

## ABSTRACT

### **Biology, History and World Status of *Diaphorina citri***

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The Asian citrus psyllid, *Diaphorina citri* Kuwayama, is an important pest of citrus because it transmits phloem-limited bacteria (*Candidatus Liberibacter* spp.) responsible for citrus greening disease (huanglongbing), considered the world's most serious disease of citrus. The psyllid has slowly spread throughout southern Asia, the Saudi Arabian Peninsula, to some islands in the Indian Ocean, and to Réunion Island and Mauritius. Huanglongbing has also spread throughout most of these regions. *D. citri* was first reported in the Americas in Brazil during the 1940s, but huanglongbing was not observed in Brazil until 2004. Since the 1990s, the psyllid has invaded many countries in Central and North America. In these newly-invaded Central and North American countries, huanglongbing has been detected in southeastern and south-central areas of the United States, eastern and western Mexico, Belize, Puerto Rico and Cuba. Following the 2005 discovery of huanglongbing in the United States (Florida), surveys revealed the disease was already fairly widespread across the state. The disease was then found in the USA states of Louisiana during 2007 and Georgia and South Carolina during 2009. Introductions of huanglongbing into central/northern Mexico and in the United States from Texas to California are imminent. Some citrus growers in Brazil and Florida have adopted a three-component management program against huanglongbing: intensive chemical control of the psyllid, aggressive removal of trees symptomatic for the disease, and the planting of disease-free nursery stock. The State of Florida imposed new, strict nursery compliant agreements to help ensure disease-free nursery stock, which has reduced the number of qualified sources for young trees and inflated prices. In spite of the three-component management program in Florida, hundreds of thousands of trees that were probably infected before the program was implemented have now been removed. Some Florida citrus growers have abandoned removing infected trees and implemented increased tree nutritional programs because these growers believe the nutritional programs sustain the productivity of infected trees. Much debate continues about the true value of these nutritional programs, and they certainly result in increased area-wide levels of inoculum. Due to the high cost of insecticidal control of the psyllid and potential disruption by insecticides of biological control of other citrus pests, many citrus growers in Mexico and Central America are interested in the alternative of managing the psyllid using augmentative biological control with a parasitoid *Tamarixia radiata*, lady beetles, and/or entomopathogens. In the meantime, researchers in entomology, plant pathology, horticulture and plant breeding continue urgently searching for breakthroughs in management tactics for huanglongbing. Entomologists continue detailing information on the biology, behavior, ecology, genomics and biological control of *D. citri* in hopes of finding weak points in psyllid populations that could be exploited to help curb disease transmission and to reduce the need for chemical control. The following aspects of *Diaphorina citri* will be reviewed: geographical distribution, taxonomy, morphology, life cycle and biology, flight activity, host plants and host plant resistance,

biological control (predators, parasitoids, and entomopathogens), detection and monitoring, vector-pathogen interactions, and vector control strategies.