

Cardin's Whitefly, *Metaleurodicus cardini* (Back) (Insecta: Hemiptera: Aleyrodidae: Aleyrodicinae)¹

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Introduction

Cardin's whitefly, *Metaleurodicus cardini* (Back), has been known in Florida since 1917. It was originally described from Cuba and was named for Professor Patricio Cardin. This whitefly is usually innocuous, but under some situations can become a damaging pest (fig.1). These situations usually occur when something has disrupted the parasite/predator complex.



Figure 1. An infestation of Cardin's whitefly, *Metaleurodicus cardini* (Back). Photograph by: Lyle J. Buss, University of Florida

Synonymy

Metaleurodicus cardini (Back) [Bondar, 1923: 81].

Aleyrodicus cardini Back, 1912: 148-151.

Aleyrodicus (*Metaleurodicus*) *cardini* Back [Quaintance. & Baker, 1913].

From USDA 2006.

Distribution

While it is known from Gainesville (north central Florida) to South Florida, it is much more common in the subtropical areas. Within the U.S., it is also found in Hawaii, near Hilo on the island Hawaii (HDA 2006).

This species is also known from Bermuda, Cuba, Dominican Republic, Haiti, Jamaica, Puerto Rico, and the Virgin Islands (USDA 2006).

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Description

Adults

The adults are greenish yellow with a fine dusting of white wax. Their wings are somewhat dusky with a conspicuous dark spot near the center of each wing (fig.2). As females deposit eggs, a fine trail of fluffy white wax is rubbed from a tuft of wax on the underside of the female abdomen (fig.3).



Figure 2. Adult Cardin's whiteflies, *Metaleurodicus cardini* (Back). Photograph by: Lyle J. Buss, University of Florida



Figure 3. Fluffy wax trails, especially along leaf veins, deposited by adult females of the Cardin's whitefly, *Metaleurodicus cardini* (Back). Photograph by: Lyle J. Buss, University of Florida

This species is similar to *M. arcanus* sp. nov.. *Metaleurodicus cardini* can be separated from *M. arcanus* since *M. cardini* possesses four abdominal compound pore pairs compared to five in *M. arcanus*, and *M. cardini* has a submarginal row of eight shaped pores that *M. arcanus* sp. nov. lacks (USDA 2006).

Eggs



Figure 4. Eggs of the Cardin's whitefly, *Metaleurodicus cardini* (Back). Photograph by: Lyle J. Buss, University of Florida

Nymphs



Figure 5. Nymphs of the Cardin's whitefly, *Metaleurodicus cardini* (Back). Photograph by: Lyle J. Buss, University of Florida

Pupae

The pupal cases are just short of 1 mm long and 0.6 mm wide. They are elongate-oval in shape and elevated on a vertical marginal waxen fringe (fig.6). Pupal cases are yellowish-white in color and become semi-transparent when empty. Parasitized pupal cases(fig.7) are blackish throughout or in spots (Back 1912).



Figure 6. Two pupae of the Cardin's whitefly, *Metaleurodicus cardini* (Back). The photograph also shows two adults (with wings — in the lower center and left) and two nymphs (more of an orange color), one in the upper right and a second, smaller one, directly below it. The two pupae (one between the adults and the topmost nymph, and the other to the right) are yellowish-white and have red eye-spots. Photograph by: Lyle J. Buss, University of Florida

The dorsum of the pupal case has five pairs of large compound pores with a reduced number of locules. Smaller pores with a star-shaped internal matrix are scattered over the dorsal surface. A row of bilocular wax pores are present around the dorsal submargin. The vasiform orifice is subcordate in outline, with the cephalic margin straight, and the operculum is somewhat rectangular in shape. The lingula is spatulate, slightly exserted and armed with four long setae (Quaintance and Baker 1913).

Diagnosis

The adult is distinguished readily from all other whiteflies known in Florida by the distinct dark spot on each wing. The pupal case will require a microscope slide preparation. The pupa is separated from other Florida species by the four pairs of abdominal cup-shaped compound pores with

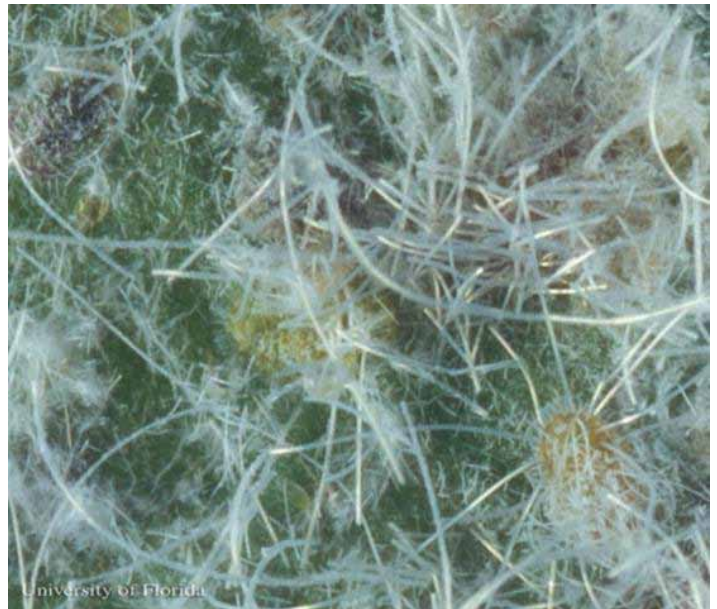


Figure 7. The pupal case of the Cardin's whitefly, *Metaleurodicus cardini* (Back), in the upper left is probably parasitized due to its blackened color. Compare it to an unparasitized nymph in the lower right of the photograph. Photograph by: Lyle J. Buss, University of Florida

reduced loculi, and the 5th pair on the cephalic segment. The only other species of this genus known in Florida, *Metaleurodicus griseus* (Dozier) (new combination), has six abdominal pairs of compound pores, and occurs only on *Eugenia* spp. in Florida.

A key that covers 16 species of whiteflies that may infest Florida citrus is available on the World Wide Web. The WWW key, developed by the Florida Department of Agriculture and Consumer Services - Division of Plant Industry (FDACS-DPI), uses color photographs of nymphs to assist in identification. It is available at: <http://www.doacs.state.fl.us/pi/enpp/ento/aleyrodi.html>.

Hosts

The most common host in Florida is *Psidium guajava*. Other hosts from FDACS-DPI files are: *Citharexylum fruticosum*, *Dipholis salicifolia*, *Duranta repens*, *Duranta* sp., *Eugenia* sp., *Malpighia glabra*, *Melaleuca quinquenervia*, *Paurotis wrightii*, *Pimenta dioica*, *Pimenta officinalis* (USDA 2006), and *Plumeria* sp. Additional hosts from the literature are: *Citrus sinensis*, *Citrus* sp., and *Citharexylum spinosum* (Mound and Halsey 1978).

Survey and Detection

Inspect the undersides of leaves for white fluffy wax trails, pupal cases, and adult whiteflies with a dark spot on each wing. This is the only whitefly in Florida easily identified from the adult.

Management

Chemical control. Whiteflies also are controlled by sprays applied primarily for control of scale insects. Spraying of commercial citrus exclusively for whitefly control is seldom practiced in Florida. Recommended control measures for commercial or dooryard citrus are significantly different. Please consult the specific management guide for your situation.

[Florida Citrus Management Guide for whiteflies](#)

It is important to note that spraying with copper for control of harmful fungal diseases will also inhibit growth of “friendly fungi” resulting in an increase in whitefly populations. Also, more than one application of sulfur per year can have an adverse effect on parasites. Spray oil has some insecticidal properties, but is primarily used to remove sooty mold which grows on the fruit and leaves.

Biological control. Natural enemies include: *Delphastus diversipes* (Champion) (Coleoptera, Coccinellidae), *Ocyrtamus parvicornis* (Loew) & *Pseudodoros clavatus* (Fabricius) (Diptera, Syrphidae), *Encarsia* sp. (Hymenoptera, Aphelinidae), *Caraeochrysa cincta* (Schneider) & *Chrysopodes collaris* (Schneider) (Neuroptera, Chrysopidae) (USDA 2006).

Selected References

Back, E.A. 1912. Notes on Cuban whiteflies with descriptions of two new species. *Canadian Entomologist* 44: 145-153.

Bondar, G. 1923. *Aleyrodidos do Brasil*. Bahia: 81.

Evans, G.A. and A.B. Hamon. (5 November 2002). Whitefly taxonomic and ecological Web site: an on-line interactive catalog of the whiteflies (Hemiptera: Aleyrodidae) of the world and their parasites and predators. http://www.fsca-dpi.org/homoptera_hemiptera/Whitefly/whitefly_catalog.htm (13 November 2002).

Hamon, A.B. (1997). Whitefly of citrus in Florida. FDACS. <http://www.doacs.state.fl.us/pi/enpp/ento/aleyrodi.html> (8 September 2000).

Hawai`i Department of Agriculture (HDA). (2006). Cardin's Whitefly. *State of Hawai`i Department of Agriculture*. http://hawaii.gov/hdoa/meetings_reports/legislative-reports/2007LegReports/ARO6%20Program%20Section.pdf (28 April 2008).

Mound, L.A., and Halsey, S.H. 1978. Whitefly of the world. British Museum (Natur. Hist.) and John Wiley and Sons, Chichester. p. 244.

Quaintance, A.L., and Baker, A.C. 1913. Classification of the Aleyrodidae Part I. Technical Series Bureau of Entomology U.S. 27: 75-77.

USDA. (2006). *Metaleurodicus cardini* (Back). *Whitefly Fauna of the World*. <http://keys.lucidcentral.org/keys/v3/whitefly/Homepage.htm> (21 April 2011).