The Asian Citrus Psyllid and the Citrus Disease Huanglongbing

Psyllid

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Huanglongbing
Where did Asian citrus psyllid and the HLB disease come from?

Most likely ACP and HLB came from India or Asia. Both the psyllid and disease are affecting citrus production in Brazil, Cuba, Mexico, Belize and Florida. S. California and Arizona have the psyllid but do not yet have the disease.

Distribution of the pest and disease around the world

Both the psyllid and HLB disease
Asian citrus psyllid, but not the disease
The psyllid (pronounced síl - lid) is a small insect, about the size of an aphid.
It has an egg stage, 5 wingless intermediate stages called nymphs, and winged adults. The pest insect (insects molt to grow bigger).
Adult psyllids can feed on either young or mature leaves. This allows adults to survive year-round.

When feeding, the adult leans forward on its elbows and tips its rear end up in a very characteristic 45° angle.
The eggs are yellow-orange, tucked into the tips of tiny new leaves. They are difficult to see because they are so small.
The nymphs produce waxy tubules that direct the honeydew away from their bodies. These tubules are unique and easy to recognize.

Nymphs can only survive by living on young, tender leaves and stems.

Thus, nymphs are found only when the plant is producing new leaves.
As the psyllid feeds, it injects a salivary toxin that causes the tips of new leaves to easily break off. If the leaf survives, then it twists as it grows.

Twisted leaves can be a sign that the psyllid has been there.
What plants can the psyllid attack?
All types of citrus and closely related plants
in the Rutaceae family

- *Citrus* (limes, lemons, oranges, grapefruit, mandarins...)
- *Fortunella* (kumquats)
- *Citropsis* (cherry orange)
- *Murraya paniculata* (orange jasmine)
- *Bergera koenigii* (Indian curry leaf)
- *Severinia buxifolia* (Chinese box orange)
- *Triphasia trifolia* (limeberry)
- *Clausena indica* (wampei)
- *Microcitrus papuana* (desert-lime)
- Others.....

Plants affected

[Image of Calamondin plant]
How did the psyllid spread through Florida?

The psyllid was first detected in backyard citrus trees in south Florida in 1998. The psyllid moved very rapidly both by flying (pink areas) as well as riding on nursery plants moved between retail nurseries throughout the state.

In retail nurseries, orange jasmine (Murraya paniculata) was a common host.
Why are we so worried about this psyllid?
The Asian citrus psyllid can pick up the bacterium that causes Huanglongbing (HLB) disease and move the disease from citrus tree to citrus tree as it feeds.

Huanglongbing means “yellow shoot disease” in Chinese.

It causes branches of citrus trees to turn yellow.
What is HLB?
HLB is thought to be caused by a bacterium that affects the plant’s ability to move nutrients

Bacterium: *Candidatus Liberibacter asiaticus*

*Some researchers think that a phytoplasma may also be required to produce symptoms*
An early sign of the disease is yellowing of the leaves.

Leaves with HLB disease have a blotchy yellow pattern that is not the same on both sides of the leaf.

Leaves with nutrient deficiencies (Zinc is an example) have the same yellow pattern on both sides of the leaf.
HLB leaf symptoms can range from slight to nearly completely yellow.
HLB disease prevents the fruit from developing the proper color.

The lower half of the fruit may remain green, which is why this disease is also sometimes called citrus greening.
Even more devastating, HLB causes the fruit to be small, oddly shaped, with aborted seeds and bitter juice.

The fruit grows crookedly, forming uneven segments.
Symptoms may not show up in the tree until 1 to 2 years after it becomes infected.

The bacterial disease

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CaliforniaCitrusThreat.org
Within 3 to 5 years after HLB infection, the tree stops bearing fruit and eventually dies. There is no cure for the disease!

This citrus tree in a backyard in Florida is obviously very sick, with few leaves and no fruit.
How does the insect pick up the bacteria?

When the insect feeds it takes up the bacteria and passes it on when it feeds on the next citrus tree or ‘citrus-like’ plant.

The psyllid carries the bacteria in its body for the rest of its life (weeks to months).
Asian citrus psyllid arrived in California from Mexico in 2008 and was found in backyard citrus in San Diego and Imperial Counties.

The red dots indicate locations where the psyllid has been found in California and the green dots in Mexico.
Pest Alert

Get the Facts on Citrus Greening (Huanglongbing)

Citrus greening disease, or huanglongbing, is one of the world’s most serious citrus diseases. There is no known cure for citrus greening. While not a threat to human health, citrus greening greatly reduces citrus production. Once infected with the disease, citrus trees usually decline within 5 to 12 years (fig. 1), whereas healthy commercial citrus trees are typically productive for more than 50 years. Trees infected with citrus greening produce bitter, misshapen, unmarketable green fruit (fig. 2).

Because there is no cure for this disease, the U.S. Department of Agriculture (USDA) prohibits citrus plants and plant material from moving outside of areas where citrus greening is present and restricts the movement of the same material from areas where the Asian citrus psyllid, a primary vector of the disease, is present.

Citrus greening is believed to have originated in China in the early 1900s. It has greatly reduced citrus production in all countries where it has become established. First detected in the United States in August 2005 in Miami-Dade County, FL, citrus greening is now established throughout most citrus-producing counties in Florida, and the entire state is under Federal quarantine for citrus greening and Asian citrus psyllid. Federal law prohibits the movement of live citrus plants, plant parts, budwood, or cuttings outside of Florida. Subsequent U.S. detections of the disease have occurred in numerous citrus-producing States and U.S. Territories. The most recent information on disease-affected areas in the United States can be found online at www.aphis.usda.gov/citrusgreening.

How It Spreads

Citrus greening is spread primarily by graft-sized insects called Asian citrus psyllids (Diaphorina citri Kuwayama). These invasive pests transmit the disease to citrus trees and other host plants when they feed on the leaves and stems. Adult psyllids resemble aphids in appearance, measuring about one-eighth of an inch. Their bodies are grayish-tan with brown markings and mottled brown wings. The last two segments of their antennae are black. They feed with the posterior of their bodies raised at a 45-degree angle (fig. 3). When disturbed, they typically jump or fly a short distance. They are most likely to be found on new shoots, or young growth, of citrus plants.

In nymph form, Asian citrus psyllids’ oval-shaped bodies are yellowish-brown. Difficult to see, nymphs cannot fly, and they move slowly. Most visible are the waxy, white excretions they produce (fig. 4).

Asian citrus psyllid eggs are yellow-orange in color and shaped like almonds. They are often tucked inside crevices and leaf folds.

Not all Asian citrus psyllids carry the disease-causing bacteria. But even non-infected psyllids can damage citrus plants and trees by stunting the growth of new shoots. On healthy plants and trees, these psyllid infestations result in burned shoot tips and twisted leaves on
HLB has not been found in California or Arizona

How can it get there?

Inside psyllid vector: HLB could be inside the body of a psyllid that flies into California or is transported by humans on fruit, leaves or stems of citrus relatives.

Illegally imported citrus trees: HLB could be infecting a citrus tree (or close relative) that is already planted in a yard or orchard in California – or it may arrive in the future this way.

It is illegal to bring citrus trees into California from other states or countries because they may be infested with ACP or infected with HLB.

Plants, such as this *Murraya* (orange jasmine), can be a source of the psyllid and the disease.
You can help search for the psyllid! It is critical for California and Arizona to keep this insect from establishing.

Look for immature stages of psyllids (eggs and nymphs) on the tips of branches in the new flush.
This web site, funded by the Citrus Research Board, provides users with basic information about the psyllid and disease.