 1. Known or Suspected Varieties Susceptible to *Hosta virus X*

Varieties determined to be highly susceptible to <i>Hosta virus X</i>	Varieties considered somewhat susceptible to <i>Hosta virus X</i>	Varieties infected by viruses (probably <i>Hosta virus X</i>) and sold because of their unusual symptoms
Birchwood Parky's Gold	Abby	Blue Freckles (probable HVX)
Blue Cadet	Diamond Tiara	Breakdance (confirmed HVX)
Corona	El Nino	Dotted Fantasy (probable HVX)
Gold Edger	Ground Master	Eternal Father (confirmed HVX)
Gold Standard	Guacamole	Kiwi Dreadlocks (probable HVX)
Golden Tiara	Janet	Kiwi Watercolours (probable HVX)
Goldrush	June	Leopard Frog (confirmed HVX)
Honeybells	Katherine Lewis	Lunacy (confirmed virus)
Royal Standard	Krossa Regal*	Pamela Ann (probable HVX)
So Sweet	Minuteman	Parkish Gold (probable HVX)
Stiletto	'Night Before Christmas'	Strip Show (probable HVX)
Striptease	Pacific Blue Edger	Tye Dye (probable HVX)
Sweet Susan	Patriot	
Sum and Substance	Paradise Joyce	
Undulata Albomarginata	Regal Splendor*	
Ventricosa	Revolution	
Venucosa	Sagae	
	Sun Power	
	Sugar and Cream	
	Tardiva	
	Yellow Splash Rim	

*Possibly another virus in addition to *Hosta virus X* infects these varieties.

Table 1. Reaction of hosta varieties to *Hosta virus X* and possibly other viruses causing similar symptoms, as reported in the literature. Reactions should be used as a general guide only, and careful care and observation made of all varieties over time, since information may change with additional research or as viruses adapt to overcome resistance. Myer, B. 2006. *Hosta virus X – Spring 2006 Update.* <http://www.hostalibrary.org/firstlook/HVXUpdate1.htm>

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SHERRIE SMITH is plant health clinic diagnostician, University of Arkansas Division of Agriculture, Cooperative Extension Service, Lonoke. **DR. ROSE GERGERICH** is professor - plant virologist, University of Arkansas, Fayetteville. **DR. JIM ROBBINS** is professor - horticulture - ornamentals, University of Arkansas Division of Agriculture, Cooperative Extension Service, Little Rock. **DR. RICK CARTWRIGHT** is professor - plant pathologist, University of Arkansas Division of Agriculture, Cooperative Extension Service, Fayetteville.

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