Research Note

PARACOCCUS MARGINATUS *WILLIAMS AND GRANARA DE WILLINK (HOMOPTERA: PSEUDOCOCCIDAE) AFFECTING PAPAYA IN PUERTO RICO*[1,2]

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The papaya mealybug (PM), *Paracoccus marginatus* Williams and Granara de Willink (Homoptera: Pseudococcidae), was detected 10 January 2001 infesting papaya plantings in Isabela, Puerto Rico. The PM was collected from experimental fields of the Puerto Rico Agricultural Experiment Station located at State Road #2, Km 114.2 (18°28'23N; 66°52'18W; 145.4 meters above sea level) Isabela, Puerto Rico.

The PM is recognized as a pest of papaya (*Carica papaya* L.), cassava (*Manihot esculenta* Crantz), *Hibiscus* spp., eggplant (*Solanum melongena* L.), avocado (*Persea americana* Mill.), annona (*Annona* spp.), and sweet potato [*Ipomoea batatas* (L.) Lam.] (Williams and Granara, 1992; Pantoja et al., 2002). This insect has been reported from papaya in Baja California, Florida, and Hawaii; and from cassava in Mexico (Williams and Granara, 1992). The insect is known to have been present since 1994 in Antigua, Belize, British Virgin Islands, Costa Rica, the Dominican Republic, Guatemala, Haiti, Nevis, St. Kitts, and the US Virgin Islands (Miller et al., 1999; Walker et al., 2005). In the United States of America the pest has been reported from Florida since 1998 (Miller et al., 1999; Walker et al., 2005) and from Hawaii since 2004 (Heu and Fukada, 2005). *Paracoccus marginatus* was first intercepted from Puerto Rico in 1995, and by 1998 it was found to be distributed throughout Puerto Rico with a higher density on the west side of the island (Sáez, 2000).

Paracoccus marginatus feeds on leaves, stems, fruits, and even on seedlings. On hibiscus plants in Florida the PM causes deformation, wrinkling and rolling of the leaves' edges and early leaf drop (Miller et al., 1999; Walker et al., 2005; Heu and Fukada, 2005). Attack on unripe papaya fruit causes sap running and blemishes, a source of fruit downgrading. Papaya fruits heavily infested with PM are essentially inedible. Under heavy infestations insects congregate in the upper part of the tree or near the main vein on the abaxial side of the lower leaves (Pantoja et al., 2002; Heu and Fukada, 2005). In Mexico, heavy infestations are occasionally found in commercial orchards; however, major infestations in Veracruz, Mexico, regularly occur prior to the rainy season (Valencia, 1975).

No reports could be found documenting PM yield reduction. In Puerto Rico, severe infestation that occurred during 2001 and 2002 required several insecticide applications

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to control the pest (Pantoja and Abreu, personal observation). Severe infestation in papaya has been documented in St. Thomas, St. Croix, St. Kitts, and the Dominican Republic (Sáez, 2000).

Diagnostic characteristics of PM are a yellowish body with a series of short waxy filaments around the margin (Miller et al., 1999; Walker et al., 2005). The ovisac is produced ventrally only, and can be twice the length of the body of the adult female. When specimens are placed in alcohol, they turn to blue-black.

Biological control appears to be the main factor keeping the species under control in Mexico, where the most important natural enemies are the encyrtids *Anagyrus* spp., *Acerophagus* spp., and *Apoanagyrus* spp. (González et al., 1999; Walker et al., 2005). Common predators such as *Chrysopa* spp. and *Chilocorus* spp. can affect the PM, but usually these predators are found in low densities. Because of the papaya mealybug's potential pest status in the Caribbean region, a classical biological control program against *P. marginatus* was initiated by introducing parasites from Mexico into the Bahamas and Florida (González et al., 1999; Walker et al., 2005). The Department of Agriculture of Puerto Rico and the United States Department of Agriculture released *Aponagyrus* spp., *Anagurys* spp., and *Acerophagus* spp. for PM control on the island (Ramírez and Sáez, 2002; Walker et al., 2005). *Acerophagus* spp. is the dominant parasitoid controlling PM in Puerto Rico and the Dominican Republic (Walker et al., 2005). Research is needed to study the distribution of *P. marginatus* in Puerto Rico in order to correlate insect density with yield reduction.

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