

Widow Spider Parasitoids *Philolema latroducti* (Fullaway) (Insecta: Hymenoptera: Eurytomidae) and *Baeus latroducti* Dozier (Insecta: Hymenoptera: Platygasteridae) ¹

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Introduction

The genus of widow spiders, *Latrodectus*, has limited records of the pathogens, parasites, and parasitoids known to affect them.

In the United States, a known associated parasitoid is *Philolema latroducti* (Fullaway). Little is documented regarding this species, but it is confirmed to target multiple widow spider species as hosts for reproduction (Boucek 1988, Fullaway 1953).

Another parasitoid of note is a scelionid wasp, *Baeus latroducti* Dozier, which was recorded as emerging from the egg sacs of the southern black widow, *Latrodectus mactans* Fabricius (Dozier 1931).

Synonymy

Philolema latroducti was originally described as *Eurytoma latroducti* (Fullaway 1953). It was later moved into the new genus *Desantisca* with other egg sac parasitoids that were originally described in the genus *Eurytoma* (Burks 1971). Research to phylogenetically reclassify the large family Eurytomidae using morphological differences placed it into the genus *Philolema* (Lotfalizadeh et al. 2007).



Figure 1. Adult *Philolema latroducti* (Fullaway), a parasitoid of the widow spiders in *Latrodectus* Walckenaer.

Credits: Christopher S. Bibbs, University of Florida

Baeus latroducti was described twice, once as *B. latroducti* (Dozier 1931) and again as *B. californicus* (Pierce 1939, Krombein et al. 1979).

Neither *P. latroducti* nor *B. latroducti* have an official common name sanctioned by the Entomological Society of America.

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Distribution

Philolema latrodecki was originally described from several collections in Hawaii, and was found during collections of brown widow, *Latrodectus geometricus* (Koch), egg sacs from Honolulu and Oahu during 1945 and 1946 (Fullaway 1953). Cataloguing of spider parasitoids in Florida has revealed its presence in the continental United States (Brambila & Evans 2001). The species appears to occupy warmer climate zones (Boucek 1988, Herting 1971, Fullaway 1953), and the known widow hosts have a wider distribution, but any movement in the United States since discovery in Florida has not been recorded. For the U.S., distribution information is incomplete and more verifiable records are necessary to provide the range of *P. latrodecki* since introduction into the contiguous 48 states.

Philolema latrodecki has also been observed outside of the United States, emerging from *L. hasselti* Thorell egg sacs in Queensland, Australia, and the island chains near the Philippines (Boucek 1988, Herting 1971).

For *B. latrodecki*, the 1979 *Catalogue of Hymenoptera in America North of Mexico* indicates occurrence in California, Hawaii, Kansas, Louisiana, Maryland, Missouri, South Carolina, and Texas (Krombein et al. 1979).



Figure 2. United States distribution of *Philolema latrodecki* and *Baeus latrodecki*.

Credits: Map based on Brambila & Evans 2001, Fullaway 1953, and Krombein et al. 1979

Description

Immatures

Eggs and larvae of both species have no formal descriptions to date.

Adults

(FULLAWAY)

Philolema latrodecki adults appear as small, black, ant-like or wasp-like organisms. The antennae are less than half of the body length, appearing short and thick.



Figure 3. Adult *Philolema latrodecki* (Fullaway), a parasitoid of the widow spiders in *Latrodectus* Walckenaer, showing size relative to a U.S. dime.

Credits: Christopher S. Bibbs, University of Florida

Under magnification, the abdomen is seen as approximately equal to or shorter than the thorax. The abdomen appears smooth and polished with a rounded surface. The head and thorax are black, but silvery hairs dull the luster. The head and thorax are rough in texture, which is in contrast to the smooth texture of the abdomen. The body is black, but the leg segments below the femur are significantly lighter in color.

Males and females are difficult to distinguish. Females average 1.5–2.0 mm in length and have a slightly protruding ovipositor at the tip of the abdomen. Their antennae have a 3-segmented club. Males average 1.0–1.75 mm in length, with a 2-segmented antennal club. The petiole joining the abdomen to the thorax is longer in males. The terminal end of the male abdomen is telescoped, resulting in a short, somewhat tapered tip.

DOZIER

Baeus latrodecki adults average less than 1.0 mm in body length. Antennae appear to have a two jointed club because of a constriction in the middle of the club. Males have wings, but females are wingless with stronger hind legs and stouter body; the eyes of both sexes are black. Body color ranges from a honey yellow to a dark orange.



Figure 4. Adult female *Philolema latroecti* (Fullaway), a parasitoid of the widow spiders in *Latrodectus* Walckenaer.
Credits: Christopher S. Bibbs, University of Florida



Figure 6. Adult male *Baeus latroecti* Dozier, a parasitoid of the southern black widow, *Latrodectus mactans* Fabricius.
Credits: Lyle J. Buss, University of Florida



Figure 5. Comparison of adult *Philolema latroecti* (Fullaway), a parasitoid of the widow spiders in *Latrodectus* Walckenaer. The female is at top, with a male below her.
Credits: Christopher S. Bibbs, University of Florida



Figure 7. Adult female *Baeus latroecti* Dozier, a parasitoid of the southern black widow, *Latrodectus mactans* Fabricius.
Credits: Lyle J. Buss, University of Florida

Hosts and Fecundity (Fullaway)

Observational data regarding either obligate egg parasitoid are limited. Laboratory observations in Honolulu and Oahu detailed the emergence of *P. latroecti* from the egg sacs of the southern black widow, *L. mactans*, and the brown

widow, *L. geometricus* Koch (Fullaway 1953). *Philolema latroecti* has also been documented emerging from the egg sacs of *L. geometricus* in Florida (Brambila & Evans 2001). Outside of the United States, this parasitoid has been recorded emerging from the egg sacs of the redback spider, *L. hasselti* (Bouceck 1988).

Rearing by Lyle Buss from an *L. geometricus* egg sac collected in Gainesville, Florida, in 2010, yielded 16 wasps for the single egg sac. Rearing by Christopher Bibbs from seven *L. geometricus* egg sacs collected in Gainesville, Florida, in 2010, yielded 13–16 wasps per egg sac. Four *L. mactans* egg sacs collected in Balm, Florida, in 2011, yielded 15–17 wasps per egg sac.



Figure 8. *Philolema latroducti* (Fullaway), a parasitoid of the widow spiders in *Latrodectus Walckenaer*, perched on the egg sac of a brown widow spider, *Latrodectus geometricus* Koch.
Credits: Lyle J. Buss, University of Florida

Based on these records, *P. latroducti* can use multiple members of the genus *Latrodectus* as a host. Other U.S. species of interest are the red widow, *Latrodectus bishopi* (Fabricius), the northern black widow, *Latrodectus variolus* Walkenaer, and the western black widow, *Latrodectus hesperus* Chamberlin & Ivie.

Baeus latroducti Dozier

Baeus latroducti was recorded emerging from egg sacs of black widows in southern California and the island of Haiti, and was introduced into Hawaii (Bianchi 1945, Dozier 1931, Pierce 1939). After oviposition, emergences occur within seven days; the number of parasitoids per emergence was not indicated. Dozier (1931) and Pierce (1939) described the parasitoid as emerging from *L. mactans*. It has not been documented since the formal description separating *L. hesperus* from *L. mactans* (Chamberlin and Ivie 1935) as to whether or not *B. latroducti* will emerge from egg sacs of *L. hesperus*.

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