CATOLACCUS HUNTERI (HYMENOPTERA: PTEROMALIDAE), A PARASITE OF *ANTHONOMUS MACROMALUS* (COLEOPTERA: CURCULIONIDAE) IN SOUTH FLORIDA

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Acerola or Barbados Cherry, *Malpighia glabra* (L.) (= *punicifolia* L.), is a tropical fruit native to the West Indies, Central America, and South America (Stahl et al. 1955, Phillips 1991). The genus *Malpighia* is present from south Texas to Peru (Asenjo 1980). Recently, it has received world-wide attention as an exceptionally high natural source of ascorbic acid (vitamin C) found in the cherry-like fruit, and its cultivation has extended throughout the subtropics and tropics (Ledon 1958). Estimated commercial acreage in the Caribbean region is over 400 acres with a potential crop value of several million dollars (Melendez 1968, Gonzalez-Ibanez 1983). In Florida, acerola is grown in the southern part of the state in homeowner's yards and as a commercial crop. Flowering and fruit set occur almost continuously from April through November in Florida, and fruits mature in approximately 30 days (Stahl et al. 1955, Ledon 1958).

The major insect pests of acerola are comprised of a complex of weevils known collectively as acerola weevils; *Anthonomus sisyphus* Clark identified from Mexico, *A. acerolae* Clark from Brazil, *A. tomentosus* (Faust) from Trinidad and Venezuela, and *A. macromalus* Gyllenhal (= *A. flavus*, = *A. bidentatus*, = *A. malpighia*) reported from several islands in the Caribbean region and Florida (Clark & Burke 1985, Clark 1992). A. macromalus was first reported in Dade County, Florida, in 1972 (Stegmaier & Burke 1974). This species appears to be native to the Neotropics, with reports from Dade County, Florida (USA) and from many of the islands of the Caribbean Region (The Dominican Republic, Puerto Rico, US Virgin Islands, Tortola, Guadeloupe, St. Kitts, St. Lucia, Antigua, Martinique, the Grenadines, and Trinidad) (Clark & Burke 1985).

The biology of *A. macromalus* was reviewed by Stegmaier & Burke (1974), and Ballof (1993). Adults deposit eggs on the anthers of flower buds or in immature fruits. Acerola weevil larvae develop in the flowers and fruit causing extensive damage to floral reproductive structures and to the flesh of the fruit. This damage results in reduced yields. To our knowledge, parasitoids have not been reported from this weevil.

Acerola fruit were collected in Dade County as part of a population dynamics study to determine the presence and importance of natural enemies as mortality factors of the acerola weevil. Collection sites were established at the University of Florida Tropical Research and Education Center, Homestead, and at two commercial sites. One commercial site was located 3.4 km west of the Education Center and the other was adjacent to the east side of the Center. Random samples of immature (green) and ripe fruits from each site were collected weekly from 7 April through 31 August 1995. The mean number of fruit collected per site per date was 75.86 (S.E. 13.03, range 6-333). Fruits were immediately placed in plastic bags and transported to the laboratory where they were held in 30 cm^3 plastic cages at $26 \pm 1°C$. The cages were checked daily and insect emergence was recorded. When parasitoids were recovered, the percentage parasitism was calculated as the ratio of the number of emerged parasitoids/(number of emerged parasitoids + the number of emerged weevil adults) $\times$ 100.

The first parasitoid was observed on 21 April 1995 from Education Center acerola fruit. This wasp was identified by S. Heydon (Bohart Museum of Entomology, UC, Davis) as *Catolaccus* (*Heterolaccus*) *hunteri* Crawford (Hymenoptera: Pteromalidae). To the best of our knowledge, this is a new host for this species. No additional specimens of *C. hunteri* emerged from subsequent fruit collections from this site (Fig. 1). The percentage parasitism for the Research Center site was 0.042% (n = 1).

Catolaccus hunteri was recovered again from samples collected on 12 June 1995, and 26 June 1995, from the second and third sites, respectively. *Catolaccus hunteri* was continually collected from these sites during July and August (Fig. 1). Percentage parasitism was 0.986% (n = 17) and 0.603% (n = 42) from the second and third sites, respectively. It is probable that an extensive survey in Florida and the Caribbean Region would contribute new parasitoid records for *A. macromalus* and perhaps other species of *Anthonomus*.

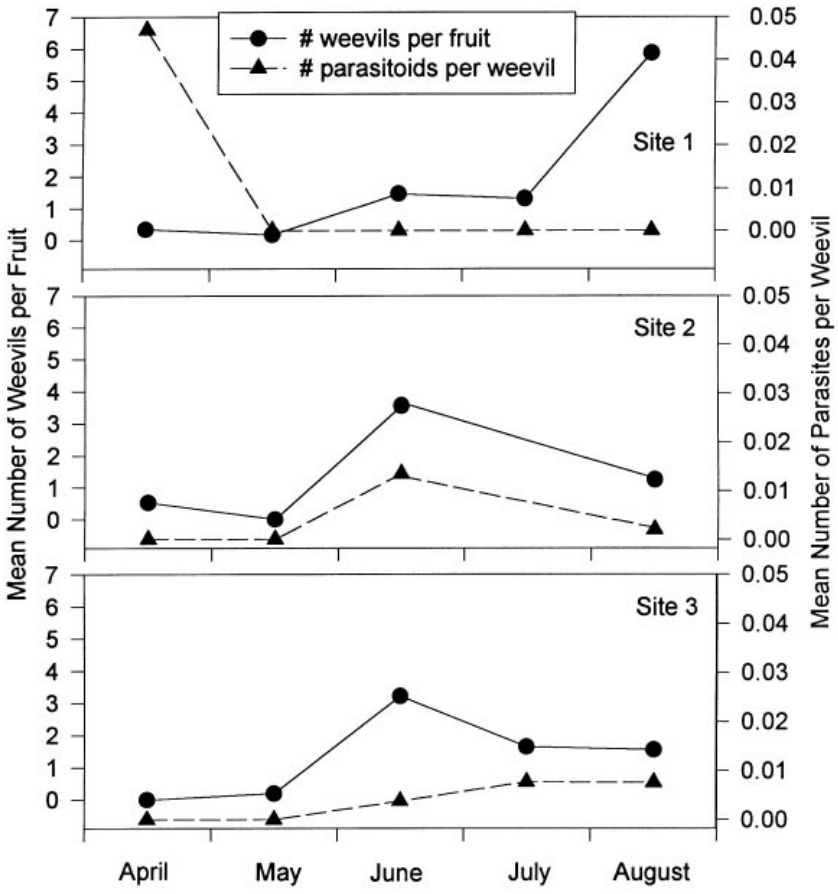

Fig. 1. Monthly emergence of *A. macromalus* and *C. hunteri* from three sites in South Florida. Site 1 (Tropical Research and Education Center), sites 2 and 3 (commercial orchards).

The highest incidence of *C. hunteri* coincided with high host densities during the months of June and August (Fig. 1). This parasite acts as an ectoparasitoid of acerola weevil larvae (personal observation) and is a known larval ectoparasitoid of several anthonomids (Pierce 1908, 1910). *Catolaccus hunteri* is one of the major parasitoids of the cotton boll weevil, *Anthonomus grandis grandis* Boheman (Cate et al. 1990, Ramalho & Wandeley 1996). This parasitoid has a known host range of at least 13 other species of *Anthonomus* in the New World and occurs in Delaware, throughout the southern US (including Arizona and California), Mexico, Guatemala, Peru, Ecuador, Colombia, Brazil, and Hawaii (Townsend 1913, Muesebeck et al. 1951, Ramalho & Wanderley 1996). The biology of *C. hunteri* is described by Pierce et al. (1912) and Berry (1947).

Based on these findings, *C. hunteri* hold promise as a biological control agent against the acerola weevil. However, further studies such as the efficacy and timing of augmentive releases of *C. hunteri* need to be conducted.

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Summary

The parasite *Catolaccus hunteri* Crawford (Hymenoptera: Pteromalidae) is reported for the first time on *Anthonomus macromalus* Gyllenhal (Coleoptera: Curculionidae) in Florida. Percentage parasitism was found to be as high as 0.986% in acerola fruit.

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