

Avocado Lace Bug, *Pseudacysta perseae* (Heidemann) (Insecta: Hemiptera: Tingidae)¹

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Introduction

The avocado lace bug, *Pseudacysta perseae* (Heidemann) (Figure 1), was originally described in 1908 as *Acysta perseae* from Florida specimens. Blatchley (1926) stated that *Acysta perseae* differed widely from *Acysta* spp. of Champion (1898). Blatchley described the genus *Pseudacysta* for *Acysta perseae*. For most of the years since its description, the avocado lace bug was regarded as having limited distribution, primarily to peninsular Florida, and being of only occasional minor economic importance. However, the number of complaints about its damage to avocado leaves, *Persea americana* P. Mill., has increased.



Figure 1. Adult and nymphs of the avocado lace bug, *Pseudacysta perseae* (Heidemann).

Credits: James Castner, University of Florida

Distribution

The known distribution of *Pseudacysta perseae* includes the Caribbean, Mexico, Guatemala, Venezuela, and French Guyana. In the United States, it is found in California and the southeastern states (Humeres et al. 2009b).

Description and Identification

The most complete description of adults and late instar nymphs was by Heidemann (1908). Medina-Gaud, Segarra-Carmona, and Franqui (1991) gave a shorter version of Heidemann's description. Blatchley (1926) described adults as 2 mm long and oblong-oval shaped. The body beneath, head, pronotum (except for the front edge and tips of posterior third), and a bar crossing the basal third of elytra, but reaching only slightly outside of the discoidal area, are piceous-brown or blackish; the remainder of the upper surface is yellowish white (we have seen numerous specimens with elytra more tawny in color, being orangish at basal area); legs and antennae are pale yellow, the claws and apical half of fourth antennal segment are blackish. The pronotum is sub-pentagonal, with front side margins obtuse and converging strongly toward the apex; the posterior portion is flat, triangular, and acutely pointed; the disc is finely and densely punctuated and with a single entire, low, median carina. Elytra are much surpassing the abdomen, their tips broadly rounded; and the discoidal area is long, narrow, and not closed behind.

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Heidemann (1908) illustrated both nymphs and adult forms. Medina-Gaud (1991) included color photographs of adults, nymphs, eggs (Figure 2), and leaf damage. Beshear et al. (1976) published a photograph of an adult museum specimen. Wolfenbarger (1963), in one photograph, illustrated nymphs, adults, eggs, and excrement on the underside of an avocado leaf. Moznette (1922) provided an excellent drawing of the adult.



Figure 2. Eggs of the avocado lace bug, *Pseudacysta perseae* (Heidemann).

Credits: Adrian Hunsberger, University of Florida

Pseudacysta perseae is the only described species in this genus, so identification to genus is tantamount to the specific level. Blatchley (1926) described the genus *Pseudacysta* and provided keys to the Tingidae of the eastern United States. Hurd (1946) provided a key to the lace bug genera of North America. Brailovsky and Torre (1985) re-described *Pseudacysta* and mentioned that it was a pest on avocado in Mexico. They commented that *Pseudacysta* is characterized by the reduction of the paranotum, confined to the humeral angles, and formed by one or two small cells, and by a discoidal area open apically. *Acysta* was cited as having the discoidal area closed in its posterior end and by having a more developed paranotum. The paranota of *Pseudacysta* are present only as small ear-like flaps on humeri.

Hosts

Known hosts include:

- avocado (=alligator pear, aguacate), *Persea americana* P. Mill.,
- camphor, *Cinnamomum camphora* (L.) J. Presl. and

- red bay, *Persea borbonia* (L.) Spreng.

Heidemann (1908) in his original description listed *Persea carolinensis* and *Persea gratissima* as hosts of specimens collected in Florida. *Persea carolinensis* is a synonym of swamp red bay, *Persea palustris* (Raf.) Sarg.

References differ as to whether *Pseudacysta palustris* is a valid species. We follow Kartesz and Kartesz (1980) in which *Pseudacysta palustris* is listed as a synonym of *Pseudacysta borbonia*. *Persea gratissima* Gaertn. F. is a synonym of *Pseudacysta americana*. In the northern part of peninsula Florida, and other parts of the Deep South, camphor is the main host. Avocado is the main host in the southern coastal region of Florida.



Figure 3. Leaf damage caused by the avocado lace bug, *Pseudacysta perseae* (Heidemann).

Credits: James Castner, University of Florida

Bionomics

The life cycle of *Pseudacysta perseae* was reported by Abud Antum (1991) to be 22 days from egg to adult stage. Moznette (1922) reported that this lace bug confines its attacks to the lower surface of the foliage, where it feeds by extracting the juices from the plant. It usually lives in colonies, depositing eggs upright in irregular rows in clusters on the lower leaf surface. The extraction of the juices from the foliage causes a gradual, localized destruction of the plant cells. The resulting chlorotic areas correspond to the location of the lace bugs below. Where a colony of these insects is present, the eggs and the lower surface of the leaf are more or less thickly covered by a dark, sticky secretion from the insects. The principal injury, however, is the destruction of the leaf cells due to the sucking habit of the insects.

Wolfenbarger (1963) reported an instance of avocado trees in one Florida grove becoming defoliated and stated that during the previous decade, avocados were rarely infested

with lace bugs. Wolfe et al. (1949) stated that it preferred the West Indian “race” of avocado, although no variety was known to be free from attack. There are 42 records of the avocado lace bug in the Florida State Collection of Arthropods (FSCA), and 29 of these have been since 1983. This bug is becoming a problem in Florida, but not nearly to the extent as it is in the Dominican Republic, for instance, where whole trees have been defoliated by it.

Wolfe et al. (1949) reported that this lace bug was found occasionally infesting the underside of leaves in winter, but more often it was found in the warmer, dry spring months. There are no May records of *Pseudacysta perseae* in the FSCA, but all other months have adult records, and most have nymphal collections. Both nymphs and adults have been reported several times during the winter months in southern Florida, but we have very few nymphal and adult records during winter in northern Florida.

Brown necrotic areas on avocado leaves (Figure 3) are frequently associated with lace bugs. Freshly affected leaves from the Homestead, Florida area were analyzed by Dr. Timothy Schubert, Plant Pathologist, FDACS, Gainesville (personal communication). He suggested that injuries from lace bug activities provided the infection court for the anthracnose fungus, *Colletotrichum gloeosporioides*, the cause of the large necrotic blotches on the leaves, that first catches attention when surveying avocado and other hosts. The anthracnose pathogen was isolated consistently from the advancing margins of the necrosis surrounding the lace bug colonies. Schubert added that dendritic necrotic patterns were due to infections by powdery mildew, *Oidium* sp.

Survey and Detection

Yellowish or brownish necrotic areas, either above or below the leaf, are indications of the presence of avocado lace bugs underneath. Black pepper-like objects, centered in the brown patches usually are eggs covered with a black, sticky substance, sometimes moldy. Also, on the underside look for black specks of excreta, cast skins, nymphs, and adults, no longer than 2 mm. For identification, place a few infested leaves and a paper towel in a plastic bag, tie securely, and ship in a mailing tube with collection data.

Management

All insecticides registered for use on avocado provide control of the lace bugs (J.E. Pena, unpublished data). Sprays should be directed to the underside of leaves and

repeated at approximate two-week intervals until control is achieved.

Abud Antun (1991) reported that the most important predator of the avocado lace bug in the Dominican Republic is the thrips, *Frankliniella vespiformis* (Crawford).

Selected References

Abud Antun AJ. 1991. Presence of the avocado lace bug, *Pseudacysta perseae* (Heidemann) (Hemiptera: Tingidae) in Dominican Republic. Primera Jornada de Proteccion Vegetal, University of Santo Domingo, Santo Domingo, Dominican Republic, (Abstract, p. 4).

Beshear RJ, Tippins HH, Howell JO. 1976. The lace bugs (Tingidae) of Georgia. University of Georgia, Agricultural Experiment Station Research Bulletin 188: 1-29.

Blatchley WS. 1926. Heteroptera or True Bugs of Eastern North America, with Especial Reference to the Faunas of Indiana and Florida. Nature Publishing Company, Indianapolis, USA. 1116 pp.

Brailovsky H, Torre L. 1986. Hemiptera-Heteroptera de Mexico XXXVI. Revision generica de la familia Tingidae LaPorte. Anales del Instituto de Biologia de la Universidad Nacional Autonoma de Mexico 56 (1985), Serie Zoologia: 869-932.

Champion GC. 1897-1901. Insecta: Rhynchota (Hemiptera-Heteroptera). Vol. II. In Goodwin and Salvin (editors). Biologia Centrali-Americana. London. 416 pp.

Gangé RJ, Peña JE, Acevedo FE. 2008. A new Lestodiplosine (Diptera: Cecidomyiidae) preying on the avocado lace bug, *Pseudacysta perseae* (Heteroptera: Tingidae) in southern Florida. Florida Entomologist 1: 43-48.

Heidemann O. 1908. Two new species of North American Tingidae. Proceedings of the Entomological Society of Washington 10: 103-108.

Henry TJ, Hilburn DJ. 1990. An annotated list of the true bugs (Heteroptera) of Bermuda. Proceedings of the Entomological Society of Washington 92: 675-684.

Hoddle M, Morse J, Stouthamer R. (2007). *Pseudacysta perseae*, biology and management of avocado lace bug in California. California Avocados. (29 November 2012)

Houguin CM, Peña JE, Henry TJ, Acevedo F. (2009). Biology of *Stethaconus praefectus* (Distant) (Heteroptera: Miridae), a newly established predator of the avocado lace bug, *Pseudacysta perseae* (Heteroptera: Tingidae), in Florida. Florida Entomologist 92. (29 November 2012)

Humeres EC, Morse JG, Stouthamer R, Roltsch W, Hoddle MS. (2009a). Evaluation of natural enemies and insecticides for control of *Pseudacysta perseae* (Hemiptera: Tingidae) on avocados in southern California. Florida Entomologist 92. (29 November 2012)

Humeres EC, Morse JG, Roltsch W, Hoddle MS. (2009b). Detection surveys and population monitoring for *Pseudacysta perseae* on avocados in Southern California. Florida Entomologist 92. (29 November 2012)

Hurd MP. 1946. Generic classification of North American Tingioidea (Hemiptera-Heteroptera). Iowa State College Journal of Science 20: 229-493.

Kartesz JT, Kartesz R. 1980. A Synonymized Checklist of Vascular Flora of the United States, Canada, and Greenland. Vol. II. The Biota of North America. University of North Carolina Press, Chapel Hill, USA. 498 pp.

Medina-Gaud S, Segarra-Carmona AE, Franqui RA. 1991. The avocado lacewing bug, *Pseudacysta perseae* (Heidemann) (Hemiptera: Tingidae). Journal of Agriculture of the University of Puerto Rico 75: 185-188.

Mizell RF, Fasulo TR, Short DE. (2002). WoodyBug: pest and beneficial arthropods of southeastern U.S. woody ornamentals. University of Florida/IFAS. CD-ROM. SW 119.

Moznette GF. 1922. The avocado, its insect enemies and how to combat them. U.S. Department of Agriculture, Farmers' Bulletin 1261. 31 pp.

Wolfe HS, Toy LR, Stahl AL. Revised by G.D. Ruehle. 1949. Avocado production in Florida. Bulletin-University of Florida, Agricultural Extension Service 141: 11-124.

Wolfenbarger DO. 1963. Insect pests of the avocado and their control. Bulletin-University of Florida, Agricultural Experiment Stations. Experimental Station Bulletin 605A. 52 pp.