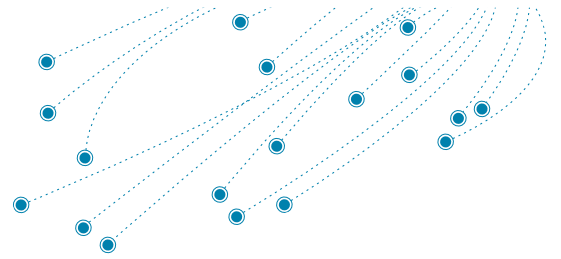


GLASSY-WINGED SHARPSHOOTER



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Invasive insects are a huge biosecurity challenge. We profile some of the most harmful insect invaders overseas to show why we must keep them out of Australia.

Species

Glassy-winged sharpshooter / *Homalodisca vitripennis*. Also known as *Homalodisca coagulata*.

Main impacts

A vector for the serious plant pathogen *Xylella fastidiosa*, which infects native plants and kills some tree crops. In high densities the sharpshooter can weaken plants. It appears to be toxic to spiders.

Native range

South-eastern USA and northern Mexico.¹

Invasive range

South-western USA, Mexico, Chile, Cook Islands, French Polynesia, Easter Island.²

Main pathways of global spread

As a contaminant of imported nursery material and plants.³

ENVIRONMENTAL IMPACTS OVERSEAS

The glassy-winged sharpshooter, a large leafhopper, has been studied mainly as a crop pest. Although documentation of environmental harm is limited, there is cause for concern. In Tahiti it reaches very high densities on urban and natural vegetation⁴. It sucks xylem sap, consuming more than a hundred times its weight in fluid each day, which can weaken plants by inducing water stress (a problem documented in orange orchards in California)⁴. The sharpshooter is thought to have 'substantial' impacts on Polynesian plants, including native forest plants, through partial defoliation of trees and wilting of small plants^{2,4}. In California it has invaded riparian woodlands in coastal and foothill areas¹, but little has been documented about its impacts apart from listing the species affected⁵.

In farmland the sharpshooter's greatest impact is as a vector for the bacterium *Xylella fastidiosa*, which infects and



WHAT TO LOOK OUT FOR

Glassy-winged sharpshooters are about 12 mm long, dark brown to black with speckles on the back and top of the head and black-and-yellow undersides. Their eyes are yellow and their wings are transparent with reddish veins. They have piercing, sucking mouthparts and rows of fine spines on their hind legs.

Photo: Alex Wild

damages a wide range of plants². The impacts of this disease on native plants have not been studied.

In Tahiti, glassy sharpshooters appear to be toxic to spiders, and perhaps to other predators. The local crab spider, *Misumenops melleoitaio*, vanished from forested sites after sharpshooters invaded⁶. Feeding trials found that 43% of the crab spiders and 65% of dome tent spiders (*Cyrtophora moluccensis*) died when they were fed sharpshooters⁶. The researchers suggest that the sharpshooter obtains protection from a toxic symbiotic bacterium. The dome tent spider is native to Australia as well as to Pacific islands.

HUMAN AND ECONOMIC IMPACTS OVERSEAS

The sharpshooter is considered a major global threat to crops and ornamental plants because it efficiently spreads *Xylella fastidiosa*, a serious pathogen of many crop plants, including grape, citrus, peach, plum, olive, alfalfa, almond, avocado, coffee, pear, pecan, mulberry, oleander, sycamore, elm, maple, oak, sweet gum and cherry plum^{2,7}. *Xylella* has become an increasing global concern since 2011 due to dramatic die-offs of olive trees on Italian farms⁷. The disease has been present for much longer in the Americas, where it damages grapes and almonds in California (destroying

more than 35,000 acres of vineyards) and citrus crops in Latin America⁷. It also infects dozens of native American plants⁸. Recently, the disease has become more serious in south-western USA, mainly due to the establishment of the glassy-winged sharpshooter, a more effective disease vector than other sap-sucking bugs.

In Tahiti the sharpshooter is an urban annoyance. At night, large numbers are attracted to lights, and collide with people, jabbing their skin and probing sweat glands. 'Sharpshooter rain' (due to fluid excretion from large numbers feeding in trees) is a major nuisance, leading to partial defoliation of street trees and puddles on roads and footpaths².

AUSTRALIAN CONCERNS

In California the glassy sharpshooter has been reported feeding on many Australian plants in cultivation, including kangaroo paws (*Anigozanthus*), walking stick palms (*Archontophoenix*), bottle trees (*Brachychiton*), flax lilies (*Dianella*), emu bushes (*Eremophila*), guinea vines (*Hibbertia*), native frangipani (*Hymenoporum flavum*), grevilleas (*Grevillea*) tea-trees (*Leptospermum*), brush box (*Lophostemon*), macadamias (*Macadamia*), paperbarks (*Melaleuca*), Australian bluebell creeper (*Sollya*), firewheel tree (*Stenocarpus*), water gum (*Tristanopsis*) and Wollemi pine (*Wollemia*)⁵. In a study of 11 Australian plants grown in California, seven proved suitable for both feeding and egg-laying: Halls Creek wattle (*Acacia cowleana*), spreading emu bush (*Eremophila divaricata*), wandoo (*Eucalyptus wandoo*), pin-cushion hakea (*Hakea laurina*), coast tea-tree (*Leptospermum laevigatum*), robin redbreast bush (*Melaleuca laterita*) and Darling pea (*Swainsona galegifolia*)⁹. The California Department of Food and Agriculture website lists over 300 plant genera as sharpshooter hosts, including many genera that occur naturally in Australia¹⁰. The diversity of species attacked suggests that thousands of Australian plant species are susceptible, including many rare species. Invertebrates that prey on sharpshooters could also be harmed.

If the sharpshooter reaches Australia, it is not expected to reach the extreme densities seen in French Polynesia, which reflect island ecosystems with few predators, parasites and competitors. The sharpshooter will be most serious as a threat to biodiversity if *Xylella fastidiosa* is also introduced.



Glassy-winged sharp shooter. Photo: Samuel | Flickr | CC BY-NC 2.0

In a contingency plan produced by Plant Health Australia, the sharpshooter is rated as having a medium risk of entering and establishing in Australia and a high risk of spreading and causing economic impacts². If the sharpshooter and *Xylella* both enter Australia, the environmental and economic impacts are expected to be severe. In California, the cost of both pests is estimated at more than US\$100 million a year, and similar costs are expected in Australia². Much of coastal Australia, particularly the tropics and subtropics, has a climate suitable for both sharpshooters and *Xylella*².

The presence of glassy-winged sharpshooters in French Polynesia is a serious concern for Australia, for they are attracted at night to airport hangar lights, and are known to enter planes². Dead sharpshooters have been found in cargo bins. Nursery stock represents another source of risk, for the eggs, which are injected into leaves, are difficult to detect, and grape imports are another source of risk².

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ABOUT THIS PROJECT

The Invasive Insects: Risks and Pathways Project is a partnership between Monash University and the Invasive Species Council. To find out more visit invasives.org.au/risks-and-pathways.